APPENDIX

GEOTECHNICAL INVESTIGATION REPORT



Geotechnical Investigation Report

Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47), City of Brampton, Ontario

Wood Reference: TP115086

Prepared for:

City of Brampton

1975 Williams Parkway, Brampton, ON, L6S 6E5

August 15, 2022



Geotechnical Investigation Report

Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47), City of Brampton, Ontario Halton Region, Ontario

Wood Reference: TP115086

Prepared for:

City of Brampton 1975 Williams Parkway, Brampton, ON, L6S 6E5

Prepared by:

Wood Environment & Infrastructure Solutions Canada Limited

3450 Harvester Road, Suite 100 Burlington, Ontario, L7N 3W5 Canada T: 905-335-2353

15 August 2022

Copyright and non-disclosure notice

The contents and layout of this report are subject to copyright owned by Wood (© Wood Environment & Infrastructure Wood Canada Limited) save to the extent that copyright has been legally assigned by us to another party or is used by Wood under license. To the extent that we own the copyright in this report, it may not be copied or used without our prior written agreement for any purpose other than the purpose indicated in this report. The methodology (if any) contained in this report is provided to you in confidence and must not be disclosed or copied to third parties without the prior written agreement of Wood. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests. Any third party who obtains access to this report by any means will, in any event, be subject to the Third-Party Disclaimer set out below.

Third-party disclaimer

Any disclosure of this report to a third party is subject to this disclaimer. The report was prepared by Wood at the instruction of, and for use by, our client named on the front of the report. It does not in any way constitute advice to any third party who is able to access it by any means. Wood excludes to the fullest extent lawfully permitted all liability whatsoever for any loss or damage howsoever arising from reliance on the contents of this report. We do not however exclude our liability (if any) for personal injury or death resulting from our negligence, for fraud or any other matter in relation to which we cannot legally exclude liability.

August 15, 2022

City of Brampton 1975 Williams Parkway, Brampton, ON, L6S 6E5

Via E-mail: Soheil.Nejatian@brampton.ca

Attention: Mr. Soheil Nejatian, P. Eng., Senior Project Engineer

Capital Works, City of Brampton

RE: Submission of Final Geotechnical Investigation

Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47)

City of Brampton - RFP No. RFP2015-016

Dear Mr. Goolsarran:

Wood Environment & Infrastructure Solutions Canada Limited take pleasure in enclosing the final Geotechnical Investigation Report carried out for the abovementioned project and we will be glad to discuss any questions arising from this work.

We thank you for giving us this opportunity to be of service to you.

Yours truly,

Wood Environment & Infrastructure Solutions Canada Limited

Hoda Seddik., M. A. Sc., P. Eng.,

Consulting Engineer

Principal Pavement Engineer/Group Lead

Seddik



CENIE	241		PAGE
GENEI 1.0		ODUCTION	
2.0.		RT FORMAT	
3.0	SCOP	E OF WORK	
	3.1	Pavement Investigation	
	3.2	Foundation Investigation	
	3.3	Limited Soil Chemical Analysis	
	3.4	Hydrogeological Investigation	
	3.5	Report	
4.0	SITE F	PHYSIOGRAPHY	14
5.0	PROJ	ECT METHODOLOGY	15
	5.1	Overall Investigation Approach	15
	5.2	Pavement Investigation	28
		5.2.1 Visual Condition Survey	28
		5.2.2 Borehole Investigation for Pavement Investigation	28
	5.3	Geotechnical Investigation	
		5.3.1 Underground Utilities	28
		5.3.2 Structures	
	5.4	Laboratory Tests	
	5.5	Groundwater Measurements	29
SECTIO	ON A: C	OLERAINE DRIVE (FROM EAST-WEST ARTERIAL TO MAYFIELD DRIVE, ~ 3.0 KM)	30
A1.0	OVER	ALL SUBSURFACE CONDITION	30
	A1.1	Topsoil	30
	A1.2	Asphaltic Concrete and Concrete	31
	A1.3	Granular Fill	
	A1.4	Silty Clay / Clayey Silt Fill	31
	A1.5	Silty Clay / Clayey Silt Till	32
	A1.6	Groundwater	32
	A1.7	Soil Corrosivity	33
A2.0	PAVE	MENT INVESTIGATIONS AND DESIGN	34
	A2.1	Visual Pavement Condition Survey	35
	A2.2	Subsurface Conditions	35
	A2.3	Groundwater Conditions	36
	A2.4	Pavement Design	36
		A2.4.1 Pavement Structure Adequacy	36
		A2.4.2 Existing and Forecasted Traffic Data	
		A2.4.3 Flexible Structural Pavement Design for Widening	38





		A2.4.4 Widening Coleraine Drive from E-W Arterial to Mayfield Drive	39
	A2.5	Rehabilitation Strategies	
	A2.6	Recommendations and Construction Features for Pavement	
		A2.6.1 Rehabilitation Strategies	
		A2.6.2 Widening of Coleraine Drive	
		A2.6.3 Subgrade / Road Base Preparation and Compaction	
		A2.6.4 Stripping and Sub-Excavation	
		A2.6.5 Drainage	
		A2.6.6 Hot Mixes and PGAC Type	
		A2.6.7 In-Situ Compaction for Hot Mix	
		A2.6.8 Frost Depth	
		A2.6.8 Detouring	
A3.0	UNDE	RGROUND UTILITIES	43
	A3.1	Subsurface Conditions	
	A3.2	Discussions and Recommendations for Underground Utilities	44
		A3.2.1 Founding Subgrade Conditions	
		A3.2.2 Trench Excavation	
		A3.2.3 Bedding	
		A3.2.4 Backfill	
		A3.2.5 Anti-Seepage Collars	47
A4.0	CULVI	ERT NO. 1 (STATION 1+650)	47
	A4.1	Subsurface Conditions	
		A4.1.1 Surficial Cover – Asphaltic Concrete	
		A4.1.2 Fill Soils	
		A4.1.3 Silty Clay / Clayey Silt Till	
		A4.1.4 Groundwater Conditions	
	A4.2	DISCUSSIONS AND RECOMMENDATIONS FOR CULVERT	
		A4.2.1 Foundation	
		A4.2.2 Soil Parameters for Design	
		A4.2.3 Earthquake Considerations	
		A4.2.4 Scour Protection	
		A4.2.5 Backfill for Culvert	
		A4.2.6 Retaining Wall	
		A4.2.7 Permanent Slopes	
A5.0	Gener	al Considerations for Design and Construction	
	A5.1	Site Preparation	
	A5.2	Embankment Widening	
	A5.3	Engineered Fill	
	A5.4	Excavation and Dewatering	
	A5.5	Temporary shoring	
	A5.6	Suitability of Existing Soils for Backfilling	
A6.0	PRELI	MINARY SOIL CHEMICAL ANALYSES	55



	A6.1	Methodology	56
	A6.2	Sample Selection for Analyses	
		A6.2.1 Site Condition Standards	57
		A6.2.2 Soil Sampling, Inspection & Preservation Procedures	57
	A6.3	Environmental Test Results and Considerations	
	A6.4	Quality Assurance / Quality Control	
SECTI	ON B: A	RTERIAL A2 (FROM MAYFIELD ROAD TO REGIONAL ROAD 50, ~3.4 KM)	61
B1.0	OVER/	ALL SUBSURFACE CONDITION	61
	B1.1	Topsoil	61
	B1.2	Asphaltic Concrete	61
	B1.3	Granular Fill	61
	B1.4	Silty Clay Fill	62
	B1.5	Silty Clay / Clayey Silt Till	62
	B1.6	Silty Sand / Sand and Silt Till	63
	B1.7	Silty Sand / Sandy Silt Till	64
	B1.8	Groundwater	64
	B1.9	Soil Corrosivity	65
B2.0	PAVE	MENT INVESTIGATIONS AND DESIGN	66
	B2.1	Visual Pavement Condition Survey	67
	B2.2	Subsurface Conditions	67
	B2.3	Groundwater Conditions	67
	B2.4	Pavement Design	67
		B2.4.1 Forecasted Traffic Data	
		B2.4.2 Flexible Structural Pavement Design	68
	B2.5	Recommendations and Construction Features for Pavement	
		B2.5.1 New Construction	69
		B2.5.2 Subgrade / Road Base Preparation and Compaction	70
		B2.5.3 Stripping and Sub-Excavation	70
		B2.5.4 Drainage	70
		B2.5.5 Hot Mixes and PGAC Type	71
		B2.5.6 In-Situ Compaction for Hot Mix	72
		B2.6.7 Frost Depth	72
		B2.6.7 Detouring	72
B3.0	UNDE	RGROUND UTILITIES	72
	B3.1	Subsurface Conditions	72
	B3.2	Discussions and Recommendations for Underground Utilities	
	B3.2.1	Founding Subgrade Conditions	
	B3.2.2	Trench Excavation	
	B3.2.3	Bedding	
	B3.2.4	Backfill	
	B3.2.5	Anti-Seepage Collars	
D4 0		DTC ON ADTEDIAL A2 (STATIONS 0 , 000 and 0 , 650)	76



	B4.1	Subsurface Cor	nditions - Culvert on Arterial A2 (Station 0+000)	76
		B4.1.1 Fill Soi	ls	77
		B4.1.2 Silty Cl	ay / Clayey Silt Till	77
		B4.1.3 Silty Sa	and / Sandy Silt Till	77
		B4.1.4 Ground	dwater Conditions	78
	B4.2	Subsurface Cor	nditions - Culvert on Arterial A2 (Station 0+650)	78
		B4.2.1 Topsoi	l	78
		B4.2.2 Fill Soi	ls	78
		B4.2.3 Sand a	nd Silt	79
		B4.2.4 Silty Cl	ay / Clayey Silt Till	79
			dwater Conditions	
	B4.3	DISCUSSIONS A	AND RECOMMENDATIONS FOR CULVERT	79
		B4.3.1 Founda	ation	80
		B4.3.2 Soil Pa	rameters for Design	81
			uake Considerations	
		B4.3.4 Scour I	Protection	82
		B4.3.5 Backfi	ll for Culvert	83
		B4.3.6 Retaini	ing Wall	83
		B4.3.7 Permai	nent Slopes	83
B5.0	Gener	al Consideration	ns for Design and Construction	84
	B5.1	Site Preparatio	n	84
	B5.2	Embankment V	Videning	84
	B5.3	Engineered Fill		85
	B5.4	Excavation and	Dewatering	85
	B5.5	Temporary sho	ring	87
	B5.6	Suitability of Ex	kisting Soils for Backfilling	87
B6.0	PRELI	MINARY SOIL C	HEMICAL ANALYSES	87
	B6.1	Methodology		88
	B6.2	Sample Selection	on for Analyses	88
		B6.2.1 Site Co	ondition Standards	89
		B6.2.2 Soil Sa	mpling, Inspection & Preservation Procedures	89
	B6.3	Environmental	Test Results & Considerations	90
	B6.4	Quality Assurar	nce / Quality Control	92
SECTI	ON C: C	OUNTRYSIDE DI	RIVE (FROM ST. JOHNS ROAD TO HIGHWAY 50, ~ 2.7 KM)	93
C1.0	OVER	ALL SUBSURFAC	E CONDITION	93
	C1.1			
	C1.2	•	rete	
	C1.3	•		
	C1.4		/ey Silt Fill	
	C1.5		ndy Silt / Sand and Silt Till	
	C1.6		/ey Silt Till	
	C1.7			







	C1.8	Soil Corrosivity	98		
C2.0	PAVE	MENT INVESTIGATIONS AND DESIGN	99		
	C2.1	Visual Pavement Condition Survey	99		
	C2.2	Subsurface Conditions	100		
	C2.3	Groundwater Conditions	101		
	C2.4	Pavement Design	101		
		C2.4.1 Pavement Structure Adequacy	101		
		C2.4.2 Existing and Forecasted Traffic Data	102		
		C2.4.3 Flexible Structural Pavement Design for Widening	102		
		C2.4.4 Widening Countryside Drive from St. Johns Road to Highway 50			
	C2.5	Rehabilitation Strategies			
	C2.6	C2.6 Recommendations and Construction Features for Pavement			
		C2.6.1 Rehabilitation Strategies			
		C2.6.2 Widening of Countryside Drive			
		C2.6.3 Subgrade / Road Base Preparation and Compaction			
		C2.7.4 Stripping and Sub-Excavation			
		C2.6.5 Drainage			
		C2.6.6 Hot Mixes and PGAC Type			
		C2.6.7 In-Situ Compaction for Hot Mix			
		C2.6.8 Frost Depth			
		C2.6.9 Detouring	108		
C3.0	UNDE	ERGROUND UTILITIES	108		
	C3.1	Subsurface Conditions	108		
	C3.2	Discussions and Recommendations for Underground Utilities			
		C3.2.1 Founding Subgrade Conditions			
		C3.2.2 Trench Excavation			
		C3.2.3 Bedding			
		C3.2.4 Backfill			
		C3.2.5 Anti-Seepage Collars	111		
C4.0	CULV	ERTS ON COUNTRYSIDE DRIVE (STATIONS 0+350, 0+700 AND 1+950)	111		
	C4.1	Subsurface Condition - Culvert on Countryside Drive (Station 0+350)			
		C4.1.1 Asphaltic Concrete			
		C4.1.2 Fill Soils			
		C4.1.3 Silty Sand / Sandy Silt / Sand and Silt Till			
		C4.1.4 Silty Clay / Clayey Silt Till			
		C4.1.5 Groundwater Conditions			
	C4.2	Subsurface Condition – Culvert on Countryside Drive (Station 0+700)			
		C4.2.1 Asphaltic Concrete			
		C4.2.2 Fill Soils			
		C4.2.4 Silty Clay / Clayey Silt Till			
		C4.2.5 Groundwater Conditions			
	C4.3	Subsurface Conditions - Culvert on Countryside Drive (Station 1+950)	115		







		C4.3.1 Asphaltic Concrete	115
		C4.3.2 Fill Soils	115
		C4.3.3 Silty Sand / Sandy Silt / Sand and Silt Till	116
		C4.3.4 Silty Clay / Clayey Silt Till	116
		C4.3.5 Groundwater Conditions	116
	C4.4	DISCUSSIONS AND RECOMMENDATIONS FOR CULVERTS	117
		C4.4.1 Foundation	117
		C4.4.2 Soil Parameters for Design	118
		C4.4.3 Earthquake Considerations	
		C4.4.4 Scour Protection	
		C4.4.5 Backfill for Culvert	120
		C4.4.6 Retaining Wall	
		C4.4.7 Permanent Slopes	121
C5.0	Gener	ral Considerations for Design and Construction	121
	C5.1	Site Preparation	121
	C5.2	Embankment Widening	121
	C5.3	Engineered Fill	122
	C5.4	Excavation and Dewatering	122
	C5.5	Temporary shoring	124
	C5.6	Suitability of Existing Soils for Backfilling	
C 6.0	PRELI	MINARY SOIL CHEMICAL ANALYSES	124
	C6.1	Methodology	125
	C6.2	Sample Selection for Analyses	125
		C6.2.1 Site Condition Standards	
		C6.2.2 Soil Sampling, Inspection & Preservation Procedures	
	C6.3	Environmental Test Results & Considerations	
	C6.4	Quality Assurance / Quality Control	
SECTI	ON D: C	CLARKWAY DRIVE (FROM CASTLEMORE ROAD TO MAYFIELD DRIVE, \sim 4.3 KI	M) 130
D1.0	OVER	ALL SUBSURFACE CONDITION	130
	D1.1	Topsoil	130
	D1.2	Asphaltic Concrete	131
	D1.3	Granular Fill	131
	D1.4	Silty Clay / Clayey Silt Fill	132
	D1.5	Sandy Silt Fill	132
	D1.6	Silty Clay / Clayey Silt Till	132
	D1.7	Silty Sand / Sand and Silt Till	133
	D1.8	Groundwater	134
	D1.9	Soil Corrosivity	134
D2.0	PAVE	MENT INVESTIGATIONS AND DESIGN	136
	D2.1	Visual Pavement Condition Survey	136
	D2 2	Subsurface Conditions	127





	D2.3	Ground	dwater Conditions	138
	D2.4	Paveme	ent Design	138
		D2.4.1	Pavement Structure Adequacy	138
		D2.4.2	Existing and Forecasted Traffic Data	139
		D2.4.3	Flexible Structural Pavement Design for Widening	140
		D2.4.4	Widening Clarkway Drive from Castlemore Drive to Mayfield Drive	141
	D2.5	Rehabil	litation Strategies	142
	D2.6	Recomi	mendations and Construction Features for Pavement	142
		D2.6.1	Rehabilitation Strategies	142
			Widening of Coleraine Drive	
		D2.6.3	Subgrade / Road Base Preparation and Compaction	143
		D2.6.4	Stripping and Sub-Excavation	143
			Drainage	
		D2.6.6	Hot Mixes and PGAC Type	144
		D2.6.7	1	
			1	
		D2.6.9	Detouring	145
D3.0	UNDE	RGROUN	ND UTILITIES	145
	D3.1	Subsurf	face Conditions	145
	D3.2	Discuss	sions and Recommendations for Underground Utilities	146
		D3.2.1	Founding Subgrade Conditions	146
		D3.2.2	Trench Excavation	147
		D3.2.3	Bedding	147
		D3.2.4	Backfill	148
		D3.2.5	Anti-Seepage Collars	149
D4.0	CULVI	RTS ON	CLARKWAY DRIVE (STATION 2+275 AND 3+325)	149
	D4.1	Subsurf	face Conditions - Culvert on Clarkway Drive (Station 2+275)	149
		D4.1.1	Asphaltic Concrete	149
		D4.1.2	Fill Soils	150
		D4.1.3	Silty Clay / Clayey Silt Till	150
		D4.1.4	Silty Sand / Sandy Silt Till	150
		D4.1.5	Groundwater Conditions	151
	D4.2	Subsurf	face Conditions - Culvert on Clarkway Drive (Station 3+325)	151
		D4.2.1	Asphaltic Concrete	151
		D4.2.2	Fill Soils	151
		D4.2.2	Silty Clay / Clayey Silt Till	152
			Groundwater Conditions	
	D4.3	DISCUS	SSIONS AND RECOMMENDATIONS FOR CULVERTS	152
		D4.3.1	Foundation	153
		D4.3.2	Soil Parameters for Design	154
		D4.3.3	Earthquake Considerations	155
			Scour Protection	
		D4.3.5	Backfill for Culvert	155







		D4.3.6 Retaining Walls	156
		D4.3.7 Permanent Slopes	
D5.0	Gener	al Considerations for Design and Construction	156
	D5.1	Site Preparation	156
	D5.2	Embankment Widening	
	D5.3	Engineered Fill	
	D5.4	Excavation and Dewatering	
	D5.5	Temporary shoring	159
	D5.6	Suitability of Existing Soils for Backfilling	
D6.0	PRELI	MINARY SOIL CHEMICAL ANALYSES	160
	D6.1	Methodology	160
	D6.2	Sample Selection for Analyses	161
		D6.2.1 Site Condition Standards	161
		D6.2.2 Soil Sampling, Inspection & Preservation Procedures	162
	D6.3	Environmental Test Results & Considerations	162
	D6.4	Quality Assurance / Quality Control	166
SECTIO	ON E: E/	AST-WEST ARTERIAL	167
(FRON	/I THE G	ORE ROAD TO COLERAINE DRIVE, ~ 2.4 KM)	167
	E1.1	Topsoil	167
	E1.2	Silty Clay / Clayey Silt Fill	
	E1.3	Sandy Silt Fill	168
	E1.4	Silty Clay / Clayey Silt Till	168
	E1.5	Silty Sand / Sandy Silt Till	169
	E1.6	Weathered Shale	170
	E1.7	Groundwater	170
	E1.8	Soil Corrosivity	170
E2.0	PAVE	MENT INVESTIGATIONS AND DESIGN	171
	E2.1	Visual Pavement Condition Survey	
	E2.2	Subsurface Conditions	172
	E2.3	Groundwater Conditions	172
	E2.4	Pavement Design	173
		E2.4.1 Forecasted Traffic Data	
		E2.4.2 Flexible Structural Pavement Design	173
	E2.5	Recommendations and Construction Features for Pavement	175
		B2.5.1 New Construction	
		E2.5.2 Subgrade / Road Base Preparation and Compaction	
		E2.5.3 Stripping and Sub-Excavation	
		E2.5.4 Drainage	
		E2.5.5 Hot Mixes and PGAC Type	
		E2.5.6 In-Situ Compaction for Hot Mix	
		F2 5 7 Frost Depth	177



		E2.5.8	Detouring	177
E3.0	UNDE	RGROUN	ID UTILITIES	177
	E3.1	Subsurf	face Conditions	177
	E3.2	Discuss	ions and Recommendations for Underground Utilities	178
		E3.2.1	Founding Subgrade Conditions	178
		E3.2.2	Trench Excavation	179
		E3.2.3	Bedding	180
		E3.2.4	Backfill	180
		E3.2.5	Anti-Seepage Collars	181
E4.0	CULVE 181	RTS ON	PLANNED EAST-WEST ARTERIAL ROAD (STATION 0+500, 1+100 and 2+4	50)
	E4.1	Subsurf	face Conditions - Culvert on Planned East-West Arterial Road (Station 0+500)	181
		E4.1.1	Topsoil	182
		E4.1.2	Fill Soils	182
		E4.1.3	Silty Clay Till	182
		E4.1.4	Silty Sand / Sandy Silt Till	182
	E4.1.5	Weathe	ered Shale	183
		E4.1.6	Groundwater Conditions	183
	E4.3	DISCUS	SIONS AND RECOMMENDATIONS FOR CULVERT (STATION 0+500)	183
		E4.3.1	Foundation	183
		E4.3.2	Soil Parameters for Design	184
		E4.3.3	Earthquake Considerations	185
		E4.3.4	Scour Protection	185
		E4.3.5	Backfill for Culvert	186
		E4.3.6	Retaining Walls	186
		E4.3.7	Permanent Slopes	186
E5.0	Genera	al Consid	lerations for Design and Construction	187
	E5.1	Site Pre	paration	187
	E5.2	Embanl	rment Construction	187
	E5.3	Engine	ered Fill	188
	E5.4	Excavat	ion and Dewatering	188
	E5.5		rary shoring	
	E5.6	Suitabil	ity of Existing Soils for Backfilling	190
E6.0	PRELIF	MINARY	SOIL CHEMICAL ANALYSES	190
	E6.1	Method	dology	190
	E6.2	Sample	Selection for Analyses	191
		E6.2.1	Site Condition Standards	
		E6.2.2	Soil Sampling, Inspection & Preservation Procedures	192
	E6.3		mental Test Results & Considerations	
	E6.4	Qualit	y Assurance / Quality Control	194



REPORT LIMITATIONS

FIGURES

Figure: Site Plan

Section A - Coleraine Drive: Figure Nos. 1A & 1B:

Section B - Arterial A2: Figure Nos. 2A & 2B

Section C - Countryside Drive: Figure Nos. 3A & 3B Section D - Clarkway Drive: Figure Nos. 4A to 4C Section E – East-West Arterial: Figure Nos. 5A & 5B

RECORD OF BOREHOLES

Explanation of Borehole Logs

Section A - Coleraine Drive: Boreholes BH A1 to A31, BH S1 and BH S2

Section B - Arterial A2: Boreholes BH B1 to B28, BH S3 to BH S6

Section C - Countryside Drive: Boreholes BH C1 to C37, BH S7 to BH S12

Section D - Clarkway Drive: Boreholes BH D1 to D57, BH S13 to BH S16

Section E – East-West Arterial: Boreholes BH E1 to E5, E7, BH S17 and BH E6/S18)

APPENDICES

Appendix A: Visual Condition Survey Results

Appendix A-A: Section A - Coleraine Drive

Appendix A-B: Section B – Arterial A2 (Not applicable for New Alignment)

Appendix A-C: Section C - Countryside Drive

Appendix A-D: Section D - Clarkway Drive

Appendix A-E: Section E – East-West Arterial (Not applicable for New Alignment)

Appendix B: Soil Laboratory Test Results

Appendix B-A: Section A - Coleraine Drive (Figure Nos. B-A1 to B-A3)

Appendix B-B: Section B - Arterial A2 (Figure Nos. B-B1 to B-B5)

Appendix B-C: Section C - Countryside Drive (Figure Nos. B-C1 to B-C7)

Appendix B-D: Section D - Clarkway Drive (Figure Nos. B-D1 to B-D4)

Appendix B-E: Section E – East-West Arterial ((Figure Nos. B-E1 to B-E3)

Appendix C: Soil Analytical Results

Appendix C-A: Section A - Coleraine Drive (Tables 1A to 4A)

Appendix C-B: Section B - Arterial A2 (Tables 1B to 10B)

Appendix C-C: Section C - Countryside Drive (Tables 1C to 10C)

Appendix C-D: Section D - Clarkway Drive (Tables 1D to 10D)

Appendix C-E: Section E – East – West Arterial (Table 1D to 10E)

Appendix D: Certificates of Analyses



GENERAL

1.0 INTRODUCTION

Wood Environment & Infrastructure Solutions Canada Limited ("Wood"), was retained by City of Brampton ("the City") to conduct an Environmental Assessment Study (EA Study) for Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47) in the City. As part of the EA Study, a geotechnical investigation was required for the approximately 16 km of new and/or widened arterial roadways in northeast Brampton. This report presents the findings of the geotechnical investigation. A hydrogeological investigation was also carried out for the project, the associated findings of which are presented in a separate cover. The project site location is shown in Figure Site Plan.

The purpose of the geotechnical investigation was to assess the existing pavement condition and obtain subsurface and groundwater information by means of a limited number of boreholes within the investigated areas. This information was used to provide recommendations for pavement design alternatives for the new roads/road widening, foundation design for culverts, slope stability analysis for embankments (where required), roadway cut and fill operations, dewatering requirements, and chemical analyses and disposal requirements of surplus materials in conformance to the MOE Clean-up guidelines for this project.

The work request and authorization to proceed with this investigation was received via email after approval of the boreholes plan from Mr. Mario Goolsarran, P. Eng, Senior Project Engineer, City of Brampton. The investigation was carried out in accordance with Wood's proposal TP02200, dated May 5, 2015, and the requirements set out the City's RFP2015-16.

This report contains the factual results of the geotechnical / pavement investigation. The number of boreholes may not be sufficient to determine all the factors that may affect construction methods and costs. Sub-surface soil and groundwater conditions between and beyond the boreholes may differ from those encountered at the borehole locations, and conditions may become apparent during construction, which could not be detected or anticipated at the time of the site investigation.

The anticipated construction conditions are also discussed, but only to the extent that they will likely influence design decisions. Construction methods discussed, however, express Wood's opinion only and are not intended to direct Contractors on how to carry out the construction. Contractors should be aware that the data and their interpretation presented in this report may not be sufficient to assess all the factors that may have an effect upon the construction.

The report is prepared with the conditions that the design and construction will be in accordance with all applicable standards, codes, regulations of authorities having jurisdiction, and carried out using good engineering practices. Further, the recommendations and opinions in this report are applicable only to the proposed project as described herein.

Once the details of the proposed works are finalized, on-going liaison with Wood is recommended during both the design and construction phases of the project to confirm that the recommendations in this report

are applicable and/or correctly interpreted and implemented. Also, any queries concerning the geotechnical aspects of the proposed project should be directed to Wood for further elaboration and/or clarification.

The enclosed *Limitations to Geotechnical Reports* are an integral part of this report.

2.0. REPORT FORMAT

Section ID	Content
General (This Section)	Overall General Project Information
Section A	Investigation results and recommendations for project components along Coleraine Drive, from proposed East-West Arterial to Mayfield Road (~ 3.0 km)
Section B	Investigation results and recommendations for project components along proposed Arterial A2, from Mayfield Road to Major Mackenzie Drive / Highway 50 (~3.4 km)
Section C	Investigation results and recommendations for project components along Countryside Drive, from St. Johns Road to Highway 50 (~ 2.7 km)
Section D	Investigation results and recommendations for project components along Clarkway Drive, from Castlemore Road to Mayfield Road (~ 3.0 km)
Section E	Investigation results and recommendations for project components along proposed East-West Arterial, from The Gore Road to Colerain Drive (~2.4 km)

3.0 SCOPE OF WORK

The scope of work for the geotechnical pavement investigation included: (i) pavement investigation for new construction / rehabilitation / widening / reconstruction; (ii) foundation investigation for structure (culverts - new and widening) and installation of underground utility; (iii) limited soil chemical analysis for soil disposal; and (iv) hydrogeological investigation (submitted in a separate report). The proposed arterial road network included five road corridors, two of which are new road alignments, as summarized in Table 3.1 based on the information provided in the RFP and as per Wood's review of site. As per the information provided, the road corridors are divided into two parts (Part A and Part B) based on the planned design and construction work.

Table 3.1: Summarized Data of the Arterial Road Network Under the EA Study

Part	Corridor	Planned Work	Road Type	From	То	Current Lanes	Planned Lanes	Appx. Length (km)
	Arterial A2 (Section A)	New Road	Major Arterial	Mayfield Rd	Major Mackenzie Drive / RR 50	none	6	3.4
А	Coleraine Drive (Section B)	Widening	Minor Arterial	E-W Arterial	Mayfield Drive	2	4	3.0
Sub-Total for Part A								



Part	Corridor	Planned Work	Road Type	From	То	Current Lanes	Planned Lanes	Appx. Length (km)
	Countryside Drive (Section C)	Widening	Minor Arterial	Clarkway Drive	RR 50	2	4	2.7
D	Clarkway Drive (Section D)	INew Road I	Minor Arterial	Castlemore Rd	E-W Arterial	2	4	1.3
В				E-W Arterial	Mayfield Drive		2 to 3	3.0
	East – West (E-W) Arterial (Section E)		Minor Arterial	The Gore Rd	Coleraine drive	none	4	2.4
Sub-Total for Part B								9.4
TOTAL (Part A & Part B)								15.8

3.1 Pavement Investigation

Pavement investigation included, but not limited to, the following:

- Visual pavement condition survey of existing road;
- Boreholes along the existing and new road alignments;
- Provision of pavement recommendations for new alignments and widening / rehabilitation / resurfacing of existing roads; and
- Pavement analysis and design, including reuse /recycling / removal options, will be conducted based on a 20-year service life.

3.2 Foundation Investigation

Foundation investigation included, but not limited to, the following:

- Boreholes for underground utility services (boreholes for pavement investigation were deepened as necessary);
- Boreholes for ten (10) structures (culverts new or widening). A monitoring well was to be installed at each structure location to monitor groundwater and for hydrogeological investigation (see Section 3.4);
- Slope stability analyses, where required. One analysis per structure (i.e. total up to ten) will be carried, if and where required;
- Provision of foundation recommendation for installation of underground utilities and structure foundations, including discussions on construction considerations, dewatering, etc.;
- Laboratory tests for soil classification.

3.3 Limited Soil Chemical Analysis

A limited soil chemical analyses was carried out for potential contaminants and assessment of the





environmental quality of soils to be excavated. Discussion with regard to contamination and disposal requirements of surplus materials are provided in conformance to the MECP clean-up guidelines.

3.4 Hydrogeological Investigation

A hydrogeological investigation was carried out along each road alignment to assess the existing groundwater conditions, determine impacts to water bearing formation / water well, provision of mitigation measures (if applicable), evaluation of construction methods, determination of possible requirement for dewatering / depressurization and / or sumping for construction etc. The report is to address applicable TRCA requirements. The findings of the hydrogeological study are presented in a separate report prepared by Wood.

3.5 Report

This Geotechnical Report includes factual conditions (field and laboratory test results), recommendations for pavement design and foundation design, and soil chemical analysis results, including corrosivity tests results, and discussion with regard to disposal options.

A separate Hydrogeological Investigation Report for the project has been prepared by Wood.

4.0 SITE PHYSIOGRAPHY

The project study area at the Highway 427 Industrial Secondary Plan Area (Area 47), located within the City of Brampton, Ontario, is within the physiographic region identified as the Peel Plain. The Peel Plain covers an area of about 300 square miles and extends towards the northeast from the Niagara Escarpment through the central portions of the York, Peel, and Halton municipalities. The Peel Plain consists of a till, containing shale and limestone fragments, that was originally deposited within a glacial lake basin (Lake Peel). The study area is the northern part of the Peel Plain that contains a bevelled till plain, that consists of fine-medium sand, and laminated silt and clay.

Based on Quaternary Geology, Bolton, Southern Ontario (Ministry of Natural Resources, Map 2275), the project area consists of Lacustrine-Wildfield Till Complex of stratified or non-stratified silt loam, silty clay loam or clay deposits, which may contain grits, silt balls or pebbles or may be interbedded with layers of till-like material.

The Peel Plain is underlain by Middle to Upper Ordovician sediments of the Georgian Bay Formation, Blue Mountain Formation, Billings Formation, Collingwood Member, and Eastview Member. The Georgian Bay Formation is characterized by interbedded grey-green to dark grey shale and fossiliferous calcareous siltstone to limestone. The Blue Mountain and Billings formations consist of dark blue-grey to brown to black shales with thin interbeds of limestone or calcareous siltstone. The Collingwood and Eastview members are characterized by black, organic-rich, fissile, very fine-grained limestones.



Based on Ontario Department of Mines, Preliminary Map No. P.470, Bolton Sheet, Southern, Bedrock Topography Series, bedrock in the project area could be about 8 m to 40 m below existing ground level.

References:

Armstrong, D.K., and Dodge, J.E.P. 2007. Paleozoic Geology of Southern Ontario, Ontario Geological Survey, pp. 5-5.

Armstrong, D.K. and Dodge, J.E.P. 2007. Paleozoic Geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release – Data 219.

Chapman L.J., and Putnam D.F. 1984. The Physiography of Southern Ontario, Third Edition. Ontario Geological Survey, Special Volume 2.

Chapman, L.J. and Putnam, D.F. 2007. Physiography of Southern Ontario; Ontario Geological Survey, Miscellaneous Release – Data 228.

Ontario Geological Survey, 2010, Surficial Geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release – Data 128 – Revised.

5.0 PROJECT METHODOLOGY

5.1 Overall Investigation Approach

Prior to start of fieldwork, proposed borehole location plans were submitted to the City for review and approval. Upon approval of the plan, the borehole locations were staked out on site by Wood. The final locations of the boreholes were adjusted, where necessary, based on existing underground utilities and site conditions.

Prior to drilling, permits for field work and utility locate clearances for existing underground utilities were obtained. The fieldwork was carried out between 20 January and 1 April 2020. At the time of this report, a total of 156 boreholes had been completed along Coleraine Drive, Arterial A2, Countryside Drive, and Clarkway Drive. The borehole details are provided in Table 5.1 to 5.5, and as-drilled borehole locations are shown in Figure Nos. 1A and 1B, 2A and 2B, 3A and 3B, 4A to 4C, 5A and 5B. The following boreholes have not been drilled and have been deferred to detail design stage, if required:

- Four (4) boreholes along Clarkway Drive (i.e. BH D14, BH D24, BH D30 and BH D42) were in conflict with existing underground utilities.
- Two (2) boreholes for Countryside Drive (i.e. BH C36 and C38).
- Five (5) boreholes along Arterial A2 located north of Countryside Drive (i.e. BH B29 to B33).
- Seventeen (17) boreholes for East-West Arterial (i.e. BH E8 to E22, S19 and S20).

Thirty-three (33) boreholes were drilled along Coleraine Drive as listed in Table 5.1.





Table 5.1: Borehole Details - Coleraine Drive

Borehole No.	Purpose of Borehole	Location / Approximate Station*	Coord	mate GPS linates NAD 83)	Depth Below Ground Surface	Ground Surface Elevation	Bottom Elevation	Figure No.
			Easting	Northing		(m)		
BH A1	Pavement & Underground utilities	Coleraine Dr., NBL, Sta. 0+000	605646	4853212	5.0	215.5	210.5	1A
BH A2	Pavement & Underground utilities	Coleraine Dr., NBL, Sta. 0+000	605648	4853213	1.8	215.4	213.5	1A
вн аз	Pavement & Underground utilities	Coleraine Dr., SBL, Sta. 0+150	605516	4853330	3.0	216.3	213.3	1A
BH A4	Pavement (topsoil measurement)	Coleraine Dr., SBL, Sta. 0+150	605511	485326	250 mm			1A
BH A5	Pavement & Underground utilities	Coleraine Dr., NBL, Sta. 0+300	605408	4853441	1.5	216.5	215.0	1A
BH A6	Pavement (topsoil measurement)	Coleraine Dr., NBL, Sta. 0+300	605412	4853445	230 mm			1A
BH A7	Pavement & Underground utilities	Coleraine Dr., SBL, Sta. 0+450	605353	4853491	1.5	218.2	216.6	1A
BH A8	Pavement & Underground utilities	Coleraine Dr., SBL, Sta. 0+450	605353	4853490	1.8	217.9	216.1	1A
BH A9	Pavement & Underground utilities	Coleraine Dr., NBL, Sta. 0+600	605252	4853597	5.0	219.1	214.1	1A
BH A10	Pavement & Underground utilities	Coleraine Dr., NBL, Sta. 0+600	605253	4853600	1.8	219.0	217.2	1A
BH A11	Pavement & Underground utilities	Coleraine Dr., SBL, Sta. 0+750	605117	4853720	3.0	219.9	216.8	1A
BH A12	Pavement (topsoil measurement)	Coleraine Dr., SBL, Sta. 0+750	605116	4853716	216 mm			1A
BH A13	Pavement & Underground utilities	Coleraine Dr., NBL, Sta. 0+900	605006	4853836	2.9	220.2	217.3	1A
BH A14	Pavement (topsoil measurement)	Coleraine Dr., NBL, Sta. 0+900	605008	4853841	200 mm			1A
BH A15	Pavement & Underground utilities	Coleraine Dr., SBL, Sta. 1+050	604898	4853934	1.5	221.5	220.0	1A
BH A16	Pavement (topsoil measurement)	Coleraine Dr., SBL, Sta. 1+050	604900	4853931	150 mm			1A
BH A17	Pavement & Underground utilities	Coleraine Dr., NBL, Sta. 1+200	604785	4854053	5.0	222.5	217.5	1A
BH A18	Pavement & Underground utilities	Coleraine Dr., NBL, Sta. 1+200	604785	4854054	1.8	222.9	221.1	1A
BH A19	Pavement & Underground utilities	Coleraine Dr., SBL, Sta. 1+350	604701	4854134	3.0	222.6	219.6	1A
BH A20	Pavement & Underground utilities	Coleraine Dr., SBL, Sta. 1+350	604693	4854133	1.2	222.4	221.2	1A







Borehole No.	Purpose of Borehole	Location / Approximate Station*	Approximate GPS Coordinates (UTM/NAD 83)		Coordinates (UTM/NAD 83) Relicition (UTM/NAD 83) Surf		Depth Below Ground Surface	Ground Surface Elevation	Bottom Elevation	Figure No.
			Easting	Northing		(m)				
BH A21	Pavement & Underground utilities	Coleraine Dr., NBL, Sta. 1+500	604576	4854257	1.5	223.2	221.7	1A		
BH A22	Pavement (topsoil measurement)	Coleraine Dr., NBL, Sta. 1+500	604578	4854261	216 mm			1A		
BH A23 / BH S1	Culvert, Pavement & Underground utilities	Coleraine Dr., SBL, Sta. 1+650	604481	4854343	9.4	222.8	213.4	1A		
BH A24	Pavement (topsoil measurement)	Coleraine Dr., SBL, Sta. 1+650	604473	4854351	250 mm			1A		
BH A25	Pavement & Underground utilities	Coleraine Dr., NBL, Sta. 1+800	604381	4854447	5.0	225.0	220.0	1A		
BH A26	Pavement & Underground utilities	Coleraine Dr., NBL, Sta. 1+800	604384	4854450	1.8	224.4	222.6	1A		
BH A27	Pavement & Underground utilities	Coleraine Dr., SBL, Sta. 1+950	604250	4854566	3.0	226.8	223.8	1A		
BH A28	Pavement & Underground utilities	Coleraine Dr., SBL, Sta. 1+950	604250	4854566	1.2	226.8	225.6	1A		
BH A29	Pavement & Underground utilities	Coleraine Dr., NBL, Sta. 2+100	604157	4854675	1.5	228.6	227.1	1B		
BH A30	Pavement & Underground utilities	Coleraine Dr., NBL, Sta. 2+100	604159	4854679	1.8	228.7	226.9	1B		
BH A31	Pavement & Underground utilities	Coleraine Dr., SBL, Sta. 2+250	604075	4854743	5.0	230.7	225.7	1B		
BH A32	Pavement (topsoil measurement)	Coleraine Dr., SBL, Sta. 2+250	604046	4854755	240 mm					
CULVERT	BOREHOLES									
BH S1 / BH A23 **	Culvert, Pavement & Underground utilities		604481	4854343	9.4	222.8	213.4	1A		
BH S2	Culvert, Pavement & Underground utilities	Coleraine Dr., NBL, Sta. 1+650	604486	4854343	9.4	222.5	213.1	1A		

^{*} Assuming Sta. 0+000 at BH A1 (in the vicinity of proposed intersection of Coleraine Drive and proposed E-W Arterial)

Thirty-one (31) boreholes were drilled along the alignment of new Arterial A2 as listed in Table 5.2.

^{**} Monitoring well installed



Table 5.2: Borehole Details – Proposed Arterial A2

Borehole		Location /		mate GPS	Depth Below	Ground Surface	Bottom	
Borehole No.	Purpose of Borehole	Approximate Station*		linates NAD 83)	Ground Surface		Elevation	Figure No.
			Easting	Northing		(m)		
BH B1	Pavement & Underground utilities	Arterial A2, Sta. 0+000	606238	4852654	1.5	211.5	210.0	2A
BH B2	Pavement & Underground utilities	Arterial A2, Sta. 0+100	606151	4852615	5.0	210.2	205.2	2A
BH B3	Pavement & Underground utilities	Arterial A2, Sta. 0+200	606056	4852586	3.0	211.8	208.8	2A
BH B4	Pavement (topsoil measurement)	Arterial A2, Sta. 0+300	605958	4852563	1.8	211.7	209.9	2A
BH B5	Pavement & Underground utilities	Arterial A2, Sta. 0+400	605861	4852545	5.0	211.3	206.2	2A
вн в6	Pavement & Underground utilities	Arterial A2, Sta. 0+500	605759	4852529	2.1	210.9	208.8	2A
BH B7 / BH S5	Culvert, Pavement & Underground utilities	Arterial A2, Sta. 0+600	605633	4852520	9.8	209.3	199.6	2A
BH B8	Pavement & Underground utilities	Arterial A2, Sta. 0+700	605564	4852529	1.7	211.1	209.4	2A
BH B9	Pavement & Underground utilities	Arterial A2, Sta. 0+800	605461	4852548	5.0	212.5	207.4	2A
BH B10	Pavement & Underground utilities	Arterial A2, Sta. 0+900	605365	4852580	1.7	212.7	211.1	2A
BH B11	Pavement & Underground utilities	Arterial A2, Sta. 1+000	605279	4852627	3.0	212.3	209.3	2A
BH B12	Pavement & Underground utilities	Arterial A2, Sta. 1+100	605192	4852676	1.7	214.3	212.6	2A
BH B13	Pavement & Underground utilities	Arterial A2, Sta. 1+200	605111	4852740	5.0	215.7	210.7	2A
BH B14	Pavement & Underground utilities	Arterial A2, Sta. 1+300	605038	4852807	1.8	217.1	215.2	2B
BH B15	Pavement & Underground utilities	Arterial A2, Sta. 1+400	604966	4852877	3.0	217.3	214.3	2B
BH B16	Pavement & Underground utilities	Arterial A2, Sta. 1+500	604893	4852946	1.8	217.9	216.1	2B
BH B17	Pavement & Underground utilities	Arterial A2, Sta. 1+600	604822	4853017	5.0	218.5	213.5	2B
BH B18	Pavement & Underground utilities	Arterial A2, Sta. 1+700	604752	4853086	1.8	219.2	217.4	2B
BH B19	Pavement & Underground utilities	Arterial A2, Sta. 1+800	604680	4853157	3.0	219.5	216.5	2B
BH B20	Pavement & Underground utilities	Arterial A2, Sta. 1+900	604609	4853227	1.8	219.9	218.1	2B







Borehole No.	Purpose of Borehole	Location / Approximate Station*	Approximate (UTM/NAD 83) Station*		Depth Below Ground Surface	(1)	Bottom Elevation	Figure No.
			Easting	Northing		(m)		
BH B21	Pavement & Underground utilities	Arterial A2, Sta. 2+000	604537	4853296	5.0	220.8	215.8	2B
BH B22	Pavement & Underground utilities	Arterial A2, Sta. 2+100 (Countryside Dr.)	604484	4853360	1.5	220.5	219.0	2B
BH B23	Pavement & Underground utilities	Arterial A2, Sta. 2+200 (Countryside Dr.)	604392	4853436	3.0	221.1	218.1	2B
BH B24	Pavement & Underground utilities	Arterial A2, Sta. 2+300 (Countryside Dr.)	604321	4853507	2.1	221.9	219.7	2B
BH B25	Pavement & Underground utilities	Arterial A2, Sta. 2+400 (Countryside Dr.)	604250	4853574	5.2	222.5	217.3	2B
BH B26	Pavement & Underground utilities	Arterial A2, Sta. 2+500 (Countryside Dr.)	604179	4853643	2.1	222.9	220.8	2B
BH B27	Pavement & Underground utilities	Arterial A2, Sta. 2+600 (Countryside Dr.)	604107	4853714	3.0	223.4	220.4	2B
BH B28	Pavement & Underground utilities	Arterial A2, Sta. 2+700 (Countryside Dr.)	604034	4853786	2.1	223.4	221.3	2B
BH B29 to B33	Pavement & Underground utilities	Boreho	les deferr	ed to detai	l design p	hase, if red	quired.	
CULVERT E	BOREHOLES							
BH S3	Culvert, Pavement & Underground utilities	Arterial A2 at Hwy 50	606278	4852633	9.4	210.7	201.2	2A
BH S4 **	Culvert, Pavement & Underground utilities	Arterial A2 at Hwy 50	606254	4852631	9.8	210.6	200.8	2A
BH S5 / BH B7 **	Culvert, Pavement & Underground utilities	Arterial A2, Sta. 0+650	605633	4852520	9.8	209.3	199.6	2A
BH S6	Culvert, Pavement & Underground utilities	Arterial A2, Sta. 0+650	605620	4852529	9.8	209.0	199.3	2A

^{*} Assuming Sta. 0+000 at BH B1 (at the intersection of Coleraine Drive and Highway 50)

** Monitoring well installed

Forty (40) boreholes were drilled along Countryside Drive as listed in Table 5.3.



Table 5.3: Borehole Details - Countryside Drive

Borehole No.	Purpose of Borehole	Location / Approximate Station*	(UTM/N	inates NAD 83)	Depth Below Ground Surface	(1)	Bottom Elevation	Figure No.
			Easting	Northing		(m)		
BH C1	Pavement & Underground utilities	Countryside Dr., EBL, Sta. 0+000	603645	4852294	3.0	215.8	212.8	3A
BH C2	Pavement & Underground utilities	Countryside Dr., EBL, Sta. 0+000	603646	4852295	1.8	215.1	213.2	3A
вн сз	Pavement & Underground utilities	Countryside Dr., WBL, Sta. 0+150	603738	4852420	1.5	216.5	215.0	3A
BH C4	Pavement (topsoil measurement)	Countryside Dr., WBL, Sta. 0+150	603731	4852419	150 mm			3A
BH C5	Pavement & Underground utilities	Countryside Dr., EBL, Sta. 0+300	603831	4852531	4.9	214.6	209.7	3A
вн С6	Pavement & Underground utilities	Countryside Dr., EBL, Sta. 0+300	603832	4852529	1.7	214.6	213.0	3A
BH C7	Pavement & Underground utilities	Countryside Dr., WBL, Sta. 0+450	603917	4852640	3.0	216.5	213.5	3A
BH C8	Pavement & Underground utilities	Countryside Dr., WBL, Sta. 0+450	603915	4852650	1.8	216.6	214.8	3A
вн с9	Pavement & Underground utilities	Countryside Dr., EBL, Sta. 0+600	604016	4852761	1.5	218.3	216.8	3A
BH C10	Pavement (topsoil measurement)	Countryside Dr., EBL, Sta. 0+600	604017	4852760	200 mm			3A
BH C11	Pavement & Underground utilities	Countryside Dr., WBL, Sta. 0+750	604113	4852893	5.2	215.2	210.0	3A
BH C12	Pavement & Underground utilities	Countryside Dr., WBL, Sta. 0+750	604113	4852900	1.2	213.6	212.4	3A
BH C13	Pavement & Underground utilities	Countryside Dr., EBL, Sta. 0+900	604197	4852992	3.0	219.0	215.9	3A
BH C14	Pavement (topsoil measurement)	Countryside Dr., EBL, Sta. 0+900	604201	4852990	250 mm			3A
BH C15	Pavement & Underground utilities	Countryside Dr., WBL, Sta. 1+050	604285	4853111	1.5	219.7	218.2	3A
BH C16	Pavement (topsoil measurement)	Countryside Dr., WBL, Sta. 1+050	604286	4853116	200 mm			3A
BH C17	Pavement & Underground utilities	Countryside Dr., EBL, Sta. 1+200	604386	4853230	5.0	219.9	214.9	3A
BH C18	Pavement & Underground utilities	Countryside Dr., EBL, Sta. 1+200	604388	4853229	1.8	219.9	218.1	3A
BH C19 / BH B22	Pavement & Underground utilities	Countryside Dr., WBL, Sta. 1+350 (same as BH B22)	604484	4853360	1.5	220.5	219.0	3A
BH C20	Pavement & Underground utilities	Countryside Dr., WBL, Sta. 1+350	604492	4853362	1.2	220.2	219.0	3A







Borehole No.	Purpose of Borehole	Location / Approximate Station*	Coordinates (UTM/NAD 83) St		Coordinates UTM/NAD 83) Below Surface Ground Elevatio Surface (1)		Bottom Elevation	Figure No.
			Easting	Northing		(m)		
BH C21	Pavement & Underground utilities	Countryside Dr., EBL, Sta. 1+500	604570	4853458	1.5	221.3	219.7	3A
BH C22	Pavement (topsoil measurement)	Countryside Dr., EBL, Sta. 1+500	504575	4853454	150 mm			3A
BH C23	Pavement & Underground utilities	Countryside Dr., WBL, Sta. 1+650	604645	4853563	5.2	221.3	216.1	3A
BH C24	Pavement & Underground utilities	Countryside Dr., WBL, Sta. 1+650	604647	4853568	1.8	220.9	219.1	3A
BH C25	Pavement & Underground utilities	Countryside Dr., EBL, Sta. 1+800	604747	4853682	3.0	220.9	217.8	3A
BH C26	Pavement (topsoil measurement)	Countryside Dr., EBL, Sta. 1+800	604751	4853681	200 mm			3A
BH C27 / BH S7	Culvert, Pavement & Underground utilities	Countryside Dr., WBL, Sta. 1+950	604850	4853816	9.8	217.8	208.0	3A
BH C28	Pavement (topsoil measurement)	Countryside Dr., WBL, Sta. 1+950	604854	4853830	270 mm			3A
BH C29	Pavement & Underground utilities	Countryside Dr., EBL, Sta. 2+100	604945	4853935	4.9	221.4	216.5	3B
BH C30	Pavement & Underground utilities	Countryside Dr., EBL, Sta. 2+100	604944	4853931	1.8	221.1	219.2	3B
BH C31	Pavement & Underground utilities	Countryside Dr., WBL, Sta. 2+250	605023	4854046	3.0	221.7	218.7	3B
BH C32	Pavement & Underground utilities	Countryside Dr., WBL, Sta. 2+250	605023	4854047	1.8	221.7	219.8	3B
BH C33	Pavement & Underground utilities	Countryside Dr., EBL, Sta. 2+400	605131	4854170	1.5	221.8	220.2	3B
BH C34	Pavement (topsoil measurement)	Countryside Dr., EBL, Sta. 2+400	605125	4854169	300 mm			3B
BH C35	Pavement & Underground utilities	Countryside Dr., WBL, Sta. 2+550	605211	4854296	1.5	220.6	219.1	3B
BH C36	Pavement & Underground utilities	Property N. of Countryside Dr., Sta. 2+550	Boreho	oles deferre	ed to deta		hase, if	3B
BH C37	Pavement & Underground utilities	Countryside Dr., WBL, Sta. 2+700	605295	4854406	1.5	220.0	218.5	3B
BH C38	Pavement & Underground utilities	Property N. of Countryside Dr., Sta. 2+700	. Boreholes deferred to detail design phase, if required.					
CULVERT BC	REHOLES							
BH S7 / BH C27 **	Culvert, Pavement & Underground utilities	Countryside Dr., WBL, Sta. 1+950	604850	4853816	9.8	217.8	208.0	3A

Wood Reference: TP115086 | 8/15/2022

Page 21 of 201





Borehole No.	Purpose of Borehole	Location / Approximate Station*	Coord	nate GPS linates NAD 83)	Depth Below Ground Surface	Ground Surface Elevation	Bottom	Figure No.
			Easting	Northing		(m)		
BH S8	Culvert, Pavement & Underground utilities	Countryside Dr., EBL, Sta. 1+950	604854	4853824	9.7	219.5	209.9	3A
BH S9	Culvert, Pavement & Underground utilities	Countryside Dr., WBL, Sta. 0+700	604080	4852848	9.4	214.4	219.7	3A
BH S10 **	Culvert, Pavement & Underground utilities	Countryside Dr., EBL, Sta. 0+700	604082	4852848	9.4	213.8	204.4	3A
BH S11	Culvert, Pavement & Underground utilities	Countryside Dr., WBL, Sta. 0+350	603849	4852560	9.2	213.2	216.1	3A
BH S12 **	Culvert, Pavement & Underground utilities	Countryside Dr., EBL, Sta. 0+350	603857	4852567	5.8	213.5	207.7	3A

^{*} Assuming Sta. 0+000 at BH C1 (about 200 m east of St. Johns Road)

Fifty-eight (58) boreholes were drilled along Clarkway Drive as listed in Table 5.4.

Table 5.4: Borehole Details – Clarkway Drive

Borehole No.	Purpose of Borehole	Location / Approximate Station*	Coord	mate GPS linates NAD 83)	Depth Below Ground Surface	Ground Surface Elevation	Bottom Elevation	Figure No.
			Easting	Northing		(m)		
BH D1	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 0+000	606251	4850676	3.0	205.6	202.6	4A
BH D2	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 0+000	606254	4850680	1.8	206.0	204.2	4A
BH D3	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 0+150	606138	4850776	1.5	206.0	204.4	4A
BH D4	Pavement (topsoil measurement)	Clarkway Dr., SBL, Sta. 0+150	606134	4850770	190 mm			4A
BH D5	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 0+300	606039	4850884	5.0	205.7	200.7	4A
BH D6	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 0+300	606040	4850886	1.8	206.1	204.3	4A
BH D7	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 0+450	605935	4850986	3.0	206.0	202.9	4A
BH D8	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 0+450	605935	4850984	0.9	205.6	204.7	4A
BH D9	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 0+600	605832	4851092	1.5	207.1	205.5	4A
BH D10	Pavement (topsoil measurement)	Clarkway Dr., NBL, Sta. 0+600	605831	4851102	230 mm			4A





^{**} Monitoring well installed



Borehole No.	Purpose of Borehole	Location / Approximate Station*	Coord	mate GPS linates NAD 83)	Depth Below Ground Surface	Ground Surface Elevation	Bottom Elevation	Figure No.
			Easting	Northing		(m)		
BH D11	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 0+750	605720	4851194	5.0	207.9	202.9	4A
BH D12	Pavement (topsoil measurement)	Clarkway Dr., SBL, Sta. 0+750	605712	4851196	200 mm			4A
BH D13	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 0+900	605607	4851398	3.0	209.3	206.2	4A
BH D14	Pavement & Underground utilities	Not drilled due	e to conflic	t with exist	ing underg	ground utili	ties.	4A
BH D15	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 1+050	605513	4851403	1.5	209.5	208.0	4A
BH D16	Pavement (topsoil measurement)	Clarkway Dr., SBL, Sta. 1+050	605497	4851406	240 mm			4A
BH D17	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 1+200	605385	4851532	5.2	210.5	205.3	4A
BH D18	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 1+200	605387	4851534	1.8	210.1	208.2	4A
BH D19	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 1+350	605297	4851614	3.0	210.6	207.6	4A
BH D20	Pavement (topsoil measurement)	Clarkway Dr., SBL, Sta. 1+350	605283	4851615	190 mm			4A
BH D21	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 1+500	605194	4851719	1.5	209.1	207.5	4A
BH D22	Pavement (topsoil measurement)	Clarkway Dr., NBL, Sta. 1+500	605189	4851734	180 mm			4A
BH D23	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 1+650	605071	4851839	5.0	209.2	204.2	4A
BH D24	Pavement & Underground utilities	Not drilled due	e to conflic	t with exist	ing underg	ground utili	ties.	4A
BH D25	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 1+800	604975	4851935	3.0	209.1	206.0	4A
BH D26	Pavement (topsoil measurement)	Clarkway Dr., NBL, Sta. 1+800	604976	4851946	200 mm			4A
BH D27	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 1+950	604867	4852040	1.5	208.6	207.1	4A
BH D28	Pavement (topsoil measurement)	Clarkway Dr., SBL, Sta. 1+950	604859	4852040	200 mm			4A
BH D29	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 2+100	604765	4852155	1.8	211.7	209.9	4B
BH D30	Pavement & Underground utilities	Not drilled due	e to conflic	t with exist	ing underg	ground utili	ties.	4B
BH D31	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 2+250	604668	4852236	3.5	210.0	206.5	4B







Borehole No.	Purpose of Borehole	Location / Approximate Station*	Coord	mate GPS dinates NAD 83)	Depth Below Ground Surface	Ground Surface Elevation	Bottom Elevation	Figure No.
			Easting	Northing		(m)		
BH D32	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 2+250	604666	4852234	1.8	208.3	206.4	4B
BH D33	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 2+400	604548	4852361	2.0	214.0	212.0	4B
BH D34	Pavement (topsoil measurement)	Clarkway Dr., NBL, Sta. 2+400	604548	4852368	190 mm			4B
BH D35	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 2+550	604458	4852462	5.0	212.9	207.9	4B
BH D36	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 2+550	604437	4852462	1.8	211.9	210.1	4B
BH D37	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 2+700	604335	4852470	3.5	214.5	211.0	4B
BH D38	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 2+700	604336	4852567	1.8	215.3	213.4	4B
BH D39	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 2+850	604234	4852659	2.0	213.0	211.0	4B
BH D40	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 2+850	604138	4852764	5.0	212.9	207.9	4B
BH D41	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 3+000	604141	4852766	2.1	213.9	211.7	4B
BH D42	Pavement (topsoil measurement)	Not drilled due	e to conflic	ct with exist	ing underg	ground utili	ties.	4B
BH D43	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 3+150	604009	4852887	3.5	217.5	214.0	4B
BH D44	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 3+150	604007	4852886	1.8	216.8	215.0	4B
BH D45	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 3+300	603917	4852984	1.8	218.8	217.0	4B
BH D46	Pavement (topsoil measurement)	Clarkway Dr., NBL, Sta. 3+300	603909	4853000	230 mm			4B
BH D47	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 3+450	603816	4853079	5.0	219.9	214.9	4B
BH D48	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 3+450	603814	4853078	1.8	219.9	218.0	4B
BH D49	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 3+600	603698	4853200	3.5	220.8	217.3	4B
BH D50	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 3+600	603700	4853201	1.8	220.8	219.0	4B
BH D51	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 3+750	603599	4853290	2.0	221.5	219.5	4B
BH D52	Pavement (topsoil measurement)	Clarkway Dr., SBL, Sta. 3+750	603578	4853305	200 mm			4B





Borehole No.	Purpose of Borehole	Location / Approximate Station*	Coord	mate GPS linates NAD 83)	Depth Below Ground Surface	Ground Surface Elevation	Bottom Elevation	Figure No.
			Easting	Northing		(m)		
BH D53	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 3+900	603497	4853398	5.0	222.0	217.0	4B
BH D54	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 3+900	603499	4853399	1.8	221.7	219.9	4B
BH D55	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 4+050	603388	4853502	3.5	222.5	219.0	4B
BH D56	Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 4+050	603380	4853532	1.8	222.0	220.2	4B
BH D57	Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 4+200	603286	4853614	2.0	223.6	221.6	4C
BH D58	Pavement (topsoil measurement)	Clarkway Dr., NBL, Sta. 4+200	603271	4853634	200 mm			4C
CULVERT BC	REHOLES							
BH S13 **	Culvert, Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 2+275	604621	4852286	9.3	210.2	207.5	4B
BH S14	Culvert, Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 2+275	604618	4852293	9.3	210.0	200.7	4B
BH S15	Culvert, Pavement & Underground utilities	Clarkway Dr., SBL, Sta. 3+325	604169	4852729	9.4	212.7	204.2	4B
BH S16 **	Culvert, Pavement & Underground utilities	Clarkway Dr., NBL, Sta. 3+325	604158	4852745	9.8	213.1	203.3	4B

^{*} Assuming Sta. 0+000 at BH D1 (about 50 m north of Castlemore Drive)

Eighteen (18) boreholes were drilled along proposed East-West Arterial Road as listed in Table 5.5.

Table 5.5: Borehole Details - East - West Arterial Road

Borehole No.	Purpose of Borehole Approximate		Coord	mate GPS linates NAD 83)	Depth Below Ground Surface	Ground Surface Elevation	Bottom Elevation	Figure No.
			Easting	Northing		(m)		
BH E1	Pavement & Underground utilities	East – West Arterial Rd., Sta. 0+000	604583	4850435	2.1	203.0	200.9	5A
BH E2	Pavement & Underground utilities	East – West Arterial Rd., Sta. 0+100	604641	4850507	5.2	204.6	199.4	5A
BH E3	Pavement & Underground utilities	East – West Arterial Rd., Sta. 0+200	604703	4850585	2.1	205.9	203.7	5A
BH E4	Pavement & Underground utilities	East – West Arterial Rd., Sta. 0+300	604766	4850663	3.0	205.1	202.0	5A





^{**} Monitoring well installed



Borehole No.	Purpose of Borehole	Location / Approximate Station*	Approximate GPS Coordinates (UTM/NAD 83)		Depth Below Ground Surface	Ground Surface Elevation	Bottom Elevation	Figure No.	
			Easting	Northing		(m)			
BH E5	Pavement & Underground utilities	East – West Arterial Rd., Sta. 0+400	604828	4850742	2.1	203.2	201.1	5A	
BH E6 / S18	Pavement & Underground utilities	East – West Arterial Rd., Sta. 0+500	604885	4850810	9.3	204.8	195.4	5A	
BH E7	Pavement & Underground utilities	East – West Arterial Rd., Sta. 0+600	604955	4850896	2.1	204.9	202.8	5A	
BH E8 to BH E22	Pavement & Underground utilities	Boreholes deferred to detail design phase, if required.							
BH E23	Pavement & Underground utilities	East – West Arterial Rd., Sta. 2+200	605606	4852284	2.1	210.7	208.5	5B	
BH E24	Pavement & Underground utilities	East – West Arterial Rd., Sta. 2+300	605614	4852383	3.0	210.7	207.7	5B	
BH E25	Pavement & Underground utilities	East – West Arterial Rd., Sta. 2+400	605628	4852476	2.1	209.3	207.2	5B	
BH E26	Pavement & Underground utilities	East – West Arterial Rd., Sta. 2+500	605650	4852571	5.2	210.0	204.8	5B	
BH E27	Pavement & Underground utilities	East – West Arterial Rd., Sta. 2+600	605680	4852668	2.1	211.1	208.9	5B	
BH E28	Pavement & Underground utilities	East – West Arterial Rd., Sta. 2+700	605714	4852764	3.0	212.4	209.4	5B	
BH E29	Pavement & Underground utilities	East – West Arterial Rd., Sta. 2+800	605743	4852863	2.1	213.5	211.3	5B	
BH E30	Pavement & Underground utilities	East – West Arterial Rd., Sta. 2+900	605749	4852965	5.2	214.3	209.2	5B	
BH E31	Pavement & Underground utilities	East – West Arterial Rd., Sta. 3+000	605728	4853064	2.1	214.9	212.7	5B	
BH E32	Pavement & Underground utilities	East – West Arterial Rd., Sta. 3+100	605683	4853156	3.0	215.0	211.9	5B	
CULVERT BO	CULVERT BOREHOLES								
BH S17*	Culvert, Pavement & Underground utilities	East – West Arterial Rd., Sta. 0+490	604874	4850797	7.0	202.6	195.6	5A	
BH E6 / S18	Culvert, Pavement & Underground utilities	East – West Arterial Rd., Sta. 0+500	604885	4850810	9.3	204.8	195.4	5A	
BH S19 and BH S20	Culvert, Pavement & Underground utilities	Boreholes deferred to detail design phase, if required.							

^{*} Monitoring well installed

The as-drilled borehole locations were obtained as northing and easting co-ordinates (UTM Coordinates, NAD 83) using a hand-held GPS unit with accuracy of ±3 m. Ground elevations at the borehole locations were estimated from the topographic survey drawing prepared by Wood for the project.



Traffic control during the investigation was provided by TCI Field Services (Brooklyn, Ontario) in accordance with the Ontario Traffic Manual – Temporary Conditions (Book 7).

All boreholes were drilled using truck- or track-mounted drill rigs, fitted with an automatic hammer, supplied and operated by Drilltech Drilling Ltd. of Newmarket, Ontario. The drilling activities were conducted under full-time oversight of Wood personnel, who also logged the soil types encountered during borehole advancement and collected soil samples.

Soil samples were generally obtained via the Standard Penetration Test (SPT) method, as per ASTM D1586, using an automatic hammer. The SPT tests consisted of freely dropping a 63.5 kg (140 lbs.) hammer a vertical distance of 0.76 m (30 inches) to drive a 51 mm (2 inch) diameter O.D. split-barrel (split spoon) sampler into the ground. The number of blows of the hammer required to drive the sampler into the relatively undisturbed ground by a vertical distance of 0.30 m (12 inches) was recorded as SPT 'N' values of the soil, which indicated the compactness of non-cohesive soils and / or implied (indirectly determined) the consistency of cohesive soils. The results of SPT are shown in the Record of Boreholes.

A monitoring well was installed in nine (9) of the borehole locations (Boreholes BH S1, BH S4, BH S5, BH S7, BH S10, BH S12, BH S13, BH S16, and BH S17) for groundwater monitoring hydrogeological investigation.

Groundwater depths in the boreholes, where encountered, were measured during drilling and upon completion of drilling, and subsequently in the monitoring well (where installed). The measured groundwater depths, where applicable, are shown on the Record of Boreholes.

Upon completion of drilling, all boreholes not installed with a monitoring well were backfilled in accordance with the general requirements of Ministry of Environment (MOE) Ontario Regulation 903. The surficial asphaltic concrete at the borehole locations were reinstated by cold patch asphalt.

A visual pavement condition survey of the existing road surface was carried out to evaluate the existing condition. Selected photographs showing the existing road condition are included in Appendix A of each Section.

Soil samples were transported to Wood's Laboratory for further review and laboratory testing (i.e., water content determination, grain size distribution analysis and Atterberg Limit test, where applicable). The soil conditions, groundwater levels, and the results of the in-situ and laboratory tests are presented on the corresponding Record of Boreholes. The laboratory test results are attached in Appendix B of each section.

Selected soil samples from each road section were analyzed for corrosive potential of soil with respect to concrete and steel.

Upon recovery, all soil samples were screened to assess for evidence of potential contamination, which included visual inspection as well as vapour screening for combustible organic vapours, using a portable

hand-held hydrocarbon surveyor (RKI Eagle 2). The results are presented on the Record of Boreholes.

Soil chemical analyses were carried out on selected soil samples from the boreholes for assessment of potential contamination and soil disposal options. The soil chemical analyses and corrosive tests were performed by AGAT Laboratories, an accredited CAEL laboratory located in Mississauga, Ontario. Results of the analysis are summarized in Appendix C of each section. The Certificates of Analyses for the soil chemical analyses and corrosivity analysis are included in Appendix D.

5.2 Pavement Investigation

5.2.1 Visual Condition Survey

Wood carried out a visual pavement condition survey of the existing road surface within the project area in August 2020 to identify any distresses. The identification and classification of the pavement distresses were carried out in accordance with MTO's "Flexible Pavement Condition Rating Manual – Guidelines for Municipalities", SP-022.

5.2.2 Borehole Investigation for Pavement Investigation

A total of 166 boreholes (as listed in Tables 5.1 to 5.5) have been drilled within the project limits at the existing pavement structure at the driving lanes / shoulders / boulevard for pavement investigation. The remaining 14 boreholes drilled at structure locations can also be used for pavement investigation. Topsoil thickness at the existing ditches were also obtained at selected locations during the field investigation. The details of the boreholes drilled at the project site are presented in Tables 5.1 to 5.5 and shown on Figure Nos. 1 to 5.

5.3 Geotechnical Investigation

5.3.1 Underground Utilities

All of the 166 boreholes drilled for the pavement investigation and 14 boreholes drilled for structures (Section 2.3.2) will be used for underground utility installations. Along all road alignments, alternating pavement investigation boreholes were drilled deeper (3 m to 5 m) to obtain sub-surface information for installation of underground utilities.

5.3.2 Structures

A total of 20 structures (culverts) are planned to be rehabilitated and / or extended and / or newly constructed along the five road alignments under the planned Area 47 road network, out of which 3 new structures are located in the two new road alignments and 7 structures are existing structures as listed in Tables 5.1 to 5.5. At the time of this report, boreholes for 2 structures located along the new East-West Arterial road alignment have not been drilled. Two boreholes were drilled at each of the remaining 8 structure locations. One



monitoring well was installed at each of the structure locations for groundwater monitoring and hydrogeological investigation.

5.4 Laboratory Tests

Laboratory testing was performed on selected samples from boreholes where tested for soil characterization, soil contamination and disposal options and soil corrosivity tests as follows:

- Water content determinations;
- Grain size distribution analyses;
- Atterberg Limit tests;
- · Soil corrosivity analyses; and
- Soil chemical analyses.

5.5 Groundwater Measurements

Groundwater depths were measured in the boreholes (where groundwater was encountered) at the time of drilling or upon completion of drilling. Groundwater was also measured subsequently in the monitoring wells.



SECTION A: COLERAINE DRIVE (FROM EAST-WEST ARTERIAL TO MAYFIELD DRIVE, ~ 3.0 KM)

A1.0 OVERALL SUBSURFACE CONDITION

A total of thirty-one (31) boreholes (BH A1 to BH A22 and BH A24 to BH A32) were drilled to depths varying from 0.2 m to 5.0 m, for the proposed road reconstruction/widening and underground service installation within project limits of Coleraine Drive (as shown in Figure Nos. 1A and 1B), which included boreholes in the driving lanes, shoulders and auger holes in the ditches. Two (2) boreholes (BH A23/S1 and S2) were drilled to a depth of about 9.4 m, for the proposed culvert rehabilitation / extension. Due to their proximity, BH A23 and BH S1 were combined into one borehole (BH A23 / S1). The boreholes in the driving lanes and pavement shoulders were sampled via Standard Penetration Test (SPT), while recording 'N' Values. Eight (8) auger holes (without SPT) were carried out in the ditches to measure the topsoil thicknesses.

The stratigraphic units and groundwater conditions are discussed in the following sections. Additional information is provided in the Record of Boreholes. The following summary is to assist the designers of the project with an understanding of the possible soil conditions at the investigated road section. The soil and groundwater conditions might vary between and beyond the borehole locations.

A1.1 **Topsoil**

Topsoil thicknesses were measured in the ditches beside the road at eight (8) locations, which varied from about 150 mm to 250 mm, with an average thickness of about 219 mm, as listed in Table A1.1.

Table A1.1: Topsoil Thickness Measurements (Coleraine Drive)

	Coordinates (U	Topsoil Thickness			
Borehole No.	Easting	Northing	(mm)		
BH A4	605511	4853326	250		
BH A6	605412	4853445	230		
BH A12	605116	4853716	216		
BH A14	605008	4853841	200		
BH A16	604900	4853931	150		
BH A22	604578	4854261	216		
BH A24	604473	4854351	250		
BH A32	604046	4854755	240		

SECTION A

A1.2 Asphaltic Concrete and Concrete

At the location of Boreholes BH A1, A3, A5, A7, A9, A11, A13, A15, A17, A19, A21, A23/S1, A25, A27, A29, A31 and S2, approximately 180 mm to 250 mm of asphaltic concrete was encountered at the pavement surface. An approximately 110 mm thick of concrete layer was encountered below the asphalt at BH A15.

A1.3 Granular Fill

Granular fill (sand and gravel and gravelly sand fill) was encountered at the surface in Boreholes BH A2, A8, A10, A18, A20, A26, A28, A30 and A31. Underlying the asphalt or concrete surfacing were layers of granular fill, which likely comprises the road base materials. The granular fill in these boreholes ranged in thickness from approximately 50 to 700 mm. The granular fills extended to depths varying from about 0.2 m to 0.9 m (Elevations 218.8 m to 229.8 m) below the existing ground surface.

Two (2) gradation tests were carried out on the selected samples of granular fill, the results of which are presented in Table A1.2 and are also shown in the Record of Boreholes.

Grain Size Distribution (%) Borehole Sample Depth **Elevation Fines Soil Classification** No. No. (m) (m) Gravel Sand Silt | Clay GRAVELLY SAND, some fines. Sample **BH A10** SS1A 0 - 0.2 219.0 - 218.8 27 60 13 does not meet OPSS1010 Granular A or **BH A30** SS1A 0 - 0.5 228.7 - 228.2 30 57 13 B due to excessive fines content

Table A1.2: Results of Grain Size Distribution Analysis (Granular Fill)

The grain size distribution curves are presented in Figures B-A1 in Appendix B-A.

A1.4 Silty Clay / Clayey Silt Fill

Silty clay / clayey silt fill was encountered beneath the concrete in Borehole A15 and below the granular fill soils, where present. The silty clay / clayey silt fill was generally brown to dark grey in colour and contained traces of gravel and organics. Cobbles were noted in the cohesive fill in Boreholes BH A11, A20, A25 to A27 and A29. Where fully penetrated, the silty clay / clayey silt fill thickness ranged from 0.6 to 2.0 m, and extended to depths varying from about 0.9 m to of 2.3 m (Elevations 214.0 m to 229.2 m) below the existing ground surface. The silty clay / clayey silt fill was present up to the termination depths of Boreholes BH A28 and A29 at about 1.2 m and 1.5 m below ground surface, respectively.

The SPT 'N' values measured in the silty clay / clayey silt fill ranged from 5 blows to 29 blows per 0.3 m of penetration, indicating firm to very stiff consistency. The measured water contents in the silty clay / clayey silt fill samples varied from about 13 % to 32 %.

SECTION A

A1.5 Silty Clay / Clayey Silt Till

Native silty clay / clayey silt till was encountered below the fill soils at depths of about 0.9 m to 2.3 m (Elevations 214.0 m to 229.2 m) and extended to the termination depths of all boreholes except Boreholes BH A28 and A29, which terminated within silty clay / clayey silt fill). The silty clay / clayey silt till was confirmed to a depth of a maximum depth of 9.4 m (Elevations 214.1 to 214.4 m) below existing ground surface at Boreholes BH S2 and A23/S1, respectively.

The clayey silt / silty clay till was brown to grey in color, and contained trace to some sand, or was sandy, and had trace gravel. Cobbles/boulders were encountered in Boreholes BH A1, A9, A11, A13, A17, A23/S1, A25, A27, A30, A31 and S2. Due to the depositional history of glacial tills, the presence of cobbles and boulders should be anticipated throughout the till deposit. Generally, the SPT 'N' values of the silty clay / clayey silt till ranged from 8 blows to greater than 50 blows per 0.3 m but were generally above 17 blows implying a firm to hard consistency overall.

The measured water contents of the silty clay / clayey silt till samples ranged from about 10 % to 26 %.

Gradation and Atterberg Limits tests were carried out on three (3) samples of the silty clay / clayey silt till, the results of which are presented in Table A1.3, and shown in the Records of Boreholes.

Table A1.3: Results of Grain Size Distribution Analysis and Atterberg Limit Tests (Silty Clay / Clayey Silt Till)

	Sample	Depth	Elevation	Grain Size Distribution (%)				Assault aug I insis			USCS
Borehole						Fines		Atterberg Limit			Modified
No.	No.	(m)	(m)	Gravel	Sand	Silt	Clay	Liquid Limit	Plastic Limit	Plasticity Index	Group Symbol
BH A1	SS 6	3.8	211.7	3	30	45	22	21	12	9	CL
BH A3	SS 4	2.4	213.9	3	18	52	27	28	15	13	CL
BH A23/S1	SS 5	3.1	219.7	1	18	48	33	30	14	16	CL/CI

The grain size distribution curves and plasticity chart are presented Figure Nos. B-A2 and B-A3 in Appendix B-A.

A1.6 Groundwater

Upon completion, groundwater was encountered in Boreholes BH A3, A13, and A23/S1 at depths of 2.7 m (Elevation 213.6 m), 2.4 m (Elevation 217.8 m), and 8.2 m (Elevation 214.6 m) below the existing ground surface, respectively. Groundwater was not encountered in the remaining boreholes.

One monitoring well was installed in BH A23/S1 at the location of the culvert crossing. The groundwater depth measured in the boreholes (where groundwater was encountered) at the time of drilling or upon completion of drilling, and in subsequent measurements in the monitoring well are summarized in Table A1.4 and shown on the Record of Boreholes.

• • •

Table A1.4: Results of Groundwater Depth Measurements

	Groundwater Measurements									
Borehole No.	During or	Upon Complet	tion of Drilling	In Monitoring Well (m)						
	Date	Depth	Elevation (m)	Date	Depth	Elevation				
BH A3	21 Jan 2020	2.7	213.6	Not installed						
BH A13	21 Jan 2020	2.4	217.8		Not installed					
				24 Apr 2020	1.8	221.0				
BH A23/S1	20 Jan 2020	8.2	214.6	4 May 2020	0.9	221.9				
				12 May 2020	0.9	221.9				

It should be noted that the groundwater at the site would fluctuate seasonally and can be expected to be somewhat higher during the spring months, and in response to major weather events.

A1.7 Soil Corrosivity

Two (2) soil samples were submitted for corrosion analysis to determine the corrosive potential of the soils with respect to buried metallic structures. The results of the analyses are presented Table A1.5, and the laboratory test certificate is included in Appendix D.

Table A1.5: Soil Corrosivity Test Results

Parameter	Units	BH A3 – SS2	BH S1/BH A23- SS4
Chloride	ug/g or (ppm)	127	276
Sulphate	ug/g or (ppm)	21	46
рН	pH Units	8.20	7.74
Electrical Conductivity	mS/cm	0.334	0.682
Resistivity	Ohm-cm	2990	1470

As per ASTM STP 1013 (Effects of Soil Characteristics on Corrosion – "chloride appears to be the main factor in increased soil corrosivity with levels in excess of 0.01 % (100 (μ g/g) considered indicative of accelerated corrosion". The chloride content measured in both samples were more than 100 μ g/g. In accordance with Table 1 of CSA A23.1-14 and based on "structurally reinforced concrete exposed to chloride, with or without freezing and thawing" and based on project location, exposure class "C-1" can be used. Class should be based on structure location and/or durability requirement.

In accordance with Table 3 of CSA A23.1-14, no additional requirement is specified for sulphate content below 0.10 % (i.e. 1,000 ppm or $\mu g/g$) below the "moderate degree of exposure" with respect to concrete.

. . .



Therefore, in accordance with Table 6 of the Canadian Standards Association (CSA) Series A23.1-14, Type GU Portland cement can be used based on the water-soluble sulphate contents measured in soils.

As noted in ASTM -STP 1013 (*Effects of Soil Characteristics on Corrosion*), pH values between 4.0 and 8.5 have very little effect on corrosion (American Water Works Association (AWWA) Standard C 105-72 (Table 1 – Soil-Test Evaluation AWWA Rating).

The measured soil resistivity values can be considered as "high" between 1000 ohm-cm and 2000 ohm-cm, and "moderate" between 2000 ohm-cm to 5000 ohm-cm for exposed metallic structures, based on ASTM STP 1000, Corrosion Testing and Evaluation - Table 3 (Corrosivity for Uncoated Steel).

Protection against steel corrosion, where required, could include one or a combination of: adequate concrete cover, low-permeability concrete, corrosion inhibitors; coated reinforcing steel; clad reinforcing steel; and corrosion-resistant alloy reinforcement.

A corrosion specialist should be retained, if necessary, to review the analysis results and provide relevant recommendation.

A2.0 PAVEMENT INVESTIGATIONS AND DESIGN

The purpose of the pavement investigation was to obtain subsurface information and to provide geotechnical recommendations for widening of Coleraine Drive which is north / south oriented, and as per the City's road classification, it is designated as a minor arterial road. The total length of the investigated road section is about 3.0 km.

At the time of the investigation, the investigated road section was a 2-lanes rural road that would be widened to 4-lanes, from Arterial A2 to Mayfield Road, including realignment at Arterial A2 west of RR50. The discussions and recommendations in the following sections are general in nature, as the details of the widening were not available at the time of this report.

The subsurface soil profile at the site consisted of surficial asphaltic concrete underlain by non-cohesive soil sand and gravel fill overlying silty clay fill, silty clay /clayey silt till which extended to the termination depths of the boreholes that ranged from 1.2 to 9.4 m.

All boreholes were open and dry upon completion to their respective vertical limits of investigation except 3 boreholes: (A3, A13, A23/S1), where groundwater was encountered at depths of 2.7 m, 2.4 m, 8.2 m below ground surface, respectively.

The discussions and recommendations in the following sections are based on the subsurface information obtained from the boreholes and are intended for use by Design Engineers.



A2.1 Visual Pavement Condition Survey

On 10 August 2020, Wood carried out a visual pavement condition survey of the existing road surface within the project area to identify any distresses. A summary of the pavement condition survey, including predominant surface defects, surface deformation and cracking, is tabulated in Table A2.1 and copies of the Pavement Condition Survey Forms are included in Appendix A-A. Based on the pavement condition survey, the existing asphaltic concrete surface condition was rated from Poor to Very Poor Condition.

Table A2.1: Existing Pavement Condition

Predominant Distress	2020 Condition Ra0ting					
Coleraine Drive from Major MacKenzie Drive to Countryside Drive ~1.8 km (2 lanes)						
280 m South of Mayfield and was rated Good Condition						
 Ravelling & coarse aggregate loss – Moderate / Frequent. Wheel Track Rutting/Distortion – Severe / Frequent. Longitudinal Cracking (single, multiple and alligator) – Very Severe/ Extensive. Centreline Cracking (single, multiple and alligator) – Moderate to Severe/Extensive. Pavement Edge Cracking - Moderate to Severe/Extensive. Transverse Cracking (single, multiple and alligator) – Moderate to Very Severe / Frequent to Extensive. 	Poor to Very Poor Condition					
Coleraine Dr-Countryside Dr to Mayfield Rd ~1.3 km (2 lan	es)					
 Ravelling & coarse aggregate loss – Severe / Intermittent. Wheel Track Rutting/Distortion – Moderate to Severe / Intermittent. Longitudinal Cracking (single, multiple and alligator) – Moderate / Frequent. Centreline Cracking (single, multiple and alligator) – Moderate / Frequent. Pavement Edge Cracking - Moderate to Severe/Frequent. Transverse Cracking (single, multiple and alligator) – Moderate to Severe / Extensive. 	Poor to Very Poor Condition					

A2.2 Subsurface Conditions

A total of 33 boreholes were drilled along Coleraine Drive from its intersection with the proposed E-W Arterial A2 Mayfield Drive (approximately 2.3 km). The subsurface soil profile at the site consisted of surficial asphaltic concrete underlain by sand and gravel fill overlying silty clay fill, silty clay /clayey silt till which extended to the termination depths of the boreholes that different in depths that ranged from 1.2 to 9.4 m as detailed in the Record of Boreholes.

The driving lanes boreholes revealed that the asphaltic concrete thickness ranged from 180 mm to 250 mm with an average of 199 mm. Non-cohesive soil (sand and gravel fill) was encountered in all the boreholes underlying the existing asphaltic concrete that ranged in thickness from 50 mm to 700 mm, with an average of 138 mm. The shoulder boreholes revealed sand and gravel fill was encountered in all the boreholes that ranged in thickness from 100 mm to 600 mm, with an average of 389 mm.



Additional subsurface information is provided in Section A1.0 and in the Record of Boreholes.

A2.3 Groundwater Conditions

Groundwater was encountered only in three boreholes during and on completion of drilling in the open boreholes at depth varying from 2.7 m to 8.2 below ground, as listed in Table A1.4. It should be pointed out that the groundwater at the site would fluctuate seasonally and can be expected to be somewhat higher during the spring months and in response to major weather events.

A2.4 Pavement Design

The purpose of the geotechnical investigation was to obtain subsurface information and to provide geotechnical recommendations for road rehabilitation/re-surfacing and widening along Coleraine Drive.

The discussions and recommendations in the following sections are based on the available information and the subsurface information obtained from the boreholes and is intended for use by Design Engineers.

A2.4.1 Pavement Structure Adequacy

A total of 24 boreholes were drilled through the pavement along Coleraine Drive, between proposed Arterial A2 and Mayfield Drive (approximately 2.3 km).

Two methods were used to assess the existing pavement structure. In-situ structure number ("SN") and insitu Granular Base Equivalency ("GBE") were estimated from the borehole data using the equivalency factors for various material types, as shown in Table A2.2.

Table A2.2: Summary of Typical Structural Layer Coefficient

Material Type		Typical AASHTO-Ontario Structural Layer Coefficient (SLC), ai (mm) (1)				
Rehabilitation	Drainage	Structural	Equivalency Factors			
Existing HL Existing Gran Base Existing Gran Sub-base Existing Gran Base/Sub-base	Acceptable 1.0 Questionable 0.9 Inadequate 0.8 to 0.5	0.14 to 0.28 0.10 to 0.14 0.05 to 0.09	1.25 0.75 0.50 0.625			
Pulverization CIR RAP/Gran A blended stabilized with EAM	1.0 1.0 1.0	0.10 to 0.14 0.28 to 0.38 0.20 to 0.25	1.0 1.6 – 1.8 1.0			

Notes:



⁽¹⁾ MTO Report MI-183 -. MTO Report MI-183 "Adaptation and Verification of AASHTO Pavement Design Parameters for Ontario Conditions" - Table 4-5.

Table A2.3 summarises the total average pavement structural thickness of the existing asphaltic concrete pavement, granular base and sub-base, as well as the average existing Structure Number 'SN' and 'GBE' before rehabilitation.

Table A2.3: Summary of Existing Pavement Structure

Boreholes	Average Thi	ckness (mm)	SN ⁽¹⁾	GBE	Predominant Subgrade	
	НМА	HMA Base/Subbase		(mm)		
No. of BHs @ MDL/EP=16 (A1, A3, A5, A7, A9, A11, A13, A15, A17, A19, A21, A23/S1, A25, A27, A29, A31)	Range (180-250) mm Av. 199 mm	Range (50-700) mm Av.138 mm	Range (38-104) mm Av. 43 mm	Range (300-688) mm Av. 336 mm	Si(y) Cl Fill - Si(y) Cl/Cl(y) Si	
No. of BHs @ SHR/TOR=9 (A2, A8, A10, A18, A20 A26, A28, A30, A32/S1)	-	Range (100-600) mm Av. 389 mm	-	-	Till	

Notes:

- 1. Existing SN calculation s the following parameters were used:
 - Existing HMA coefficient, = 0.14;
 - Existing granular base/subbase coefficient, and concrete = 0.12/0.9

A2.4.2 Existing and Forecasted Traffic Data

The traffic data represented as Average Annual Daily Traffic (AADT₂₀₂₀) in both directions was estimated by Wood Traffic Group as presented in Table A2.4. This traffic data was used to projected traffic data for 20 years design life. Equivalent single axle loads (ESALs) were calculated cumulatively over 20 years as described in the Ministry of Transportation Report "Procedures for Estimating Traffic Loads for Pavement Design, 1995".

Table A2.4: Traffic Data - Minor Arterial (Rural)

AADT in Both Directions 2020 ⁽¹⁾	Growth Rate (%)	Comm. Vehicles (%)	Design ESALs @ 20 Years	Traffic Category
7,400	2.0%	6.0%	2,994,018 ~ 3.0 x 10 ⁶	Category

^{(1) 2020} is the anticipated construction year.

A2.4.3 Flexible Structural Pavement Design for Widening

After reviewing the field data and laboratory test results, the minimum pavement structural design for the widening of Coleraine Drive is presented in Table A2.5, which was determined in accordance with the 1993 American Association of State Highway and Transportation Officials ('AASHTO') Guide for the Design of Pavement Structures using the Darwin Software Program.

The AASHTO Pavement Design is considered to be a function of estimated future traffic in both directions (ESALs), reliability (R), which is a function of road classification, overall standard deviation (S_o), resilient modulus (M_r), as well as initial and terminal serviceability (P_o , P_t). From these parameters, the structure number (SN) is calculated. The SN is defined in the AASHTO Guide as a number, which provides a measure of the pavement strength and thickness needed to avoid overstressing the subgrade.

The following design parameters were chosen to calculate the required structure number for the design of flexible pavement using the AASHTO method, as described in the Ministry of Transportation Materials Information Report MI-183 "Adaptation and Verification of AASHTO Pavement Design Parameters for Ontario Conditions".

- Initial serviceability, $P_i = 4.5$; - Terminal serviceability, $P_t = 2.5$;

- Reliability level, R = 90 percent;

- Overall standard of deviation, $S_o = 0.49$; - Subgrade Resilient Modulus, M_r (kPa) $M_r = 30,000$

Table A2.5: Recommended Minimum Structural Pavement Design

		AASHTO Design fo	or 20 Yea	rs		Recommende	d HMA & PGAC	7
			ed SN	ρε	ent	Mai	rshall	tegor
ESALs	НМА	Granular	Required Design SN Selected SN		Total Pavement Thickness	HI 3 (HS) / HL 1	HL 8 (HS) / HDBC	Traffic Category
						Surface Course	Binder Course	Traf
			Th	nickness (mm)			
3.0 X 10 ⁶	150	Gran A = 450 mm or Gran A = 150 mm Gran B Type II = 300 mm	123	126	600	SP 50 mm PGAC 64-28	50+50 mm PGAC 58-28	С
		The Regional Minimum	Paveme	nt Struc	ture Desi	ign for Arterial F	Roads	
3.0 X 10 ⁶	160	Gran A = 150 mm Gran Type II = 450 min (subgrade base slopes at	-	151.2	760	40-50 HL1	100-110 mm HL8 (HS)/ HDBC	С



		AASHTO Design fo	or 20 Yea	rs		Recommende	d HMA & PGAC	>	
ESALs	_		ed SN	þe	l ent ess	Ma	Category		
ESALs	НМА	Granular	Requir Design		Total Pavement Thickness	HI 3 (HS) / HL 1 Surface Course	HL 8 (HS) / HDBC Binder Course	Traffic Cat	
			Tł	nickness ((mm)		7		
		3% and top of subgrade at 2, so depth varies).				No rap. No enginof 64-28)	ne oils, min PGAC		

Notes:

- Pavement shall be placed over approved subgrade.
- Granular A and Granular B Type II: Compaction as per OPSS Form 1010 (100% SPMDD).

The Regional minimum design was selected for the road widening since it is intended to be Regional road.

A2.4.4 Widening Coleraine Drive from E-W Arterial to Mayfield Drive

Pavement recommendations for widening of Coleraine Drive are presented in Table A2.6, including hot mix type, lift thickness, and PGAC type making up the recommended asphalt thickness, as well as the traffic category, in accordance with OPSS.MUNI 1151. The granular thicknesses of the widening given in the table is a minimum thickness and should match the adjacent existing pavement granular thickness to promote positive lateral drainage. Also, the thicknesses can be increased depending on grading requirements.

Table A2.6: Widening of Coleraine Drive

НМА		2010	Traffic	
Туре	Thickness (mm)	PGAC	Category	
HL 1 / DFC – Surface Course	50 mm	64-28	C	
HL 8 (HS) / HDBC – Binder Course	50 mm 60 mm	64-28	C	
Granular Base 'A'	150 mm	-	1	
Granular Subbase 'B' Type II	450 mm	-	-	
Total Pavement Structure	760 mm	-	-	



Full depth excavation, as required and commencing from the existing edge of pavement, will be required to accommodate the proposed design thickness.

The excavated granular materials from the shoulder can be re-used as fill material for subgrade for the widening/embankment, provided it is not contaminated. New Granular B subbase should be added and compacted, followed by new Granular A base material. Both base and subbase can vary in thickness to match the adjacent existing pavement granular in order to promote positive lateral drainage. The Granular A base course should be compacted and overlain with 2 lifts of HL 8 (HS) or HDBC binder course, and 1 lift of HL 1 or DFC surface course, as per Table A2.6. Installation of subdrain is recommended, if lateral drainage of the existing subgrade is not possible.

A2.5 Rehabilitation Strategies

The selected rehabilitation strategy was based on Wood's geotechnical / pavement investigation and analysis, including a visual pavement condition assessment, subgrade condition, and calculated ESALs. Consideration was also given to user delay, cost and/or disruption of traffic and an anticipated construction year of 2020. Two (2) proposed rehabilitation strategies for Coleraine Drive are as follows:

Option 1: In-Place Pulverization, Remixing & Resurfacing with 200 mm HMA

Prior to pulverization, mill the entire road section to a depth of 50 mm. Then pulverize the existing asphalt concrete thickness into an equivalent depth of granular base material to a total depth of 300 mm. The resulting mixture of asphalt concrete and granular is then graded to cross fall, compacted and used as a base. The advantages of this option include the elimination of surface defects and reflection cracking and the reuse of the existing material efficiently. Typically, the GBE for bituminous crushed recovered material is in the order of 1.0. In-place pulverization should be graded and compacted and resurfaced with 200 mm of HMA. This option will raise the vertical profile by 200 mm and will provide 15 to 17 years of service life and average SN of 126 mm after resurfacing.

Option 2: Full Depth Reconstruction and Resurface

This option involves excavation to a depth of 760 mm to accommodate the design in Table A2.5. Proof-roll, re-grade and compact, add 600 mm of new granular A and compact, and resurfacing with 160 mm of hot mix. This option will improve drainage and the structural capacity of the pavement and will have lower maintenance cost over the pavement service life than the existing pavement. This option will not raise the vertical profile and will provide 20 years of service life and SN of 151.2 mm after reconstruction.

A2.6 Recommendations and Construction Features for Pavement

A2.6.1 Rehabilitation Strategies

Option 1 - In-Place Pulverization, Remixing & Resurfacing with 200 mm HMA. Prior to pulverization mill 50 mm and pulverize is cost cost-effective option. This option will raise the existing vertical profiles by 200 mm and will provide service life of 15 to 17 years.

A2.6.2 Widening of Coleraine Drive

Pavement recommendations for widening of Coleraine Drive are presented in Table A2.6 for new pavement structure, including hot mix type, lift thickness, and PGAC type making up the recommended asphalt thickness, as well as the traffic category, in accordance with OPSS 1151. The granular thicknesses of the widening given in the table is a minimum thickness and should match the adjacent existing pavement granular thickness to promote positive lateral drainage. Also, the thicknesses can be increased depending on grading requirements.

Full depth excavation, as necessary, and commencing from the existing edge of pavement, will be required to accommodate the proposed design thickness. The excavated granular materials from the shoulder can be reused as fill material for subgrade for the widening/embankment, provided it is not contaminated. New Granular B Type II subbase should be added and compacted, followed by new Granular A base material. Both base and subbase can vary in thickness to match the adjacent existing pavement granular in order to promote positive lateral drainage. The Granular A base course should be compacted and overlaid with 2 lifts of HL 8 (HS) /HDBC Binder course, and 1 lift of HL 1 or DFC surface course, as per Table A2.6. Installation of subdrain is recommended if lateral drainage of the existing subgrade is not possible.

A2.6.3 Subgrade / Road Base Preparation and Compaction

The pavement structural design recommended for roads is applicable, provided the subgrade is prepared under dry weather conditions, proof-rolled with a heavy rubber-tired vehicle (such as a grader or loaded dump truck) in the presence of the geotechnical consultant. Any loose, soft or unstable areas, if detected during proof-rolling, must be sub-excavated, replaced with approved granular materials and compacted. Any additional engineered fill, if required, should be placed in thin layers not exceeding 200 mm and compacted to a minimum of 98 % of Standard Proctor Maximum Dry Density (SPMDD). Granular materials should be placed in thin layers not exceeding approximately 200 mm, within \pm 2 % of its optimum moisture content, and thoroughly compacted to a minimum of 100 % of SPMDD.

The subgrade should be provided with adequate drainage. If wet weather conditions prevail at the time of construction, adjustments to this design may be required, i.e. if the subgrade becomes excessively wet or rutted during construction activities, additional sub-base material may be required. The need for additional sub-base material is best determined during construction.

All granular base and sub-base materials must be compacted to at least 100% of SPMDD.

A2.6.4 Stripping and Sub-Excavation

No additional sub-excavation, other than removal of organics and topsoil are anticipated within the widening limits, as presented in Table A1.1 that ranged from 150 mm to 250 mm. However, any unsuitable soft or saturated material should be removed. Deeper stripping depths may be required, depending on the actual site conditions between borehole locations.

A2.6.5 Drainage

Prior to completing the rehabilitation, it is recommended that adequate drainage be provided both laterally and longitudinally along the length of the project.

To meet the design requirements for the pavement life, the road subgrade and granular courses should be well drained at all times. This can be accomplished by ensuring proper grading of the subgrade and positive lateral drainage of the granular base daylighting at the ditch. Alternatively, full-length perforated subdrain pipes of 150 mm diameter should be installed along both sides of the road, below the roadbed level, to ensure effective drainage, in accordance with OPSD 216.021. The sub-drainpipes should be wrapped in suitable non-woven geotextile surrounded by a minimum drainage zone of 19 mm size clear stone of minimum 150 mm thickness. A minimum slope of 2 % should be maintained across the paved sections (finished road surface) to ensure proper surface drainage. New pavement should slope towards the gutter/ditch.

A2.6.6 Hot Mixes and PGAC Type

The following Marshall hot mixes should be used on Coleraine Drive:

 DFC / HL 1 surface course mix and HL 8 (HS) /HDBC binder course should be used to provide the roadway with high durability.

Material Specification should be as per OPSS.MUNI 1150 Material Specification for Hot Mix Asphalt. For aggregates, the material specification should be as per OPSS.MUNI 1003.

Performance Graded Asphalt Cement ("PGAC") 64-28 should be used for both surface course and binder course. This PGAC should satisfy the requirements of MP1 of SHRP Specifications for Superpave.

<u>Recycled Materials:</u> The use of reclaimed asphalt pavement (RAP) is not permitted as per the Regional minimum requirements for Marshall mixes for the Regional Arterial Roads.

Steel slag aggregates should not be allowed.





<u>Transition Treatments at Limits of Paving</u>: At the limits of the project, a butt joint with the existing pavement is recommended. The butt joint between successive lifts of hot mix should be staggered at a distance of not less than 5 m, in accordance with OPSS.PROV 313. It should be ensured that no joint location corresponds with a joint location in any other layer.

The transition treatment from earth cut to earth fill should be in accordance with OPSD 205.010.

<u>Tack Coat:</u> It is recommended that all milled surfaces, and binder course surfaces will be tack coated prior to top course asphalt, if exposed to extended traffic. Construction Specification should be as per OPSS.PROV 308, April 2012.

A2.6.7 In-Situ Compaction for Hot Mix

In all areas, asphaltic concrete should be compacted as per OPSS.MUNI 310, Table 10 (April 2011). It should be noted that the granular base and sub-base materials should be compacted to the City's standards or to minimum 100 % SPMDD.

<u>Field Quality Assurance:</u> Plate samples of loose hot mix should be obtained for each paving day, and extraction/gradation and full Marshall compliance testing should be carried out on these samples. The finished surface shall be true to required profile and cross-section within 6 mm from required elevations and thickness. The surface shall show no depressions or bumps exceeding 3 mm under a 3.0 m long straight edge, placed parallel to the road centreline.

A2.6.8 Frost Depth

A minimum depth of 1.4 m should be used for frost protection as per OPSD 3090.101.

A2.6.8 Detouring

No long-term detouring is planned. Therefore, no special treatment will be required.

A3.0 UNDERGROUND UTILITIES

The geotechnical investigation scope of work included obtaining subsurface conditions and providing recommendations for installation of proposed underground utility services. Accordingly, selected boreholes (i.e. alternating pavement boreholes) were deepened to a depth of 3 m to 5 m, as listed in Table 5.1. Information obtained from all relevant boreholes drilled along Coleraine Drive have been considered in this section, as applicable.



A3.1 Subsurface Conditions

A total of twenty-five (25) boreholes (not including the eight augered boreholes for topsoil measurements) were drilled in driving lanes and shoulder areas of Coleraine Drive to depths varying from about 1.2 m to 9.4 m, for pavement investigation, underground utility installation and one structure.

Overall, the project site along Coleraine Drive consisted of surficial cover (topsoil, asphaltic concrete, concrete and / or exposed granular fill) underlain by fill soils (granular and / or silty clay / clayey silt) overlying native silty clay / clayey silt till. The fill soils extended to depths varying from about 0.9 m to 2.3 m (Elevations 214.0 m to 229.2 m) below the existing ground surface. The silty clay / clayey silt till was confirmed to a depth of about 9.4 m (up to Elevation 213.1 m) below existing ground surface in the deeper boreholes at the structure location.

Groundwater depths measured in the boreholes and monitoring wells varied from 0.9 m to 8.2 m (Elevations 221.9 m to 213.6 m) below ground surface.

Detailed subsurface and groundwater conditions are provided in Section A1.0.

A3.2 Discussions and Recommendations for Underground Utilities

As per information available, the planned Coleraine Drive rehabilitation / widening within the project limits will include installation of underground utilities and associated manholes and catch basins. Details of the installation were not available at the time of this report. Existing utilities, if any, should be protected and taken into consideration for design and construction of the proposed underground utilities and road widening.

The ground (road) elevations within the project limits (based on borehole location) varied from about 215.5 m (at BH A1) to 230.7 m (at BH A31), with the overall the ground surface was sloping up from south (RR 50) to north (Mayfield Road, RR14).

The recommendations and discussions for excavation and installation of underground utility services, and associated manholes / catch basins, are provided in the following sections.

A3.2.1 Founding Subgrade Conditions

From the investigation result, fill soils (granular, silty clay) were present to depths varying from 0.9 m to 2.3 m below existing ground / road level, which included granular fill to depths varying from 0.2 m to 0.9 m in some of the boreholes. The SPT values in the silty clay / clayey silt fill below the granular fill indicated a firm to hard but generally stiff consistency.

The native silty clay / clayey silt till below the fill soils were of firm to hard consistency overall, with the majority indicating very stiff to hard consistency, and should be generally competent to support underground utility services.



It is recommended that the inverts of underground utilities be founded on native soils, or competent fill soil subgrade. Existing fills or soft soil encountered at the founding level should be compacted, if possible, or otherwise, should be sub-excavated and backfilled with compacted soil as recommended in Section A5.3 (Engineered Fill).

For manholes and catch basins founded on competent subgrade (i.e., approved existing fill, imported engineered fill, silty clay / clayey till), a Geotechnical Reaction at Serviceability Limit State (SLS) of 100 to 150 kPa and a factored Geotechnical Resistance at Ultimate Limit State (factored ULS) of 150 to 225 kPa, depending on the subgrade conditions, may be used, which should be verified by a geotechnical engineer during construction. Under the SLS bearing values, settlements of up to 25 mm may take place.

The frost penetration depth for the project area should be considered as 1.4 m.

The highest groundwater elevation measured during the investigation within the project limits of Coleraine Drive was 0.9 m (Elevation 221.9 m) below ground surface in the monitoring well installed at the culvert location. As such, groundwater may be present within the excavation depths for the underground utilities. Also, perched water in sandy / silty pockets and / or water from surface runoff will require dewatering during excavation. As the excavation will generally be in clayey soils, groundwater seepage, if any, into the excavation is likely to be slow and a properly filtered sump and pump system, or gravity drainage, may be used for dewatering excavation.

General discussions regarding excavation and dewatering are provided in Section A5.4. Detailed dewatering consideration for the project is included Wood's hydrogeological investigation report, which is submitted under a separate cover.

Trench excavation, pipe bedding and anti-seepage collar considerations are discussed in following sections.

General discussions provided in Section A5.0 should also be considered for design and construction.

A3.2.2 Trench Excavation

Trench excavation should be carried out as per the latest Ontario's Occupational Health and Safety Act (OHSA) and Regulations for Construction Projects. The soils classifications are shown in Section A5.4. Based on the soils encountered in the boreholes, the sides of excavations are expected to be temporarily stable at 1H:1V for Type 2 and Type 3 soils, provided excavations are properly dewatered and underground utilities are installed and backfilled within a reasonable short period of time. Provisions should be made for dewatering, as noted in Section A5.4. Trenching should be in accordance with OPSS.MUNI 401 (Construction Specification for Trenching, Backfilling and Compacting).

It is important for frost heave compatibility that the trench backfill within the frost zone of 1.4 m depth matches the soil exposed on the trench walls.





A3.2.3 Bedding

Bedding for underground pipes should be placed in accordance with the design requirements and current Ontario Provincial Standards (OPS) specifications (Ontario Provincial Standard Drawing (OPSD) 802.10 for flexible pipes and OPSD 802.30, 802.31 and 802.32 for rigid pipes). It is recommended that a minimum of 150 mm thick bedding material (Class 'B' Type or better) be placed below the pipe invert. The thickness of the bedding may, however, need to be increased depending on the pipe diameter, or if wet or weak subgrade conditions are encountered. If the subgrade is weak, it should be sub-excavated and replaced with engineered fill to support the pipes and allow the use of Class 'B' Type bedding. If weak subgrade is encountered and cannot totally be removed, Class 'A' Type bedding (e.g. minimum 100 mm thick lean concrete) should be used to provide a workable surface and support the proposed pipes.

For the areas to be filled, the fill soils should first be placed approximately to final grade and subsequently excavated to install the underground pipes in order to prevent pipe settlement due to overburden loads.

Should the pipes be installed in soft clay soils, the joints should be restrained from movements and the backfill around the pipes should be properly compacted in order to prevent long-term movements. A layer of geotextile (Terrafix 270R or equivalent) should be placed between the soft clayey soils and the granular bedding/backfill in order to prevent soil migration.

The possibility of pipe movements in soft clayey soils, after installation, should be considered in the design and construction of the underground pipes.

Construction of underground pipes should be carried out in accordance with the relevant OPSS.MUNI 410 (Construction Specification for Pipe Sewer Installation in Open Cut), or other relevant applicable municipal / regional standards.

A3.2.4 Backfill

Based on the visual and tactile examination of the soil samples, the on-site excavated granular / silty clay fill and silty clay / clayey silt till may be re-used as backfill in sewer trenches provided their moisture contents at the time of construction are at or near the optimum. Moisture conditioning of the sub-excavation soils may be required prior to reuse. It should be noted that samples of silty clay / clayey silt that contained organics typically had water contents that were higher than the range optimum for compaction. The excavated cohesive fill should be carefully examined for organic content and moisture condition by qualified geotechnical personnel in order to confirm the need for moisture conditioning or its acceptability for use as backfill.

The backfill should be placed in maximum 200 mm thick layers at or near (\pm 2 %) optimum moisture content, and each layer should be compacted to at least 95 % Standard Proctor Maximum Dry Density (SPMDD).



Backfill around the manhole / catch basins should be brought up simultaneously on all sides and operation of heavy equipment near the walls should be restricted to minimize potential movement and/or damage.

Unsuitable material such as organic soils, boulders, cobbles, frozen soils, etc., should not be used for backfilling.

A3.2.5 Anti-Seepage Collars

From the borehole information, the underground utilities will be installed in clayey soil (silty clay fill, silty clay / clayey silt till). As such, anti-seepage collars should not be required.

A4.0 CULVERT NO. 1 (STATION 1+650)

One existing culvert (approximate Station 1+650), located within the project limits on Coleraine Drive, is planned to be rehabilitated / extended to accommodate the proposed road widening. Based on available information, the existing culvert is a concrete structure with a span of about 2.4 m, and is about 10 m long and 0.6 m high. Other information of the existing culvert and details of the proposed rehabilitation / extension were not available at the time of preparation of this report.

The geotechnical investigation consisted of drilling two (2) boreholes (BH A23/S1 and S2) at the existing culvert location to obtain subsurface and groundwater condition at the culvert location. Both boreholes were drilled to a depth of about 9.4 m (Elevations 213.4 m and 213.1 m) below the existing ground surface. The culvert and borehole locations are shown on Figure Nos. 1A and 1B.

A4.1 Subsurface Conditions

Based on the soil conditions observed in the boreholes drilled for culvert, the subsurface profile at the culvert location generally consisted of fill soils (sand and gravel, and silty clay / clayey silt fill), which were underlying the asphaltic concrete. Native silty clay / clayey silt till was encountered underlying the fill soils in both boreholes to the termination depth.

The stratigraphic units and groundwater conditions for each culvert are discussed in the following sections and presented in the Record of Boreholes. The following summary is to assist the designers of the project with an understanding of the soil conditions encountered at the proposed culvert location. The soil and groundwater conditions might vary between and beyond the borehole locations.

A4.1.1 Surficial Cover – Asphaltic Concrete

At both borehole locations, 200 mm thick asphaltic concrete was encountered at the ground surface.



A4.1.2 Fill Soils

Fill soils encountered below the asphaltic concrete consisted of sand and gravel fill overlying silty clay / clayey silt fill, which extended to a depth of 2.2 m (Elevations 220.2 m and 220.6 m) below the existing ground surface. The granular fill was approximately 100 mm thick and is likely granular road base material.

The sand and gravel fill was brown and contained trace to some silt. The silty clay fill, which was encountered below the sand and gravel fill, was dark grey to brown in colour and contained traces of gravel and organics. SPT 'N' values measured within the silty clay / clayey silt fill ranged from 5 to 8 blows per 0.3 m. Water contents measured in the fill samples ranged from 23 % to 31 %.

A4.1.3 Silty Clay / Clayey Silt Till

Native silty clay / clayey silt till was encountered underlying the fill soils and extended to the termination depth of 9.4 m (Elevations 213.4 m and 213.1 m) below the existing ground surface) in both boreholes.

The silty clay / clayey silt till was brown to grey in colour, and contained some sand and traces of gravel. Cobbles/boulders were encountered in both boreholes. SPT 'N' values measured within the silty clay / clayey silt till ranged between 19 blows and more than 50 blows per 0.3 m, implying very stiff to hard consistency. Water contents measured in the silty clay / clayey silt till varied from 10 % to 22 %.

Gradation and Atterberg Limits tests were carried out in one (1) sample from BH A23/S1 (SS5), the results of which are presented in Table A1.3, and are also shown in the Records of Boreholes.

A4.1.4 Groundwater Conditions

Upon completion, groundwater was encountered in Borehole BH A23/S1 at a depth of 8.2 m (Elevation 214.6 m) below the existing ground surface. Groundwater was not encountered in Borehole BH S2.

Groundwater measured subsequently in the monitoring well installed in BH A23/S1 ranged between 0.9 m and 1.8 m below the existing ground surface (Elevations 221.9 m to 221.0 m). Measured groundwater depths are listed in Table A1.4 and shown on the Record of Boreholes.

It should be noted that the groundwater at the site would fluctuate seasonally and can be expected to be somewhat higher during the spring months, and in response to major weather events.

A4.2 DISCUSSIONS AND RECOMMENDATIONS FOR CULVERT

The purpose of the geotechnical investigation was to obtain subsurface information and to provide geotechnical recommendations with respect to proposed culvert rehabilitation / extension.





Within the depths of the two boreholes drilled adjacent to the existing culvert location, fill soils (sand and gravel, silty clay / clayey silt) were encountered to a depth of about 2.2 m (Elevations 220.2 m and 220.6 m) below ground surface, overlying very stiff to hard silty clay / clayey silt till

The foundation type of existing culvert and details of the proposed rehabilitation / extension were not available at the time of preparation of this report. Accordingly, general considerations for the culverts are presented the following sections.

A4.2.1 Foundation

Based on the boreholes drilled at or in the vicinity of the culvert locations, values of geotechnical reaction at Serviceability Limit State (SLS) and the factored geotechnical resistance at Ultimate Limit State (ULS) are provided in Table A4.1 which may be used for design.

Table A4.1: Recommended ULS / SLS Bearing Values for Culvert Foundations

Borehole No.	Founding Stratum	Depth Below Existing Grade (m)	Elevation (m)	Geotechnical Reaction at SLS (kPa)	Factored Geotechnical Resistance at ULS ⁽¹⁾ (kPa)		
BU V35 / C1	Fill	above 2.2 (±)	above 220.6 (±)	not recommended	not recommended		
DH A23 / 31	Very stiff to hard silty clay till	below 2.2 (±)	below 220.6 (±)	200	300		
BH S2	Fill	above 2.2 (±)	above 220.2 (±)	not recommended	not recommended		
DH 32	Very stiff to hard silty clay till	below 2.2 (±)	below 220.2 (±)	200	300		
Engineered fill per OPSS.MUNI 1010 (if used), as per Section A5.3 150 225							

Notes: (1) A resistance factor of $\Phi = 0.5$ has been applied to the ULS values provided.

The geotechnical bearing values provided in Table A4.1 are intended to assess the feasibility and sizes of footings and are for vertical loads (no inclination) without load eccentricity. Under the SLS pressures, foundation settlements could be up to 25 mm (total) and 20 mm (differential). Detail foundation analysis should be carried out, if necessary, to confirm SLS/ULS and corresponding settlements.

The design frost depth penetration is 1.4 m. All foundations should be covered by at least 1.4 m deep soil or equivalent synthetic thermal insulation.

Highest groundwater level measured during geotechnical investigation period was at about Elevation 221.9 m. As such, a minimum groundwater level at Elevation 222 m or the creek water level, whichever is higher, should be considered for design. If required, the regional high flood level of the creek may be used.

During construction, groundwater control and / or creek diversion (e.g., cofferdam, sheetpiles) to control the ingress of creek water may be required. General recommendations related to excavation and groundwater control are presented in Section A5.4.

A4.2.2 Soil Parameters for Design

The unfactored soil parameters listed in Table A4.2A may be used for design of earth structures. It should be noted that these parameters are based on published information and/or semi-empirical/theoretical relationships, and are conservative and should be verified by field/laboratory testing, if more representative parameters are required.

Table A4.2: Unfactored Static Soil Parameters for Design

	Total Stress Analysis		Effective Stress Analysis		Earth Pressure Coefficients ⁽¹⁾			Bulk Unit	Coefficient of Friction
Material	C (kPa)	Φ (deg)	c' (kPa)	Φ' (deg)	Active K _a	At-Rest Ko	Passive K _p	Weight (kN/m³)	between Concrete and Soil
Very stiff to hard silty clay / clayey silt till	100	0	0	30 ⁽²⁾	0.33	0.50	3.0	19	0.35
			Eng	jineered	Fill (3)				
Granular A (OPSS.MUNI 1010)	0	35	0	35	0.27	0.43	3.7	24 ⁽⁴⁾	
Granular B Type I or Type II (OPSS.MUNI 1010)	0	32	0	32	0.31	0.47	3.3	23 ⁽⁴⁾	0.4

Notes: (1) Values based on semi-empirical relationships. For SLS, K_p values should be reduced to 1/3 of indicated value to limit lateral movement.

A4.2.3 Earthquake Considerations

Based on the soil conditions observed in the boreholes (maximum drill depth of 9.4 m below ground) and the possible bedrock depth at the culvert location (~30 m), and in conformance with the criteria in Table 4.1 (Section 4.4.3.2 – Seismic Properties) of the Canadian Highway Bridge Design Code CSA S6-19 ("CHBDC"), the project site may be classified as Site Class D ("stiff soil").

⁽²⁾ Normally-consolidated range.

⁽³⁾ All engineered fill should be compacted to at least 100 % SPMDD for supporting foundations.

⁽⁴⁾ Unit weight values for engineered fill compacted to 100 % SPMDD. For backfill of retaining walls, unit weights for Granular A and Granular B compacted to 95 % SPMDD may be taken as 22 kN/m3 and 21 kN/m3, respectively.



The design values of site coefficients F(T), F(PGA) and F(PGV) can be obtained from Geological Survey of Canada on Natural resources Canada website: 'www.earthquakecanada.ca" or Tables 4.2 to 4.9 (Section 4.4.3.3 – Site Coefficients) of CHBDC, and the design spectral acceleration, S (T), should be determined as per Section 4.4.3.4 (Design Spectral Acceleration and Displacement Values) and Tables 4.2 to 4.9 in Section 4.4.3.3 of CHBDC.

A4.2.4 Scour Protection

Culvert and headwall footings should be protected against scour and erosion in the form of cut-off walls, rip-rap or equivalent. Scour protection should be designed based on the hydrology requirement by an experienced engineer. Alternatively, the foundations could be placed below the depth of scour and frost penetration. If rip-rap protection is used, it should be separated from the native soils with a geotextile filter fabric (e.g. Terrafix 600R or equivalent) or a filter zone of granular material. The embankment slope surface should be covered with topsoil and seeded/sodded as soon as possible after completion of construction.

A4.2.5 Backfill for Culvert

Backfill materials around culvert should consist of non-frost susceptible, free-draining granular materials in accordance with OPSS.MUNI 1010 (i.e., Granular 'A' or Granular 'B'). Such granular backfill should be compacted to at least 95 % SPMDD (Standard Proctor Maximum Dry Density). Free-draining backfill materials and the drain pipes and weep holes, etc., should be used provided to prevent hydrostatic pressure build-up.

Backfill, backfill transition and cover for the culvert should conform to Ontario Provincial Standard Drawing (OPSD) 3101.150 (Walls, Abutment, Backfill, Minimum Granular Requirement) or applicable City Standard.

Engineered fill is discussed in Section A5.3, and excavation and dewatering during construction are discussed in Section A5.4.

To increase sliding resistance, a shear key may be used, if required. The shear key can be designed using the unfactored K_p values for the soils provided in Table A4.2. The movement of the retaining structure to mobilize the passive resistance should be considered in the design.

A4.2.6 Retaining Wall

If retaining walls are constructed at the ends of the culvert (inlet and outlet), they may be founded on the very stiff to hard native silty clay till. If required, the wall may also be founded on the engineered fill per OPSS.MUNI 1010. The frost and scour protection recommendations provided in Sections A4.2.1 and A4.2.4, respectively should also be adhered to in designing retaining wall foundations.

Soft fill areas should be recompacted (if possible) or replaced with the engineered fill described in Section A5.3. The founding subgrade should be verified by a geotechnical engineer. The SLS/ULS values and

. . .



soil parameters provided in Tables A4.1 and A4.2 may be used for design of wall foundations, as required. Slope stability analyses should be carried for the retaining wall, once the detailed design is completed.

A4.2.7 Permanent Slopes

A slope of 2H:1V (2 Horizontal: 1 Vertical) or flatter should be constructed for the permanent fill embankment. The embankment should be constructed using engineered fill (Section A5.3). The global slope stability should be analyzed during detailed design, if the new embankment height is higher than 2 m high, once the detailed design is finalized. All permanent slope surfaces should be protected against erosion by surface water and creek water.

Construction of the embankment should follow the requirements of OPSS.MUNI 206 (*Construction Specification for Grading*), or applicable City Standard.

A5.0 General Considerations for Design and Construction

A5.1 Site Preparation

Site preparation will likely generally include stripping of topsoil / asphalt / concrete, excavation to subgrade, proof-rolling, sub-excavating soft spots, if encountered, and backfilling, if necessary, with engineered fill.

All topsoil and loose soil or soil mixed with organic matter should be stripped from pavement areas, manhole / catch basin founding areas, and base of underground utility services. Subgrade preparation of pavement is discussed in Section A2.6.3. Any loose, soft or unstable areas in the exposed subgrade should be subexcavated and replaced with approved fill and compacted (Section A5.3). Lean concrete may be used to backfill sub-excavated areas.

Excavation should be carried out with a temporary slope of 1H:1V or flatter above the groundwater level (Section A5.4). Roadway shoring protection systems may be required during construction of the culverts. Temporary shoring is discussed in Section A5.5.

A5.2 Embankment Widening

Based on site condition, the proposed road widening will generally involve fill sections along the investigation limits. The embankment required for road widening should be constructed with compacted engineered fill at 2H:1V (or flatter) side slopes. If a side slope steeper than 2H:1V slope is required or if the height of the embankment / cut slope is greater than 2 m, slope stability analysis should be carried out to assess stability of the planned slope, depending on the subsurface conditions. Where existing embankments are to be widened, the side slopes should be benched in accordance with OPSD 208.010 prior to placement of the widening fills. Final (permanent) embankment side slopes in granular fills should be established to match the





existing slopes or as per OPSD 200.010. Final slopes should be treated with a seed and mulch to prevent ravelling.

Widening of the road will require, as a minimum, stripping the existing ground surface cover (topsoil, asphaltic concrete, vegetation cover, surficial fill soils, etc.) from the area required for road widening. The planned widening will generally be constructed to the same elevation as the existing road surface. Grading, backfilling and compacting should follow OPSS.MUNI 206 (Construction Specification for Grading), OPSS.MUNI 401 (Construction Specification for Trenching, Backfilling and Compacting), OPSS 501.MUNI (Construction Specification for Compacting), and / or the City's requirements.

Backfilling, if required, for site grading (e.g., for subgrade raise, replacement of soft soil) should be placed as engineered fill. Engineered fill per OPSS.MUNI 1010 should be used to replace soft / incompetent soils and/or raising grade. Engineered fill should be prepared according to the City's standards / contract specifications. Engineered fill is discussed in Section A5.3.

The fill soils used for embankment widening should consist of approved clean fill (e.g., Select Subgrade Materials - OPSS 1010).

A5.3 Engineered Fill

Engineered fill per OPSS.MUNI 1010, where required, may be used to backfill excavated areas, backfill around manholes, replace soft/incompetent soils, and / or raise grades. Engineered fill for backfill of excavated areas should be placed after stripping existing fill soils, any soils containing excessive organic matters and otherwise unsuitable soils.

Engineered fill can be prepared by placing fill soil and compacted as per OPSS.MUNI 501 (*Construction Specification for Compacting*) and/or applicable City Standard. Alternatively, engineered fill should be placed in loose layers not exceeding 200 mm. The water content of the fill should be within $\pm 2\%$ of its optimum moisture content (OMC) at the time of its placement, and it should be thoroughly compacted to a minimum of 98 % of Standard Proctor Maximum Dry Density (SPMDD) in general.

The fill soils should consist of inorganic soils and should not be frozen during backfilling and compaction. Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are necessary for the construction of a certifiable engineered fill. The compaction procedures and quality control should be overseen by a geotechnical engineer.

A5.4 Excavation and Dewatering

All excavations should be carried out in accordance with the latest Ontario's Occupational Health and Safety Act (OHSA) and Regulations for Construction Projects (O. Reg. 213/91). The soils to be excavated can be classified as follows:





Existing fill soils Type 3

Firm to hard silty clay / clayey silt till

Type 1 to 3 (varies by consistency)

Very dense silty sand (above groundwater level / fully dewatered) Type 1 Very dense silty sand (below groundwater level) Type 3

In accordance with the OHSA, a maximum short-term slope of 1H:1V is required to within 1.2 m of the trench bottom for temporary excavations in Type 1 and 2 cohesive till and native silty sand that is above the groundwater level, or properly dewatered. For Type 1 and 2 soils, a maximum depth of 1.2 m high vertical cut at the bottom of excavation may generally be constructed. However, under the groundwater table a 1.2 m high vertical cut may not be stable and flatter slopes may be required. Type 3 soils above the groundwater level may be inclined at 1H:1V or flatter from the bottom. In the case of saturated Type 3 fills or native granular deposits below the prevailing groundwater, if adequate dewatering is not implemented, slopes of open excavations will have to be reduced to 2H: 1V or flatter. In the absence of proper dewatering or groundwater control of Type 3 soils, slope flattening may be insufficient to prevent particularly saturated granular soils from becoming unstable and devolving to Type 4 materials. Near the ground surface, occasional 3H:1V or flatter slopes may be required due to loose/soft surficial soils. If open cut cannot be carried out, a temporary shoring system may be used to limit the extent of excavation. General consideration for temporary shoring is provided in Section A5.5.

Trenching should be carried out in accordance with OPSS.MUNI 401 (Construction Specification for Trenching, Backfilling and Compacting).

Stockpiles, materials or any heavy equipment should be kept at least the same horizontal distance as the depth of the excavation from the upper edge of the excavation to prevent slope instability. All surface drainage should be directed away from any open excavations and trenches.

Based on observations at the borehole locations and planned excavation depth, normal excavation equipment should be suitable for excavation. Hard till soils may require additional effort for excavation (e.g., heavy excavator, rippers, impact hammer, etc.). The terms describing the compactness (very loose, loose, compact, dense, very dense) or consistency (very soft, soft, firm, stiff, very stiff, hard) of soil strata give an indication of the effort needed for excavation. It should be noted that cobbles / boulders can be encountered in the till and in fill soils. Therefore, removal of the cobbles / boulders should be considered and planned for.

During the construction, temporary runoff controls such as sediment trap, interceptor drain, dyke and / or silt fence should be installed to prevent uncontrolled water / sediment flow into existing water courses. The effluent from dewatering operations should also be filtered or passed through sediment traps to prevent turbidity.

Based on the soil and groundwater conditions at the borehole locations, groundwater control within the excavated area should not be significant. In the clayey soils, groundwater seepage into the excavation, if encountered, is likely to be slow and a properly filtered sump and pump system or gravity drainage may be



. . .



used for dewatering the excavation. High water flow rates (e.g. from perched water in fills or granular layers with the cohesive tills) may be encountered during construction and the dewatering effort could require an increased number of sumps and pumps.

Use of lean concrete mud mat or granular layer may be warranted where founding surfaces are to be exposed for extended period, especially if the work is carried out during wet weather. Care should also be exercised to minimize disturbance to the final subgrade during excavation.

It is recommended that qualified geotechnical personnel be present during the foundation excavation to review the conditions of the foundation subgrade.

A5.5 Temporary shoring

Temporary shoring may be required for vertical excavation during construction of culverts, installation of underground utilities or roadway protection. This can be accomplished using soldier piles with lagging (or similar) in order to support the sides of the excavation. Temporary shoring design and construction should comply with OPSS.MUNI 539 (Construction Specification for Temporary Protection Systems), or applicable City Standard. The temporary shoring system should be designed to resist the lateral earth, surcharge and hydrostatic pressures which could occur during construction. Bracings should be installed within the shoring system to minimize movements of the soils. The temporary shoring system should be designed in accordance with the latest editions of Canadian Foundation Engineering Manual's (CFEM) and Canadian Highway Bridge Design Code (CHBDC), together with the requirements of the Ontario Health and Safety Regulations, as applicable.

The shoring system should be designed and approved by a professional engineer. Geotechnical parameters provided in Section A4.2.2 may be considered for design of shoring.

A5.6 Suitability of Existing Soils for Backfilling

Most of the excavated soils (i.e. granular fills, clayey fill and silty clay till) can be suitable for being reused for backfill, provided they can be separately stored, properly compacted and are environmentally acceptable. Fill soils containing construction debris (or similar) and organic matter should not be reused. Soils that are too wet to compact will require additional processing (e.g., drying). Cobbles and boulders (larger than 100 mm in size), if any, should be discarded by mechanical means (e.g., sieving) or manual removal.

A6.0 PRELIMINARY SOIL CHEMICAL ANALYSES

Environmental soil chemical analyses were carried out to provide preliminary discussions for soil disposal options as part of the Geotechnical Investigation Preliminary Design for the Site, the results of which are discussed in the following section.



• • •



No Phase I or Phase II Environmental Site Assessment (ESA) reports have been conducted or provided to Wood for review.

It is assumed that a Record of Site Condition, (RSC) as per Ontario Regulation 153/04 Records of Site Condition, Part XV.1 of the *Environmental Protection Act* (EPA), as amended ("O.Reg.153/04, as amended") is not required at this time.

A6.1 Methodology

The environmental soil screening and laboratory analyses program was carried out in general accordance with the current *Ontario Regulation 153/04 Records of Site Condition, Part XV.1 of the Environmental Protection Act (EPA)*, as amended (O. Reg. 153/04) in order to characterize the soil at the Site and to provide an initial discussion on disposal options for surplus material during future construction. It should be noted that the scope of work does not meet the analytical or administrative requirements of Ontario Regulation 406/19 On Site and Excess Soil Management (O. Reg. 406/19) in the event that the soil is to be considered for beneficial offsite reuse.

A Record of Site Condition (RSC) was not part of the scope of work. Due to the limited scope of work, further environmental assessment would be required in the event that an RSC is required.

A6.2 Sample Selection for Analyses

The environmental component of the subsurface investigation included the following activities:

- Conducting the soil sampling activities in accordance with the Ministry of the Environment (MOE) document entitled "Guide for Completing Phase Two Environmental Site Assessments under Ontario Regulation 153/04" dated June 2011, the Ministry of the Environment and Energy (MOEE) document entitled "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario", dated December 1996; and MOE document entitled "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" issued by the Laboratory Services Branch of the MOE and dated March 9, 2004, amended as of July 1, 2011 (Analytical Protocol);
- Based on City of Brampton instruction, submission of seven (7) soil samples for laboratory analysis of metals & inorganics to assist in determining appropriate soil disposal options, if required, during construction;
- Submission of one (1) soil sample for Ontario Regulation 347 (O. Reg. 347) as amended by Ontario Regulation 558/00 (O. Reg. 558/00) Toxicity Characteristic Leaching Procedure (TCLP) for volatile organic compounds (VOCs), Organochlorine (OC) pesticides, polychlorinated biphenyls (PCBs) and metals and inorganics to determine landfill acceptability of soil/granular fill originating from the Site;
- Comparison of the laboratory analytical results to soil standards presented in the Ministry of the Environment, Conservation and Parks (MECP) document entitled "Soil, Ground Water and Sediment





Standards for Use Under Part XV.1 of the Environmental Protection Act," (the "MECP SCS") dated April 15, 2011 and O. Reg. 347, as amended by O. Reg. 558/00, Schedule 4 Leachate Quality Criteria provided in the MECP document entitled "Registration Guidance Manual For Generators of Liquid Industrial and Hazardous Waste," October 2000 (the "Schedule 4 Criteria").

A6.2.1 Site Condition Standards

Analytical soil results were compared to the MECP Table 1 (background) SCS for all types of Property Use (except Agricultural) (Table 1 SCS) and MECP Table 3 (generic) SCS for Industrial/Community Property Use for Medium/Fine Textured Soils (Table 3 SCS).

The chemical analyses results were also evaluated against the following tables of Appendix 1 (Generic Excess Soil Quality Standards) of the new MECP O.Reg.406/19 "On-Site and Excess Soil Management," additional elements which are expected to come into force in January 2023:

- Table 1 Full Depth Background Site Condition Standards for all types of property use (except agricultural) (Table 1 Excess Soil Quality Standards); and
- Table 3.1 Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent, for industrial/commercial/community property use (Table 3.1 Excess Soil Quality Standards).

Furthermore, TCLP analyses results were also compared with Table 3.1 Leachate Screening Levels for Full Depth Excess Soil in a Non-Potable Ground Water condition, Volume Independent, Industrial / Commercial / Community Property Use, Appendix 2 - Generic Leachate Screening Levels for Excess Soil Reuse – of O.Reg.406/19.

A6.2.2 Soil Sampling, Inspection & Preservation Procedures

Soil samples were obtained for laboratory analysis and field screening, where applicable, using a drill rig equipped with split spoon sampling capabilities. The drillers cleaned the split spoon by removing loose dirt from the split spoon using a wire brush, washing the split spoon using a brush in a dilute mix of potable water and Alconox soap, rinsing the split spoon with distilled water and rinsing the split spoon with methanol and allowing the split spoon to air dry.

The drillers obtained the split spoon sample by auguring to the specified depth, hammering the spoon about 0.6 m into the soil and removing the spoon. The split spoon sample was inspected for visual and/or olfactory evidence of environmental impacts. Disposable nitrile gloves were used and replaced between the handling of successive samples.

The soil samples retrieved from the borehole investigations were examined, classified and logged according to soil type, moisture content, colour, consistency, and presence of visible indicators of environmental impact. Soil samples requiring vapour analysis were split into duplicate fractions upon recovery at the surface. The

Wood Reference: TP115086 | 8/15/2022

Page 57 of 201



primary sample fractions were placed in 120 and/or 250 millilitre (mL) sample jars with Teflon-lined lids and methanol preserved (cored) samples were placed in 40 mL vials and subsequently stored in coolers on ice for potential future laboratory analysis. The volatile sample fractions were placed in resealable plastic sample bags and stored at ambient temperature for subsequent field vapour screening. The samples were selected on the basis of visual/olfactory evidence of impacts, field screening results, or from the vicinity of the apparent water table.

Representative soil samples collected during the investigation were submitted to AGAT Laboratories (AGAT) of Mississauga, Ontario, for metals & inorganics. AGAT is accredited by the Standards Council of Canada (SCC) and the Canadian Association for Laboratory Accreditation (CALA) in accordance with ISO/IEC 17025:2005 – "General Requirements for the Competence of Testing and Calibration Laboratories" for the tested parameters set out in the Soil, Ground Water and Sediment Standards.

A6.3 Environmental Test Results and Considerations

Wood completed a preliminary Environmental Soil Quality Testing Program (the Investigation) as part of the Geotechnical Investigation. The details of the drilling program, including borehole locations and drilling methodology are presented in the geotechnical investigation sections of this report. Soil samples submitted for chemical analysis were collected from depths between 0.3 m and 3.0 m below ground surface (mbgs) based on presence of fill material and depth of construction works, as detailed in Table A6.1.

Depth **Sample ID Parameters Tested** (m) Metals and Inorganics A3 SS4 2.4 - 3.00.3 - 0.9Metals and Inorganics A9 SS1 Metals and Inorganics A13 SS1 0.3 - 0.9Metals and Inorganics **BH A17 SS3** 1.5 -2.1 Metals and Inorganics 0.6 - 1.3**BH A20 SS2** Metals and Inorganics **BH A28 SS2** 0.6 - 1.2Metals and Inorganics **BH A31 SS2** 0.9 - 1.5

Table A6.1: Environmental Tests

Wood observed fill material in all of the boreholes.

Headspace combustible organic vapour (COV) concentration measurements recorded in the soil samples were all non-detectable. Total organic vapour (TOV) concentration measurements recorded in the soil samples were all non-detectable. No other evidence (i.e., visual/olfactory) of potential environmental impacts were observed in any of the soil samples collected from this project area.



The soil samples collected as part of this preliminary assessment that had Table 1 SCS exceedances are as follows:

- A9 SS1 and its field duplicate (DUP1) for electrical conductivity (EC) and sodium adsorption ratio (SAR);
- A13 SS1 for EC;
- BH A20 SS2 for EC and SAR;
- BH A28 SS2 for EC and SAR; and
- BH A31 SS2 for EC and SAR.

The other analyzed soil samples had concentrations that met the Table 1 SCS for metals and inorganics.

The soil samples collected as part of this assessment that exceeded the Table 3 SCS are as follows:

- DUP1 of soil sample A9 SS1 for EC;
- A13 SS1 for EC;
- BH A20 SS2 for EC;
- BH A28 SS2 for EC and SAR; and
- BH A31 SS2 for EC.

The other analyzed soil samples had concentrations that met the Table 3 SCS for metals and inorganics.

When compared to the O. Reg. 406/19 Excess Soil Quality Standards Exceedances, the soil samples collected as part of this assessment that had Table 1 Excess Soil Quality Standards exceedances are as follows:

- A9 SS1 and its field duplicate (DUP1) for electrical conductivity (EC) and sodium adsorption ratio (SAR);
- A13 SS1 for EC;
- BH A20 SS2 for EC and SAR;
- BH A28 SS2 for EC and SAR; and
- BH A31 SS2 for EC and SAR.

The other analyzed soil samples had concentrations that met the Table 1 Excess Soil Quality Standards for metals and inorganics.

The soil samples collected as part of this assessment that had Table 3.1 Excess Soil Quality Standards exceedances are as follows:

- DUP1 of soil sample A9 SS1 for EC;
- A13 SS1 for EC;
- BH A20 SS2 for EC;
- BH A28 SS2 for EC and SAR; and
- BH A31 SS2 for EC.





The other analyzed soil samples had concentrations that met the Table 3.1 Excess Soil Quality Standards for metals and inorganics, the contaminant of concern indicated by the City of Brampton.

The TCLP analyses for the parameters tested indicated that dry soils (soils that would pass a slump test) would meet the Schedule 4 Leachate Quality Criteria.

Soil analytical results are shown in Tables 1A to 4A in Appendix C-A. The laboratory certificates of analysis for the bulk analysis and the certificates of analysis for the O. Reg. 347 TCLP analysis are included Appendix D.

A6.4 Quality Assurance / Quality Control

<u>Field Quality Control:</u> Field quality control was not performed for this segment and is discussed in separate reports being written as part of the Geotechnical Investigation.

<u>Laboratory Quality Control</u>: The 2011 Analytical Protocol provides requirements for sample handling and storage requirements, reporting requirements, analytical methods and QA/QC procedures for analytical parameters.

As per the 2011 Analytical Protocol, all samples/sample extracts were analyzed within their applicable hold times using approved analytical methods. The report limits were met for all samples and tested parameters. No tested parameter was present in a detectable concentration in any laboratory Method Blank and all laboratory surrogates, reference materials and replicate samples are considered acceptable.

SECTION B: ARTERIAL A2 (FROM MAYFIELD ROAD TO REGIONAL ROAD 50, ~3.4 KM)

B1.0 OVERALL SUBSURFACE CONDITION

The new road (Arterial A2) is proposed between Highway 50 and Mayfield Road, as shown Figure Nos. 2A and 2B. A total of 33 boreholes (BH B1 to B33) along the road alignment and 4 boreholes (BH S3 to S6) at two culvert locations were planned to be drilled. Seven (7) boreholes (i.e. BH B29 to B33) located north of Countryside have been deferred to the detail design stage, if needed, as discussed with and approved by the City.

A total of twenty-seven (27) boreholes (BH B1 to B28, not including B7) were drilled to depths varying from 1.5 m to 5.2 m, along the alignment proposed new road (Arterial A2). Additionally, four (4) boreholes (BH S3, S4, B7/S5 and S6) were drilled to depths ranging between 9.4 m and 9.8 m, for the one proposed new culvert and one culverts rehabilitations / extensions. Due to their proximity, BH B7 and BH S5 were combined into one borehole (BH B7 / S5). The boreholes were drilled along the proposed alignment. Boreholes BH S3 and BH S4 were located at the two sides of an existing culvert on Highway 50, at its proposed intersection with the new Arterial A2. Boreholes BH S5 and BH B7/S5 were located at the two sides of a proposed culvert at the intersection of the proposed Arterial A2 with the proposed E-W Arterial.

The stratigraphic units and groundwater conditions are discussed in the following sections. Additional information is provided in the Record of Boreholes. The following summary is to assist the designers of the project with an understanding of the possible soil conditions at the investigated road section. The soil and groundwater conditions might vary between and beyond the borehole locations.

B1.1 Topsoil

Topsoil was encountered at the surface of all boreholes except Boreholes BH B1, BH B22, BH B23 to BH28, inclusive, BH S3 and BH S4. The thickness of the topsoil varied between 100 and 300 mm.

B1.2 Asphaltic Concrete

In Boreholes BH B1 and BH B22, approximately 140 and 200 mm of asphalt was encountered, respectively.

B1.3 Granular Fill

Granular fill (gravelly sand and sand and gravel fill), likely comprising granular road base in whole or part, was encountered underlying the asphalt layer in Boreholes BH B1 and BH B22 or was exposed at the surface at Boreholes BH B24, BH S3 and BH S4. Borehole BH B24 was drilled next to a vegetated area and Boreholes BH S3 and BH S4 were drilled on the driving lane / shoulder of existing roads. The thickness was 700 mm in BH B1 and BH S3, 400 mm in BH B22, 600 mm in BH B24, and 900 mm in BH S4. The SPT 'N' values of the granular



fill ranged from 9 to more than 50 blows per 0.3 m. Water contents measured in granular fill samples varied from about 6 % to 7 %.

Two (2) sieve analyses were carried out on the selected samples of granular fill zone from Boreholes BH B1 and BH B22. The test results are presented in Table B1.1 and are also shown in the Record of Boreholes.

Grain Size Distribution (%) Borehole Sample Depth **Elevation Fines Soil Classification** No. No. (m) (m) Gravel Sand Silt | Clay GRAVELLY SAND, some fines. 211.2 -Sample does not meet BH B1 SS1A 0.3 - 0.8 32 56 12 210.7 OPSS1010 Granular A or B due to excessive fines content GRAVELLY SAND, trace fines. 220.2 -BH B22 SS1A 0.3 - 0.6 33 58 9 Sample meets OPSS1010 219.9 Granular B Type I

Table B1.1: Results of Grain Size Distribution Analysis (Granular Fill)

The grain size distribution curves are presented in Figure B-B1 in Appendix B-B.

B1.4 Silty Clay Fill

Silty clay fill was encountered at the ground surface or below the topsoil / granular fill soils at all borehole locations. The silty clay fill was generally brown, dark grey, or black in colour and contained some sand and trace to some gravel, with trace of organics noted in several boreholes. The silty clay fill extended to a minimum depth of about 0.6 m below the existing ground surface to a maximum depth of 3.7 m (Elevations 206.8 m to 222.7 m). In Boreholes BH B1, BH B22, and BH B24, the silty clay fill was encountered to the termination depths of the boreholes at 1.5 m to 2.1 m below ground surface. The SPT 'N' values of the silty clay fill ranged from 4 to 36 blows per 0.3 m. The measured water contents of the silty clay fill samples ranged from about 13 % to 47 %.

B1.5 Silty Clay / Clayey Silt Till

Natural silty clay / clayey silt till was generally encountered below the fill soils in all boreholes except Boreholes BH B1, BH B22, and BH B24, which were terminated within the silty clay fill. Where encountered, the silty clay / clayey silt till extended to the termination depths of all boreholes except in Borehole BH S4. The silty clay / clayey silt till was brown, grey, or black in color, and contained trace to some gravel, cobbles/boulders, and oxidation. Layers of silty sand and sand and silt were encountered at Elevation 207.2 m in Borehole BH B2 and Elevation 205.6 m in Borehole BH B7/S5, respectively. The SPT 'N' values of the silty clay / clayey silt till ranged from 5 blows to greater than 50 blows per 0.3 m, implying a firm to hard consistency, but were generally over 15 blows per 0.3 m, i.e. generally very stiff to hard. The measured water contents of the silty clay / clayey silt till samples ranged from about 9 % to 28 %.

Gradation and Atterberg Limits tests were carried out on five (5) samples from the till deposit, the results of which are presented in Table B1.2, and shown in the Records of Boreholes.

Table B1.2: Results of Grain Size Distribution Analysis and Atterberg Limit Tests (Clayey Silt / Silty Clay Till)

				Grair	Grain Size Distribution (%)				Atterberg Limit		USCS
Borehole	Sample	Depth	Elevation			Fir	nes	P	itterberg Li	mit	Modified
No.	No.	(m)	(m)	Gravel	Sand	Silt	Clay	Liquid Limit	Plastic Limit	Plasticity Index	Group Symbol
BH B11	SS 3	1.6	210.7	2	24	49	25	26	16	10	CL
BH B17	SS 3	1.6	216.9	5	21	47	27	28	17	11	CL
BH B25	SS 6	4.1	218.4	1	10	49	40	35	19	16	CI
BH B27	SS 3	1.8	221.6	1	18	53	28	31	18	13	CI
BH S3	SS 6	3.8	206.9	3	33	46	18	22	12	10	CL

The grain size distribution curves and plasticity chart are presented in Figure Nos. B-B2 and B-B3 in Appendix B-B.

B1.6 Silty Sand / Sand and Silt Till

A layer of silty sand to sand and silt till was encountered within the silty clay / clayey silt till in Boreholes BH B2 and BH B7/S5 and extended to about 3.7 m to 4.5 m depth below the existing ground surface (Elevation 206.5 m to 204.8 m). The silty sand to sand and silt till was brown to grey in color and contained trace to some gravel and traces of clay. The SPT 'N' values of the till were 65 and 58 blows per 0.3 m of penetration, indicating a very dense state of compactness. Two water contents measured in the silty sand to sand and silt till were 11 % and 12 %.

Two (2) gradation tests were carried out on samples of the silty sand to sand and silt till, the results of which are presented in Table B1.3, and shown in the Records of Boreholes.

Table B1.3: Results of Grain Size Distribution Analysis (Silty Sand / Sand and Silt)

Davahala	Cample	l. Dth	Floretion	Grain Size Distribution (%)					
Borehole No.	No.	(m)	Elevation		Canal	Fir	nes	Soil Classification	
NO.	NO.	(111)	(m)	Gravel	Sand	Silt	Clay		
BH B2	SS 5	3.1	207.1	14	49	33	4	SILTY SAND, some gravel, trace clay	
BH B7/S5	SS 6	3.8	205.5	4	43	50	3	SAND AND SILT, trace gravel, trace clay	

The grain size distribution curves are presented in Figure B-B4 in Appendix B-B.





B1.7 Silty Sand / Sandy Silt Till

Natural silty sand / sandy silt till were encountered in Boreholes BH S3 and BH S4 below the silty clay / clayey silt till, and extended to the termination depth of the boreholes at 9.4 to 9.8 m (Elevation 201.2 to 200.8 m), respectively. The silty sand / sandy silt till was grey in colour and contained traces clay and gravel. SPT 'N' values measured in the silty sand / sandy silt till ranged between 35 blows to more than 50 blows per 0.3 m indicating dense to very dense compactness. Cobbles and boulders were encountered in the silty sand / sandy silt till.

Water contents measured in silty sand / sandy silt till samples varied from 15 % to 17 %.

One (1) gradation test was carried out on one sample of the till, the results of which are presented in Table B1.4, and also shown in the Record of Borehole.

Table B1.4: Results of Grain Size Distribution Analysis Tests (Silty Sand / Sandy Silt Till)

Para	Borehole Sa		Danish	Flanction	Grain Size Distribution (%)					
Боге		No.	(m)	Elevation	Crovel	Cand	Fines Silt Clay		Soil Classification	
INC	0.	NO.	(111)	(m)	Gravel	Sand				
ВН	S3	SS 9	7.7	203.0	1	35	56	8	SANDY SILT TILL, trace clay, trace gravel	

The grain size distribution curve is presented in Figure B-B5 in Appendix B-B.

B1.8 Groundwater

Upon completion, groundwater was encountered in Boreholes BH B2, B7/S5, BH B9, BH B20, BH B21, BH S6, BH S3, BH S4 and BH S6 at depths of 1.2 to 7.6 m below the existing ground surface. Groundwater was not encountered in the remaining boreholes.

Two (2) monitoring wells were installed, one each in Boreholes BH B7/S5 and BH S4, at the location of the culverts crossing. The groundwater depths measured in the boreholes at the time of drilling or upon completion of drilling, where encountered, and in subsequent measurements in the monitoring wells are summarized in Table B1.5 and shown on the Record of Boreholes.

Table B1.5: Results of Groundwater Level Measurements

	Groundwater Measurements							
Borehole No.	During or U	pon Completio	on of Drilling (m)	In Monitoring Well (m)				
	Date	Depth	Elevation	Date Depth Elevati		Elevation		
BH S3	10-Jan-20	7.0	203.7	Not installed				
BH S4	10-Jan-20	7.6	203.0	Well damaged by others (road construction)				
BH B2	23 Jan 2020	3.7	206.5	Not installed				

Wood Reference: TP115086 | 8/15/2022

Page 64 of 201





	Groundwater Measurements								
Borehole No.	During or U	pon Completio	n of Drilling (m)	In Monitoring Well (m)					
	Date	Depth	Elevation	Date	Depth	Elevation			
BH B7/S5	26 Feb 2020	5.8	203.5	4 May 2020	-0.7	210.0			
ВП В//33	26 Feb 2020	5.0	203.3	12 May 2020	-0.5	209.8			
BH S6	26 Feb 2020	5.5	203.5	Not installed					
BH B9	20 Feb 2020	4.3	208.2	Not installed					
BH B20	24 Jan 2020	1.2	218.7	Not installed					
BH B21	24 Jan 2020	2.7	218.1	Not installed					

Note: Negative (-ve) values indicate that the groundwater level is above the ground surface (artesian).

It should be noted that the groundwater at the site would fluctuate seasonally and can be expected to be somewhat higher during the spring months, and in response to major weather events.

B1.9 Soil Corrosivity

Resistivity

Two (2) soil samples were submitted for corrosion analysis to determine the corrosive potential of the soils with respect to buried metallic structures. The results of the analyses are presented Table B1.6, and the laboratory test certificate is included in Appendix D.

Units **Parameter BH S6-SS5 BH 24- SS1** Chloride ug/g or (ppm) 13 54 24 68 Sulphate ug/g or (ppm) рΗ pH Units 8.20 8.15 **Electrical Conductivity** mS/cm 0.145 0.335

Ohm-cm

Table B1.6: Soil Corrosivity Test Results

As per ASTM STP 1013 (Effects of Soil Characteristics on Corrosion – "chloride appears to be the main factor in increased soil corrosivity with levels in excess of 0.01 % (100 μ g/g) considered indicative of accelerated corrosion". The chloride content measured in the sample was less than 100 μ g/g. In accordance with Table 1 of CSA A23.1-14 and based on "structurally reinforced concrete exposed to chloride, with or without freezing and thawing" and based on project location, exposure class "C-1" can be used. Class should be based on structure location and/or durability requirement.

6900

2990

In accordance with Table 3 of CSA A23.1-14, no additional requirement is specified for sulphate content below 0.10% (i.e. 1,000 ppm or $\mu q/q$) below the "moderate degree of exposure" with respect to concrete. Therefore,



in accordance with Table 6 of the Canadian Standards Association (CSA) Series A23.1-14, Type GU Portland cement can be used based on the water-soluble sulphate content measured in soil.

As noted in ASTM -STP 1013 (*Effects of Soil Characteristics on Corrosion*), pH values between 4.0 and 8.5 have very little effect on corrosion (American Water Works Association (AWWA) Standard C 105-72 (Table 1 – Soil-Test Evaluation AWWA Rating).

The measured soil resistivity value of 6900 ohm-cm from Borehole BH S6-SS5 and 2990 ohm-cm for Borehole BH 24-SS1 can be considered as "low" and "moderate", respectively, for exposed metallic structures, based on ASTM STP 1000, Corrosion Testing and Evaluation - Table 3 (Corrosivity for Uncoated Steel).

Protection against steel corrosion, where required, could include one or a combination of: adequate concrete cover, low-permeability concrete, corrosion inhibitors; coated reinforcing steel; clad reinforcing steel; and corrosion-resistant alloy reinforcement.

A corrosion specialist should be retained, if necessary, to review the analysis results and provide relevant recommendation.

B2.0 PAVEMENT INVESTIGATIONS AND DESIGN

The purpose of the pavement investigation was to obtain subsurface information and to provide geotechnical recommendations for new construction of Arterial A2 which will be north / south oriented, and as the City's road classification, it is a Major Arterial road. The length of the investigation of the new road is about 3.3 km.

The proposed Arterial A2 is a new alignment designated as rural road with 6-lanes from Mayfield Road to Major MacKenzie Drive / RR 50. The discussions and recommendations in the following sections are general in nature as the details of the new alignment were not available at the time of this report. At the time of this report, seven (7) boreholes (BH B29 to BH B33), located in the private lands north of Countryside Drive, could not be drilled and have been deferred to detailed design stage, if required. Therefore, the subsurface profile and the discussions and recommendations in the following sections are applicable only to the planned road section up to Borehole BH B28 (Sta. 2+700). Additional investigation should be carried out for the section from Borehole BH B28 (Sta.2+700) to Mayfield Road (Sta. 3+300) during detailed design.

The subsurface soil profile at the site consisted of granular and cohesive silty clay fills, and native soils (silty clay /clayey silt till, silty sand / sandy and silt, silty sand / sandy silt till) which extended to the termination depths of the boreholes that ranged from 1.5 m to 9.8 m below ground surface.

All boreholes were open and dry upon completion to their respective vertical limits of investigation except eight (8) boreholes (BH B2, BH B7/S5, BH B9, BH B20, BH B21, BH S3, BH S4, BH S6). The termination depths of the open and dry boreholes ranged from 1.5 m to 5.2 m below ground surface.





The discussions and recommendations in the following sections are based on the subsurface information obtained from the boreholes and are intended for use by Design Engineers.

B2.1 Visual Pavement Condition Survey

Not applicable, as this is a new construction.

B2.2 Subsurface Conditions

At the time of this report, a total of thirty-one (31) boreholes had been drilled along the proposed central line of the Arterial A2 and at two culvert locations, between Mayfield Road and Major Mackenzie Drive / RR 50 (approximately 3.3 km). As noted above, five (5) boreholes have not been drilled and are to be drilled at a later date.

The subsurface soil profile at the site consisted of surface covering materials (topsoil, asphalt, and/or fill) overlying native soils. The thickness of topsoil ranged from 100 mm to 300 mm, asphaltic concrete ranged from 140 mm to 200 mm were encountered at Boreholes BH B2 (at intersection of Highway 50 and Coleraine Drive) and BH B22 (drilled at Countryside Drive), granular fill material (gravelly sand and sand and gravel) ranged from 400 mm to 660 mm, and silty clay fill material was encountered to the maximum depth of to 3.7 m. The native soils (silty clay /clayey silt till, silty sand / sand and silt, silty sand / sandy silt till) extended to the termination depths of the boreholes which ranged from 1.7 m to 9.8 m as detailed in the Record of Boreholes.

Additional subsurface information is provided in Section B1.0 and in the Record of Boreholes.

B2.3 Groundwater Conditions

Groundwater was encountered in a number of boreholes during and on completion of drilling in the open boreholes at depths varying from 7.6 m below ground to 0.7 m above ground (artesian condition), as listed in Table B1.5. It should be pointed out that the groundwater at the site would fluctuate seasonally and can be expected to be somewhat higher during the spring months and in response to major weather events.

B2.4 Pavement Design

The purpose of the geotechnical investigation was to obtain subsurface information and to provide geotechnical recommendations for new construction of new 6-lane north-south major arterial road (Arterial A2).

The discussions and recommendations in the following sections are based on the available information and the subsurface information obtained from the boreholes and is intended for use by Design Engineers.





B2.4.1 **Forecasted Traffic Data**

The traffic data represented as Average Annual Daily Traffic (AADT₂₀₁₆) in both directions was estimated by Wood Traffic Group as presented in Table B2.1. This traffic data was used to projected traffic data for 20 years design life. Equivalent single axle loads (ESALs) were calculated cumulatively over 20 years as described in the Ministry of Transportation Report "Procedures for Estimating Traffic Loads for Pavement Design, 1995".

Table B2.1: Traffic Data along Coleraine Drive from Arterial A2 to Mayfield Dr, Ontario

AADT in Both Directions 2020 ⁽¹⁾	Growth Rate (%)	Comm. Vehicles (%)	Design ESALs @ 20 Years	Traffic Category
9,780	2.0%	6.0%	5,058,663 ~ 5.1 x 10 ⁶	Category

²⁰²⁰ is the anticipated construction year.

B2.4.2 **Flexible Structural Pavement Design**

After reviewing the field data and laboratory test results, the minimum pavement structural design for the new construction of the Arterial A2 is presented in Table B2.2 and was determined in accordance with the 1993 American Association of State Highway and Transportation Officials ('AASHTO') Guide for the Design of Pavement Structures using the Darwin Software Program.

The AASHTO Pavement Design is considered to be a function of estimated future traffic in both directions (ESALs), reliability (R), which is a function of road classification, overall standard deviation (So), resilient modulus (M_r), as well as initial and terminal serviceability (P_o, P_t). From these parameters, the structure number (SN) is calculated. The SN is defined in the AASHTO Guide as a number, which provides a measure of the pavement strength and thickness needed to avoid overstressing the subgrade.

The following design parameters were chosen to calculate the required structure number for the design of flexible pavement using the AASHTO method, as described in the Ministry of Transportation Materials Information Report MI-183 "Adaptation and Verification of AASHTO Pavement Design Parameters for Ontario Conditions".

-	Initial serviceability,	$P_i = 4.5$;
	minutal Schriccasinity/	

Terminal serviceability, $P_t = 2.5$;

Reliability level, R = 90 percent;

Overall standard of deviation, $S_0 = 0.49;$

Subgrade Resilient Modulus, M_r (kPa) $M_r = 30,000$

Table B2.2: Recommended Minimum Structural Pavement Design

		AASHTO Design f	or 20 Ye	ars		Recommende	d HMA & PGAC	X
			σZ	NS	nt ss	Mar	shall	egor
ESALs	НМА	Gran A	Required Design SN Selected SN		Total Pavement Thickness	HL 3 (HS) /HL 1 Surface Course	HL8 Binder Course	Traffic Category
			Thi	ckness	(mm)			
5.1 X 10 ⁶	170	Gran A = 450 mm or Gran A = 150 mm Gran B Type II = 300 mm	133	134	620	SP 50 mm PGAC 64-28	60+60 mm PGAC 58-28	С
		The Regional Minimum	Paveme	nt Struc	ture Desi	gn for Arterial R	Roads	
2 0 V 106	160	Gran A = 150 mm Gran Type II = 450 min (subgrade base slopes at	_	151.2	760	40-50 HL1	100-110 mm HL8 (HS)/HDBC	С
5.0 X 10°	3.0 X 10 ⁶ 160	3% and top of subgrade at 2, so depth varies).	-	131.2	760	No rap. No engi		

Notes:

- Pavement shall be placed over approved subgrade.
- Granular A and Granular B Type II: Compaction as per OPSS Form 1010 (100% SPMDD).

The Regional minimum design was selected for the road widening since it is intended to be Regional road.

B2.5 Recommendations and Construction Features for Pavement

B2.5.1 New Construction

Pavement recommendations for new alignment is presented in Table B2.3, including hot mix type, lift thickness, and PGAC type making up the recommended asphalt thickness, as well as the traffic category, in accordance with OPSS.MUNI 1151. The granular thicknesses of the widening given in the table is a minimum thickness and should match the adjacent existing pavement granular thickness to promote positive lateral drainage. Also, the thicknesses can be increased depending on grading requirements.

Table B2.3: New Construction of Arterial Widening of Arterial A2

НМА	НМА						
Туре	Thickness (mm)	PGAC	Category				
HL 1 / DFC – Surface Course	50 mm	64-28	C				
HL 8 (HS) / HDBC – Binder Course	50 mm	64-28					
	60 mm	04-20					
Granular Base 'A'	150 mm	-	-				
Granular Subbase 'B' Type II	450 mm	-	-				
Total Pavement Structure	760 mm						

B2.5.2 Subgrade / Road Base Preparation and Compaction

The pavement structural design recommended for roads is applicable, provided the subgrade is prepared under dry weather conditions, proof-rolled with a heavy rubber-tired vehicle (such as a grader or loaded dump truck) in the presence of the geotechnical consultant. Any loose, soft or unstable areas, if detected during proof-rolling, must be sub-excavated, replaced with approved granular materials and compacted. Any additional engineered fill, if required, should be placed in thin layers not exceeding 200 mm and compacted to a minimum of 98 % of Standard Proctor Maximum Dry Density (SPMDD). Granular materials should be placed in thin layers not exceeding approximately 200 mm, within ± 2 % of its optimum moisture content, and thoroughly compacted to a minimum of 100 % of SPMDD.

The subgrade should be provided with adequate drainage. If wet weather conditions prevail at the time of construction, adjustments to this design may be required, i.e. if the subgrade becomes excessively wet or rutted during construction activities, additional sub-base material may be required. The need for additional sub-base material is best determined during construction.

All granular base and sub-base materials must be compacted to at least 100% of SPMDD.

B2.5.3 Stripping and Sub-Excavation

No additional sub-excavation, other than removal of organics and topsoil (ranging in thickness from 100 mm to 300 mm), are anticipated within the widening limits. However, any unsuitable soft or saturated material should be removed. Deeper stripping depths may be required, depending on the actual site conditions between borehole locations.

B2.5.4 Drainage

Prior to completing the rehabilitation, it is recommended that adequate drainage be provided both laterally and longitudinally along the length of the project.



To meet the design requirements for the pavement life, the road subgrade and granular courses should be well drained at all times. This can be accomplished by ensuring proper grading of the subgrade and positive lateral drainage of the granular base daylighting at the ditch. Alternatively, full-length perforated subdrain pipes of 150 mm diameter should be installed along both sides of the road, below the roadbed level, to ensure effective drainage, in accordance with OPSD 216.021. The sub-drain pipes should be wrapped in suitable non-woven geotextile surrounded by a minimum drainage zone of 19 mm size clear stone of minimum 150 mm thickness. A minimum slope of 2 % should be maintained across the paved sections (finished road surface) to ensure proper surface drainage. New pavement should slope towards the gutter/ditch.

B2.5.5 Hot Mixes and PGAC Type

The following Marshall hot mixes should be used on Arterial A2:

 DFC / HL 1 surface course mix and HL 8 (HS) /HDBC binder course should be used to provide the roadway with high durability.

Material Specification should be as per OPSS 1150 Material Specification for Hot Mix Asphalt. For aggregates, the material specification should be as per OPSS.MUNI 1003.

Performance Graded Asphalt Cement ("PGAC") 64-28 should be used only for surface course and PGAC 58-28 for binder course. This PGAC should satisfy the requirements of MP1 of SHRP Specifications for Superpave.

<u>Recycled Materials:</u> The use of reclaimed asphalt pavement (RAP) is not permitted as per the Regional minimum requirements for Marshall mixes for the Regional Arterial Roads.

Steel slag aggregates should not be allowed.

<u>Transition Treatments at Limits of Paving</u>: At the limits of the project, a butt joint with the existing pavement is recommended. The butt joint between successive lifts of hot mix should be staggered at a distance of not less than 5 m, in accordance with OPSS.PROV 313. It should be ensured that no joint location corresponds with a joint location in any other layer.

The transition treatment from earth cut to earth fill should be in accordance with OPSD 205.010.

<u>Tack Coat:</u> It is recommended that all milled surfaces, and binder course surfaces will be tack coated prior to top course asphalt, if exposed to extended traffic. Construction Specification should be as per OPSS Prov. 308, April 2007.



B2.5.6 In-Situ Compaction for Hot Mix

In all areas, asphaltic concrete should be compacted as per OPSS.MUNI 310, Table 10 (April 2011). It should be noted that the granular base and sub-base materials should be compacted to the City's standards or to minimum 100 % SPMDD.

<u>Field Quality Assurance:</u> Plate samples of loose hot mix should be obtained for each paving day, and extraction/gradation and full Marshall compliance testing should be carried out on these samples. The finished surface shall be true to required profile and cross-section within 6 mm from required elevations and thickness. The surface shall show no depressions or bumps exceeding 3 mm under a 3.0 m long straight edge, placed parallel to the road centreline.

B2.6.7 Frost Depth

A minimum depth of 1.4 m should be used for frost protection as per OPSD 3090.101.

B2.6.7 Detouring

No long-term detouring is planned. Therefore, no special treatment will be required.

B3.0 UNDERGROUND UTILITIES

The geotechnical investigation scope of work included obtaining subsurface conditions and providing recommendations for installation of proposed underground utility services. Accordingly, selected boreholes (i.e. alternating pavement boreholes) were deepened to a depth of 3 m to 5 m, as listed in Table 5.2. Information obtained from all relevant boreholes drilled along proposed alignment of Arterial A2 have been considered in this section, as applicable.

B3.1 Subsurface Conditions

At the time of this report, a total of thirty-one (31) boreholes had been drilled in along the alignment of the proposed road (at and south of Countryside Drive) and at culvert locations (one existing and one proposed) to depths varying from about 1.5 m to 9.8 m, for pavement investigation, underground utility installation and two culverts. Five (5) boreholes (i.e. BH B29 to B33), located north of Countryside Drive, have been deferred to detail design stage, if required.

Overall, the project site along Arterial A2 (from Sta. 0+000 to Sta. 2+700) consisted of surficial cover (topsoil, asphaltic concrete, and / or exposed fills) underlain by fill soils (granular and / or silty clay) overlying native soils (silty clay / clayey silt till, silty sand to sand and silt and / or silty sand / sandy silt till). Within the drilled depth, the fill soils extended to depths varying from about 0.6 m to 3.7 m (Elevations 206.8 m to 222.7 m) below the existing ground surface. Generally, till soils (silty clay / clayey silt and / or silty sand / sandy silt)



were confirmed to a depth of about 9.8 m (up to Elevation 199.3 m) below existing ground surface in the deeper boreholes at the structure locations.

Groundwater levels measured in the boreholes (upon completion of drilling) and subsequently monitoring wells varied from 0.7 m above ground to 7.6 m (Elevations 210.0 m to 203.0 m) below ground surface.

Detailed subsurface and groundwater conditions are provided in Section B1.0.

B3.2 Discussions and Recommendations for Underground Utilities

As per information available, the proposed Arterial A2 will include installation of underground utilities and associated manholes and catch basins. Details of the installation were not available at the time of this report. Existing utilities, if any, should be protected and taken into consideration for design and construction of the proposed underground utilities and road.

The ground (road) elevations along the alignment (based on borehole locations up to the investigated limits) varied from about 209.0 m (at BH S6) to 223.4 m (at BH 28), with the overall the ground surface was sloping up from south (Highway 50) to north (towards Mayfield Road).

The recommendations and discussions for excavation and installation of underground utility services, and associated manholes / catch basins, are provided in the following sections.

B3.2.1 Founding Subgrade Conditions

From the investigation result, fill soils (granular, silty clay) were present to depths varying from 0.6 m to 3.7 m below existing ground / road level. The granular fill was encountered to depths varying from 0.4 m to 1.2 m in four boreholes that were drilled on the road / shoulder and one borehole (BH B24) drilled next to a vegetated area. The SPT values in the silty clay fill implied a firm to hard consistency. The granular fill, where encountered, was loose to very dense.

The native soils below the fill soils were of generally very stiff to hard consistency (with occasional firm to stiff areas) and / or of dense to very dense compactness overall, and should be generally competent to support underground utility services.

It is recommended that the inverts of underground utilities be founded on native soils, or competent fill soil subgrade. Soft / loose soils encountered at the founding level should be compacted, if possible, or otherwise, should be sub-excavated and backfilled with compacted soil as recommended in Section B5.3 (Engineered Fill).

For manholes and catch basins founded on competent subgrade (i.e., approved existing fill, imported engineered fill, native soils), a Geotechnical Reaction at Serviceability Limit State (SLS) of 100 to 150 kPa and a factored Geotechnical Resistance at Ultimate Limit State (factored ULS) of 150 to 225 kPa, depending on the





subgrade conditions, may be used, which should be verified by a geotechnical engineer during construction. Under the SLS bearing values, settlements of up to 25 mm may take place.

The frost penetration depth for the project area should be considered as 1.4 m.

The highest groundwater elevation measured during the investigation within the investigated project limits of the proposed Arterial A2 was at Elevation 218.1 m (2.7 m below ground surface). It should be noted that groundwater level measured in the monitoring well installed at Borehole BH B7/S5 location (drilled for proposed culvert) was up to 0.7 m above existing ground surface (up to Elevation 210.0 m). As such, groundwater may be present within the excavation depths for the underground utilities. Also, perched water in sandy / silty pockets and / or water from surface runoff will require dewatering during excavation. As the excavation will generally be in clayey soils, groundwater seepage, if any, into the excavation is likely to be slow and a properly filtered sump and pump system, or gravity drainage, may be used for dewatering excavation.

General discussions regarding excavation and dewatering are provided in Section B5.4. Detailed dewatering consideration for the project is included Wood's hydrogeological investigation report, which is submitted under a separate cover.

Trench excavation, pipe bedding, backfill, and anti-seepage collar considerations are discussed in following sections.

General discussions provided in Section B5.0 should also be considered for design and construction.

B3.2.2 Trench Excavation

Trench excavation should be carried out as per the latest Ontario's Occupational Health and Safety Act (OHSA) and Regulations for Construction Projects. The soils classifications are shown in Section B5.4. Based on the soils encountered in the boreholes, the sides of excavations are expected to be temporarily stable at 1H:1V for Type 2 and Type 3 soils, provided excavations are properly dewatered and underground utilities are installed and backfilled within a reasonable short period of time. Provisions should be made for dewatering, as noted in Section B5.4. Trenching should be in accordance with OPSS.MUNI 401 (Construction Specification for Trenching, Backfilling and Compacting).

It is important for frost heave compatibility that the trench backfill within the frost zone of 1.4 m depth matches the soil exposed on the trench walls.

B3.2.3 Bedding

Bedding for underground pipes should be placed in accordance with the design requirements and current Ontario Provincial Standards (OPS) specifications (Ontario Provincial Standard Drawing (OPSD) 802.10 for flexible pipes and OPSD 802.30, 802.31 and 802.32 for rigid pipes). It is recommended that a minimum of



. . .



150 mm thick bedding material (Class 'B' Type or better) be placed below the pipe invert. The thickness of the bedding may, however, need to be increased depending on the pipe diameter, or if wet or weak subgrade conditions (soft or loose) are encountered. If the subgrade is weak and cannot be completed, it should be sub-excavated and replaced with engineered fill to support the pipes and allow the use of Class 'B' Type bedding. If weak subgrade is encountered and cannot totally be removed, Class 'A' Type bedding (e.g. minimum 100 mm thick lean concrete) should be used to provide a workable surface and support the proposed pipes.

For the areas to be filled, the fill soils should first be placed approximately to final grade and subsequently excavated to install the underground pipes in order to prevent pipe settlement due to overburden loads.

Should the pipes be installed in soft clay soils, the joints should be restrained from movements and the backfill around the pipes should be properly compacted in order to prevent long-term movements. A layer of geotextile (Terrafix 270R or equivalent) should be placed between the soft clayey soils and the granular bedding/backfill in order to prevent soil migration.

The possibility of pipe movements in soft clayey soils, after installation, should be considered in the design and construction of the underground pipes.

Construction of underground pipes should be carried out in accordance with the relevant OPSS.MUNI 410 (Construction Specification for Pipe Sewer Installation in Open Cut), or other relevant applicable municipal / regional standards.

B3.2.4 Backfill

Based on the visual and tactile examination of the soil samples, the on-site excavated granular / silty clay fill and native soils may be re-used as backfill in sewer trenches provided their moisture contents at the time of construction are at or near the optimum. Moisture conditioning of the sub-excavation soils may be required prior to reuse. The excavated cohesive fill should be carefully examined for organic content and moisture condition by qualified geotechnical personnel in order to confirm the need for moisture conditioning or its acceptability for use as backfill.

The backfill should be placed in maximum 200 mm thick layers at or near (\pm 2 %) optimum moisture content, and each layer should be compacted to at least 95 % Standard Proctor Maximum Dry Density (SPMDD).

Backfill around the manhole / catch basins should be brought up simultaneously on all sides and operation of heavy equipment near the walls should be restricted to minimize potential movement and/or damage.

Unsuitable material such as organic soils, boulders, cobbles, frozen soils, etc., should not be used for backfilling.

B3.2.5 Anti-Seepage Collars

From the borehole information, the underground utilities will most likely be installed in clayey soil (silty clay fill, silty clay / clayey silt till). As such, anti-seepage collars should not be required.

B4.0 CULVERTS ON ARTERIAL A2 (STATIONS 0+000 and 0+650)

Two (2) culverts (one existing and one proposed) are located within the project limits of the proposed Arterial A2, as listed in Table 5.2.

The existing culvert is located under Highway 50 just south of its intersection with Coleraine Drive, where the proposed Arterial A2 will connect to Highway 50 (approximate at assumed Sta. 0+000 for Arterial A2). The geotechnical investigation program consisted of drilling two (2) boreholes (BH S3 and BH S4) at the existing culvert location to obtain subsurface condition at the culvert locations and to provide geotechnical recommendations.

A new culvert is proposed at the planned intersection of Arterial A2 and E-W Arterial, at approximate Sta. 0+650 of Arterial A2. The geotechnical investigation program consisted of drilling two (2) boreholes (BH B7/S5 and BH S6) at the proposed culvert location to obtain subsurface conditions at the culvert location and to provide geotechnical recommendations.

Details of the existing culvert, rehabilitation / extension and proposed culvert were not available at the time of preparation of this report.

The stratigraphic units and groundwater conditions for each culvert are discussed in the following sections and presented in the Record of Boreholes. The following summary is to assist the designers of the project with an understanding of the soil conditions encountered at the proposed culvert location. The soil and groundwater conditions might vary between and beyond the borehole locations.

B4.1 Subsurface Conditions - Culvert on Arterial A2 (Station 0+000)

Two (2) boreholes (BH S3 and BH S4) were drilled at the vicinity of two ends of the existing culvert on Highway 50 (approximate Sta. 0+000), just south of Colerain Drive. The boreholes were drilled to depths of 9.4 m and 9.8 m below the existing ground surface, respectively. The existing culvert is a concrete culvert. Other detail of the existing culvert was not available at the time of this report. The culvert and borehole locations are shown on Figure No. 2A.

Based on the soil conditions observed in the boreholes drilled for culvert, the subsurface profile at the culvert location generally consisted of fill soils (sand and gravel and silty clay / clayey silt fill), which were exposed at the ground surface. Native silty clay / clayey silt till and silty sand / sandy silt till were encountered underlying

• • •



the fill soils in both boreholes. Groundwater was encountered in the drilled Boreholes BH S3 and BH S4 at depths of 7.0 m (Elevation 203.7 m) and 7.6 m (Elevation 203.0 m) below the existing ground surface, respectively.

B4.1.1 Fill Soils

Fill soils were encountered at the surface of both boreholes and consisted of sand and gravel fill and silty clay fill, which extended to a depth of 3.0 m and 3.7 m below the existing ground surface in Boreholes BH S3 and S4, respectively.

The sand and gravel fill was dark grey to brown and contained trace to some silt. The silty clay fill, which was encountered below the sand and gravel fill, was dark grey to black in colour and contained trace to some sand, some gravel and traces of organics. SPT 'N' values measured within the fill soils ranged from 9 to 45 blows per 0.3 m. Water contents measured in the fill samples ranged from 5 % to 29 %.

B4.1.2 Silty Clay / Clayey Silt Till

Native silty clay / clayey silt till was encountered underlying the fill soils and extended to depths of 7.2 m at Borehole BH S3 and 9.4 m at Borehole BH S4.

The silty clay / clayey silt till was brown to grey in colour, with some sand to sandy and traces of gravel. SPT 'N' values measured within the silty clay / clayey silt till ranged from 15 blows to more than 50 blows per 0.3 m, implying stiff to hard consistency. Water contents measured in the silty clay /clayey silt till ranged between 9 % and 15 %

Gradation and Atterberg Limits tests were carried out in one (1) sample (SS 6) from Borehole BH S3, the results of which are presented in Table B1.2 above and shown on the Record of Borehole.

B4.1.3 Silty Sand / Sandy Silt Till

Native silty sand / sandy silt till were encountered in Boreholes BH S3 and BH S4 below the clayey silt / silty clay till, and confirmed to the termination depth of the boreholes at 9.4 and 9.8 m (Elevation 201.2 and 200.8 m), respectively. The silty sand / sandy silt till was grey in colour and contained traces of clay and gravel. SPT 'N' values measured in the silty sand / sandy silt till ranged between 35 blows to more than 50 blows per 0.3 m indicating dense to very dense compactness. Water contents measured in silty sand / sandy silt till samples varied from 15 % to 17 %.

One (1) gradation test was carried out in one sample (SS 9) from Borehole BH S3, the results of which are presented in Table B2.4 above, and also shown on the Record of Borehole.



B4.1.4 Groundwater Conditions

Upon completion, groundwater was encountered in Boreholes BH S3 and BH S4 at depths of 7.0 m (Elevation 203.7 m) and 7.6 m (Elevation 203.0 m) below the existing ground surface, respectively.

One (1) monitoring well was installed in Borehole BH S4. Groundwater depth measured in the boreholes during drilling, and subsequent measurements in the monitoring well are summarized in Table B1.5 above and shown on the Record of Boreholes.

It should be noted that the groundwater could fluctuate seasonally and can be expected to be somewhat higher during the spring months and in response to major weather events.

B4.2 Subsurface Conditions - Culvert on Arterial A2 (Station 0+650)

Two (2) boreholes (BH B7/S5 and BH S6) were drilled at the vicinity of the proposed culvert at Sta. 0+650. Both boreholes were drilled to depths of about 9.8 m below the existing ground surface. Details of the proposed culvert was not available at the time of this report. The culvert and borehole locations are shown on Figure No. 2A.

Based on the soil conditions observed in the boreholes drilled for culvert, the subsurface profile at the culvert location generally consisted of fill soils (silty clay / clayey silt fill), which were below the surficial cover of topsoil. Native silty clay / clayey silt till was encountered underlying the fill soils in both boreholes. Groundwater level measured upon completion of drilling in both boreholes (BH B7/S5 and BH S6) was at Elevation 203.5 m, corresponding to depths of 5.8 m and 5.5 m below the existing ground surface, respectively. Groundwater level above ground surface was measured subsequently in the monitoring well installed in Borehole BH B7/S5.

B4.2.1 Topsoil

In Boreholes BH B7/S5 and BH S6, 150 mm and 100 mm of topsoil was encountered at the ground surface, respectively.

B4.2.2 Fill Soils

Fill soils were encountered below the surficial cover of topsoil in both boreholes and consisted of silty clay fill, which extended to a depth of 0.7 m below the existing ground surface in Boreholes BH S3 and BH S4.

The silty clay fill was dark brown in colour and contained trace to some gravel and traces of organics. SPT 'N' values measured within the fill soils were 4 and6 blows per 0.3 m. Two water contents measured in the fill samples were 40 % and 47 %.



B4.2.3 Sand and Silt

A layer of natural sand and silt was encountered within the silty clay/clayey silt till in Borehole BH B7/S5. The 0.8 m thick sand and silt extended to about 4.5 m depth below the existing ground surface (Elevation 204.8 m). The sand and silt was grey in color and contained trace gravel and clay. One (1) SPT 'N' value measured in the layer was 58 blows per 0.3 m of penetration, indicating a very dense state of compactness. Measured water content in the silty sand to sandy silt was 12 %.

One (1) gradation test was carried out in sample (SS6) from Borehole BH B7/S5, the results of which are presented in Table B1.3, and shown in the Records of Boreholes.

B4.2.4 Silty Clay / Clayey Silt Till

Native silty clay / clayey silt till was encountered underlying the fill soils and extended to the termination depth of both boreholes.

The silty clay / clayey silt till was brown to grey in colour, with some sand to sandy and traces of gravel. SPT 'N' values measured within the silty clay / clayey silt till ranged from 5 to more than 50 blows per 0.3 m, implying a firm to hard consistency. The cohesive till is generally hard except for within 2 m of the ground surface at both boreholes, where the cohesive till is firm to very stiff with the SPT 'N' values of 5 to 27 blows per 0.3 m of. Water contents measured in the silty clay /clayey silt till ranged between 9 % and 28 %.

B4.2.5 Groundwater Conditions

Upon completion, groundwater was encountered in Boreholes BH B7/S5 and S6 at elevation 203.5 m or depths of 5.8 m and 5.5 m below the existing ground surface, respectively.

One (1) monitoring well was installed in Borehole BH B7/S5. Groundwater level measured subsequently in the well was above ground level (artesian, up to 0.7 m above existing ground). The groundwater depths measured in subsequent measurements in the monitoring well are summarized in Table B1.5 above and shown on the Record of Boreholes.

It should be noted that the groundwater could fluctuate seasonally and can be expected to be somewhat higher during the spring months and in response to major weather events.

B4.3 DISCUSSIONS AND RECOMMENDATIONS FOR CULVERT

The purpose of the geotechnical investigation was to obtain subsurface information and to provide geotechnical recommendations with respect to proposed culvert construction and existing culvert rehabilitation / extension.

• • •

Within the depths of the four boreholes drilled adjacent to the existing culvert location, fill soils (sand and gravel and silty clay) were encountered to a depth of about 0.7 m to 3.7 m (Elevations 208.3 m and 205.6 m) below ground surface, overlying firm to hard and / or dense to very dense native soil deposits and/or till. The firm native soils were encountered immediately below the fill soils.

The foundation type of existing culvert and details of the proposed rehabilitation / extension were not available at the time of preparation of this report. Accordingly, general considerations for the culverts are presented the following sections.

B4.3.1 Foundation

Based on the boreholes drilled at or in the vicinity of the culvert locations, values of geotechnical reaction at Serviceability Limit State (SLS) and the factored geotechnical resistance at Ultimate Limit State (ULS) are provided in Table B4.1 which may be used for design.

Table B4.1: Recommended ULS / SLS Bearing Values for Culvert Foundations

Borehole No.	Founding Stratum	Founding Stratum Pounding Stratum Founding Stratum Grade (m)		Geotechnical Reaction at SLS (kPa)	Factored Geotechnical Resistance at ULS ⁽¹⁾ (kPa)					
	Fill	above 3.0 (±)	above 207.7 (±)	not recommended	not recommended					
BH S3	Stiff to hard silty clay till / very dense silty sand / sandy silt till	below 2.2 (±)	below 207.7 (±)	200	300					
	Fill	above 3.7 (±)	above 206.8 (±)	not recommended	not recommended					
BH S4	Stiff to hard silty clay till / very dense silty sand / sandy silt till	below 2.2 (±)	below 206.8 (±)	200	300					
DII D7/CF	Fill / firm silty clay / clayey silt till	above 0.7 (±)	above 207.9 (±)	not recommended	not recommended					
BH B7/S5	Very stiff to hard silty clay till	below 2.2 (±)	below 207.9 (±)	200	300					
BH S6	Fill / firm silty clay / clayey silt till	above 1.4 (±)	above 207.6 (±)	not recommended	not recommended					
рп 30	Stiff to hard silty clay till	below 2.2 (±)	below 207.6 (±)	200	300					
Eng	Engineered fill per OPSS.MUNI 1010 (if used), as per Section B5.3 150 225									

Notes: (1) A resistance factor of Φ = 0.5 has been applied to the ULS values provided.

The geotechnical bearing values provided in Table B4.1 are intended to assess the feasibility and sizes of footings and are for vertical loads (no inclination) without load eccentricity. Under the SLS pressures, foundation settlements could be up to 25 mm (total) and 20 mm (differential). Detail foundation analysis should be carried out, if necessary, to confirm SLS/ULS and corresponding settlements.

The design frost depth penetration is 1.4 m. All foundations should be covered by at least 1.4 m deep soil or equivalent synthetic thermal insulation.

Highest groundwater level measured during geotechnical investigation in the boreholes / monitoring well at the culvert location (Sta. 0+000) was at about Elevation 203.7 m. As such, a minimum groundwater level at Elevation 204 m or the creek water level, whichever is higher, should be considered for design.

At the culvert location (Sta. 0+650), groundwater was measured up to 0.7 m above ground (up to Elevation 210.0 m). Therefore, a minimum groundwater level at Elevation 209 m, i.e. the ground surface elevation at the location, should be considered for design. Additional investigation may be necessary to assess the artesian water, especially if a large excavation in anticipated at this location.

If required, the regional high flood level of the creek may be used.

During construction, considerable dewatering efforts and / or creek diversion (e.g., cofferdam, sheetpiles) to control the ingress of creek water may be required. General recommendations related to excavation and dewatering are presented in Section B5.4.

B4.3.2 Soil Parameters for Design

The unfactored soil parameters listed in Table B4.2 may be used for design of earth structures. It should be noted that these parameters are based on published information and/or semi-empirical/theoretical relationships, and are conservative and should be verified by field/laboratory testing, if more representative parameters are required.

Table B4.2: Unfactored Static Soil Parameters for Design

	Total Stress Analysis		Effective Stress Analysis		Earth Pressure Coefficients ⁽¹⁾			Bulk Unit	Coefficient of Friction
Material	C (kPa)	Ф (deg)	c' (kPa)	Φ' (deg)	Active K _a	At- Rest K _o	Passive K _p	Weight (kN/m³)	between Concrete and Soil
Stiff to hard silty clay / clayey silt till	100	0	0	30 ⁽²⁾	0.33	0.50	3.0	19	0.35
Very dense silty sand / sandy silt till	0	35	0	35	0.27	0.43	3.7	20	0.4





	Total Stress Analysis		Effective Stress Analysis		Earth Pressure Coefficients ⁽¹⁾			Bulk Unit	Coefficient of Friction	
Material	C (kPa)	Ф (deg)	c' (kPa)	Φ' (deg)	Active K _a	At- Rest K _o	Passive K _p	Weight (kN/m³)	between Concrete and Soil	
				Enginee	red Fill ⁽³)				
Granular A (OPSS.MUNI 1010)	0	35	0	35	0.27	0.43	3.7	24 ⁽⁴⁾	0.4	
Granular B Type I or Type II (OPSS.MUNI 1010)	0	32	0	32	0.31	0.47	3.3	23 ⁽⁴⁾	0.4	

Notes: (1) Values based on semi-empirical relationships. For SLS, K_p values should be reduced to 1/3 of indicated value to limit lateral movement.

B4.3.3 Earthquake Considerations

Based on the soil conditions observed in the boreholes (maximum drill depth of 9.4 m below ground) and the possible bedrock depth at the culvert location (~30 m), and in conformance with the criteria in Table 4.1 (Section 4.4.3.2 – Seismic Properties) of the Canadian Highway Bridge Design Code CSA S6-19 ("CHBDC"), the project site may be classified as Site Class D ("stiff soil").

The design values of site coefficients F(T), F(PGA) and F(PGV) can be obtained from Geological Survey of Canada on Natural resources Canada website: 'www.earthquakecanada.ca" or Tables 4.2 to 4.9 (Section 4.4.3.3 – Site Coefficients) of CHBDC, and the design spectral acceleration, S (T), should be determined as per Section 4.4.3.4 (Design Spectral Acceleration and Displacement Values) and Tables 4.2 to 4.9 in Section 4.4.3.3 of CHBDC.

B4.3.4 Scour Protection

Culvert and headwall footings should be protected against scour and erosion in the form of cut-off walls, rip-rap or equivalent. Scour protection should be designed based on the hydrology requirement by an experienced engineer. Alternatively, the foundations could be placed below the depth of scour and frost penetration. If rip-rap protection is used, it should be separated from the native soils with a geotextile filter fabric (e.g. Terrafix 600R or equivalent) or a filter zone of granular material. The embankment slope surface should be covered with topsoil and seeded/sodded as soon as possible after completion of construction.

⁽²⁾ Normally-consolidated range.

⁽³⁾ All engineered fill should be compacted to at least 100 % SPMDD for supporting foundations.

⁽⁴⁾ Unit weight values for engineered fill compacted to 100 % SPMDD. For backfill of retaining walls, unit weights for Granular A and Granular B compacted to 95 % SPMDD may be taken as 22 kN/m3 and 21 kN/m3, respectively.

B4.3.5 Backfill for Culvert

Backfill materials around culvert should consist of non-frost susceptible, free-draining granular materials in accordance with OPSS.MUNI 1010 (i.e., Granular 'A' or Granular 'B'). Such granular backfill should be compacted to at least 95 % SPMDD (Standard Proctor Maximum Dry Density). Free-draining backfill materials and the drain pipes and weep holes, etc., should be used provided to prevent hydrostatic pressure build-up.

Backfill, backfill transition and cover for the culvert should conform to Ontario Provincial Standard Drawing (OPSD) 3101.150 (Walls, Abutment, Backfill, Minimum Granular Requirement) or applicable City Standard.

Engineered fill is discussed in Section B5.3, and excavation and dewatering during construction are discussed in Section B5.4.

To increase sliding resistance, a shear key may be used, if required. The shear key can be designed using the unfactored K_p values for the soils provided in Table B4.2. The movement of the retaining structure to mobilize the passive resistance should be considered in the design.

B4.3.6 Retaining Wall

If retaining walls are constructed at the ends of the culvert (inlet and outlet), they may be founded on the stiff to hard native silty clay till. If required, the wall may also be founded on the engineered fill per OPSS.MUNI 1010. The frost and scour protection recommendations provided in Sections B4.3.1 and B4.3.4, respectively should also be adhered to in designing retaining wall foundations.

Soft fill areas should be recompacted (if possible) or replaced with the engineered fill described in Section B5.3. The founding subgrade should be verified by a geotechnical engineer. The SLS/ULS values and soil parameters provided in Tables B4.1 and B4.2 may be used for design of wall foundations, as required. Slope stability analyses should be carried for the retaining wall, once the detailed design is completed.

B4.3.7 Permanent Slopes

A slope of 2H:1V (2 Horizontal : 1 Vertical) or flatter should be constructed for permanent fill embankment. The embankment should be constructed using engineered fill (Section B5.3). Global slope stability should be analyzed during detailed design, if the new embankment height is higher than 2 m high, once the detailed design is finalized. All permanent slope surfaces should be protected against erosion by surface water and creek water.

Construction of the embankment should follow the requirements of OPSS.MUNI 206 (*Construction Specification for Grading*), or applicable City Standard.

B5.0 General Considerations for Design and Construction

B5.1 Site Preparation

Site preparation will likely generally include stripping of topsoil / asphalt / concrete, excavation to subgrade, proof-rolling, sub-excavating soft spots, if encountered, and backfilling, if necessary, with engineered fill.

All topsoil and loose soil or soil mixed with organic matter should be stripped from pavement areas, manhole / catch basin founding areas, and base of underground utility services. Subgrade preparation of pavement is discussed in Section B2.6.3. Any loose, soft or unstable areas in the exposed subgrade should be subexcavated and replaced with approved fill and compacted (Section B5.3). Lean concrete may be used to backfill sub-excavated areas.

Excavation should be carried out with a temporary slope of 1H:1V or flatter above the groundwater level (Section B5.4). Roadway shoring protection systems may be required during construction of the culverts. Temporary shoring is discussed in Section B5.5.

B5.2 Embankment Widening

Based on site condition, the proposed road widening will generally involve fill sections along the investigation limits. The embankment required for road widening should be constructed with compacted engineered fill at 2H:1V (or flatter) side slopes. If a side slope steeper than 2H:1V slope is required or if the height of the embankment / cut slope is greater than 2 m, slope stability analysis should be carried out to assess stability of the planned slope, depending on the subsurface conditions. Where existing embankments are to be widened, the side slopes should be benched in accordance with OPSD 208.010 prior to placement of the widening fills. Final (permanent) embankment side slopes in granular fills should be established to match the existing slopes or as per OPSD 200.010. Final slopes should be treated with a seed and mulch to prevent ravelling.

Widening of the road will require, as a minimum, stripping the existing ground surface cover (topsoil, asphaltic concrete, vegetation cover, surficial fill soils, etc.) from the area required for road widening. The planned widening will generally be constructed to the same elevation as the existing road surface. Grading, backfilling and compacting should follow OPSS.MUNI 206 (Construction Specification for Grading), OPSS.MUNI 401 (Construction Specification for Trenching, Backfilling and Compacting), OPSS 501.MUNI (Construction Specification for Compacting), and / or the City's requirements.

Backfilling, if required, for site grading (e.g., for subgrade raise, replacement of soft soil) should be placed as engineered fill. Engineered fill per OPSS.MUNI 1010 should be used to replace soft / incompetent soils and/or raising grade. Engineered fill should be prepared according to the City's standards / contract specifications. Engineered fill is discussed in Section B5.3.

The fill soils used for embankment widening should consist of approved clean fill (e.g., Select Subgrade Materials - OPSS 1010).



. . .





B5.3 Engineered Fill

Engineered fill per OPSS.MUNI 1010, where required, may be used to backfill excavated areas, backfill around manholes, replace soft / incompetent soils, and / or raise grades. Engineered fill for backfill of excavated areas should be placed after stripping existing fill soils, any soils containing excessive organic matters and otherwise unsuitable soils.

Engineered fill can be prepared by placing fill soil and compacted as per OPSS.MUNI 501 (*Construction Specification for Compacting*) and/or applicable City Standard. Alternatively, engineered fill should be placed in loose layers not exceeding 200 mm. The water content of the fill should be within \pm 2 % of its optimum moisture content (OMC) at the time of its placement, and it should be thoroughly compacted to a minimum of 98 % of Standard Proctor Maximum Dry Density (SPMDD) in general.

The fill soils should consist of inorganic soils and should not be frozen during backfilling and compaction. Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are necessary for the construction of a certifiable engineered fill. The compaction procedures and quality control should be overseen by a geotechnical engineer.

B5.4 Excavation and Dewatering

All excavations should be carried out in accordance with the latest Ontario's Occupational Health and Safety Act (OHSA) and Regulations for Construction Projects (O. Reg. 213/91). The soils to be excavated can be classified as follows:

Existing fill soils Type 3
Firm to hard silty clay / clayey silt till Type 1 to 3

(varies by consistency)

Very dense silty sand / sandy silt till (above groundwater level / fully dewatered)

Type 1

Very dense silty sand / sandy silt till (below groundwater level)

Type 3

In accordance with the OHSA, a maximum short-term slope of 1H:1V is required to within 1.2 m of the trench bottom for temporary excavations in Type 1 and 2 cohesive till and native silty sand that is above the groundwater level, or properly dewatered. For Type 1 and 2 soils, a maximum depth of 1.2 m high vertical cut at the bottom of excavation may generally be constructed. However, under the groundwater table a 1.2 m high vertical cut may not be stable and flatter slopes may be required. Type 3 soils above the groundwater level may be inclined at 1H:1V or flatter from the bottom. In the case of saturated Type 3 fills or native granular deposits below the prevailing groundwater, if adequate dewatering is not implemented, slopes of open excavations will have to be reduced to 2H: 1V or flatter. In the absence of proper dewatering or groundwater control of Type 3 soils, slope flattening may be insufficient to prevent particularly saturated granular soils from



becoming unstable and devolving to Type 4 materials. Near the ground surface, occasional 3H:1V or flatter slopes may be required due to loose/soft surficial soils. If open cut cannot be carried out, a temporary shoring system may be used to limit the extent of excavation. General consideration for temporary shoring is provided in Section B5.5.

Trenching should be carried out in accordance with OPSS.MUNI 401 (Construction Specification for Trenching, Backfilling and Compacting).

Stockpiles, materials or any heavy equipment should be kept at least the same horizontal distance as the depth of the excavation from the upper edge of the excavation to prevent slope instability. All surface drainage should be directed away from any open excavations and trenches.

Based on observations at the borehole locations and planned excavation depth, normal excavation equipment should be suitable for excavation. Hard till soils may require additional effort for excavation (e.g., heavy excavator, rippers, impact hammer, etc.). The terms describing the compactness (very loose, loose, compact, dense, very dense) or consistency (very soft, soft, firm, stiff, very stiff, hard) of soil strata give an indication of the effort needed for excavation. It should be noted that cobbles / boulders can be encountered in the till and in fill soils. Therefore, removal of the cobbles / boulders should be considered and planned for.

During the construction, temporary runoff controls such as sediment trap, interceptor drain, dyke and / or silt fence should be installed to prevent uncontrolled water / sediment flow into existing water courses. The effluent from dewatering operations should also be filtered or passed through sediment traps to prevent turbidity.

Based on the soil and groundwater conditions at the borehole locations, groundwater control within the excavated area should not be significant. It should be noted at the location of culvert (Station 0+650), artesian condition (i.e., groundwater higher than ground level was measured. Additional investigation (such as test pitting) may be required at this location to confirm the artesian condition and / or to plan for groundwater control / dewatering. In the clayey soils, groundwater seepage into the excavation, if encountered, is likely to be slow and a properly filtered sump and pump system or gravity drainage may be used for dewatering the excavation. High water flow rates (e.g. from perched water in fills or granular layers with the cohesive tills) may be encountered during construction and the dewatering effort could require an increased number of sumps and pumps.

Use of a lean concrete mud mat or granular layer may be warranted where founding surfaces are to be exposed for extended period, especially if the work is carried out during wet weather. Care should also be exercised to minimize disturbance to the final subgrade during excavation.

It is recommended that qualified geotechnical personnel be present during the foundation excavation to review the conditions of the foundation subgrade.





B5.5 Temporary shoring

Temporary shoring may be required for vertical excavation during construction of culvert, installation of underground utilities or roadway protection. This can be accomplished using soldier piles with lagging (or similar) in order to support the sides of the excavation. Temporary shoring design and construction should comply with OPSS.MUNI 539 (Construction Specification for Temporary Protection Systems), or applicable City Standard. The temporary shoring system should be designed to resist the lateral earth, surcharge and hydrostatic pressures which could occur during construction. Bracings should be installed within the shoring system to minimize movements of the soils. The temporary shoring system should be designed in accordance with the latest editions of Canadian Foundation Engineering Manual's (CFEM) and Canadian Highway Bridge Design Code (CHBDC), together with the requirements of the Ontario Health and Safety Regulations, as applicable.

The shoring system should be designed and approved by a professional engineer. Geotechnical parameters provided in Section B4.3.2 may be considered for design of shoring.

B5.6 Suitability of Existing Soils for Backfilling

Most of the excavated soils (i.e. granular fills, clayey fill and till soils) can be suitable for being reused for backfill, provided they can be separately stored, properly compacted and are environmentally acceptable. Fill soils containing construction debris (or similar) and organic matter should not be reused. Soils that are too wet to compact will require additional processing (e.g., drying). Cobbles and boulders (larger than 100 mm in size), if any, should be discarded by mechanical means (e.g., sieving) or manual removal.

B6.0 PRELIMINARY SOIL CHEMICAL ANALYSES

Environmental soil chemical analyses were carried out to provide preliminary discussions for soil disposal options as part of the Geotechnical Investigation Preliminary Design for the Site, the results of which are discussed in the following section.

No Phase I or Phase II Environmental Site Assessment (ESA) reports have been conducted or provided to Wood for review.

It is assumed that a Record of Site Condition, (RSC) as per Ontario Regulation 153/04 Records of Site Condition, Part XV.1 of the *Environmental Protection Act* (EPA), as amended ("O.Reg.153/04, as amended") is not required at this time.



B6.1 Methodology

The environmental soil screening and laboratory analyses program was carried out in general accordance with the current *Ontario Regulation 153/04 Records of Site Condition, Part XV.1 of the Environmental Protection Act (EPA)*, as amended (O. Reg. 153/04) in order to characterize the soil at the Site and to provide an initial discussion on disposal options for surplus material during future construction. It should be noted that the scope of work does not meet the analytical or administrative requirements of Ontario Regulation 406/19 On Site and Excess Soil Management (O. Reg. 406/19) in the event that the soil is to be considered for beneficial reuse.

A Record of Site Condition (RSC) was not part of the scope of work. Due to the limited scope of work, further environmental assessment would be required in the event that an RSC is required.

B6.2 Sample Selection for Analyses

The environmental component of the preliminary subsurface investigation included the following activities:

- Conducting the soil sampling activities in accordance with the Ministry of the Environment (MOE) document entitled "Guide for Completing Phase Two Environmental Site Assessments under Ontario Regulation 153/04" dated June 2011, the Ministry of the Environment and Energy (MOEE) document entitled "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario", dated December 1996; and MOE document entitled "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" issued by the Laboratory Services Branch of the MOE and dated March 9, 2004, amended as of July 1, 2011 (Analytical Protocol);
- Based on City of Brampton instruction, submission of eight (8) soil samples for laboratory analysis of metals & inorganics and organochlorine (OC) pesticides, and two (2) soil samples for analysis of volatile organic compounds (VOCs) and petroleum hydrocarbons (PHC) F1 to F4 to assist in determining appropriate soil disposal options, if required, during construction;
- Based on City of Brampton instruction, submission of two (2) soil samples for Ontario Regulation 347 (O. Reg. 347) as amended by Ontario Regulation 558/00 (O. Reg. 558/00) Toxicity Characteristic Leaching Procedure (TCLP) for four (4) or more of volatile organic compounds (VOCs), Organochlorine (OC) pesticides, polychlorinated biphenyls (PCBs), benzo(a)pyrene and metals and inorganics to determine landfill acceptability of soil/granular fill originating from the Site; and
- Comparison of the laboratory analytical results to soil standards presented in the Ministry of the Environment, Conservation and Parks (MECP) document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act," (the "MECP SCS") dated April 15, 2011 and O. Reg. 347, as amended by O. Reg. 558/00, Schedule 4 Leachate Quality Criteria provided in the MECP document entitled "Registration Guidance Manual For Generators of Liquid Industrial and Hazardous Waste," October 2000 (the "Schedule 4 Criteria").

B6.2.1 Site Condition Standards

The analytical soil results were compared to the MECP Table 1 (background) SCS for all types of Property Use (except Agricultural) (Table 1 SCS) and MECP Table 3 (generic) SCS for Industrial/Commercial/Community Property Use for Medium/Fine Textured Soils (Table 3 SCS).

The chemical analyses results were also evaluated against the following tables of Appendix 1 (Generic Excess Soil Quality Standards) of the new MECP O.Reg.406/19 "On-Site and Excess Soil Management," additional elements which are expected to come into force in January 2023:

- Table 1 Full Depth Background ESQS for all types of property use (except agricultural) (Table 1 ESQS);
 and
- Table 3.1 Full Depth ESQS in a Non-Potable Ground Water Condition, Volume Independent, for industrial/commercial/community property use (Table 3.1 ESQS).

Furthermore, TCLP analyses results were also compared with Table 3.1 Leachate Screening Levels for Full Depth Excess Soil in a Non-Potable Ground Water condition, Volume Independent, Industrial / Commercial / Community Property Use, Appendix 2 – Generic Leachate Screening Levels for Excess Soil Reuse – of O.Req.406/19.

B6.2.2 Soil Sampling, Inspection & Preservation Procedures

Soil samples were obtained for laboratory analysis and field screening, where applicable, using a drill rig equipped with split spoon sampling capabilities. The drillers cleaned the split spoon by removing loose dirt from the split spoon using a wire brush, washing the split spoon using a brush in a dilute mix of potable water and Alconox soap, rinsing the split spoon with distilled water and rinsing the split spoon with methanol and allowing the split spoon to air dry.

The drillers obtained the split spoon sample by auguring to the specified depth, hammering the spoon about 0.6 m into the soil and removing the spoon. The split spoon sample was inspected for visual and/or olfactory evidence of environmental impacts. Disposable nitrile gloves were used and replaced between the handling of successive samples.

The soil samples retrieved from the borehole investigations were examined, classified and logged according to soil type, moisture content, colour, consistency, and presence of visible indicators of environmental impact. Soil samples requiring vapour analysis were split into duplicate fractions upon recovery at the surface. The primary sample fractions were placed in 120 and/or 250 millilitre (mL) sample jars with Teflon-lined lids and methanol preserved (cored) samples were placed in 40 mL vials and subsequently stored in coolers on ice for potential future laboratory analysis. The volatile sample fractions were placed in resealable plastic sample bags and stored at ambient temperature for subsequent field vapour screening. The samples were selected on the basis of visual/olfactory evidence of impacts, field screening results, or from the vicinity of the apparent water table.





Representative soil samples collected during the investigation were submitted to AGAT Laboratories (AGAT) of Mississauga, Ontario, for metals & inorganics, VOCs and PHCs. AGAT is accredited by the Standards Council of Canada (SCC) and the Canadian Association for Laboratory Accreditation (CALA) in accordance with ISO/IEC 17025:2005 – "General Requirements for the Competence of Testing and Calibration Laboratories" for the tested parameters set out in the Soil, Ground Water and Sediment Standards.

B6.3 Environmental Test Results & Considerations

Wood conducted a preliminary Environmental Soil Quality Testing Program (the Investigation) as part of the Geotechnical Investigation. The details of the drilling program, including borehole locations and drilling methodology are presented in the geotechnical investigation sections of this report. Soil samples submitted for chemical analysis were collected from depths between surface and 5.0 m below ground surface (mbgs) based on presence of fill material and depth of construction works, as detailed Table B6.1.

Table B6.1: Environmental Tests

Sample ID	Depth (m)	Parameters Tested
BH B2 SS1	0.3 – 0.6	PHCs, VOCs, OC pesticides
BH B2 SS5	3.05 – 3.6	Metals and Inorganics
BH B5 SS1	0.3 – 0.6	OC pesticides
BH B5 SS4	2.3 – 2.9	Metals and Inorganics
BH B8 SS1	Surface – 0.6	OC pesticides
BH B9 SS5	4.6 – 5.0	Metals and Inorganics
BH BH11 SS2	0.8 – 1.4	Metals and Inorganics
BH B12 SS1	Surface – 0.6	OC pesticides
BH B15 SS1	Surface – 0.6	OC pesticides
BH B17 SS1	Surface – 0.6	OC pesticides
BH B17 SS3	1.5 – 2.1	Metals and Inorganics
BH B21 SS1	Surface – 0.6	OC pesticides
BH B22 SS1	0.3 – 0.9	Metals and Inorganics
BH B23 SS1	Surface – 0.6	Metals and Inorganics
BH B25 SS1	Surface – 0.6	OC pesticides
BH B28 SS2	0.7-1.4	PHCs and VOCs
BH S3 SS3	1.5 – 2.1	Metals and Inorganics

PHC = Petroleum Hydrocarbons

VOC = Volatile Organic Compounds

OC = Organochlorine

Wood observed fill material in all the boreholes. Headspace combustible organic vapour (COV) concentration measurements recorded in the soil samples were ranging from non-detectable to 20 parts per million (ppm).



• • •



Total organic vapour (TOV) concentration measurements recorded in the soil samples were ranging from non-detectable to 1 ppm.

No other evidence (i.e., visual/olfactory) of potential environmental impacts were observed in any of the soil samples collected from this project area.

The soil samples collected as part of this assessment that had Table 1 SCS exceedances are as follows:

- BHB22 SS1 for EC and SAR; and
- BHS3 SS3 for EC and SAR.

The other analyzed soils samples met the Table 1 SCS for metals and inorganics, PHCs, VOCs, and OC pesticides.

The soil sample collected as part of this assessment that exceeded the Table 3 SCS is as follows:

BHS3 SS3 for EC and SAR.

The other analyzed soil samples had concentrations that met the Table 3 SCS for metals and inorganics, PHCs, VOCs, and OC pesticides.

When compared to the O. Reg. 406/19 ESQS, the soil samples collected as part of this assessment that had Table 1 ESQS exceedances are as follows:

- BHB22 SS1 for EC and SAR; and
- BHS3 SS3 for EC and SAR.

The other analyzed soil samples had concentrations that met the Table 1 ESQS for metals and inorganics, PHCs, VOCs, and OC pesticides.

The soil sample collected as part of this assessment that had Table 3.1 ESQSexceedances is as follows:

BHS3 SS3 for EC and SAR.

The other analyzed soil samples had concentrations that met the Table 3.1 ESQS for metals and inorganics, PHCs, VOCs, and OC pesticides.

The TCLP analyses for the parameters tested indicated that dry soils (soils that would pass a slump test) would meet the Schedule 4 Leachate Quality Criteria.





Soil analytical results are shown in Tables 1B to 10B in Appendix C-B. The laboratory certificates of analysis for the bulk analysis and the certificates of analysis for the O. Reg. 347 TCLP analysis are included in Appendix D.

B6.4 Quality Assurance / Quality Control

<u>Field Quality Control:</u> Field quality control was not performed for this segment and is discussed in separate reports being written as part of the Geotechnical Investigation.

<u>Laboratory Quality Control</u>: The 2011 Analytical Protocol provides requirements for sample handling and storage requirements, reporting requirements, analytical methods and QA/QC procedures for analytical parameters.

As per the 2011 Analytical Protocol, all samples/sample extracts were analyzed within their applicable hold times using approved analytical methods. The report limits were met for all samples and tested parameters. No tested parameter was present in a detectable concentration in any laboratory Method Blank and all laboratory surrogates, reference materials and replicate samples are considered acceptable.

SECTION C: COUNTRYSIDE DRIVE (FROM ST. JOHNS ROAD TO HIGHWAY 50, ~ 2.7 KM)

C1.0 OVERALL SUBSURFACE CONDITION

A total of forty (40) boreholes (BH C1 to BH C35, BH C37 and Borehole BH S7 to BH S12) were drilled to depths varying from 0.2 m to 9.8 m, for the proposed road reconstruction/widening, underground service installation and culvert rehabilitation / extension, which included boreholes in the driving lanes, shoulders and auger holes in the ditches. Due to their proximity, BH C19 was combined with BH B22 (drilled for Arterial A2) as "BH C19/B22". Similarly, BH C27 was combined with BH S7 as "BH C27/S7". Boreholes BH C36 and C38 have been deferred to the detail design stage, if needed, as discussed with and approved by the City.

The boreholes in the driving lanes and pavement shoulders were sampled via Standard Penetration Test (SPT), while recording 'N' Values. SPT was not carried out in the auger holes in the ditches, where only the topsoil thicknesses were measured.

The stratigraphic units and groundwater conditions are discussed in the following sections. Additional information is provided in the Record of Boreholes. The following summary is to assist the designers of the project with an understanding of the possible soil conditions at the investigated road section. The soil and groundwater conditions might vary between and beyond the borehole locations.

C1.1 Topsoil

In Borehole BH C12, approximately 100 mm of topsoil was encountered at the surface. Topsoil thicknesses were also measured in the ditches beside the road at eight (8) locations, which varied from about 150 mm to 300 mm, with an average thickness of about 215 mm, as listed in Table C1.1.

Table C1.1: Topsoil Thickness Measurements

	Coordinates (U	TM, Zone 17T)	Topsoil Thickness
Borehole No.	Easting	Northing	(mm)
BH C4	603731	4852419	150
BH C10	604017	4852760	200
BH C14	604201	4852990	250
BH C16	604286	4853116	200
BH C22	604575	4853454	150
BH C26	604751	4853681	200
BH C28	604854	4853830	270
BH C34	605125	4854169	300

C1.2 Asphaltic Concrete

In the boreholes drilled through the asphalt pavement (BH C1, C3, C5, C7, C9, C11, C13, C15, C17, C19/B22, C21, C23, C25, C27/S7, C29, C31, C33, C35 and C37), approximately 90 mm to 200 mm of asphaltic concrete was encountered.

C1.3 Granular Fill

Granular fill soils underlying the asphalt and surficial topsoil ranged from 150 mm to 800 mm in thickness.

Granular fill soils (sand and gravel fill) were also encountered at the surface in Boreholes BH C2, C6, C8, C18, C20, C24, C30 and C32. The granular fill in these boreholes extended to a minimum depth of 0.3 m to a maximum depth of 0.6 m below the existing ground surface (Elevations 214.0 m to 221.1). The SPT 'N' values of the granular fil ranged from 5 to 30 blows per 0.3 m. Water contents measured in granular fill samples varied from about 3 % to 5 %.

A gradation test was carried out in one sample (SS 1A) from Borehole BH C19/B22, the results of which are presented in Table C1.2, and shown in the Records of Boreholes.

Grain Size Distribution (%) Sample Depth **Elevation** Borehole No. **Fines** Soil Classification No. (m) (m) Sand Gravel Silt Clay GRAVELLY SAND, trace 0.2 -220.3 fines. Sample meets BH C19/BH B22* SS1A 33 58 9 0.6 219.9 OPSS1010 Granular B Type I

Table C1.2: Results of Grain Size Distribution Analysis (Granular Fill)

The grain size distribution curves are presented in Figure B-C1 in Appendix B-C.

C1.4 Silty Clay / Clayey Silt Fill

Silty clay / clayey silt fill was encountered below the granular fill soils in all borehole locations except Boreholes BH C8 and C18. The silty clay / clayey silt fill was generally brown/dark brown to grey/dark grey in colour and contained some sand, trace to some gravel and traces of organics. The silty clay silty clay / clayey silt fill extended to depths varying from 0.9 m to 2.2 m (Elevations 211.0 m to 220.9 m) below the existing ground surface. Boreholes BH C2, C12, C19/B22 and C20 were terminated in the silty clay/clayey silt fill at depths ranging from 1.2 to 1.8 m the existing ground surface. The SPT 'N' values of the silty clay / clayey silt fill ranged from 5 to 38 blows per 0.3 m. The measured water contents of the silty clay fill samples ranged from about 9 % to 37 %.

The measured water contents in the silty clay silty clay / clayey silt fill varied from about 9 % to 28 %.

^{*} Due to proximity, Boreholes C19 and BH B22 (Arterial A2) were combined.

Gradation and Atterberg Limits tests were carried out in one sample (SS 3) from Borehole BH C1, the results of which are presented in Table C1.3, and shown on the Records of Boreholes.

Table C1.3: Results of Grain Size Distribution Analysis and Atterberg Limit Tests (Silty Clay / Clayey Silt Fill)

				Grair	Grain Size Distribution (%)				:4	USCS	
Borehole	Sample	Depth	Elevation			Fir	nes	Atterberg Limit		mit	Modified
No.	No.	(m)	(m)	Gravel	Sand	Silt	Clay	Liquid Limit	Plastic Limit	Plasticity Index	Group Symbol
BH C1	SS 3	1.5	214.3	0	14	48	38	49	22	27	Cl

The grain size distribution curve and plasticity chart are presented in Figure Nos. B-C2 and B-C3 in Appendix B-C.

C1.5 Silty Sand / Sandy Silt / Sand and Silt Till

Native silty sand / sandy silt / sand and silt till was encountered below the fill soils in Boreholes BH C5, C6, C31, C32, S8, S11 and S12. A seam of gravelly silty sand till was encountered within the silty clay/clayey silt till near Elevation 210 in Borehole S10. The silty sand / sandy silt / sand and silt till was encountered at depths ranging from about 1.2 m to 2.2 m (Elevations 211.0 m to 220.5 m) below the existing ground surface. With the exception of Boreholes BH S8 and S11, the remaining boreholes were terminated within the silty sand / sandy silt / sand silt till. Auger refusal was encountered in BH S12. Where fully penetrated, the granular till in Boreholes BH S8 and S11 was 0.8 and 5.6 m thick, respectively.

The silty sand / sandy silt / sand silt till was brown to grey in color and contained trace to some clay, trace gravel. Cobbles and boulders were observed in several boreholes. The SPT 'N' values measured in the silty sand / sandy silt / sand silt till ranged between 20 blows and greater than 50 blows per 0.3 m but generally above 33 blows, indicating compact to very dense condition overall and dense to very dense typically. The measured water contents in the till ranged between 9 % and 21 %.

Gradation and Atterberg Limits tests were carried out in four (4) selected samples of silty sand / sandy silt / sand silt till, the results of which are presented in Table C1.4, and shown on the Records of Boreholes.



Table C1.4: Results of Grain Size Distribution Analysis and Atterberg Limit Tests (Silty Sand / Sandy Silt / Sand and Silt Till)

				Grain	Grain Size Distribution (%)		n (%)	Δ	Atterberg Limit		USCS
		Depth	Elevation			Fir	nes	Atterberg Limit		1	Modified
No.	No.	(m)	(m)	Gravel	Sand	Silt	Clay	Liquid Limit	Plastic Limit	Plasticity Index	Group Symbol
BH C27/S7	SS 4	2.3	215.5	1	40	52	7	17	14	3	ML
BH C31	SS 3	1.5	220.2	0	67	31	2	-	-	-	-
BH S10	SS 6	3.8	210.0	31	29	33	7	-	-	-	-
BH S11	SS 6	3.8	209.4	1	42	55	2	-	-	-	-

The grain size distribution curve and plasticity chart are presented in Figure Nos. B-C4 and B-C5 in Appendix B-C.

C1.6 Silty Clay / Clayey Silt Till

In all boreholes that was extended beyond the fill soils, except Boreholes BH C2, C5, C6, C19/B22, C20, C27/S7, C31, C32 and S12, native silty clay / clayey silt till was encountered below the fill soils or the silty sand / sandy silt / silt and sand till, and extended to the termination depths of the boreholes at depths varying from about 1.5 m to 9.8 m (Elevations 220.2 m to 204.0 m). Cobbles and/or boulders were reported in the cohesive till in Boreholes BH C1, C23, C24, and S8 to S11 and their presence should be expected throughout this material based on the depositional history of glacial tills.

The silty clay / clayey silt till was brown to grey in colour, and contained trace to some sand and trace gravel and cobbles/boulders. The SPT 'N' values of the clayey silt / silty clay till generally ranged from 7 blows to more than 50 blows per 0.3 m implying firm to hard consistency. The lower values were generally immediately below the fill soils. In majority of the boreholes, the 'N' value was more than 12 blows (stiff). The measured water contents of the silty clay / clayey silt till samples ranged from about 8 % to 28 %.

Gradation and Atterberg Limits tests were carried out in two samples of the silty clay / clayey silt till, the results of which are presented in Table C1.5, and shown on the Records of Boreholes.

Table C1.5: Results of Grain Size Distribution Analysis and Atterberg Limit Tests (Silty Clay / Clayey Silt Till)

				Grair	Size Dis	tributio	n (%)	Attorborg Limit			USCS
Borehole	Sample	Depth	Elevation				Fines		Atterberg Limit		Modified
No.	No.	(m)	(m)	Gravel	Sand	Silt	Clay	Liquid Limit	Plastic Limit	Plasticity Index	Group Symbol
BH S9	SS 7	4.6	209.8	12	32	47	9	17	12	5	CL-ML
BH C17	SS 7	4.6	215.3	1	11	50	38	31	16	15	CI

The grain size distribution curve and plasticity chart are presented in Figure Nos. B-C6 and B-C7 in Appendix B-C.

C1.7 Groundwater

Upon completion, groundwater was encountered in Boreholes BH C5, C11, C27/S7, C31, S8, S10 and S11 at depths varying from about 1.5 m to 8.2 m (Elevations 220.2 m to 205.6 m) below the existing ground surface. Groundwater was not encountered in the remaining boreholes during or upon completion of boreholes.

A monitoring well was installed in each of Boreholes BH C27/S7, S10 and S12 at the locations of the culvert crossings. Groundwater depths measured in the boreholes (where encountered) at the time of drilling or upon completion of drilling, and in subsequent measurements in the monitoring well are summarized in Table C1.6 and shown on the Record of Boreholes.

Table C1.6: Results of Groundwater Depth Measurements

			Groundwater M	leasurements			
Borehole No.	During or U	oon Completic	on of Drilling (m)	In Monitoring Well (m)			
	Date	Depth	Elevation	Date	Depth	Elevation	
BH C5	25 Mar 2020	3.0	211.6		Not installed	l	
BH C11	27 Mar 2020	4.9	210.3		Not installed	I	
				24 Apr 2020	1.7	216.1	
BH C27/S7	H C27/S7 26 Mar 2020		215.1	4 May 2020	1.7	216.1	
				12 May 2020	1.9	215.9	
BH C31	19 Mar 2020	1.5	220.2		Not installed		
BH S8	26 Mar 2020	2.4	217.1		Not installed	1	
DU 610	10 M 2020	0.2	205.6	4 May 2020	0.9	212.9	
BH S10	18 Mar 2020	8.2	205.6	12 May 2020	1.0	212.8	
BH S11	24 Mar 2020	2.1	211.1	Not installed			
DU C12	24 Mar 2020	D		4 May 2020	1.4	212.1	
BH S12	24 Mar 2020	Dry	-	12 May 2020	1.5	212.0	



It should be noted that the groundwater at the site would fluctuate seasonally and can be expected to be somewhat higher during the spring months, and in response to major weather events.

C1.8 Soil Corrosivity

One (1) soil sample was submitted for corrosion analysis to determine the corrosive potential of the soils with respect to buried metallic structures. The results of the analyses are presented Table C1.7, and the laboratory test certificate is included in Appendix D.

Soil Characteristic Units BH C17-SS3 **BH C31-SS3 BH S10-SS5** BH S12-SS5 Chloride (2:1) ug/g or (ppm) 141 69 363 546 65 35 Sulphate (2:1) ug/g or (ppm) 21 18 рΗ 8.54 8.12 8.09 рН 8.17 **Electrical Conductivity** mS/cm 0.392 0.224 0.798 1.08 4460 Resistivity Ohm-cm 2550 1250 926

Table C1.7: Summary of Analytical Testing

As per ASTM STP 1013 (Effects of Soil Characteristics on Corrosion – "chloride appears to be the main factor in increased soil corrosivity with levels in excess of 0.01 % (100 (μ g/g) considered indicative of accelerated corrosion". The chloride content measured in the samples varied from 69 to 546 μ g/g. In accordance with Table 1 of CSA A23.1-14 and based on "structurally reinforced concrete exposed to chloride, with or without freezing and thawing" and based on project location, exposure class "C-1" can be used. Class should be based on structure location and/or durability requirement.

In accordance with Table 3 of CSA A23.1-14, no additional requirement is specified for sulphate content below 0.10 % (i.e. 1,000 ppm or μ g/g) below the "moderate degree of exposure" with respect to concrete. Therefore, in accordance with Table 6 of the Canadian Standards Association (CSA) Series A23.1-14, Type GU Portland cement can be used based on the water-soluble sulphate content measured in soil.

As noted in ASTM -STP 1013 (*Effects of Soil Characteristics on Corrosion*), pH values between 4.0 and 8.5 have very little effect on corrosion (American Water Works Association (AWWA) Standard C 105-72 (Table 1 – Soil-Test Evaluation AWWA Rating).

The measured soil resistivity values can be considered as "very high" for values below 1000 ohm-cm, "high" between 1000 ohm-cm and 2000 ohm-cm and "moderate" between 2000 ohm-cm to 5000 ohm-cm for



exposed metallic structures, based on ASTM STP 1000, Corrosion Testing and Evaluation - Table 3 (Corrosivity for Uncoated Steel).

Protection against steel corrosion, where required, could include one or a combination of: adequate concrete cover, low-permeability concrete, corrosion inhibitors; coated reinforcing steel; clad reinforcing steel; and corrosion-resistant alloy reinforcement.

A corrosion specialist should be retained, if necessary, to review the analysis results and provide relevant recommendation.

C2.0 PAVEMENT INVESTIGATIONS AND DESIGN

The purpose of the pavement investigation was to obtain subsurface information and to provide geotechnical recommendations for widening along Countryside Drive which is east / west oriented, and as per the City's road classification, it is designated as a minor arterial road. The total length of the investigated road section is about 2.7 km.

At the time of the investigation, the investigated road section was a 2-lanes rural road that would be widened to 4-lanes, from Clarkway Drive to RR 50 including realignment at RR50, Ontario. The discussions and recommendations in the following sections are general in nature as the details of the widening were not available at the time of this report. At the time of this report, two (2) boreholes (BH C36 and C38), located in the private lands north of Countryside Drive, have been deferred to detailed design stage, if required.

The subsurface soil profile at the site consisted of surficial asphaltic concrete underlain by non-cohesive soil sand and gravel fill overlying silty clay fill, silty clay /clayey silt till which extended to the termination depths of the boreholes that ranged from 1.2 to 9.8 m.

All boreholes were open and dry upon completion to their respective vertical limits of investigation except in seven boreholes (BHs C5, C11, C27/S7, C31, S8, S10 and S11), where groundwater was encountered at depths ranging from 2.1 m to 8.2 m below ground surface.

The discussions and recommendations in the following sections are based on the subsurface information obtained from the boreholes and are intended for use by Design Engineers.

C2.1 Visual Pavement Condition Survey

On 10 August 2020, Wood carried out a visual pavement condition survey of the existing road surface within the project area to identify any distresses. A summary of the pavement condition survey, including predominant surface defects, surface deformation and cracking, is tabulated in Table C2.1 and copies of the Pavement Condition Survey Forms are included in Appendix A-C. Based on the pavement condition survey, the existing asphaltic concrete surface condition ranged from Good to Fairly Good to Fair for with some



locations in Fairly Poor to Poor from Clarkway Drive to Coleraine Drive. The existing asphaltic concrete surface condition ranged from Good to Fairly Good with some locations in Fair and Poor Condition from Coleraine Dr to Hwy 50.

Table C2.1: Existing Pavement Condition

Predominant Distress	2020 Condition Ra0ting
Clarkway Dr to Coleraine Dr ~ 1.4 km (2 lanes)	
 Ravelling & coarse aggregate loss – Slight / Intermittent. Wheel Track Rutting/Distortion – Very Severe /Few. Longitudinal Cracking (single, multiple and alligator) – Slight to Moderate / Intermittent. Centreline Cracking (single, multiple and alligator) – Moderate / Intermittent. Transverse Cracking (single, multiple and alligator) – Moderate /Frequent. 	Ranged from Good to Fairly Good to Fair with some locations in Fairly Poor to Poor Condition.
Coleraine Dr to Hwy 50 ~ 0.8 km (2 lanes)	
 Ravelling & coarse aggregate loss – Severe /Extensive. Wheel Track Rutting/Distortion – Slight /Few. 	Ranged from Good to Fairly Good
 Longitudinal Cracking (single, multiple and alligator) – Moderate / Intermittent. Centreline Cracking (single, multiple and alligator) – Slight / Intermittent. Transverse Cracking (single, multiple and alligator) – Moderate /Few. 	with some locations in Fair and Poor Condition.

C2.2 Subsurface Conditions

A total of 42 boreholes have been drilled along Countryside Drive from St. Johns Road to Highway 50 including realignment at RR50, Ontario (approx. 2.7 km), including boreholes at three culvert locations. Due to proximity to BH B22, Borehole C19 was not drilled and combined as BH C19/B22. Similarly, BH C27 and S7 were combined as BH C27/S7. As noted above, two (2) boreholes have not been drilled and are to be drilled at a later date.

The subsurface soil profile at the site consisted of surficial asphaltic concrete underlain by sand and gravel fill overlying silty clay fill, silty clay /clayey silt till which extended to the termination depths of the boreholes that different in depths that ranged from 1.2 to 9.8 m as detailed in the Record of Boreholes.

The driving lanes boreholes revealed that the asphaltic concrete thickness ranged from 90 mm to 200 mm with an average of 123 mm. Non-cohesive soil (sand and gravel fill) was encountered in all the boreholes underlying the existing asphaltic concrete that ranged in thickness from 150 mm to 800 mm, with an average of 442 mm. The shoulder boreholes revealed sand and gravel fill was encountered in all the boreholes that ranged in thickness from 300 mm to 600 mm, with an average of 535 mm. Two boreholes C12 and C22 encountered 100 mm of topsoil and the other 150 mm of asphaltic concrete overlying fill material.

Additional subsurface information is provided in Section C1.0 and in the Record of Boreholes.

C2.3 Groundwater Conditions

Groundwater was encountered in a number of boreholes during and on completion of drilling in the open boreholes at depths varying from 1.5 m to 8.2 m below ground, as listed in Table C1.6. It should be pointed out that the groundwater at the site would fluctuate seasonally and can be expected to be somewhat higher during the spring months and in response to major weather events.

C2.4 Pavement Design

The purpose of the geotechnical investigation was to obtain subsurface information and to provide geotechnical recommendations for road rehabilitation/re-surfacing and widening along Countryside Drive.

The discussions and recommendations in the following sections are based on the available information and the subsurface information obtained from the boreholes and is intended for use by Design Engineers.

C2.4.1 Pavement Structure Adequacy

Two methods were used to assess the existing pavement structure. In-situ structure number ("SN") and insitu Granular Base Equivalency ("GBE") were estimated from the borehole data using the equivalency factors for various material types, as shown in Table C2.2.

Table C2.2: Summary of Typical Structural Layer Coefficient

Material Type	Typical AASHTO-Ont Layer Coefficient (SI	Granular base Equivalency	
Rehabilitation	Drainage	Structural	Factors
Existing HL Existing Gran Base Existing Gran Sub-base Existing Gran Base/Sub-base	Acceptable 1.0 Questionable 0.9 Inadequate 0.8 to 0.5	0.14 to 0.28 0.10 to 0.14 0.05 to 0.09	1.25 0.75 0.50 0.625
Pulverization CIR RAP/Gran A blended stabilized with EAM	1.0 1.0 1.0	0.10 to 0.14 0.28 to 0.38 0.20 to 0.25	1.0 1.6 – 1.8 1.0

⁽¹⁾ MTO Report MI-183 -. MTO Report MI-183 "Adaptation and Verification of AASHTO Pavement Design Parameters for Ontario Conditions" - Table 4-5.

Table C2.3 summarises the total average pavement structural thickness of the existing asphaltic concrete pavement, granular base and sub-base, as well as the average existing Structure Number 'SN' and 'GBE' before rehabilitation.

Table C2.3: Summary of Existing Pavement Structure

# of BHs	Average Th	ickness (mm)	SN ⁽¹⁾	GBE	Predominant	
	НМА	Base/Subbase	(mm)		Subgrade	
# of BHs @ MDL /EP=17 (C1, C3, C5, C7, C9, C11, C13, C15, C17, C21, C25, C27 / S7, C29, C31, C33, C35, C37)	Range (90-200) mm Av. 123 mm	Range (150-800) mm Av.442 mm	Range (48-120) mm Av. 82 mm	Range (244-644) mm Av. 430 mm	Si(y) Cl Fill	
# of BHs @ SHR/TOR=10 (C2, C6, C8, C12, C18, C20, C22, C24, C30, C32)	100 mm Tps @ BH C12 150 mm HMA @BHC22	Range (300-600) mm Av. 535 mm	-	-	Si(y) Cl/Cl(y) Si Till	

Notes:

MDL= Mid driving Lane EP = Edge of Pavement SHR = Shoulder Rounding TOS = Toe of Slope.

- (1) Existing SN calculations the following parameters were used:
 - Existing HMA coefficient, = 0.28
 - Existing granular base/subbase coefficient, and concrete = 0.12/0.9

C2.4.2 Existing and Forecasted Traffic Data

The traffic data represented as Average Annual Daily Traffic (AADT₂₀₂₀) in both directions was estimated by Wood Traffic Group as presented in Table C2.4. This traffic data was used to projected traffic data for 20 years design life. Equivalent single axle loads (ESALs) were calculated cumulatively over 20 years as described in the Ministry of Transportation Report "Procedures for Estimating Traffic Loads for Pavement Design, 1995".

Table C2.4: Traffic Data - Minor Arterial (Rural)

AADT in Both Directions 2020 ⁽¹⁾	Growth Rate (%)	Comm. Vehicles (%)	Design ESALs @ 20 Years	Traffic Category	
5,888	2.0%	6.0%	2,379,031 ~ 2.4 x 10 ⁶	Category B	

^{(1) 2020} is the anticipated construction year.

C2.4.3 Flexible Structural Pavement Design for Widening

After reviewing the field data and laboratory test results, the minimum pavement structural design for widening of Countryside Drive is presented in Table C2.5 and was determined in accordance with the 1993 American Association of State Highway and Transportation Officials ('AASHTO') Guide for the Design of Pavement Structures using the Darwin Software Program.





The AASHTO Pavement Design is considered to be a function of estimated future traffic in both directions (ESALs), reliability (R), which is a function of road classification, overall standard deviation (S_o), resilient modulus (M_r), as well as initial and terminal serviceability (P_o , P_t). From these parameters, the structure number (SN) is calculated. The SN is defined in the AASHTO Guide as a number, which provides a measure of the pavement strength and thickness needed to avoid overstressing the subgrade.

The following design parameters were chosen to calculate the required structure number for the design of flexible pavement using the AASHTO method, as described in the Ministry of Transportation Materials Information Report MI-183 "Adaptation and Verification of AASHTO Pavement Design Parameters for Ontario Conditions".

- Initial serviceability, $P_i = 4.5$; - Terminal serviceability, $P_t = 2.5$;

- Reliability level, R = 90 percent;

- Overall standard of deviation, $S_o = 0.49$; - Subgrade Resilient Modulus, M_r (kPa) $M_r = 30,000$

Table C2.5: Recommended Minimum Structural Pavement Design

		AASHTO Design for 20 Years					Recommended HMA & PGAC	
			Required Design SN	Selected SN	Total Pavement Thickness	Marshall		tegor
ESALs	НМА	Gran A				HL 3 (HS) /HL 1 Surface Course	HL8 Binder Course	Traffic Category
	Thickness (mm)							
2.4 X 10 ⁶	150	Gran A = 400 mm or Gran A = 150 mm Gran B Type II = 250 mm	119	119	550	SP 50 mm	50+50 mm	В
		Gran A = 480 mm or Gran A = 130 mm Gran B Type II = 350 mm	119	130.2	630	PGAC 64-28	PGAC 58-28	J

Notes:

- Pavement shall be placed over approved subgrade.
- Granular A and Granular B Type II: Compaction as per OPSS Form 1010 (100% SPMDD).

The City of Brampton minimum Pavement Structure is as follows (Arterial Road STD#208 - 2019):

- 50 mm HL3 Asphalt (High Stability or HL1)
- 85 mm HL8 Asphalt (100 mm for All New Subdivision Roads)





150 mm Granular "A" or 130 mm of 20 mm Crusher Run Limestone
 450 mm Granular "B" or 350 mm of 50 mm Crusher Run Limestone

The structure number (SN) of the City of Brampton design is 118.2 mm or by using Crusher Run Limestone SN = 123.9 mm.

The AASHTO pavement design was selected for the road widening since it is tailored on soil field investigation, traffic data and traffic loading of 20 years period, with the granular thickness increased to match the City's minimum requirements. However, the granular B Type II thickness shall be increased to 450 mm to match the City's Standards (Table C2.6).

C2.4.4 Widening Countryside Drive from St. Johns Road to Highway 50

Pavement recommendations for widening of Countryside Drive are presented in Table C2.6, including hot mix type, lift thickness, and PGAC type making up the recommended asphalt thickness, as well as the traffic category, in accordance with OPSS.MUNI 1151. The granular thicknesses of the widening given in the table is a minimum thickness and should match the adjacent existing pavement granular thickness to promote positive lateral drainage. Also, the thicknesses can be increased depending on grading requirements.

НМА Traffic **PGAC** Thickness (mm) **Type** Category HL 3 (HS) / HL 1 50 mm 64-28 В HL 8 (HS) /HDBC 50 mm 58-28 50 mm 58-28 Granular Base 'A' 20m Crusher Run 130 mm Granular Subbase 'B' Modified or 50m 450 mm Crusher Run or Limestone 730 mm **Total Pavement Structure**

Table C2.6: Widening of Countryside Drive

The granular thicknesses of the widening given in the table is a minimum thickness and should be increased, as required, to match the adjacent existing pavement granular thickness to promote positive lateral drainage (refer to the Borehole Log Data). Also, the thicknesses can be increased depending on grading requirements.

Full depth excavation, as required and commencing from the existing edge of pavement, will be required to accommodate the proposed design thickness.



The excavated granular materials from the shoulder can be re-used as fill material for subgrade for the widening/embankment, provided it is not contaminated. New Granular B subbase should be added and compacted, followed by new Granular A base material. Both base and subbase can vary in thickness to match the adjacent existing pavement granular in order to promote positive lateral drainage. The Granular A base course should be compacted and overlain with 2 lifts of HL 8 (HS) / HDBC binder course, and 1 lift of HL 3 (HS) or HL 1 surface course, as per Table C2.6. Installation of subdrain is recommended, if lateral drainage of the existing subgrade is not possible.

C2.5 Rehabilitation Strategies

The selected rehabilitation strategy was based on Wood's geotechnical/pavement investigation and analysis, including a visual pavement condition assessment, subgrade condition, and calculated ESALs. Consideration was also given to user delay, cost and/or disruption of traffic and an anticipated construction year of 2020. The proposed rehabilitation strategy is as follows:

In-Place Pulverization, Remixing & Resurfacing with 120 mm of HMA: This strategy involves pulverizing the existing asphalt concrete thickness into an equivalent depth of granular base material to a total depth of 240 mm. The resulting mixture of asphalt concrete and granular is then graded to cross fall, compacted and used as a base. The advantages of this option include the elimination of surface defects and reflection cracking and the reuse of the existing material efficiently. Typically, the GBE for bituminous crushed recovered material is in the order of 1.0. In-place pulverization should be graded and compacted and resurfaced with 120 mm of HMA. This option will raise the vertical profile by 120 mm and will provide 16 to 18 years of service life and average SN of 115 mm after resurfacing.

C2.6 Recommendations and Construction Features for Pavement

C2.6.1 Rehabilitation Strategies

In-Place Pulverization, Remixing & Resurfacing with 120 mm of HMA. This option will raise the existing vertical profile by 120 mm and will provide service life of 16-18 years.

C2.6.2 Widening of Countryside Drive

Pavement recommendations for widening of Countryside Drive are presented in Table C2.6 for new pavement structure, including hot mix type, lift thickness, and PGAC type making up the recommended asphalt thickness, as well as the traffic category, in accordance with OPSS 1151. The granular thicknesses of the widening given in the table is a minimum thickness and should match the adjacent existing pavement granular thickness to promote positive lateral drainage. Also, the thicknesses can be increased depending on grading requirements.



Full depth excavation, as necessary, and commencing from the existing edge of pavement, will be required to accommodate the proposed design thickness. The excavated granular materials from the shoulder can be reused as fill material for subgrade for the widening/embankment, provided it is not contaminated. New Granular B Type II subbase should be added and compacted, followed by new Granular A base material. Both base and subbase can vary in thickness to match the adjacent existing pavement granular in order to promote positive lateral drainage. The Granular A base course should be compacted and overlaid with 2 lifts of HL 8 (HS) /HDBC binder course, and 1 lift of HL 3 (HS) / HL 1 surface course, as per Table C2.6. Installation of subdrain is recommended, if lateral drainage of the existing subgrade is not possible.

C2.6.3 Subgrade / Road Base Preparation and Compaction

The pavement structural design recommended for roads is applicable, provided the subgrade is prepared under dry weather conditions, proof-rolled with a heavy rubber-tired vehicle (such as a grader or loaded dump truck) in the presence of the geotechnical consultant. Any loose, soft or unstable areas, if detected during proof-rolling, must be sub-excavated, replaced with approved granular materials and compacted. Any additional engineered fill, if required, should be placed in thin layers not exceeding 200 mm and compacted to a minimum of 98 % of Standard Proctor Maximum Dry Density (SPMDD). Granular materials should be placed in thin layers not exceeding approximately 200 mm, within ± 2 % of its optimum moisture content, and thoroughly compacted to a minimum of 100 % of SPMDD.

The subgrade should be provided with adequate drainage. If wet weather conditions prevail at the time of construction, adjustments to this design may be required, i.e. if the subgrade becomes excessively wet or rutted during construction activities, additional sub-base material may be required. The need for additional sub-base material is best determined during construction.

All granular base and sub-base materials must be compacted to at least 100% of SPMDD.

C2.7.4 Stripping and Sub-Excavation

No additional sub-excavation, other than removal of organics and topsoil are anticipated within the widening limits, as presented in Table C1.1 that ranged from 150 mm to 300 mm. However, any unsuitable soft or saturated material should be removed. Deeper stripping depths may be required, depending on the actual site conditions between borehole locations.

C2.6.5 Drainage

Prior to completing the rehabilitation, it is recommended that adequate drainage be provided both laterally and longitudinally along the length of the project.

To meet the design requirements for the pavement life, the road subgrade and granular courses should be well drained at all times. This can be accomplished by ensuring proper grading of the subgrade and positive lateral drainage of the granular base daylighting at the ditch. Alternatively, full-length perforated subdrain



. . .



pipes of 150 mm diameter should be installed along both sides of the road, below the roadbed level, to ensure effective drainage, in accordance with OPSD 216.021. The sub-drainpipes should be wrapped in suitable non-woven geotextile surrounded by a minimum drainage zone of 19 mm size clear stone of minimum 150 mm thickness. A minimum slope of 2 % should be maintained across the paved sections (finished road surface) to ensure proper surface drainage. New pavement should slope towards the gutter/ditch.

C2.6.6 Hot Mixes and PGAC Type

The following Marshall hot mixes should be used on Countryside Drive:

 HL 3 (HS) / HL 1 surface course mix and HL 8 (HS) /HDBC binder course should be used to provide the roadway with high durability.

Material Specification should be as per OPSS.MUNI 1150 Material Specification for Hot Mix Asphalt. For aggregates, the material specification should be as per OPSS MUNI 1003.

Performance Graded Asphalt Cement ("PGAC") 64-28 should be used only for surface course and PG 58-28 for binder course. This PGAC should satisfy the requirements of MP1 of SHRP Specifications for Superpave. Recycled Materials: The use of reclaimed asphalt pavement (RAP) is permitted in Marshall mixes. The percent of RAP for HL 8 and HL 3 should be as per OPSS.MUNI 1150.

RAP containing steel slag aggregates should not be allowed.

<u>Transition Treatments at Limits of Paving</u>: At the limits of the project, a butt joint with the existing pavement is recommended. The butt joint between successive lifts of hot mix should be staggered at a distance of not less than 5 m, in accordance with OPSS.PROV 313. It should be ensured that no joint location corresponds with a joint location in any other layer.

The transition treatment from earth cut to earth fill should be in accordance with OPSD 205.010.

<u>Tack Coat:</u> It is recommended that all milled surfaces, and binder course surfaces will be tack coated prior to top course asphalt, if exposed to extended traffic. Construction Specification should be as per OPSS Prov. 308, April 2007.

C2.6.7 In-Situ Compaction for Hot Mix

In all areas, asphaltic concrete should be compacted as per OPSS.MUNI 310, Table 10 (April 2011). It should be noted that the granular base and sub-base materials should be compacted to the City's standards or to minimum 100 % SPMDD.

<u>Field Quality Assurance:</u> Plate samples of loose hot mix should be obtained for each paving day, and extraction/gradation and full Marshall compliance testing should be carried out on these samples. The



. . .



finished surface shall be true to required profile and cross-section within 6 mm from required elevations and thickness. The surface shall show no depressions or bumps exceeding 3 mm under a 3.0 m long straight edge, placed parallel to the road centreline.

C2.6.8 Frost Depth

A minimum depth of 1.4 m should be used for frost protection as per OPSD 3090.101.

C2.6.9 Detouring

No long-term detouring is planned. Therefore, no special treatment will be required.

C3.0 UNDERGROUND UTILITIES

The geotechnical investigation scope of work included obtaining subsurface conditions and providing recommendations for installation of proposed underground utility services. Accordingly, selected boreholes (i.e. alternating pavement boreholes) were deepened to a depth of 3 m to 5 m, as listed in Table 5.3. Information obtained from all relevant boreholes drilled along Countryside Drive have been considered in this section, as applicable.

C3.1 Subsurface Conditions

A total of thirty-two (32) boreholes (not including the eight augered boreholes for topsoil measurements) were drilled in driving lanes and shoulder areas of Coleraine Drive to depths varying from about 1.2 m to 9.8 m, for pavement investigation, underground utility installation and three culverts. *Two boreholes (BH C36 and C38) had not been drilled at the time of this report and will be drilled at a later date.*

Overall, the project site along Countryside Drive consisted of surficial cover (topsoil, asphaltic concrete, and/or exposed granular fill) underlain fill soils (granular and / or silty clay / clayey silt) overlying native till soils (silty sand / sandy silt / sand and silt and/or silty clay / clayey silt). The fill soils extended to depths varying from about 0.9 m to 2.2 m (Elevations 211.0 m to 220.9 m) below the existing ground surface. The silty sand / sandy silt / sand and silt till was encountered up to a maximum depth of 7.8 m (Elevation 205.4 m) below the existing ground surface in BH S11. The silty clay / clayey silt till was confirmed to a depth of about 9.8 m (Elevation 208.0 m) below existing ground surface BH C23 / S7.

Groundwater depths measured in the boreholes and monitoring wells varied from 0.9 m to 8.2 m (Elevations 216.1 m to 205.6 m) below ground surface.

Detailed subsurface and groundwater conditions are provided in Section C1.0.



C3.2 Discussions and Recommendations for Underground Utilities

As per information available, the planned Countryside Drive rehabilitation / widening within the project limits will include installation of underground utilities and associated manholes and catch basins. Details of the installation were not available at the time of this report. Existing utilities, if any, should be protected and taken into consideration for design and construction of the proposed underground utilities and road widening.

The ground (road) elevations within the project limits (based on borehole location) varied from about 213.2 m (at BH S11) to 221.8 m (at BH C33), with the overall the ground surface was sloping up from west (St. Johns Road) to east (Highway 50).

The recommendations and discussions for excavation and installation of underground utility services, and associated manholes / catch basins, are provided in the following sections.

C3.2.1 Founding Subgrade Conditions

From the investigation result, fill soils (granular, silty clay) were present to depths varying from 0.9 m to 2.2 m below existing ground / road level, which included granular fill to depths varying from 0.3 m to 0.6 m in some of the boreholes. The SPT values in the silty clay / clayey silt fill below the granular fill indicated a firm to hard but generally stiff consistency. The granular fill was in loose to compact condition.

The native tills soils (silty clay / clayey silt and silty sand / sandy silt / sand and silt) below the fill soils were of firm to hard consistency and / or compact to very dense overall, with the majority indicating very stiff to hard consistency and dense to very dense compactness, and should be generally competent to support underground utility services.

It is recommended that the inverts of underground utilities be founded on native soils, or competent fill soil subgrade. Existing fills or soft soil encountered at the founding level should be compacted, if possible, or otherwise, should be sub-excavated and backfilled with compacted soil as recommended in Section C5.3 (Engineered Fill).

For manholes and catch basins founded on competent subgrade (i.e., approved existing fill, imported engineered fill, till soils), a Geotechnical Reaction at Serviceability Limit State (SLS) of 100 to 150 kPa and a factored Geotechnical Resistance at Ultimate Limit State (factored ULS) of 150 to 225 kPa, depending on the subgrade conditions, may be used, which should be verified by a geotechnical engineer during construction. Under the SLS bearing values, settlements of up to 25 mm may take place.

The frost penetration depth for the project area should be considered as 1.4 m.

The highest groundwater elevation measured during the investigation within the project limits of Countryside Drive was 0.9 m (Elevation 212.9 m) below ground surface in the monitoring well installed at the culvert location (BH S10). As such, groundwater may be present within the excavation depths for the underground utilities. Also, perched water in sandy / silty pockets and / or water from surface runoff will require dewatering

• • •



during excavation. As the excavation will generally be in clayey soils, groundwater seepage, if any, into the excavation is likely to be slow and a properly filtered sump and pump system, or gravity drainage, may be used for dewatering excavation.

General discussions regarding excavation and dewatering are provided in Section C5.4. Detailed dewatering consideration for the project is included Wood's hydrogeological investigation report, which is submitted under a separate cover.

Trench excavation, pipe bedding and anti-seepage collar considerations are discussed in following sections.

General discussions provided in Section C5.0 should also be considered for design and construction.

C3.2.2 Trench Excavation

Trench excavation should be carried out as per the latest Ontario's Occupational Health and Safety Act (OHSA) and Regulations for Construction Projects. The soils classifications are shown in Section C5.4. Based on the soils encountered in the boreholes, the sides of excavations are expected to be temporarily stable at 1H:1V for Type 2 and Type 3 soils, provided excavations are properly dewatered and underground utilities are installed and backfilled within a reasonable short period of time. Provisions should be made for dewatering, as noted in Section C5.4. Trenching should be in accordance with OPSS.MUNI 401 (Construction Specification for Trenching, Backfilling and Compacting).

It is important for frost heave compatibility that the trench backfill within the frost zone of 1.4 m depth matches the soil exposed on the trench walls.

C3.2.3 Bedding

Bedding for underground pipes should be placed in accordance with the design requirements and current Ontario Provincial Standards (OPS) specifications (Ontario Provincial Standard Drawing (OPSD) 802.10 for flexible pipes and OPSD 802.30, 802.31 and 802.32 for rigid pipes). It is recommended that a minimum of 150 mm thick bedding material (Class 'B' Type or better) be placed below the pipe invert. The thickness of the bedding may, however, need to be increased depending on the pipe diameter, or if wet or weak subgrade conditions are encountered. If the subgrade is weak, it should be sub-excavated and replaced with engineered fill to support the pipes and allow the use of Class 'B' Type bedding. If weak subgrade is encountered and cannot totally be removed, Class 'A' Type bedding (e.g. minimum 100 mm thick lean concrete) should be used to provide a workable surface and support the proposed pipes.

For the areas to be filled, the fill soils should first be placed approximately to final grade and subsequently excavated to install the underground pipes in order to prevent pipe settlement due to overburden loads.

Should the pipes be installed in soft clay soils, the joints should be restrained from movements and the backfill around the pipes should be properly compacted in order to prevent long-term movements. A layer of



geotextile (Terrafix 270R or equivalent) should be placed between the soft clayey soils and the granular bedding/backfill in order to prevent soil migration.

The possibility of pipe movements in soft clayey soils, after installation, should be considered in the design and construction of the underground pipes.

Construction of underground pipes should be carried out in accordance with the relevant OPSS.MUNI 410 (Construction Specification for Pipe Sewer Installation in Open Cut), or other relevant applicable municipal / regional standards.

C3.2.4 Backfill

Based on the visual and tactile examination of the soil samples, the on-site excavated granular / silty clay fill and till soils may be re-used as backfill in sewer trenches provided their moisture contents at the time of construction are at or near the optimum. Moisture conditioning of the sub-excavation soils may be required prior to reuse. The excavated cohesive fill should be carefully examined for organic content and moisture condition by qualified geotechnical personnel in order to confirm the need for moisture conditioning or its acceptability for use as backfill.

The backfill should be placed in maximum 200 mm thick layers at or near (\pm 2 %) optimum moisture content, and each layer should be compacted to at least 95 % Standard Proctor Maximum Dry Density (SPMDD).

Backfill around the manhole / catch basins should be brought up simultaneously on all sides and operation of heavy equipment near the walls should be restricted to minimize potential movement and/or damage.

Unsuitable material such as organic soils, boulders, cobbles, frozen soils, etc., should not be used for backfilling.

C3.2.5 Anti-Seepage Collars

From the borehole information, the underground utilities will be installed in clayey soil (silty clay fill, silty clay / clayey silt till). As such, anti-seepage collars should not be required.

C4.0 CULVERTS ON COUNTRYSIDE DRIVE (STATIONS 0+350, 0+700 AND 1+950)

Three (3) existing culvert (approximate Station 0+300, 0+700 and 1+950), located within the project limits on Countryside Drive, are planned to be rehabilitated / extended to accommodate the proposed road widening. The geotechnical investigation consisted of drilling six (6) boreholes (BH C27/S7 and S8 to S12) at the existing culvert locations to obtain subsurface and groundwater condition. The boreholes were drilled to depth of



about 5.8 m to 9.8 m (Elevations 204.4 m and 219.5 m) below the existing ground surface. One boreholes was terminated at the depth of 5.8 m due to auger refusal on likely boulder. The remaining boreholes were drilled to depth varying from 9.2 m to 9.8 m. Based on available information:

- the existing culvert over Rainbow Creek Tributary at Station 0+350 is a concrete box culvert with a span of about 3.5 m and is about 12 m long;
- the existing culvert over West Humber Tributary (Clarkway Tributary) at Station 0+700 is a concrete culvert with a span of about 7.1 m and is about 9.2 m long; and
- the existing culvert over West Humber Tributary (Gore Road Tributary) at Station 1+950 is a concrete culvert with a span of about 5.5 m and is about 7.5 m long.

Other information of the existing culverts and details of the proposed rehabilitations / extensions were not available at the time of preparation of this report. The culvert and borehole locations are shown in Figure Nos. 3A and 3B.

The stratigraphic units and groundwater conditions for each culvert are discussed in the following sections and presented on the Record of Boreholes. The following summary is to assist the designers of the project with an understanding of the soil conditions encountered at the proposed culvert location. The soil and groundwater conditions might vary between and beyond the borehole locations.

C4.1 Subsurface Condition - Culvert on Countryside Drive (Station 0+350)

Two (2) boreholes (BH S11 and S12) were drilled in the vicinity the existing culvert over Rainbow Creek Tributary at Station 0+350. Based on the soil conditions observed in the boreholes drilled for culvert, the subsurface profile consisted of fill soils (sand and gravel and silty clay / clayey silt fill) underlying the asphaltic concrete. Native silty sand / sandy silt / sand and silt and/or silty clay / clayey silt till were encountered underlying the fill soils in both boreholes.

C4.1.1 Asphaltic Concrete

At Boreholes BH S11 and S12 locations, about 200 mm and 140 mm thick asphaltic concrete, respectively, was encountered at the ground surface.

C4.1.2 Fill Soils

Fill soils were encountered in both boreholes below the asphaltic concrete and consisted of sand and gravel fill and silty clay / clayey silt fill, which extended to a depth of about 2.2 m (Elevations 211.0 m and 211.3 m) below the existing ground surface in both boreholes.

The sand and gravel fill was brown in colour and contained trace to some silt. The silty clay / clayey silt fill, which was encountered below the sand and gravel fill, was dark brown / grey in colour and contained trace



• • •



to some gravel and trace of organics. SPT 'N' values measured within the fill soils ranged from 6 blows to 16 blows per 0.3 m. Water contents measured in the fill samples ranged from 5 % to 21 %.

C4.1.3 Silty Sand / Sandy Silt / Sand and Silt Till

Native silty sand / sandy silt / sand and silt till was encountered below the fill soils in both boreholes and extended to a depth of about 7.8 m (Elevation 205.4 m) below the existing ground surface in Borehole BH S11, and to the termination depth of BH S12 5.8 m (Elevation 207.7 m). Borehole BH S12 was terminated due to auger refusal on possible cobbles/boulders or bedrock. The presence of cobbles and boulders should be anticipated throughout this granular till deposit based on the depositional history of this material.

The silty sand / sandy silt / sand and silt till was brown to grey in colour, and contained trace clay and trace gravel. The SPT 'N' values measured within the silty sand / sandy silt / sand and silt till ranged from 20 blows to more than 50 blows per 0.3 m, implying compact to very dense condition. Water contents measured in the till samples varied from 12 % to 16 %.

Gradation testing was carried out in one sample (BH S11 / SS6), the results of which are presented in Table C1.4 and shown on the Record of Borehole sheet.

C4.1.4 Silty Clay / Clayey Silt Till

Native silty clay / clayey silt till was encountered underlying the silty sand / sandy silt / sand and silt till and confirmed to the termination depth of Borehole BH S11 at 9.2 m (Elevation 204.0) below the existing ground surface.

The silty clay / clayey silt till was brown to grey in colour, and contained trace sand to some sand or was sandy, trace to some gravel, and cobbles / boulders. One (1) SPT 'N' value measured within the silty clay / clayey silt till was more than 50 blows per 0.3 m, implying hard consistency. A single water content measured in the silty clay / clayey silt till was 10 %.

C4.1.5 Groundwater Conditions

Upon completion, groundwater was encountered in Borehole BH S11 at a depth of 2.1 m (Elevation 211.1 m) below the existing ground surface. Groundwater was not encountered in Borehole BH S12 during and upon completion of the drilling.

The highest groundwater depth measured in monitoring well installed in BH S12 was about 1.4 m (Elevation 212.1 m) below ground surface. Groundwater measurements during drilling and in the monitoring well are summarized in Table C1.5 and shown on the Record of Borehole.

It should be noted that the groundwater could fluctuate seasonally and can be expected to be somewhat higher during the spring months and in response to major weather events.

C4.2 Subsurface Condition – Culvert on Countryside Drive (Station 0+700)

Two (2) boreholes (BH S9 and S10) were drilled in the vicinity of existing culvert over the West Humber Tributary (Clarkway Tributary) at Station 0+700. Based on the soil conditions observed in the boreholes drilled for culvert, the subsurface profile at the culvert location consisted of fill soils (sand and gravel and silty clay / clayey silt fill) underlying the asphaltic concrete. Native silty clay / clayey silt till was encountered underlying the fill soils to the termination depths of both boreholes.

C4.2.1 Asphaltic Concrete

At Boreholes BH S9 and S10 locations, 150 mm thick asphaltic concrete was encountered at the ground surface in both boreholes.

C4.2.2 Fill Soils

Fill soils were encountered below the asphaltic concrete and consisted of sand and gravel fill and silty clay / clayey silt fill, which extended to depths of about 1.8 m and 1.5 m (Elevations 212.6 m and 212.3 m) below the existing ground surface in Boreholes BH S9 and S10, respectively.

The sand and gravel fill was brown to grey in colour and contained trace to some silt. The silty clay / clayey silt fill, which was encountered below the sand and gravel fill, was brown and dark brown in colour, and contained trace to some sand and gravel. SPT 'N' values measured within the fill soils ranged from 7 to 9 blows per 0.3 m. Water contents measured in the fill samples ranged from 16 % to 23 %.

C4.2.4 Silty Clay / Clayey Silt Till

Native silty clay / clayey silt till was encountered underlying the fill soils and extended to the termination depth of both boreholes at 9.4 m (Elevations 205.0 m and 204.4 m) below the existing ground surface.

The silty clay / clayey silt till was brown to grey in colour, and contained trace to some sand or was sandy, and trace gravel and cobbles / boulders. The SPT 'N' values measured within the silty clay / clayey silt till ranged between 7 blows and more than 50 blows per 0.3 m, implying firm to hard consistency. Water contents measured in the silty clay / clayey silt till ranged from 8 % to 19 %.

Gradation and Atterberg Limits tests were carried out in one sample (BH S9 / SS7), the results of which are presented in Table C1.5 above and shown on the Record of Borehole sheets.





C4.2.5 Groundwater Conditions

Upon completion, groundwater was encountered in Borehole BH S10 at a depth of 8.2 m (Elevation 205.6 m) below the existing ground surface. Groundwater was not encountered during and upon completion of the drilling of Borehole BH S9.

The highest groundwater depth measured in monitoring well installed in BH S10 was about 0.9 m (Elevation 212.9 m) below ground surface. Groundwater measurements during drilling and in the monitoring well are summarized in Table C1.6 and shown on the Record of Boreholes.

It should be noted that the groundwater could fluctuate seasonally and can be expected to be somewhat higher during the spring months and in response to major weather events.

C4.3 Subsurface Conditions - Culvert on Countryside Drive (Station 1+950)

Two (2) boreholes (BH C27 / S7 and S8) were drilled in the vicinity of the existing culvert over West Humber Tributary (Gore Road Tributary) at Station 1+950. Based on the soil conditions observed in the boreholes drilled for culvert, the subsurface profile consisted of fill soils (sand and gravel and silty clay / clayey silt fill) underlying the asphaltic concrete. Native silty sand / sandy silt till and/or silty clay / clayey silt till was encountered underlying the fill soils.

C4.3.1 Asphaltic Concrete

At Boreholes BH C27 / S7 and S8 locations, 130 mm and 140 mm thick asphaltic concrete, respectively, was encountered at the ground surface.

C4.3.2 Fill Soils

Fill soils were encountered below the asphaltic concrete and consisted of sand and gravel fill and silty clay / clayey silt fill, which extended to a depth of 2.2 m (Elevations 215.6 m and 217.3 m) below the existing ground surface.

The sand and gravel fill was brown in colour and contained trace to some silt. The silty clay / clayey silt fill, which was encountered below the sand and gravel fill, was dark grey and dark brown in colour and contained some sand, trace to some gravel and trace organics. SPT 'N' values measured within the fill soils ranged from 6 blows to 17 blows per 0.3 m. Water contents measured in the fill samples ranged from 4 % to 28 %.

C4.3.3 Silty Sand / Sandy Silt / Sand and Silt Till

An 0.8 m thick layer of native silty sand / sandy silt till was encountered underlying the fill soils up to a depth of 3.0 m (Elevation 216.6 m) below the existing ground surface in Borehole BH S8. The fill in borehole BH C27/S7 was underlain by sand and silt till with cobbles and boulders. Borehole BH C27/S7 was terminated in the granular till.

The silty sand / sandy silt / sand and silt till was brown in colour changing to grey with depth, and contained trace to some clay and trace gravel. Measured SPT 'N' values the granular till varied from 40 to over 50 blows per 0.3 m, indicating a dense to very dense condition. The water contents measured in the silty sand / sandy silt till sample were 9 to 26 %.

Gradation and Atterberg Limits tests were carried out in one (1) sample (BH C27 / S7 - SS4), the results of which are presented in Table C1.4 above and shown in the Records of Boreholes.

C4.3.4 Silty Clay / Clayey Silt Till

Native silty clay / clayey silt till was encountered underlying the sand and silt till in Borehole BH S8. The cohesive till was confirmed to the termination depth of 9.7 m (Elevations 209.9 m) below the existing ground surface.

The silty clay / clayey silt till was brown to grey in colour, and contained trace to some sand, trace gravel and cobbles / boulders. The SPT 'N' values measured within the silty clay / clayey silt till ranged between 31 blows and more than 50 blows per 0.3 m, implying hard consistency. Water contents measured in the silty clay / clayey silt till ranged from 9 % to 28 %.

C4.3.5 Groundwater Conditions

Upon completion, groundwater was encountered in Boreholes BH C27 / S7 and S8 at depths of 2.7 m and 2.4 m (Elevations 215.1 m and 217.1 m) below the existing ground surface, respectively.

Highest groundwater depth measured in monitoring well installed in BH C27 / S7 was about 1.7 m (Elevation 216.1 m) below ground surface. Groundwater measurements during drilling and in the monitoring well are summarized in Table C1.6 and shown on the Record of Boreholes.

It should be noted that the groundwater could fluctuate seasonally and can be expected to be somewhat higher during the spring months and in response to major weather events.

C4.4 DISCUSSIONS AND RECOMMENDATIONS FOR CULVERTS

The purpose of the geotechnical investigation was to obtain subsurface information and to provide geotechnical recommendations with respect to proposed culvert rehabilitation / extension.

Within the depths of the six boreholes drilled adjacent to the existing culvert locations, fill soils (sand and gravel and silty clay / clayey silt) were encountered to a depth of about 1.8 m to 2.2 m (Elevations 217.3 m and 211.0 m) below ground surface, overlying generally very stiff to hard and / or compact to very dense native till. The firm till soil were encountered only immediately below the fill soils.

The foundation type of existing culvert and details of the proposed rehabilitation / extension were not available at the time of preparation of this report. Accordingly, general considerations for the culverts are presented the following sections.

C4.4.1 Foundation

Based on the boreholes drilled at or in the vicinity of the culvert locations, values of geotechnical reaction at Serviceability Limit State (SLS) and the factored geotechnical resistance at Ultimate Limit State (ULS) are provided in Table C4.1 which may be used for design.

Table C4.1: Recommended ULS / SLS Bearing Values for Culvert Foundations

Borehole No.	Founding Stratum	Depth Below Existing Grade (m)	Elevation (m)	Geotechnical Reaction at SLS (kPa)	Factored Geotechnical Resistance at ULS ⁽¹⁾ (kPa)
DII	Fill	above 2.2 (±)	above 215.6 (±)	not recommended	not recommended
BH C27/S7	Dense sand and silt till / hard				
	silty clay / clayey silt till	below 2.2 (±)	below 215.6 (±)	200	300
	Fill	above 2.2 (±)	above 217.3 (±)	not recommended	not recommended
BH S8	Very dense silty sand / sandy silt				
	till / hard silty clay / clayey silt till	below 2.2 (±)	below 217.3 (±)	200	300
BH S9	Fill	above 2.1 (±)	above 212.2 (±)	not recommended	not recommended
DU 23	Hard silty clay / clayey silt till	below 2.1 (±)	below 212.2 (±)	200	300
	Fill	above 1.5 (±)	above 212.3 (±)	not recommended	not recommended
BH S10	Very stiff to hard silty clay /				
	clayey silt till	below 1.5 (±)	below 212.3 (±)	200	300
		above 2.2 (±)	above 211.0 (±)	not recommended	not recommended
BH S11	Fill				



Borehole No.	Founding Stratum	Depth Below Existing Grade (m)	Elevation (m)	Geotechnical Reaction at SLS (kPa)	Factored Geotechnical Resistance at ULS ⁽¹⁾ (kPa)
	Dense to very dense silty sand / sandy silt / sand and silt till / hard silty clay / clayey silt till	below 2.2 (±)	below 211.0 (±)	200	300
	Fill	above 2.2 (±)	above 211.0 (±)	not recommended	not recommended
BH S12	Compact to very dense silty sand / sandy silt / sand and silt till	below 2.2 (±)	below 211.0 (±)	200	300
Eng	ineered fill per OPSS.MUNI 1010 (i	150	225		

Notes: (1) A resistance factor of $\Phi = 0.5$ has been applied to the ULS values provided.

The geotechnical bearing values provided in Table C4.1 are intended to assess the feasibility and sizes of footings and are for vertical loads (no inclination) without load eccentricity. Under the SLS pressures, foundation settlements could be up to 25 mm (total) and 20 mm (differential). Detail foundation analysis should be carried out, if necessary, to confirm SLS/ULS and corresponding settlements.

The design frost depth penetration is 1.4 m. All foundations should be covered by at least 1.4 m deep soil or equivalent synthetic thermal insulation.

Highest groundwater level measured during geotechnical investigation in the boreholes / monitoring well at the culvert location (Sta. 0+350) was at about Elevation 212.1 m (1.4 m below ground), at culvert location (Sta. 0+700) was at about Elevation 212.9 m (0.9 m below ground) and at culvert location (Sta. 1+950) was at about Elevation 216.1 m (1.7 m below ground). As such, a minimum groundwater level at Elevations of 212 m, 213 m and 216 m, respectively, or the creek water levels, whichever is higher, should be considered for design.

If required, the regional high flood level of the creek may be used.

During construction, considerable dewatering efforts and / or creek diversion (e.g., cofferdam, sheetpiles) to control the ingress of creek water may be required. General recommendations related to excavation and dewatering are presented in Section C5.4.

C4.4.2 Soil Parameters for Design

The unfactored soil parameters listed in Table C4.2 may be used for design of earth structures. It should be noted that these parameters are based on published information and/or semi-empirical/theoretical relationships, and are conservative and should be verified by field/laboratory testing, if more representative parameters are required.



Table C4.2: Unfactored Static Soil Parameters for Design

Material	Total Stress Analysis Analysis Analysis		ess	Earth Pressure Coefficients ⁽¹⁾			Bulk Unit	Coefficient of Friction between	
wateriai	C (kPa)	Φ (deg)	c' (kPa)	Φ' (deg)	Active K _a	At- Rest K _o	Passive K _p	Weight (kN/m³)	Concrete and Soil
Dense to very dense silty sand / sandy silt till	0	35	0	35	0.27	0.43	3.7	20	0.4
Very stiff to hard silty clay / clayey silt till	100	0	0	30 ⁽²⁾	0.33	0.50	3.0	19	0.35
				Enginee	red Fill (3)				
Granular A (OPSS.MUNI 1010)	0	35	0	35	0.27	0.43	3.7	24 ⁽⁴⁾	0.4
Granular B Type I or Type II (OPSS.MUNI 1010)	0	32	0	32	0.31	0.47	3.3	23 ⁽⁴⁾	0.4

Notes: (1) Values based on semi-empirical relationships. For SLS, K_p values should be reduced to 1/3 of indicated value to limit lateral movement.

C4.4.3 Earthquake Considerations

Based on the soil conditions observed in the boreholes (maximum drill depth of 9.4 m below ground) and the possible bedrock depth at the culvert location (~30 m), and in conformance with the criteria in Table 4.1 (Section 4.4.3.2 – Seismic Properties) of the Canadian Highway Bridge Design Code CSA S6-19 ("CHBDC"), the project site may be classified as Site Class D ("stiff soil").

The design values of site coefficients F(T), F(PGA) and F(PGV) can be obtained from Geological Survey of Canada on Natural resources Canada website: 'www.earthquakecanada.ca" or Tables 4.2 to 4.9 (Section 4.4.3.3 – Site Coefficients) of CHBDC, and the design spectral acceleration, S (T), should be determined as per Section 4.4.3.4 (Design Spectral Acceleration and Displacement Values) and Tables 4.2 to 4.9 in Section 4.4.3.3 of CHBDC.

⁽²⁾ Normally-consolidated range.

⁽³⁾ All engineered fill should be compacted to at least 100 % SPMDD for supporting foundations.

⁽⁴⁾ Unit weight values for engineered fill compacted to 100 % SPMDD. For backfill of retaining walls, unit weights for Granular A and Granular B compacted to 95 % SPMDD may be taken as 22 kN/m3 and 21 kN/m3, respectively.

C4.4.4 Scour Protection

Culvert and headwall footings should be protected against scour and erosion in the form of cut-off walls, rip-rap or equivalent. Scour protection should be designed based on the hydrology requirement by an experienced engineer. Alternatively, the foundations could be placed below the depth of scour and frost penetration. If rip-rap protection is used, it should be separated from the native soils with a geotextile filter fabric (e.g. Terrafix 600R or equivalent) or a filter zone of granular material. The embankment slope surface should be covered with topsoil and seeded/sodded as soon as possible after completion of construction.

C4.4.5 Backfill for Culvert

Backfill materials around culverts should consist of non-frost susceptible, free-draining granular materials in accordance with OPSS.MUNI 1010 (i.e., Granular 'A' or Granular 'B'). Such granular backfill should be compacted to at least 95 % SPMDD (Standard Proctor Maximum Dry Density). Free-draining backfill materials and the drain pipes and weep holes, etc., should be used provided to prevent hydrostatic pressure build-up.

Backfill, backfill transition and cover for the culvert should conform to Ontario Provincial Standard Drawing (OPSD) 3101.150 (Walls, Abutment, Backfill, Minimum Granular Requirement) or applicable City Standard.

Engineered fill is discussed in Section C5.3, and excavation and dewatering during construction are discussed in Section C5.4.

To increase sliding resistance, a shear key may be used, if required. The shear key can be designed using the unfactored K_p values for the soils provided in Table C4.2. The movement of the retaining structure to mobilize the passive resistance should be considered in the design.

C4.4.6 Retaining Wall

If retaining walls are constructed at the ends of the culvert (inlet and outlet), they may be founded on the dense to very dense or the very stiff to hard till. If required, the wall may also be founded on the engineered fill per OPSS.MUNI 1010. The frost and scour protection recommendations provided in Sections C4.4.1 and C4.4.4, respectively should also be adhered to in designing retaining wall foundations.

Soft fill areas should be recompacted (if possible) or replaced with the engineered fill described in Section C5.3. The founding subgrade should be verified by a geotechnical engineer. The SLS/ULS values and soil parameters provided in Tables C4.1 and C4.2 may be used for design of wall foundations, as required. Slope stability analyses should be carried for the retaining wall, once the detailed design is completed.

C4.4.7 Permanent Slopes

A slope of 2H:1V (2 Horizontal: 1 Vertical) or flatter should be constructed for a permanent fill embankment. The embankment should be constructed using engineered fill (Section C5.3). Global slope stability should be analyzed during detailed design, if the new embankment height is higher than 2 m high, once the detailed design is finalized. All permanent slope surfaces should be protected against erosion by surface water and creek water.

Construction of the embankment should follow the requirements of OPSS.MUNI 206 (*Construction Specification for Grading*), or applicable City Standard.

C5.0 General Considerations for Design and Construction

C5.1 Site Preparation

Site preparation will likely generally include stripping of topsoil / asphalt / concrete, excavation to subgrade, proof-rolling, sub-excavating soft spots, if encountered, and backfilling, if necessary, with engineered fill.

All topsoil and loose soil or soil mixed with organic matter should be stripped from pavement areas, manhole / catch basin founding areas, and base of underground utility services. Subgrade preparation of pavement is discussed in Section C2.6.3. Any loose, soft or unstable areas in the exposed subgrade should be sub-excavated and replaced with approved fill and compacted (Section C5.3). Lean concrete may be used to backfill sub-excavated areas.

Excavation should be carried out with a temporary slope of 1H:1V or flatter above the groundwater level (Section C5.4). Roadway shoring protection systems may be required during construction of the culverts. Temporary shoring is discussed in Section C5.5.

C5.2 Embankment Widening

Based on site condition, the proposed road widening will generally involve fill sections along the investigation limits. The embankment required for road widening should be constructed with compacted engineered fill at 2H:1V (or flatter) side slopes. If a side slope steeper than 2H:1V slope is required or if the height of the embankment / cut slope is greater than 2 m, slope stability analysis should be carried out to assess stability of the planned slope, depending on the subsurface conditions. Where existing embankments are to be widened, the side slopes should be benched in accordance with OPSD 208.010 prior to placement of the widening fills. Final (permanent) embankment side slopes in granular fills should be established to match the existing slopes or as per OPSD 200.010. Final slopes should be treated with a seed and mulch to prevent ravelling.

Widening of the road will require, as a minimum, stripping the existing ground surface cover (topsoil, asphaltic concrete, vegetation cover, surficial fill soils, etc.) from the area required for road widening. The planned

. . .



widening will generally be constructed to the same elevation as the existing road surface. Grading, backfilling and compacting should follow OPSS.MUNI 206 (Construction Specification for Grading), OPSS.MUNI 401 (Construction Specification for Trenching, Backfilling and Compacting), OPSS 501.MUNI (Construction Specification for Compacting), and / or the City's requirements.

Backfilling, if required, for site grading (e.g., for subgrade raise, replacement of soft soil) should be placed as engineered fill. Engineered fill per OPSS.MUNI 1010 should be used to replace soft / incompetent soils and/or raising grade. Engineered fill should be prepared according to the City's standards / contract specifications. Engineered fill is discussed in Section C5.3.

The fill soils used for embankment widening should consist of approved clean fill (e.g., Select Subgrade Materials - OPSS 1010).

C5.3 Engineered Fill

Engineered fill per OPSS.MUNI 1010, where required, may be used to backfill excavated areas, backfill around manholes, replace soft/ incompetent soils, and / or raise grades. Engineered fill for backfill of excavated areas should be placed after stripping existing fill soils, any soils containing excessive organic matters and otherwise unsuitable soils.

Engineered fill can be prepared by placing fill soil and compacted as per OPSS.MUNI 501 (Construction Specification for Compacting) and/or applicable City Standard. Alternatively, engineered fill should be placed in loose layers not exceeding 200 mm. The water content of the fill should be within ± 2 % of its optimum moisture content (OMC) at the time of its placement, and it should be thoroughly compacted to a minimum of 98 % of Standard Proctor Maximum Dry Density (SPMDD) in general.

The fill soils should consist of inorganic soils and should not be frozen during backfilling and compaction. Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are necessary for the construction of a certifiable engineered fill. The compaction procedures and quality control should be overseen by a geotechnical engineer.

C5.4 Excavation and Dewatering

All excavations should be carried out in accordance with the latest Ontario's Occupational Health and Safety Act (OHSA) and Regulations for Construction Projects (O. Reg. 213/91). The soils to be excavated can be classified as follows:

Existing fill soils
Firm to hard silty clay / clayey silt till

Type 3
Type 1 to 3
(varies by consistency)





Dense to very dense silty sand / sandy silt till
(above groundwater level / fully dewatered)

Type 1

Dense to very dense silty sand / sandy silt till (below groundwater level)

Type 3

In accordance with the OHSA, a maximum short-term slope of 1H:1V is required to within 1.2 m of the trench bottom for temporary excavations in Type 1 and 2 cohesive till and native silty sand that is above the groundwater level, or properly dewatered. For Type 1 and 2 soils, a maximum depth of 1.2 m high vertical cut at the bottom of excavation may generally be constructed. However, under the groundwater table a 1.2 m high vertical cut may not be stable and flatter slopes may be required. Type 3 soils above the groundwater level may be inclined at 1H:1V or flatter from the bottom. In the case of saturated Type 3 fills or native granular deposits below the prevailing groundwater, if adequate dewatering is not implemented, slopes of open excavations will have to be reduced to 2H: 1V or flatter. In the absence of proper dewatering or groundwater control of Type 3 soils, slope flattening may be insufficient to prevent particularly saturated granular soils from becoming unstable and devolving to Type 4 materials. Near the ground surface, occasional 3H:1V or flatter slopes may be required due to loose/soft surficial soils. If open cut cannot be carried out, a temporary shoring system may be used to limit the extent of excavation. General consideration for temporary shoring is provided in Section C5.5.

Trenching should be carried out in accordance with OPSS.MUNI 401 (Construction Specification for Trenching, Backfilling and Compacting).

Stockpiles, materials or any heavy equipment should be kept at least the same horizontal distance as the depth of the excavation from the upper edge of the excavation to prevent slope instability. All surface drainage should be directed away from any open excavations and trenches.

Based on observations at the borehole locations and planned excavation depth, normal excavation equipment should be suitable for excavation. Hard till soils may require additional effort for excavation (e.g., heavy excavator, rippers, impact hammer, etc.). The terms describing the compactness (very loose, loose, compact, dense, very dense) or consistency (very soft, soft, firm, stiff, very stiff, hard) of soil strata give an indication of the effort needed for excavation. It should be noted that cobbles / boulders can be encountered in the till and in fill soils. Therefore, removal of the cobbles / boulders should be considered and planned for.

During the construction, temporary runoff controls such as sediment trap, interceptor drain, dyke and / or silt fence should be installed to prevent uncontrolled water / sediment flow into existing water courses. The effluent from dewatering operations should also be filtered or passed through sediment traps to prevent turbidity.

Based on the soil and groundwater conditions at the borehole locations, groundwater control within the excavated area should not be significant. In the clayey soils, groundwater seepage into the excavation, if encountered, is likely to be slow and a properly filtered sump and pump system or gravity drainage may be used for dewatering the excavation. High water flow rates (e.g. from perched water in fills or granular layers

. . .



with the cohesive tills) may be encountered during construction and the dewatering effort could require an increased number of sumps and pumps.

Use of lean concrete mud mat or granular layer may be warranted where founding surfaces are to be exposed for extended period, especially if the work is carried out during wet weather. Care should also be exercised to minimize disturbance to the final subgrade during excavation.

It is recommended that qualified geotechnical personnel be present during the foundation excavation to review the conditions of the foundation subgrade.

C5.5 Temporary shoring

Temporary shoring may be required for vertical excavation during construction of culvert, installation of underground utilities or roadway protection. This can be accomplished using soldier piles with lagging (or similar) in order to support the sides of the excavation. Temporary shoring design and construction should comply with OPSS.MUNI 539 (Construction Specification for Temporary Protection Systems), or applicable City Standard. The temporary shoring system should be designed to resist the lateral earth, surcharge and hydrostatic pressures which could occur during construction. Bracings should be installed within the shoring system to minimize movements of the soils. The temporary shoring system should be designed in accordance with the latest editions of Canadian Foundation Engineering Manual's (CFEM) and Canadian Highway Bridge Design Code (CHBDC), together with the requirements of the Ontario Health and Safety Regulations, as applicable.

The shoring system should be designed and approved by a professional engineer. Geotechnical parameters provided in Section C4.4.2 may be considered for design of shoring.

C5.6 Suitability of Existing Soils for Backfilling

Most of the excavated soils (i.e. granular fills, clayey fill and till soils) can be suitable for being reused for backfill, provided they can be separately stored, properly compacted and are environmentally acceptable. Fill soils containing construction debris (or similar) and organic matter should not be reused. Soils that are too wet to compact will require additional processing (e.g., drying). Cobbles and boulders (larger than 100 mm in size), if any, should be discarded by mechanical means (e.g., sieving) or manual removal.

C6.0 PRELIMINARY SOIL CHEMICAL ANALYSES

Environmental soil chemical analyses were carried out to provide preliminary discussions for soil disposal options as part of the Geotechnical Investigation Preliminary Design for the Site, the results of which are discussed in the following section.





No Phase I or Phase II Environmental Site Assessment (ESA) reports have been conducted or provided to Wood for review.

It is assumed that a Record of Site Condition, (RSC) as per Ontario Regulation 153/04 Records of Site Condition, Part XV.1 of the *Environmental Protection Act* (EPA), as amended ("O.Reg.153/04, as amended") is not required at this time.

C6.1 Methodology

The environmental soil screening and laboratory analyses program was carried out in general accordance with the current *Ontario Regulation 153/04 Records of Site Condition, Part XV.1 of the Environmental Protection Act (EPA)*, as amended (O. Reg. 153/04) in order to characterize the soil at the Site and to provide an initial discussion on disposal options for surplus material during future construction. It should be noted that the scope of work does not meet the analytical or administrative requirements of Ontario Regulation 406/19 On Site and Excess Soil Management (O. Reg. 406/19) in the event that the soil is to be considered for beneficial offsite reuse.

A Record of Site Condition (RSC) was not part of the scope of work. Due to the limited scope of work, further environmental assessment would be required in the event that an RSC is required.

C6.2 Sample Selection for Analyses

The environmental component of the preliminary subsurface investigation included the following activities:

- Conducting the soil sampling activities in accordance with the Ministry of the Environment (MOE) document entitled "Guide for Completing Phase Two Environmental Site Assessments under Ontario Regulation 153/04" dated June 2011, the Ministry of the Environment and Energy (MOEE) document entitled "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario", dated December 1996; and MOE document entitled "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" issued by the Laboratory Services Branch of the MOE and dated March 9, 2004, amended as of July 1, 2011 (Analytical Protocol);
- Based on City of Brampton instruction, submission of nine (9) soil samples for laboratory analysis of metals & inorganics, three (3) soil sample for analysis of petroleum hydrocarbons (PHC) F1 to F4, two (2) soil samples for analysis of volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs), and one (1) soil sample for analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX), to assist in determining appropriate soil disposal options, if required, during construction;
- Based on City of Brampton instruction, submission of one (1) soil sample for Ontario Regulation 347 (O. Reg. 347) as amended by Ontario Regulation 558/00 (O. Reg. 558/00) Toxicity Characteristic Leaching Procedure (TCLP) for volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs) and metals and inorganics to determine landfill acceptability of soil/granular fill originating from the Site; and
- Comparison of the laboratory analytical results to soil standards presented in the Ministry of the Environment, Conservation and Parks (MECP) document entitled "Soil, Ground Water and Sediment



. . .



Standards for Use Under Part XV.1 of the Environmental Protection Act," (the "MECP SCS") dated April 15, 2011 and O. Reg. 347, as amended by O. Reg. 558/00, Schedule 4 Leachate Quality Criteria provided in the MECP document entitled "Registration Guidance Manual For Generators of Liquid Industrial and Hazardous Waste," October 2000 (the "Schedule 4 Criteria").

C6.2.1 Site Condition Standards

All analytical soil results were compared to the MECP Table 1 (background) SCS for all types of Property Use (except Agricultural) (Table 1 SCS) and MECP Table 3 (generic) SCS for Industrial/Commercial/Community Property Use for Medium/Fine Textured Soils (Table 3 SCS).

The chemical analyses results were also evaluated against the following tables of Appendix 1 (Generic Excess Soil Quality Standards) of the new MECP O.Reg.406/19 "On-Site and Excess Soil Management," additional elements which are expected to come into force in January 2023:

- Table 1 Full Depth Background Site Condition Standards for all types of property use (except agricultural) (Table 1 Excess Soil Quality Standards); and
- Table 3.1 Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent, for industrial/commercial/community property use (Table 3.1 Excess Soil Quality Standards).

Furthermore, TCLP analyses results were also compared with Table 3.1 Leachate Screening Levels for Full Depth Excess Soil in a Non-Potable Ground Water condition, Volume Independent, Industrial/Commercial/Community Property Use, Appendix 2 - Generic Leachate Screening Levels for Excess Soil Reuse – of O.Reg.406/19.

C6.2.2 Soil Sampling, Inspection & Preservation Procedures

Soil samples were obtained for laboratory analysis and field screening, where applicable, using a drill rig equipped with split spoon sampling capabilities. The drillers cleaned the split spoon by removing loose dirt from the split spoon using a wire brush, washing the split spoon using a brush in a dilute mix of potable water and Alconox soap, rinsing the split spoon with distilled water and rinsing the split spoon with methanol and allowing the split spoon to air dry.

The drillers obtained the split spoon sample by auguring to the specified depth, hammering the spoon about 0.6 m into the soil and removing the spoon. The split spoon sample was inspected for visual and/or olfactory evidence of environmental impacts. Disposable nitrile gloves were used and replaced between the handling of successive samples.

The soil samples retrieved from the borehole investigations were examined, classified and logged according to soil type, moisture content, colour, consistency, and presence of visible indicators of environmental impact. Soil samples requiring vapour analysis were split into duplicate fractions upon recovery at the surface. The

• • •

primary sample fractions were placed in 120 and/or 250 millilitre (mL) sample jars with Teflon-lined lids and methanol preserved (cored) samples were placed in 40 mL vials and subsequently stored in coolers on ice for potential future laboratory analysis. The volatile sample fractions were placed in resealable plastic sample bags and stored at ambient temperature for subsequent field vapour screening. The samples were selected on the basis of visual/olfactory evidence of impacts, field screening results, or from the vicinity of the apparent water table.

Representative soil samples collected during the investigation were submitted to AGAT Laboratories (AGAT) of Mississauga, Ontario, for metals & inorganics, VOCs and PHC. AGAT is accredited by the Standards Council of Canada (SCC) and the Canadian Association for Laboratory Accreditation (CALA) in accordance with ISO/IEC 17025:2005 – "General Requirements for the Competence of Testing and Calibration Laboratories" for the tested parameters set out in the Soil, Ground Water and Sediment Standards.

C6.3 Environmental Test Results & Considerations

Wood conducted a preliminary Environmental Soil Quality Testing Program (the Investigation) as part of the Geotechnical Investigation. The details of the drilling program, including borehole locations and drilling methodology are presented in the geotechnical investigation sections of this report. Soil samples submitted for chemical analysis were collected from depths between 0.3 m and 3.9 m below ground surface (mbgs) based on presence of fill material and depth of construction works, as detailed in Table C6.1.

Table C6.1: Environmental Tests

Sample ID	Depth (m)	Parameters Tested
BH C1 SS4	2.3 – 3.9	Metals and Inorganics
BH C6 SS2	0.6 – 1.2	Metals and Inorganics
BH C12 SS2	0.6 – 1.2	Metals and Inorganics
BH C13 SS3	1.5 – 2.1	Metals and Inorganics
BH C17 SS1	0.3 – 0.9	Metals and Inorganics
BH C24 SS2	0.6 – 1.2	Metals and Inorganics
BH C25 SS3	1.5 – 2.1	Metals and Inorganics
BH C29 SS1	0.3 – 0.9	Metals and Inorganics, PHCs, VOCs, PAHs
BH C33 SS1	0.3 – 0.9	PHCs, VOCs, PAHs
BH C37 SS1	0.3 – 0.9	Metals and Inorganics
BH S11 SS5	3.05 – 3.7	PHCs, BTEX

PHC = Petroleum Hydrocarbons

VOC = Volatile Organic Compounds

BTEX = Benzene, Toluene, Ethylbenzene, Xylenes

PAH = Polycyclic Aromatic Hydrocarbons



Wood observed fill material in all the boreholes. Headspace combustible organic vapour (COV) concentration measurements recorded in the soil samples were all non-detectable. Total organic vapour (TOV) concentration measurements recorded in the soil samples were all non-detectable.

No other evidence (i.e., visual/olfactory) of potential environmental impacts were observed in any of the soil samples collected from this project area.

The soil samples collected as part of this assessment that had Table 1 SCS exceedances are as follows:

- BH C6 SS2 for EC and SAR;
- BH C12 SS2 for EC and SAR;
- BH C13 SS3 for EC and SAR;
- BH C24 SS2 for EC and SAR;
- BH C25 SS3 and its field duplicate DUP for EC and SAR;
- BH C29 SS1 for EC and SAR; and
- BH C37 SS1 for EC and SAR.

The other analyzed soil samples had concentrations that met the Table 1 SCS for metals and inorganics, PHCs, VOCs, including BTEX, and PAHs.

The soil samples collected as part of this assessment that had Table 3 SCS exceedances are as follows:

- BH C6 SS2 for SAR;
- BH C12 SS2 for EC and SAR;
- BH C13 SS3 for EC;
- BH C25 SS3 and its field duplicate DUP for EC; and
- BH C29 SS1 for EC.

The other analyzed soil samples met had concentrations that met the Table 3 SCS for metals and inorganics, PHCs, VOCs, including BTEX, and PAHs.

When compared to the O. Reg. 406/19 Excess Soil Quality Standards Exceedances, the soil samples collected as part of this assessment that had Table 1 Excess Soil Quality Standards exceedances are as follows:

- BH C6 SS2 for EC and SAR;
- BH C12 SS2 for EC and SAR;
- BH C13 SS3 for EC and SAR;
- BH C24 SS2 for EC and SAR;
- BH C25 SS3 and its field duplicate DUP for EC and SAR;





- BH C29 SS1 for EC and SAR; and
- BH C37 SS1 for EC and SAR.

The other analyzed soil samples had concentrations that met the Table 1 Excess Soil Quality Standards for metals and inorganics, PHCs, VOCs, including BTEX, and PAHs.

The soil samples collected as part of this assessment that had Table 3.1 Excess Soil Quality Standards exceedances are as follows:

- BH C6 SS2 for SAR;
- BH C12 SS2 for EC and SAR;
- BH C13 SS3 for EC;
- BH C25 SS3 and its field duplicate DUP for EC; and
- BH C29 SS1 for EC.

The other analyzed soil samples had concentrations that met the Table 3.1 Excess Soil Quality Standards for metals and inorganics, PHCs, VOCs, including BTEX, and PAHs.

The TCLP analyses for the parameters tested indicated that dry soils (soils that would pass a slump test) would meet the Schedule 4 Leachate Quality Criteria.

Soil analytical results are shown in Tables 1C to 10C in Appendix C-C. The laboratory certificates of analysis for the bulk analysis and the certificates of analysis for the O. Reg. 347 TCLP analysis are included Appendix D.

C6.4 Quality Assurance / Quality Control

<u>Field Quality Control:</u> Field quality control was not performed for this segment and is discussed in separate reports being written as part of the Geotechnical Investigation.

<u>Laboratory Quality Control</u>: The 2011 Analytical Protocol provides requirements for sample handling and storage requirements, reporting requirements, analytical methods and QA/QC procedures for analytical parameters.

As per the 2011 Analytical Protocol, all samples/sample extracts were analyzed within their applicable hold times using approved analytical methods. The report limits were met for all samples and tested parameters. No tested parameter was present in a detectable concentration in any laboratory Method Blank and all laboratory surrogates, reference materials and replicate samples are considered acceptable.

SECTION D: CLARKWAY DRIVE (FROM CASTLEMORE ROAD TO MAYFIELD DRIVE, ~ 4.3 KM)

D1.0 OVERALL SUBSURFACE CONDITION

A total of fifty-four (54) boreholes (BH D1 to D58, excluding BH D14, D24, D30 and D42) were drilled to depths varying from 0.2 m to 5.2 m, for the proposed road reconstruction/widening and underground service installation, which included boreholes in the driving lanes, shoulders and auger holes in the ditches. Boreholes BH D14, D24, D30 and D42 could not be drilled due to presence of utilities in the shoulder/ditch areas. Four (4) boreholes (BH S13, S14, S15 and S16) were drilled to depths ranging between 9.3 m and 9.8 m at two culverts, which are planned to be rehabilitated / extended. The boreholes in the driving lanes and pavement shoulders were sampled via Standard Penetration Test (SPT), while recording 'N' Values. Thirteen (13) auger holes (without SPT) were carried out in the ditches to measure the topsoil thicknesses.

The stratigraphic units and groundwater conditions are discussed in the following sections. Additional information is provided in the Record of Boreholes. The following summary is to assist the designers of the project with an understanding of the possible soil conditions at the investigated road section. The soil and groundwater conditions might vary between and beyond the borehole locations.

D1.1 Topsoil

Topsoil thicknesses were also measured in the ditches beside the road at thirteen (13) locations, which varied from about 180 mm to 240 mm, with an average thickness of about 205 mm, as listed in Table D1.1.

Table D1.1: Topsoil Thickness Measurements

Borehole No.	Coordinates (U	TM, Zone 17T)	Topsoil Thickness
Borenole No.	Easting	Northing	(mm)
BH D4	606134	4850770	190
BH D10	605831	4851102	230
BH D12	605712	4851196	200
BH D16	605497	4851406	240
BH D20	605283	4851615	190
BH D22	605189	4851734	180
BH D26	604976	4851946	200
BH D28	604859	4852040	200
BH D34	604548	4852368	190
BH D40	604216	4852671	220



Borehole No.	Coordinates (U	Topsoil Thickness	
borenoie No.	Easting	Northing	(mm)
BH D46	603909	4853000	230
BH D52	603578	4853305	200
BH D58	603271	4853634	200

At Boreholes BH D2 and D29 locations, approximately 50 mm and 150 mm of topsoil was encountered at the surface, respectively.

D1.2 Asphaltic Concrete

At the location of Boreholes BH D1, D3, D5, D7, D9, D11, D13, D15, D17, D19, D21, D23, D25, D27, D31, D32, D33, D35, D37, D39, D40, D41, D43, D45, D47, D49, D51, D53, D55, D57 and S13 to S16, approximately 80 to 160 mm of asphaltic concrete was encountered at the pavement surface. A layer of 180 mm of concrete was encountered below the asphalt in Borehole BH D57.

D1.3 Granular Fill

Granular fill, ranging from 100 mm to 1290 mm in thickness, where fully penetrated, was encountered below the asphaltic concrete in all boreholes drilled through the pavement, except in Borehole BH D57. Borehole BH D21 was terminated in the granular fill. A 100 mm thick layer of granular fill was intercepted within the cohesive fill layer in Borehole D2 at a depth of 0.5 m.

Granular fill (sand and gravel) was also encountered at the surface in Boreholes BH D6, D8, D18, D36, D38, D44, D48, D50, D54 and D56, which extended to depths varying from of 0.1 m to 1.1 m (Elevations 205.5 m to 221.6 m) below the existing ground surface. Borehole D8, which was terminated in the granular fill.

The SPT 'N' values measured in the granular fill ranged from 9 blows to more the 50 blows per 0.3 m of penetration. The measured water contents in the granular fill samples varied from about 3 % to 11 %.

Two (2) gradation tests were carried out on the selected samples of granular fill, the results of which are presented in Table D1.2 and are also shown on the Record of Boreholes. Cobbles were enountered in the granular fill in Boreholes BH D8 and D21.

Table D1.2: Results of Grain Size Distribution Analysis (Granular Fill)

Dh.i		Deside	Electrica.	Grain	Size Dist	stribution (%)		
Borenoi No.	e Sample No.	Deptn (m)	Elevation (m)	Gravel	Cond	F	ines	Soil Classification
NO.	140.	(111)	(111)	Gravei	Sand	Silt	Clay	
BH D6	SS1A	0.0 - 0.6	206.1 - 205.5	36	49		15	SAND AND GRAVEL, some fines. Sample does not meet OPSS1010 Granular A or
BH D41	SS1A	0.1 - 0.2	213.8 - 213.7	35	50	13	2	B due to excessive fines content



The grain size distribution curves are presented on Figure B-D1 in Appendix B-D.

D1.4 Silty Clay / Clayey Silt Fill

Silty clay / clayey silt fill was encountered below the granular fill / topsoil / asphaltic concrete at all borehole locations, except at Boreholes BH D6, D8, D21, D31 and D39. Boreholes BH D8 and D21 were terminated within the granular fill. Where fully penetrated, the silty clay / clayey silt fill thickness ranged from about 0.3 to 3.1 m, and extended to depths varying from about 0.6 m to 4.1m (Elevations 203.7 m to 222.9 m) below the existing ground. Eleven boreholes (BH D9, D15, D18, D27, D29, D32, D33, D36, D38, D39 and D41) terminated within the silty clay / clayey silt fill at depths varying from about 1.5 m and 2.1 m below ground surface.

The silty clay / clayey silt fill was generally brown to dark grey in colour and contained trace to some sand, trace of gravel and organics. Cobbles were noted in the cohesive fill in Boreholes BH D9 and D13.

The SPT 'N' values measured in the silty clay / clayey silt fill ranged from 0 blows to 38 blows per 0.3 m of penetration. One zero blow count (i.e. penetration with spoon self-weight) was measured in BH D37. In the rest of the test, a minimum 'N' value of 5 blow per 0.3 m was observed. The measured water contents in the silty clay / clayey silt fill samples varied from about 6 % to 28 %.

D1.5 Sandy Silt Fill

Sandy silt fill was encountered below the granular fill at borehole locations BH D31 and D39. The sandy fill extended to a depth of 2.2 m (Elevation 207.8 m) below ground surface in Borehole BH D31. Borehole BH 39 was terminated within the sandy silt fill.

The sandy silt fill was generally dark brown / dark grey in colour and contained trace to some clay and trace of gravel. The SPT 'N' values measured in the sandy silt fill were all 9 blows per 0.3 m of penetration. Two water contents measured in the sandy silt fill samples were about 14 % and 23 %.

D1.6 Silty Clay / Clayey Silt Till

Native silty clay / clayey silt till was encountered below the fill soils in all boreholes that did not terminate within the fill soils, and were encountered at depths of about 0.6 m to 4.1 m (Elevations 203.7 m to 222.9 m) and extended to the termination depths of all boreholes, except Boreholes BH S13 and S14, where it was underlain by silty sand / sandy silt till (Section D1.7). The silty clay / clayey silt till was confirmed to a maximum termination depth at about 9.8 m (Elevation 203.3 m) below existing ground surface in BH S16. In the rest of the boreholes the silty clay / clayey silt till extended up to depths (including termination depths) of about 1.5 m to 9.4 m (Elevations 200.7 m to 221.6 m) below existing ground surface.

The clayey silt / silty clay till was brown to grey in color, and contained trace to some sand and trace amount of gravel. Cobbles/boulders were encountered in some of the boreholes at various depths. Due to the depositional history of glacial tills, the presence of cobbles and boulders should be anticipated throughout

. . .



the till deposit. Generally, the SPT 'N' values of the silty clay / clayey silt till ranged from 3 blows to greater than 50 blows per 0.3 m blows implying a soft to hard consistency overall. Generally, 'N' values were above 10 blows per 0.3 m, (stiff consistency).

The measured water contents of the silty clay / clayey silt till samples ranged from about 8 % to 22 %.

Gradation and Atterberg Limits tests were carried out on four (4) samples of the silty clay / clayey silt till, the results of which are presented in Table D1.3, and shown in the Records of Boreholes.

Table D1.3: Results of Grain Size Distribution Analysis and Atterberg Limit Tests (Silty Clay / Clayey Silt Till)

				Grair	Grain Size Distribution (%)			Attorborg Limit		USCS	
Borehole	Sample	Depth	Elevation		Fines		nes	All	Atterberg Limit		Modified
No.	No.	(m)	(m)	Gravel	Sand	Silt	Clay	Liquid Limit	Plastic Limit	Plasticity Index	Group Symbol
BH D19	SS 3	1.8	208.8	2	22	49	27	27	16	11	CL
BH D49	SS 5	3.3	217.5	2	19	48	31	29	17	12	CL
BH S13	SS 6	4.9	205.3	3	16	50	31	26	17	9	CL
BH S15	SS 7	4.8	207.9	6	31	46	17	18	13	5	CL-ML

The grain size distribution curves and plasticity chart are presented Figure Nos. B-D2 and B-D3 in Appendix B-D.

D1.7 Silty Sand / Sand and Silt Till

Native silty sand / sand and silt till were encountered in Borehole BH S13 and S14 below the silty clay / clayey silt till, and extended to the termination depth of the boreholes at about 9.3 m (Elevations 200.9 m and 200.7 m, respectively). The silty sand / sand and silt till was grey in color, contained trace clay and trace gravel and cobbles / boulders. SPT 'N' values measured in the silty sand / sand and silt till varied from 9 blows to 50 blows per 0.3 m indicating loose to very dense compactness. Water contents measured in silty sand / sand and silt till samples varied from 13 % to 21 %.

Gradation and Atterberg Limit tests were carried out in one sample (SS 8) from Borehole BH S14, the results of which are presented in Table D1.4, and also shown in the Records of Boreholes.

Table D1.4: Results of Grain Size Distribution Analysis and Atterberg Limit Tests (Sand and Silt Till)

		Dont		Gra	ain Size I	Distribut	ion	Atterberg Limit		mit	USCS
Borehole	Sample	Dept	Elevation	Gravel	Sand	Fir	nes	Atterberg Limit		Modified	
No.	No.	n (m)	(m)	Gravei	Sand	Silt	Clay	Liquid	Liquid Plastic Plasticity Limit Limit Index		Group
		(III)			(%	6)		Limit			Symbol
BH S14	SS 8	7.9	202.0	-	51	47	2	Non-plastic		SM	

Wood Reference: TP115086 | 8/15/20225/2/2022

Page 133 of 201



The grain size distribution curve is presented in Figure No. B-D4 in Appendix B-D.

D1.8 Groundwater

Upon completion, groundwater was encountered in Boreholes BH D3, D6 to D8, D15, D17 to D19, D21, D23, D25, D40 and S13 and S14 at depths of 0.6 to 4.6 m (Elevation 204.1 to 210.2.9 m) below the existing ground surface. Groundwater was not encountered in the remaining boreholes.

A monitoring well was installed at the locations of BH S13 and S16 at the culvert crossings. The groundwater depth measured in the boreholes (where groundwater was encountered) at the time of drilling or upon completion of drilling, and in subsequent measurements in the monitoring well are summarized in Table D1.5 and shown on the Record of Boreholes.

Groundwater Measurements Borehole No. During or Upon Completion of Drilling (m) In Monitoring Well (m) Date Depth **Elevation** Date Depth **Elevation** D3 18 Feb 2020 0.6 205.4 Not installed 18 Feb 2020 205.5 Not installed D6 0.6 D7 18 Feb 2020 1.8 204.1 Not installed D8 18 Feb 2020 0.6 205.0 Not installed Not installed D15 19 Feb 2020 0.9 208.6 1 Apr 2020 Not installed D17 4.6 205.9 1 Apr 2020 1.2 208.9 Not installed D18 19 Feb 2020 Not installed D19 1.2 209.4 19 Feb 2020 Not installed D21 1.2 207.8 Not installed 19 Feb 2020 1.2 208.0 D23 24 Feb 2020 1.2 Not installed D25 207.9 13 Feb 2020 Not installed D40 2.7 210.2 **BH S13** 25 Feb 2020 4.3 1.4 205.9 12 May 2020 208.8 BH S14 25 Feb 2020 4.1 205.9 Not installed BH S16 24 Feb 2020 12 May 2020 3.2 209.9 Not encountered

Table D1.5: Results of Groundwater Depth Measurements

It should be noted that the groundwater at the site would fluctuate seasonally and can be expected to be somewhat higher during the spring months, and in response to major weather events.

D1.9 Soil Corrosivity

Three (2) soil samples were submitted for corrosion analysis to determine the corrosive potential of the soils with respect to buried metallic structures. The results of the analyses are presented Table D2.6, and the laboratory test certificate is included in Appendix D.

Table D2.6: Soil Corrosivity Test Results

Parameter	Units	BH D53 – SS4	BH S14 – SS5	BH S16 – SS5
Chloride	ug/g or (ppm)	660	107	242
Sulphate	ug/g or (ppm)	31	208	26
рН	pH Units	7.97	8.00	8.12
Electrical Conductivity	mS/cm	1.4	0.554	0.575
Resistivity	Ohm-cm	763	1810	1740

As per ASTM STP 1013 (Effects of Soil Characteristics on Corrosion – "chloride appears to be the main factor in increased soil corrosivity with levels in excess of 0.01 % (100 (μ g/g) considered indicative of accelerated corrosion". The chloride content measured in all three samples were more than 100 μ g/g. In accordance with Table 1 of CSA A23.1-14 and based on "structurally reinforced concrete exposed to chloride, with or without freezing and thawing" and based on project location, exposure class "C-1" can be used. Class should be based on structure location and/or durability requirement.

In accordance with Table 3 of CSA A23.1-14, no additional requirement is specified for sulphate content below 0.10 % (i.e. 1,000 ppm or μ g/g) below the "moderate degree of exposure" with respect to concrete. Therefore, in accordance with Table 6 of the Canadian Standards Association (CSA) Series A23.1-14, Type GU Portland cement can be used based on the water-soluble sulphate contents measured in soils.

As noted in ASTM -STP 1013 (*Effects of Soil Characteristics on Corrosion*), pH values between 4.0 and 8.5 has very little effect on corrosion (American Water Works Association (AWWA) Standard C 105-72 (Table 1 – Soil-Test Evaluation AWWA Rating).

The measured soil resistivity values below 1000 ohm-cm can be considered as "very high" and between 1000 ohm-cm and 2000 ohm-cm as "high" for exposed metallic structures, based on ASTM STP 1000, Corrosion Testing and Evaluation - Table 3 (Corrosivity for Uncoated Steel).

Protection against steel corrosion, where required, could include one or a combination of: adequate concrete cover, low-permeability concrete, corrosion inhibitors; coated reinforcing steel; clad reinforcing steel; and corrosion-resistant alloy reinforcement.

A corrosion specialist should be retained, if necessary, to review the analysis results and provide relevant recommendation.



D2.0 PAVEMENT INVESTIGATIONS AND DESIGN

The purpose of the pavement investigation was to obtain subsurface information and to provide geotechnical recommendations for widening of Clarkway Drive which is north / south oriented, and as per the City's road classification, it is designated as a minor arterial road. The total length of the investigated road section is about 4.3 km.

At the time of the investigation, the investigated Castlemore Road was a 2-lanes rural road that would be widened to 4-lanes; from Castlemore Road to E-W Arterial as rural for about 1.3 km, and urbanizing 3.0 km from E-W arterial and Mayfield Road with potential continuous centre turn lane. The discussions and recommendations in the following sections are general in nature as the details of the widening were not available at the time of this report.

The subsurface soil profile at the site consisted of surficial asphaltic concrete underlain by non-cohesive soil sand and gravel fill overlying silty clay fill, silty clay /clayey silt till which extended to the termination depths of the boreholes that ranged from 0.9 to 9.4 m.

All boreholes were open and dry upon completion to their respective vertical limits of investigation except in two boreholes (BH S13 and S14), where groundwater was encountered at depths of 4.3 m and 4.1 m, respectively, below ground surface.

The discussions and recommendations in the following sections are based on the subsurface information obtained from the boreholes and are intended for use by Design Engineers.

D2.1 Visual Pavement Condition Survey

On 10 August 2020, Wood carried out a visual pavement condition survey of the existing road surface within the project area to identify any distresses. A summary of the pavement condition survey, including predominant surface defects, surface deformation and cracking, is tabulated in Table D2.1 and copies of the Pavement Condition Survey Forms are included in Appendix A-D. Based on the pavement condition survey, the existing asphaltic concrete surface condition was rated Poor Condition from Castlemore Rd to Countryside Dr with some locations ranged from Fairly Good, Fair, Fairly Poor to Very Poor. The existing asphaltic concrete surface condition from Castlemore Rd to Countryside Dr ranged from Fair to Poor to Very Poor condition. The existing asphaltic concrete surface condition from Clarkway Drive from Countryside Dr to Mayfield Rd ranged from Very Poor to Poor condition with some locations ranged from Fair to Good.



Table D2.1: Existing Pavement Condition

Predominant Distress	2020 Condition Ra0ting
Clarkway Drive from Castlemore Rd to Countryside Dr ~3.1 km	(2 lanes)
300 m North of Castlemore Rd recently paved and rated Good Condition.	
 Ravelling & coarse aggregate loss – Moderate / Frequent. Wheel Track Rutting/Distortion – Slight / Intermittent. Longitudinal Cracking (single, multiple and alligator) – Moderate to Severe/ Frequent to Extensive. Centreline Cracking (single, multiple and alligator) – Moderate to Severe/ Frequent to Extensive. Pavement Edge Cracking – Moderate to Severe/ Frequent to Extensive. Transverse Cracking (single, multiple and alligator) – Moderate to Severe / Frequent to Extensive. 	Ranged from Fair to Poor to Very Poor Condition with some locations ranged from Fairly Poor to Good
Clarkway Drive from Countryside Dr to Mayfield Rd. ~ 1.2 km	(2 lanes)
Patched NBL North of Countryside from 50 – 100 m and from 125 – 150 m. Patched South of Mayfield Rd from 10 to 100 m.	
 Ravelling & coarse aggregate loss – Moderate / Intermittent. Wheel Track Rutting/Distortion – Moderate / Frew. Longitudinal Cracking (single, multiple and alligator) – Severe / Frequent. Centreline Cracking (single, multiple and alligator) – Moderate / Frequent. Pavement Edge Cracking - Severe/ Frequent. Transverse Cracking (single, multiple and alligator) – Moderate / Frequent. 	Ranged from Very Poor to Poor Condition with some locations ranged from Fair to Good

D2.2 Subsurface Conditions

A total of 58 boreholes were drilled along Clarkway Drive from Castlemore Road to Mayfield Road (approx. 4.3 km). Four (4) boreholes could not be drilled due to presence of underground utility along shoulder/ditch. The subsurface soil profile at the site consisted of surficial asphaltic concrete underlain by sand and gravel fill overlying silty clay fill, silty clay /clayey silt till which extended to the termination depths of the boreholes that different in depths that ranged from 0.9 to 9.4 m as detailed in the Record of Boreholes.

The driving lanes boreholes revealed that the asphaltic concrete thickness ranged from 85 mm to 160 mm with an average of 114 mm. Non-cohesive soil (sand and gravel fill) was encountered in all the boreholes underlying the existing asphaltic concrete that ranged in thickness from 100 mm to 1,410 mm, with an average of 544 mm. The shoulder boreholes revealed sand and gravel fill was encountered in all the boreholes that ranged in thickness from 100 mm to 1,250 mm, with an average of 512 mm. Two boreholes (BH D2 and D29) encountered topsoil ranged in depth from 50 mm - 150 mm. Another 2 boreholes (BH D32 and D40) encountered asphaltic concrete ranged in thickness from 110 mm – 150 mm.

Additional subsurface information is provided in Section D1.0 and in the Record of Boreholes.

D2.3 Groundwater Conditions

Groundwater was encountered in a number of boreholes during and on completion of drilling in the open boreholes at depths varying from 0.6 m to 4.6 m below ground, as listed in Table D1.4. It should be pointed out that the groundwater at the site would fluctuate seasonally and can be expected to be somewhat higher during the spring months and in response to major weather events.

D2.4 Pavement Design

The purpose of the geotechnical investigation was to obtain subsurface information and to provide geotechnical recommendations for road rehabilitation/re-surfacing and widening along Clarkway Drive.

The discussions and recommendations in the following sections are based on the available information and the subsurface information obtained from the boreholes and is intended for use by Design Engineers.

D2.4.1 Pavement Structure Adequacy

Two methods were used to assess the existing pavement structure. In-situ structure number ("SN") and insitu Granular Base Equivalency ("GBE") were estimated from the borehole data using the equivalency factors for various material types, as shown in Table D2.2.

Table D2.2: Summary of Typical Structural Layer Coefficient

Material Type	Typical AASHTO-Ont Layer Coefficient (SI	Granular base Equivalency	
Rehabilitation	Drainage	Structural	Factors
Existing HL Existing Gran Base Existing Gran Sub-base Existing Gran Base/Sub-base	Acceptable 1.0 Questionable 0.9 Inadequate 0.8 to 0.5	0.14 to 0.28 0.10 to 0.14 0.05 to 0.09	1.25 0.75 0.50 0.625
Pulverization	1.0	0.10 to 0.14	1.0
CIR	1.0	0.28 to 0.38	1.6 – 1.8
RAP/Gran A blended stabilized with EAM	1.0	0.20 to 0.25	1.0

⁽¹⁾ MTO Report MI-183 -. MTO Report MI-183 "Adaptation and Verification of AASHTO Pavement Design Parameters for Ontario Conditions" - Table 4-5.

Table D2.3 summarises the total average pavement structural thickness of the existing asphaltic concrete pavement, granular base and sub-base, as well as the average existing Structure Number 'SN' and 'GBE' before rehabilitation.



Table D2.3: Summary of Existing Pavement Structure

No of Boreholes	Average Thickness (mm)		SN ⁽¹⁾	GBE	Predominant Subgrade	
	НМА	HMA Base/Subbase		nm)		
# of BHs @ MDL/EP= 28						
(D1, D3, D5, D7, D9, D11, D13, D15, D17, D19, D21, D23, D25, D27, D31, D33, D35, D37, D39, D41, D43, D45, D47, D49, D51, D53, D55, D57)	Range (85-160) mm Av. 114 mm	Range (100-1,410) mm Av. 544 mm	Range (25-165) mm Av. 75 mm	Range (188-994) mm Av. 482 mm	Si(y) Cl Fill	
# of BHs @ SHR/TOR= 14 (D2, D6, D8, D18, D29, D32, D36, D38, D40, D44, D48, D50, D54, D56)	HMA@ BHs (D32, D40) (110-150) mm Tps @ BHs (D2, D29) (50-150) mm	Range (100-1,250) mm Av. 512 mm	-	-	Si(y) CI/CI(y) Si Till	

Notes:

- Existing SN calculation s the following parameters were used:
 - Existing HMA coefficient, = 0.14
 - Existing granular base/subbase coefficient, and concrete = 0.12/0.9

D2.4.2 Existing and Forecasted Traffic Data

The traffic data represented as Average Annual Daily Traffic (AADT₂₀₂₀) in both directions was estimated by Wood Traffic Group as presented in Table D2.4. This traffic data was used to projected traffic data for 20 years design life. Equivalent single axle loads (ESALs) were calculated cumulatively over 20 years as described in the Ministry of Transportation Report "Procedures for Estimating Traffic Loads for Pavement Design, 1995".

Table D2.4: Traffic Data along Clarkway Drive

AADT in Both Directions 2020 ⁽¹⁾	Growth Rate (%)	Comm. Vehicles (%)	Design ESALs @ 20 Years	Traffic Category				
Clarkway Drive from Castlemore Rd to E-W Arterial ~1.3 km (Rural)								
3,620	2.0%	6.0%	1,464,641 ~ 1.5 x 10 ⁶	Category B				
Clarkway Drive from E-W Arterial to Mayfield Road. ~ 3.0 km (Urban)								
2,360	2.0%	6.0%	725,132 ~ 0.75 x 10 ⁶	Category B				

^{(1) 2020} is the anticipated construction year.

D2.4.3 Flexible Structural Pavement Design for Widening

After reviewing the field data and laboratory test results, the minimum pavement structural design for the widening of Clarkway Drive is presented in Table D2.5 and was determined in accordance with the 1993 American Association of State Highway and Transportation Officials ('AASHTO') Guide for the Design of Pavement Structures using the Darwin Software Program.

The AASHTO Pavement Design is considered to be a function of estimated future traffic in both directions (ESALs), reliability (R), which is a function of road classification, overall standard deviation (S_o), resilient modulus (M_r), as well as initial and terminal serviceability (P_o , P_t). From these parameters, the structure number (SN) is calculated. The SN is defined in the AASHTO Guide as a number, which provides a measure of the pavement strength and thickness needed to avoid overstressing the subgrade.

The following design parameters were chosen to calculate the required structure number for the design of flexible pavement using the AASHTO method, as described in the Ministry of Transportation Materials Information Report MI-183 "Adaptation and Verification of AASHTO Pavement Design Parameters for Ontario Conditions".

- Initial serviceability, $P_i = 4.5$; - Terminal serviceability, $P_t = 2.5$;

Terrimal serviceasinty,

- Reliability level, R = 90 percent;

- Overall standard of deviation, $S_o = 0.49$; - Subgrade Resilient Modulus, M_r (kPa) $M_r = 30,000$

Table D2.5: Recommended Minimum Structural Pavement Design

	AASHTO Design for 20 Years					Recommended HMA & PGAC		
			SN	NS	ss	Marshall		gory
ESALs	НМА	Gran A	Design SN Requirement	Selected SN	Total Pavement Thickness	HI 3 (HS) / HL 1 Surface Course	HL 8 (HS) / HDBC Binder Course	Traffic Category
Thickness (mm)								
Clarkway Drive from Castlemore Rd to E-W Arterial ~1.3 km (Rural) ESALs = 1.5 X 10 ⁶								
Clarkway Drive from E-W Arterial to Mayfield Road ~ 3.0 km (Urban) ESALs = 0.75 X 10 ⁶								
1.5 X 10 ⁶ 0.75 X 10 ⁶	135	Gran A = 400 mm or Gran A = 150 mm Gran B Type II = 250 mm	112	112.7	535	SP 50 mm	85 mm	В
	133	Gran A = 480 mm or Gran A = 130 mm Gran B Type II = 350 mm		123.9	615	PGAC 64-28	PGAC 58-28	



Notes:

- Pavement shall be placed over approved subgrade.
- Granular A and Granular B Type II: Compaction as per OPSS Form 1010 (100% SPMDD).

The City of Brampton minimum Pavement Structure is as follows (Arterial Road STD#208 - 2019):

- 50 mm HL3 Asphalt (High Stability or HL1)
- 85 mm HL8 Asphalt (100 mm for All New Subdivision Roads)

150 mm Granular "A" or 130 mm of 20 mm Crusher Run Limestone
 450 mm Granular "B" or 350 mm of 50 mm Crusher Run Limestone

The structure number (SN) of the City of Brampton design is 118.2 mm or by using Crusher Run Limestone SN = 123.9 mm

The City of Brampton pavement design standard was selected for the roadway widening since it provides better granular thickness in comparison to the AASHTO pavement structure design.

D2.4.4 Widening Clarkway Drive from Castlemore Drive to Mayfield Drive

Pavement recommendations for widening of Clarkway Drive are presented in Table D2.6, including hot mix type, lift thickness, and PGAC type making up the recommended asphalt thickness, as well as the traffic category, in accordance with OPSS 1151. The granular thicknesses of the widening given in the table is a minimum thickness and should match the adjacent existing pavement granular thickness to promote positive lateral drainage. Also, the thicknesses can be increased depending on grading requirements.

Table D2.6: Widening of Clarkway Drive

НМА	DCAC	Traffic	
Туре	Thickness (mm)	PGAC	Category
HL 3 (HS) / HL 1	50 mm	64-28	В
HL 8 (HS) /HDBC	85 mm	58-28	В
Granular Base 'A' or 20m Crusher Run	150 mm	-	-
Granular Subbase 'B' Modified or 50m Crusher Run or Limestone	450 mm	-	-
Total Pavement Structure	735 mm	-	-

The granular thicknesses of the widening given in the table is a minimum thickness and should be increased, as required, to match the adjacent existing pavement granular thickness to promote positive lateral drainage (refer to the Borehole Log Data). Also, the thicknesses can be increased depending on grading requirements.



Full depth excavation, as required and commencing from the existing edge of pavement, will be required to accommodate the proposed design thickness.

The excavated granular materials from the shoulder can be re-used as fill material for subgrade for the widening/embankment, provided it is not contaminated. New Granular B subbase should be added and compacted, followed by new Granular A base material. Both base and subbase can vary in thickness to match the adjacent existing pavement granular in order to promote positive lateral drainage. The Granular A base course should be compacted and overlain with 1 lift of HL 8 (HS) / HDBC binder course, and 1 lift of HL 3 (HS) or HL 1 surface course, as per Table D2.6. Installation of subdrain is recommended, if lateral drainage of the existing subgrade is not possible.

D2.5 Rehabilitation Strategies

The selected rehabilitation strategy was based on Wood's geotechnical/pavement investigation and analysis, including a visual pavement condition assessment, subgrade condition, and calculated ESALs. Consideration was also given to user delay, cost and/or disruption of traffic and an anticipated construction year of 2020. The proposed rehabilitation strategy is as follows:

In-Place Pulverization, Remixing & Resurfacing with 135 mm of HMA: This strategy involves pulverizing the existing asphalt concrete thickness into an equivalent depth of granular base material to a total depth of 240 mm. The resulting mixture of asphalt concrete and granular is then graded to cross fall, compacted and used as a base. The advantages of this option include the elimination of surface defects and reflection cracking and the reuse of the existing material efficiently. Typically, the GBE for bituminous crushed recovered material is in the order of 1.0. In-place pulverization should be graded and compacted and resurfaced with 135 mm of HMA. This option will raise the vertical profile by 135 mm and will provide 14 to 18 years of service life and average SN of 135 mm after resurfacing.

D2.6 Recommendations and Construction Features for Pavement

D2.6.1 Rehabilitation Strategies

In-Place Pulverization, Remixing & Resurfacing with 135 mm of HMA. This option will raise the existing vertical profile by 135 mm and will provide service life of 14-18 years.

D2.6.2 Widening of Coleraine Drive

Pavement recommendations for widening of Clarkway Drive are presented in Table D2.6 for new pavement structure, including hot mix type, lift thickness, and PGAC type making up the recommended asphalt thickness, as well as the traffic category, in accordance with OPSS 1151. The granular thicknesses of the widening given in the table is a minimum thickness and should match the adjacent existing pavement granular thickness to promote positive lateral drainage. Also, the thicknesses can be increased depending on grading requirements.

. . .



Full depth excavation, as necessary, and commencing from the existing edge of pavement, will be required to accommodate the proposed design thickness. The excavated granular materials from the shoulder can be re-used as fill material for subgrade for the widening/embankment, provided it is not contaminated. New Granular B Type II subbase should be added and compacted, followed by new Granular A base material. Both base and subbase can vary in thickness to match the adjacent existing pavement granular in order to promote positive lateral drainage. The Granular A base course should be compacted and overlaid with 1 lift of HL 8 (HS) /HDBC binder course, and 1 lift of HL 3 (HS) / HL 1 surface course, as per Table D2.6 Installation of subdrain is recommended, if lateral drainage of the existing subgrade is not possible.

D2.6.3 Subgrade / Road Base Preparation and Compaction

The pavement structural design recommended for roads is applicable, provided the subgrade is prepared under dry weather conditions, proof-rolled with a heavy rubber-tired vehicle (such as a grader or loaded dump truck) in the presence of the geotechnical consultant. Any loose, soft or unstable areas, if detected during proof-rolling, must be sub-excavated, replaced with approved granular materials and compacted. Any additional engineered fill, if required, should be placed in thin layers not exceeding 200 mm and compacted to a minimum of 98 % of Standard Proctor Maximum Dry Density (SPMDD). Granular materials should be placed in thin layers not exceeding approximately 200 mm, within ± 2 % of its optimum moisture content, and thoroughly compacted to a minimum of 100 % of SPMDD.

The subgrade should be provided with adequate drainage. If wet weather conditions prevail at the time of construction, adjustments to this design may be required, i.e. if the subgrade becomes excessively wet or rutted during construction activities, additional sub-base material may be required. The need for additional sub-base material is best determined during construction.

All granular base and sub-base materials must be compacted to at least 100% of SPMDD.

D2.6.4 Stripping and Sub-Excavation

No additional sub-excavation, other than removal of organics and topsoil (ranging in thickness from 50 mm to 240 mm), are anticipated within the widening limits. However, any unsuitable soft or saturated material should be removed. Deeper stripping depths may be required, depending on the actual site conditions between borehole locations.

D2.6.5 Drainage

Prior to completing the rehabilitation, it is recommended that adequate drainage be provided both laterally and longitudinally along the length of the project.



To meet the design requirements for the pavement life, the road subgrade and granular courses should be well drained at all times. This can be accomplished by ensuring proper grading of the subgrade and positive lateral drainage of the granular base daylighting at the ditch. Alternatively, full-length perforated subdrain pipes of 150 mm diameter should be installed along both sides of the road, below the roadbed level, to ensure effective drainage, in accordance with OPSD 216.021. The sub-drainpipes should be wrapped in suitable non-woven geotextile surrounded by a minimum drainage zone of 19 mm size clear stone of minimum 150 mm thickness. A minimum slope of 2 % should be maintained across the paved sections (finished road surface) to ensure proper surface drainage. New pavement should slope towards the gutter/ditch.

D2.6.6 Hot Mixes and PGAC Type

The following Marshall hot mixes should be used on Clarkway Drive:

• HL 3 (HS) / HL 1 surface course mix and HL 8 (HS) /HDBC binder course should be used to provide the roadway with high durability.

Material Specification should be as per OPSS 1150 Material Specification for Hot Mix Asphalt. For aggregates, the material specification should be as per OPSS.MUNI 1003.

Performance Graded Asphalt Cement ("PGAC") 64-28 should be used only for surface course and PG 58-28 for binder course. This PGAC should satisfy the requirements of MP1 of SHRP Specifications for Superpave.

<u>Recycled Materials:</u> The use of reclaimed asphalt pavement (RAP) is permitted in Marshall mixes. The percent of RAP for HL 8 and HL 3 should be as per OPSS.MUNI 1150.

RAP containing steel slag aggregates should not be allowed.

<u>Transition Treatments at Limits of Paving</u>: At the limits of the project, a butt joint with the existing pavement is recommended. The butt joint between successive lifts of hot mix should be staggered at a distance of not less than 5 m, in accordance with OPSS.PROV 313. It should be ensured that no joint location corresponds with a joint location in any other layer.

The transition treatment from earth cut to earth fill should be in accordance with OPSD 205.010.

<u>Tack Coat:</u> It is recommended that all milled surfaces, and binder course surfaces will be tack coated prior to top course asphalt, if exposed to extended traffic. Construction Specification should be as per OPSS Prov. 308, April 2007.



D2.6.7 In-Situ Compaction for Hot Mix

In all areas, asphaltic concrete should be compacted as per OPSS.MUNI 310, Table 10 (April 2011). It should be noted that the granular base and sub-base materials should be compacted to the City's standards or to minimum 100 % SPMDD.

<u>Field Quality Assurance:</u> Plate samples of loose hot mix should be obtained for each paving day, and extraction/gradation and full Marshall compliance testing should be carried out on these samples. The finished surface shall be true to required profile and cross-section within 6 mm from required elevations and thickness. The surface shall show no depressions or bumps exceeding 3 mm under a 3.0 m long straight edge, placed parallel to the road centre line.

D2.6.8 Frost Depth

A minimum depth of 1.4 m should be used for frost protection as per OPSD 3090.101.

D2.6.9 Detouring

No long-term detouring is planned. Therefore, no special treatment will be required.

D3.0 UNDERGROUND UTILITIES

The geotechnical investigation scope of work included obtaining subsurface conditions and providing recommendations for installation of proposed underground utility services. Accordingly, selected boreholes (i.e. alternating pavement boreholes) were deepened to a depth of 3 m to 5 m, as listed in Table 5.4. Information obtained from all relevant boreholes drilled along Clarkway Drive have been considered in this section, as applicable.

D3.1 Subsurface Conditions

A total of forty-one (41) boreholes (not including the thirteen augered boreholes for topsoil measurements) were drilled in driving lanes and shoulder areas of Clarkway Drive to depths varying from about 0.9 m to 9.8 m, for pavement investigation, underground utility installation and two structures (culverts). Borehole BH D8 was stopped at a depth of 0.9 m due to existing underground utility. The remaining boreholes were drilled to a minimum depth of about 1.5 m below ground level.

Overall, the project site along Clarkway Drive consisted of surficial cover (topsoil, asphaltic concrete, concrete and / or exposed granular fill) underlain by fill soils (granular and/or silty clay / clayey silt and/or sandy silt) overlying native silty clay / clayey silt till. Silty sand / sand and silt till was encountered at two borehole locations (BH S13 and S14), below the silty clay / clayey silt till. The fill soils extended to depths varying from



about 0.6 m to 4.1 m (Elevations 203.7 m to 222.9 m) below the existing ground surface. The native till soils (silty clay / clayey silt till and/or silty sand / sand and silt) were confirmed to a depth of up to 9.8 m (up to Elevation 200.7 m) below existing ground surface in the deeper boreholes at the structure locations.

Groundwater depths measured in the boreholes and monitoring wells varied from 0.6 m to 4.6 m (Elevations 204.1 m to 209.9 m) below ground surface.

Detailed subsurface and groundwater conditions are provided in Section D1.0.

D3.2 Discussions and Recommendations for Underground Utilities

As per information available, the planned Countryside Drive rehabilitation / widening within the project limits will include installation of underground utilities and associated manholes and catch basins. Details of the installation were not available at the time of this report. Existing utilities, if any, should be protected and taken into consideration for design and construction of the proposed underground utilities and road widening.

The ground (road) elevations within the project limits (based on borehole location) varied from about 205.6 m (at BH D1) to 223.6 m (at BH D57), with the overall the ground surface was sloping up from south (Castlemore Road) to north (Mayfield Road).

The recommendations and discussions for excavation and installation of underground utility services, and associated manholes / catch basins, are provided in the following sections.

D3.2.1 Founding Subgrade Conditions

From the investigation result, fill soils (granular and/or silty clay / clayey silt and/or sandy silt) were present to depths varying from 0.6 m to 4.1 m below existing ground / road level, which included granular fill to depths varying from 0.1 m to 1.3 m in some of the boreholes. The SPT values in the silty clay / clayey silt fill below the granular fill indicated a firm to hard. The granular fill was in loose to very dense condition overall, and was compact to compact to very dense generally.

The native tills soils (silty clay / clayey silt and silty sand / sand and silt) below the fill soils were of soft to hard consistency and / or loose to very dense overall, with the majority indicating stiff to hard consistency and compact to very dense compactness, and should be generally competent to support underground utility services.

It is recommended that the inverts of underground utilities be founded on native soils, or competent fill soil subgrade. Existing fills or soft soil encountered at the founding level should be compacted, if possible, or otherwise, should be sub-excavated and backfilled with compacted soil as recommended in Section D5.3 (Engineered Fill).



For manholes and catch basins founded on competent subgrade (i.e., approved existing fill, imported engineered fill, till soils), a Geotechnical Reaction at Serviceability Limit State (SLS) of 100 to 150 kPa and a factored Geotechnical Resistance at Ultimate Limit State (factored ULS) of 150 to 225 kPa, depending on the subgrade conditions, may be used, which should be verified by a geotechnical engineer during construction. Under the SLS bearing values, settlements of up to 25 mm may take place.

The frost penetration depth for the project area should be considered as 1.4 m.

The highest groundwater elevation measured during the investigation within the project limits of Clarkway Drive was about 1.2 m (Elevation 209.4 m) below ground surface in the monitoring well installed at the culvert location (BH D19). As such, groundwater may be present within the excavation depths for the underground utilities. Also, perched water in sandy / silty pockets and / or water from surface runoff will require dewatering during excavation. As the excavation will generally be in clayey soils, groundwater seepage, if any, into the excavation is likely to be slow and a properly filtered sump and pump system, or gravity drainage, may be used for dewatering excavation.

General discussions regarding excavation and dewatering are provided in Section D5.4. Detailed dewatering consideration for the project is included Wood's hydrogeological investigation report, which is submitted under a separate cover.

Trench excavation, pipe bedding and anti-seepage collar considerations are discussed in following sections.

General discussions provided in Section D5.0 should also be considered for design and construction.

D3.2.2 Trench Excavation

Trench excavation should be carried out as per the latest Ontario's Occupational Health and Safety Act (OHSA) and Regulations for Construction Projects. The soils classifications are shown in Section D5.4. Based on the soils encountered in the boreholes, the sides of excavations are expected to be temporarily stable at 1H:1V for Type 2 and Type 3 soils, provided excavations are properly dewatered and underground utilities are installed and backfilled within a reasonable short period of time. Provisions should be made for dewatering, as noted in Section D5.4. Trenching should be in accordance with OPSS.MUNI 401 (Construction Specification for Trenching, Backfilling and Compacting).

It is important for frost heave compatibility that the trench backfill within the frost zone of 1.4 m depth matches the soil exposed on the trench walls.

D3.2.3 Bedding

. . .

Bedding for underground pipes should be placed in accordance with the design requirements and current Ontario Provincial Standards (OPS) specifications (Ontario Provincial Standard Drawing (OPSD) 802.10 for flexible pipes and OPSD 802.30, 802.31 and 802.32 for rigid pipes). It is recommended that a minimum of



150 mm thick bedding material (Class 'B' Type or better) be placed below the pipe invert. The thickness of the bedding may, however, have to be increased depending on the pipe diameter, or if wet or weak subgrade conditions are encountered. If the subgrade is weak, it should be sub-excavated and replaced with engineered fill to support the pipes and allow the use of Class 'B' Type bedding. If weak subgrade is encountered and cannot totally be removed, Class 'A' Type bedding (e.g. minimum 100 mm thick lean concrete) should be used to provide a workable surface and support the proposed pipes.

For the areas to be filled, the fill soils should first be placed approximately to final grade and subsequently excavated to install the underground pipes in order to prevent pipe settlement due to overburden loads.

Should the pipes be installed in soft clay soils, the joints should be restrained from movements and the backfill around the pipes should be properly compacted in order to prevent long-term movements. A layer of geotextile (Terrafix 270R or equivalent) should be placed between the soft clayey soils and the granular bedding/backfill in order to prevent soil migration.

The possibility of pipe movements in soft clayey soils, after installation, should be considered in the design and construction of the underground pipes.

Construction of underground pipes should be carried out in accordance with the relevant OPSS.MUNI 410 (Construction Specification for Pipe Sewer Installation in Open Cut), or other relevant applicable municipal / regional standards.

D3.2.4 Backfill

Based on the visual and tactile examination of the soil samples, the on-site excavated granular / silty clay fill and till soils may be re-used as backfill in sewer trenches provided their moisture contents at the time of construction are at or near the optimum. Moisture conditioning of the sub-excavation soils may be required prior to reuse. The excavated cohesive fill should be carefully examined for organic content and moisture condition by qualified geotechnical personnel in order to confirm the need for moisture conditioning or its acceptability for use as backfill.

The backfill should be placed in maximum 200 mm thick layers at or near (± 2 %) optimum moisture content, and each layer should be compacted to at least 95 % Standard Proctor Maximum Dry Density (SPMDD).

Backfill around the manhole / catch basins should be brought up simultaneously on all sides and operation of heavy equipment near the walls should be restricted to minimize potential movement and/or damage.

Unsuitable material such as organic soils, boulders, cobbles, frozen soils, etc., should not be used for backfilling.



D3.2.5 Anti-Seepage Collars

From the borehole information underground utilities will likely be installed in clayey soil (silty clay fill, silty clay / clayey silt). As such, anti-seepage collars should not be required.

D4.0 CULVERTS ON CLARKWAY DRIVE (STATION 2+275 AND 3+325)

Two existing culverts (approximate Stations 2+275 and 3+325), located within the project limits on Clarkway Drive, are planned to be rehabilitated / extended to accommodate the proposed road widening. The geotechnical investigation consisted of drilling four (4) boreholes (BH S13 to S16) at the existing culvert locations (two boreholes at each culvert) to obtain subsurface and groundwater condition at the culvert locations. The boreholes were drilled to depths varying from about 9.3 m to 9.8 m (Elevations 207.5 m to 200.7 m) below the existing ground surface. The culvert and borehole locations are shown in Figure Nos. 4A to 4C.

Based on available information, the existing culvert at Station 3+325 is a concrete structure with a clear span of about 6.5 m, and is about 12 m long. Other information on the existing culverts and details of the proposed rehabilitations / extensions were not available at the time of preparation of this report.

The stratigraphic units and groundwater conditions for each culvert are discussed in the following sections and presented in the Record of Boreholes. The following summary is to assist the designers of the project with an understanding of the soil conditions encountered at the proposed culvert location. The soil and groundwater conditions might vary between and beyond the borehole locations.

D4.1 Subsurface Conditions - Culvert on Clarkway Drive (Station 2+275)

Two (2) boreholes (BH S13 and S14) were drilled at the vicinity of Culvert at Sta. 2+275. Based on the soil conditions observed in the boreholes drilled for culvert, the subsurface profile at the culvert location consisted of fill soils (sand and gravel, and silty clay / clayey silt), which were underlying the asphaltic concrete. Native silty clay / clayey silt till was encountered underlying the fill soils, and overlying silty sand / sand and silt till in both boreholes. The silty sand / sand and silt till was present to the termination depths of the boreholes.

D4.1.1 Asphaltic Concrete

Asphaltic concrete layers 80 mm and 90 mm thick were encountered at the surface of Boreholes BH S13 and S14, respectively.



D4.1.2 Fill Soils

Fill soils were encountered in both boreholes below the asphaltic concrete and consisted of sand and gravel fill and silty clay / clayey silt fill, which extended to a depth of 4.1 m (Elevations 206.1 m and 205.9 m) below the existing ground surface in Boreholes BH S13 and S14, respectively.

The sand and gravel fill was generally brown and contained trace to some silt. The silty clay / clayey silt fill, which was encountered below the sand and gravel fill, was brown to grey in colour and contained trace to some sand, trace to some gravel and traces of organics.

SPT 'N' values measured within the fill soils ranged from 6 to 67 blows per 0.3 m. Water contents measured in the fill samples ranged from 4 % to 15 % with the granular fill having an average water content of 4 %.

D4.1.3 Silty Clay / Clayey Silt Till

Native silty clay / clayey silt till was encountered underlying the fill soils and extended to depths of 5.6 m (Elevation 204.6 m) below ground surface at BH S13 and 7.2 m (Elevation 202.8 m) at BH S14.

The silty clay / clayey silt till was grey in colour, and contained trace to some sand and trace gravel. SPT 'N' values measured within the silty clay / clayey silt till ranged from 3 blows to 27 blows per 0.3 m, implying soft to very stiff consistency. Water contents measured in the silty clay /clayey silt till ranged between 12 % and 22 %.

Results of gradation and Atterberg Limit tests carried out a silty clay / clayey silt till sample are presented in Table D1.3, and shown on the Record of Borehole BH S13.

D4.1.4 Silty Sand / Sandy Silt Till

Native silty sand / sand and silt till was encountered underlying the silty clay / clayey silt till and extended to terminations depths of the boreholes at 9.3 m (Elevations 200.9 m and 200.7 m) below ground surface at BH S13 and BH S14, respectively.

The silty sand / sand and silt till was grey in colour, and contained trace clay and trace gravel. Cobbles and boulders were encountered in BH S13. SPT 'N' values measured within the silty sand / sand and silt till ranged from 9 blows to more than 50 blows per 0.3 m, implying loose to very dense condition. Water contents measured in the silty sand / sand and silt till ranged between 13 % and 21 %.

Results of gradation and Atterberg Limit tests carried out on one silty sand / sandy silt till samples are presented in Table D1.4, and shown on the Record of Borehole BH S14.



D4.1.5 Groundwater Conditions

Upon completion, groundwater was encountered in Boreholes BH S13 and S14 at depths of 4.3 m and 4.1 m (Elevation 205.9 m) below the existing ground surface, respectively.

One (1) monitoring well was installed in BH S13. Groundwater was measured at a depth of about 1.4 m (Elevation 208.8 m) in one subsequent measurement in the monitoring well. The groundwater measurements are summarized in Table D1.5 and shown on the Record of Boreholes.

It should be noted that the groundwater could fluctuate seasonally and can be expected to be somewhat higher during the spring months and in response to major weather events.

D4.2 Subsurface Conditions - Culvert on Clarkway Drive (Station 3+325)

Two (2) boreholes (BH S15 and S16) were drilled at the vicinity of Culvert at Sta. 3+325. Based on the soil conditions observed in the boreholes drilled for culvert, the subsurface profile at the culvert location consisted of fill soils (sand and gravel, and silty clay / clayey silt), which were underlying the asphaltic concrete. Native silty clay / clayey silt till was encountered underlying the fill soils, and extended to the termination depth of both boreholes.

D4.2.1 Asphaltic Concrete

Asphaltic concrete layers 100 mm and 90 mm thick were encountered at the surface of Boreholes BH S15 and S16, respectively.

D4.2.2 Fill Soils

Fill soils were encountered in both boreholes below the asphaltic concrete and consisted of sand and gravel fill and silty clay / clayey silt fill, which extended to a depth of 2.2 m (Elevations 210.5 m and 210.8 m) below the existing ground surface in Boreholes BH S15 and S16, respectively.

The sand and gravel fill was generally grey and contained trace to some silt. The silty clay / clayey silt fill, which was encountered below the sand and gravel fill, was brown to dark grey in colour and contained trace to some sand and trace to some gravel.

SPT 'N' values measured within the fill soils ranged from 8 to 37 blows per 0.3 m. Water contents measured in the fill samples ranged from 3 % to 24 %.



D4.2.2 Silty Clay / Clayey Silt Till

Native silty clay / clayey silt till was encountered underlying the fill soils and extended to the termination depths of the boreholes at 9.4 m (Elevation 203.2 m) below ground surface at BH S15 and 9.8 m (Elevation 203.3 m) at BH S14.

The silty clay / clayey silt till was brown to grey in colour, and contained trace to some sand, or was sandy, and trace gravel. Cobbles / boulders were encountered within the cohesive till in both boreholes. SPT 'N' values measured within the silty clay / clayey silt till ranged from 20 blows to more than 50 blows per 0.3 m, implying a very stiff to hard consistency. Water contents measured in the silty clay /clayey silt till ranged between 9 % and 22 %.

Results of gradation and Atterberg Limit tests carried out on one silty clay / clayey silt till samples are presented in Table D1.3, and shown on the Record of Borehole BH S15.

D4.2.3 Groundwater Conditions

Groundwater was not encountered upon completion of both Boreholes BH S15 and S16. One (1) monitoring well was installed in BH S16, at the location of the culvert crossing. Groundwater was measured at a depth of about 3.2 m (Elevation 209.9 m) in one subsequent measurement in the monitoring well. The groundwater measurements are summarized in Table D1.5 and shown on the Record of Boreholes.

It should be noted that the groundwater could fluctuate seasonally and can be expected to be somewhat higher during the spring months and in response to major weather events.

D4.3 DISCUSSIONS AND RECOMMENDATIONS FOR CULVERTS

The purpose of the geotechnical investigation was to obtain subsurface information and to provide geotechnical recommendations with respect to proposed culvert rehabilitation / extension.

Within the depths of the four boreholes drilled adjacent to the existing culvert location, fill soils (sand and gravel and silty clay / clayey silt) were encountered to a depth of about 2.2 m to 4.1 m (Elevations 210.8 m and 205.9 m) below ground surface, overlying soft to hard and / or loose to very dense till.

The foundation type of existing culvert and details of the proposed rehabilitation / extension were not available at the time of preparation of this report. Accordingly, general considerations for the culverts are presented the following sections.



D4.3.1 Foundation

Based on the boreholes drilled at or in the vicinity of the culvert locations, values of geotechnical reaction at Serviceability Limit State (SLS) and the factored geotechnical resistance at Ultimate Limit State (ULS) are provided in Table D4.1 which may be used for design.

Table D4.1: Recommended ULS / SLS Bearing Values for Culvert Foundations

Borehole No.	Depth Below Existing Elevation Grade (m) (m)		Geotechnical Reaction at SLS (kPa)	Factored Geotechnical Resistance at ULS ⁽¹⁾ (kPa)	
	Fill	above 4.1 (±)	above 206.1 (±)	not recommended	not recommended
BH S13	Very stiff silty clay till	4.1 to 5.6 (±)	206.1 to 204.6 (±)	100	150
BH S13	Very dense silty sand / sand and silt till	below 5.6 (±)	below 204.6 (±)	200	300
	Fill / soft silty clay / clayey silt till	above 6.1 (±)	above 204.0 (±)	not recommended	not recommended
BH S14	Stiff silty clay/clayey silt till / dense to very dense silty sand/sand and silt till	below 6.1 (±)	below 204.0 (±)	200	300
	Fill	above 2.2 (±)	above 210.5 (±)	not recommended	not recommended
BH S15	Very stiff to hard silty clay/clayey silt till	below 2.2 (±)	below 210.5 (±)	200	300
	Fill	above 2.2 (±)	above 210.8 (±)	not recommended	not recommended
BH S16	Very stiff to hard silty clay/clayey silt till	below 2.2 (±)	below 210.8 (±)	200	300
Eng	ineered fill per OPSS.MUNI 1010 (if	used), as per S	Section B5.3	150	225

Notes: (1) A resistance factor of $\Phi = 0.5$ has been applied to the ULS values provided.

The geotechnical bearing values provided in Table D4.1 are intended to assess the feasibility and sizes of footings and are for vertical loads (no inclination) without load eccentricity. Under the SLS pressures, foundation settlements could be up to 25 mm (total) and 20 mm (differential). Detail foundation analysis should be carried out, if necessary, to confirm SLS/ULS and corresponding settlements.

The design frost depth penetration is 1.4 m. All foundations should be covered by at least 1.4 m deep soil or equivalent synthetic thermal insulation.



Highest groundwater level measured during geotechnical investigation in the boreholes / monitoring well at the culvert location (Sta. 2+275) was at about Elevation 208.8 m (1.4 m below ground) and at culvert location (Sta. 3+325) was at about Elevation 209.9 m (3.2 m below ground). As such, a minimum groundwater level at Elevations of 209 m and 210 m, respectively, or the creek water levels, whichever is higher, should be considered for design. If required, the regional high flood level of the creek may be used.

During construction, considerable dewatering efforts and / or creek diversion (e.g., cofferdam, sheetpiles) to control the ingress of creek water may be required. General recommendations related to excavation and dewatering are presented in Section D5.4.

D4.3.2 Soil Parameters for Design

The unfactored soil parameters listed in Table D4.2 may be used for design of earth structures. It should be noted that these parameters are based on published information and/or semi-empirical/theoretical relationships, and are conservative and should be verified by field/laboratory testing, if more representative parameters are required.

Table D4.2: Unfactored Static Soil Parameters for Design

Material	Total Stress Analysis Analysis Effective Stress Analysis		ess		rth Pres pefficien		Bulk Unit	Coefficient of Friction between	
iviateriai	C (kPa)	Ф (deg)	c' (kPa)	Φ' (deg)	Active K _a	At- Rest K _o	Passive K _p	Weight (kN/m³)	Concrete and Soil
stiff to hard silty clay / clayey silt till	100	0	0	30 ⁽²⁾	0.33	0.50	3.0	19	0.35
Compact silty sand / sand and silt till	0	32	0	32	0.31	0.47	3.3	20	0.4
Dense to very dense silty sand / sand and silt till	0	35	0	35	0.27	0.43	3.7	20	0.4
			l	Enginee	red Fill (3)				
Granular A (OPSS.MUNI 1010)	0	35	0	35	0.27	0.43	3.7	24 ⁽⁴⁾	0.4
Granular B Type I or Type II (OPSS.MUNI 1010)	0	32	0	32	0.31	0.47	3.3	23 ⁽⁴⁾	0.4

Notes: (1) Values based on semi-empirical relationships. For SLS, K_p values should be reduced to 1/3 of indicated value to limit lateral movement.



- (2) Normally-consolidated range.
- $^{(3)}$ All engineered fill should be compacted to at least 100 % SPMDD for supporting foundations.
- (4) Unit weight values for engineered fill compacted to 100 % SPMDD. For backfill of retaining walls, unit weights for Granular A and Granular B compacted to 95 % SPMDD may be taken as 22 kN/m³ and 21 kN/m³, respectively.

D4.3.3 Earthquake Considerations

Based on the soil conditions observed in the boreholes (maximum drill depth of 9.4 m below ground) and the possible bedrock depth at the culvert location (~30 m), and in conformance with the criteria in Table 4.1 (Section 4.4.3.2 – Seismic Properties) of the Canadian Highway Bridge Design Code CSA S6-19 ("CHBDC"), the project site may be classified as Site Class D ("stiff soil").

The design values of site coefficients F(T), F(PGA) and F(PGV) can be obtained from Geological Survey of Canada on Natural resources Canada website: 'www.earthquakecanada.ca" or Tables 4.2 to 4.9 (Section 4.4.3.3 – Site Coefficients) of CHBDC, and the design spectral acceleration, S (T), should be determined as per Section 4.4.3.4 (Design Spectral Acceleration and Displacement Values) and Tables 4.2 to 4.9 in Section 4.4.3.3 of CHBDC.

D4.3.4 Scour Protection

Culvert and headwall footings should be protected against scour and erosion in the form of cut-off walls, rip-rap or equivalent. Scour protection should be designed based on the hydrology requirement by an experienced engineer. Alternatively, the foundations could be placed below the depth of scour and frost penetration. If rip-rap protection is used, it should be separated from the native soils with a geotextile filter fabric (e.g. Terrafix 600R or equivalent) or a filter zone of granular material. The embankment slope surface should be covered with topsoil and seeded/sodded as soon as possible after completion of construction.

D4.3.5 Backfill for Culvert

Backfill materials around culvert should consist of non-frost susceptible, free-draining granular materials in accordance with OPSS.MUNI 1010 (i.e., Granular 'A' or Granular 'B'). Such granular backfill should be compacted to at least 95 % SPMDD (Standard Proctor Maximum Dry Density). Free-draining backfill materials and the drain pipes and weep holes, etc., should be used provided to prevent hydrostatic pressure build-up.

Backfill, backfill transition and cover for the culvert should conform to Ontario Provincial Standard Drawing (OPSD) 3101.150 (Walls, Abutment, Backfill, Minimum Granular Requirement) or applicable City Standard.

Engineered fill is discussed in Section D5.3, and excavation and dewatering during construction are discussed in Section D5.4.



To increase sliding resistance, a shear key may be used, if required. The shear key can be designed using the unfactored K_p values for the soils provided in Table D4.2. The movement of the retaining structure to mobilize the passive resistance should be considered in the design.

D4.3.6 Retaining Walls

If retaining walls are constructed at the ends of the culvert (inlet and outlet), they may be founded on the stiff to hard native silty clay till. If required, the wall may also be founded on the engineered fill per OPSS.MUNI 1010. The frost and scour protection recommendations provided in Sections D4.3.1 and D4.3.4, respectively should also be adhered to in designing retaining wall foundations.

Soft fill areas should be recompacted (if possible) or replaced with the engineered fill described in Section D5.3. The founding subgrade should be verified by a geotechnical engineer. The SLS/ULS values and soil parameters provided in Tables D4.1 and D4.2 may be used for design of wall foundations, as required. Slope stability analyses should be carried for the retaining wall, once the detailed design is completed.

D4.3.7 Permanent Slopes

A slope of 2H:1V (2 Horizontal : 1 Vertical) or flatter should be constructed for permanent fill embankment. The embankment should be constructed using engineered fill (Section D5.3). Global slope stability should be analyzed during detailed design, if the new embankment height is higher than 2 m high, once the detailed design is finalized. All permanent slope surfaces should be protected against erosion by surface water and creek water.

Construction of the embankment should follow the requirements of OPSS.MUNI 206 (*Construction Specification for Grading*), or applicable City Standard.

D5.0 General Considerations for Design and Construction

D5.1 Site Preparation

Site preparation will likely generally include stripping of topsoil / asphalt / concrete, excavation to subgrade, proof-rolling, sub-excavating soft spots, if encountered, and backfilling, if necessary, with engineered fill.

All topsoil and loose soil or soil mixed with organic matter should be stripped from pavement areas, manhole / catch basin founding areas, and base of underground utility services. Subgrade preparation of pavement is discussed in Section D2.6.3. Any loose, soft or unstable areas in the exposed subgrade should be subexcavated and replaced with approved fill and compacted (Section D5.3). Lean concrete may be used to backfill sub-excavated areas.



Excavation should be carried out with a temporary slope of 1H:1V or flatter above the groundwater level (Section D5.4). Roadway shoring protection systems may be required during construction of the culverts. Temporary shoring is discussed in Section D5.5.

D5.2 Embankment Widening

Based on site condition, the proposed road widening will generally involve fill sections along the investigation limits. The embankment required for road widening should be constructed with compacted engineered fill at 2H:1V (or flatter) side slopes. If a side slope steeper than 2H:1V slope is required or if the height of the embankment / cut slope is greater than 2 m, slope stability analysis should be carried out to assess stability of the planned slope, depending on the subsurface conditions. Where existing embankments are to be widened, the side slopes should be benched in accordance with OPSD 208.010 prior to placement of the widening fills. Final (permanent) embankment side slopes in granular fills should be established to match the existing slopes or as per OPSD 200.010. Final slopes should be treated with a seed and mulch to prevent ravelling.

Widening of the road will require, as a minimum, stripping the existing ground surface cover (topsoil, asphaltic concrete, vegetation cover, surficial fill soils, etc.) from the area required for road widening. The planned widening will generally be constructed to the same elevation as the existing road surface. Grading, backfilling and compacting should follow OPSS.MUNI 206 (Construction Specification for Grading), OPSS.MUNI 401 (Construction Specification for Trenching, Backfilling and Compacting), OPSS 501.MUNI (Construction Specification for Compacting), and / or the City's requirements.

Backfilling, if required, for site grading (e.g., for subgrade raise, replacement of soft soil) should be placed as engineered fill. Engineered fill per OPSS.MUNI 1010 should be used to replace soft / incompetent soils and/or raising grade. Engineered fill should be prepared according to the City's standards / contract specifications. Engineered fill is discussed in Section D5.3.

The fill soils used for embankment widening should consist of approved clean fill (e.g., Select Subgrade Materials - OPSS 1010).

D5.3 Engineered Fill

Engineered fill per OPSS.MUNI 1010, where required, may be used to backfill excavated areas, backfill around manholes, replace soft/incompetent soils, and / or raise grades. Engineered fill for backfill of excavated areas should be placed after stripping existing fill soils, any soils containing excessive organic matters and otherwise unsuitable soils.

Engineered fill can be prepared by placing fill soil and compacted as per OPSS.MUNI 501 (Construction Specification for Compacting) and/or applicable City Standard. Alternatively, engineered fill should be placed in loose layers not exceeding 200 mm. The water content of the fill should be within ± 2 % of its optimum moisture content (OMC) at the time of its placement, and it should be thoroughly compacted to a minimum of 98% of Standard Proctor Maximum Dry Density (SPMDD) in general.

. . .



The fill soils should consist of inorganic soils and should not be frozen during backfilling and compaction. Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are necessary for the construction of a certifiable engineered fill. The compaction procedures and quality control should be overseen by a geotechnical engineer.

D5.4 Excavation and Dewatering

All excavations should be carried out in accordance with the latest Ontario's Occupational Health and Safety Act (OHSA) and Regulations for Construction Projects (O. Reg. 213/91). The soils to be excavated can be classified as follows:

Existing fill soils, Type 3

Loose silty sand / sand and silty (below groundwater level),

soft silty clay / clayey silt till

Type 4

Firm to hard silty clay / clayey silt till

Type 1 to 3

(varies by consistency)

Dense to very dense silty sand / sand and silt till

(above groundwater level / fully dewatered)

Dense to very dense silty sand / sand and silt till (below groundwater level)

Type 3

In accordance with the OHSA, a maximum short-term slope of 1H:1V is required to within 1.2 m of the trench bottom for temporary excavations in Type 1 and 2 cohesive till and native silty sand that is above the groundwater level, or properly dewatered. For Type 1 and 2 soils, a maximum depth of 1.2 m high vertical cut at the bottom of excavation may generally be constructed. However, under the groundwater table a 1.2 m high vertical cut may not be stable and flatter slopes may be required. Type 3 soils above the groundwater level may be inclined at 1H:1V or flatter from the bottom. In the case of saturated Type 3 fills or native granular deposits below the prevailing groundwater, if adequate dewatering is not implemented, slopes of open excavations will have to be reduced to 2H: 1V or flatter. In the absence of proper dewatering or groundwater control of Type 3 soils, slope flattening may be insufficient to prevent particularly saturated granular soils from becoming unstable and devolving to Type 4 materials, which requires 3H:1V or flatter slopes. Near the ground surface, occasional 3H:1V or flatter slopes may be required due to loose/soft surficial soils. If open cut cannot be carried out, a temporary shoring system may be used to limit the extent of excavation. General consideration for temporary shoring is provided in Section D5.5.

Trenching should be carried out in accordance with OPSS.MUNI 401 (Construction Specification for Trenching, Backfilling and Compacting).



Stockpiles, materials or any heavy equipment should be kept at least the same horizontal distance as the depth of the excavation from the upper edge of the excavation to prevent slope instability. All surface drainage should be directed away from any open excavations and trenches.

Based on observations at the borehole locations and planned excavation depth, normal excavation equipment should be suitable for excavation. Hard till soils may require additional effort for excavation (e.g., heavy excavator, rippers, impact hammer, etc.). The terms describing the compactness (very loose, loose, compact, dense, very dense) or consistency (very soft, soft, firm, stiff, very stiff, hard) of soil strata give an indication of the effort needed for excavation. It should be noted that cobbles / boulders can be encountered in the till and in fill soils. Therefore, removal of the cobbles / boulders should be considered and planned for.

During the construction, temporary runoff controls such as sediment trap, interceptor drain, dyke and / or silt fence should be installed to prevent uncontrolled water / sediment flow into existing water courses. The effluent from dewatering operations should also be filtered or passed through sediment traps to prevent turbidity.

Based on the soil and groundwater conditions at the borehole locations, groundwater control within the excavated area should not be significant. In the clayey soils, groundwater seepage into the excavation, if encountered, is likely to be slow and a properly filtered sump and pump system or gravity drainage may be used for dewatering the excavation. High water flow rates (e.g. from perched water in fills or granular layers with the cohesive tills) may be encountered during construction and the dewatering effort could require an increased number of sumps and pumps.

Use of lean concrete mud mat or granular layer may be warranted where founding surfaces are to be exposed for extended period, especially if the work is carried out during wet weather. Care should also be exercised to minimize disturbance to the final subgrade during excavation.

It is recommended that qualified geotechnical personnel be present during the foundation excavation to review the conditions of the foundation subgrade.

D5.5 Temporary shoring

Temporary shoring may be required for vertical excavation during construction of culvert, installation of underground utilities or roadway protection. This can be accomplished using soldier piles with lagging (or similar) in order to support the sides of the excavation. Temporary shoring design and construction should comply with OPSS.MUNI 539 (*Construction Specification for Temporary Protection Systems*), or applicable City Standard. The temporary shoring system should be designed to resist the lateral earth, surcharge and hydrostatic pressures which could occur during construction. Bracings should be installed within the shoring system to minimize movements of the soils. The temporary shoring system should be designed in accordance with the latest editions of Canadian Foundation Engineering Manual's (CFEM) and Canadian Highway Bridge



Design Code (CHBDC), together with the requirements of the Ontario Health and Safety Regulations, as applicable.

The shoring system should be designed and approved by a professional engineer. Geotechnical parameters provided in Section D4.3.2 may be considered for design of shoring.

D5.6 Suitability of Existing Soils for Backfilling

Most of the excavated soils (i.e. granular fills, clayey fill and till soils) can be suitable for being reused for backfill, provided they can be separately stored, properly compacted and are environmentally acceptable. Fill soils containing construction debris (or similar) and organic matter should not be reused. Soils that are too wet to compact will require additional processing (e.g., drying). Cobbles and boulders (larger than 100 mm in size), if any, should be discarded by mechanical means (e.g., sieving) or manual removal.

D6.0 PRELIMINARY SOIL CHEMICAL ANALYSES

Environmental soil chemical analyses were carried out to provide preliminary discussions for soil disposal options as part of the Geotechnical Investigation Preliminary Design for the Site, the results of which are discussed in the following section.

No Phase I or Phase II Environmental Site Assessment (ESA) reports have been conducted or provided to Wood for review.

It is assumed that a Record of Site Condition, (RSC) as per Ontario Regulation 153/04 Records of Site Condition, Part XV.1 of the *Environmental Protection Act* (EPA), as amended ("O.Reg.153/04, as amended") is not required at this time.

D6.1 Methodology

The environmental soil screening and laboratory analyses program was carried out in general accordance with the current *Ontario Regulation 153/04 Records of Site Condition, Part XV.1 of the Environmental Protection Act (EPA)*, as amended (O. Reg. 153/04) in order to characterize the soil at the Site and to provide an initial discussion on disposal options for surplus material during future construction. It should be noted that the scope of work does not meet the analytical or administrative requirements of Ontario Regulation 406/19 On Site and Excess Soil Management (O. Reg. 406/19) in the event that the soil is to be considered for beneficial reuse.

A Record of Site Condition (RSC) was not part of the scope of work. Due to the limited scope of work, further environmental assessment would be required in the event that an RSC is required.



D6.2 Sample Selection for Analyses

The environmental component of the subsurface investigation included the following activities:

- Conducting the soil sampling activities in accordance with the Ministry of the Environment (MOE) document entitled "Guide for Completing Phase Two Environmental Site Assessments under Ontario Regulation 153/04" dated June 2011, the Ministry of the Environment and Energy (MOEE) document entitled "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario", dated December 1996; and MOE document entitled "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" issued by the Laboratory Services Branch of the MOE and dated March 9, 2004, amended as of July 1, 2011 (Analytical Protocol);
- Based on City of Brampton instruction, submission of fourteen (14) soil samples for laboratory analysis of metals & inorganics, and one (1) soil sample for analysis of volatile organic compounds (VOCs), petroleum hydrocarbons (PHC) F1 to F4, and organochlorine (OC) pesticides to assist in determining appropriate soil disposal options, if required, during construction;
- Submission of one (1) soil sample for Ontario Regulation 347 (*O. Reg. 347*) as amended by Ontario Regulation 558/00 (*O. Reg. 558/00*) Toxicity Characteristic Leaching Procedure (TCLP) for VOCs, polychlorinated biphenyls (PCBs), OC pesticides and metals and inorganics to determine landfill acceptability of soil/granular fill originating from the Site; and
- Comparison of the laboratory analytical results to soil standards presented in the Ministry of the Environment, Conservation and Parks (MECP) document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act," (the "MECP SCS") dated April 15, 2011 and O. Reg. 347, as amended by O. Reg. 558/00, Schedule 4 Leachate Quality Criteria provided in the MECP document entitled "Registration Guidance Manual For Generators of Liquid Industrial and Hazardous Waste," October 2000 (the "Schedule 4 Criteria").

D6.2.1 Site Condition Standards

All analytical soil results were compared to the MECP Table 1 (background) SCS for all types of Property Use (except Agricultural) Residential/ Parkland /Institutional/Industrial/Commercial/Community Property Use (Table 1 SCS) and MECP Table 3 (generic) SCS for Industrial/Commercial/Community Property Use for Medium/Fine Textured Soils (Table 3 SCS).

The chemical analyses results were also evaluated against the following tables of Appendix 1 (Generic Excess Soil Quality Standards) of the new MECP O.Reg.406/19 "On-Site and Excess Soil Management," additional elements which are expected to come into force in January 2023:

• Table 1 Full Depth Background Site Condition Standards for all types of property use (except agricultural) (Table 1 Excess Soil Quality Standards); and



 Table 3.1 Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent, for industrial/commercial/community property use (Table 3.1 Excess Soil Quality Standards).

Furthermore, TCLP analyses results were also compared with Table 3.1 Leachate Screening Levels for Full Depth Excess Soil in a Non-Potable Ground Water condition, Volume Independent, Industrial/Commercial/Community Property Use, Appendix 2 - Generic Leachate Screening Levels for Excess Soil Reuse – of O.Reg.406/19.

D6.2.2 Soil Sampling, Inspection & Preservation Procedures

Soil samples were obtained for laboratory analysis and field screening, where applicable, using a drill rig equipped with split spoon sampling capabilities. The drillers cleaned the split spoon by removing loose dirt from the split spoon using a wire brush, washing the split spoon using a brush in a dilute mix of potable water and Alconox soap, rinsing the split spoon with distilled water and rinsing the split spoon with methanol and allowing the split spoon to air dry.

The drillers obtained the split spoon sample by auguring to the specified depth, hammering the spoon about 0.6 m into the soil and removing the spoon. The split spoon sample was inspected for visual and/or olfactory evidence of environmental impacts. Disposable nitrile gloves were used and replaced between the handling of successive samples.

The soil samples retrieved from the borehole investigations were examined, classified and logged according to soil type, moisture content, colour, consistency, and presence of visible indicators of environmental impact. Soil samples requiring vapour analysis were split into duplicate fractions upon recovery at the surface. The primary sample fractions were placed in 120 and/or 250 millilitre (mL) sample jars with Teflon-lined lids and methanol preserved (cored) samples were placed in 40 mL vials and subsequently stored in coolers on ice for potential future laboratory analysis. The volatile sample fractions were placed in resealable plastic sample bags and stored at ambient temperature for subsequent field vapour screening. The samples were selected on the basis of visual/olfactory evidence of impacts, field screening results, or from the vicinity of the apparent water table.

Representative soil samples collected during the investigation were submitted to AGAT Laboratories (AGAT) of Mississauga, Ontario, for metals & inorganics, VOCs and PHC. AGAT is accredited by the Standards Council of Canada (SCC) and the Canadian Association for Laboratory Accreditation (CALA) in accordance with ISO/IEC 17025:2005 – "General Requirements for the Competence of Testing and Calibration Laboratories" for the tested parameters set out in the Soil, Ground Water and Sediment Standards.

D6.3 Environmental Test Results & Considerations

Wood completed a preliminary Environmental Soil Quality Testing Program (the Investigation) as part of the Geotechnical Investigation. The details of the drilling program, including borehole locations and drilling



methodology are presented in the geotechnical investigation sections of this report. Soil samples submitted for chemical analysis were collected from depths between surface and 4.4 m below ground surface (mbgs) based on presence of fill material and depth of construction works, as detailed Table D6.1.

Table D6.1: Environmental Tests

Sample ID	Depth (m)	Parameters Tested
BH D5 SS6	3.8 – 4.4	Metals and Inorganics
BH D17 SS2	0.9 – 1.5	Metals and Inorganics, PHC, VOC, OC pesticides
BH D18 SS3	1.2 – 1.8	Metals and Inorganics
BH D25 SS3	1.5 – 2.1	Metals and Inorganics
BH D27 SS2	0.9 – 1.5	Metals and Inorganics
BH D31 SS3	1.6 – 2.0	Metals and Inorganics
BH D35 SS2	0.8 – 1.2	Metals and Inorganics
BH D37 SS4	2.3 – 2.7	Metals and Inorganics
BH D41 SS3	1.5 – 2.1	Metals and Inorganics
BH D44 SS1	Surface – 0.6	Metals and Inorganics
BH D47 SS4	2.3 – 2.7	Metals and Inorganics
BH D50 SS3	1.2 – 1.8	Metals and Inorganics
BH D55 SS2	0.8 – 1.2	Metals and Inorganics
BH D57 SS1	Surface – 0.5	Metals and Inorganics

PHC = Petroleum Hydrocarbons

VOC = Volatile Organic Compounds

OC = Organochlorine

Wood observed fill material in all the boreholes. Headspace combustible organic vapour (COV) concentration measurements recorded in the soil samples were ranging from non-detectable to 10 parts per million (ppm). Total organic vapour (TOV) concentration measurements recorded in the soil samples were ranging from non-detectable to 1 ppm.

No other evidence (i.e., visual/olfactory) of potential environmental impacts were observed in any of the soil samples collected from this project area.

The soil samples collected as part of this assessment that exceeded the Table 1 SCS are as follows:

- BH D5 SS6 for EC and SAR;
- BH D17 SS2 for EC and SAR:
- BH D18 SS3 for EC and SAR;
- BH D25 SS3 for EC and SAR;



- BH D27 SS2 for EC and SAR;
- BH D31 SS3 for EC and SAR;
- BH D35 SS2 for EC and SAR;
- BH D37 SS4 for EC and SAR;
- BH D41 SS3 for EC and SAR;
- BH D44 SS1 for EC and SAR;
- BH D47 SS4 for EC and SAR;
- BH D50 SS3 for EC and SAR;
- BH D55 SS2 for EC and SAR; and
- BH D57 SS1 for EC and SAR.

The remaining samples were below the Table 1 SCS for metals and inorganics, PHCs, VOCs, and OC pesticides.

The soil samples collected as part of this assessment that exceeded the Table 3 SCS are as follows:

- BH D5 SS6 for EC;
- BH D17 SS2 for EC;
- BH D25 SS3 for EC;
- BH D27 SS2 for EC;
- BH D35 SS2 for EC;
- BH D44 SS1 for EC and SAR;
- BH D47 SS4 for EC and SAR; and
- BH D50 SS3 for SAR.

The remaining samples were below the Table 3 SCS for metals and inorganics, PHCs, VOCs, and OC pesticides. When compared to the O. Reg. 406/19 Excess Soil Quality Standards Exceedances, the soil samples collected as part of this assessment that exceeded the Table 1 Excess Soil Quality Standards are as follows:

- BH D5 SS6 for EC and SAR:
- BH D17 SS2 for EC and SAR;
- BH D18 SS3 for EC and SAR;
- BH D25 SS3 for EC and SAR;
- BH D27 SS2 for EC and SAR;
- BH D31 SS3 for EC and SAR;

BH D35 SS2 for EC and SAR;

- BH D37 SS4 for EC and SAR;
- BH D41 SS3 for EC and SAR;



- BH D44 SS1 for EC and SAR;
- BH D47 SS4 for EC and SAR;
- BH D50 SS3 for EC and SAR;
- BH D55 SS2 for EC and SAR; and
- BH D57 SS1 for EC and SAR.

The other analyzed soil samples were below the Table 1 Excess Soil Quality Standards for metals and inorganics, PHCs, VOCs, and OC pesticides.

The soil samples collected as part of this assessment that exceeded the Table 3.1 Excess Soil Quality Standards are as follows:

- BH D5 SS6 for EC;
- BH D17 SS2 for EC;
- BH D25 SS3 for EC;
- BH D27 SS2 for EC;
- BH D35 SS2 for EC;
- BH D44 SS1 for EC and SAR;
- BH D47 SS4 for EC and SAR; and
- BH D50 SS3 for SAR.

The other analyzed soil samples were below the Table 3.1 Excess Soil Quality Standards for metals and inorganics, PHCs, VOCs, and OC pesticides.

It should be noted that EC and SAR are commonly associated with road salt used for de-icing activities along roads and highways.

The QP has determined that the EC and SAR exceedances in soil are likely attributed to the de-icing salt which has been applied to surfaces at the Site for the safety of vehicular and pedestrian traffic under conditions of snow or ice or both and, therefore, the exceedances are exempt in accordance with Section 49.1(1) of O.Reg.153/04. However, the presence of EC/SAR exceedances in soils would still provide an excess soils management concern, since any excess soil generated at the Site will require disposal at an appropriate disposal or soil treatment facility that can accept soils with concentrations of the contaminants, including EC/SAR, above the Table 1 SCS.

The TCLP analyses for the parameters tested indicated that dry soils (soils that would pass a slump test) would meet the Schedule 4 Leachate Quality Criteria.



Soil analytical results are shown in Tables 1D to 10D in Appendix C-D. The laboratory certificates of analysis for the bulk analysis and the certificates of analysis for the O. Reg. 347 TCLP analysis are included in Appendix D.

D6.4 Quality Assurance / Quality Control

<u>Field Quality Control:</u> Field quality control was not performed for this segment and is discussed in separate reports being written as part of the Geotechnical Investigation.

<u>Laboratory Quality Control</u>: The 2011 Analytical Protocol provides requirements for sample handling and storage requirements, reporting requirements, analytical methods and QA/QC procedures for analytical parameters.

As per the 2011 Analytical Protocol, all samples/sample extracts were analyzed within their applicable hold times using approved analytical methods. The report limits were met for all samples and tested parameters. No tested parameter was present in a detectable concentration in any laboratory Method Blank and all laboratory surrogates, reference materials and replicate samples are considered acceptable.

SECTION E: EAST-WEST ARTERIAL (FROM THE GORE ROAD TO COLERAINE DRIVE, ~ 2.4 KM)

A total of eighteen (18) boreholes (BH E1 to BH E6/S18, BH E7, BH E23 to BH E32, and BH S17)) were drilled in vacant lands to depths varying from 2.1 m to 9.3 m for the proposed new road, underground service installation and culvert construction. Planned Boreholes BH E8 to BH E22 have been deferred to the detail design stage, if needed, as discussed with and approved by the City. Boreholes BH E6 and BH S18 were combined to a single Borehole "BH E6 / S18" because of their close proximity. Two (2) boreholes (BH S17 and BHE6 / S18) were drilled to depths of 7.0 m and 9.3 m, respectively at one new proposed culvert location. The boreholes were sampled via Standard Penetration Test (SPT), while recording 'N' Values.

The stratigraphic units and groundwater conditions are discussed in the following sections. Additional information is provided in the Record of Boreholes. The following summary is to assist the designers of the project with an understanding of the possible soil conditions at the investigated road section. The soil and groundwater conditions might vary between and beyond the borehole locations.

E1.1 Topsoil

Topsoil was encountered at the ground surface at all eighteen (18) borehole locations. Topsoil thicknesses varied from about 76 mm to 100 mm, with an average thickness of about 83 mm, as listed in Table E1.1.

Table E1.1: Topsoil Thickness Measurements

Davahala Na	Coordinates (Topsoil Thickness	
Borehole No.	Easting	Northing	(mm)
BH E1	604583	4850435	100
BH E2	604641	4850507	76
BH E3	604703	4850585	76
BH E4	604766	4850663	76
BH E5	604828	4850742	100
BH S17	604874	4850797	100
BH E6 / S18	604885	4850810	76
BH E7	604955	4850896	76
BH E23	605606	4852284	76
BH E24	605614	4852383	76
BH E25	605628	4852476	76
BH E26	605650	4852571	76
BH E27	605680	4852668	100
BH E28	605714	4852764	100
BH E29	605743	4852863	76
BH E30	605749	4852965	76
BH E31	605728	4853064	76
BH E32	605683	4853156	76
	Average		83



E1.2 Silty Clay / Clayey Silt Fill

Silty clay / clayey silt fill was encountered below the topsoil at all the borehole locations except Borehole BH S17. The silty clay / clayey silt fill is likely reworked native soil and extended to a depth of about 0.7 m (Elevations 202.4 m to 214.3 m) below the existing ground.

The silty clay / clayey silt fill was generally brown to dark brown in colour and contained trace to some sand, trace gravel, trace rootlets and organics. Cobbles were noted in the fill in Boreholes BH E2, BH E6 / S18, BH E28 and BH E32.

The SPT 'N' values measured in the silty clay fill ranged from 3 blows to 12 blows per 0.3 m of penetration. The measured water contents in the silty clay fill samples varied from about 3 % to 36 %.

E1.3 Sandy Silt Fill

The sandy silt fill encountered below the topsoil at Borehole BH S17 extended to a depth of about 0.7 m (Elevation 201.9 m) below ground surface.

The sandy silt fill was generally dark brown / brown in colour and contained trace clay, trace gravel, trace cobbles, and trace organics. One SPT 'N' value measured in the sandy silt fill was 9 blows per 0.3 m of penetration, and one water content measured in the sandy silt fill sample was about 17 %.

E1.4 Silty Clay / Clayey Silt Till

Native silty clay / clayey silt till was encountered below the silty clay / clayey silt fills in all boreholes except Borehole BH E5 and BH S17, and extended to the termination of depths of all boreholes at about 2.1 m to 5.2 m (Elevations 199.4 m to 212.7 m) below existing ground surface, except BH E6 / S18 and BH E26. T

The silty clay / clayey silt till was brown to brownish grey to grey in color, and contained trace sand to sandy, trace gravel and oxidation stains. Cobbles/boulders were encountered in some boreholes at various depths. Approximately 100 mm of sandy seam with gravel was observed within the till at depth 4.6 m (Elevation 200.0 m) below grade in Borehole BH E2. Sandy / silty seams were also observed at a depth of 1.8 m below grade in BH E25 (Elevations 207.5 m).

SPT 'N' values within the silty clay / clayey silt till ranged from 7 blows to 49 blows per 0.3 m blows implying firm to hard consistency. Majority of the measured 'N' values implied stiff to very stiff consistency (10 blows to 29 blows per 0.3 m. The measured water contents of the silty clay / clayey silt till samples ranged from about 4 % to 25 %.

Gradation and Atterberg Limits tests were carried out on four (4) silty clay / clayey silt till samples, the results of which are presented in Table E1.2, and shown in the Records of Boreholes.

Table E1.2: Results of Grain Size Distribution Analysis and Atterberg Limit Tests (Silty Clay / Clayey Silt Till)

				Grain Size Distribution (%)		n (%)	Λ.4.4	USCS			
Borehole	Sample	Depth	Elevation			Fir	nes	Att	mit	Modified	
No.	No.	(m)	(m)	Gravel	Sand	Silt	Clay	Liquid Limit	Plastic Limit	Plasticity Index	Group Symbol
BH E3	SS 3	1.8	204.1	1	22	50	27	29	18	11	CL
BH E7	SS 3	1.8	203.1	5	17	46	32	32	17	15	CI
BH E23	SS 3	1.8	208.9	1	28	51	20	25	15	10	CL
BH E30	SS 6	4.1	210.3	1	24	52	23	24	13	11	CL

The grain size distribution curves and the plasticity chart are presented Figure Nos. B-E1 and B-E2 in Appendix B-E.

E1.5 Silty Sand / Sandy Silt Till

Native silty sand / sandy silt till was encountered below the fill soils in Boreholes BH E5 and BH S17, and below the silty clay / clayey silt till in Boreholes BH E6 / S18 and BH E26, and extended to the depth varying from 2.1 m to 8.5 m (Elevations 201.1 m and 196.3 m, respectively). Boreholes BH E5 and BH E26 were terminated within the silty sand / sandy silt till deposit at depths 2.1 m and 5.2 m below grade, respectively.

The silty sand / sandy silt till was brown to grey in color, and contained trace clay, trace gravel, and oxidation stains. Cobbles / boulders were observed at various depths within the silty sand / sandy silt till. Clay seams were observed within the till in Boreholes BH E5 and BH E26.

SPT 'N' values measured in the silty sand / sandy silt till varied from 6 blows to more than 50 blows per 0.3 m indicating loose to very dense compactness. The 'N' values were all above 37 blows (dense to very dense), except immediately below fill soil in Borehole BH E5. Water contents measured in the silty sand / sandy silt till samples varied from 7 % to 21 %.

Gradation and Atterberg Limit tests were carried out in two silty sand / sandy silt till samples, the results of which are presented in Table E1.3, and also shown on the Records of Boreholes.

Table E1.3: Results of Grain Size Distribution Analysis and Atterberg Limit Tests (Silty Sand / Sandy Silt Till)

		Danis		Grain Size Distribution (%)		_	USCS				
Borehole	Sample	Dept	Elevation		Fines		Fines Atterberg Limit			mit	Modified
No.	No.	h (m)	(m)	Gravel	Sand	nd Silt C	Clay	Liquid Limit	Plastic Limit	Plasticity Index	Group Symbol
BH E6 / S18	SS 9	7.7	197.1	6	34	59	1	non-plastic		ML	
BH S17	SS 5	3.1	199.5	7	41	49	3		non-plastic	2	ML



The grain size distribution curve is presented in Figure No. B-E3 in Appendix B-E.

E1.6 Weathered Shale

Weathered shale (that could be augered through) was encountered below the silty sand / sandy silt till deposit in Boreholes BH E6 / S18 and BH S17, which were terminated within the weathered shale at depths of 9.3 m and 7.0 m (Elevation 195.4 m and 195.6 m) below ground surface, respectively. Clayey soils were observed within the weathered shale in Borehole BH S17.

The weathered shale was grey in colour. SPT 'N' values measured in weather shale deposit were all more than 50 blows per 0.3 m of penetration. Water content measured in the weathered shale sample varied between 6 % and 7 %.

E1.7 Groundwater

Upon completion, free groundwater (seepage) was not observed in any of the boreholes. A monitoring well was installed at the location of Borehole BH S17. Groundwater depth measured in the monitoring well is listed in Table E1.4 and shown on the Record of Boreholes.

Groundwater Measurements During or Upon Completion of Drilling (m) In Monitoring Well (m) **Borehole No.** Date Depth **Elevation** Date Depth **Elevation BH S17** 12 Jan 2022 26 Jan 2022 3.3 199.3 Not encountered

Table E1.4: Results of Groundwater Depth Measurements

It should be noted that the groundwater at the site would fluctuate seasonally and can be expected to be somewhat higher during the spring months, and in response to major weather events.

E1.8 Soil Corrosivity

Three (3) soil samples were submitted for corrosion analysis to determine the corrosive potential of the soils with respect to buried metallic structures. The results of the analyses are presented Table E1.5, and the laboratory test certificate is included in Appendix E.

Table E1.5: Soil Corrosivity Test Results

Parameter	Units	BH E16 – SS4	BH E31 – SS5	BH S17 – SS3
Chloride	ug/g or (ppm)	32	20	7
Sulphate	ug/g or (ppm)	13	40	16
рН	pH Units	8.12	7.58	8.36
Electrical Conductivity	mS/cm	0.195	0.235	0.119
Resistivity	Ohm-cm	5130	4260	8400

202.6

0.0

1 Apr 2022



As per ASTM STP 1013 (Effects of Soil Characteristics on Corrosion – "chloride appears to be the main factor in increased soil corrosivity with levels in excess of 0.01 % (100 (μ g/g) considered indicative of accelerated corrosion". The chloride content measured in all three samples were less than 100 μ g/g. In accordance with Table 1 of CSA A23.1-14 and based on "structurally reinforced concrete exposed to chloride, with or without freezing and thawing" and based on project location, exposure class "C-1" can be used. Class should be based on structure location and/or durability requirement.

In accordance with Table 3 of CSA A23.1-14, no additional requirement is specified for sulphate content below 0.10 % (i.e. 1,000 ppm or $\mu g/g$) below the "moderate degree of exposure" with respect to concrete. Therefore, in accordance with Table 6 of the Canadian Standards Association (CSA) Series A23.1-14, Type GU Portland cement can be used based on the water-soluble sulphate contents measured in soils.

As noted in ASTM -STP 1013 (*Effects of Soil Characteristics on Corrosion*), pH values between 4.0 and 8.5 have very little effect on corrosion (American Water Works Association (AWWA) Standard C 105-72 (Table 1 – Soil-Test Evaluation AWWA Rating).

The measured soil resistivity value of 4260 ohm-cm can be considered as a "Moderate" corrosive environment, and other two measured values between 5000 ohm-cm and 10000 ohm-cm as an environment of "Low" corrosivity for exposed metallic structures, based on ASTM STP 1000, Corrosion Testing and Evaluation - Table 3 (Corrosivity for Uncoated Steel).

Protection against steel corrosion, where required, could include one or a combination of: adequate concrete cover, low-permeability concrete, corrosion inhibitors; coated reinforcing steel; clad reinforcing steel; and corrosion-resistant alloy reinforcement.

A corrosion specialist should be retained, if necessary, to review the analysis results and provide relevant recommendation.

E2.0 PAVEMENT INVESTIGATIONS AND DESIGN

The purpose of the pavement investigation was to obtain subsurface information and to provide geotechnical recommendations for new construction East-West (E-W) Arterial, and as per the City's road classification, it is designated as a minor arterial road. The total length of the investigated road section is about 2.4 km.

The proposed E-W Arterial is a new alignment designated as rural road with 4-lanes from The Gore Road to Coleraine Drive. The discussions and recommendations in the following sections are general in nature as the details of the new alignment were not available at the time of this report. At the time of this report, eighteen (18) boreholes from E1 to E7 (including E6/S17), S18 and E23 to E32 had been drilled. The remaining boreholes have been deferred to detail design phase, if needed. Therefore, the subsurface profile and the discussions



and recommendations in the following sections are applicable only to the planned road section for the above boreholes.

Additional investigation should be carried out for the section from Borehole BH E8 to BH E22 for pavement and Underground utilities and BH S19 and BH S20 for Culvert, Pavement & Underground utilities during detailed design.

The discussions and recommendations in the following sections are based on the subsurface information obtained from the boreholes and are intended for use by Design Engineers.

E2.1 Visual Pavement Condition Survey

Not applicable, as this is a new construction.

E2.2 Subsurface Conditions

At the time of this report, a total of eighteen (18) boreholes had been drilled along the proposed central line of the E-W Arterial and at two culvert locations Sta. (0+500) where monitoring well was installed.

The subsurface soil profile at the site consisted of surface covering materials (topsoil, asphalt, and/or fill) overlying native soils. The thickness of topsoil ranged from 76 mm to 100 mm, followed silty clay / clayey silt fill was encountered below the topsoil at all the borehole locations except Boreholes BH S17. Where sandy silt fill was encountered below the topsoil at borehole location BH S17. The native soils underlying the fill soils consisted of silty clay /clayey silt till and / or silty sand / sandy silt till, as detailed in the Record of Boreholes.

Additional subsurface information is provided in Section E1.0 and in the Record of Boreholes.

E2.3 Groundwater Conditions

All boreholes were open and dry upon completion of drilling to their respective vertical limits of investigation, except 2 boreholes BH E6//S18 and BH S17 where Groundwater level was inferred from soil conditions during drilling. Two groundwater measurements made in the monitoring well (BH S17) were 0.0 (at ground surface) and 3.3 m below ground surface. It should be pointed out that the groundwater at the site would fluctuate seasonally and can be expected to be somewhat higher during the spring months and in response to major weather events.

E2.4 Pavement Design

The purpose of the geotechnical investigation was to obtain subsurface information and to provide geotechnical recommendations for new construction of new 4-lane east-west minor arterial road (East-West Arterial).

The discussions and recommendations in the following sections are based on the available information and the subsurface information obtained from the boreholes and is intended for use by Design Engineers.

E2.4.1 Forecasted Traffic Data

The traffic data represented as Average Annual Daily Traffic (AADT₂₀₁₆) in both directions was estimated by Wood Traffic Group as presented in Table E2.1. This traffic data was used to projected traffic data for 20 years design life. Equivalent single axle loads (ESALs) were calculated cumulatively over 20 years as described in the Ministry of Transportation Report "Procedures for Estimating Traffic Loads for Pavement Design, 1995".

Table E2.1: Traffic Data along E-W Arterial from the Gore Road to Coleraine Drive, Ontario

AADT in Both Directions 2020 ⁽¹⁾	Growth Rate (%)	Comm. Vehicles (%)	Design ESALs @ 20 Years	Traffic Category
11,020	2.0%	6.0%	4,458,659 (~ 4.5 x 10 ⁶)	Category

^{(1) 2020} is the anticipated construction year.

E2.4.2 Flexible Structural Pavement Design

After reviewing the field data and laboratory test results, the minimum pavement structural design for the new construction of the East-West Arterial is presented in Table E2.2 and was determined in accordance with the 1993 American Association of State Highway and Transportation Officials ('AASHTO') Guide for the Design of Pavement Structures using the Darwin Software Program.

The AASHTO Pavement Design is considered to be a function of estimated future traffic in both directions (ESALs), reliability (R), which is a function of road classification, overall standard deviation (S_o), resilient modulus (M_r), as well as initial and terminal serviceability (P_o , P_t). From these parameters, the structure number (SN) is calculated. The SN is defined in the AASHTO Guide as a number, which provides a measure of the pavement strength and thickness needed to avoid overstressing the subgrade.

The following design parameters were chosen to calculate the required structure number for the design of flexible pavement using the AASHTO method, as described in the Ministry of Transportation Materials Information Report MI-183 "Adaptation and Verification of AASHTO Pavement Design Parameters for Ontario Conditions".



- Initial serviceability, $P_i = 4.5$; - Terminal serviceability, $P_t = 2.5$;

- Reliability level, R = 90 percent;

- Overall standard of deviation, $S_o = 0.49$; - Subgrade Resilient Modulus, M_r (kPa) $M_r = 30,000$

Table E2.2: Recommended Minimum Structural Pavement Design

		AASHTO Design f	Recommended HMA & PGAC		γ				
			pa SN	7 Z Z		Marsh	nall	юба	
ESALs	НМА	Gran A	Required Design SN	Selected SN	Total Pavement Thickness	HL 3 (HS) /HL 1 Surface Course	HL8 Binder Course	Traffic Category	
	Thickness (mm)								
4.5 X 10 ⁶	165	Gran A = 450 mm or Gran A = 150 mm Gran B Type II = 300 mm	130	132	615	SP 50 mm PGAC 64-28	55+60 mm PGAC 58-28	С	

Notes:

- Pavement shall be placed over approved subgrade.
- Granular A and Granular B Type II: Compaction as per OPSS Form 1010 (100% SPMDD).

The City of Brampton minimum Pavement Structure is as follows (Arterial Road STD#208 - 2019):

- 50 mm HL3 Asphalt (High Stability or HL1)
- 85 mm HL8 Asphalt (100 mm for All New Subdivision Roads)
- 150 mm Granular "A" or 130 mm of 20 mm Crusher Run Limestone
 450 mm Granular "B" or 350 mm of 50 mm Crusher Run Limestone

The structure number (SN) of the City of Brampton design is 118.2 mm or by using Crusher Run Limestone SN = 123.9 mm

The AASHTO pavement design was selected for the road widening since it is tailored on traffic data, design period of 20 years and soil field investigation and provides higher selected SN of 130 mm in comparison to the City of Brampton pavement design standards. However, the granular B Type II thickness shall be increased to 450 mm to match the City's Standards (Table E2.3).



E2.5 Recommendations and Construction Features for Pavement

B2.5.1 New Construction

Total Pavement Structure

Pavement recommendations for new alignment is presented in Table E2.3, including hot mix type, lift thickness, and PGAC type making up the recommended asphalt thickness, as well as the traffic category, in accordance with OPSS.MUNI 1151. Also, the granular thicknesses can be increased depending on grading requirements.

НМА **Traffic PGAC** Thickness (mm) Category Type HL 3 (HS) / HL 1 64-28 50 mm C HL 8 (HS) /HDBC 55 mm 58-28 HL 8 (HS) /HDBC 60 mm 58-28 Granular Base 'A' or 20m Crusher Run 150 mm Granular Subbase 'B' Modified or 50m 450 mm Crusher Run or Limestone

765 mm

Table E2.3: New Construction of Arterial Widening of Arterial A2

E2.5.2 Subgrade / Road Base Preparation and Compaction

The pavement structural design recommended for roads is applicable, provided the subgrade is prepared under dry weather conditions, proof-rolled with a heavy rubber-tired vehicle (such as a grader or loaded dump truck) in the presence of the geotechnical consultant. Any loose, soft or unstable areas, if detected during proof-rolling, must be sub-excavated, replaced with approved granular materials and compacted. Any additional engineered fill, if required, should be placed in thin layers not exceeding 200 mm and compacted to a minimum of 98 % of Standard Proctor Maximum Dry Density (SPMDD). Granular materials should be placed in thin layers not exceeding approximately 200 mm, within ± 2 % of its optimum moisture content, and thoroughly compacted to a minimum of 100 % of SPMDD.

The subgrade should be provided with adequate drainage. If wet weather conditions prevail at the time of construction, adjustments to this design may be required, i.e. if the subgrade becomes excessively wet or rutted during construction activities, additional sub-base material may be required. The need for additional sub-base material is best determined during construction.

All granular base and sub-base materials must be compacted to at least 100% of SPMDD.



E2.5.3 Stripping and Sub-Excavation

No additional sub-excavation, other than removal of organics and topsoil (ranging in thickness from 76 mm to 100 mm), are anticipated within the widening limits. However, any unsuitable soft or saturated material should be removed. Deeper stripping depths may be required, depending on the actual site conditions between borehole locations.

E2.5.4 Drainage

Prior to completing the new construction, it is recommended that adequate drainage be provided both laterally and longitudinally along the length of the project.

To meet the design requirements for the pavement life, the road subgrade and granular courses should be well drained at all times. This can be accomplished by ensuring proper grading of the subgrade and positive lateral drainage of the granular base daylighting at the ditch. Alternatively, full-length perforated subdrain pipes of 150 mm diameter should be installed along both sides of the road, below the roadbed level, to ensure effective drainage, in accordance with OPSD 216.021. The sub-drainpipes should be wrapped in suitable non-woven geotextile surrounded by a minimum drainage zone of 19 mm size clear stone of minimum 150 mm thickness. A minimum slope of 2 % should be maintained across the paved sections (finished road surface) to ensure proper surface drainage. New pavement should slope towards the gutter/ditch.

E2.5.5 Hot Mixes and PGAC Type

The following Marshall hot mixes should be used on E-W Arterial:

• HL 3 (HS) / HL 1 surface course mix and HL 8 (HS) /HDBC binder course should be used to provide the roadway with high durability.

Material Specification should be as per OPSS 1150 Material Specification for Hot Mix Asphalt. For aggregates, the material specification should be as per OPSS.MUNI 1003.

Performance Graded Asphalt Cement ("PGAC") 64-28 should be used only for surface course and PG 58-28 for binder course. This PGAC should satisfy the requirements of MP1 of SHRP Specifications for Superpave.

<u>Recycled Materials:</u> The use of reclaimed asphalt pavement (RAP) is permitted in Marshall mixes. The percent of RAP for HL 8 and HL 3 should be as per OPSS.MUNI 1150.

RAP containing steel slag aggregates should not be allowed.

<u>Transition Treatments at Limits of Paving</u>: At the limits of the project, a butt joint with the existing pavement is recommended. The butt joint between successive lifts of hot mix should be staggered at a distance of not



less than 5 m, in accordance with OPSS.PROV 313. It should be ensured that no joint location corresponds with a joint location in any other layer.

The transition treatment from earth cut to earth fill should be in accordance with OPSD 205.010.

<u>Tack Coat:</u> It is recommended that all milled surfaces, and binder course surfaces will be tack coated prior to top course asphalt, if exposed to extended traffic. Construction Specification should be as per OPSS Prov. 308, April 2007.

E2.5.6 In-Situ Compaction for Hot Mix

In all areas, asphaltic concrete should be compacted as per OPSS.MUNI 310, Table 10 (April 2011). It should be noted that the granular base and sub-base materials should be compacted to the City's standards or to minimum 100 % SPMDD.

<u>Field Quality Assurance:</u> Plate samples of loose hot mix should be obtained for each paving day, and extraction/gradation and full Marshall compliance testing should be carried out on these samples. The finished surface shall be true to required profile and cross-section within 6 mm from required elevations and thickness. The surface shall show no depressions or bumps exceeding 3 mm under a 3.0 m long straight edge, placed parallel to the road centre line.

E2.5.7 Frost Depth

A minimum depth of 1.4 m should be used for frost protection as per OPSD 3090.101.

E2.5.8 Detouring

No long-term detouring is planned. Therefore, no special treatment will be required.

E3.0 UNDERGROUND UTILITIES

The geotechnical investigation scope of work included obtaining subsurface conditions and providing recommendations for installation of proposed underground utility services. Accordingly, selected boreholes (i.e., alternating pavement boreholes) were deepened to a depth of 3 m to 5 m, as listed in Table 5.4. Information obtained from all relevant boreholes drilled along the proposed East-West arterial road have been considered in this section, as applicable.

E3.1 Subsurface Conditions

A total of eighteen (18) boreholes were drilled in vacant land along the proposed East-West arterial road to depths varying from about 2.1 m to 9.3 m, for pavement investigation, underground utility installation and

. . .



one culvert. Proposed Boreholes BH E8 – E22 and BH S15-16 were not drilled and have been deferred to design stage, if required. The recommendations and discussions provided in this section is based on the drilled boreholes. Additional investigation should be carried out in the areas between Boreholes BH E7 and BH 23 to confirm the soil condition.

Overall, based the drilled boreholes (BH E1 to BH E7 and BH E23 to BH E32), the project site along proposed East-West arterial road consisted of surficial cover (topsoil) underlain by fill soils (silty clay / clayey silt or sandy silt) overlying native till (silty clay / clayey silt and / or silty sand / sandy silt). The fill soils extended to a depth of 0.7 m (Elevations 201.9 m to 214.3 m) below the existing ground surface. The native till soils (silty clay / clayey silt till and/or silty sand / sandy silt) were confirmed to a depth of up to 8.5 m (up to Elevation 196.3 m) below existing ground surface in the deeper boreholes at the structure location. Weathered shale was encountered below the till the two deep Boreholes E6 / S17 and S18.

Highest groundwater level measured in the monitoring well was at 0 m (i.e., at the ground level, Elevation 202.6 m) below ground surface.

Detailed subsurface and groundwater conditions are provided in Section E1.0.

E3.2 Discussions and Recommendations for Underground Utilities

As per information available, the planned East-West arterial road within the project limits will include installation of underground utilities and associated manholes and catch basins. Details of the installation were not available at the time of this report. Existing utilities, if any, should be protected and taken into consideration for design and construction of the proposed underground utilities and road widening.

The ground (road) elevations within the project limits (based on borehole location) varied from about 202.6 m (at BH S17) to 215.0 m (at BH E32), with the overall the ground surface generally sloping up from west (The Gore Road) to east (Coleraine Drive).

The recommendations and discussions for excavation and installation of underground utility services, and associated manholes / catch basins, are provided in the following sections, based the drilled boreholes (BH E1 to BH E7 and BH E23 to BH E32). Additional investigation should be carried out in the areas between Boreholes BH E7 and BH 23 to confirm the soil condition.

E3.2.1 Founding Subgrade Conditions

From the investigation result, fill soils (silty clay / clayey silt or sandy silt) were present to a depth of 0.7 m below existing ground. The fill soils were generally in soft to stiff / loose condition.

The native till soils (silty clay / clayey silt and silty sand / sandy silt) below the fill soils were in generally of stiff to hard and / or dense to very dense overall. Some firm or loose / compact areas in the upper portions of the strata. Therefore, the existing ground should be generally competent to support underground utility

. . .



services. It is recommended that the inverts of underground utilities be founded on native soils, or competent fill soil subgrade. Existing fills or soft / loose soil encountered at the founding level should be compacted, if possible, or otherwise, should be sub-excavated and backfilled with compacted soil as recommended in Section E5.3 (Engineered Fill).

For manholes and catch basins founded on competent subgrade (i.e., approved existing fill, imported engineered fill, till soils), a Geotechnical Reaction at Serviceability Limit State (SLS) of 100 to 150 kPa and a factored Geotechnical Resistance at Ultimate Limit State (factored ULS) of 150 to 225 kPa, depending on the subgrade conditions, may be used, which should be verified by a geotechnical engineer during construction. Under the SLS bearing values, settlements of up to 25 mm may take place.

The frost penetration depth for the project area should be considered as 1.4 m.

The highest groundwater depth measured during the investigation within the project limits of planned East-West arterial road was about 0 m (at ground level, Elevation 206.9 m) below ground surface in the monitoring well installed at the culvert location (BH S17). Groundwater level fluctuates over times, and may be present within the excavation depths for the underground utilities. In addition, dewatering during excavation may be required due to perched water in sandy / silty pockets and / or from surface runoff. As the excavation will generally be in clayey / silty soils, groundwater seepage, if any, into the excavation is likely to be slow and a properly filtered sump and pump system, or gravity drainage, may be used for dewatering excavation.

General discussions regarding excavation and dewatering are provided in Section E5.4. Detailed dewatering consideration for the project is included in Wood's hydrogeological investigation report, which is submitted under a separate cover.

Trench excavation, pipe bedding and anti-seepage collar considerations are discussed in following sections.

General discussions provided in Section E5.0 should also be considered for design and construction.

E3.2.2 Trench Excavation

Trench excavation should be carried out as per the latest Ontario's Occupational Health and Safety Act (OHSA) and Regulations for Construction Projects. The soils classifications are shown in Section E5.4. Based on the soils encountered in the boreholes, the sides of excavations are expected to be temporarily stable at 1H:1V for Type 2 and Type 3 soils, provided excavations are properly dewatered and underground utilities are installed and backfilled within a reasonable short period of time. Provisions should be made for dewatering, as noted in Section E5.4. Trenching should be in accordance with OPSS.MUNI 401 (Construction Specification for Trenching, Backfilling and Compacting).

It is important for frost heave compatibility that the trench backfill within the frost zone of 1.4 m depth matches the soil exposed on the trench walls.



E3.2.3 Bedding

Bedding for underground pipes should be placed in accordance with the design requirements and current Ontario Provincial Standards (OPS) specifications (Ontario Provincial Standard Drawing (OPSD) 802.10 for flexible pipes and OPSD 802.30, 802.31 and 802.32 for rigid pipes). It is recommended that a minimum of 150 mm thick bedding material (Class 'B' Type or better) be placed below the pipe invert. The thickness of the bedding may, however, have to be increased depending on the pipe diameter, or if wet or weak subgrade conditions are encountered. If the subgrade is weak, it should be compacted, if possible, or otherwise, subexcavated and replaced with engineered fill to support the pipes and allow the use of Class 'B' Type bedding. If weak subgrade is encountered and cannot totally be removed, Class 'A' Type bedding (e.g., minimum 100 mm thick lean concrete) should be used to provide a workable surface and support the proposed pipes.

For the areas to be filled, the fill soils should first be placed approximately to final grade and subsequently excavated to install the underground pipes in order to prevent pipe settlement due to overburden loads.

Should the pipes be installed in soft clay soils, the joints should be restrained from movements and the backfill around the pipes should be properly compacted in order to prevent long-term movements. A layer of geotextile (Terrafix 270R or equivalent) should be placed between the soft clayey soils and the granular bedding/backfill in order to prevent soil migration.

The possibility of pipe movements in soft clayey soils, after installation, should be considered in the design and construction of the underground pipes.

Construction of underground pipes should be carried out in accordance with the relevant OPSS.MUNI 410 (Construction Specification for Pipe Sewer Installation in Open Cut), or other relevant applicable municipal / regional standards.

E3.2.4 Backfill

Based on the visual and tactile examination of the soil samples, the on-site excavated silty clay / clayey silt / sandy silt fill and native till soils may be re-used as backfill in sewer trenches provided their moisture contents at the time of construction are at or near the optimum. Moisture conditioning (e.g., drying) of the sub-excavation soils may be required prior to reuse. The excavated cohesive fill should be carefully examined for organic content and moisture condition by qualified geotechnical personnel in order to confirm the need for moisture conditioning or its acceptability for use as backfill.

The backfill should be placed in maximum 200 mm thick layers at or near (\pm 2 %) optimum moisture content, and each layer should be compacted to at least 95 % Standard Proctor Maximum Dry Density (SPMDD).

Backfill around the manhole / catch basins should be brought up simultaneously on all sides and operation of heavy equipment near the walls should be restricted to minimize potential movement and/or damage.



Unsuitable material such as organic soils, boulders, cobbles, frozen soils, etc., should not be used for backfilling.

E3.2.5 Anti-Seepage Collars

From the borehole information underground utilities will likely be installed in clayey soil (silty clay fill, silty clay / clayey silt). As such, anti-seepage collars should not be required. If installed in silty soil (e.g., silty sand / sandy silt till or fill, anti-seepage collars should be used.

E4.0 CULVERTS ON PLANNED EAST-WEST ARTERIAL ROAD (STATION 0+500, 1+100 and 2+450)

Three culverts are planned along the East-West Arterial Road alignment as approximate Stations 0+500, 1+100 and 2+450, with two boreholes to be drilled at each culvert locations. The culvert at Station 2+450 is located at the intersection East-West Arterial Road and Arterial A2, and is discussed in Section B4.0 (Station 0+650 of Arterial A2). An access permit could not be obtained for advancement of the boreholes (BH S19 and BH S20) planned for the culvert at Station 1+100. These boreholes have been deferred to a later date (detail design stage), as discussed with and approved by the City. Therefore, this section includes subsurface conditions, recommendations and discussion for the Culvert at Station 0+500 only

The geotechnical investigation for the culvert at Station 0+500 consisted of drilling two (2) boreholes (BH E6 / S18 and BH S17) to obtain subsurface and groundwater conditions and were drilled to depths of 7.0 m and 9.3 m (Elevations 195.6 m and 195.4 m) below the existing ground surface, respectively. The culvert and borehole locations are shown in Figure Nos. 5A and 5B.

Details of the proposed culvert were not available at the time of preparation of this report.

The stratigraphic units and groundwater conditions are discussed in the following sections and presented in the Record of Boreholes. he following summary is to assist the designers of the project with an understanding of the soil conditions encountered at the proposed culvert location. The soil and groundwater conditions might vary between and beyond the borehole locations.

E4.1 Subsurface Conditions - Culvert on Planned East-West Arterial Road (Station 0+500)

Two (2) boreholes (BH E6 / S18 and BH S17) were drilled at the vicinity of Culvert at Sta. 0+500. Based on the soil conditions observed in the boreholes drilled for culvert, the subsurface profile at the culvert location consisted of fill soils (silty clay / sandy silt) underlying the surficial topsoil. Native silty clay till was encountered below the fill soils in BH E6 / S18. Native silty sand / sandy silt till was encountered underneath the fill soil and the silty clay till in BH S17. Weathered shale was encountered below the till soils and extended to the termination depths in both boreholes.

• • •



E4.1.1 Topsoil

Topsoil 76 mm and 100 mm thick was encountered at the surface of Boreholes BH E6 / S18 and BH S17, respectively.

E4.1.2 Fill Soils

Silty clay / sandy silt fill soils were encountered below the topsoil and extended to a depth of 0.7 m (Elevations 201.9 m and 204.1 m) below the existing ground surface in Boreholes BH S17 and BH E6 / S18, respectively.

The silty clay fill was dark brown / brown in colour and contained trace gravel, trace organics, and trace cobbles. The sandy silt fill was dark brown / brown in colour and contained trace clay, trace gravel, trace cobbles and organics.

Two SPT 'N' values measured within the fill soils ranged were 6 and 9 blows per 0.3 m penetration. Water contents measured in one silty clay fill sample was 29 %, and in one sandy silt sample was 17 %.

E4.1.3 Silty Clay Till

Native silty clay till was encountered underlying the fill soils in Borehole BH E6 / S18 and extended to a depth of about 2.2 m (Elevation 202.6 m) below ground surface.

The silty clay till was brown in colour and contained trace gravel, trace cobbles, and oxidation stains. Two SPT 'N' values measured within the silty clay till were 30 and 36 blows per 0.3 m penetration, implying hard consistency. Water contents measured in two silty clay till samples were 12 % and 14 %.

E4.1.4 Silty Sand / Sandy Silt Till

Native silty sand / sandy silt till was encountered underlying the sandy silt fill in Borehole BH S17 and below silty clay till in Borehole BH E6 / S18, and extended to depths of about 5.5 m to 8.5 m (Elevations 197.1 m and 196.3 m) below ground surface at BH S17 and BH E6 / S18, respectively.

The silty sand / sandy silt till was brown to grey in colour, and contained trace clay, trace gravel, and oxidation stains. Cobbles and boulders were encountered at various depth within the till. SPT 'N' values measured within the silty sand / sandy silt till were all more than 50 blows per 0.3 m, indicating very dense condition. Water contents measured in the silty sand / sandy silt till samples ranged between 7 % and 14 %.

Results of gradation and Atterberg Limit tests carried out on two silty sand / sandy silt till samples are presented in Table E1.3, and shown on the Record of Boreholes.





E4.1.5 Weathered Shale

Weathered shale was encountered below the silty sand / sandy silt till in both boreholes and extended to the termination depths of the Boreholes BH E6 / S18 and BH S17 at about 9.3 m and 7.0 m (Elevation 195.4 m and 195.6 m) below ground surface, respectively. Clayey soils were observed within the weathered shale in BH S17.

The weathered shale was grey in colour. The SPT 'N' values measured in weather shale deposit were more than 50 blows per 0.3 m of penetration. Two water contents measured in the weathered shale samples were 6% and 7%.

E4.1.6 Groundwater Conditions

Groundwater was not encountered in both Boreholes upon completion. Groundwater levels measured in a monitoring well installed in BH S17 were at depths of about 0.0 m (i.e., at ground surface) and 3.3 m (Elevations 202.6 m and 199.3 m). The groundwater measurements are summarized in Table E1.4 and shown on the Record of Boreholes.

It should be noted that the groundwater could fluctuate seasonally and can be expected to be somewhat higher during the spring months and in response to major weather events.

E4.3 DISCUSSIONS AND RECOMMENDATIONS FOR CULVERT (STATION 0+500)

The purpose of the geotechnical investigation was to obtain subsurface information and to provide geotechnical recommendations with respect to proposed culvert construction.

Within the depths of the two boreholes drilled adjacent to the planned culvert location, fill soils (silty clay / sandy silt) were encountered to a depth of about 0.7 m (Elevations 201.9 m and 204.1 m) below ground surface, overlying hard / very dense till followed by hard weathered shale.

The foundation types of planned culvert were not available at the time of preparation of this report. Accordingly, general considerations for the culverts are presented in the following sections.

E4.3.1 Foundation

Based on the boreholes drilled at or in the vicinity of the planned culvert location, values of geotechnical reaction at Serviceability Limit State (SLS) and the factored geotechnical resistance at Ultimate Limit State (ULS) are provided in Table E4.1 which may be used for design.



Table E4.1: Recommended ULS / SLS Bearing Values for Culvert Foundations

Borehole No.	Founding Stratum	Depth Below Existing Grade (m)	Elevation (m)	Geotechnical Reaction at SLS (kPa)	Factored Geotechnical Resistance at ULS ⁽¹⁾ (kPa)
BH E6 / S18	Fill / frost depth hard silty clay / very dense silty sand / sandy silt till	above 1.4 (±) below 1.4 (±)	above 203.4 (±) below 203.4 (±)	not recommended 200	not recommended 300
BH S17	Fill / frost depth very dense silty sand/sandy silt till	above 1.4 (±) below 1.4 (±)	above 201.2 (±) below 201.2 (±)	not recommended 200	not recommended 300
Engi	neered fill per OPSS.MUNI 1010 (150	225		

⁽¹⁾ A resistance factor of $\Phi = 0.5$ has been applied to the ULS values provided.

The geotechnical bearing values provided in Table E4.1 are intended to assess the feasibility and sizes of footings and are for vertical loads (no inclination) without load eccentricity. Under the SLS pressures, foundation settlements could be up to 25 mm (total) and 20 mm (differential). Detail foundation analysis should be carried out, if necessary, to confirm SLS/ULS and corresponding settlements.

The design frost depth penetration is 1.4 m. All foundations should be covered by at least 1.4 m deep soil or equivalent synthetic thermal insulation.

Based on the groundwater levels measured in the monitoring well, a minimum groundwater level at Elevation of 202.6 m should be considered for design. If required, the regional high flood level of the creek may be used.

During construction, considerable dewatering efforts and / or creek diversion (e.g., cofferdam, sheetpiles) to control the ingress of creek water may be required. General recommendations related to excavation and dewatering are presented in Section E5.4.

E4.3.2 Soil Parameters for Design

The unfactored soil parameters listed in Table E4.2 may be used for design of earth structures. It should be noted that these parameters are based on published information and/or semi-empirical/theoretical relationships, and are conservative and should be verified by field/laboratory testing, if more representative parameters are required.

Table E4.2: Unfactored Static Soil Parameters for Design

Matavial	Total Stress Analysis		Effective Stress Analysis		Earth Pressure Coefficients ⁽¹⁾		Bulk Unit			
Material	C (kPa)	Φ (deg)	c' (kPa)	Φ' (deg)	Active K _a	At- Rest K _o	Passive K _p	Weight (kN/m³)	between Concrete and Soil	
Hard silty clay till	150	0	0	32 ⁽²⁾	0.31	0.47	3.25	20	0.35	
Very dense silty sand / sandy silt till	0	35	0	35	0.27	0.43	3.7	21	0.4	
Engineered Fill (3)										
Granular A (OPSS.MUNI 1010)	0	35	0	35	0.27	0.43	3.7	24 ⁽⁴⁾	0.4	
Granular B Type I or Type II (OPSS.MUNI 1010)	0	32	0	32	0.31	0.47	3.3	23 ⁽⁴⁾	0.4	

Notes: ⁽¹⁾ Values based on semi-empirical relationships. For SLS, K_p values should be reduced to 1/3 of indicated value to limit lateral movement.

E4.3.3 Earthquake Considerations

Based on the soil conditions observed in the boreholes (maximum drill depth of 9.3 m below ground) and the possible bedrock depth at the culvert location (~10 m), and in conformance with the criteria in Table 4.1 (Section 4.4.3.2 – Seismic Properties) of the Canadian Highway Bridge Design Code CSA S6-19 ("CHBDC"), the project site may be classified as Site Class C ("very dense soil and soft rock").

The design values of site coefficients F(T), F(PGA) and F(PGV) can be obtained from Geological Survey of Canada on Natural resources Canada website: 'www.earthquakecanada.ca" or Tables 4.2 to 4.9 (Section 4.4.3.3 – Site Coefficients) of CHBDC, and the design spectral acceleration, S (T), should be determined as per Section 4.4.3.4 (Design Spectral Acceleration and Displacement Values) and Tables 4.2 to 4.9 in Section 4.4.3.3 of CHBDC.

E4.3.4 Scour Protection

Culvert and headwall footings should be protected against scour and erosion in the form of cut-off walls, riprap or equivalent. Scour protection should be designed based on the hydrology requirement by an experienced engineer. Alternatively, the foundations could be placed below the depth of scour and frost

⁽²⁾ Normally-consolidated range.

⁽³⁾ All engineered fill should be compacted to at least 100 % SPMDD for supporting foundations.

⁽⁴⁾ Unit weight values for engineered fill compacted to 100 % SPMDD. For backfill of retaining walls, unit weights for Granular A and Granular B compacted to 95 % SPMDD may be taken as 22 kN/m³ and 21 kN/m³, respectively.



penetration. If rip-rap protection is used, it should be separated from the native soils with a geotextile filter fabric (e.g. Terrafix 600R or equivalent) or a filter zone of granular material. The embankment slope surface should be covered with topsoil and seeded/sodded as soon as possible after completion of construction.

E4.3.5 Backfill for Culvert

Backfill materials around culvert should consist of non-frost susceptible, free-draining granular materials in accordance with OPSS.MUNI 1010 (i.e., Granular 'A' or Granular 'B'). Such granular backfill should be compacted to at least 95 % SPMDD (Standard Proctor Maximum Dry Density). Free-draining backfill materials and the drain pipes and weep holes, etc., should be used provided to prevent hydrostatic pressure build-up.

Backfill, backfill transition and cover for the culvert should conform to Ontario Provincial Standard Drawing (OPSD) 3101.150 (Walls, Abutment, Backfill, Minimum Granular Requirement) or applicable City Standard.

Engineered fill is discussed in Section E5.3, and excavation and dewatering during construction are discussed in Section E5.4.

To increase sliding resistance, a shear key may be used, if required. The shear key can be designed using the unfactored K_p values for the soils provided in Table E4.2. The movement of the retaining structure to mobilize the passive resistance should be considered in the design.

E4.3.6 Retaining Walls

If retaining walls are constructed at the ends of the culvert (inlet and outlet), they may be founded on the hard native silty clay till or very dense sandy silt / silty sand till. If required, the wall may also be founded on the engineered fill per OPSS.MUNI 1010. The frost and scour protection recommendations provided in Sections E.3.1 and E4.3.4, respectively should also be adhered to in designing retaining wall foundations.

Soft fill areas should be recompacted (if possible) or replaced with the engineered fill described in Section E5.3. The founding subgrade should be verified by a geotechnical engineer. The SLS/ULS values and soil parameters provided in Tables E4.1 and E4.2 may be used for design of wall foundations, as required. Slope stability analyses should be carried for the retaining wall, once the detailed design is completed.

E4.3.7 Permanent Slopes

A slope of 2H:1V (2 Horizontal : 1 Vertical) or flatter should be constructed for permanent fill embankment. The embankment should be constructed using engineered fill (Section E5.3). The global slope stability should be analyzed during detailed design, if the new embankment height is higher than 2 m high, once the detailed design is finalized. All permanent slope surfaces should be protected against erosion by surface water and creek water.



Construction of the embankment should follow the requirements of OPSS.MUNI 206 (*Construction Specification for Grading*), or applicable City Standard.

E5.0 General Considerations for Design and Construction

E5.1 Site Preparation

Site preparation will likely generally include stripping of topsoil, excavation to subgrade, proof-rolling, sub-excavating soft spots, if encountered, and backfilling, if necessary, with engineered fill.

All topsoil and loose soil or soil mixed with organic matter should be stripped from pavement areas, manhole / catch basin founding areas, and base of underground utility services. Subgrade preparation of pavement is discussed in Section E2.6.3. Any loose, soft or unstable areas in the exposed subgrade should be subexcavated and replaced with approved fill and compacted (Section E5.3). Lean concrete may be used to backfill sub-excavated areas.

Excavation should be carried out with a temporary slope of 1H:1V or flatter above the groundwater level (Section E5.4). Roadway shoring protection systems may be required during construction of the culverts. Temporary shoring is discussed in Section E5.5.

E5.2 Embankment Construction

Based on site condition, the proposed road construction will generally involve fill sections along the investigation limits. The embankment requires for road construction should be constructed with compacted engineered fill at 2H:1V (or flatter) side slopes. If a side slope steeper than 2H:1V slope is required or if the height of the embankment / cut slope is greater than 2 m, slope stability analysis should be carried out to assess stability of the planned slope, depending on the subsurface conditions. Final (permanent) embankment side slopes in granular fills should be established to match the existing slopes or as per OPSD 200.010. Final slopes should be treated with a seed and mulch to prevent ravelling.

Construction of the road will require, as a minimum, stripping the existing ground surface cover (topsoil, vegetation cover, surficial fill soils, etc.) from the area required for road construction. Grading, backfilling and compacting should follow OPSS.MUNI 206 (Construction Specification for Grading), OPSS.MUNI 401 (Construction Specification for Trenching, Backfilling and Compacting), OPSS 501.MUNI (Construction Specification for Compacting), and / or the City's requirements.

Backfilling, if required, for site grading (e.g., for subgrade raise, replacement of soft soil) should be placed as engineered fill. Engineered fill per OPSS.MUNI 1010 should be used to replace soft / incompetent soils and/or raising grade. Engineered fill should be prepared according to the City's standards / contract specifications. Engineered fill is discussed in Section E5.3.



The fill soils used for embankment widening should consist of approved clean fill (e.g., Select Subgrade Materials - OPSS 1010).

E5.3 Engineered Fill

Engineered fill per OPSS.MUNI 1010, where required, may be used to backfill excavated areas, backfill around manholes, replace soft/incompetent soils, and / or raise grades. Engineered fill for backfill of excavated areas should be placed after stripping existing fill soils, any soils containing excessive organic matters and otherwise unsuitable soils.

Engineered fill can be prepared by placing fill soil and compacted as per OPSS.MUNI 501 (Construction Specification for Compacting) and/or applicable City Standard. Alternatively, engineered fill should be placed in loose layers not exceeding 200 mm. The water content of the fill should be within \pm 2 % of its OMC at the time of its placement, and it should be thoroughly compacted to a minimum of 98 % of SPMDD in general.

The fill soils should consist of inorganic soils and should not be frozen during backfilling and compaction. Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are necessary for the construction of a certifiable engineered fill. The compaction procedures and quality control should be overseen by a geotechnical engineer.

E5.4 Excavation and Dewatering

All excavations should be carried out in accordance with the latest OHSA and Regulations for Construction Projects (O. Reg. 213/91). The soils to be excavated can be classified as follows:

Existing fill soils	Type 4
Hard silty clay till	Type 1
Very dense silty sand / sandy silt till (above groundwater level / fully dewatered)	Type 1
Very dense silty sand / sandy silt till (below groundwater level)	Type 3

In accordance with the OHSA, a maximum short-term slope of 1H:1V is required to within 1.2 m of the trench bottom for temporary excavations in Type 1 and 2 cohesive till and native silty sand / sandy silt till that is above the groundwater level, or properly dewatered. For Type 1 and 2 soils, a maximum depth of 1.2 m high vertical cut at the bottom of excavation may generally be constructed. However, under the groundwater table a 1.2 m high vertical cut may not be stable and flatter slopes may be required. Type 3 soils above the groundwater level may be inclined at 1H:1V or flatter from the bottom. In the case of saturated Type 3 fills or native granular deposits below the prevailing groundwater, if adequate dewatering is not implemented, slopes of open excavations will have to be reduced to 2H: 1V or flatter. In the absence of proper dewatering or groundwater control of Type 3 soils, slope flattening may be insufficient to prevent particularly saturated granular soils from becoming unstable and devolving to Type 4 materials, which requires 3H:1V or flatter slopes. Near the ground surface, occasional 3H:1V or flatter slopes may be required due to loose/soft surficial



soils. If open cut cannot be carried out, a temporary shoring system may be used to limit the extent of excavation. General consideration for temporary shoring is provided in Section E5.5.

Trenching should be carried out in accordance with OPSS.MUNI 401 (Construction Specification for Trenching, Backfilling and Compacting).

Stockpiles, materials or any heavy equipment should be kept at least the same horizontal distance as the depth of the excavation from the upper edge of the excavation to prevent slope instability. All surface drainage should be directed away from any open excavations and trenches.

Based on observations at the borehole locations and planned excavation depth, normal excavation equipment should be suitable for excavation. Hard till soils may require additional effort for excavation (e.g., heavy excavator, rippers, impact hammer, etc.). The terms describing the compactness (very loose, loose, compact, dense, very dense) or consistency (very soft, soft, firm, stiff, very stiff, hard) of soil strata give an indication of the effort needed for excavation. It should be noted that cobbles / boulders can be encountered in the till and in fill soils. Therefore, removal of the cobbles / boulders should be considered and planned for.

During the construction, temporary runoff controls such as sediment trap, interceptor drain, dyke and / or silt fence should be installed to prevent uncontrolled water / sediment flow into existing water courses. The effluent from dewatering operations should also be filtered or passed through sediment traps to prevent turbidity.

Based on the soil and groundwater conditions at the borehole locations, groundwater control within the excavated area should not be significant. In the clayey / silty glacial till soils, groundwater seepage into the excavation, if encountered, is likely to be slow and a properly filtered sump and pump system or gravity drainage may be used for dewatering the excavation. High water flow rates (e.g., from perched water in fills or granular layers with the tills) may be encountered during construction and the dewatering effort could require an increased number of sumps and pumps.

Use of lean concrete mud mat or granular layer may be warranted where founding surfaces are to be exposed for extended period, especially if the work is carried out during wet weather. Care should also be exercised to minimize disturbance to the final subgrade during excavation.

It is recommended that qualified geotechnical personnel be present during the foundation excavation to review the conditions of the foundation subgrade.

E5.5 Temporary shoring

Temporary shoring may be required for vertical excavation during construction of culvert, installation of underground utilities or roadway protection. This can be accomplished using soldier piles with lagging (or similar) in order to support the sides of the excavation. Temporary shoring design and construction should comply with OPSS.MUNI 539 (Construction Specification for Temporary Protection Systems), or applicable City

. . .



Standard. The temporary shoring system should be designed to resist the lateral earth, surcharge and hydrostatic pressures which could occur during construction. Bracings should be installed within the shoring system to minimize movements of the soils. The temporary shoring system should be designed in accordance with the latest editions of Canadian Foundation Engineering Manual's (CFEM) and Canadian Highway Bridge Design Code (CHBDC), together with the requirements of the Ontario Health and Safety Regulations, as applicable.

The shoring system should be designed and approved by a professional engineer. Geotechnical parameters provided in Section E4.3.2 may be considered for design of shoring.

E5.6 Suitability of Existing Soils for Backfilling

Most of the excavated soils (i.e., clayey and silty fills and till soils) can be suitable for being reused for backfill, provided they can be separately stored, properly compacted and are environmentally acceptable. Fill soils containing construction debris (or similar) and organic matter should not be reused. Soils that are too wet to compact will require additional processing (e.g., drying). Cobbles and boulders (larger than 100 mm in size), if any, should be discarded by mechanical means (e.g., sieving) or manual removal.

E6.0 PRELIMINARY SOIL CHEMICAL ANALYSES

Environmental soil chemical analyses were carried out to provide preliminary discussions for soil disposal options as part of the Geotechnical Investigation Preliminary Design for the site, the results of which are discussed in the following section.

No Phase I or Phase II Environmental Site Assessment (ESA) reports have been conducted or provided to Wood for review.

It is assumed that a Record of Site Condition, (RSC) as per Ontario Regulation 153/04 Records of Site Condition, Part XV.1 of the *Environmental Protection Act* (EPA), as amended ("O.Reg.153/04, as amended") is not required at this time.

E6.1 Methodology

The environmental soil screening and laboratory analyses program was carried out in general accordance with the current *Ontario Regulation 153/04 Records of Site Condition, Part XV.1 of the Environmental Protection Act (EPA)*, as amended (O. Reg. 153/04) in order to characterize the soil at the Site and to provide an initial discussion on disposal options for surplus material during future construction. It should be noted that the scope of work does not meet the analytical or administrative requirements of Ontario Regulation 406/19 On Site and Excess Soil Management (O. Reg. 406/19) in the event that the soil is to be considered for beneficial reuse.



A Record of Site Condition (RSC) was not part of the scope of work. Due to the limited scope of work, further environmental assessment would be required in the event that an RSC is required.

E6.2 Sample Selection for Analyses

The environmental component of the subsurface investigation included the following activities:

- Conducting the soil sampling activities in accordance with the Ministry of the Environment (MOE) document entitled "Guide for Completing Phase Two Environmental Site Assessments under Ontario Regulation 153/04" dated June 2011, the Ministry of the Environment and Energy (MOEE) document entitled "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario", dated December 1996; and MOE document entitled "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" issued by the Laboratory Services Branch of the MOE and dated March 9, 2004, amended as of July 1, 2011 (Analytical Protocol);
- Based on City of Brampton instruction, submission of eleven (11) soil samples for laboratory analysis of metals & inorganics, three (3) soil samples for analysis of volatile organic compounds (VOCs) and petroleum hydrocarbons (PHC) F1 to F4, and six (6) soil samples for organochlorine (OC) pesticides to assist in determining appropriate soil disposal options, if required, during construction;
- Submission of one (1) soil sample for Ontario Regulation 347 (*O. Reg. 347*) as amended by Ontario Regulation 558/00 (*O. Reg. 558/00*) Toxicity Characteristic Leaching Procedure (TCLP) for VOCs, polychlorinated biphenyls (PCBs), benzo(a)pyrene and metals and inorganics to determine landfill acceptability of soil/granular fill originating from the Site; and
- Comparison of the laboratory analytical results to soil standards presented in the Ministry of the Environment, Conservation and Parks (MECP) document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act," (the "MECP SCS") dated April 15, 2011 and O. Reg. 347, as amended by O. Reg. 558/00, Schedule 4 Leachate Quality Criteria provided in the MECP document entitled "Registration Guidance Manual For Generators of Liquid Industrial and Hazardous Waste," October 2000 (the "Schedule 4 Criteria").

E6.2.1 Site Condition Standards

All analytical soil results were compared to the MECP Table 1 (background) SCS for all types of Property Use (except Agricultural) Residential/ Parkland /Institutional/Industrial/Commercial/Community Property Use (Table 1 SCS) and MECP Table 3 (generic) SCS for Industrial/Commercial/Community Property Use for Medium/Fine Textured Soils (Table 3 SCS).

The chemical analyses results were also evaluated against the following tables of Appendix 1 (Generic Excess Soil Quality Standards) of the new MECP O.Reg.406/19 "On-Site and Excess Soil Management," additional elements which are expected to come into force in January 2023:

• Table 1 Full Depth Background Site Condition Standards for all types of property use (except agricultural) (Table 1 Excess Soil Quality Standards); and



 Table 3.1 Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent, for industrial/commercial/community property use (Table 3.1 Excess Soil Quality Standards).

TCLP analyses results were compared with O. Reg. 347, as amended by O. Reg. 558/00, Schedule 4 Leachate Quality Criteria provided in the MECP document entitled "Registration Guidance Manual For Generators of Liquid Industrial and Hazardous Waste," October 2000 (the "Schedule 4 Criteria").

TCLP analyses results were also compared with Table 3.1 Leachate Screening Levels for Full Depth Excess Soil in a Non-Potable Ground Water condition, Volume Independent, Industrial/Commercial/Community Property Use, Appendix 2 - Generic Leachate Screening Levels for Excess Soil Reuse – of O.Reg.406/19.

E6.2.2 Soil Sampling, Inspection & Preservation Procedures

Soil samples were obtained for laboratory analysis and field screening, where applicable, using a drill rig equipped with split spoon sampling capabilities. The drillers cleaned the split spoon by removing loose dirt from the split spoon using a wire brush, washing the split spoon using a brush in a dilute mix of potable water and Alconox soap, rinsing the split spoon with distilled water and rinsing the split spoon with methanol and allowing the split spoon to air dry.

The drillers obtained the split spoon sample by auguring to the specified depth, hammering the spoon about 0.6 m into the soil and removing the spoon. The split spoon sample was inspected for visual and/or olfactory evidence of environmental impacts. Disposable nitrile gloves were used and replaced between the handling of successive samples.

The soil samples retrieved from the borehole investigations were examined, classified and logged according to soil type, moisture content, colour, consistency, and presence of visible indicators of environmental impact. Soil samples requiring vapour analysis were split into duplicate fractions upon recovery at the surface. The primary sample fractions were placed in 120 and/or 250 millilitre (mL) sample jars with Teflon-lined lids and methanol preserved (cored) samples were placed in 40 mL vials and subsequently stored in coolers on ice for potential future laboratory analysis. The volatile sample fractions were placed in resealable plastic sample bags and stored at ambient temperature for subsequent field vapour screening. The samples were selected on the basis of visual/olfactory evidence of impacts, field screening results, or from the vicinity of the apparent water table.

Representative soil samples collected during the investigation were submitted to AGAT Laboratories (AGAT) of Mississauga, Ontario, for metals & inorganics, VOCs ,PHCs, and OC pesticides. AGAT is accredited by the Standards Council of Canada (SCC) and the Canadian Association for Laboratory Accreditation (CALA) in accordance with ISO/IEC 17025:2005 – "General Requirements for the Competence of Testing and Calibration Laboratories" for the tested parameters set out in the Soil, Ground Water and Sediment Standards.

E6.3 Environmental Test Results & Considerations

Wood completed a preliminary Environmental Soil Quality Testing Program (the Investigation) as part of the Geotechnical Investigation. The details of the drilling program, including borehole locations and drilling methodology are presented in the geotechnical investigation sections of this report. Soil samples submitted for chemical analysis were collected from depths between surface and 1.4 m below ground surface (mbgs) based on presence of fill material and depth of construction works, as detailed Table D6.1.

Table D6.1: Environmental Tests

Sample ID	Depth (m)	Parameters Tested
E1 SS1	Surface – 0.6	Metals and Inorganics
E2 SS1	Surface – 0.6	Metals and Inorganics and OC Pesticides
E2 SS2	0.8 – 1.4	PHCs and VOCs
E3 SS1	Surface – 0.6	Metals and Inorganics
E3 SS2	0.8 – 1.4	OC Pesticides
E5 SS2	0.8 – 1.4	Metals and Inorganics
E7 SS1	Surface – 0.6	Metals and Inorganics
E23 SS1	Surface – 0.6	Metals and Inorganics
E24 SS1	Surface – 0.6	OC Pesticides
E25 SS1	Surface – 0.6	Metals and Inorganics
E26 SS1	Surface – 0.6	OC Pesticides
E27 SS1	Surface – 0.6	Metals and Inorganics
E27 SS2 + DUP3	0.8 – 1.4	PHCs and VOCs
E28 SS2 + DUP2	0.8 – 1.4	OC Pesticides
E29 SS1	Surface – 0.6	Metals and Inorganics
E30 SS1	Surface – 0.6	Metals and Inorganics
E32 SS1	Surface – 0.6	Metals and Inorganics
E32 SS2	0.8 – 1.4	OC Pesticides

PHC = Petroleum Hydrocarbons

VOC = Volatile Organic Compounds

OC = Organochlorine

Wood observed evidence of fill material in the boreholes.

Headspace combustible organic vapour (COV) and total organic vapour (TOV) concentration measurements recorded in the soil samples were non-detectable.



No evidence (i.e., visual/olfactory) of potential environmental impacts were observed in any of the soil samples.

Where present, detected concentrations of metals and inorganics, PHCs, VOCs, and OC pesticides were below the Table 1 and Table 3 SCS, and Table 1 and Table 3.1 Excess Soil Quality Standards.

The TCLP analyses for the parameters tested indicated that dry soils (soils that would pass a slump test) would meet the Schedule 4 Leachate Quality Criteria and the Table 3.1 Appendix 2 criteria

Soil analytical results are shown in Tables 1E to 10E in Appendix C-E. The laboratory certificates of analysis for the bulk analysis and the certificates of analysis for the O. Reg. 347 TCLP analysis are included in Appendix E.

E6.4 Quality Assurance / Quality Control

<u>Field Quality Control:</u> Field quality control was not performed for this segment and is discussed in separate reports being written as part of the Geotechnical Investigation.

<u>Laboratory Quality Control</u>: The 2011 Analytical Protocol provides requirements for sample handling and storage requirements, reporting requirements, analytical methods and QA/QC procedures for analytical parameters.

As per the 2011 Analytical Protocol, all samples/sample extracts were analyzed within their applicable hold times using approved analytical methods. The report limits were met for all samples and tested parameters. No tested parameter was present in a detectable concentration in any laboratory Method Blank and all laboratory surrogates, reference materials and replicate samples are considered acceptable.



CLOSURE

CLOSURE

The subsoil information and recommendations contained in this report should be used solely for the purpose of geotechnical assessment of the project as described in this report.

The Limitations to Geotechnical Reports are an integral part of this report.

Sincerely,

Wood Environment & Infrastructure Solutions Canada Limited

Hoda Seddik, M.A.Sc., P.I r.a.

Principal Pavement Engir eer

Shami Malla, M.Civ. Eng., P.Eng. Senior Geotechnical Engineer

Alessandro Pellerito, PhD, C.Chem.

Environmental Scientist

Dirka U. Prout, P.Eng.

Senior Geotechnical Engineer

lan A. Powell, B.E.S., P.Geo., QP_{ESA}

Senior Environmental Geoscientist

wood.

LIMITATIONS TO GEOTECHNICAL REPORTS

- 1. The work performed in the preparation of this report and the conclusions presented herein are subject to the following:
 - a) The contract between Wood and the Client, including any subsequent written amendment or Change Order dully signed by the parties (hereinafter together referred as the "Contract");
 - b) Any and all time, budgetary, access and/or site disturbance, risk management preferences, constraints or restrictions as described in the contract, in this report, or in any subsequent communication sent by Wood to the Client in connection to the Contract; and
 - c) The limitations stated herein.
- 2. Standard of care: Wood has prepared this report in a manner consistent with the level of skill and are ordinarily exercised by reputable members of Wood's profession, practicing in the same or similar locality at the time of performance, and subject to the time limits and physical constraints applicable to the scope of work, and terms and conditions for this assignment. No other warranty, guaranty, or representation, expressed or implied, is made or intended in this report, or in any other communication (oral or written) related to this project. The same are specifically disclaimed, including the implied warranties of merchantability and fitness for a particular purpose.
- 3. **Limited locations:** The information contained in this report is restricted to the site and structures evaluated by Wood and to the topics specifically discussed in it, and is not applicable to any other aspects, areas or locations.
- 4. **Information utilized:** The information, conclusions and estimates contained in this report are based exclusively on: i) information available at the time of preparation, ii) the accuracy and completeness of data supplied by the Client or by third parties as instructed by the Client, and iii) the assumptions, conditions and qualifications/limitations set forth in this report.
- 5. **Accuracy of information:** No attempt has been made to verify the accuracy of any information provided by the Client or third parties, except as specifically stated in this report (hereinafter "Supplied Data"). Wood cannot be held responsible for any loss or damage, of either contractual or extra-contractual nature, resulting from conclusions that are based upon reliance on the Supplied Data.
- 6. **Report interpretation:** This report must be read and interpreted in its entirety, as some sections could be inaccurately interpreted when taken individually or out-of-context. The contents of this report are based upon the conditions known and information provided as of the date of preparation. The text of the final version of this report supersedes any other previous versions produced by Wood.
- 7. No legal representations: Wood makes no representations whatsoever concerning the legal significance of its findings, or as to other legal matters touched on in this report, including but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and change. Such interpretations and regulatory changes should be reviewed with legal counsel.
- 8. **Decrease in property value:** Wood shall not be responsible for any decrease, real or perceived, of the property or site's value or failure to complete a transaction, as a consequence of the information contained in this report.
- 9. **No third party reliance:** This report is for the sole use of the party to whom it is addressed unless expressly stated otherwise in the report or Contract. Any use or reproduction which any third party makes of the report, in whole or in part, or any reliance thereon or decisions made based on any information or conclusions in the report is the sole responsibility of such third party. Wood does not represent or warrant the accuracy, completeness, merchantability, fitness for purpose or usefulness of this document, or any information contained in this document, for use or consideration by any third party. Wood accepts no responsibility whatsoever for damages or loss of any nature or

wood.

LIMITATIONS TO GEOTECHNICAL REPORTS

kind suffered by any such third party as a result of actions taken or not taken or decisions made in reliance on this report or anything set out therein. including without limitation, any indirect, special, incidental, punitive or consequential loss, liability or damage of any kind.

- 10. **Assumptions**: Where design recommendations are given in this report, they apply only if the project contemplated by the Client is constructed substantially in accordance with the details stated in this report. It is the sole responsibility of the Client to provide to Wood changes made in the project, including but not limited to, details in the design, conditions, engineering or construction that could in any manner whatsoever impact the validity of the recommendations made in the report. Wood shall be entitled to additional compensation from Client to review and assess the effect of such changes to the project.
- 11. **Time dependence**: If the project contemplated by the Client is not undertaken within a period of 18 months following the submission of this report, or within the time frame understood by Wood to be contemplated by the Client at the commencement of Wood's assignment, and/or, if any changes are made, for example, to the elevation, design or nature of any development on the site, its size and configuration, the location of any development on the site and its orientation, the use of the site, performance criteria and the location of any physical infrastructure, the conclusions and recommendations presented herein should not be considered valid unless the impact of the said changes is evaluated by Wood, and the conclusions of the report are amended or are validated in writing accordingly.

Advancements in the practice of geotechnical engineering, engineering geology and hydrogeology and changes in applicable regulations, standards, codes or criteria could impact the contents of the report, in which case, a supplementary report may be required. The requirements for such a review remain the sole responsibility of the Client or their agents.

Wood will not be liable to update or revise the report to take into account any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

- 12. **Limitations of visual inspections:** Where conclusions and recommendations are given based on a visual inspection conducted by Wood, they relate only to the natural or man-made structures, slopes, etc. inspected at the time the site visit was performed. These conclusions cannot and are not extended to include those portions of the site or structures, which were not reasonably available, in Wood's opinion, for direct observation.
- 13. **Limitations of site investigations**: Site exploration identifies specific subsurface conditions only at those points from which samples have been taken and only at the time of the site investigation. Site investigation programs are a professional estimate of the scope of investigation required to provide a general profile of subsurface conditions.

The data derived from the site investigation program and subsequent laboratory testing are interpreted by trained personnel and extrapolated across the site to form an inferred geological representation and an engineering opinion is rendered about overall subsurface conditions and their likely behaviour with regard to the proposed development. Despite this investigation, conditions between and beyond the borehole/test hole locations may differ from those encountered at the borehole/test hole locations and the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies.

Final sub-surface/bore/profile logs are developed by geotechnical engineers based upon their interpretation of field logs and laboratory evaluation of field samples. Customarily, only the final bore/profile logs are included in geotechnical engineering reports.

Bedrock, soil properties and groundwater conditions can be significantly altered by environmental remediation and/or construction activities such as the use of heavy equipment or machinery, excavation, blasting, pile-driving or

wood.

LIMITATIONS TO GEOTECHNICAL REPORTS

draining or other activities conducted either directly on site or on adjacent terrain. These properties can also be indirectly affected by exposure to unfavorable natural events or weather conditions, including freezing, drought, precipitation and snowmelt.

During construction, excavation is frequently undertaken which exposes the actual subsurface and groundwater conditions between and beyond the test locations, which may differ from those encountered at the test locations. It is recommended practice that Wood be retained during construction to confirm that the subsurface conditions throughout the site do not deviate materially from those encountered at the test locations, that construction work has no negative impact on the geotechnical aspects of the design, to adjust recommendations in accordance with conditions as additional site information is gained and to deal quickly with geotechnical considerations if they arise.

Interpretations and recommendations presented herein may not be valid if an adequate level of review or inspection by Wood is not provided during construction.

14. Factors that may affect construction methods, costs and scheduling: The performance of rock and soil materials during construction is greatly influenced by the means and methods of construction. Where comments are made relating to possible methods of construction, construction costs, construction techniques, sequencing, equipment or scheduling, they are intended only for the guidance of the project design professionals, and those responsible for construction monitoring. The number of test holes may not be sufficient to determine the local underground conditions between test locations that may affect construction costs, construction techniques, sequencing, equipment, scheduling, operational planning, etc.

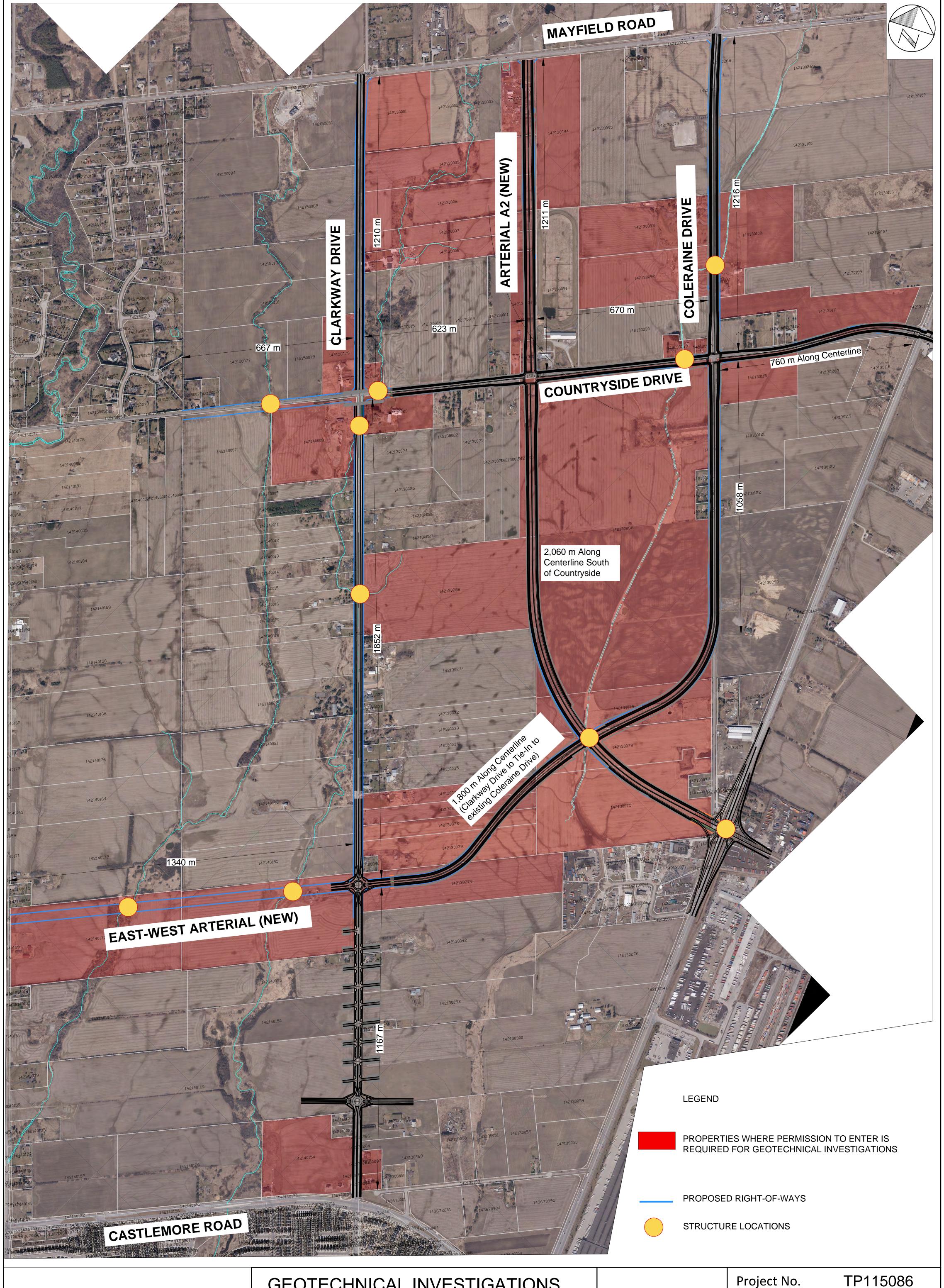
Any contractors bidding on or undertaking the works should draw their own conclusions as to how the subsurface and groundwater conditions may affect their work, based on their own investigations and interpretations of the factual soil data, groundwater observations, and other factual information.

- 15. **Groundwater and Dewatering**: Wood will accept no responsibility for the effects of drainage and/or dewatering measures if Wood has not been specifically consulted and involved in the design and monitoring of the drainage and/or dewatering system.
- 16. **Environmental and Hazardous Materials Aspects**: Unless otherwise stated, the information contained in this report in no way reflects on the environmental aspects of this project, since this aspect is beyond the Scope of Work and the Contract. Unless expressly included in the Scope of Work, this report specifically excludes the identification or interpretation of environmental conditions such as contamination, hazardous materials, wild life conditions, rare plants or archeology conditions that may affect use or design at the site. This report specifically excludes the investigation, detection, prevention or assessment of conditions that can contribute to moisture, mould or other microbial contaminant growth and/or other moisture related deterioration, such as corrosion, decay, rot in buildings or their surroundings. Any statements in this report or on the boring logs regarding odours, colours, and unusual or suspicious items or conditions are strictly for informational purposes
- 17. **Sample Disposal**: Wood will dispose of all uncontaminated soil and rock samples after 30 days following the release of the final geotechnical report. Should the Client request that the samples be retained for a longer time, the Client will be billed for such storage at an agreed upon rate. Contaminated samples of soil, rock or groundwater are the property of the Client, and the Client will be responsible for the proper disposal of these samples, unless previously arranged for with Wood or a third party.



FIGURES

wood.





GEOTECHNICAL INVESTIGATIONS A OA S

I L OLICY AREA 47

ARTERIAL ROAD NETWORK WITHIN HIGHWAY 427 INDUSTRIAL SECONDARY PLAN AREA (AREA 17) GEOTECHNICAMPERIMPSISHOW TO ENTER

TP115086 Project No. JUNE 3, 2019 Date

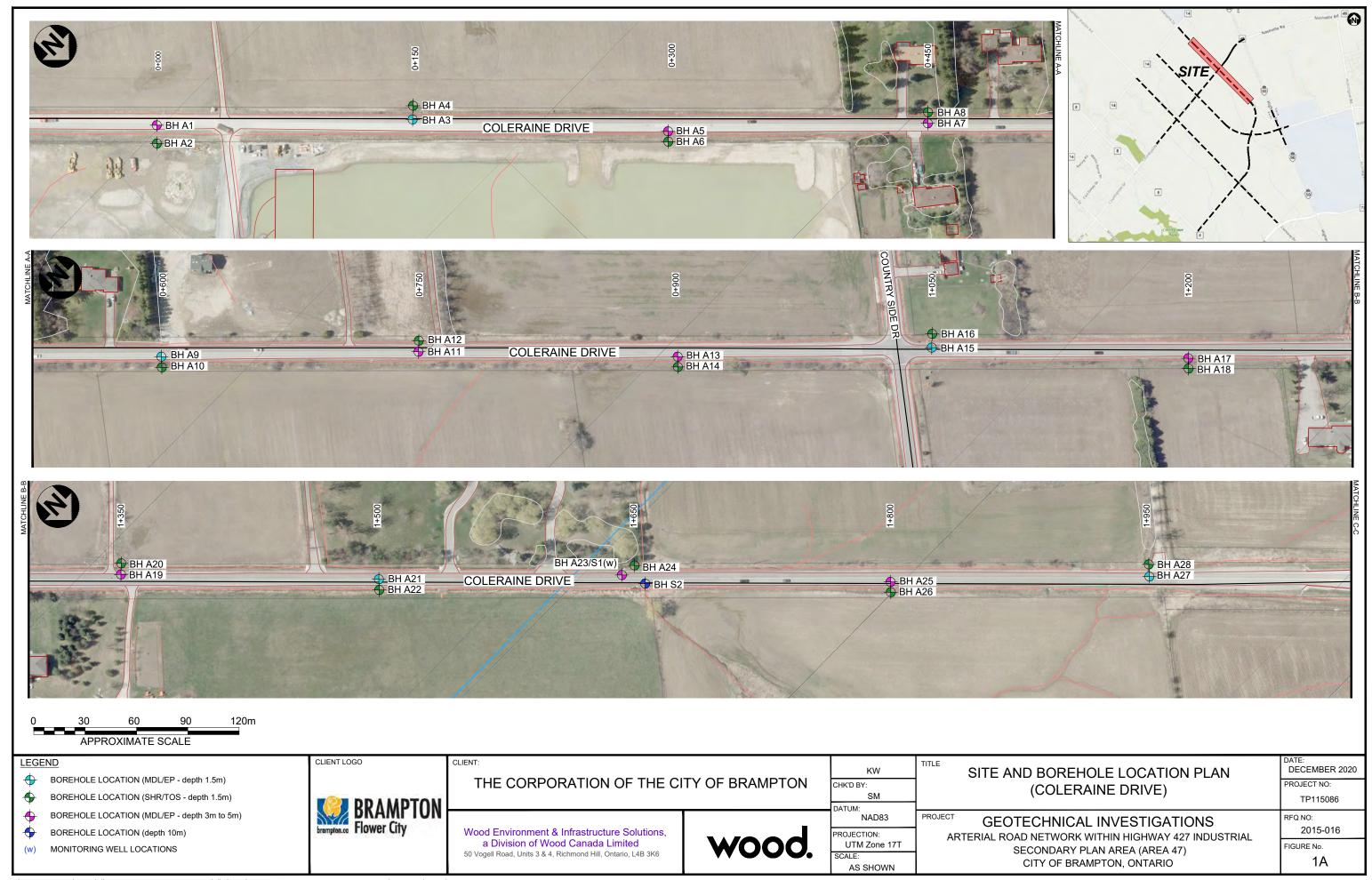
Drawing No.

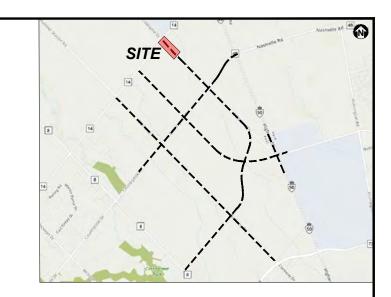


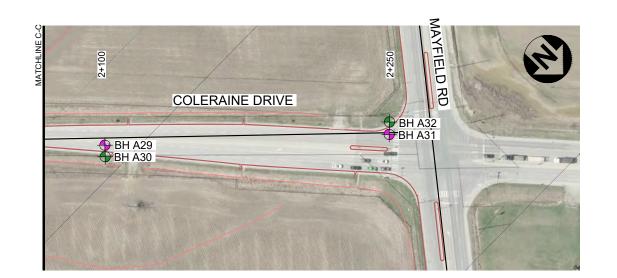
SECTION A COLERAINE DRIVE (FROM ARTERIAL A2 TO MAYFIELD DRIVE, ~3 KM)

FIGURES











BOREHOLE LOCATION (MDL/EP - depth 1.5m)

BOREHOLE LOCATION (SHR/TOS - depth 1.5m)

BOREHOLE LOCATION (MDL/EP - depth 3m to 5m)

BOREHOLE LOCATION (depth 10m) MONITORING WELL LOCATIONS

CLIENT LOGO

THE CORPORATION OF THE CITY OF BRAMPTON

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited 50 Vogell Road, Units 3 & 4, Richmond Hill, Ontario, L4B 3K6

Wood.

KW CHK'D BY: SM

DATUM: NAD83

ROJECTION: UTM Zone 17T AS SHOWN

TITLE SITE AND BOREHOLE LOCATION PLAN (COLERAINE DRIVE)

CITY OF BRAMPTON, ONTARIO

GEOTECHNICAL INVESTIGATIONS ARTERIAL ROAD NETWORK WITHIN HIGHWAY 427 INDUSTRIAL SECONDARY PLAN AREA (AREA 47)

DECEMBER 2020 PROJECT NO: TP115086 RFQ NO:

2015-016

FIGURE No. 1B

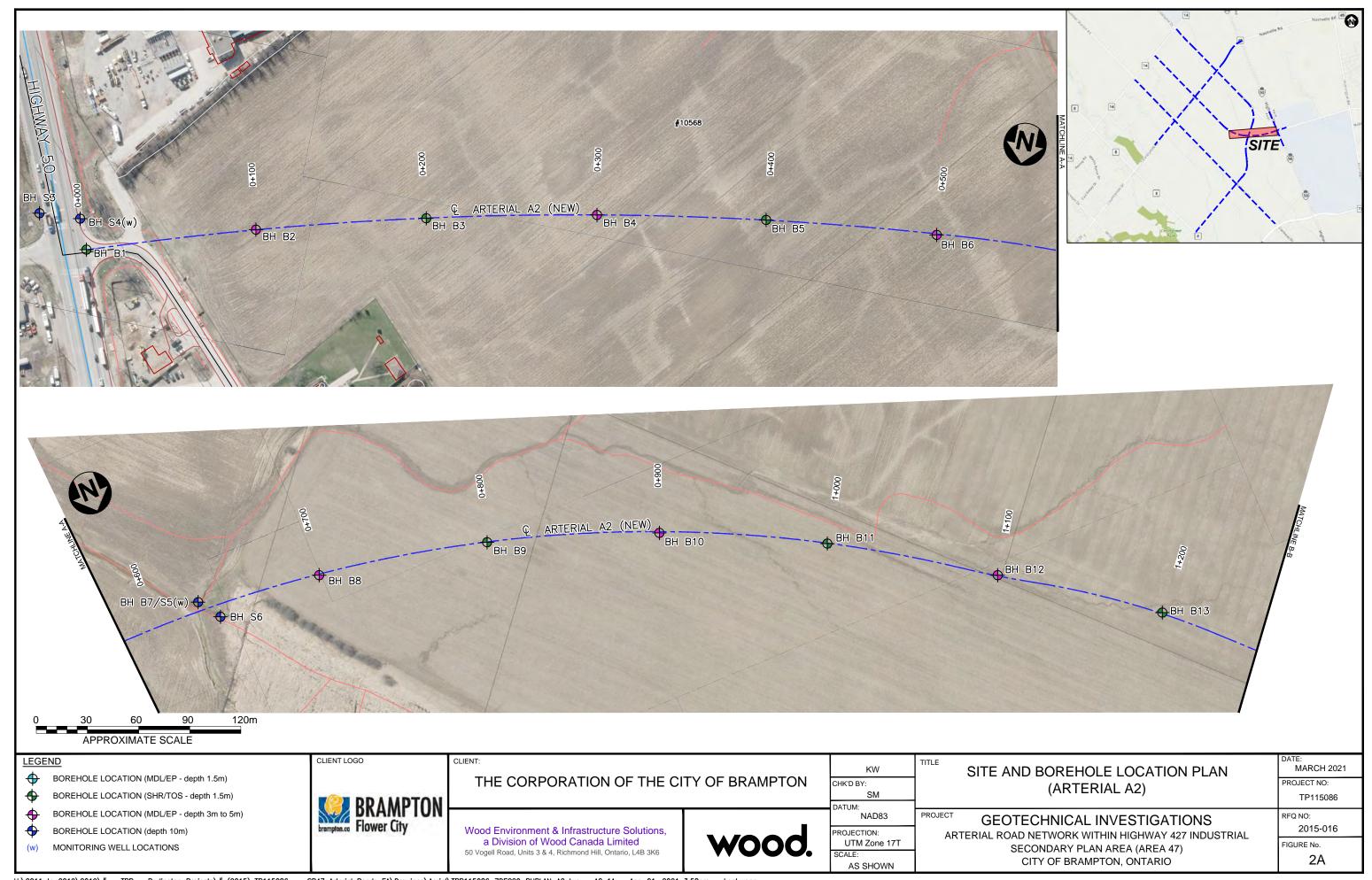
BRAMPTON Flower City

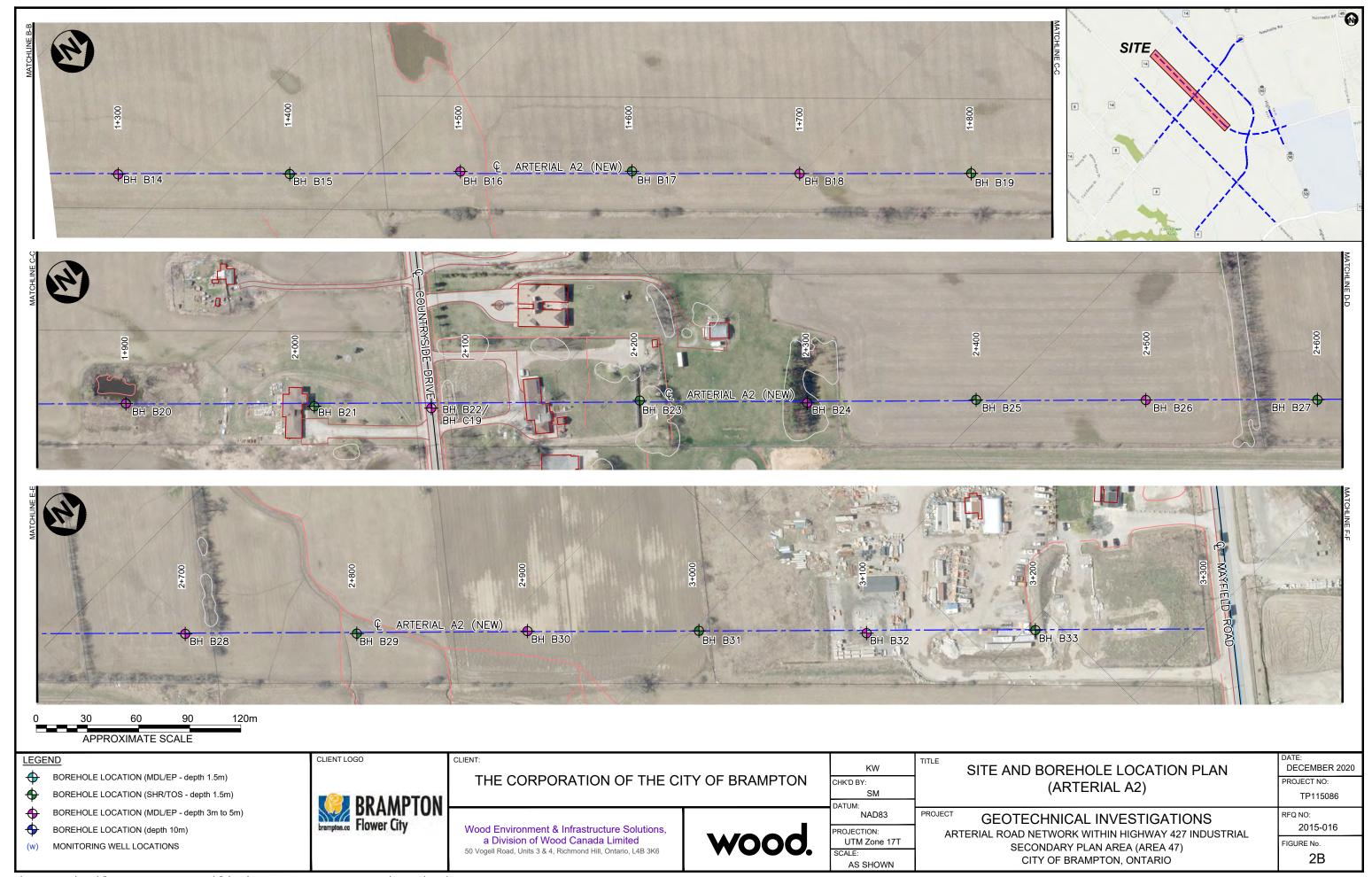


SECTION B ARTERIAL A2 (FROM MAYFIELD ROAD TO MAJOR MACKENZIE DRIVE / RR 50, ~3.4 KM)

FIGURES





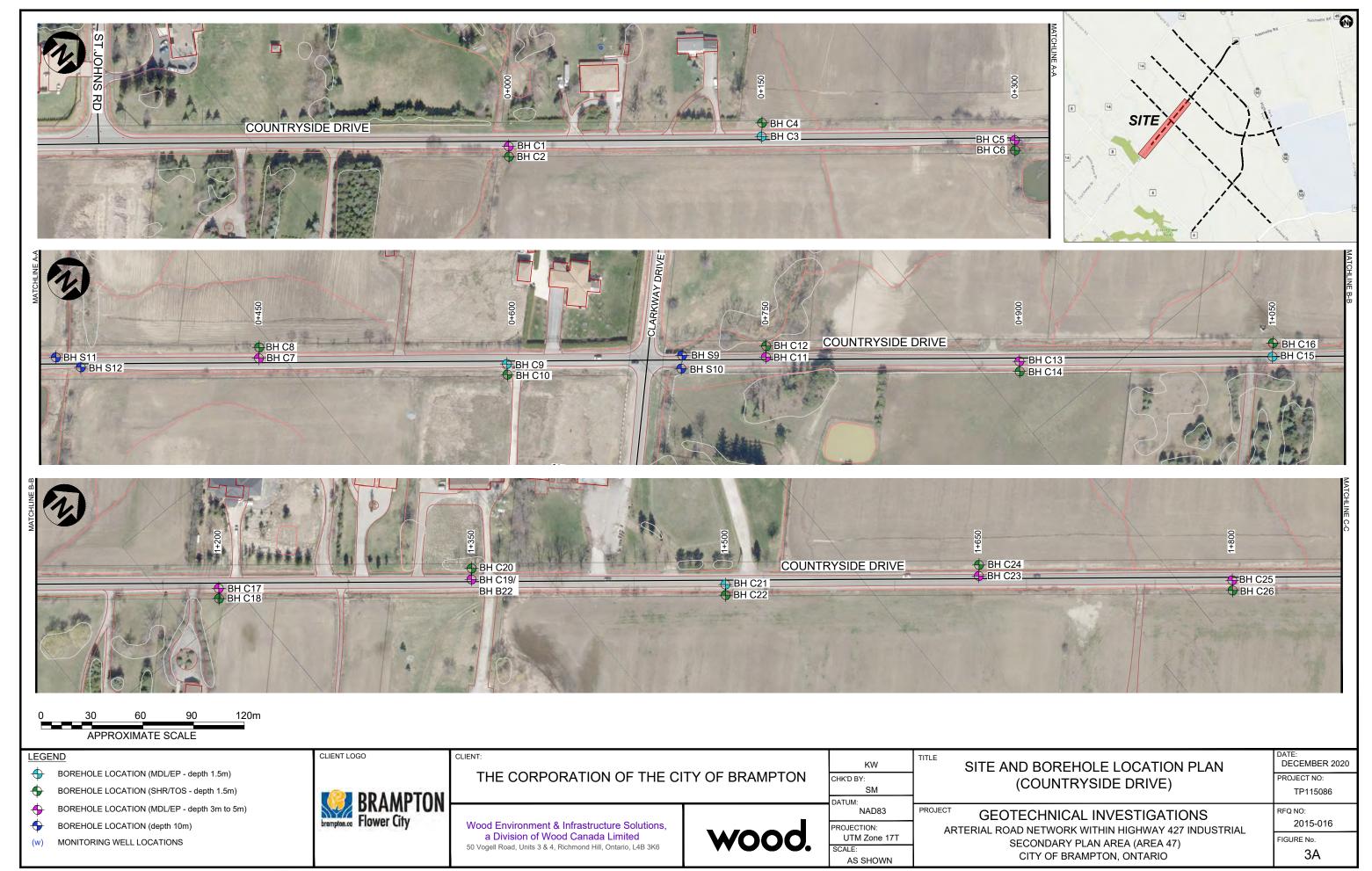


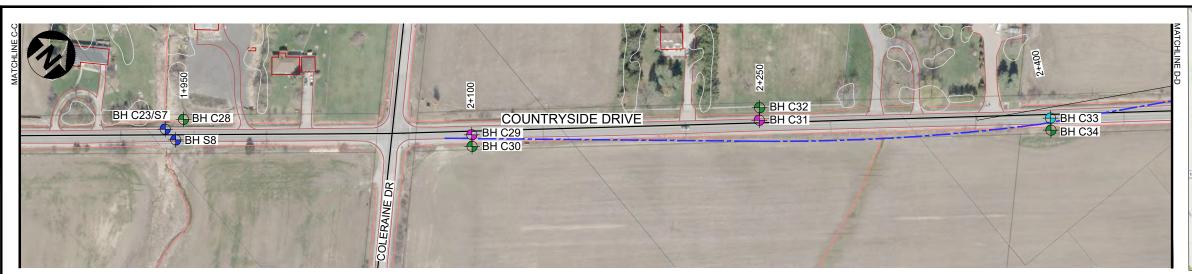


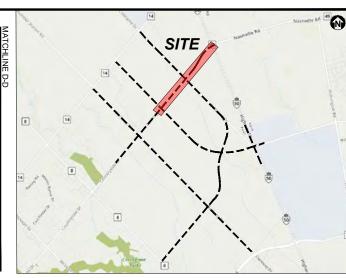
SECTION C COUNTRYSIDE DRIVE (FROM CLARKWAY DRIVE TO RR 50, ~3 KM)

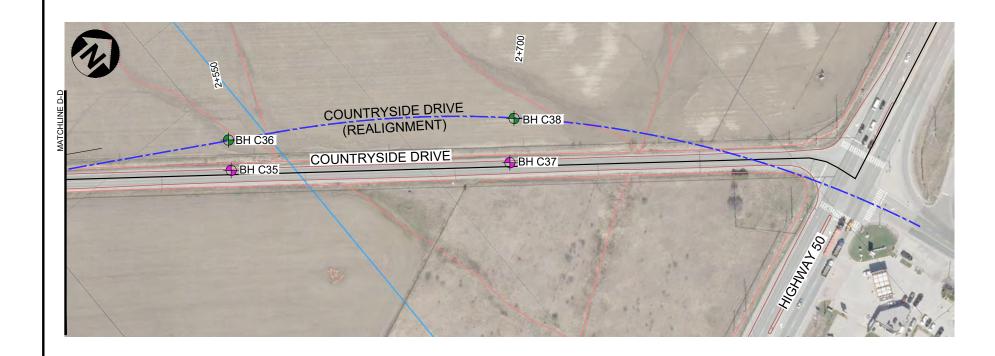
FIGURES











0	30	60	90	120m		
APPROXIMATE SCALE						

BOREHOLE LOCATION (MDL/EP - depth 1.5m)

BOREHOLE LOCATION (SHR/TOS - depth 1.5m)

BOREHOLE LOCATION (MDL/EP - depth 3m to 5m)

BOREHOLE LOCATION (depth 10m)

MONITORING WELL LOCATIONS

CLIENT LOGO

BRAMPTON Flower City

THE CORPORATION OF THE CITY OF BRAMPTON

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited 50 Vogell Road, Units 3 & 4, Richmond Hill, Ontario, L4B 3K6

Wood

TITLE

SM DATUM: NAD83

CHK'D BY:

KW

ROJECTION: UTM Zone 17T AS SHOWN

SITE AND BOREHOLE LOCATION PLAN (COUNTRYSIDE DRIVE)

GEOTECHNICAL INVESTIGATIONS ARTERIAL ROAD NETWORK WITHIN HIGHWAY 427 INDUSTRIAL SECONDARY PLAN AREA (AREA 47) CITY OF BRAMPTON, ONTARIO

DECEMBER 2020 PROJECT NO: TP115086

> RFQ NO: 2015-016

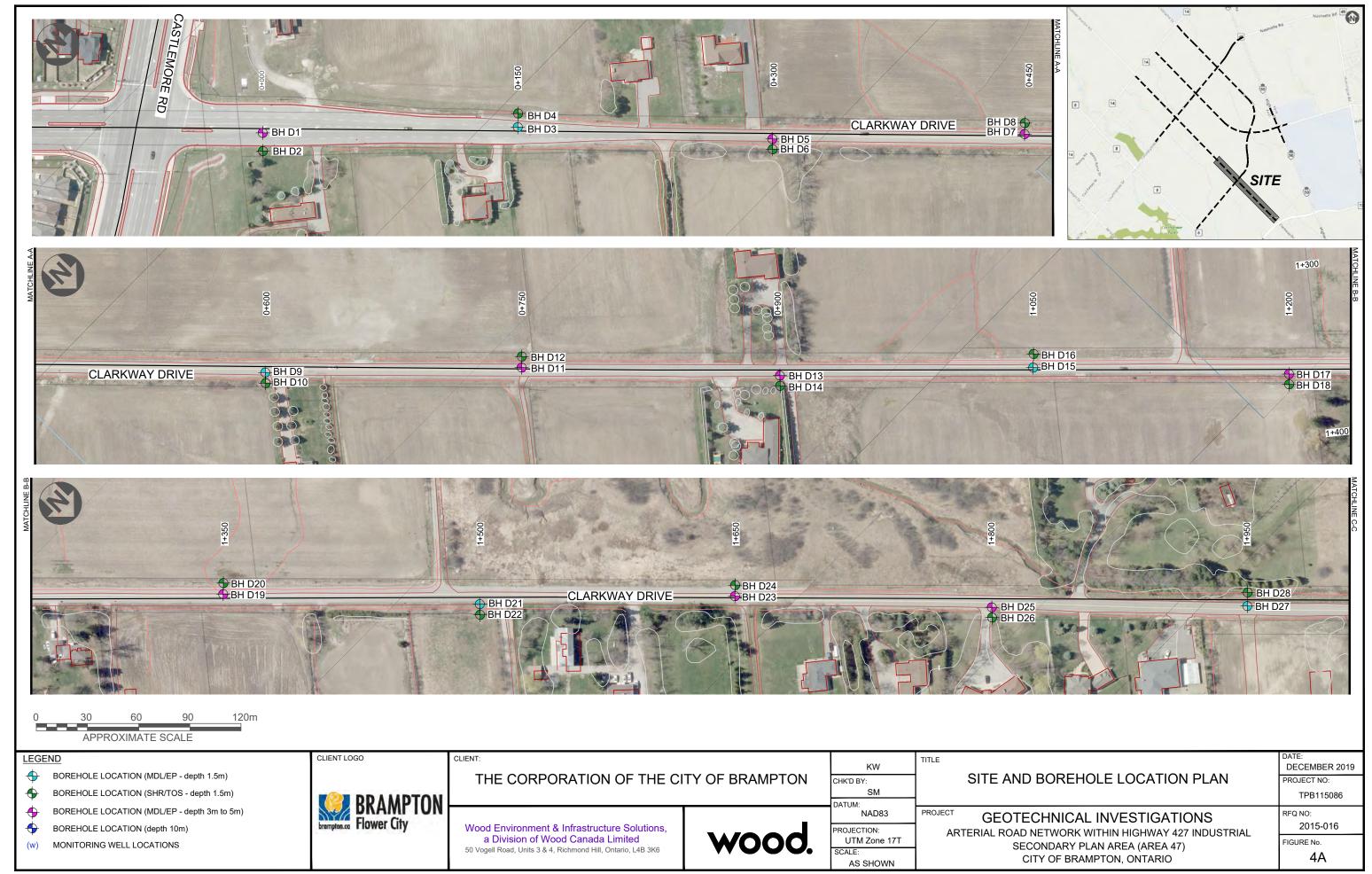
FIGURE No. 3B

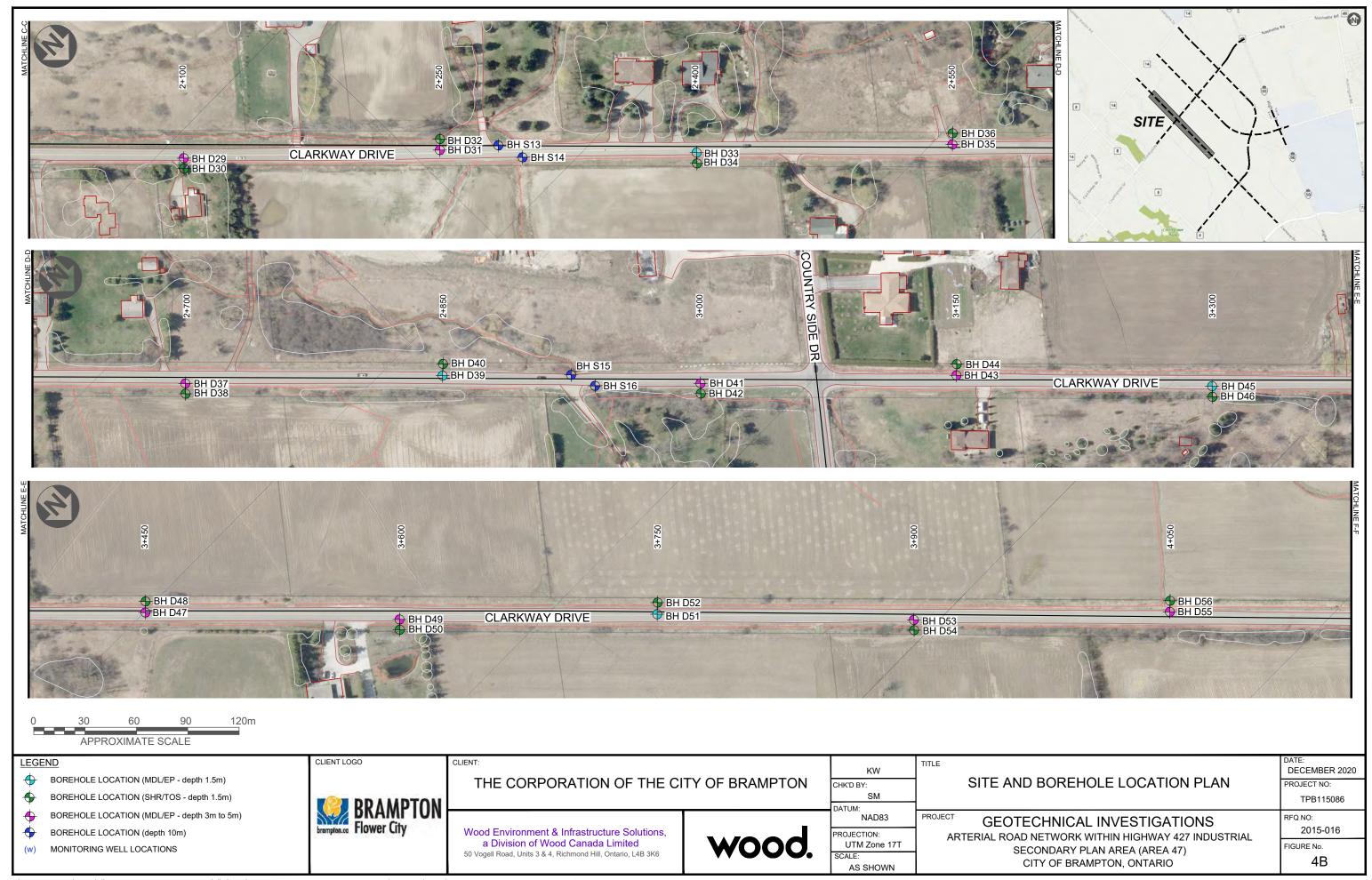


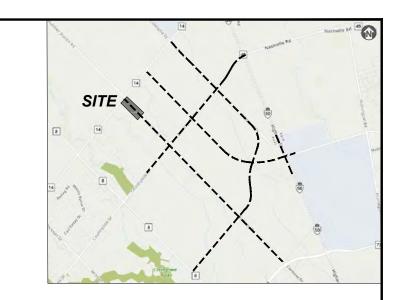
SECTION D CLARKWAY DRIVE (FROM CASTLEMORE ROAD TO MAYFIELD DRIVE, ~3 KM)

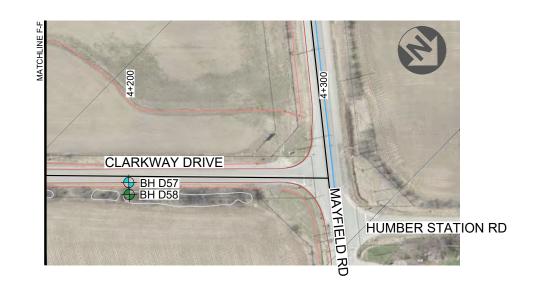
FIGURES













BOREHOLE LOCATION (MDL/EP - depth 1.5m)

BOREHOLE LOCATION (SHR/TOS - depth 1.5m)

BOREHOLE LOCATION (MDL/EP - depth 3m to 5m)

BOREHOLE LOCATION (depth 10m)

MONITORING WELL LOCATIONS

CLIENT LOGO

BRAMPTON Flower City

THE CORPORATION OF THE CITY OF BRAMPTON

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited 50 Vogell Road, Units 3 & 4, Richmond Hill, Ontario, L4B 3K6

Wood.

TITLE

SM DATUM: NAD83

CHK'D BY:

KW

ROJECTION: UTM Zone 17T

AS SHOWN

SITE AND BOREHOLE LOCATION PLAN

GEOTECHNICAL INVESTIGATIONS ARTERIAL ROAD NETWORK WITHIN HIGHWAY 427 INDUSTRIAL SECONDARY PLAN AREA (AREA 47) CITY OF BRAMPTON, ONTARIO

DECEMBER 2020 PROJECT NO: TPB115086 RFQ NO:

> 2015-016 FIGURE No.

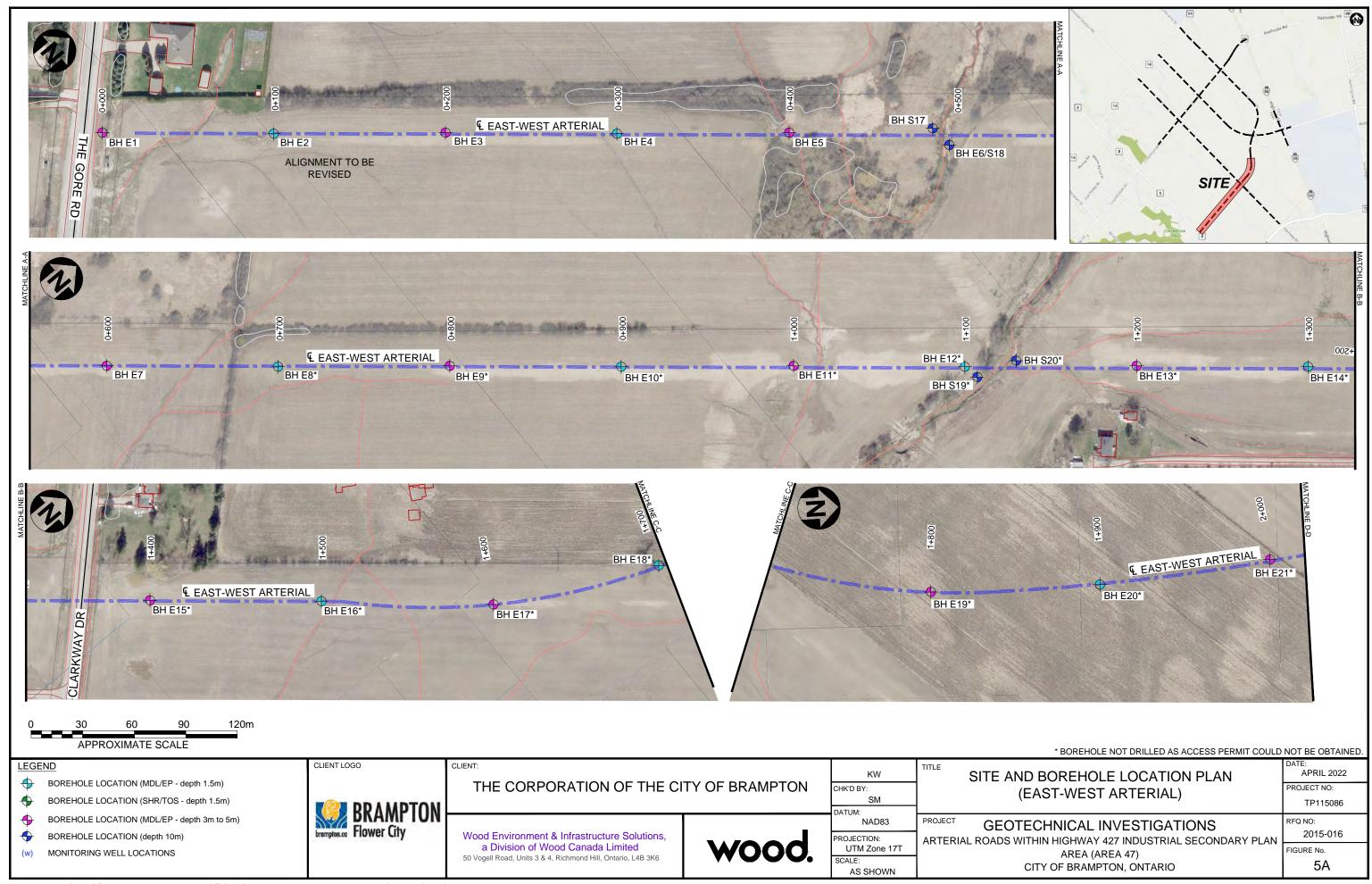
4C

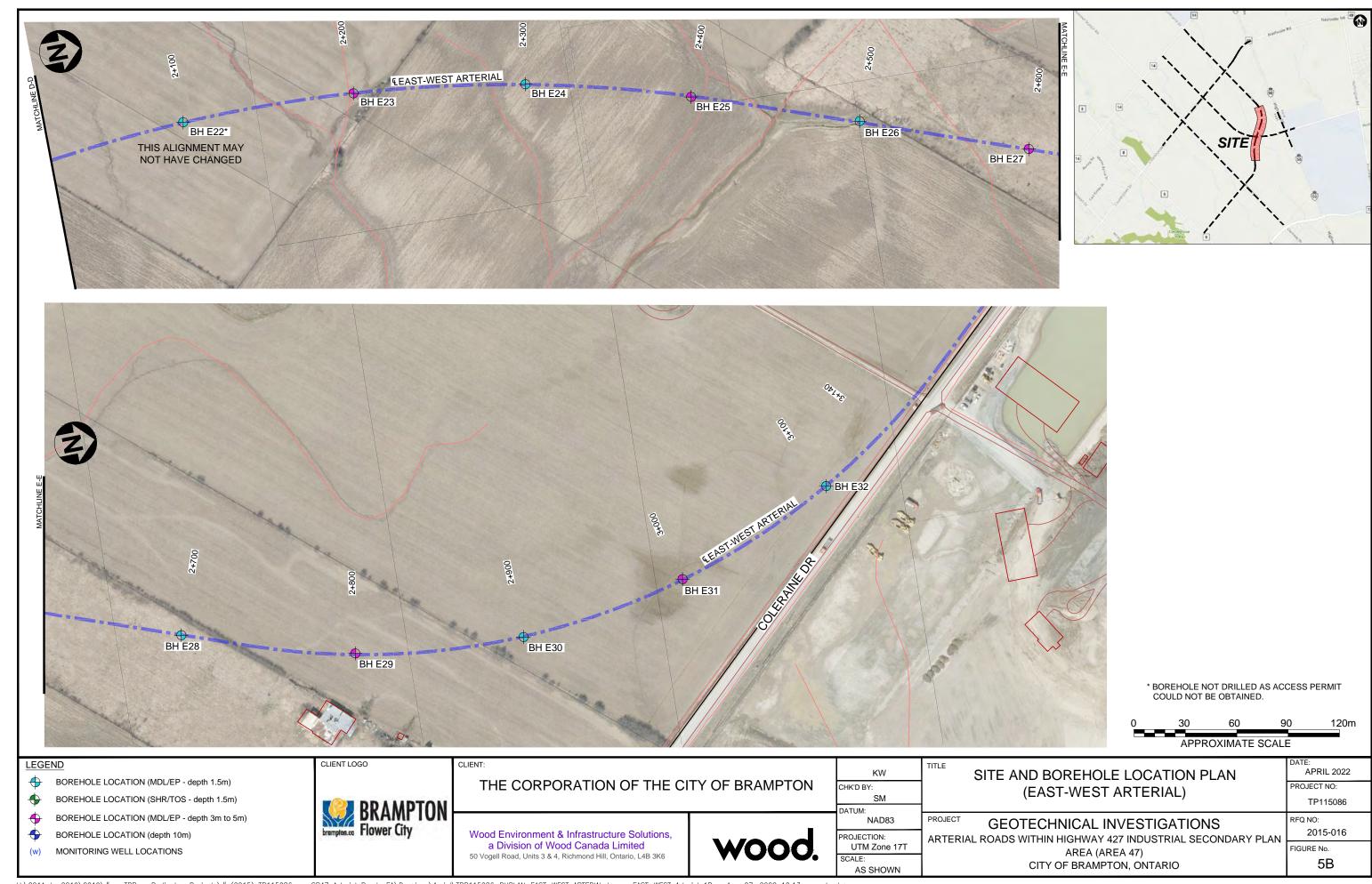


SECTION E EAST – WEST ARTERIAL ROAD (FROM THE GORE ROAD TO COLERAINE DRIVE, ~2.4 KM)

FIGURES









EXPLANATION OF BOREHOLE LOGS AND RECORD OF BOREHOLES

wood.

EXPLANATION OF BOREHOLE LOG

This form describes some of the information provided on the borehole logs, which is based primarily on examination of the recovered samples, and the results of the field and laboratory tests. Additional description of the soil/rock encountered is given in the accompanying geotechnical report.

GENERAL INFORMATION

Project details, borehole number, location coordinates and type of drilling equipment used are given at the top of the borehole log.

SOIL LITHOLOGY

Elevation and Depth

This column gives the elevation and depth of inferred geologic layers. The elevation is referred to the datum shown in the Description column.

Lithology Plot

This column presents a graphic depiction of the soil and rock stratigraphy encountered within the borehole.

Description

This column gives a description of the soil stratums, based on visual and tactile examination of the samples augmented with field and laboratory test results. Each stratum is described according to the *Modified Unified Soil Classification System*.

The compactness condition of cohesionless soils (SPT) and the consistency of cohesive soils (undrained shear strength) are defined as follows (Ref. Canadian Foundation Engineering Manual):

Compac	tness of
<u>Cohesionless</u> <u>Soils</u>	SPT N-Value
Very loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	> 50

Consistency of	<u>Undrained</u>	Shear Strength
Cohesive Soils	<u>kPa</u>	<u>psf</u>
Very soft	0 to 12	0 to 250
Soft	12 to 25	250 to 500
Firm	25 to 50	500 to 1000
Stiff	50 to 100	1000 to 2000
Very stiff	100 to 200	2000 to 4000
Hard	Over 200	Over 4000

Soil Sampling

Sample types are abbreviated as follows:

SS	Split Spoon	TW	Thin Wall Open (Pushed)	RC	Rock Core
AS	Auger Sample	TP	Thin Wall Piston (Pushed)	WS	Washed Sample

Additional information provided in this section includes sample numbering, sample recovery and numerical testing results.

Field and Laboratory Testing

Results of field testing (e.g., SPT, pocket penetrometer, and vane testing) and laboratory testing (e.g., natural moisture content, and limits) executed on the recovered samples are plotted in this section.

Instrumentation Installation

Instrumentation installations (monitoring wells, piezometers, inclinometers, etc.) are plotted in this section. Water levels, if measured during fieldwork, are also plotted. These water levels may or may not be representative of the static groundwater level depending on the nature of soil stratum where the piezometer tips are located, the time elapsed from installation to reading and other applicable factors.

Comments

This column is used to describe non-standard situations or notes of interest.

Wood Environment & Infrastructure Solutions

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada

Tel. No.: (905) 415-2632 www.woodplc.com

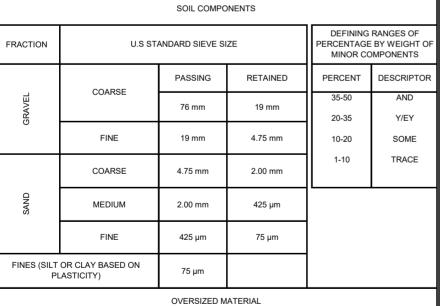
wood.

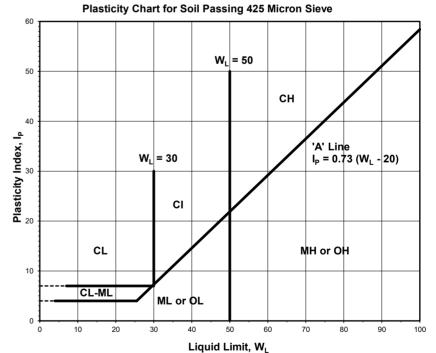
MODIFIED * UNIFIED CLASSIFICATION SYSTEM FOR SOILS

*The soil of each stratum is described using the Unified Soil Classification System (Technical Memorandum 36-357 prepared by Waterways Experiment Station, Vicksburg, Mississippi, Corps of Engineers, U.S Army. Vol. 1

March 1953.) modified slightly so that an inorganic clay of "medium plasticity" is recognized.

			March 1	953.) modified slightly so that an inorganic clay of "medium plasticity" is recognized.	
	MAJOR DIVISION		GROUP SYMBOL	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA
WEIGHT	THAN HALF RACTION 14.75mm	CLEAN GRAVELS	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	$C_u = D_{60} > 4$; $C_C = \frac{(D_{30})^2}{D_{10} \times D_{10} \times D_{60}} = 1 \text{ to } 3$
BY WEI	RAVELS MORE THAN HAL THE COARSE FRACTION LARGER THAN 4.75mm	(TRACE OR NO FINES)	GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS
AN HALF	GRAVELS MORE THE COARSE F LARGER THAN	DIRTY GRAVELS (WITH SOME OR	GM	SILTY GRAVELS, GRAVEL-SAND- SILT MIXTURES	ATTERBERG LIMITS BELOW "A" LINE OR P.I LESS THAN 4
ORE TH	ō	MORE FINES)	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES	ATTERBERG LIMITS ABOVE "A" LINE OR P.I MORE THAN 7
SOILS (MORE THAN HALF BY LARGER THAN 75µm)	AALLER	CLEAN SANDS (TRACE OR NO	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	$C_u = \frac{D_{60}}{D_{10}} > 6; C_C = \frac{(D_{30})^2}{D_{10}} = 1 \text{ to } 3$
AINED S	RE THAN RACTION IAN 4.75m		SP	POORLY GRADED GRAVELS, GRAVEL- SAND MIXTURES, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS
COARSE GRAINED L	MORE THAN	DIRTY SANDS (WITH SOME OR	SM	SILTY SANDS, SAND-SILT MIXTURES	ATTERBERG LIMITS BELOW "A" LINE OR P.I LESS THAN 4
700		MORE FINES)	SC	CLAYEY SANDS, SAND-CLAY MIXTURES	ATTERBERG LIMITS ABOVE "A" LINE OR P.I MORE THAN 7
HT SMALLER	SILTS BELOW "A" LINE NEGLIGIBLE ORGANIC CONTENT	W _L < 50	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY SANDS OF SLIGHT PLASTICITY	
BY WEIGHT	SILTS B NEGLIG C	W _L > 50	МН	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS	CLASSIFICATION IS BASED UPON PLASTICITY CHART
ORE THAN HALF E THAN 75µm)	CLAYS ABOVE "A" LINE NEGLIGIBLE ORGANIC CONTENT	W _L < 30	CL	INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY OR SILTY CLAYS, LEAN CLAYS	(SEE BELOW)
AORE TH	ABOVE GIBLE OI CONTEN	30 < W _L < 50	CI	INORGANIC CLAYS OF MEDIUM PLASTICITY, SILTY CLAYS	
SOILS (N		W _L > 50	СН	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
RAINED	FINE-GRAINED SOILS (MORE THA CONT SLITS CLAYS ABO) & CLAYS BELOW NEGLIGIBLE "A" LINE CONT		OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	WHENEVER THE NATURE OF THE FINES CONTENT HAS NOT
FINE-GI			ОН	ORGANIC CLAYS OF HIGH PLASTICITY	BEEN DETERMINED, IT IS DESIGNATED BY THE LETTER "F", E.G SF IS A MIXTURE OF SAND WITH SILT OR CLAY
	HIGH ORGANIC SOILS	<u> </u>	Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS	STRONG COLOUR OR ODOUR, AND OFTEN FIBROUS TEXTURE





Wood Environment & Infrastructure Solutions

ROUNDED OR SUBROUNDED: COBBLES 76 mm TO 200 mm BOULDERS > 200 mm

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada

Tel. No.: (905) 415-2632 www.woodplc.com

wood.

NOT ROUNDED:

ROCK FRAGMENTS > 76 mm ROCKS > 0.76 CUBIC METRE IN VOLUME

Note 1: Soils are classified and described according to their engineering properties

Note 2: The modifying adjectives used to define the actual or estimated percentage range by weight of minor components are consistent with the Canadian Foundation Engineering Manual.



SECTION A COLERAINE DRIVE (FROM ARTERIAL A2 TO MAYFIELD DRIVE ~3 KM)

RECORD OF BOREHOLES



R	ECORD	OF BOREHO	LE N	o.	BH.	<u>A1</u>										W	00	d
Pro	ject Number:	TP115086							Drilling	g Location:	Coleraine Di	r., NBL, Sta	a. 0+000 E:605	646	Lo	ogged by:	MS	
Pro	ject Client:	City of Brampton							Drilling	g Method:	N:4853212 150 mm So	olid Stem A	ugers		c	ompiled b	y: PR	
Pro	ject Name:	Arterial Road Network Secondary Plan Area (within H	lighwa	y 427	Industr	ial		Drilling	g Machine:	Truck Moun	ted Drill			R	eviewed l	oy: <u>SM/I</u>	DP
Pro	ject Location:	Brampton, Ontario	(Area 47)						Date	Started:	Jan 21, 2020	Date	Completed: <u>Ja</u>	n 21, 202	20 R	evision N	o.: <u>0, 12</u>	2/1/20
	LITH	HOLOGY PROFILE		SC	IL SA	MPLI	NG			FIELD	TESTING		TESTING					
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould * Undrained She	tionTesting PPT	△ COV (LE 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	m) □ TOV (ppm) 00 300 400 W W _L ⊕ Liquid	INSTRUMENTATION INSTALLATION	[GR	COMM & GRAIN DISTRIB (%	SIZE SUTION	CL
	Geodetic Ground	Surface Elevation: 215.5 m bout 180 mm ASPHALT	215.3	S	S	<u> </u>	S	-	ш	20 40	60 80	20 4	0 60 80	22	OI C	- OA		
$\overset{\times\!\!\!\times}{\times\!\!\!\!\times}$	\	Sand and Gravel FILL moist	21 5.2 0. 3					Ė										
	tra	dark grey/brown Silty Clay FILL ace gravel, trace organics	,	SS	1	100	10	- - - -	215 -	0		25						
			214.0	SS	2	83	25	1 - - - -	214 -	0		a o						
		brown/grey SILTY CLAY TILL trace sand, trace gravel very stiff to hard	1.5	SS	3	100	37	- - - - - 2	214	0		as o 18						
		cobbles/boulders		SS	4	83	37	- - - - -	213 -	0	ı	as o 14						
				SS	5	100	38	- - - - - -	212 -	0		as o 12						
		grey		SS	6	100	25	- - - - 4		0		a α <u> </u>			3	30	45	22
				SS	7	100	33	- - - -	211 -	0	1	as o 13						
XX		END OF BOREHOLE	210.5 5.0					<u> </u>										

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD OF BOREHOLE N	o.	BH	<u>A2</u>								wood.
Pro	ject Number: TP115086						Drilling	Location:	Coleraine Di N:4853213	r., NBL, Sta. 0+000 E:605	648	Logged by: MS
Pro	ject Client: City of Brampton						Drilling	Method:	150 mm So	lid Stem Augers		Compiled by: PR
Pro	ject Name: Arterial Road Network within F Secondary Plan Area (Area 47)	lighwa	y 427 l	ndustr	ial		Drilling	Machine:	Truck Mount	ted Drill		Reviewed by: SM/DP
Pro	ject Location: Brampton, Ontario						Date S	Started:	Jan 21, 2020	Date Completed: <u>Ja</u>	n 21, 20	20 Revision No.: 0, 12/1/20
	LITHOLOGY PROFILE	SC	IL SA	MPLI	NG			FIELD	TESTING	LAB TESTING Soil Vapour Reading	_	
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould	tionTesting PPT	COV (LEL) ■ TOV (LEL) 2 4 6 8 △ COV (ppm) □ TOV (ppm) 100 200 300 400 W ₉ W W ₄ ■ COV (ppm) Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
$\overline{\otimes}$	Geodetic Ground Surface Elevation: 215.4 m Sand and Gravel FILL moist	0)	0)	ш.	0)	-		20 40	00 00	20 40 60 60	_==_	Ground frozen to about 300 mm below surface
$\overset{**}{\overset{*}{\overset{*}{\overset{*}{\overset{*}{\overset{*}}{\overset{*}{\overset{*}}{\overset{*}}{\overset{*}}{\overset{*}{\overset{*}}{\overset{*}}{\overset{*}}}}}}}$	214.9	SS	1	100	61	-	215 -		0	•		Solo Woundoon
	dark grey/brown 0.5 Silty Clay FILL trace sand, trace gravel, with oxidation	ss	2	100	10	- - - -		0				
\bigotimes	214.1					- 1 -						
	brown 1.2 SILTY CLAY / CLAYEY SILT TILL trace sand, tarce gravel very stiff	SS	3	100	29	- - - -	214 -	0		•		
	213.5 END OF BOREHOLE 1.8					_	-					
								: :	1 1	: : : :		

 $\frac{\textstyle \sum}{\textstyle =}$ No freestanding groundwater measured in open borehole on completion of drilling.

RECORD OF BOREHOLE No. BH A3 Project Number: TP115086 Drilling Location: Coleraine Dr., SBL, Sta. 0+150 E:605516 N:4853330														W	00	d.	
Pro	ect Number: TP115086							Drilling	Location:	Coleraine D	., SBL, S	ta. 0+150 E:605	516	Lo	gged by:	MS	
Pro	ect Client: City of Brampton							Drilling	g Method:	150 mm So	lid Stem	Augers		Co	ompiled by	/: <u>PR</u>	
Proj	ect Name: Arterial Road Network with	hin Hi	ghwa	y 427 I	ndustr	ial		Drilling	g Machine:	Truck Moun	ed Drill			Re	eviewed b	y: SM/ C)P
Proj	Secondary Plan Area (Area ect Location: Brampton, Ontario	a 47)						_ Date S	Started:	Jan 21, 2020	Date	Completed: Ja	n 21, 202	. 0 Re	evision No	.: <u>0, 12</u>	/1/20
	LITHOLOGY PROFILE		SO	IL SA	MPLI	NG			FIELD	TESTING		TESTING					
Lithology Plot	DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould * Undrained She	ear Strength (kPa)	△ COV (L 2 △ COV (p 100 W _P Plastic	/apour Reading EL) ■ TOV (LEL) 4 6 8 pm) □ TOV (ppm) 200 300 400 W W Liquid	NSTRUMENTATION INSTALLATION	C	COMME & GRAIN DISTRIBU (%)	SIZE UTION	0
Ξ	Geodetic Ground Surface Elevation: 216.3 m about 200 mm ASPHALT	16.1	Š	Š	Ř	S		==	20 40	60 80	20	40 60 80	<u> </u>	GR	SA	SI	CL
XXX	Sand and Gravel FILL 2	16.0					-	216 -									
	dark grey/brown Silty Clay FILL trace gravel, trace organics	0.3	SS	1	50	9	- - - - -		0		ە 2	9					
			SS	2	100	12	- 1 - - - -	215 -	0		26						
			SS	3	100	7	- - - - - 2	-	0		o 22						
****		14.0 2.3					-	214 -			:						
	SILTY CLAY / CLAYEY SILT TILL trace sand. trace gravel very stiff	142.2	SS	4	100	21	-		0		ı ⊕			3	18	52	27
202X	END OF BOREHOLE	3.0					- 3				:						
											:						

 $\frac{\nabla}{2}$ Groundwater encountered on completion of drilling on $\frac{1/21/2020}{2}$ at a depth of: $\frac{2.7 \text{ m}}{2}$.

RECORD OF BOREHOLE No. BH A5														WC	ood.
Pro	ject Number:	TP115086							Drilling	g Location:	Coleraine Dr	r., NBL, Sta. 0+300 E:605	408	Logged by:	MS
Pro	ject Client:	City of Brampton							Drilling	g Method:	N:4853441 150 mm Sol	lid Stem Augers		Compiled by:	PR
Pro	ject Name:	Arterial Road Network	within H	ighwa	y 427 l	ndustr	ial		Drilling	g Machine:	Truck Mount	ted Drill		Reviewed by:	SM/DP
Pro	ject Location:	Secondary Plan Area (A Brampton, Ontario	rea 4/)						Date \$	Started:	Jan 21, 2020	Date Completed: Ja	n 21, 2020	Revision No.:	0, 12/1/20
	LITH	OLOGY PROFILE	I	SO	IL SA	MPLII	NG			FIELD	TESTING	LAB TESTING			
							(9)				ationTesting	Soil Vapour Reading ▲ COV (LEL) ■ TOV (LEL)	NOI	COMMEN &	TS
₹		DESCRIPTION		e	mber	(%	'N' / RQD (%)		E Z		PPT • DCPT Nilcon Vane*	2 4 6 8 △ COV (ppm) □ TOV (ppm)	ATU	GRAIN SI	
ogy P				le Typ	le Nu	/ery (Ž Ž	E) H	ATIO	MTO Vane* △ Intact ▲ Remould	♦ Intact ♦ Remould	100 200 300 400 W _P W W _L	RUME ALLAT	DISTRIBUT (%)	ION
Lithology Plot	Geodetic Ground S	Surface Elevation: 216.5 m		Sample Type	Sample Number	Recovery (%)	SPT '	DEРТН (m)	ELEVATION	* Undrained Sh	near Strength (kPa) 0 60 80	Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION		SI CL
_	al	oout 200 mm ASPHALT	216.3	.,			- 0,	-							
$\overset{\sim}{\bowtie}$	\	Sand and Gravel FILL moist	21 6.2 0.3					Ė	216 -						
▓	tro	brown Silty Clay FILL ce gravel, trace organics		SS	1	79	12	-	210	0		8			
\bowtie	ua	ce graver, trace organics						- - - 1							
		brown	215.3 1.2	SS	2	100	18	-				•			
	SILTY	CLAY / CLAYEY SILT TILL race sand, trace gravel	215.0					-	215 -						
		very stiff END OF BOREHOLE													
		т													
War	d E&IS, a Divis	ion of Wood													

R	ECORD	OF BOREHO	LE No	o. [BH	<u> </u>											W	00	d.
Pro	ject Number:	TP115086							Drilling	g Location:	Colerain	e Dr.,	SBL, Sta. 0)+450 E:605	353	L	ogged by:	MS	
Pro	ject Client:	City of Brampton							Drilling	g Method:	N:48534 150 mm	Solic	d Stem Aug	ers		c	ompiled by:	PR	
Pro	ject Name:	Arterial Road Network Secondary Plan Area	k within H	ighwa	y 427 I	ndustr	ial		Drilling	g Machine:	Truck M	ounte	d Drill			R	eviewed by	SM/D	P
Pro	ject Location:	Brampton, Ontario	(Alca 47)						Date 9	Started:	Jan 21, 2	2020	Date Co	mpleted: <u>Ja</u>	n 21, 20	20 R	evision No.	0, 12/	/1/20
	LITH	OLOGY PROFILE		SO	IL SA	MPLI	NG			FIELD	TESTING	}	LAB TE						
							(%		_		tionTesting		Soil Vapou COV (LEL) 2 4	r Reading ■ TOV (LEL) 6 8	INSTRUMENTATION INSTALLATION		COMMEI	NTS	
Plot		DESCRIPTION		фе	Sample Number	(%)	'N' / RQD (%)	<u> </u>	E N	O SPT MTO Vane*	PPT ● D Nilcon Va			□ TOV (ppm) 300 400	TION		GRAIN S		
l ology I				Sample Type	ple N	Recovery (%)	N'.	DEPTH (m)	ELEVATION	△ Intact ▲ Remould	♦ Intact♦ Remot		W _P W		IRUM FALL	-	(%)		
⇒ I	Geodetic Ground S	urface Elevation: 218.2 m		San	Sarr	Rea	SPT	DEP		* Undrained Sh 20 40	ear Strength (F		Plastic 20 40	Liquid 60 80	SNS	GR	SA	SI	CL
X		Sand and Gravel FILL	218.0 21 0.2					-	218 -										
$\overset{x}{\bowtie}$		moist dark grey	0.3	SS	1	75	11	-											
$\overset{\otimes}{\otimes}$		Silty Clay FILL trace gravel	217.2	33	'	75	"	-				1							
	SILTY	brown CLAY / CLAYEY SILT TIL race sand, trace gravel very stiff	0.9	ss	2	100	20	1 - -	217 -	0									
		END OF BOREHOLE	216.6 1.5					-											
														: :					

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD	OF BOREHOL	E No	o.	BH	<u> 88</u>											W	00	d.
Pro	ject Number:	TP115086							Drilling	Location:	Coleraine D N:4853490	r., SBL, S	ta. 0+45	0 E:605	353	L	ogged by:	MS	
Pro	ject Client:	City of Brampton							Drilling	Method:	150 mm Sc	lid Stem	Augers			c	ompiled b	y: PR	
Pro	ject Name:	Arterial Road Network w Secondary Plan Area (A	vithin H	ighwa	y 427 l	Industr	ial		Drilling	Machine:	Track Mour	ted Drill				R	eviewed b	y: <u>SM/D</u>	P
Pro	ject Location:	Brampton, Ontario	16a 41)						Date 9	Started:	Jan 23, 202) Date	e Comple	eted: Jar	n 23, 202	20 R	evision No	o.: 0, 12 /	/1/20
	LITH	OLOGY PROFILE		SC	IL SA	MPLI	NG			FIELD	TESTING		3 TEST						
/ Plot		DESCRIPTION		Туре	Sample Number	y (%)	SPT 'N' / RQD (%)	(m)	(m) NOI		ationTesting PPT ● DCPT Nilcon Vane* ◇ Intact	▲ COV (L 2 △ COV (p 100	4 6 ppm) □ 200 300	TOV (LEL) 8 TOV (ppm) 400	INSTRUMENTATION INSTALLATION	ı	COMMI & GRAIN DISTRIB	SIZE UTION	
Lithology Plot				Sample Type	ample	Recovery (%)	P I	DEРТН (m)	ELEVATION	▲ Remould * Undrained Sh	◆ Remould near Strength (kPa)	W _P ■ Plastic		W _L	ISTRU ISTALI	GR	(%) SA) SI	CL
❈	Geodetic Ground	Surface Elevation: 217.9 m Sand and Gravel FILL trace organics		S	S	<u>«</u>	S	-		20 40	60 80	20	40 60	80	22	GIX	- JA	- 51	- OL
₩		moist	217.5	SS	1	100	14	E	-	0		4							
$\overset{**}{\otimes}$		brown Silty Clay FILL trace gravel	0.5					Ė	-										
$\overset{ imes}{ imes}$			246.7	SS	2	83	8	- 1	217 -	0		4							
	SILT	brown / CLAY / CLAYEY SILT TILL	1.2					Ė											
		trace sand, trace gravel very stiff	216.1	SS	3	25	20	_		0		ds · · · · :							
·X/ <u>V</u>		END OF BOREHOLE	1.8					-	-					:					
												:		:					
												:							
												:							
												:							
												:							
										: :		:							
														:					
												:		-					
					1	1	l	1		1 1		:	: :	1					

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

RECORD OF BOREHOLE No. BH A9														wood.
Pro	ject Number:	TP115086							Drilling	Location:		r., NBL, Sta. 0+600 E:605	252 Log	gged by: MS
Pro	ject Client:	City of Brampton							Drilling	Method:	N:4853597 150 mm So	lid Stem Augers	Co	mpiled by: PR
Pro	ject Name:	Arterial Road Network wit Secondary Plan Area (Are	thin Hi	ghwa	y 427 I	ndustr	ial		Drilling	Machine:	Truck Moun	ted Drill	Re	viewed by: SM/DP
Pro	ject Location:		a 41)						Date S	Started:	Jan 21, 2020	Date Completed: Ja	121, 2020 Re	vision No.: <u>0, 12/1/20</u>
	LITH	IOLOGY PROFILE	Т	so	IL SA	MPLII	NG			FIELD	TESTING	LAB TESTING		
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	Penetra ○ SPT □ MTO Vane* △ Intact ▲ Remould	tionTesting PPT	Soil Vapour Reading	ON	COMMENTS & GRAIN SIZE ISTRIBUTION (%)
Lith	Geodetic Ground	Surface Elevation: 219.1 m		Sarr	San	Rea	SPT	DEP	H	* Undrained Sh 20 40	ear Strength (kPa) 60 80	Plastic Liquid 20 40 60 80	GR GR	SA SI CL
***		bout 190 mm ASPHALT Sand and Gravel FILL 2	218.9 21 8.2					-	219 -					
		moist dark grey/dark brown Silty Clay FILL trace gravel	0.3	ss	1	75	10		- - -	0		9 O ₁₃		
	SILTY trace sa	brown/grey Y CLAY / CLAYEY SILT TILL and, trace gravel, trace cobbles very stiff to hard	0.9	SS	2	63	21	- 1 - - - -	218 -	0		o ₁₇		
				SS	3	100	72	- - - - 2	217 —		0 1	12		
				SS	4	100	44	- - - -	-)	°13		
				ss	5	100	66	3	216 —		0 1	13		
		grey	-	SS	6	100	34	- - - - 4	215 —	0		a o ₁₁		
			-	ss	7	100	33	- - - - -	- - - -	0		a o .		
XX		END OF BOREHOLE	5.0					- 5						

 $\frac{\textstyle \sum}{\textstyle =}$ No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD	OF BOREHOL	0.	BH.	A10	ı								wood.	
Pro	ject Number:	TP115086							Drilling	g Location:	Coleraine Di N:4853600	., NBL, St	a. 0+600 E:605	253	Logged by: MS
	ject Client:	City of Brampton							Drilling	g Method:	150 mm So		ugers		Compiled by: PR
	ject Name:	Arterial Road Network w Secondary Plan Area (A	vithin H rea 47)	lighwa	y 427	Industr	ial		Drilling	g Machine:	Track Mount				Reviewed by: SM/DP
Pro	ject Location:	Brampton, Ontario							Date S	Started:	Jan 23, 2020	Date	Completed: <u>Ja</u>	n 23, 202	0 Revision No.: 0, 12/1/20
	LITH	OLOGY PROFILE		SC	IL SA	MPLI	NG			FIELD	TESTING		TESTING apour Reading	_	0011151150
					_		(%)		Ê		tionTesting PPT • DCPT	▲ COV (LE	EL) TOV (LEL) 4 6 8	INSTRUMENTATION INSTALLATION	COMMENTS &
Plot		DESCRIPTION		уре	Sample Number	(%)	SPT 'N' / RQD (%)	Ê		MTO Vane*	Nilcon Vane*	△ COV (pp 100 2	m)	ATION	GRAIN SIZE DISTRIBUTION
Lithology Plot				Sample Type	nple N	Recovery (%)	Ņ	DEРТН (m)	ELEVATION	△ Intact ▲ Remould		W _P	W W _L	TALL	(%)
<u>=</u>	Geodetic Ground S	Surface Elevation: 219.0 m Sand and Gravel FILL		Sar	Sar	Rec	S.	DE		20 40	ear Strength (kPa) 60 80	Plastic 20 4	Liquid 10 60 80	88	GR SA SI CL 27 60 (13)
$\overset{x}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}{\mathsf{$	\setminus	some topsoil moist	218.8 0. 2	SS	1	100	8	_	-			g			(1)
\bowtie		brown/grey Silty Clay FILL							-						
₩		trace gravel		SS	2	83	12		-						
₩			217.8	00	-			— 1 _	218 -						
		brown CLAY / CLAYEY SILT TILL	1.2					-							
	t	race sand, trace gravel very stiff	217.2	SS	3	83	24	-	-						
A/X		END OF BOREHOLE	1.8									:			
												:			
												:			
												:			
												:			
												:			
												:			

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD OF BOREHOLE N	o.	BH A	<u> A11</u>									WO	od.
Pro	ject Number: TP115086						Drilling	Location:	Coleraine Dr N:4853720	r., SBL, Sta	. 0+750 E:605	117	Logged by:	MS
Pro	ject Client: City of Brampton						Drilling	Method:	150 mm So	lid Stem Au	igers		Compiled by:	PR
Pro	ject Name: Arterial Road Network within H	lighwa	y 427 I	ndustr	ial		Drilling	Machine:	Truck Mount	ted Drill			Reviewed by:	SM/DP
Pro	Secondary Plan Area (Area 47) ject Location: Brampton, Ontario						Date S	started:	Jan 21, 2020	Date 0	Completed: <u>Jar</u>	21, 2020	Revision No.:	0, 12/1/20
	LITHOLOGY PROFILE	SC	IL SA	MPLI	NG			FIELD	TESTING		TESTING oour Reading	_		
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould	tionTesting PPT	△ COV (LEL 2 4 △ COV (ppm 100 200	D) ■ TOV (LEL)	INSTRUMENTATION INSTALLATION	COMMENT & GRAIN SIZ DISTRIBUTI (%)	Έ
	Geodetic Ground Surface Elevation: 219.9 m about 200 mm ASPHALT 219.7	0)	0)	Ш	0)		<u> </u>	20 40		20 40		==		
***	Sand and Gravel FILL 219.9 moist 0.3						-							
	dark grey Silty Clay FILL trace gravel, trace organics, trace cobbles 219.0	ss	1	25	12		219 —	0		a o 24				
	brown 0.9 SILTY CLAY / CLAYEY SILT TILL trace sand, trace gravel, cobbles/boulders stiff to hard	SS	2	58	14	- 1 - - -	-	0		a o 14				
		SS	3	83	28	- - - - - 2	218 -	0		14				
						-	-							
	216.8 END OF BOREHOLE 3.0	SS	4	100	38	- - - - 3	217 -	0		14				
								: :		: :				

 $\frac{\textstyle \sum}{\textstyle =}$ No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

		E No	o.	BH	<u>A13</u>			D ***	.1	0-1:	NDI OL GLOGO TOTAL	wood.
							_		N:4853836		06 Logged by: MS Compiled by: PR	
		/ithin ∐	iabwa	v 427	Industi	rial		_				Reviewed by: SM/DP
	Secondary Plan Area (A	rea 47)	igiiwa	iy 421	iiiuusti	IGI						
LITH	OLOGY PROFILE		SC	DIL SA	AMPLI	NG					Soil Vapour Reading	Z COMMENTS
Geodetic Ground S	DESCRIPTION Surface Elevation: 220.2 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □ MTO Vane* Δ Intact ▲ Remould * Undrained Sh	PPT ● DCPT Nilcon Vane* ◇ Intact ● Remould ear Strength (kPa)	A COV (LEL)	INSTRUMENTATION INSTRUMENTATION INSTRUMENTATION INSTRUMENTATION (%) GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		220.0 21 9.9					-	220 -				
	moist dark grey/grey Silty Clay FILL		SS	1	67	9	- - - -	- - - -	0		1	
		218.6	ss	2	83	14	1 - - - -	219 -	0]	
		1.5	SS	3	100	36	2	- - - -	0		3	
	brown	217.9 2.3					<u> </u>	-				
	trace clay, trace gravel very dense wet	217.3	SS	4	100	82		= :		0 🛭	3	
je je	iect Number: iect Client: iect Name: iect Location: LITH Geodetic Ground S al trace sa	iect Number: TP115086 iect Client: City of Brampton iect Name: Arterial Road Network w Secondary Plan Area (A Brampton, Ontario LITHOLOGY PROFILE DESCRIPTION Geodetic Ground Surface Elevation: 220.2 m about 200 mm ASPHALT Sand and Gravel FILL moist dark grey/grey Silty Clay FILL trace sand, trace gravel, trace organics or trace gravel, cobbles/boulders hard Dirown SILTY CLAY / CLAYY SILT TILL trace sand to sand t	iect Number: TP115086 iect Client: City of Brampton iect Name: Arterial Road Network within H Secondary Plan Area (Area 47) iect Location: Brampton, Ontario LITHOLOGY PROFILE DESCRIPTION Geodetic Ground Surface Elevation: 220.2 m about 200 mm ASPHALT 220.0 Sand and Gravel FILL 216.9 moist 0.3 dark grey/grey Silty Clay FILL trace sand, trace gravel, trace organics 218.6 brown SILTY CLAY / CLAYEY SILT TILL trace sand to sandy, trace gravel, cobbles/boulders hard Drown SILTY SAND trace clay, trace gravel very dense wet 217.3	iect Number: TP115086 iect Client: City of Brampton iect Name: Arterial Road Network within Highwa Secondary Plan Area (Area 47) iect Location: Brampton, Ontario LITHOLOGY PROFILE DESCRIPTION Geodetic Ground Surface Elevation: 220.2 m about 200 mm ASPHALT moist 219.9 moist 0.3 dark grey/grey Silty Clay FILL trace sand, trace gravel, trace organics SS 218.6 SILTY CLAY / CLAYEY SILT TILL trace sand to sandy, trace gravel, cobbles/boulders hard Drown SILTY SAND trace clay, trace gravel very dense wet 217.3	iect Number: TP115086 ject Client: City of Brampton ject Name: Arterial Road Network within Highway 427 Secondary Plan Area (Area 47) ject Location: Brampton, Ontario LITHOLOGY PROFILE DESCRIPTION James Jame	iect Number: TP115086 ject Client: City of Brampton ject Name: Arterial Road Network within Highway 427 Industriated Location: Brampton, Ontario LITHOLOGY PROFILE DESCRIPTION DESCRIPTION Jack During Description Geodetic Ground Surface Elevation: 220.2 m about 200 mm ASPHALT 220.0 Sand and Gravel FILL 216.9 moist 0.3 dark grey/grey Silty Clay FILL trace sand, trace gravel, trace gravel, cobbles/boulders hard Drown SILTY CLAY / CLAYEY SILT TILL trace sand to sandy, trace gravel, cobbles/boulders hard Drown SILTY SAND trace clay, trace gravel very dense wet 217.3	City of Brampton Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47) Brampton, Ontario	iect Number: TP115086 iect Client: City of Brampton iect Name: Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47) Brampton, Ontario DESCRIPTION DESCRI	Prilling Prilling	Drilling Location: Drilling Location: Drilling Method: Drillin	Drilling Location: Coleraine Dr N:4853836 150 mm Sol 150 mm	Drilling Location: Coleraine Dr., NBL, Sta. 0+900 E:8050 N:4853836 Sin m Solid Stem Augers

Canada Limited

R	ECORD	OF BOREH	OLE N	o. <u>l</u>	BH A	<u> 415</u>												W	00	d
Pro	oject Number:	TP115086							Drilling	g Location:	Coleraine D	r., S	BL, Sta	a. 1+05	50 E:604	1898		Logged by:	MS	<u> </u>
Pro	oject Client:	City of Brampton							Drilling	g Method:	N:4853934 150 mm Sc	olid	Stem A	ugers				Compiled by:	PR	
Pro	oject Name:	Arterial Road Netwo	ork within H	lighwa	y 427 I	ndustr	ial		Drilling	g Machine:	Truck Moun	ted	Drill					Reviewed by:	SM/D	P
Pro	ject Location:	Brampton, Ontario	ea (Area 47)						Date S	Started:	Jan 22, 2020	0	_Date	Compl	eted: <u>Ja</u>	n 22, 20	20	Revision No.:	<u>0, 12/</u>	/1/20
	LITH	OLOGY PROFILE		SO	IL SA	MPLII	NG				TESTING		LAB Soil Va	TEST		z		COMMEN	Te	
					<u>.</u>		(%)		<u>E</u>		tionTesting PPT ● DCPT		COV (LE	L) =	TOV (LEL)	INSTRUMENTATION INSTALLATION		&		
Bot		DESCRIPTION		уре	lumbe	(%)	'N' / RQD	Ê		MTO Vane*	Nilcon Vane* ♦ Intact	1.	COV (ppi	m) 🗆 00 300	TOV (ppm) 400	ATIOI		GRAIN SI		
ology		DESCRIPTION Surface Elevation: 221.5 m		Sample Type	Sample Number	Recovery (%)	Ņ	DЕРТН (m)	ELEVATION		 Remould 		W _P	W	W _L	TALL		(%)		
Lit	Geodetic Ground S	Surface Elevation: 221.5 m		Sar	Sar	Red	SPT	DEF		* Undrained She	ear Strength (kPa) 60 80	-	Plastic 20 4	0 60	Liquid 80	NS NS	GR	SA	SI	CL
-		out 110 mm CONCRETE	221.3 22 0.2																	
$\overset{\times}{\overset{\times}{\overset{\times}{\overset{\times}{\overset{\times}{\overset{\times}{\overset{\times}{\overset{\times}$	tra	dark grey Silty Clay FILL ce gravel, trace organics	220.6	SS	1	46	10	- - -	221 -	0		8 · ·								
	SILTY	brown CCLAY / CLAYEY SILT T race sand, trace gravel firm to stiff	0.9	ss	2	100	8	- 1 - -	- - -	0		20								
X	-	END OF BOREHOLE	220.0 1.5					-	220 -			╀	-							
															-					
															-					
															-					
															-					

 $\frac{\textstyle \sum}{\textstyle =}$ No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

		OF BOREHOLE N	lo.	<u>BH</u>	<u> A17</u>	•							wood.
	oject Number:								Location:	N:4854053	., NBL, Sta. 1+200 E:604	785	_ Logged by: MS
	oject Client: oject Name:	City of Brampton Arterial Road Network within	Lighur	ny 427	Indust	rial			g Method:	Truck Mount	id Stem Augers		Compiled by: PR Reviewed by: SM/DP
	oject Name.	Secondary Plan Area (Area 4	7)	ay 421	muusu	i iai			g Machine: Started:	Jan 22, 2020	Date Completed: Ja	n 22 2020	- · -
1 10								Date		,		11 22, 2020	
	LITH	OLOGY PROFILE	SC	OIL SA	MPLI	NG	-			TESTING	LAB TESTING Soil Vapour Reading	z	COMMENTS
Lithology Plot	Geodetic Ground S	DESCRIPTION Surface Elevation: 222.5 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould	 Intact Remould ear Strength (kPa)	▲ COV (LEL) ■ TOV (LEL) 2 4 6 8 △ COV (ppm) □ TOV (ppm) 100 200 300 400 W _P W W _L Plastic Liquid 20 40 60 80	INSTALLATION	& GRAIN SIZE DISTRIBUTION (%)
(XX)	al	bout 200 mm ASPHALT	3				-			: :			
	\	Sand and Gravel FILL 228.4 moist 0.3 grey/brown Silty Clay FILL trace sand and gravel	ss	1	83	9	- - - - - -	222 -	0		23		
		221.0		2	83	6	- 1 - - - -	221 -	0		32		
		brown 1.9 'CLAY / CLAYEY SILT TILL race sand, trace gravel very stiff to hard	ss	3	100	20	- - - - 2		0		o ₂₆		
		cobbles /boulders	SS	4	100	41	-	220 -	C) E	13		
			SS	5	100	101	3	219 –		101	0 0 14		
		greyish brown	ss	6	100	45	- - - 4 -			O 8	1 011		
		217.3	ss	7	100	34	- - - - -	218 -	0	E E	0 0 25		
Z V Z		END OF BOREHOLE 5.0					"						

 $\frac{\textstyle \sum}{\textstyle =}$ No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD OF BOREHOLE N	Ο.	BH.	A18									wood
Pro	ject Number: TP115086			Drilling	Location:	Coleraine Dr., N:4854054	NBL, Sta.	1+200 E:604	785	Logged by: MS			
Pro	ject Client: City of Brampton						Drilling	Method:	150 mm Solid	d Stem Au	gers		Compiled by: PR
	ject Name: Arterial Road Network within I Secondary Plan Area (Area 47	Highwa)	ay 427 I	Industr	ial			Machine:	Truck Mounte				Reviewed by: SM/DP
Pro	ject Location: Brampton, Ontario						Date S	Started:	Jan 22, 2020	Date C	ompleted: <u>Jar</u>	n 22, 202	Revision No.: 0, 12/1/20
	LITHOLOGY PROFILE	SC	DIL SA	MPLI	NG			FIELD.	TESTING		ESTING our Reading	_	00141451170
Lithology Plot	DESCRIPTION Geodetic Ground Surface Elevation: 222.9 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould	PPT ● DCPT Nilcon Vane* Intact Remould Par Strength (kPa)	COV (LEL) 2 4 COV (ppm) 100 200	■ TOV (LEL) 6 8 □ TOV (ppm)	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
	Sand and Gravel FILL trace organics	ee.	1	100	17	_	-	0					
	moist 222.5 brown/dark brown 0.4 Silty Clay FILL trace gravel, with oxidation	SS	'	100	17	- - -	-		29				
	221.7		2	83	12	- 1 	222 -	0					
	brown 1.2 SILTY CLAY/ CLAYEY SILT TILL trace sand, trace gravel very stiff	SS	3	100	22	- - - -	-	0	B				
XX	END OF BOREHOLE 1.8					_							
		1	Ì	Ì		ı		I : :	1 1	1 1	1 1		

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD OF BOREHOLE N	ο.	BH.	A19								WO	00.
Pro	oject Number: TP115086						Drilling	g Location:	Coleraine Dr. N:4854134	., SBL, Sta. 1+350 E:604	701		MS
Pro	oject Client: City of Brampton						Drilling	g Method:		lid Stem Augers		_ Compiled by:	PR
Pro	oject Name: Arterial Road Network within H	lighwa	ay 427	Industr	ial		Drilling	g Machine:	Truck Mount	ed Drill		_ Reviewed by:	SM/DP
Pro	Secondary Plan Area (Area 47) ject Location: Brampton, Ontario						Date	Started:	Jan 22, 2020	Date Completed: Jai	n 22, 2020	_ Revision No.:	0, 12/1/20
	LITHOLOGY PROFILE	SC	DIL SA	MPLII	NG	_		FIELD	TESTING	LAB TESTING Soil Vapour Reading	7	COMMENT	•
			-e		(%)		Œ		tionTesting PPT ● DCPT	▲ COV (LEL) ■ TOV (LEL) 2 4 6 8	INSTRUMENTATION	COMMENT &	
Plot	DESCRIPTION	Гуре	Sample Number	(%)	SPT 'N' / RQD (%)	Ξ		MTO Vane* △ Intact	Nilcon Vane* ♦ Intact	△ COV (ppm) □ TOV (ppm) 100 200 300 400	ATIO	GRAIN SIZ DISTRIBUTI	ON
Lithology Plot		Sample Type	J eldr	Recovery (%)	/ .N	DEРТН (m)	ELEVATION	▲ Remould	◆ Remould	W _P W W _L ■ → ●	TALL	(%)	
Ë	Geodetic Ground Surface Elevation: 222.6 m	San	San	Rec	SPT	DEF		* Undrained Sho	ear Strength (kPa) 60 80	Plastic Liquid 20 40 60 80	SN (GR SA S	I CL
XXX	about 200 mm ASPHALT 222.4 Sand and Gravel FILL 220.9					-							
\boxtimes	moist 0.3 dark grey/brown					Ē							
❈	Silty Clay FILL trace sand, trace organics	SS	1	100	12	-	222 -			28			
$\overset{w}{\otimes}$	adoc sana, adoc organico					_ _ 1							
❈		SS	2	67	12	- '				3 · · · o			
燚	221.1					E							
	SILTY CLAY / CLAYEY SILT TILL	00		400	0.4	-	221 -						
	trace sand, trace gravel hard	SS	3	100	34	- - 2				15			
						Ē		-					
						-							
		SS	4	100	57	-	220 -		0	3 ○ 10			
	219.6 END OF BOREHOLE 3.0					- 3							
	END OF BOREHOLE 3.0												
Ma.	od E&IS. a Division of Wood												

Canada Limited

 $\stackrel{\underline{\vee}}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RI	ECORD OF BOREHOLE N	lo.	BH.	<u> A20</u>								wood
Pro	ject Number: TP115086						Drilling	Location:		SBL, Sta. 1+350 E:604	693	_ Logged by: MS
Pro	ject Client: City of Brampton						Drilling	Method:	N:4854133 150 mm Solid	d Stem Augers		Compiled by: PR
Pro	ject Name: Arterial Road Network within Secondary Plan Area (Area 47	Highwa	ay 427 I	ndustr	ial		Drilling	Machine:	Track Mounte	d Drill		Reviewed by: SM/DP
Pro	ject Location: Brampton, Ontario	,					Date S	Started:	Jan 23, 2020	Date Completed: <u>Jar</u>	1 23, 2020	Revision No.: <u>0, 12/1/20</u>
	LITHOLOGY PROFILE	SC	DIL SA	MPLI	NG			FIELD	TESTING	LAB TESTING Soil Vapour Reading	_	
Lithology Plot	DESCRIPTION Geodetic Ground Surface Elevation: 222.4 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould	Nilcon Vane* Intact Remould Par Strength (kPa)	COV (LEL) TOV (LEL) 2 4 6 8	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
\bowtie	Sand and Gravel FILL moist 222.1	ss	1	100	26	_						
	dark grey/brown 0.3 Silty Clay FILL trace gravel, trace organics, trace cobbles	33	'	100	20	- - -	222 -					
	221.3		2	100	12	_ _ 1	-	0				
26	brown SILTY CLAY / CLAYEY SILT TILL trace sand, trace gravel 221:2 1.2					<u> </u>	-					
	trace sand, trace gravel stiff END OF BOREHOLE											

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD	OF BOREHOLE	E No). <u>l</u>	BH	<u>A21</u>								wood.
Pro	ject Number:	TP115086							Drilling	Location:	Coleraine Dr N:4854257	., NBL, Sta. 1+500 E:60	1576	Logged by: MS
Pro	ject Client:	City of Brampton							Drilling	Method:	150 mm Sol	lid Stem Augers		Compiled by: PR
Pro	ject Name:	Arterial Road Network with Secondary Plan Area (Area	hin Hi	ghwa	y 427 l	ndustr	ial		Drilling	g Machine:	Truck Mount	ed Drill		Reviewed by: SM/DP
Pro	ject Location:	Brampton, Ontario	~ 71)						Date 9	Started:	Jan 22, 2020	Date Completed: <u>Ja</u>	n 22, 2020	Revision No.: <u>0, 12/1/20</u>
	LITH	OLOGY PROFILE		so	IL SA	MPLI	NG			FIELD	TESTING	LAB TESTING		
							(%)			1	ationTesting	Soil Vapour Reading ▲ COV (LEL) ■ TOV (LEL)	NSTRUMENTATION INSTALLATION	COMMENTS &
<u>Po</u>		DESCRIPTION		e De	Sample Number	(%	'N' / RQD (%)	=	E Z	O SPT MTO Vane*	PPT • DCPT Nilcon Vane*	2 4 6 8 △ COV (ppm) □ TOV (ppm) 100 200 300 400	A TOOL	GRAIN SIZE
ogy P				Sample Type	ole Nu	Recovery (%)	'N' / R	DEРТН (m)	ELEVATION	△ Intact ▲ Remould	♦ Intact ♦ Remould	W _P W W _L	ALLA	DISTRIBUTION (%)
Lithology	Geodetic Ground S	urface Elevation: 223.2 m		Samp	Samp	Reco	SPT	DEP.	ELE	* Undrained Sh 20 40	ear Strength (kPa) 60 80	Plastic Liquid 20 40 60 80	INST	GR SA SI CL
×××	ab	out 200 mm ASPHALT	223.0 22 0.9					-	223 -	: :				
$\diamond\!$	``	moist	0.3					Ė						
$\overset{x}{\otimes}$	tra	dark grey Silty Clay FILL ace sand, trace organics		SS	1	50	10	-	-	0		3 · · · · · · · · · · · · · · · · · · ·		
$\overset{x}{\otimes}$	uc	oo sana, wass organiss	- }					_ _ 1						
$\overset{ imes}{ imes}$		2	221.9	SS	2	58	9	_	222 -	0		,		
	SILTY	greyish brown 2:	221: \$ 1.5					-	-					
	tr	race sand, trace gravel stiff	1.9											
		END OF BOREHOLE	_											
										: :				
										: :				
Noc	od E&IS, a Divisi	on of Wood \ \\ \tau \cdots								le en complet				

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com $\frac{V}{2}$ No freestanding groundwater measured in open borehole on completion of drilling

R	ECORD OF BOREHOLE N	0.	<u>BH</u>	A23	/ B	<u>H S</u>	<u>1</u>						WO	ood.
Pro	oject Number: TP115086						_ Drilling	g Location:	Coleraine Di N:4854343	r., SBL, Sta. 1+0	650 E:60448	1	Logged by:	MS
Pro	oject Client: City of Brampton						_ Drilling	g Method:		lid Stem Auger	s		Compiled by:	PR
Pro	oject Name: Arterial Road Network within I Secondary Plan Area (Area 47)	Highwa	ay 427	Industr	rial		_ Drilling	g Machine:	Truck Mount	ted Drill			Reviewed by:	SM/DP
Pro	oject Location: Coleraine Drive, Brampton, Or						_ Date \$	Started:	Jan 20, 2020	Date Com	pleted: Jan 2	20, 2020	Revision No.:	0, 3/30/21
	LITHOLOGY PROFILE	SC	OIL SA	AMPLI	NG	-			TESTING	LAB TES Soil Vapour F		,	COMMEN	TO
lology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	EVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould	PPT ● DCPT Nilcon Vane* Intact Remould	△ COV (LEL) 2 4 △ COV (ppm) 100 200 3 W _P W	TOV (LEL) 6 8 TOV (ppm) 00 400 W _L	INSTALLATION OUT	GRAIN SI DISTRIBUT (%)	ZE
	Geodetic Ground Surface Elevation: 222.8 m about 200 mm ASPHALT	1	Sar	Re	SP.	DE		* Undrained Sh 20 40	ear Strength (kPa) 60 80	Plastic 20 40 6			R SA	SI CL
X	222.6 brown 22 0 . 2	1		<u> </u>		ŧ]			<u></u>			
$\overset{\otimes}{\otimes}$	Sand and Gravel FILL 0.3 trace to some silt moist dark grey/brown Silty Clay / Clayey Silt FILL	ss	1	100	7		222 -	0		o 24		¥		
$\overset{\otimes}{\otimes}$	trace gravel, trace organics	SS	2	100	5	1 				°23				
$\stackrel{\otimes}{\otimes}$		ss	3	100	8	2	221 -			31				
	brown 2.2 SILTY CLAY TILL trace to some sand, trace gravel, cobbles/boulders very stiff to hard	ss	4	100	30	+ - - - -	220 -	0	Γ	s ^O 16				
		SS	5	83	53	3			• • • • • • • • • • • • • • • • • • • •	16		1	18	48 33
	grey	SS	6	100	28	- 4	219	0		s ° ₂₁				
		SS	7	100	71	5	218 -		0 1	a o 13				
						6	217 -							
		SS	8	100	33		216 -	0		22				
						- - - - - - -								
		SS	9	100	86 / 280mm	8	215 -		86 280	s O mm 13				
						- - - -	214 -							
		SS	10	80	50 /		a	<u>-</u>	50 .					
28	213.4 END OF BOREHOLE 9.4		10	00	100mm				50 100 mm	17 17				
Voc	od E&IS, a Division of Wood anada Limited	water er	ncounter	red on cr	ompletic	on of dri	illing on	<u>1/20/2020</u> at a	depth of: 8.2 m	. R Cave in de	epth after remov	/al of augers	: <u>9.1 m</u> .	

Groundwater depth observed on 5/12/2020 at a depth of: 0.9 m.

RECORD OF BOREHOLE No. BH A23 / BH S1



Project Number: TP115086 Project Name: Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47)

Project Location: Coleraine Drive, Brampton, Ontario

	LITHOLOGY PROFILE	SC	IL SA	MPLII	NG			FIELD TESTING	LAB TESTING					
								PenetrationTesting	Soil Vapour Reading ▲ COV (LEL) ■ TOV (LEL)	INSTRUMENTATION INSTALLATION		COMM &		
t	DESCRIPTION	Φ	nber	(%	%) ac		Ē	O SPT □ PPT ● DCPT	2 4 6 8 △ COV (ppm) □ TOV (ppm)	NTA	_	GRAIN	SIZE	
gy Pi	Beoordi Hon	e Typ	e Nur	ery (%	1' / R((E)	ATIO!	MTO Vane* Nilcon Vane* △ Intact ◇ Intact ▲ Remould ◆ Remould	100 200 300 400 W _L	UME		ISTRIB (%	UTION)	
Lithology Plot		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	* Undrained Shear Strength (kPa)	Plastic Liquid 20 40 60 80	NSTR NSTA	GR	SA	SI	CL
_	50 mm dia. monitoring well with flushmount	0)	0)	ш	0)		ш	20 40 60 80	20 40 00 00	_==				
	protective casing installed (depth below ground surface):													
	Concrete: 0.0 - 0.3 m Sand: 0.3 - 0.6 m													
	Bentonite: 0.6 - 5.5 m Sand Filter: 5.5 - 6.1 m													
	Screen: 6.1 - 9.1 m													
	Groundwater measurements in monitoring well (depth below ground surface):													
	24 Apr 2020: 1.8 m 4 May 2020: 0.9 m													
	12 May 2020: 0.9 m													

RI	ECORD	OF BOREHOLE N	O.	BH	A25	<u> </u>						wood.
Pro	ject Number:	TP115086						Drilling	g Location:	Coleraine Di N:4854447	r., NBL, Sta. 1+800 E:604	381 Logged by: MS
	ject Client:	City of Brampton						Drilling	g Method:		lid Stem Augers	Compiled by: PR
	ect Name:	Arterial Road Network within F Secondary Plan Area (Area 47)	lighwa	y 427 l	Indust	rial		•	g Machine:	Truck Moun		Reviewed by: SM/DP
Pro	ject Location:	Brampton, Ontario						Date	Started:	Jan 22, 2020	Date Completed: <u>Jar</u>	n 22, 2020 Revision No.: 0, 12/1/20
	LITH	OLOGY PROFILE	SC	IL SA	MPLI	NG			FIELD	TESTING	LAB TESTING Soil Vapour Reading	-
Lithology Plot	Geodetic Ground S	DESCRIPTION Surface Elevation: 225.0 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould	 ♦ Intact ♦ Remould ear Strength (kPa)	Sov Vajovo reasung COV (LEL) ■ TOV (LEL) 2 4 6 8 △ COV (ppm) □ TOV (ppm) 100 200 300 400 W _P W W _L ■ O Plastic Liquid 20 40 60 80	COMMENTS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
***		bout 200 mm ASPHALT 224.8 Sand and Gravel FILL 226.7					-					
	tra	moist 0.3 grey/brown Silty Clay FILL ace gravel, trace cobbles 224.1	SS	1	100	13			0		a o 13	
	SILTY trace sand	brown/grey 0.9 CLAY / CLAYEY SILT TILL d, trace gravel, cobbles/boulders very stiff to hard	ss	2	100	25	- 1 - - - -	224 -	0		a	
			SS	3	75	31	2	223 —	0		a ° ₁₃	
			SS	4	100	76 / 180mm	- - - - - -			76 180 mi	n °13	
			ss	5	100	91	3	222 -		01	a o	
		grey					- 4	221 –				
		9.0)	SS	6	92	57				0 1	⁹ °11	
		220.0	SS	7	100	74	- - - - 5	220 -		0 1	B O 12	
		END OF BOREHOLE 5.0										

 $\frac{\textstyle \sum}{\textstyle =}$ No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD OF BOREHOLE N	Ο.	BH.	A26									WO	od.
Pro	eject Number: TP115086						Drilling	Location:	Coleraine Dr N:4854450	., NBL, Sta	a. 1+800 E:604	384	_ Logged by:	MS
Pro	eject Client: City of Brampton						Drilling	Method:	150 mm Sol		ugers		_ Compiled by:	
	oject Name: Arterial Road Network within F Secondary Plan Area (Area 47)	Highwa)	ay 427	Industr	ial		_	Machine:	Truck Mount				_ Reviewed by:	
Pro	ject Location: Brampton, Ontario						Date S	Started:	Jan 22, 2020	Date	Completed: <u>Ja</u>	n 22, 2020	_ Revision No.:	0, 12/1/20
	LITHOLOGY PROFILE	SC	OIL SA	MPLI	NG			FIELD	TESTING	LAB Soil Va	TESTING apour Reading	7	COMMENT	re
Lithology Plot	DESCRIPTION Geodetic Ground Surface Elevation: 224.4 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould	ionTesting PPT	▲ COV (LE 2 4	L) ■ TOV (LEL)	INSTRUMENTATION INSTALLATION	& GRAIN SIZ DISTRIBUTI (%)	ΖE
\bowtie	Sand and Gravel FILL trace organics		4	100	10	-								
	moist 224.0 dark grey/brown 0.4 Silty Clay FILL	ss	1	100	19	-	224 -	0						
	trace gravel, trace cobbles	ss	2	100	18	- - - - 1	-	0		1				
	223.2 brown 1.2													
	SILTY CLAY / CLAYEY SILT TILL trace sand, trace gravel hard 222.6	SS	3	100	40	- - -	223 -	0		3				
<u> </u>	END OF BOREHOLE 1.8					-								

 $\frac{\textstyle \sum}{\scriptstyle =}$ No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD OF BOREHOLE N	<u>A27</u>								wood				
Pro	oject Number: TP115086						_ Drilling Location:		Coleraine Di N:4854566	r., SBL, Sta. 1+950 E:604	Logged by: MS			
Pro	oject Client: City of Brampton						Drilling	Method:		lid Stem Augers	Compiled by: PR			
Pro	oject Name: Arterial Road Network within H Secondary Plan Area (Area 47)	lighwa	y 427 I	Industr	ial		Drilling	Machine:	Truck Moun	ted Drill		Reviewed by: SM/DP		
Pro	oject Location: Brampton, Ontario						Date S	started:	Jan 22, 2020	Date Completed: Ja	D Revision No.: <u>0, 12/1/20</u>			
	LITHOLOGY PROFILE	SC	IL SA	MPLI	NG			FIELD '	TESTING	LAB TESTING Soil Vapour Reading				
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould * Undrained She	ear Strength (kPa)	▲ COV (LEL)	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)		
	Geodetic Ground Surface Elevation: 226.8 m about 250 mm ASPHALT	Ø	S	<u>«</u>	S	_		20 40	60 80	20 40 60 80	22	GR GA GI GE		
	226.6 Sand and Gravel FILL 226.5 moist 0.3 brown Silty Clay FILL trace gravel, trace cobbles	SS	1	100	13	- - - - -	226	0		o ₁₆				
	225.3	SS	2	100	29	- 1 - - -	-	0		13				
	brown 1.5 SILTY CLAY / CLAYEY SILT TILL trace sand, trace gravel, cobbles/boulders hard	SS	3	100	41		225 —	0		12				
	223.8	SS	4	100	57	- - - - - - 3	224 —		0 1	12				
									: :					

 $\frac{\textstyle \sum}{\textstyle =}$ No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RECORD OF BOREHOLE No. BH A28															W	00d.				
Proj	ject Number:	TP115086							Drilling	Location:	Coleraine Dr N:4854566	, SBL, St	a. 1+950 E:604	250	Logged by:					
Proj	ject Client:	City of Brampton							Drilling	Method:	150 mm Sol	id Stem A	Compiled by	PR						
Proj	ject Name:	Arterial Road Networl Secondary Plan Area	k within H (Area 47)	ighwa	y 427 I	ndustr	ial		Drilling	Machine:	Truck Mount	ed Drill			Reviewed by: SM/DP					
Pro	ect Location:	Brampton, Ontario							Date S	Started:	Jan 22, 2020	Date	Completed: Ja	n 22, 2020	Mevision No.	: <u>0, 12/1/20</u>				
	LITH	OLOGY PROFILE		SO	IL SA	MPLI	NG			FIELD :	TESTING		TESTING apour Reading							
					L		(%		=		tionTesting PPT • DCPT	▲ COV (LEL) ■ TOV (LEL) 5 5 6 8 5		INSTRUMENTATION INSTALLATION	COMME &	NTS				
olot		DESCRIPTION		be	Sample Number	(%)	SPT 'N' / RQD (%)	<u> </u>	(E) NC	MTO Vane*	Nilcon Vane*	△ COV (pp	om) □ TOV (ppm) 00 300 400	TION	GRAIN S DISTRIBU					
Lithology Plot				Sample Type	ple N	Recovery (%)	N'.	DEРТН (m)	ELEVATION	△ Intact ▲ Remould	♦ Intact♦ Remould	W _P	W W _L	IRUM IALL/	(%)					
Litho	Geodetic Ground	Surface Elevation: 226.8 m		Sam	Sam	Reco	SPT	DEP	EE	* Undrained She 20 40	ear Strength (kPa) 60 80	Plastic 20	Liquid 40 60 80	LSNI LSNI	GR SA	SI CL				
₩		Sand and Gravel FILL moist		SS	1	100	46	Ė	-											
₩			226.2	33	'	100	40	-	-											
		brown Silty Clay FILL	0.6					Ė	226 —											
₩		trace gravel		SS	2	100	12	- - 1	220 -	0										
***		END OF BOREHOLE	225.6 1.2					<u> </u>	=											
												:								
												:								
												:								
												:								
												:								
												:								
												:								
												:								
												:								
												:								
												:								
												:								
												:								
												:								
												:								

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD	OF BOREHO	LE No	o. <u> </u>	<u>BH</u>	<u>A29</u>								WC	od.		
Pro	Project Number: TP115086					Drilling	g Location:	Coleraine Dr.,	NBL, Sta. 2+100 E:604	157	Logged by:	MS					
Pro	ject Client:	City of Brampton							Drilling	g Method:	N:4854675 150 mm Solid		Compiled by: PR				
Pro	ject Name:	Arterial Road Network	within H	ighwa	y 427 l	ndustr	ial		Drilling	g Machine:	Truck Mounte	d Drill	Reviewed by:	SM/DP			
Pro	ject Location:	Secondary Plan Area (Brampton, Ontario	Area 47)						Date \$	Started:	Jan 22, 2020	Date Completed: Ja	n 22, 2020	Revision No.:	0, 12/1/20		
	LITU	OLOGY PROFILE		SOIL SAMPLING						EIEI D	TESTING	I AR TESTING					
	LIIT	OLOGY PROFILE		30	IL SA	IVIPLII	NG	-				Soil Vapour Reading COV (LEL) TOV (LEL)	z	COMMENTS			
					er		'N' / RQD (%)		Ē		PPT • DCPT	2 4 6 8	INSTRUMENTATION INSTALLATION O	& GRAIN SIZE			
, Plot		DESCRIPTION		Туре	Sample Number	Recovery (%)	RQL	Ê	Š.	MTO Vane* △ Intact	Nilcon Vane* ♦ Intact	COV (ppm) □ TOV (ppm) 100 200 300 400	MEN.	DISTRIBUT	ION		
Lithology Plot				Sample Type	nple	cover	ž	DEPTH (m)	ELEVATION	▲ Remould	◆ Remould ear Strength (kPa)	W_P W W_L Plastic Liquid	TALI	(%)			
±Ξ	Geodetic Ground S	Surface Elevation: 228.6 m		Sar	Sar	Re	SPT	DE	긥	20 40	60 80	20 40 60 80	<u>N</u> G	R SA S	SI CL		
XX		Sand and Gravel FILL	228.4 0.2					Ē									
\bowtie		moist		00		400		-	000								
$\overset{x}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}}{\overset{x}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}{\mathsf{$			227.7	SS	1	100	44	Ē	228 -)						
$\overset{\sim}{\otimes}$		brown Silty Clay FILL	227.7 0.9					- 1									
₩	tra	ace gravel, trace cobbles		SS	2	100	18	-		0							
XX		END OF BOREHOLE	227.1 1.5					-									
		END OF BORLINGE	1.0														
	ad ESIS a Divida										: :						

 $\frac{\sqrt{2}}{2}$ No freestanding groundwater measured in open borehole on completion of drilling.

RECORD OF BOREHOLE No. BH A30														ood.	
Pro	ject Number:	TP115086						Drilling	Location:	Coleraine D	., NBL, S	ta. 2+100 E:60	4159	Logged by:	MS
Pro	ject Client:	City of Brampton						Drilling	Method:	150 mm So	lid Stem /	Augers		Compiled by	/: <u>PR</u>
Pro	ject Name:	Arterial Road Network within H Secondary Plan Area (Area 47)	lighwa	ıy 427 l	Industr	ial		Drilling	Machine:	Track Moun	ted Drill			Reviewed by	y: SM/DP
Pro	ject Location:	Brampton, Ontario						Date 9	Started:	Jan 23, 2020	Date Completed: Ja		ın 23, 202	Revision No	.: <u>0, 12/1/20</u>
	LITH	OLOGY PROFILE	SC	OIL SA	MPLI	NG			FIELD '	TESTING		TESTING			
Lithology Plot		DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould * Undrained She	ear Strength (kPa)	△ COV (L/2 / 100 / 100 / 2 / 100 /	/apour Reading EL) ■ TOV (LEL) 4 6 8 pm) □ TOV (ppm) 200 300 400 W WL	Į₹z∣	COMME & GRAIN: DISTRIBU (%)	SIZE JTION
❈	Geodetic Ground S	Surface Elevation: 228.7 m Sand and Gravel FILL some topsoil	Ø	Ö	œ	<u> </u>	-	<u> </u>	20 40	60 80	20	40 60 80	22		
₩		moist 228.2	SS	1	100	16	-	-	0					30 57	(13)
	tra	dark grey/brown 0.5 Silty Clay FILL icce gravel, with oxidation	SS	2	100	13	- - - - - 1	228 -	0		1				
		brown 1.2 CLAY / CLAYEY SILT TILL d, trace gravel, cobbles/boulders hard 226.9	ss	3	100	38	- - - - -	227 —	0		9				
XZX		END OF BOREHOLE 1.8						-							

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RECORD OF BOREHOLE No. BH A31													wood.
Proj	ject Number: TP115086						Drilling	Location:	Coleraine Di N:4854743	r., SBL, Sta	Logged by: MS		
Proj	ject Client: City of Brampton						Drilling	Method:	150 mm So	lid Stem A	Compiled by: PR		
Proj	ject Name: Arterial Road Network within F Secondary Plan Area (Area 47)	lighwa	ıy 427 l	ndustr	ial		Drilling	Machine:	Truck Moun	ted Drill			Reviewed by: SM/DP
Proj	ject Location: Brampton, Ontario						Date 9	Started:	Jan 22, 2020	Date	Completed: <u>Jar</u>	n 22, 202	20 Revision No.: 0, 12/1/20
	LITHOLOGY PROFILE	SC	OIL SA	MPLI	NG			FIELD .	TESTING		TESTING		
Lithology Plot	DESCRIPTION	Туре	Number	PenetrationTesting				COMMENTS & GRAIN SIZE DISTRIBUTION (%)					
itholog		Sample Type	ample	ecove	Ν̈	DEPTH	LEVA	* Undrained She	ar Strength (kPa)	■	→ Liquid	NSTRI NSTAI	(70) GR SA SI CL
	Geodetic Ground Surface Elevation: 230.7 m about 200 mm ASPHALT 230.5	, v	o o	ir.	- o	-	, ш	20 40	60 80	20 4	0 60 80	==	
	Sand and Gravel FILL 0.2 moist 229.8	ss	1	100	38	- - - - - -	230 —			3 0 5			
	grey/brown 0.9 Silty Clay FILL trace gravel 229.2	SS	2	100	16	- - - - - -	-	0		o 21			
	brown/brownish grey 1.5 SILTY CLAY / CLAYEY SILT TILL trace sand, trace gravel, cobbles/boulders very stiff to hard	SS	3	100	27	2	229 -	0		0 14			
		SS	4	100	29	- - - - -	228 —	0	1	a ° ₁₅			
		SS	5	100	39	3	-	O-		a o: 14			
		ss	6	92	44	- - - - 4 - -	227 -	C)	°13			
	225.7 END OF BOREHOLE 5.0	SS	7	100	36	- - - - - - - 5	226 -	0		a o 13			

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

RECORD OF BOREHOLE No. BH S2													ood.			
Pro	ject Number: TP115086						Drilling	Orilling Location: Coleraine Dr., NBL, Sta. 1+650 E:6044 N:4854343								
Pro	ject Client: City of Brampton						Drilling	g Method:	150 mm Soli	id Stem Auge		Compiled by:	PR			
Pro	ject Name: Arterial Road Network within H Secondary Plan Area (Area 47)		ıy 427 l	Industi	rial		Drilling	g Machine:	Track Mounte	ed Drill			Reviewed by:	SM/DP		
Pro	ject Location: Brampton, Ontario						Date S	Started:	Jan 20, 2020	Date Cor	1 20, 2020	Revision No.:	0, 12/1/20			
	LITHOLOGY PROFILE	SC	IL SA	MPLI	NG			FIELD TESTING LAB TESTING Soil Vapour Reading Z								
					(%		=			Soil Vapour ▲ COV (LEL) 2 4	r Reading ■ TOV (LEL) 6 8	INSTRUMENTATION INSTALLATION	COMMEN &	TS		
olot	DESCRIPTION	be De	mper	(%)	go (<u>-</u>	E N	O SPT MTO Vane*	PPT ● DCPT Nilcon Vane*	△ COV (ppm)	I I	TION	GRAIN SIZ DISTRIBUT			
Lithology Plot		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION	△ Intact ▲ Remould	♦ Intact Remould	W _P W	W _L	RUMI ALLA	(%)	ION		
Lithol	Geodetic Ground Surface Elevation: 222.4 m	Samp	Samp	Reco	SPT	DEP	ELE	* Undrained Sho 20 40	ear Strength (kPa) 60 80	Plastic 20 40	Liquid 60 80	TSNI	R SA	SI CL		
****	about 200 mm ASPHALT 222.3 brown 220.2					-										
	Sand and Gravel FILL 0.3 trace to some silt					-	222 -									
$\overset{ ext{w}}{ ext{w}}$	moist dark grey/brown	SS	1	100	8	-		0	a	°24						
$\overset{ ext{w}}{ ext{w}}$	Silty Clay / Clayey Silt FILL trace gravel, trace organics					- - 1										
$\overset{ ext{w}}{ ext{w}}$		SS	2	42	8	_		0	-	26						
\bowtie						-	221 -									
\bowtie	brown	SS	3	75	7	-		0		0_26						
$\overset{ ext{w}}{ ext{w}}$	220.2					_ 2				26						
	SILTY CLAY / CLAYEY SILT TILL					-										
	trace sand, trace gravel, cobbles/boulders very stiff to hard	SS	4	100	29	-	220 -	0	8	°13						
	·					Ē					1					
						<u> </u>										
		ss	5	46	42	-	219 -	0		12						
						[
	grey					4										
		SS	6	100	28	_		0	as a	°21						
						F	218 -									
		SS	7	100	19	- - 5		0	8	16						
						-										
						_	217 -									
						- 6										
		SS	8	100	35	[216 -			21						
						Ė	210			21						
						- - - 7										
						- '										
							215 -									
						-										
		SS	9	100	36	- ₈ 🗷		0	····· 🛊	011						
						Ē										
						-	214 -									
						Ė										
						9										
	213.1	SS	10	100	50 / 100mm	<u> </u>	-	5	0 100 mm	°10						
	213.1 SS 10 100 507 50 10 100 mm 100 100 mm 100 100 mm															
_					L											
	od E&IS, a Division of Wood Selection	anding	groundv	vater me	easured	in open	boreho	le on completi	on of drilling.	Cave in €	depth after rem	noval of augers	s: <u>7.9 m</u> .			
50 V	/ogell Road, Units 3 & 4															
Can	No · (905) 415-2632 a qualified Geote	chnical E	Engineer.	Also, bo	rehole in	formatio	n should	nding of all poter be read in conju	ntial conditions pres	ent and require in echnical report fo	nterpretative ass	istance from	8	Scale: 1 : 53		
	woodplc.com commissioned ar	nd the ac	company	/ing'Expl	anation o	f Boreho	ole Log'.	•	•	•			ı	age: 1 of 1		

Scale: 1 : 53 Page: 1 of 1



SECTION B ARTERIAL A2 (FROM MAYFIELD ROAD TO MAJOR MACKENZIE DRIVE / RR 50, ~3.4 KM)

RECORD OF BOREHOLES

wood.

RECORD OF BOREHOLE No. BH B1													0	od.							
Pro	ject Number:	TP115086						Drilling	Loca	ation:	4	Arterial A2,	Sta.	0+000	E:60	6238 N:4	852654	l	ogged by	: <u>М</u>	s
Pro	ect Client:	City of Brampton						Drilling	Meth	nod:	_	150 mm So	lid S	Stem Au	igers			(Compiled b	y: <u>P</u>	R
Pro	ect Name:	Arterial Road Network within H Secondary Plan Area (Area 47)	lighwa	y 427 I	ndustr	ial		_ Drilling Machine:		Truck Mounted Drill					F	Reviewed	by: <u>S</u>	M/DP			
Pro	ect Location:	Brampton, Ontario						Date S	Starte	d:	J	an 10, 2020)	_Date C	Compl	leted: Jai	n 10, 202	2 0 F	Revision N	o.: <u>0,</u>	1/5/21
	LITH	OLOGY PROFILE	SC	IL SA	MPLI	NG			F	IELD	TE	STING	LAB TESTING			ING					
		<u> </u>							Penetrat				_	Soil Var	our Re		N O		COMM		3
Lithology Plot		DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	△ Ir ▲ R	Vane ³ tact temould	' ! <	Nilcon Vane* Intact Remould	Δ	2 4 COV (ppm 100 200 W _P		TOV (ppm) 0 400 W _L	INSTRUMENTATION INSTALLATION		4 GRAIN DISTRIE (%	SIZE	
Ë	Geodetic Ground S	urface Elevation: 211.5 m	Sar	Sar	Rec	SP	DE	ä	* Undi	20 40	near)	Strength (kPa) 60 80	-	Plastic 20 40	60	Liquid 80	S S S	GR	SA	SI	CL
***	_	brown 0.1 Sand and Gravel FILL					-	-								;		32	56		(12)
\bowtie	•	moist	SS	4	100	27	-	211 —		0											
₩		210.7 brown/dark grey 0.8	33	1	100	21	-														
\bowtie	some sand, to	Silty Clay FILL race to some gravel, trace organics					1	-													
₩	como cana, a	ace to come graver, hade organice	SS	2	100	12	-	-					a · · ·								
***		210.0 END OF BOREHOLE 1.5						210 -		:			╁		- :						
															-						
															:						
															-						
															-						
															-						
															:						
															-						
															:						
															:	-					
															-	-					
															:						
															:						
															:	-					
															-						
															:						
															:						
															:						
															-						

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD OF														W	00	d.						
Pro	oject Number: TP11	15086							Drilling	g Locat	ion:	Ar	terial /	A2, S	Sta. 0+	- 100	E:60	6151 N:4	1852615	L	ogged by	: MS	
Pro	ject Client: City	of Brampton							Drilling	g Metho	od:	15	50 mm	Sol	id Ste	em Au	ıgers			C	compiled I	ру: <u>PR</u>	
Pro	oject Name: Arte	rial Road Network v ondary Plan Area (A	vithin H	lighwa	y 427 l	ndustr	ial		Drilling	g Mach	ine:	Tra	ack Mo	ount	ed Dr	ill				R	Reviewed	oy: <u>SM/</u>	DP
Pro	oject Location: Bran	npton, Ontario	1 ea 41)						Date	Started	:	<u>Ja</u>	n. 23,	2020		Oate C	Compl	eted: <u>Ja</u>	n. 23, 2	020 R	Revision N	o.: <u>0, 5/</u>	2/22
	LITHOLO	GY PROFILE		SC	IL SA	MPLI	NG			FI	ELD	TES	STING	3			ΓEST						
							(%		=				Testing		▲ CC 2	Soli Vap DV (LEL 4		TOV (LEL)	INSTRUMENTATION INSTALLATION		COMM 8		
ğ	DES	CRIPTION		be	Sample Number	(%	SPT 'N' / RQD (%)	=	E N	O SPT	Vane*		● D lcon Va			OV (ppn	1) 🗆	TOV (ppm)	A TOTAL	 	GRAIN DISTRIE	SIZE	
Lithology Plot				Sample Type	Je N	Recovery (%)	Ž F	DEРТН (m)	ELEVATION	△ Inta ▲ Re	act mould	♦	Intact Remou	uld	W		W	WL	RUM	'	(%		
Litho	Geodetic Ground Surface E	Elevation: 210.2 m		Sam	Sam	Reco	SPT	DEP.	ELE	* Undra 20			trength (k i0 80		Pla 20	astic) 4,0	6,0	Liquid 80	INST	GR	SA	SI	CL
	about 30	00 mm TOPSOIL	209.9				_	-	210 -		:				:	:	:						
₩	Silt	brown y Clay FILL	0.3	SS	1	75	7	Ē		0				4	: :	30		;	1				
❈	(<u>re</u> \	worked soil) brown	209.5 0.7					-								•••••			İ				
	trace sa	/ CLAYEY SILT TILL and, trace gravel		00		400	47	_ _ 1]			· · · · · · · · · · · · · · · · · · ·			:		· · · · :	ł				
	very	stiff to hard		SS	2	100	17	-	209 -				: ::		v□ o 13	3							
								-]									ļ				
				SS	3	100	22	-															
				00		100		_ 2		<u> </u>	· :				13	3 :	:						
								-	208 -	1					:	:	:		1				
	cobb	oles/boulders		SS	4	100	45	Ē] · · · · :		 O	:		013		• • • • • • • • • • • • • • • • • • • •		İ				
			207.2					Ė							13				ł				
X	SILT	brown Y SAND TILL	3.0					— 3 -					: : .						ł				
1	sc	ome gravel ery dense		SS	5	75	65	-	207 -	<u> </u>			0	· · · · a	1 0 11				ļ	14	49	33	4
1		wet	206.5					Ęz	<u></u>	<u> </u>			: : : · · · · :										
	SILTY CLAY	rown/grey / CLAYEY SILT TILL	3.7					<u></u>	= :	} ::													
	trace sa hard	and, trace gravel d to very stiff		SS	6	83	34	4 - -	206 -	3 :	0			ø	0 11	:	:	:					
								Ė]					:				1				
		grey	•	SS	7	100	27	-		†****	0		:						İ				
			205.2		′	100	21	_ 5_			· · · · · · · · · · · · · · · · · · ·				11	• • • • •	· · · · · · · · · · · · · · · · · · ·						
	END C	F BOREHOLE	5.0								:					:	:						
											:				:	:	:						
											:				:	:	:	:					
											:				:	:	:						
											•				:	:	:						
											:				:	:	:						
											:				:	:	:						
											•				:	:	:	:					
											:				:	:	:	:					
											:				:	:	:	:					
											:				:	:	:	:					
											•				:	:	:	:					
											:												
																		:					
																	:	:					
																	-						
																	:						

 $\frac{\nabla}{\pi}$ Groundwater encountered on completion of drilling on <u>1/23/2020</u> at a depth of: <u>3.7 m</u>.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RECORD OF BOREHOLE No. BH B3														W	ood.
Pro	oject Number: TP11	5086						Drilling	Location:	Arterial A2, S	Sta. 0+200	E:606056 N:4	852586	Logged by:	MS
Pro	oject Client: City	of Brampton						Drilling	Method:	150 mm So	lid Stem Au	igers		Compiled by:	PR
Pro	oject Name: Arter	ial Road Network within H ndary Plan Area (Area 47)	lighwa	ıy 427 I	ndustr	ial		Drilling	Machine:	Track Mount	ted Drill			Reviewed by	SM/DP
Pro	oject Location: Bram	pton, Ontario						Date S	Started:	Jan 23, 2020	Date 0	Completed: <u>Jai</u>	n 23, 2020	Revision No.:	0, 1/5/21
	LITHOLOG	Y PROFILE	SC	IL SA	MPLI	NG			FIELD	TESTING		TESTING bour Reading			
Lithology Plot	DES(CRIPTION evation: 211.8 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould	ear Strength (kPa)	▲ COV (LEL) ■ TOV (LEL)	INSTRUMENTATION INSTALLATION	COMMEI & GRAIN S DISTRIBU (%)	SIZE
~~	about 20	0 mm TOPSOIL 211.6					-	-							
$\overset{\times}{\overset{\times}{\overset{\times}{\overset{\times}{\overset{\times}{\overset{\times}{\overset{\times}{\overset{\times}$	Silty trace grav (rew	grey/brown 0.2 Clay FILL el, trace organics orked soil) 211.1	SS	1	58	5	-	-	0	4	30				
	SILTY CLAY I trace sand, trace	brown 0.7 CLAYEY SILT TILL gravel, cobbles/boulders stiff to hard	SS	2	100	21	- - - 1 - -	211 -	0		o 12				
			SS	3	100	28	- - - - - - 2	210 —	0		12				
	bro	wnish grey					- - - -	-							
		208.8	SS	4	100	46	_ _ _ 3	209 -	(12				
<u> </u>	END O	F BOREHOLE 3.0					3								

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

Project Numbur TP110086 Project Cited Up of Brampton Project Numbur Secondary Read Petroper 472 Industrial Project I continue Secondary Read Petroper 472 Industrial Project I continue Secondary Read Petroper 472 Industrial Project I continue Secondary Read Petroper 472 Industrial DESCRIPTION D	RECORD OF BOREHOLE No. BH B4															WC	ood
Project Name: Project Name: Secondary Plan Area (Area 47) Project Location: Brampton, Ontario Description D	Pro	ject Number:	TP115086							Drilling	Location:	Arterial A2, S	ta. 0+300	E:605958 N:4	852563	Logged by:	MS
Project Location: Brampton, Ontario Date Started: Jan 23, 2020 Date Completed: Jan 23, 2020 Revision No.: 0, 1 LITHOLOGY PROFILE SOIL SAMPLING DESCRIPTION D	Pro	ject Client:	City of Brampton							Drilling	g Method:	150 mm Soli	d Stem Au	gers		Compiled by:	PR
Project Location: Brampton, Ontario Date Started: Jan 23, 2020 Date Completed: Jan 23, 2020 Revision No.: 0, 1/2 LITHOLOGY PROFILE SOIL SAMPLING Penetration Testing Sort Appur Reading Sort Appur Britation Testing	Pro	ject Name:	Arterial Road Network	within H	ighwa	y 427 I	ndustr	ial		Drilling	g Machine:	Track Mounte	d Drill			Reviewed by:	SM/DP
DESCRIPTION PenetrationTesting O SPT	Pro	ject Location:	Brampton, Ontario	rea 47)						Date 9	Started:	Jan 23, 2020	Date C	completed: Ja	n 23, 2020	Revision No.:	0, 1/5/21
DESCRIPTION DESCRIPTION		LITH	OLOGY PROFILE		SO	IL SA	MPLI	NG			FIELD	TESTING					
Sity Clay FILL S S S S S S S S S	ithology Plot				ample Type	ample Number	ecovery (%)	PT 'N' / RQD (%)	EPTH (m)		O SPT □ MTO Vane* △ Intact ▲ Remould * Undrained She	PPT ● DCPT Nilcon Vane* ◇ Intact ◆ Remould ear Strength (kPa)	△ COV (LEL_ 2 4 △ COV (ppm 100 200 W _P Plastic	TOV (LEL) 6 8) □ TOV (ppm) 300 400 W W _L Liquid	NSTRUMENTATION NSTALLATION	& GRAIN SI DISTRIBUT (%)	ZE TON
Sity Clay FilL Sity Clay FilL Sity Clay FilL Sity Clay FilL Sity Clay FilL Sity Clay FilL Sity Clay FilL Sity Clay Fill Sity		Geodetic Ground S a	Burface Elevation: 211.7 m bout 200 mm TOPSOIL	211.5	Ø	S	<u>«</u>	S	-	Ш	20 40	60 80	20 40	60 80	22	OK SA	- OL
SILTY CLAY/ CLAYEY SILT TILL trace sand, trace gravel stiff to very stiff SS 2 100 13 - 1 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0	X	tra	Silty Clay FILL ace gravel, trace organics	0.2 211.1	SS	1	83	5	- - - -	-	0	es					
209.9			CLAY / CLAYEY SILT TILL race sand, trace gravel		SS	2	100	13	- - - 1	211 -	0	as					
209.9					SS	3	100	24	-	210 -	0	23					
	XX		END OF BOREHOLE														

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD	OF BOREHOLE N	o.	<u>BH</u>	<u>B5</u>									wood
Pro	ject Number:	TP115086						Drilling	g Location:	Arterial A2,	Sta. 0+400	E:605861 N:4	852545	Logged by: MS
Pro	ject Client:	City of Brampton						_ Drilling	g Method:	150 mm So	lid Stem A	ugers		Compiled by: PR
Pro	ject Name:	Arterial Road Network within H	lighwa	ıy 427 l	Industi	rial		Drilling	g Machine:	Track Mount	ted Drill			Reviewed by: SM/DP
Pro	ject Location:	Secondary Plan Area (Area 47) Brampton, Ontario						_ Date S	Started:	Jan 23, 2020	Date (Completed: <u>Ja</u>	n 23, 202	0 Revision No.: 0, 1/5/21
	LITH	OLOGY PROFILE	SC	OIL SA	MPLI	NG			FIELD	TESTING	LAB	TESTING		
Lithology Plot		DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould * Undrained She	tionTesting PPT DCPT Nilcon Vane* Intact Remould ear Strength (kPa)	△ COV (LEI 2 4 △ COV (ppr 100 20 W _P Plastic	m) □ TOV (ppm) 00 300 400 W W _L ⊕ Liquid	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
	Geodetic Ground	Surface Elevation: 211.3 m bout 300 mm TOPSOIL	_ o	o o	Ľ	S S	-	<u> ш</u>	20 40	60 80	20 4	0 60 80	==	S.
X		211.0 dark grey/brown Sitty Clay FILL trace gravel 210.6 (reworked soil) 0,7	SS	1	83	6	- - -	211 -	0		17			
		brown / CLAY / CLAYEY SILT TILL d, trace gravel, cobbles/boulders stiff to hard	SS	2	100	10	- - 1 - -	210 -	0		☑ O 14			
			SS	3	100	18	- - - - - - 2		0		o 13			
							[-	209 -						
			SS	4	100	35			0		°13			
		grey	SS	5	100	28	3	208 -	0		⁰ 11			
			SS	6	100	20	- - - 4 - - -	207 -	0		N 0			
		206.2	SS	7	100	17	-	-	0		a o 14			
:A Z:K		END OF BOREHOLE 5.0												

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RECORD OF BOREHOLE N					BH	<u>B6</u>												WO	od.
Pro	ject Number:	TP115086							Drilling	Locatio	on:	Arter	ial A2, S	Sta. 0+50	0 E:6	05759 N:	4852529	Logged by: M	
Pro	ject Client:	City of Brampton							Drilling	Method	d:	150	mm So	lid Stem	Auger	s		Compiled by: P	R
Pro	ject Name:	Arterial Road Network	within H	ighwa	y 427 l	Industi	rial		Drilling	g Machin	ne:	Track	k Mount	ted Drill				Reviewed by: S	M/DP
Pro	ject Location:	Secondary Plan Area (A Brampton, Ontario	Area 47)						Date S	Started:		Feb 7	7, 2020	Date	Com	pleted: Fe	eb 7, 2020	Revision No.: 0,	1/5/21
	LITH	OLOGY PROFILE	1	SO	II SA	MPLI	NG	1		FIF	ו חו	EST	ING	ΙΔΕ	RTES	TING			
		OLOGI PROFILE		30	IL OF	AVII LI		1				onTes		Soil '	Vapour F		_Z	COMMENTS	3
					ber		(%)		Œ	O SPT			• DCPT	2	4	6 8 TOV (ppm)	ĔZ	& GRAIN SIZE	
y Plot		DESCRIPTION		Туре	Num	ر%) در	/RQI	Ê	NO.	MTO Va △ Intac	t	♦ In:	n Vane* tact	100	200 3	00 400	LATIC	DISTRIBUTIO	
Lithology Plot				Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION	▲ Rem * Undrain	ould ed She	◆ Ro		W _P ■ Plastic	W	W _L ■ Liquid	INSTRUMENTATION INSTALLATION	(%)	
<u>5</u>	Geodetic Ground S	Surface Elevation: 210.9 m bout 150 mm TOPSOIL	210.8	Sa	Sa	- A	R	<u> </u>	<u> </u>	20	40	60	80		40 6	60 80	22	GR SA SI	CL
	Sil	brown ty Clay / Clayey Silt FILL	0.2	SS	1	83	6	-		0 - 1				S					
\bowtie	tr	race sand, trace rootlets (reworked soil)	210.2					Ē	-										
	— — — — SII TY	brown CLAY CLAYEY SILT TILL	0.7					ŧ	210 -										
	trace	sand to sandy, trace gravel very stiff		SS	2	100	20	F 1	210 -	0				2 3					
		,						Ė		1									
			ŀ					ŧ											
				SS	3	100	29	Ē	209 -) 								
XX.		END OF BOREHOLE	208.8					<u> </u>			- :	- :			:		1		
		END OF BOREHOLE	2.1											:					
															1				
														:					
														:					
														:					
														:					
															:				
														:					
															:				
														:					
														:					
														:	:				
														:					
															:				
														:					
															:				
											:			:	:				

 $\frac{\textstyle \sum}{\textstyle =}$ No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD OF BOREHOLE N	o.	BH	B7 /	BH	S5	<u>i</u>							1	MOC	bd
Pro	oject Number: TP115086						_ Drillin	g Location:	: <u>A</u>	rterial A2,	Sta. 0+600 E	::605633 N:4	852520	Logged	by: MS	· · ·
Pro	oject Client: City of Brampton						_ Drilling	g Method:	_1	50 mm So	lid Stem Aug	ers		Compile	ed by: PR	
Pro	oject Name: Arterial Road Network within H Secondary Plan Area (Area 47)	lighwa	y 427	Industi	rial		_ Drilling	g Machine:	: <u>Tı</u>	ack Moun	ted Drill			Review	ed by: SM	/DP
Pro	oject Location: Brampton, Ontario						_ Date :	Started:	<u>F</u>	eb 26, 2020	Date Co	mpleted: Fe	b 26, 2020) Revisio	n No.: <u>0, 3</u>	/30/21
	LITHOLOGY PROFILE	SC	IL SA	MPLI	NG			FIEL	D TE	STING	LAB TE					
					(%		2	1		Testing	Soil Vapou COV (LEL) 2 4	ur Reading ■ TOV (LEL)	NOIL	CON	MENTS &	
olot	DESCRIPTION	фе	ımber	(%)	SQD (<u>ء</u>	E) NO	O SPT MTO Van		DCPT ilcon Vane*	7 /	☐ TOV (ppm) 300 400	靐		AIN SIZE RIBUTION	
Lithology Plot		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	EVATION	△ Intact ▲ Remoul	\Diamond	Intact Remould	W _P W		NSTRUMENTATION NSTALLATION	Dion	(%)	
Litho	Geodetic Ground Surface Elevation: 209.3 m	Sam	Sam	Reco	SPT	DEP	ELE			strength (kPa) 60 80	Plastic 20 40	Liquid 60 80	LSN LSN LSN LSN LSN LSN LSN LSN LSN LSN	GR SA	. SI	CL
XX	about 150 mm TOPSOIL 209.2 dark brown 0.2	SS	1	100	6	-	000				A					
	Silty Clay / Clayey Silt FILL trace to some gravel, trace organics		•			Ė	209 -]			40					
	brown to grey 0.7 SILTY CLAY / CLAYEY SILT TILL					-										
	trace sand to sandy, trace to some gravel firm to hard	SS	2	100	8	<u> </u>		0			a o 25					
						F	208 -									
						Ė										
		SS	3	100	27	_ 2					⁰ 12					
						Ė	007									
	grey	SS	4	100	50	E	207 -		0							
			,	100		-		ļ			°13					
					— 3		ļ									
		5	100	69	F	206 -			0	a 0						
						Ė		<u> </u>								
//	grey 3.7 SAND AND SILT TILL trace clay, trace gravel					<u>+</u>		ļ								
	firm to hard	SS	6	83	58	Ė .	005) [12			4 43	50	3
	grey				64 /	ŧ	205 -		(64						
	grey 4.5 SILTY CLAY / CLAYEY SILT TILL trace sand to sandy, trace to some gravel,	SS	7	100	150mn	Ė				150 mm	10					
	cobbles/boulders hard					— 5 -										
						-	204 -	.								
						F.	∇									
						6	<u>=</u>	1								
		SS	8	100	62 / 150mm	Ī	203 -		6	2 0 150 mm	a o 13					
						ŧ										
						-										
						- 7		1								
						-	202 -									
						ŧ]								
		SS	9	100	66	E 8		ļ <u>i</u>		0 1	o 24					
						F	201 -									
						-										
						Ė										
						— 9 -	2									
		SS	10	100	39	Ė	200 -		: • · · · ·		23					
	199.6					<u> </u>			-		23					
END OF BOREHOLE 9.8 Wood E&IS, a Division of Wood ☐ Groundwater encountered on completion of drilling on 2/26/2020 at a depth of: 5.8 m. ☐ Cave																
Car	nada Limited						-		it a dep	oth of: <u>5.8 m</u>	. 🖪 Cave in	depth after rer	noval of au	gers: <u>9.1 m</u> .		
Rich	nmond Hill, Ontario, L4B 3K6								otential	conditions pre	esent and require	interpretative ass	sistance from	, [
Tel.	No.: (905) 415-2632 a qualified Geotecommissioned ar	rehole in	formati	be read in co	onjunctio	on with the geo	otechnical report f	or which it was				: 1 : 53 1 of 2				

Scale: 1 : 53 Page: 1 of 2

RECORD OF BOREHOLE No. BH B7 / BH S5



Project Number:	TP115086	Project Name: Arterial Road Network within Highway 427 Industrial Secondary Plan Area
-		(Area 47)

Project Location: Brampton, Ontario

110	ect Location. brampton, Ontario							T						
	LITHOLOGY PROFILE	SC	IL SA	MPLI	NG			FIELD TESTING	LAB TESTING Soil Vapour Reading	_]		CO1	ENTO	
					(%		٦	PenetrationTesting	▲ COV (LEL) ■ TOV (LEL)	INSTRUMENTATION INSTALLATION		COMM &		
lot	DESCRIPTION	e e	Sample Number	(%	SPT 'N' / RQD (%)		ELEVATION (m)	O SPT □ PPT ● DCPT MTO Vane* Nilcon Vane*	△ COV (ppm) □ TOV (ppm) 100 200 300 400	ENTA	_	GRAIN	SIZE	
gy P		e Typ	e Nu	ery ('	1'/R	E) =	AT10	MTO Vane* Nilcon Vane* △ Intact ◇ Intact ▲ Remould ◆ Remould	W _P W W _I	LLA-	L	115 I RIE (%)	SUTION	
Lithology Plot		Sample Type	ampl	Recovery (%)	PT 'N	DЕРТН (m)	LEV/	* Undrained Shear Strength (kPa)	Plastic Liquid	ISTR ISTA	GR	SA	SI	CL
	50 mm dia. monitoring well with flushmount	o o	Ø	Ľ	Ø		Ш	20 40 60 80	20 40 60 80	==	OIT	O/L	- Ci	OL.
	protective casing installed (depth below ground surface):													
	Sand: 0.0 - 0.6 m													
	Bentonite: 0.6 - 5.5 m Sand Filter: 5.5 - 9.1 m													
	Screen: 6.1 - 9.1 m													
	Groundwater measurements in monitoring well (depth below ground surface):													
	4 May 2020: -0.7 m (above ground) 12 May 2020: -0.5 m (above ground)													
	12 May 2020: -0.5 m (above ground)													

R	ECORD OF BOREHOLE N	Ο.	<u>BH</u>	<u>B8</u>								wood
Pro	ject Number: TP115086						Drilling	Location:	Arterial A2, S	ta. 0+700 E:605564 N:4	852529	Logged by: MS
Pro	ject Client: City of Brampton						Drilling	Method:	150 mm Soli	id Stem Augers		Compiled by: PR
Pro	ject Name: Arterial Road Network within I Secondary Plan Area (Area 47	Highwa	ay 427 I	Industr	ial		Drilling	Machine:	Track Mounte	ed Drill		Reviewed by: SM/DP
Pro	ject Location: Brampton, Ontario)					Date S	Started:	Feb 20, 2020	Date Completed: Fel	20, 202	0 Revision No.: 0, 1/5/21
	LITHOLOGY PROFILE	sc	DIL SA	MPLI	NG			FIELD .	TESTING	LAB TESTING		
					(%		-			Soil Vapour Reading COV (LEL) TOV (LEL) 4 6 8	INSTRUMENTATION INSTALLATION	COMMENTS &
jo	DESCRIPTION	g.	Sample Number	(%)	SPT 'N' / RQD (%)	٦	E N	○ SPT □ MTO Vane*	PPT ● DCPT L Nilcon Vane*	△ COV (ppm) □ TOV (ppm) 100 200 300 400	TION	GRAIN SIZE DISTRIBUTION
Lithology Plot		Sample Type	Je N	Recovery (%)	, 'Y	DEРТН (m)	ELEVATION	△ Intact ▲ Remould	Nilcon Vane* ◇ Intact ◆ Remould	W _P W W _L	ALLA	(%)
Lithol	Geodetic Ground Surface Elevation: 211.1 m	Samp	Samp	Reco	SPT	DEP.	ELE)	* Undrained She	ear Strength (kPa) 60 80	Plastic Liquid 20 40 60 80	INST	GR SA SI CL
***	about 100 mm TOPSOIL 211.0 dark brown 0.1	1				-	211 -					
$\overset{ imes}{ imes}$	Silty Clay FILL trace gravel, trace organics	SS	1	100	9	-	-	0	a			
****	(reworked soil) 210.5 brown 0.6					-	-					
	SILTY CLAY / CLAYEY SILT TILL trace sand, trace gravel	ss	2	100	22	- - - 1	-	0				
	very stiff to hard					<u> </u>	210 —					
		ss	3	44	36	-	-	0	a			
<i>XX</i>	209.4 END OF BOREHOLE 1.7					-	-					

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD	OF BOREHOLE	E No	o. <u>l</u>	BH I	<u>B9</u>									WOO	od.
Pro	ject Number:	TP115086							Drilling	Location:	Arterial A2, S	Sta. 0+800	E:605461 N:4	852548	Logged by: MS	
Pro	ject Client:	City of Brampton							Drilling	Method:	150 mm Sol	id Stem Au	gers		Compiled by: PF	<u> </u>
Pro	ject Name:	Arterial Road Network wit	ithin H	ighwa	y 427 I	ndustr	ial		Drilling	Machine:	Track Mount	ed Drill			Reviewed by: SN	M/DP
Pro	ject Location:	Secondary Plan Area (Are Brampton, Ontario	ea 47)						Date S	Started:	Feb 20, 2020	Date C	ompleted: Fel	b 20, 2020	Revision No.: 0,	1/5/21
	LITH	OLOGY PROFILE		so	IL SA	MPLI	NG			FIELD	TESTING		ESTING			
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould	tionTesting PPT	△ COV (LEL) 2 4 △ COV (ppm 100 200	our Reading TOV (LEL) 6 8 1 TOV (ppm) 300 400 W W Liquid	NSTRUMENTATION NSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTIOI (%)	
=	Geodetic Ground S	urface Elevation: 212.5 m out 100 mm TOPSOIL	212.3 0.1	Š	Se	ž	SF		111	20 40	60 80	20 40		ZZ	GR SA SI	CL
	trac	Silty Clay FILL ce gravel, trace organics	0.1 211.8	SS	1	100	15	- - - -	212 -	0		36)			
		brown CLAY / CLAYEY SILT TILL and and sandy, trace gravel, cobbles/boulders stiff to hard	0.7	SS	2	100	13	- - - 1 - - - -	211 —	0	E	19				
			-	SS	3	100	34	- - - - 2	-	0		18				
		grey		SS	4	100	68	- - - - - - - -	210 -		O 8	³ °11				
			_	SS	5	100	48		209 -		O	1 O				
				SS	6	100	72	- 4 - 5			O 8	° 11				
		END OF BOREHOLE	207.4 5.0	SS	7	100	49	- - - - - 5	-		0 .	13				

 $\frac{\nabla}{z}$ Groundwater encountered on completion of drilling on <u>2/20/2020</u> at a depth of: <u>4.3 m</u>.

RECORD OF BOREHOLE No. BH B10																WO	od.
Pro	ject Number:	TP115086							Drilling	Location:	Arterial A2,	Sta. 0+9	00 E:6	05365 N:4	852580	Logged by:	<u>MS</u>
Pro	ject Client:	City of Brampton							Drilling	Method:	150 mm Sc	lid Sten	n Auger	s		Compiled by:	PR
Pro	ject Name:	Arterial Road Network w Secondary Plan Area (A	vithin H	ighwa	y 427 l	ndustr	ial		Drilling	Machine:	Track Moun	ted Drill				Reviewed by: §	SM/DP
Pro	ject Location:	Brampton, Ontario	irea 41)						Date S	started:	Feb 20, 202) Da	ite Com	oleted: Fel	o 20, 2020	Revision No.: (), 1/5/21
	LITH	OLOGY PROFILE		SO	IL SA	MPLI	NG			FIELD	TESTING		AB TES		_		
					_		(%)		(E)		ationTesting PPT • DCPT	▲ COV	(LEL)	TOV (LEL)	INSTRUMENTATION INSTALLATION	COMMENT &	
Plot		DESCRIPTION		ype	Sample Number	(%)	SPT 'N' / RQD (%)	Ê		MTO Vane*		△ COV 100	(ppm) D 200 30	TOV (ppm) 00 400	ATION	GRAIN SIZ	
Lithology Plot				Sample Type	n eldı	Recovery (%)	ž	DEРТН (m)	ELEVATION	△ Intact ▲ Remould	◆ Remould	W _P	W	W _L	TALL	(%)	
Lithe	Geodetic Ground S	Surface Elevation: 212.7 m		San	Sarr	Rea	SPT	DEP		* Undrained St 20 40	near Strength (kPa) 60 80	Plast 20		Liquid 0 80	N N	GR SA SI	CL
	a	dark brown	212.6 0.2	00	,	70		-									
₩	tra	Silty Clay FILL ace gravel, trace organics	242.4	SS	1	79	8	_	-	0		8					
	~	(reworked soil) brown/brownish grey	212.1 - 0.6					Ė	212 -								
	SILTY t	CLAY / CLAYEY SILT TILL race sand, trace gravel		SS	2	100	18	- - 1	-	0		a					
		very stiff to hard	-					ŧ									
				SS	3	100	54	-	-		0	.					
XX		END OF BOREHOLE	211.0 1.7							1 1			- :				
										: :		:					
												:					
												:					
												:					
												:					
								L									

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

RI	ECORD OF E	OREHOLE N	lo.	ВН	B11	•								W	00	d.
Proj	ect Number: TP1150	86						Drilling	Location:	Arterial A2,	Sta. 1+000 E:605279 N:4	852627	L	ogged by:	MS	
Proj	ect Client: City of	Brampton						Drilling	g Method:	150 mm So	olid Stem Augers		c	ompiled by	: <u>PR</u>	
Proj	ect Name: Arterial Second	Road Network within lary Plan Area (Area 47	Highwa '\	ay 427	Industr	ial		Drilling	g Machine:	Track Moun	ted Drill		R	eviewed by	/: <u>SM/I</u>	DP
Proj	ect Location: Brampt	on, Ontario	,					Date 9	Started:	Feb 20, 2020	Date Completed: Fe	b 20, 20	20 R	evision No	: <u>0, 1/</u>	5/21
	LITHOLOGY	PROFILE	sc	DIL SA	MPLI	NG			FIELD	TESTING	LAB TESTING					
Lithology Plot		RIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould	tionTesting PPT	Soil Vapour Reading ▲ COV (LEL) ■ TOV (LEL) 2 4 6 8 △ COV (ppm) □ TOV (ppm) 100 200 300 400 W _P W W _L ■ □ Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	I GR	COMME & GRAIN S DISTRIBU (%)	SIZE JTION	CL
XX	about 100 n	mm TOPSOIL 212.2 wn/brown 0.1					-				1 1 1 1					
	Silty C trace gravel, (reworl	lay FILL trace organics ked soil) 211.6 own 0.7	SS	1	100	16	- - - -	212 -	0		25					
	trace sand to sa	LAY TILL indy, trace gravel if to hard	ss	2	100	25	- 1 - 1 	211 —	0		13					
			ss	3	100	43	- - - - 2	-	- C)	13		2	24	49	25
	browni	sh grey	SS	4	100	56	- - - - -	210 -		0	a 0					
224	END OF B	209.3 BOREHOLE 3.0					<u> </u>	-								

 $\frac{\textstyle \sum}{\textstyle -}$ No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD	OF BOREHOL	E No	o.	BH	B12	<u>.</u>											W	00	od.
Pro	ject Number:	TP115086							Drilling	Location:	Arte	rial A2,	Sta. 1+10	00 E:60	05192 N:4	852676	l	ogged by	: <u>MS</u>	
Pro	ject Client:	City of Brampton							Drilling	Method:	150	mm So	lid Stem	Auger	8		(Compiled	oy: <u>PR</u>	
Pro	ject Name:	Arterial Road Network v Secondary Plan Area (A	within H	lighwa	ıy 427	Industi	rial		Drilling	Machine:	Trac	k Moun	ted Drill				F	Reviewed	by: <u>SM</u>	/DP
Pro	ject Location:	Brampton, Ontario							Date S	Started:	Feb	20, 2020) Dat	te Comp	oleted: Fe	b 20, 20	20 F	Revision N	lo.: <u>0, 1</u>	/5/21
	LITH	IOLOGY PROFILE		SC	IL SA	MPLI	NG			FIELD	TEST	ING		B TES		_				
Plot		DESCRIPTION		ype	lumber	(%)	SPT 'N' / RQD (%)	(E	(E) NO	O SPT □ MTO Vane	Nilco	DCPT on Vane*	▲ COV ((LEL) ■ 4 € (ppm) □	TOV (LEL)	INSTRUMENTATION INSTALLATION		COMN 8 GRAIN DISTRIE	i SIZE	I
Lithology Plot				Sample Type	Sample Number	Recovery (%)	V.N. Td	DEРТН (m)	ELEVATION	 △ Intact ▲ Remould * Undrained Si 	ear Strer	Remould ngth (kPa)	W _P ■ Plastic		W _L ■ Liquid	ISTRUN ISTALL	GR	(% SA	6) SI	CL
<u> </u>	Geodetic Ground S	Surface Elevation: 214.3 m bout 150 mm TOPSOIL	214.1	Ø	Ø	2	S	_	Ш	20 40	60	80	20	40 6	0 80	22	GK	- SA	- 31	CL
\bowtie		dark brown Silty Clay FILL	0.2	SS	1	83	17	-	214 -	0			a							
***		ace gravel, trace organics (reworked soil) greyish brown	213.6 0.6					ŧ	-											
	SILTY	CLAY / CLAYEY SILT TILL trace sand, trace gravel		SS	2	100	24	- - - 1	-				.							
		very stiff to hard						╞ '	213 -											
			040.0	SS	3	100	69	-				D								
XX		END OF BOREHOLE	212.6 1.7																	
													:							
													:							
													:							
													:							
													:							
													:							
													:							
													:							
													:							
													:							

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

RI	ECORD OF BOREHOLE N	o.	BH	B13									WO	od.
Pro	ject Number: TP115086						Drilling	Location:	Arterial A2, S	Sta. 1+200	E:605111 N:4	852740		MS
Pro	ject Client: City of Brampton						Drilling	Method:	150 mm So	lid Stem Au	ugers		Compiled by:	PR
Pro	ject Name: Arterial Road Network within F Secondary Plan Area (Area 47)	Highwa	y 427 I	ndustr	rial		Drilling	g Machine:	Track Mount	ted Drill			Reviewed by:	SM/DP
Pro	ject Location: Brampton, Ontario						Date S	Started:	Feb 20, 2020	Date 0	Completed: Fel	b 20, 2020	Revision No.:	0, 1/5/21
	LITHOLOGY PROFILE	SC	IL SA	MPLI	NG			FIELD T	ESTING		TESTING			
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □ F MTO Vane* △ Intact ▲ Remould	onTesting PPT	△ COV (LEL 2 4 △ COV (ppn 100 20 W _P	n) □ TOV (ppm) 0 300 400 W W _L	NSTRUMENTATION NSTALLATION	COMMENT & GRAIN SIZ DISTRIBUTI (%)	Έ
Ē	Geodetic Ground Surface Elevation: 215.7 m about 100 mm TOPSOIL 215.6-	San	San	Reo	SPT	DEF		* Undrained Shea 20 40	ar Strength (kPa) 60 80	Plastic 20 40	Liquid 0 60 80	N N N	GR SA S	SI CL
	dark brown/brown Silty Clay FILL trace gravel, trace organics (reworked soil) 215.0	ss	1	75	8	- - - - -	215 —	0		32				
	brown 0.7 SILTY CLAY / CLAYEY SILT TILL trace sand, trace gravel, cobbles/boulders hard to very stiff	SS	2	54	36	- - - 1 - -		0	E	o 17				
		SS	3	100	44	- - - - 2	214 —	0		1 O 14				
		SS	4	100	64	- - - - - -	213 —		0 4	° 13				
		SS	5	100	39	3	-	0		13				
	grey	SS	6	100	19	- - - - 4	212 -	0	ē	³ 0				
	210.7	SS	7	100	21		211 —	0	E	ı o 12				
	END OF BOREHOLE 5.0													

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD	OF BOREHOL	E No	o.	BH	<u>B14</u>												W	00	d.
	ject Number:									g Location:				E:605038	N:48528	07		ed by:	MS	
	ject Client:	City of Brampton								g Method:			d Stem A	ugers				piled by:	PR	
	ject Name:	Secondary Plan Area (A	vithin H rea 47)	ighwa	y 427 l	Industr	ial											ewed by:		
Pro	-	Date Started: Jan 24, 2020 Date Completed: J			Revi	sion No.:	0, 1/5	5/21												
	LITH	OLOGY PROFILE		SC	IL SA	MPLI	NG								-		C	OMMEN	ITC	
					J.		(%)		Ê		_		COV (LE	L) TOV (I	EL) O	_		&		
<u>B</u> ot		DESCRIPTION		ype	nmbe	(%)	RQD	Ê		MTO Vane	* Nilcon Va		△ COV (ppr 100 20	n) 🗆 TOV (p	MENT (md	2		RAIN SI		
Lithology				nple 1	nple h	over)	/ .N. J	HT	EVAT	▲ Remould	◆ Remo	- 1			I RU	4		(%)		
=	Geodetic Ground S	urface Elevation: 217.1 m		Sar	Sar	Rec	SP	DE						0 60 80	N S	2	GR	SA	SI	CL
₩		drak brown / brown	216.9 0.2	SS	1	100	7	-		0										
▓	tra	Silty Clay FILL ce gravel, trace organics	216.5					_												
	OII TV	(reworked soil) brown	0.6					-												
	SILIY	cLAY / CLAYEY SILT TILL race sand, trace gravel very stiff to hard		SS	2	100	25	- - 1	216 -			da								
		very sun to hard	ŀ					-												
				SS	3	100	56	-			· · · o									
		END OF BOREHOLE	215.2 1.8									_			_					
										:										
										:										
										:										
										:				1 1						
										:										
										:										
										:										
										:										
										:										
										:	: :		: :	1 1						

 $\frac{\textstyle \sum}{\textstyle =}$ No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RI	ECORD	OF BOREHOL	E No).	BH_	<u>B15</u>									wood.
Proj	ect Number:	TP115086							Drilling	g Location:	Arterial A2,	Sta. 1+400 E	::604966 N:4	852877	Logged by: MS
Proj	ect Client:	City of Brampton							Drilling	g Method:	150 mm So	olid Stem Aug	jers		Compiled by: PR
Proj	ect Name:	Arterial Road Network v Secondary Plan Area (A	within H	ighwa	y 427	Industr	rial		Drilling	g Machine:	Track Moun	ted Drill			Reviewed by: SM/DP
Proj	ect Location:	Brampton, Ontario	uea 41)						Date	Started:	Jan 24, 2020	Date Co	mpleted: <u>Jar</u>	1 24, 2020	D Revision No.: 0, 1/5/21
	LITH	IOLOGY PROFILE		SO	IL SA	MPLI	NG	_		FIELD '	TESTING		ESTING ur Reading		
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould * Undrained She	tionTesting PPT	△ COV (LEL) 2 4 △ COV (ppm) 100 200 W _P W Plastic	TOV (LEL) 6 8 TOV (ppm) 300 400 V WL Liquid	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
<u> </u>	Geodetic Ground a	Surface Elevation: 217.3 m about 150 mm TOPSOIL	217.2	Ø	S	<u>~</u>	S	_	Ш	20 40	60 80	20 40	60 80	22	GR GA GI GE
		dark brown / brown Silty Clay FILL trace gravel (reworked soil) brown	0.2 216.8 0.6	SS	1	100	6	- - - -	217 -	0		28			
		CLAY / CLAYEY SILT TILL trace sand, trace gravel hard		SS	2	100	32	- - - - - -	216 —	0		5 0			
			-	SS	3	100	35			0		as ○ 14			
			-					- 2 - - - -	215 —						
		END OF BOREHOLE	214.3	SS	4	100	52	- - - - 3		-	⊙·	as 0 13			

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RI	ECORD	OF BOREHOLI	E No). <u> </u>	BH_	<u>B16</u>									WC	ood.
Pro	ject Number:	TP115086							Drilling	g Location:	Arterial A2, S	ta. 1+500	E:604893 N:4	852946	Logged by:	MS
Pro	ject Client:	City of Brampton							Drilling	g Method:	150 mm Soli	d Stem A	ugers		Compiled by:	PR
Pro	ject Name:	Arterial Road Network w Secondary Plan Area (Ar	ithin H	ighwa	y 427 l	Industr	ial		Drilling	g Machine:	Track Mounte	ed Drill			Reviewed by:	SM/DP
Pro	ject Location:	Brampton, Ontario	ea 41)						Date S	Started:	Jan 24, 2020	Date	Completed: <u>Ja</u>	n 24, 2020	Revision No.:	0, 1/5/21
	LITH	OLOGY PROFILE		SO	IL SA	MPLI	NG			FIELD	TESTING		TESTING apour Reading	7	COMMEN	TO
					٦		(%)		(E)	1	tionTesting PPT ● DCPT	▲ COV (LE	EL) TOV (LEL) 4 6 8	INSTRUMENTATION INSTALLATION	COMMEN &	
E B		DESCRIPTION		/be	Sample Number	(%)	'N' / RQD (%)	Ê		MTO Vane*	Nilcon Vane* ♦ Intact	△ COV (pp	m)	TION	GRAIN SI DISTRIBUT	
Lithology				Sample Type	ple N	Recovery (%)	ž	DЕРТН (m)	ELEVATION	△ Intact ▲ Remould	♦ Intact ♦ Remould	W _P	W W _L	ALL/	(%)	
Lit Lit	Geodetic Ground S	urface Elevation: 217.9 m		Sam	Sam	Rea	SPT	DEP	ELE	* Undrained She 20 40	ear Strength (kPa) 60 80	Plastic 20 4	Liquid 10 60 80	LSNI	GR SA	SI CL
 XX	al	drak brown / brown	217.8					1 -			: :	:				
▓		Silty Clay FILL		SS	1	100	8	Ė		0	a					
		(reworked soil) brown	217.4 					-								
	SILTY tr	CLAY / CLAYEY SILT TILL race sand, trace gravel		SS	2	100	21	- - - 1	217 -	6						
		very stiff to hard	ļ					<u></u> '								
				22	•	100	F.C.	-								
			216.1	SS	3	100	56	-		1						
ra.		END OF BOREHOLE	1.8					-						1		
										: :						
											: :					

R	ECORD	OF BOREHOLE	E No	o. <u> </u>	BH	B17	•									W	00	d.
Pro	ject Number:	TP115086							Drilling	Location:	Arterial A2,	Sta. 1+600	E:604822 N:4	853017	L	ogged by:	MS	
Pro	ject Client:	City of Brampton							Drilling	Method:	150 mm So	lid Stem A	Augers		_ c	ompiled by	/: <u>PR</u>	
Pro	ject Name:	Arterial Road Network with	thin H	ighwa	y 427 I	ndustr	ial		Drilling	Machine:	Track Mount	ted Drill			R	eviewed by	y: <u>SM/E</u>)P
Pro	ject Location:	Secondary Plan Area (Are Brampton, Ontario	ea 47)						Date 9	Started:	Jan 24, 2020	Date	Completed: Jai	n 24, 2020	_ R	evision No	.: <u>0, 1/</u>	5/21
	LITH	OLOGY PROFILE		SO	IL SA	MPLI	NG			FIELD	TESTING		TESTING					
/ Plot		DESCRIPTION		Туре	Sample Number	y (%)	SPT 'N' / RQD (%)	(m)	(m) NOI	O SPT □ MTO Vane* △ Intact	tionTesting PPT ● DCPT Nilcon Vane* ◇ Intact	△ COV (LI 2 △ COV (p) 100 2	apour Reading EL) ■ TOV (LEL) 4 6 8 om) □ TOV (ppm) 00 300 400	INSTRUMENTATION INSTALLATION	I	COMME & GRAIN S DISTRIBL	SIZE JTION	
Lithology Plot				Sample Type	ample	Recovery (%)	Ņ. Ā	DЕРТН (m)	ELEVATION	▲ Remould * Undrained She	◆ Remould ear Strength (kPa)	W _P ■ Plastic	W W _L → Liquid	ISTRU	GR	(%) sa	SI	CL
<u> </u>	Geodetic Ground S	Surface Elevation: 218.5 m bout 150 mm TOPSOIL	218.3	S	S	<u>«</u>	S		Ш	20 40	60 80	20	40 60 80	22	GIX			
$\overset{\otimes}{\otimes}$		dark brown / brown Silty Clay FILL (reworked soil)	0.2 217.9	SS	1	100	8	- - -	218 -	0		3	1					
	trace	brown SILTY CLAY TILL sand to sandy, trace gravel, cobbles/boulders	0.6					- - - - - 1										
		very stiff to hard		SS	2	100	21	- - -		0		16						
			•	SS	3	100	30	-	217 -			■ 19			5	21	47	27
			-					— 2 - -										
				SS	4	100	42	- - - -	216 -	0)	a o 15						
								3	-									
				SS	5	100	50	-	215 -		• • • • • • • • • • • • • • • • • • • •	13						
		grey		SS	6	100	39	- 4 - 4	-	0	1	a o 14						
			-					- - - -	214 -									
		END OF BOREHOLE	213.4 5.0	SS	7	100	29	- - 5	-	0		13						
												:						

 $\frac{\textstyle \sum}{\textstyle -}$ No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD	OF BOREHOLE N	lo.	<u>BH</u>	<u>B18</u>	<u>.</u>											V	VO	00	4
Pro	ject Number:	TP115086						Drilling	g Location:	4	Arterial A2, S	Sta. 1+70	0 E:6	04752 N:4	853086	L	ogged b	y: <u>N</u>	/IS	_
Pro	ject Client:	City of Brampton						Drilling	g Method:	_	150 mm So	lid Stem	Auger	s		c	Compiled	l by: <u>F</u>	PR	
Pro	ject Name:	Arterial Road Network within Secondary Plan Area (Area 47	Highwa	ay 427	Industi	rial		Drilling	g Machine:	1	rack Mount	ed Drill				F	Reviewe	d by: S	SM/DP	
Pro	ject Location:	Brampton, Ontario	')					Date S	Started:	_	lan 24, 2020	Dat	e Com	pleted: Ja	n 24, 20	20 F	Revision	No.: <u>0</u>), 1/5/2°	1
	LITH	OLOGY PROFILE	SC	DIL S/	MPLI	NG			FIELD) TE	ESTING			TING						
Plot		DESCRIPTION	lype	Sample Number	(%)	SPT 'N' / RQD (%)	(m)	(m) NOI		⊃ PF e* I	nTesting PT • DCPT Nilcon Vane*	▲ COV (2 △ COV (4 ppm) □	TOV (LEL) 6 8 TOV (ppm) 00 400	INSTRUMENTATION INSTALLATION		GRAI DISTRI		E	
Lithology Plot			Sample Type	mple h	Recovery (%)	\.\Y.	DEРТН (m)	ELEVATION	▲ Remould	1	Remould Strength (kPa)	W _P ■ Plastic	W	W _L Liquid	STRUI			%)		
<u> </u>	Geodetic Ground S	Surface Elevation: 219.2 m bout 150 mm TOPSOIL 219.1		Sa	, a	R		<u> </u>	20 4	10	60 80	20		80 80	22	GR	SA	SI		CL
X		drak brown / brown Silty Clay FILL trace gravel (reworked soil) 0.2 218.6	SS	1	100	8	- - - -	219 -	0			3								
	SILTY trace san	brown CLAY / CLAYEY SILT TILL d, tarce gravel, cobbles/boulders very stiff to hard	SS	2	100	20	_ _ _ 1		 O			3								
			ss	3	100	43	- - - -	218 -		0		3								
XX		END OF BOREHOLE 1.8					_													
												:	1							
												:								
												:								
													-							
										:		:	:							

 $\frac{\textstyle \sum}{\textstyle =}$ No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD OF BOREH	OLE N	0.	BH	<u>B19</u>	i								wood.
	oject Number: TP115086								g Location:			E:604680 N:4	853157	Logged by: MS
	oject Client: City of Brampton								g Method:	150 mm Sol		igers		Compiled by: PR
	oject Name: Arterial Road Netwo Secondary Plan Are	ork within H a (Area 47)	lighwa	ıy 427 l	Industr	ial			g Machine:	Track Mount				Reviewed by: SM/DP
Pro	oject Location: Brampton, Ontario							Date S	Started:	Jan 24, 2020	Date 0	Completed: <u>Jai</u>	n 24, 202	0 Revision No.: 0, 1/5/21
	LITHOLOGY PROFILE		SC	IL SA	MPLI	NG			FIELD.	TESTING		TESTING oour Reading	_	0011115170
Lithology Plot	DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould * Undrained She	itionTesting PPT	△ COV (LEL 2 4 △ COV (ppm 100 200 W _P Plastic) ■ TOV (LEL)	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
5	Geodetic Ground Surface Elevation: 219.5 m about 200 mm TOPSOIL	219.3	Š	ő	Ř	ß			20 40	60 80	20 40	60 80	ZZ	GR SA SI CL
※	dark brown/brown Sitty Clay FILL trace gravel (reworked soil)	0.2 218.9 0.¢	SS	1	100	7	- - - - -	219 -	0		1 0			
	brown SILTY CLAY / CLAYEY SILT TI trace sand, trace gravel very stiff to hard	LL	SS	2	100	29	- - - 1 - -	- - - - -	0	B	o 15			
			SS	3	83	37	- - - - - 2	218 -	0		o 16			
	greyish brown						- - - - -	217 —						
		216.5	SS	4	100	40	E ,		0		14			
<u> (XA</u>	END OF BOREHOLE	216.5 3.0					— 3							

 $\stackrel{\textstyle \nabla}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD	OF BOREHOLE	E No	. <u>I</u>	<u>BH I</u>	<u>B20</u>									WO	od.
Pro	ject Number:	TP115086							Drilling	Location:	Arterial A2, S	ta. 1+900	E:604609 N:4	853227		MS
Pro	ject Client:	City of Brampton							Drilling	Method:	150 mm Sol	id Stem Au	ugers		Compiled by:	PR
Pro	ject Name:	Arterial Road Network wi	ithin Hig	ghwa	y 427 I	ndustr	ial		Drilling	Machine:	Track Mount	ed Drill			Reviewed by:	SM/DP
Pro	ject Location:	Secondary Plan Area (Are Brampton, Ontario	ea 47)						Date S	tarted:	Jan 24, 2020	Date 0	Completed: <u>Jar</u>	n 24, 2020	Revision No.:	0, 1/5/21
	LITH	OLOGY PROFILE		SO	IL SA	MPLI	NG			FIELD '	TESTING		TESTING pour Reading	_	00141511	
Lithology Plot	Geodetic Ground S	DESCRIPTION Surface Elevation: 219.9 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould	ear Strength (kPa)	▲ COV (LEL	D. TOV (LEL) 6 8 1) □ TOV (ppm) 0 300 400 W WL Liquid	INSTRUMENTATION INSTALLATION	COMMENT & GRAIN SIZ DISTRIBUTI (%)	ZE
***	а	drak grey / brown	219.8 0.1	SS	1	75	9	-	-	0						
※		Silty Clay FILL trace gravel (reworked soil) brown	219.3	33	'	75	9	- - -	-							
	SILTY	CLAY / CLAYEY SILT TILL race sand, trace gravel very stiff to hard		SS	2	100	26	- 1 - 1	219 - - 7 -	0						
				SS	3	100	56	- = - -	= =		. •					
<i>XX</i>		END OF BOREHOLE	1.8					-				- : :				

 $\frac{\nabla}{z}$ Groundwater encountered on completion of drilling on <u>1/24/2020</u> at a depth of: <u>1.2 m</u>.

RI	ECORD	OF BOREHOL	E No	o. <u>I</u>	<u>BH </u>	<u>B21</u>								wood
Pro	ject Number:	TP115086							Drilling	Location:	Arterial A2, S	Sta. 2+000 E:604537 N:4	853296	_ Logged by: MS
Pro	ject Client:	City of Brampton							Drilling	Method:	150 mm Sol	id Stem Augers		Compiled by: PR
	ject Name:	Arterial Road Network v Secondary Plan Area (A	within H Area 47)	ighwa	y 427 I	ndustr	ial		Drilling	Machine:	Track Mount			Reviewed by: SM/DP
Pro	ject Location:	Brampton, Ontario							Date 9	Started:	Jan 24, 2020	Date Completed: Jar	n 24, 2020	Revision No.: <u>0, 1/5/21</u>
	LITH	OLOGY PROFILE		SO	IL SA	MPLI	NG			FIELD	TESTING	LAB TESTING Soil Vapour Reading		
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □ MTO Vane* △ Intact ▲ Remould	tionTesting PPT	A COV (ELL)	NSTRUMENTATION NSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
5	Geodetic Ground S al	urface Elevation: 220.8 m Dout 200 mm TOPSOIL	220.6	တိ	Š	Ϋ́	ß	<u> </u>	<u> </u>	20 40	60 80	20 40 60 80	ZZ	GR SA SI CL
		grey / dark brown / brown Silty Clay FILL ce gravel, trace organics (reworked soil)	0.2	SS	1	100	12	- - - - -	220 —	0		s 0 14		
				SS	2	100	9	- 1 - - - -	-	0		o 22		
			218.6	SS	3	100	9	- - - - - 2	219 -	0	8	39		
	SILTY	brown CLAY / CLAYEY SILT TILL race sand, trace gravel stiff to hard	2.2	SS	4	100	13	+		0		3 O ₁₇		
				SS	5	100	27	3 - - - - - -	-	•		0 16		
		grey		ss	6	100	22	- - 4 - - -	217 —	0	E	°17		
			215.8	SS	7	22	30	- - - - - 5	216 -	0		20		
		END OF BOREHOLE	5.0											

Groundwater encountered on completion of drilling on 1/24/2020 at a depth of: 2.7 m. Cave in depth after removal of augers: 4.3 m.

R	ECORD	OF BOREHO	LE N	0.	ВН	B22												W	ood.	
Pro	ject Number:	TP115086							Drilling	Location:	Arter	ial A2, S	Sta. 2+10	0 (Cou	ntryside D)r.)	Lo	ogged by:	MS	_
Pro	ject Client:	City of Brampton							Drilling	g Method:	150 i	mm So	4853360 lid Stem	Augers	s		c	ompiled by	: <u>PR</u>	_
Pro	ject Name:	Arterial Road Networ	k within H	lighwa	ıy 427 l	ndustr	ial		Drilling	g Machine:	Truck	k Mount	ed Drill				R	eviewed by	/: <u>SM/DP</u>	_
Pro	ject Location:	Secondary Plan Area Brampton, Ontario	(Area 47)						Date S	Started:	Jan 2	3, 2020	Date	e Comp	oleted: <u>Jar</u>	n 23, 202	2 0 R	evision No	.: <u>0, 1/5/21</u>	-
	LITH	OLOGY PROFILE		SC	IL SA	MPLI	NG			FIELD	TEST	ING		TES						
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	Penetra ○ SPT □ MTO Vane* △ Intact ▲ Remould * Undrained She	PPT € Nilcor ◇ Int ◆ Re	DCPT N Vane* tact emould	▲ COV (L 2 △ COV (p	4 € ppm) □ 200 30	TOV (LEL) 8 TOV (ppm)	INSTRUMENTATION INSTALLATION		COMME & GRAIN S DISTRIBL (%)	SIZE JTION	
Ë	Geodetic Ground	Surface Elevation: 220.5 m bout 200 mm ASPHALT	220.2	Sa	Sa	ag.	RS		<u> </u>	20 40	60	80	20	40 6	0 80	22	GR	SA	SI CL	_
***		Sand and Gravel FILL moist	220.3 0.2					-	-								33	58	(9)	
₩			219.9	SS	1	75	9	-	220 -				ş							
\bowtie		brown/dark grey Silty Clay FILL trace gravel	0.6					-	-											
		udoc gravor		SS		100	40	— 1 _	-											
$\overset{ imes}{ imes}$			219.0	33	2	100	18	-	219 -											
~~~		END OF BOREHOLE	1.5						219 -			:								
													:							
													:							
													:							
										: :			:	: :						
													:							
													:							
													:							
													:							
													:							
													:	:						
													:							
													:							
					1	İ	l	ı		1		1	1							

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

RE	ECORD	OF BOREHOLE No	). <u>l</u>	BH I	<u> 323</u>								WC	ood.
Proje	ect Number:	TP115086						Drilling	Location:	Arterial A2, Sta	a. 2+200 E:604392 N:48	53436	Logged by:	AS
Proje	ect Client:	City of Brampton						Drilling	Method:	Solid Stem Au	igers		_ Compiled by:	KC/ZF
Proje	ect Name:	Arterial Road Network within Hi Plan Area (Area 47)	ghway	/ 427 In	dustria	al Seco	ndary	Drilling	Machine:	MST Bomb			Reviewed by:	SM/DP
Proje	ect Location:	Proposed East-West Arterial Ro	ad, Br	ampto	1			Date S	tarted:	Jan 26, 2022	Date Completed:	1 26, 2022	_ Revision No.:	0, 3/10/22
	LITH	OLOGY PROFILE	SC	DIL SA	MPLI	NG			FIELD	TESTING	LAB TESTING Soil Vapour Reading	7		
Lithology Plot		DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	<b>DEPTH</b> (m)	ELEVATION (m)	○ SPT □ MTO Vane* △ Intact ▲ Remould	PPT • DCPT	COV (LEL) TOV (LEL)  2 4 6 8  COV (ppm) TOV (ppm) 100 200 300 400  W _p W W _L Plastic Liquid	INSTRUMENTATION INSTALLATION	COMMEN & GRAIN SI DISTRIBUT (%)	ZE
<u>₹</u> (	Geodetic Ground	Surface Elevation: 221.1 m brown	Sa	Sa	å	S	JO .	ם 221 -	20 40		20 40 60 80	ZZ	GR SA	SI CL
	some sar	Silty Clay FILL Id, trace gravel, trace organics, oxidation	SS	1	100	36	- - - - -	-	0	<b>8</b>	°22			
			SS	2	38	18	- - 1 - - - -	220 -	0	<b>45</b>	⁰ 20			
		218.8	SS	3	100	22	- - - - - 2 -	219	<b>○</b>	181	°20			
		brown 2.3 SILTY CLAY TILL					-							
	trace to so	ome sand, trace to some gravel, oxidation hard	SS	4	100	31					014			
		218.0 END OF BOREHOLE 3.0					_ 3	-						
Wood	d E&IS, a Divisi	on of Wood							<u> </u>	eletion of drilling	: : : :			

Canada Limited

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

Borehole details as presented, do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified Geotechnical Engineer or Professional Geoscientist. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying Explanation of Borehole Log'.

Scale: 1:53

RECORD	OF BOREHOLE No	). <u>[</u>	BH E	<u> 324</u>										W	00	d.
Project Number:	TP115086						Drilling	Location:	Arterial A2, S	ita. 2+300	E:604321 N:48	53507	Lo	ogged by:	<u>AS</u>	<u> </u>
Project Client:	City of Brampton						Drilling	Method:	Solid Stem A	Augers			c	ompiled by:	KC/ZF	:
Project Name:	Arterial Road Network within Hi	ghway	/ 427 In	dustria	l Seco	ndary	Drilling	Machine:	MST Bomb				R	eviewed by:	SM/DI	P
Project Location:	Plan Area (Area 47) Proposed East-West Arterial Ro	ad, Bra	amptor	1			Date S	tarted:	Jan 26, 2022	Date 0	Completed: <u>Jai</u>	n 26, 202	2 R	evision No.:	0, 3/10	)/22
LITH	OLOGY PROFILE	SC	IL SA	MPLI	NG			FIELD	TESTING		TESTING					
			L		(%)		<u>-</u>		tionTesting	Soil Va  COV (LEI  2  4	pour Reading L) ■ TOV (LEL) 6 8	INSTRUMENTATION INSTALLATION		COMMEN &	ITS	
Plot	DESCRIPTION	ype	Sample Number	(%)	SPT 'N' / RQD (%)	Ê	ELEVATION (m)	MTO Vane* △ Intact			n)   TOV (ppm)	ENT/		GRAIN SI		
Lithology Plot		Sample Type	N eld	Recovery (%)	.N. /	DEPTH (m)	VAT	▲ Remould	◆ Remould	W _P	W W _L	TRUN		(%)		
Geodetic Ground	Surface Elevation: 221.9 m dark brown	San	San	Rec	SPT	DEF	H	* Undrained She	ear Strength (kPa) 60 80	Plastic 20 4	Liquid 0 60 80	SN NS NS	GR	SA	SI	CL
	Gravelly Sand FILL trace clay, organics	SS	1	100	100	_	-			6						
<b>&amp;</b>	moist 221.3						-									
	brown 0.6  Silty Clay FILL  nd, trace gravel, trace organics,					-										
Sollie Sai	oxidation	SS	2	54	19	— 1 -	221 -	0		⁰ 15						
						_	-			30						
	trace cobbles					_	-									
	040.0	SS	3	83	15	- - 2	220 -	0		18						
***	END OF BOREHOLE 2.1					-			: :							
											n n					
											n n					
								: :								
Mood ESIS a Divis																

 $\frac{\nabla}{2}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

#### RECORD OF BOREHOLE No. BH B25 Project Number: TP115086 Drilling Location: Arterial A2, Sta. 2+400 E:604250 N:4853574 Logged by: Project Client: Drilling Method: Solid Stem Augers KC/ZF City of Brampton Compiled by: Arterial Road Network within Highway 427 Industrial Secondary Drilling Machine: Plan Area (Area 47) Proposed East-West Arterial Road, Brampton Date Started: Project Name: MST Bomb SM/DP Reviewed by: Project Location: Jan 26, 2022 Date Completed: Jan 26, 2022 Revision No.: 0, 3/10/22 LITHOLOGY PROFILE **SOIL SAMPLING FIELD TESTING LAB TESTING** INSTRUMENTATION INSTALLATION **COMMENTS** PenetrationTesting COV (LEL) TOV (LEL) Ê O SPT ☐ PPT ● DCPT Sample Number **GRAIN SIZE** 'N' / RQD COV (ppm) □ TOV (ppm) **DESCRIPTION** Recovery (%) 100 200 300 400 DISTRIBUTION DEPTH (m) ithology I W_L W. W (%) * Undrained Shear Strength (kPa) Plastic SA CL Surface Elevation: 222.5 r 40 60 20 Silty Clay FILL some sand, trace gravel, trace organics, 022 92 15 oxidation 222 brown SILTY CLAY/CLAYEY SILT TILL some sand, trace to some gravel, trace cobbles, trace organics, oxidation very stiff to hard SS 2 100 16 0 221 100 o 17 26 2 220 °16 SS 100 38 0 SS 5 100 36 °16 219 19 35 SS 6 100 19 Ó 10 49 40 218 SS 018 75 16 0 5 217. END OF BOREHOLE Wood E&IS, a Division of Wood $\stackrel{ extstyle op}{=}$ No freestanding groundwater measured in open borehole on completion of drilling.

Canada Limited

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6

Tel. No.: (905) 415-2632 www.woodplc.com

RI	ECORD (	OF BOREHOLE No	o. <u>l</u>	<u>BH I</u>	<u> 326</u>									W	00	d.
Proj	ject Number:	TP115086						Drilling	Location:	Arterial A2, S	sta. 2+500 E:604179 N:48	53643	Lo	gged by:	AS	
Proj	ject Client:	City of Brampton						Drilling	Method:	Solid Stem A	Augers		Co	ompiled by:	KC/ZI	=
Proj	ject Name:	Arterial Road Network within Hi	ighwa	y 427 Ir	ndustria	al Seco	ndary	Drilling	Machine:	MST Bomb			Re	eviewed by:	SM/D	Р
Proj	ject Location:	Plan Area (Area 47) Proposed East-West Arterial Ro	ad, Br	ampto	n			Date S	tarted:	Jan 26, 2022	Date Completed: Ja	n 26, 2022	2 Re	evision No.:	0, 3/10	0/22
	LITHO	LOGY PROFILE	SC	DIL SA	MPLI	NG			FIELD	TESTING	LAB TESTING Soil Vapour Reading	7		2011151		
				  -		(%)		Ê	ı	tionTesting PPT • DCPT	▲ COV (LEL) ■ TOV (LEL) 2 4 6 8	INSTRUMENTATION INSTALLATION		COMMEN &		
Plot	I	DESCRIPTION	Гуре	Sample Number	(%) k	SPT 'N' / RQD (%)	Ê	ELEVATION (m)			△ COV (ppm) □ TOV (ppm) 100 200 300 400	MENT ATIO		GRAIN SI DISTRIBUT		
Lithology Plot			Sample Type	nple !	Recovery (%)	, Z	DEPTH (m)	EVAT	▲ Remould	Remould  ear Strength (kPa)	$W_P$ $W$ $W_L$ Plastic Liquid	STALL		(%)		
₹ 🗮	Geodetic Ground Su	urface Elevation: 222.9 m brown	Sar	Sar	å	S	ᆷ	<u> </u>	20 40	60 80	20 40 60 80	22	GR	SA	SI	CL
▓	some sand	Silty Clay FILL , trace gravel, trace organics,	SS	1	100	17	-	-	0		15					
▓		oxidation					E									
▓							F .	222 -								
▓			SS	2	100	13	<u>-</u> 1 - -	-	0		30					
$\frac{8}{2}$		<u>221.5</u> brown 1.4					-	-								
	SILTY ( some sa	CLAY / CLAYEY SILT TILL and, trace gravel, oxidation	SS	3	100	28	-	-			10					
		very stiff 220.8	30				- 2	221 -			15					
	E	ND OF BOREHOLE 2.1														
Woo.	nd F&IS. a Divisio	n of Wood		1			<u> </u>		<u> </u>							

Canada Limited

 $\frac{\vee}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

### Project Number: TP115086 Drilling Location: Arterial A2, Sta. 2+600 E:604107 N:4853714 Logged by: Project Client: Drilling Method: Solid Stem Augers KC/ZF City of Brampton Compiled by: Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47) Proposed East-West Arterial Road, Brampton Date Started: Project Name: MST Bomb SM/DP Reviewed by: Project Location: Jan 26, 2022 Date Completed: Jan 26, 2022 Revision No.: 0, 3/10/22 LITHOLOGY PROFILE **SOIL SAMPLING FIELD TESTING** LAB TESTING INSTRUMENTATION INSTALLATION **COMMENTS** PenetrationTesting ▲ COV (LEL) ■ TOV (LEL) Ê O SPT ☐ PPT ● DCP1 Sample Number **GRAIN SIZE** TOV (ppm) 'N' / RQD COV (ppm) □ Plot **DESCRIPTION** Recovery (%) ELEVATION DISTRIBUTION 100 200 300 400 DEPTH (m) ithology, W_L W. W (%) * Undrained Shear Strength (kPa) Plastic SA CL 40 60 20 brown Silty Clay FILL some sand, trace gravel, trace organics, oxidation °31 SS 71 9 223 °26 SS 2 100 15 0 222 brown SILTY CLAY / CLAYEY SILT TILL 18 31 some sand, trace gravel, oxidation hard 100 52 53 2 221 017 SS 100 73 0 220.3 3.0 END OF BOREHOLE Wood E&IS, a Division of Wood

Canada Limited

RECORD OF BOREHOLE No. BH B27

 $\stackrel{ extstyle op}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6

Tel. No.: (905) 415-2632 www.woodplc.com

RI	ECORD	OF BOREHOLE No	o. <u>l</u>	<u>BH I</u>	<u> 328</u>									W	000	<b>d</b> .
Proj	ect Number:	TP115086						Drilling	Location:	Arterial A2, S	Sta. 2+700 E:604034 N	I:4853786		Logged by:	<u>AS</u>	_
Proj	ect Client:	City of Brampton						Drilling	Method:	Solid Stem A	Augers			Compiled by:	KC/ZF	
Proj	ect Name:	Arterial Road Network within H	ighway	/ 427 Ir	ndustria	al Seco	ndary	Drilling	Machine:	MST Bomb			!	Reviewed by:	SM/DP	
Proj	ect Location:	Plan Area (Area 47) Proposed East-West Arterial Ro	ad, Br	ampto	n			Date S	tarted:	Jan 26, 2022	Date Completed:	Jan 26, 20	22	Revision No.:	0, 3/10/	22
	LITH	OLOGY PROFILE	SC	DIL SA	MPLI	NG			FIELD	TESTING	LAB TESTING					
				_		(%)		<u> </u>		tionTesting PPT • DCPT	Soil Vapour Reading  ▲ COV (LEL) ■ TOV (I  2 4 6 8	INSTRUMENTATION		COMMEN &	ITS	
Blot		DESCRIPTION	ype	Sample Number	(%)	SPT 'N' / RQD (%)	Ê	ELEVATION (m)	MTO Vane* △ Intact		△ COV (ppm) □ TOV (p 100 200 300 400	ATION (mdd		GRAIN SI		
Lithology Plot			Sample Type	nple N	Recovery (%)	ż	DEРТН (m)	VATI	▲ Remould	◆ Remould	W _p W W	TRUL		(%)		
£		Surface Elevation: 223.4 m dark brown and black	San	San	Rec	SP	DE		* Undrained Shi	ear Strength (kPa) 60 80	Plastic Liquid	S S S	GR	SA	SI	CL
▩		Silty Clay FILL ome sand, trace gravel	SS	1	83	22	-	223 -	0		28:					
▩							Ė				28					
	SILTY	brown 0.7					Ė	-								
	some sar	nd, trace gravel, trace organics, oxidation	SS	2	100	23	<u> </u>		0		1 °15					
		very stiff					}	222 -								
							F									
		221.2	SS	3	100	27	_ _ 2		0		16					
ra		END OF BOREHOLE 2.1														
										6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6						
										6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6						
	d ERIC a Divisi					_			·		·		_			

 $\frac{\nabla}{2}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Comparison   Com	R	ECORD	OF BORE	HOLE N	o. <u> </u>	BH :	<u>S3</u>									V	100	9
Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Property   Control   Propert	Pro	ject Number:	TP115086							Drilling	g Location:	Arterial A2 a	at Hwy 50	E:606278 N:48	52633	Logged b	y: <u>MS</u>	/ RM
Date   Secondary Man Array (Area 47)	Pro	ject Client:	City of Brampton	1						Drilling	g Method:	150 mm Sc	olid Stem A	ugers		Compiled	by: PR	
The content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the	Pro	ject Name:				y 427 l	ndustr	rial		Drilling	g Machine:	Track Moun	ted Drill			Reviewed	by: <b>SM/</b>	DP
DESCRIPTION	Pro	ject Location:								Date \$	Started:	Jan 10, 020	2Date	Completed: <u>Jar</u>	n 10, 0202	Revision	No.: <u>0, 3</u>	31/21
DESCRIPTION    S		LITH	OLOGY PROFIL	.E	SO	IL SA	MPLI	NG			FIELD	TESTING						
Such and Surface (Surface) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (19								(9)					▲ COV (LE	L) TOV (LEL)	NOI			
Such and Surface (Surface) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (19	ĕ		DESCRIPTION		e	mber	(%	9) QD	_				△ COV (pp	m)   TOV (ppm)	TON	GRAI	N SIZE	
Such and Surface (Surface) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (19	ogy P				le Typ	le Nui	/ery (	ž Ž	ш) Н.	ATIO	△ Intact	Intact			ALLAT			
Such and service PUL.  Such as the first PULL  Substitution of the PULL  Substitution of the PULL  Substitution of the PULL  Substitution of the PULL  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pull  Substitution of the Pul	Lithol	Geodetic Ground S	urface Elevation: 210.7 m		Samp	Samp	Reco	SPT '	DEPT	ELEV					INSTI INST			CL
Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Section   Sect	$\bowtie$		dark grey / brown Sand and Gravel FILL						-									
Set of a grow of a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a growth and a	$\bowtie$		moist		SS	1	100	30	- - -				7					
Strip Clay Transport grower growed, lating 200	₩		dark grey / grey						-	210 -								
SS 4 100 10 20 30 30 30 30 10 20 30 30 30 30 40 10 30 30 30 30 30 40 10 30 30 30 30 30 30 30 30 30 30 30 30 30	$\bowtie$	Silt trace to some	e sand, trace to some	ILL gravel, trace	00	,	75	16	- 1									
SS 3 83 10 2 3 3 3 3 46 18  SILTY CAN TILL some sand to sandy, face gravel, cish shoulders silf to hard  SS 6 100 88 4 9 0 15 907 907 15 907 907 907 907 907 907 907 907 907 907	$\overset{XX}{X}$		organics		33	2	/3	10	-				13					
SS 3 83 10 2 3 3 3 3 46 18  SILTY CAN TILL some sand to sandy, face gravel, cish shoulders silf to hard  SS 6 100 88 4 9 0 15 907 907 15 907 907 907 907 907 907 907 907 907 907	$\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}}{\overset{x}}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}{\mathsf{$								-									
SIT ON TILL  SOR SET TO LAND  SET TOWN  SIT ON TILL  SOR SET TO LAND  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TOWN  SET TO	$\overset{ imes}{ imes}$				SS	3	83	10	-	209 -			<b>B</b>					
Second Second Country, Nation Growth, Second Second Country, Nation Growth, Second Second Country, Nation Growth, Second Second Country, Nation Growth, Second Second Country, Nation Growth, Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second	$\overset{\times\!\!\!\!\times}$								2	•								
Second Second Country, Nation Growth, Second Second Country, Nation Growth, Second Second Country, Nation Growth, Second Second Country, Nation Growth, Second Second Country, Nation Growth, Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second	$\overset{\sim}{\sim}$																	
Second Second Country, Nation Growth, Second Second Country, Nation Growth, Second Second Country, Nation Growth, Second Second Country, Nation Growth, Second Second Country, Nation Growth, Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second	$\overset{ imes}{ imes}$				SS	4	100	10	Ė	208 -	0		s ° ₂₀					
SILTY CLAY TILL some search to samely, trace gravely, could be abundance of the same trace gravely and the same trace gravely could be abundance of the same trace gravely and the same trace gravely and the same trace gravely and the same trace gravely and the same trace gravely gravely and trace of sety, tensor of same trace gravely gravely dense moist to well SS 9 100 250 mm - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203 - 203	$\bowtie$								-					i i i				
SS   S   S   S   S   S   S   S   S			SILTY CLAY TILL						.— 3 - -									
SS   6   100   88		some	cobbles/boulders	gravel,	SS	5	100	15	-		0		15					
grey  grey  SANDY SILT TILL  trace clay, trace gravel, cobbles/boulders very dense most to set  END OF BOREHOLE  9, 100, 85, 10 100, 85, 10 100, 85, 10 100, 150 mm  202  END OF BOREHOLE  9, 100, 85, 10 100, 85, 10 100, 150 mm  1, 35, 56, 8  Non-plastic  Scale: 1:53  Scale: 1:53  Scale: 1:53			Suil to Haid						-	207 -								
grey  grey  SANDY SILT TILL  trace clay, trace gravel, cobbles/boulders very dense most to set  END OF BOREHOLE  9, 100, 85, 10 100, 85, 10 100, 85, 10 100, 150 mm  202  END OF BOREHOLE  9, 100, 85, 10 100, 85, 10 100, 150 mm  1, 35, 56, 8  Non-plastic  Scale: 1:53  Scale: 1:53  Scale: 1:53									_ _ 4									
SS   7   100   250mm   5   1   205   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100					SS	6	100	88	-				10			3 33	46	18
SS   7   100   250mm   5   1   205   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100									Ė									
grey  SS ND/GNT TILL  trace clay, trace gray (achies/boulders wert dense moist to wet  SS 9 100 877 200 44 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47 200 47					SS	7	100		-	206 -		90	:   as o :   500 mBn :					
SS 8 100 44 204 7									5									
SS 8 100 44 204 7																		
SS 8 100 44 204 7			arev						E	205 -								
SS 8 100 44  SS 8 100 44  SS 8 100 44  SS 9 100 877  SANDY SILT TILL  trace clay, trace gravel, cobbles/boulders very dense moist to wet  SS 9 100 877  8 200 mm 15  1 35 56 8  Non-plastic  Non-plastic  Non-plastic  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To me  To m			3 7						-									
SANDY SILT TILL trace clay, trace gravel, cobbles/boulders very dense moist to wet  SS 9 100 87/ 203 - 87 203 - 87 203 - 87 203 - 87 200 mm 15  In 35 56 8 Non-plastic  SS 9 100 100 150/m  END OF BOREHOLE  9.4  So Year Class  For Description of Wood Amada Limited Or Vogel Road, Units 3 & 4 Kichmord Hill, Ontario, L4B 3K6 Amada  So Year Class a Division of Wood Amada Limited Or Vogel Road, Units 3 & 4 Kichmord Hill, Ontario, L4B 3K6 Amada  Expenses of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second									F °									
SANDY SILT TILL trace clay, trace gravel, cobbles/boulders very dense moist to wet  SS 9 100 87/ 280mm 8 280 mm 15  1 35 56 8  Non-plastic  To a 203 - 87/ 280 mm 15  1 35 56 8  Non-plastic  Non-plastic  Find of BoreHole  9.4  Solved E&IS, a Division of Wood anada Limited  O'vogell Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Units 3 & 4  Schring Road, Uni					SS	8	100	44				<b>5</b>	10					
SANDY SILT TILL trace clay, trace gravel, cobbles/boulders very dense moist to wet  SS 9 100 877  87 8 8 280 mm 15  1 35 56 8  Non-plastic  Non-plastic  Non-plastic  SC 10 100 150 mm  END OF BOREHOLE  9.4									-	204 -								
SANDY SILT TILL trace clay, trace gravel, cobbles/boulders very dense moist to wet  SS 9 100 877  87 8 8 280 mm 15  1 35 56 8  Non-plastic  Non-plastic  Non-plastic  SC 10 100 150 mm  END OF BOREHOLE  9.4				000.5					- - 7 <u>-</u>	Z :								
trace clay, trace gravel, cobbles/boulders very dense moist to wet  SS 9 100 280mm 8 280 mm 15 1 35 56 8 Non-plastic  Wet  Language To the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the properties of the	T T		grey						-	-								
SS 9 100 87/ 280mm 8 1 35 56 8  Wet 202 - 9 2012 SS 10 100 507/ 150mm 9 17  END OF BOREHOLE 9.4 Signal of State of Completion of drilling on 1/10/202 at a depth of: 7.0 m.  Groundwater encountered on completion of drilling on 1/10/202 at a depth of: 7.0 m.  Borehole details as presented, do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was Scale: 1 : 53 commissioned and the accompanying Explanation of Borehole Log*.	1	trace clay	, trace gravel, cobbles	s/boulders						000								
wet  201.2 SS 10 100 50 1 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 150 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9.4 201.2 SS 10 100 mm 17  END OF BOREHOLE 9	1		moist to wet		SS	9	100		Ė	203 -		87	B 015			1 35	56	8
Vood E&IS, a Division of Wood Canada Limited  10 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Janada  20 In Society (10 In No.: (905) 415-2632  20 In Society (10 In No.: (905) 415-2632  20 In Society (10 In No.: (905) 415-2632  20 In Society (10 In No.: (905) 415-2632  20 In In In In In In In In In In In In In	W.							20011111	- 8 -			281	olww ia		Non	-plastic		
Vood E&IS, a Division of Wood Canada Limited  10 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Janada  20 In Society (10 In No.: (905) 415-2632  20 In Society (10 In No.: (905) 415-2632  20 In Society (10 In No.: (905) 415-2632  20 In Society (10 In No.: (905) 415-2632  20 In In In In In In In In In In In In In	K								-				Ē					
Vood E&IS, a Division of Wood anada Limited  © Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 anada  el. No.: (905) 415-2632  © SS 10 100 150 150 1 150 mm	1								-	202 -								
Vood E&IS, a Division of Wood Canada Limited  10 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Planada  20 I. 20 SS 10 10 100 150 mm  20 Groundwater encountered on completion of drilling on 1/10/202 at a depth of: 7.0 m.  20 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Planada  21 I. 20 SS 10 100 150 mm  22 Groundwater encountered on completion of drilling on 1/10/202 at a depth of: 7.0 m.  23 Borehole details as presented, do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying Explanation of Borehole Log¹.	1		WOL						Ė.									
Nood E&IS, a Division of Wood Canada Limited  □ Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Anada (Pl. No.: (905) 415-2632  Borehole details as presented, do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying/Explanation of Borehole Log¹.	K					40	100		-  -			50						
Nood E&IS, a Division of Wood Canada Limited  □ Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Anada (Pl. No.: (905) 415-2632  Borehole details as presented, do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying/Explanation of Borehole Log¹.	И.		END OF BOREHOLE		33	10	100	150mm	_			150 mm	17					
Canada Limited  10 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Alanada Fel. No.: (905) 415-2632  Borehole details as presented, do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was  Scale: 1:53																		
Canada Limited  10 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Zanada  21 Each Stanada Senada	Wor	nd F&IQ a Divini	on of Wood	$\nabla$							<u>  :                                   </u>	<u> </u>	:					
Richmond Hill, Ontario, L4B 3K6  Canada el. No.: (905) 415-2632 el. No.: (905) 425-2632  Borehole details as presented, do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying Explanation of Borehole Log.  Scale: 1:53	Can	ada Limited		≚ Groundw	ater en	counter	ed on co	ompletio	n of dril	lling on	<u>1/10/202</u> at a d	depth of: <u>7.0 m</u> .						
rel. No.: (905) 415-2632 a qualified Geoted-chirical Engineer. Also, borehole Log: commission of Borehole Log: commission of Borehole Log: a commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: commission of Borehole Log: c	Rich	nmond Hill, Ontar	s 3 & 4 io, L4B 3K6	Borehole details	as prese	nted. do	not cons	titute a th	orough i	understa	nding of all note	ntial conditions or	esent and rem	uire interpretative ass	istance from			
	Tel.	No.: (905) 415-2	632	a qualified Geoter	chnical E	ngineer.	Also, bo	rehole inf	formatio	n should	be read in conju	unction with the ge	otechnical rep	ort for which it was				

⊃rc	ject Number:			<b>0.</b>	<u>BH :</u>	<u>S4</u>				Location:	Arterial A2 a			52631	_ Logged by:	od.
	ject Client: ject Name:	City of Brampton		مريطانية ال	407	l.a.da.d.				Method:	150 mm Sol		jers		Compiled by:  Reviewed by:	PR CM/DD
		Arterial Road Net Secondary Plan A Brampton, Ontar	Area (Area 47)	iignwa	y 427 i	inausti	ıaı		-	g Machine: Started:	Track Mount Jan 10, 0202		mpleted: <b>Ja</b> i	. 40, 0202	_ ,	
-10									Date			Date CC	impieted. <u>Jai</u>	1 10, 0202	_ Nevision No	0, 3/31/21
	LITH	OLOGY PROFIL	.E	SC		MPLI		_		Penetra	TESTING ationTesting	Soil Vapor	ur Reading TOV (LEL)	NOIL	COMMENT	тѕ
Lithology Plot		DESCRIPTION  urface Elevation: 210.6 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	MTO Vane* △ Intact ▲ Remould	PPT DCPT  Nilcon Vane*  Intact Remould ear Strength (kPa) 60 80	2 4 △ COV (ppm) 100 200 W _P V Plastic 20 40	6 8 TOV (ppm) 300 400  V W _L Liquid 60 80	INSTRUMENTATION INSTALLATION	GRAIN SIZ DISTRIBUTI (%)	
		brown Sand and Gravel FILL moist		SS	1	42	45	- - - -	210 –		) · · · · · · · · · · · · · · · · · · ·	1° ₇				
	Silt trace to some	dark brown / black y Clay / Clayey Silt F e sand, trace to some organics	209.7 0.9 ILL gravel, trace	SS	2	83	11	- - - - 1	210 -	0	E	³ °22				
				SS	3	75	9	2	209 -	0		o 29				
				SS	4	100	9	-	208 -	0	E	o ₂₅				
× × ×				SS	5	67	11	- 3 - - - - - -	207 -	0		o 29				
	some	brown SILTY CLAY TILL sand to sandy, trace of cobbles/boulders stiff to hard	3.7	SS	6	100	59	- - 4 - -			0 6	3 O ₁₁				
				SS	7	100	101	- - - - - 5	206 -		101	<b>)</b> 0				
		grey						- 6	205 —							
				ss	8	100	46	- - - - - -	204 -		⊙	10 10				
								- - 7 - -								
				SS	9	100	45	- 5 - 5 - 8 - 8	<u>7</u> 203 −		)· · · · · · · · · · · · · · · · · · ·	3 O 14				
		 grey Y SILT / SILTY SAND	<u>201.9</u> 0 TILL					-  -  -  -  -	202 -							
1	trace clay	, trace gravel, cobbles very dense wet	s/boulders	ss	10	100	55	- 9 - - - -	201 —		0	s o ₁₆				
			200.8 9.8					<u> </u>	201							
	od E&IS, a Divisi ada Limited	on of Wood	∑ Groundw	ater en	counter	ed on co	mpletic	n of dri	illing on	1 <u>/10/202</u> at a d	depth of: <u>7.6 m</u> .			1 <u>1</u>		

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

## RECORD OF BOREHOLE No. BH S4



Project Number: TP115086 Project Name: Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47)

Project Location: Brampton, Ontario

1 10	ect Location. <u>Brampton, Ontario</u>							Ι						
	LITHOLOGY PROFILE	SC	IL SA	MPLI	NG			FIELD TESTING	LAB TESTING Soil Vapour Reading	z		СОММ	ENTS	
			ei		(%)		Ē	PenetrationTesting  ○ SPT □ PPT ● DCPT	▲ COV (LEL) ■ TOV (LEL) 2 4 6 8	INSTRUMENTATION INSTALLATION		&		
Plot	DESCRIPTION	уре	dmu	(%) /	RQD	Œ	NO NO	MTO Vane* Nilcon Vane* △ Intact ◇ Intact	△ COV (ppm) □ TOV (ppm) 100 200 300 400	MENT		GRAIN ISTRIE	UTION	
Lithology Plot		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEРТН (m)	ELEVATION (m)	A Remould ◆ Remould  * Undrained Shear Strength (kPa)	VV _P VV VV _L	TALL		(%	o)	
Lit	END OF BOREHOLE	Sar	Sar	Rec	SP.	DE		20 40 60 80	Plastic Liquid 20 40 60 80	8 S	GR	SA	SI	CL
	50 mm dia. monitoring well with flushmount protective casing installed (depth below ground surface):													
	Sand: 0.0 - 0.6 m													
	Bentonite: 0.6 - 5.8 m Sand Filter: 5.5 - 9.1 m Screen: 6.1 - 9.1 m													

RI	ECORD OF BOREHOLE N	<b>o.</b> <u> </u>	BH :	<u>S6</u>									WO	ood.
Pro	ect Number: TP115086						Drilling	g Location:	Arterial A2, S	Sta. 0+600	E:605620 N:4	852529	_ Logged by:	MS
Pro	ect Client: City of Brampton						_ Drilling	g Method:	150 mm So	lid Stem A	Augers		_ Compiled by:	PR
Pro	ect Name: Arterial Road Network within F Secondary Plan Area (Area 47)		y 427 l	Industr	rial		Drilling	g Machine:	Track Mount	ted Drill			_ Reviewed by:	SM/DP
Pro	ect Location: Brampton, Ontario						_ Date \$	Started:	Feb 26, 2020	Date	Completed: Fel	b 26, 2020	_ Revision No.:	0, 1/5/21
	LITHOLOGY PROFILE	SO	IL SA	MPLI	NG			FIELD	TESTING		TESTING			
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	tionTesting  PPT	▲ COV (LI 2 △ COV (pr	/apour Reading EL) ■ TOV (LEL) 4 6 8 pm) □ TOV (ppm) 200 300 400  W W Liquid	INSTRUMENTATION INSTALLATION	COMMEN & GRAIN SI DISTRIBUT (%)	ZE TION
<u> </u>	Geodetic Ground Surface Elevation: 209.0 m about 100 mm TOPSOIL 208.9	Se	S	- X	SF		<u> </u>	20 40		20	40 60 80	22 0	GR SA	SI CL
	Sitty Clay / Clayey Sitt FILL some sand, trace to some gravel, trace organics 208.3	SS	1	100	4			0		9	⁰ 47			
	brown to grey  SILTY CLAY / CLAYEY SILT TILL  trace to some sand, trace gravel, cobbles/boulders firm to hard	SS	2	100	5	- - - 1 - -	208 -	0	E	o 28	3:			
		SS	3	100	10	- - - - - 2	207 -	0	6	⁰ 19				
		SS	4	100	35	-		0	E	o 15				
	grey	SS	5	100	57	3	206 -		0 4	15				
		SS	6	100	62	- 4 - 4	205 –		Ö 6	¹⁰ 9				
		SS	7	100	108	- - - - - 5	204 —		108	) o 12				
						-	∑ = 203 -							
		SS	8	100	69 / 150mm		•		69 150 mm	O 16				
						- 7 - - - -	202 -							
		SS	9	100	83	- - - - 8 - - - -	201 –		O 6	20				
						9	200 -							
	199.3 END OF BOREHOLE 9.8	SS	10	100	43	-			)	23				
	d E&IS, a Division of Wood ada Limited  □ Groundw	ater en	counter	ed on co	ompletio	n of dr	illing on :	<u>2/26/2020</u> at a	depth of: <u>5.5 m</u> .	. 🖫 Cav	e in depth after ren	noval of auger	s: <u>6.1 m</u> .	
50 V Rich Cana Tel.	ogell Road, Units 3 & 4 mond Hill, Ontario, L4B 3K6	as prese	nted, do	not cons	titute a th	norough	understa on should	nding of all pote	ntial conditions pre	esent and req	uire interpretative ass port for which it was			Scale: 1 : 53



# SECTION C COUNTRYSIDE DRIVE (FROM CLARKWAY DRIVE TO RR 50, ~3 KM)

**RECORD OF BOREHOLES** 



R	ECORD OF BOREHOLE N	0.	ВН	<u>C1</u>											W	00	d.
Pro	ject Number: TP115086						Drilling	g Location:	Countryside N:4852294	Dr., E	BL, S	ta. 0+000 E:6	03645	L	ogged by:	MS	
Pro	ject Client: City of Brampton						Drilling	g Method:	150 mm So	id Ste	m Au	gers		c	compiled b	y: <u><b>SN</b></u>	
Pro	ject Name: Arterial Road Network within H Secondary Plan Area (Area 47)	lighwa	ıy 427 I	ndustr	ial		Drilling	g Machine:	Track Moun	ed Dri	ill			F	Reviewed b	у: <u><b>SM</b> /</u>	DP
Pro	ject Location: Brampton, Ontario						Date 9	Started:	Mar 25, 2020		ate C	ompleted: Ma	r 25, 202	<u>0</u> F	Revision N	o.: <b>0, 2/</b> 8	8/21
	LITHOLOGY PROFILE	SC	OIL SA	MPLI	NG			FIELD	TESTING	L	AB T	ESTING					
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact ▲ Remould	PPT ● DCPT  Nilcon Vane*	△ CC 2 100 100 W ₁	V (LEL) 4 OV (ppm) 0 200	our Reading TOV (LEL) 6 8 D TOV (ppm) 300 400 W WL C Liquid	INSTRUMENTATION INSTALLATION		COMMI & GRAIN DISTRIB (%	SIZE UTION )	
Ē	Geodetic Ground Surface Elevation: 215.8 m about 100 mm ASPHALT 215.7	Sa	Sa	Re	SP	DE	<u>                                     </u>	20 40		20		60 80	žž	GR	SA	SI	CL
	brown Sand and Gravel FILL moist	SS	1	83	12	-	215 —	0		D ₃							
	grey 0.9  Silty Clay / Clayey Silt FILL  trace to some sand, trace gravel, trace organics	SS	2	92	8	— 1 - - - - -	- - - -	0		1	°37						
		SS	3	100	8	- - - 2 -	214 -	0			26	•		0	14	48	38
	SILTY CLAY / CLAYEY SILT TILL trace to some sand, trace gravel, cobbles/boulders hard	SS	4	100	40	- - - - - - - 3	213 —	0		0 14	1						
	END OF BOREHOLE 3.0																

 $\frac{\textstyle \sum}{\textstyle -}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD OF BOREHOLE N	Ο.	<u>BH</u>	<u>C2</u>									wood.
	ject Number: TP115086						_	g Location:	N:4852295		Sta. 0+000 E:6	03646	Logged by: MS
	ject Client: City of Brampton						_	g Method:	150 mm Soli		igers		Compiled by: SN
	ject Name: Arterial Road Network within I Secondary Plan Area (Area 47 ject Location: Brampton, Ontario	Highwa )	ay 427	Industr	ial		_	g Machine: Started:	Track Mounte		Completed: Ma	r 25 2020	Reviewed by: <u>SM / DP</u> 0 Revision No.: 0, 2/8/21
	LITHOLOGY PROFILE	sc	DII SA	MPLI	NG				TESTING		ESTING		
	EITHOLOGITROTILL			NVII						Soil Vap	oour Reading ) ■ TOV (LEL)	NO O	COMMENTS
Lithology Plot	DESCRIPTION  Geodetic Ground Surface Elevation: 215.1 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	MTO Vane*  △ Intact  ▲ Remould	Nilcon Vane*	100 200	W W _L ◆ Liquid	INSTALLATION INSTALLATION	& GRAIN SIZE DISTRIBUTION (%)  GR SA SI CL
$\stackrel{\overline{\times}}{\otimes}$	brown  Sand and Gravel FILL  moist	SS				-	-						
$\bowtie$	moist 214.5		1	75	6	F		0					
	dark grey 0.6  Silty Clay / Clayey Silt FILL  trace sand, trace gravel		2	100	7	- - - 1	214 —	0	<b>a</b>				
						E							
$\overset{ imes}{ imes}$	949.9	SS	3	100	19	-	-	0					
<b>~~</b>	213.2 END OF BOREHOLE 1.8					_	-						

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD	OF BOREHO	LE No	o. <u>I</u>	<u>BH (</u>	<u>C3</u>									WO	od.
Pro	ject Number:	TP115086							Drilling	Location:		Dr., WBL,	Sta. 0+150 E:6	603738		<u>ns</u>
Pro	ject Client:	City of Brampton							Drilling	g Method:	N:4852420 150 mm So	lid Stem Au	igers		_ Compiled by:	SN
Pro	ject Name:	Arterial Road Network Secondary Plan Area (	within H	ighwa	y 427 lı	ndustri	ial		Drilling	g Machine:	Track Mount	ed Drill			_ Reviewed by: §	SM / DP
Pro	ject Location:	Brampton, Ontario	A100 41)						Date S	Started:	Mar 25, 2020	Date 0	Completed: Ma	r 25, 2020	_ Revision No.: 0	, 2/8/21
	LITH	OLOGY PROFILE		so	IL SA	MPLI	NG			FIELD	TESTING		TESTING bour Reading	_		
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact ▲ Remould  * Undrained She	ar Strength (kPa)	△ COV (LEL  2 4  △ COV (ppm  100 200  W _P Plastic	TOV (LEL) 6 8 1) □ TOV (ppm) 0 300 400  W WL Liquid	NSTRUMENTATION NSTALLATION	COMMENTS & GRAIN SIZI DISTRIBUTIO (%) GR SA SI	E ON
∵ XXX		Surface Elevation: 216.5 m about 90 mm ASPHALT	216.4 216.2	Ø	S	ď	S	_	ш	20 40	60 80	20 40	60 80	22	SK 5A 51	CL
	Sil	brown Sand and Gravel FILL moist dark brown / brown ty Clay / Clayey Silt FILL nd, trace gravel, trace organi	0.3	SS	1	83	5	- - - - -	216 -	0		3				
	SILTY	brown  CLAY / CLAYEY SILT TILL  trace sand, trace gravel  stiff	0.9 215.0	SS	2	100	9	— 1 - - - -	- - - - 215 —	0	Į.	3				
		END OF BOREHOLE	1.5													

 $\frac{\textstyle \sum}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD OF BOREHOLE	No	<b>)</b> . <u> </u>	BH (	<u>C5</u>								wood
Pro	ject Number: TP115086							Drilling	Location:	Countryside N:4852531	Dr., EBL, Sta. 0+300	E:603831	Logged by: MS
Pro	ject Client: City of Brampton							Drilling	g Method:		lid Stem Augers		Compiled by: SN
	ject Name: Arterial Road Network with Secondary Plan Area (Area	<u>hin H</u> a 47)	ighwa	y 427 I	ndusti	rial		•	g Machine:	Track Moun			Reviewed by: SM / DP
Pro	ject Location: Brampton, Ontario							Date S	Started:	Mar 25, 2020	Date Completed	Mar 25, 202	0 Revision No.: 0, 2/8/21
	LITHOLOGY PROFILE		SO	IL SA	MPLI	NG			FIELD.	resting	LAB TESTING Soil Vapour Reading		COMMENTO
Lithology Plot	DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	ionTesting  PPT	△ COV (LEL) ■ TOV- 2 4 6 8 △ COV (ppm) □ TOV- 100 200 300 44  W _P W V ■ O Plastic Liqu 20 40 60 8	STRUMENTAT	COMMENTS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
_ ‱	Geodetic Ground Surface Elevation: 214.6 m about 100 mm ASPHALT 2	14.5	0)	0)	ш.	0)	-	<u></u>	20 40	00 80	20 40 60 60	,   = =	<u> </u>
	brown Sand and Gravel FILL moist  2 dark grey	13.8	SS	1	83	30	-	214 -	0		90 5		
	Silty Clay / Clayeŷ Silt FILL trace sand, trace gravel, trace organics		SS	2	100	38	- 1 - - - -	- - - -	0		10		
	brown SILTY SAND / SANDY SILT TILL trace to some clay, trace gravel dense to very dense moist to wet	13.1 1.5	SS	3	83	46	- - - - - 2	213 -		)	0 10		
			SS	4	100	82	-  -  -  -  -	212 -		O	³⁰ 12		
	grey	-	SS	5	100	69	- - - - 3 <u>-</u> -	-		0	021		
		-	ss	6	79	52	- - - 4 ₽	211 -		0	a 0 ₁₇		
	2	:09.7	SS	7	100	55 / 150mm	-  -  -  -  -	210 -		55 0 150 mm	©20		
	END OF BOREHOLE	4.9											
Woo	od E&IS, a Division of Wood	nundwa	ater en	counter	ed on co	nmnletio	n of dril	ling on '	8/25/2020 at a	denth of: 3.0 m	☐ Cave in depth aft	er removal of au	nare: 10 m

Canada Limited

RI	ECORD OF BOREHOLE N	Ο.	BH	<u>C6</u>									WOOD	
	ject Number: TP115086					[	Drilling	Location:	N:4852529		Sta. 0+300 E:6	03832	Logged by: MS	_
	ject Client: City of Brampton						_	Method:	150 mm Sol		ugers		_ Compiled by: SN	_
	ject Name: Arterial Road Network within h Secondary Plan Area (Area 47) ject Location: Brampton, Ontario	Highwa )	ay 427 I	Industr	ial		Drilling Date St	Machine:	Track Mount		Completed: Ma	2E 2020	Reviewed by: SM / DP	_
PIO						'	Date 3		Mar 25, 2020			1 25, 2020	_ Revision No.: <u>0, 2/8/21</u>	_
	LITHOLOGY PROFILE	SC	OIL SA	MPLI	NG		-		TESTING tionTesting	Soil Va	TESTING pour Reading  .) ■ TOV (LEL)	Z O	COMMENTS	
Lithology Plot	DESCRIPTION  Geodetic Ground Surface Elevation: 214.6 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	NOI	O SPT □  MTO Vane*  △ Intact  ▲ Remould	PPT	2 4	6 8 n) □ TOV (ppm) 0 300 400 W W _L ← Liquid	NSTRUMENTATION INSTALLATION	& GRAIN SIZE DISTRIBUTION (%)  GR SA SI C	L
	brown <b>Sand and Gravel FILL</b> moist	SS	1	83	11	-	1111	0		9				
	brown 0.6  Silty Clay / Clayey Silt FILL					- - -	214 —							
	trace sand, trace to some gravel	SS	2	88	34	- 1	-	0		9				
	brown 1.2  SILTY SAND / SANDY SILT TILL trace to some clay, trace gravel very dense 213.0	SS	3	100	75	-	213 —		О Б	3				
	moist 1.7  END OF BOREHOLE						210							

 $\frac{\textstyle \sum}{\scriptstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

171	ECORD OF BOREHOLE N	Ю.	<u>BH (</u>	<u>C7</u>									WC	od.
Pro	oject Number: TP115086						Drilling	Location:	Countryside	Dr., WBL	, Sta. 0+450 E:	603917	_ Logged by:	MS
Pro	oject Client: City of Brampton						Drilling	Method:	N:4852640 150 mm So	id Stem A	Augers		Compiled by:	SN
Pro	oject Name: Arterial Road Network within Secondary Plan Area (Area 4)	Highwa	ay 427 I	ndustr	ial		Drilling	Machine:	Track Mount	ed Drill			_ Reviewed by:	SM / DP
Pro	oject Location: Brampton, Ontario	()					Date 9	Started:	Mar 25, 2020	Date	Completed: Ma	ar 25, 2020	_ Revision No.:	0, 2/8/21
	LITHOLOGY PROFILE	sc	DIL SA	MPLI	NG			FIELD '	TESTING		TESTING /apour Reading	_		
Lithology Plot	DESCRIPTION  Geodetic Ground Surface Elevation: 216.5 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	ionTesting  PPT	△ COV (LI 2  △ COV (pi 100 2  W _P Plastic	### TOV (LEL)  ### TOV (Depth)  ### TOV (ppm)  ### TOV (ppm)  ### TOV (ppm)  ### United States    ### Liquid  ### 40 60 80	INSTALLATION	COMMENT & GRAIN SIZ DISTRIBUTI (%)	Έ
***	about 100 mm ASPHALT 216.4	H—					-			:				
	Sand and Gravel FILL moist 215.9 dark grey 0.6		1	50	15		216 -	0	6	D ₃				
	Silty Clay / Clayey Silt FILL trace sand, trace gravel 215.5 brown 1.1 SILTY CLAY / CLAYEY SILT TILL		2	100	16	_ 1 1	-	0		ı o				
	trace to some sand, trace gravel very stiff to hard	ss	3	100	28	-  -  -  -	215 -	0		o 16				
						_ 2 _ _ _	-			16				
	grey 213.5	ss	4	100	32	- - - - - - 3	214 -	0		1 0 15				
2014	END OF BOREHOLE 3.0									:				

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

ECORD	OF BOREHOL	BH (	<u>C8</u>									wood.		
ject Number:	TP115086							Drilling	Location:	Countryside N:4852650	Dr., WBL, S	Sta. 0+450 E:	603915	Logged by: MS
ject Client:	City of Brampton							Drilling	Method:	150 mm Sol	id Stem Au	gers		Compiled by: SN
ject Name:	Secondary Plan Area (A	within H Area 47)	ighwa	ıy 427 I	ndustr	ial		Drilling	Machine:	Track Mount				Reviewed by: SM / DP
ject Location:	Brampton, Ontario							Date 9	Started:	Mar 25, 2020	Date C	completed: Ma	r 25, 2020	Revision No.: <u>0, 2/8/21</u>
LITH	OLOGY PROFILE		SC	IL SA	MPLI	NG			FIELD '	TESTING			7	COMMENTS
Geodetic Ground S	DESCRIPTION Surface Elevation: 216.6 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane* △ Intact ▲ Remould  * Undrained She	PPT ● DCPT  Nilcon Vane*  ◇ Intact ◆ Remould  ear Strength (kPa)	△ COV (LEL)  2 4  △ COV (ppm 100 200  W _P Plastic	TOV (LEL) 6 8 1 TOV (ppm) 300 400  W WL Cliquid	INSTRUMENTATIOI INSTALLATION	& GRAIN SIZE DISTRIBUTION (%)
	brown		SS	1	42	9	- - -	-	0		1			
SILTY trace	brown  CCLAY / CLAYEY SILT TILL to some sand, trace gravel very stiff to hard	216.0 0.6	SS	2	100	22	_ - - - - 1	216 -	0		1			
			SS	3	58	49	- - - -	215 —		O	1			
	END OF BOREHOLE	214.8 1.8					-							
j	ject Number: ject Client: ject Name: ject Location: LITH	ject Number: TP115086  ject Client: City of Brampton  ject Name: Arterial Road Network \ Secondary Plan Area ( Brampton, Ontario  LITHOLOGY PROFILE  DESCRIPTION  Geodetic Ground Surface Elevation: 216.6 m brown Sand and Gravel FILL moist  brown SILTY CLAY / CLAYEY SILT TILL trace to some sand, trace gravel very stiff to hard	ject Number: TP115086  ject Client: City of Brampton  ject Name: Secondary Plan Area (Area 47)  Brampton, Ontario  LITHOLOGY PROFILE  DESCRIPTION  Geodetic Ground Surface Elevation: 216.6 m brown Sand and Gravel FILL moist  216.0  brown SILTY CLAY / CLAYEY SILT TILL trace to some sand, trace gravel very stiff to hard	ject Number: TP115086  ject Client: City of Brampton  ject Name: Arterial Road Network within Highwa Secondary Plan Area (Area 47)  Brampton, Ontario  LITHOLOGY PROFILE  DESCRIPTION  Geodetic Ground Surface Elevation: 216.6 m brown Sand and Gravel FILL moist  SS  216.0  brown SILTY CLAY / CLAYEY SILT TILL trace to some sand, trace gravel very stiff to hard  SS  214.8	ject Number: TP115086 ject Client: City of Brampton ject Name: Arterial Road Network within Highway 427 is Secondary Plan Area (Area 47) ject Location: Brampton, Ontario  LITHOLOGY PROFILE  DESCRIPTION  DESCRIPTION  Geodetic Ground Surface Elevation: 216.6 m brown Sand and Gravel FILL moist  SS 1  216.0  Drown SILTY CLAY / CLAYEY SILT TILL trace to some sand, trace gravel very stiff to hard  SS 3	ject Client: City of Brampton  ject Name: Arterial Road Network within Highway 427 Industry Secondary Plan Area (Area 47)  Brampton, Ontario  LITHOLOGY PROFILE  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION	ject Number: TP115086  ject Client: City of Brampton  ject Name: Secondary Plan Area (Area 47)  ject Location: Brampton, Ontario   LITHOLOGY PROFILE  DESCRIPTION  DESCRIPTION  Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn V Jagumn	ject Number: TP115086  ject Client: City of Brampton  ject Name: Secondary Plan Area (Area 47)  Brampton, Ontario   DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRI	piect Number: TP115086 Drilling piect Client: City of Brampton Drilling piect Name: Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47) Parampton, Ontario Date State Location: Brampton, Ontario Date State Location: Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description Description D	pect Number: TP115086 Drilling Location:    City of Brampton   Drilling Method:	Drilling Location:   Countryside   N:4852650   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm Sol   150 mm	pect Number: TP115086 pect Client: City of Brampton pect Name: Secondary Plan Area (Area 47) pect Location: Brampton, Ontario  Drilling Method: Name: Secondary Plan Area (Area 47) pect Location: Date Started: Mar 25, 2020 Date Client: Date Started: Mar 25, 2020 Date Client: Date Started: Date Started: Mar 25, 2020 Date Client: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Started: Date Star	Drilling Location:   Countryside Dr., WBL, Sta. 0+450   E:	piect Number: TP115086  City of Brampton  Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47) piect Location: Brampton, Ontario  Drilling Method: Drilling Method: Track Mounted Drill  Date Started: Mar 25, 2020 Date Completed: Mar 25, 2020  Date Completed: Mar 25, 2020 Date Completed: Mar 25, 2020  Date Completed: Mar 25, 2020 Date Completed: Mar 25, 2020 Date Completed: Mar 25, 2020 Date Completed: Mar 25, 2020  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description  Description

 $\frac{\textstyle \sum}{\textstyle -}$  No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD	OF BOREHOL	BH (	<u>C9</u>									wood		
Pro	ject Number:	TP115086							Drilling	Location:	Countryside N:4852761	Dr., EBL, S	Sta. 0+600 E:6	04016	Logged by: MS
Pro	ject Client:	City of Brampton							Drilling	Method:	150 mm Sol	id Stem Au	igers		Compiled by: SN
Pro	ject Name:	Arterial Road Network v Secondary Plan Area (A	vithin H	ighwa	y 427 l	ndustr	ial		Drilling	Machine:	Track Mount	ed Drill			Reviewed by: SM / DP
Pro	ject Location:	Brampton, Ontario	uea 41)						Date 9	Started:	Mar 25, 2020	Date C	Completed: Ma	r 25, 2020	Revision No.: <u>0, 2/8/21</u>
	LITH	IOLOGY PROFILE		SO	IL SA	MPLII	NG			FIELD '	TESTING		TESTING pour Reading	_	COMMENTO
Lithology Plot	Geodetic Ground S	DESCRIPTION  Surface Elevation: 218.3 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	<ul> <li>Intact</li> <li>Remould</li> </ul> ear Strength (kPa)	△ COV (LEL 2 4 △ COV (ppm 100 200	) ■ TOV (LEL)	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)  GR SA SI CL
<b>***</b>	a	bout 110 mm ASPHALT brown	218.2 0.1					-			: :	: :	: :		
	Sil	Sand and Gravel FILL moist dark grey / brown Ity Clay / Clayey Silt FILL ind, trace gravel, trace organics	217.9 — 0.6	SS	1	83	10	- - - -	218 -	0		1			
	SILTY	brown  CLAY / CLAYEY SILT TILL  to some sand, trace gravel very stiff	0.9	ss	2	100	20	- - 1 -	217 -	· · · · · · · · · · · · · · · · · · ·		1			
<i>3</i> /2/		END OF BOREHOLE	216.8 1.5												

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

RI	ECORD OF BOREHOLE N	lo.	BH (	<u>C11</u>								wood.
	oject Number: TP115086						_	Location:	N:4852893	Dr., WBL, Sta. 0+750 E:	604113	Logged by: MS
	oject Client: City of Brampton						_	Method:	•	id Stem Augers		Compiled by: SN
	oject Name: Arterial Road Network within Secondary Plan Area (Area 4' oject Location: Brampton, Ontario	Highwa ')	ıy 427 I	ndustr	rial		_	Machine: Started:	Track Mount		r 27 2020	Reviewed by: <u>SM / DP</u> Revision No.: <u>0, 2/8/21</u>
110		sc	NI CA	MDLI	NC	ı	Date				1 21, 2020	TREVISION NO.: 0, ZIOIZI
	LITHOLOGY PROFILE	SC	OIL SA	MPLI					TESTING tionTesting	Soil Vapour Reading  COV (LEL) TOV (LEL)	NO NO	COMMENTS
Lithology Plot	DESCRIPTION  Geodetic Ground Surface Elevation: 215.2 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	PPT  ● DCPT  Nilcon Vane*  ◇ Intact  ◆ Remould  ear Strength (kPa)	2 4 6 8  △ COV (ppm) □ TOV (ppm) 100 200 300 400  W _p W W _L Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	& GRAIN SIZE DISTRIBUTION (%)
_	<b>about 120 mm ASPHALT</b> 215.0			_		-	215 -					
	Sand and Gravel FILL moist  214.6  dark grey / grey  Silty Clay / Clayey Silt FILL		1	83	21	- - - -	-	0		^D 2		
	trace sand, trace to some gravel, trace organics	SS	2	100	18	- 1 - - - - -	214 -	0		1 ° 9		
		ss	3	92	7	- - - 2 -	213 —	0		20		
	SILTY CLAY / CLAYEY SILT TILL trace to some sand, trace gravel very stiff to hard	SS	4	100	17	- - - - - - - - 3	- - - -	О		1 O ₁₇		
		SS	5	100	29		212 -	0		1 ° 17		
	grey	SS	6	83	22	- - 4 -	211 -	0	- F	1 0		
	210.0	ss	7	83	34		-	0		12		
azr.	END OF BOREHOLE 5.2						210 -					

 $\frac{\nabla}{\pi}$  Groundwater encountered on completion of drilling on <u>3/27/2020</u> at a depth of: <u>4.9 m</u>.

RI	ECORD OF BOREHOLE N	<b>o.</b>	BH (	<u>C12</u>									WC	ood.
	ject Number: TP115086					[	Drilling L	ocation:	Countryside N:4852900	Dr., WBL,	Sta. 0+750 E:	604113	Logged by:	MS
Pro	ject Client: City of Brampton						Orilling M	lethod:	150 mm Sol		ugers		Compiled by:	
	ject Name: Arterial Road Network within F Secondary Plan Area (Area 47)	lighwa	y 427 I	ndustr	ial		Orilling M		Track Mounte				_ Reviewed by:	
Pro	ject Location: Brampton, Ontario						Date Sta	rted:	Mar 25, 2020	Date (	Completed: Ma	r 25, 2020	_ Revision No.:	0, 2/8/21
	LITHOLOGY PROFILE	SC	IL SA	MPLII	NG				TESTING	LAB Soil Va	TESTING pour Reading	z	COMMEN	Te
Lithology Plot	DESCRIPTION  Geodetic Ground Surface Elevation: 213.6 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	VATION (	SPT □  ITO Vane* Intact Remould	Nilcon Vane*	▲ COV (LEL 2 4	D) ■ TOV (LEL)	INSTRUMENTATION INSTALLATION	& GRAIN SI DISTRIBUT (%)	ZE
***	about 100 mm TOPSOIL 213.5- brown 0.1					-	_							
	Sand and Gravel FILL moist 213.0	SS	1	75	6	- - -	213							
	dark brown / brown 0.6  Silty Clay / Clayey Silt FILL  trace sand, trace gravel	SS	2	100	6	- - - 1	=							
***	212.4 <b>END OF BOREHOLE</b> 1.2					-								

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

R	RECORD OF BOREHOLE No. BH C13															,	WOO	od.
Pro	oject Number:	TP115086							Drilling	g Location:	Countryside N:4852992	Dr., EBL	, Sta. 0+	900 E:6	04197	Logge	d by: MS	<u> </u>
Pro	oject Client:	City of Brampton							Drilling	g Method:	150 mm So	lid Stem	Augers			Compi	led by: SN	<u> </u>
Pro	oject Name:	Arterial Road Network v Secondary Plan Area (A			y 427 I	Industr	ial		Drilling	g Machine:	Track Moun	ted Drill				Review	ved by: SN	1 / DP
Pro	oject Location:	Brampton, Ontario							Date S	Started:	Mar 27, 2020	<b>)</b> Date	e Comple	ted: Ma	r 27, 20	20 Revision	on No.: <u>0, 2</u>	2/8/21
	LITH	IOLOGY PROFILE		SC	IL SA	MPLI	NG			FIELD	TESTING		3 TESTI Vapour Read		_			
Lithology Plot	Geodetic Ground	DESCRIPTION Surface Elevation: 219.0 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	<ul> <li>♦ Intact</li> <li>♦ Remould</li> <li>ear Strength (kPa)</li> </ul>	▲ COV (L 2 △ COV (p	EL) ■ 1 4 6 ppm) □ 1 200 300 W	OV (LEL) 8	INSTRUMENTATION INSTALLATION	GR	MMENTS & AIN SIZE RIBUTION (%)	<b>I</b>
_	a	bout 140 mm ASPHALT brown	218.9 0.1	• • • • • • • • • • • • • • • • • • • •				-	-									
	Sil	Sand and Gravel FILL moist  dark brown / brown ty Clay / Clayey Silt FILL nd, trace gravel, trace organics	218.5 ——0.8	SS	1	83	11	- - - - -	- - - - -	0		a o 16						
	SILTY	brown/grey CLAY / CLAYEY SILT TILL to some sand, trace gravel very stiff to hard	0.9	SS	2	100	17	- - - - - -	218 -	0		o ₁₇						
				SS	3	100	23	2	217 -	0		15						
	215 END OF BOREHOLE 3			SS	4	100	30	-  -  -  -  -	-			a o ₁₇						
			215.9					- - - 3	216 -			17						
														-				

 $\frac{\textstyle \sum}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD	OF BOREHO	DLE No	<b>o.</b> !	BH (	<u>C15</u>								WC	ood.
Pro	ject Number:	TP115086							Drilling	Location:		Dr., WBL, Sta. 1+050 E:	604285	Logged by:	MS
Pro	ject Client:	City of Brampton							Drilling	g Method:	N:4853111 150 mm So	lid Stem Augers		Compiled by:	SN
Pro	ject Name:	Arterial Road Networ Secondary Plan Area	rk within H	ighwa	y 427 I	ndustr	ial		Drilling	g Machine:	Track Mount	ted Drill		Reviewed by:	SM / DP
Pro	ject Location:	Brampton, Ontario	(Alea 41)						Date 9	Started:	Mar 27, 2020	Date Completed: Ma	ar 27, 2020	Revision No.:	0, 2/8/21
	LITH	OLOGY PROFILE		SO	IL SA	MPLI	NG			FIELD	TESTING	LAB TESTING			_
							(%		E	1	tionTesting	Soil Vapour Reading  COV (LEL) TOV (LEL)  4 6 8	INSTRUMENTATION INSTALLATION	COMMEN	TS
<u>Po</u>		DESCRIPTION		фе	Sample Number	(%)	'N' / RQD (%)	(c	E) NO	MTO Vane*	PPT ● DCPT  Nilcon Vane*  ◇ Intact	△ COV (ppm) □ TOV (ppm) 100 200 300 400	FINTA	GRAIN SIZ DISTRIBUT	
ology F				Sample Type	ple N	Recovery (%)	Ÿ.	ОЕРТН (m)	ELEVATION	△ Intact ▲ Remould	<ul><li>♦ Intact</li><li>♦ Remould</li></ul>	W _P W W _L	RUM ALLA	(%)	ION
<b>⇒</b>	Geodetic Ground S	urface Elevation: 219.7 m		Sam	Sam	Reco	SPT	DEP	ELE	* Undrained Sh 20 40	ear Strength (kPa) 60 80	Plastic Liquid 20 40 60 80	INST	GR SA	SI CL
<b>**</b>		brown	219.6 0.1					-	-						
$\overset{\times\!\!\!\times}{\times}$		Sand and Gravel FILL moist	219.2 ———0.8					_	-						
$\overset{\otimes}{\otimes}$	Silt	dark grey / brown y Clay / Clayey Silt FILL		SS	1	100	16	_	219 -	0					
		ace to some gravel, trace	0.9					- 1	-						
		CLAY / CLAYEY SILT TIL to some sand, trace grave firm to stiff		SS	2	100	10		-	0					
7.0-		END OF BOREHOLE	1.5												

 $\frac{\textstyle \sum}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

RECORI Project Number	D OF BOREHOLE No.	0.	<u>BH</u>	<u>C17</u>	•		_ Drillin	g Location:	Countryside N:4853230	Dr., EBL, St	a. 1+200 E:6	04386	_ Logged by:	od.
Project Client:	City of Brampton						_ Drillin	g Method:	150 mm Sol	id Stem Aug	jers		Compiled by:	SN
Project Name:	Arterial Road Network within H Secondary Plan Area (Area 47)	lighwa	y 427	Industi	rial		_ Drilling	g Machine:	Track Mount	ed Drill			Reviewed by:	SM / DP
Project Locatio	n: Brampton, Ontario						_ Date :	Started:	Mar 27, 2020	Date Co	mpleted: Ma	r 27, 2020	Revision No.:	0, 2/8/21
LIT	THOLOGY PROFILE	SC	DIL SA	MPLI	NG			FIELD '	TESTING	LAB TE	ESTING			
thology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	Penetra ○ SPT □  MTO Vane* △ Intact ▲ Remould	tionTesting  PPT	Soil Vapor	ur Reading ■ TOV (LEL) 6 8 □ TOV (ppm) 300 400  V W _L Liquid	INSTRUMENTATION INSTALLATION	COMMEN & GRAIN SI DISTRIBUT (%)	ZE
Geodetic Groun	about 130 mm ASPHALT 219.8	()	0)	LE.	0)	-	ш	20 40	60 60	2,0 4,0	60 80		<u> </u>	
trace	brown 0.1 Sand and Gravel FILL 219.5 moist 0.5 dark brown / brown Silty Clay / Clayey Silt FILL sand, trace gravel, trace organics 219.0	SS	1	100	11	-  -  -  -  -  -	219 -	0		s o 15				
tra	brown / brownish grey SILTY CLAY TILL ace to some sand, trace gravel stiff to hard	SS	2	88	14	- 1 - - - - - -		0	ρ	16				
		SS	3	100	24	- - - 2 -	218 -	0		15				
		SS	4	100	41	- 3	217 -	0	E	³ 015				
		SS	5	100	30			0		15				
	grey	SS	6	50	14	- - 4 -	216 -	0		18				
	214.9	SS	7	100	20		215 -	0	a a	s <b>B</b> ●		1	I 11	50 38
1222	END OF BOREHOLE 5.0					5								

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD OF BOREHOLE No. BH C18																W	00	d.
Pro	ject Number:	TP115086							Drilling	g Location:	Countrysic N:4853229	de Di	r., EBL, S	ta. 1+200 E	:604388		Logged by:		
Pro	ject Client:	City of Brampton							Drilling	g Method:	150 mm S		Stem Au	gers			Compiled b	y: <u><b>SN</b></u>	
Pro	ject Name:	Arterial Road Network v Secondary Plan Area (A	within H Area 47)	ighwa	y 427 l	ndustr	ial		Drilling	g Machine:	Track Mou	nted	Drill				Reviewed b	y: <u>SM / Г</u>	DP
Pro	ject Location:	Brampton, Ontario							Date S	Started:	Apr 1, 2020	0	Date C	completed: A	pr 1, 202	0	Revision No	o.: <u>0, 2/8/</u>	/21
	LITH	IOLOGY PROFILE		SC	IL SA	MPLI	NG			FIELD	TESTING	$\perp$		TESTING our Reading			COMM	ENTO	
*		DESCRIPTION		ø.	ıber	(9	(%) Qt		Œ.	O SPT 🗆	tionTesting PPT ● DCF	T _	COV (LEL)	) TOV (LEL	_		COMMI & GRAIN	SIZE	
Lithology Plot		DEGORIT HOR		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEРТН (m)	ELEVATION	MTO Vane*  △ Intact  ▲ Remould	Nilcon Vane	_	100 200 W _P	W W _L	RUME		DISTRIB (%		
Litho	Geodetic Ground	Surface Elevation: 219.9 m		Sam	Sam	Reco	SPT	DEP	ELE	* Undrained Sh 20 40	ear Strength (kPa 60 80	)	Plastic 20 40	Liquid 60 80	INST	GR	SA	SI	CL
$\bowtie$		brown Sand and Gravel FILL moist		SS	1	88	5	-	-										
$\bowtie$		most	219.3	00	'	00		-	-			Ī							
	SILTY	brown CLAY / CLAYEY SILT TILL	0.6					Ē	-										
	trace	e to some sand, trace gravel stiff to very stiff		SS	2	100	12	- - 1 -	219 -	0		4							
				SS	3	100	19	-	-	0		. 🛦							
			218.1					<u> </u>	-			$\downarrow$							
		END OF BOREHOLE	1.8																

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD	OF BOREHO	LE No	<b>o.</b> !	BH (	<u>C19</u>	/ BI						W	ood.		
Pro	ject Number:	TP115086							Drilling	Location:	Countryside N:4853360	Dr., WBL, S	Sta. 1+350 E:	604448	Logged by:	MS
Pro	ject Client:	City of Brampton							Drilling	g Method:	150 mm Sol	id Stem Au	gers		Compiled by	/: <u>SN</u>
Pro	ject Name:	Arterial Road Network Secondary Plan Area	within H	ighwa	y 427 I	ndustr	ial		Drilling	g Machine:	Track Mount	ed Drill			Reviewed b	y: <b>SM / DP</b>
Pro	ject Location:	Brampton, Ontario	(740477)						Date S	Started:	Jan 23, 2020	Date C	ompleted: <u>Ja</u>	n 23, 2020	Revision No	o.: <u>0, 2/8/21</u>
	LITH	OLOGY PROFILE		SC	IL SA	MPLI	NG			FIELD '	TESTING		ESTING our Reading	-		
Lithology Plot	Geodetic Ground S	DESCRIPTION  Surface Elevation: 209.0 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact ▲ Remould	<ul> <li>Intact</li> <li>Remould</li> </ul> ear Strength (kPa)	△ COV (LEL)  2 4  △ COV (ppm  100 200	TOV (LEL)  6 8  ) □ TOV (ppm)  300 400  W WL  Liquid	INSTRUMENTATION INSTALLATION	COMME & GRAIN DISTRIBU (%)	SIZE JTION
	al	bout 200 mm ASPHALT	208.8					-								(2)
		Sand and Gravel FILL moist brown/dark grey	0.2 208.4 0.6	SS	1	75	9	-	-	0					33 58	(9)
		Silty Clay FILL trace gravel	-	SS	2	100	18	- - - 1 -	208 —	0		1				
$\overset{\otimes}{\otimes}$		END OF BOREHOLE	207.5 1.5					-	-							

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD OF BOREHOLE	No.	<u>BH</u>	C20									W	ood.
Pro	oject Number: TP115086						Drilling	_ocation:	Countryside N:4853362	Dr., WBL, Sta	. 1+350 E:	604492	Logged by:	MS
Pro	oject Client: City of Brampton						Drilling	Method:	150 mm Sol	id Stem Auge	rs		Compiled by:	SN
	oject Name: Arterial Road Network with Secondary Plan Area (Area	hin Highw a 47)	ay 427	Indust	rial		Drilling	Machine:	Track Mount				Reviewed by:	SM / DP
Pro	oject Location: Brampton, Ontario						_ Date St	arted:	Apr 1, 2020	Date Con	npleted: Ap	r 1, 2020	Revision No.:	0, 2/8/21
	LITHOLOGY PROFILE	S	OIL S	AMPLI	NG			FIELD	TESTING	LAB TES		-	0011151	170
			-		(%)		<u>E</u>		ationTesting PPT • DCPT	▲ COV (LEL) ■	■ TOV (LEL) 6 8	INSTRUMENTATION INSTALLATION	COMMEN &	
Plot	DESCRIPTION	ype	Sample Number	(%)	'N' / RQD (%)	Ê		MTO Vane*		△ COV (ppm) [ 100 200	□ TOV (ppm) 300 400	ATION	GRAIN SI DISTRIBUT	
Lithology		Sample Type	⊔ple N	Recovery (%)	ż	DЕРТН (m)	ELEVATION	△ Intact ▲ Remould	◆ Remould	W _P W	WL	TALL	(%)	
÷	Geodetic Ground Surface Elevation: 220.2 m	San	San	Rec	SPT	DEF		Undrained Sh 20 40	near Strength (kPa)	Plastic 20 40	Liquid 60 80	S S S	GR SA	SI CL
$\overset{\otimes}{\otimes}$	Sand and Gravel FILL moist	ss	1	100	16	-	220 —			<b>.</b>				
$\overset{\times\!\!\!\times}{\otimes}$	2 dark grey / brown	0.5				_	=							
$\bowtie$	Silty Clay / Clayey Silt FILL trace sand, trace to some gravel, trace organi					-	=							
$\overset{\times\!\!\!\!\times}$		SS	2	67	11	- - 1	=	0		]				
***	END OF BOREHOLE	1.2				-								
	Borehole was terminated due to the close proximity of existing watermain													
									: :	E E	: :			

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com  $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD	<b>OF BOREHOL</b>	E No	o. <u>l</u>	BH (	<u>C21</u>									wood
Pro	ject Number:	TP115086							Drilling	Location:	Countryside	Dr., EBL, S	ta. 1+500 E:6	04570	Logged by: MS
Pro	ject Client:	City of Brampton							Drilling	g Method:	N:4853458 150 mm Sol	id Stem Au	gers		Compiled by: SN
Pro	ject Name:	Arterial Road Network	within H	ighwa	y 427 I	ndustr	ial		Drilling	g Machine:	Track Mounte	ed Drill			Reviewed by: SM / DP
Pro	ject Location:	Secondary Plan Area (A Brampton, Ontario	Area 4/)						Date S	Started:	Mar 27, 2020	Date C	ompleted: Ma	r 27, 2020	Revision No.: <u>0, 2/8/21</u>
	LITH	OLOGY PROFILE		SO	IL SA	MPLII	NG			FIELD	TESTING		TESTING our Reading	7	COMMENTS
Lithology Plot	Coordatio Conward	DESCRIPTION Surface Elevation: 221.3 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact ▲ Remould	<ul> <li>Intact         <ul> <li>Remould</li> </ul> </li> <li>ear Strength (kPa)</li> </ul>	△ COV (LEL)  2 4  △ COV (ppm  100 200	TOV (LEL)  6 8  ) □ TOV (ppm)  300 400  W WL  Liquid	INSTRUMENTATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
_	a	bout 200 mm ASPHALT	221.1	.,	U)			-	-						
	Sil	brown Sand and Gravel FILL moist dark grey / brown ty Clay / Clayey Silt FILL nd, trace gravel, trace organics	0.2 220.8 0.5	SS	1	100	9	-	221	0		1			
	SILTY	brown CLAY / CLAYEY SILT TILL to some sand, trace gravel stiff	219.7	SS	2	100	14	1 - - - - -	220 —	0		1			
a cie		END OF BOREHOLE	1.5												

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

ECORD (	OF BOREHOLE	E No	<b>).</b>	ВН	C23									wood.
ject Number:	TP115086							Drilling	g Location:	N:4853563			604645	Logged by: MS
ject Client:	City of Brampton							Drilling	g Method:	150 mm So	lid Stem A	ugers		Compiled by: SN
ject Name:	Arterial Road Network wit Secondary Plan Area (Are	thin Hi	ighwa	y 427 l	Industr	rial		Drilling	g Machine:	Track Mount	ted Drill			Reviewed by: SM / DP
ject Location:	Brampton, Ontario							Date 9	Started:	Mar 27, 2020	)Date	Completed: Ma	r 27, 202	0 Revision No.: 0, 2/8/21
LITHO	LOGY PROFILE		SO	IL SA	MPLI	NG			FIELD	TESTING				
ι	DESCRIPTION		mple Type	mple Number	covery (%)	T 'N' / RQD (%)	PTH (m)	EVATION (m)	O SPT □  MTO Vane*  △ Intact ▲ Remould	PPT	△ COV (LE 2 4 △ COV (ppi 100 20	L) TOV (LEL) 6 8 m) TOV (ppm) 00 300 400 W W _L	STRUMENTATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
Geodetic Ground Sur		221.2	Sa	Sa	Re	S	<u> </u>	<u> </u>					žž	GR SA SI CL
Sa	brown and and Gravel FILL moist  dark grey Clay / Clayey Silt FILL	0.1 220.7 0.6	SS	1	100	16	- - - - - -	221 -	0	4	ao 5			
SILTY C trace to	rown / brownish grey CLAY / CLAYEY SILT TILL	0.9	SS	2	100	8	- - - - - - - -	220 -	0		o 16			
			SS	3	100	23	- - - 2 -	219 —	0		a o			
			SS	4	100	41	- 3	- - - - -	0	Ī	°13			
			SS	5	100	44		218 -	C	)	a ○ 10			
			SS	6	100	30	- 4 - 4 	217 —	0	ī	n o. 14			
			SS	7	100	18	- - - - 5	-	0		a o 15			
)	gject Number: oject Client: oject Name: oject Location:  LITHC  Geodetic Ground Sur abc Si Silty trace sanc by SILTY C	oject Number: TP115086 oject Client: City of Brampton Oject Name: Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson Secondary Plan Area (Anderson	oject Number: TP115086 oject Client: City of Brampton  Arterial Road Network within H Secondary Plan Area (Area 47) Brampton, Ontario  LITHOLOGY PROFILE  DESCRIPTION  Geodetic Ground Surface Elevation: 221.3 m about 150 mm ASPHALT 221.2 brown 0.1 Sand and Gravel FILL moist 220.7 dark grey 0.6 Silty Clay / Clayey Silt FILL trace sand, trace gravel, trace organics 0.9 SILTY CLAY / CLAYEY SILT TILL trace to some sand, trace gravel, cobbles/boulders firm to hard	pject Number: TP115086 pject Client: City of Brampton pject Name: Arterial Road Network within Highwa Secondary Plan Area (Area 47) pject Location: Brampton, Ontario  LITHOLOGY PROFILE SC  DESCRIPTION  Geodetic Ground Surface Elevation: 221.3 m about 150 mm ASPHALT 221.2 brown Sand and Gravel FILL moist 220.7 dark grey 0.6 Sitty Clay / Clayey Silt FILL 220.4 brown / brownis prey SILTY CLAY / CLAYEY SILT TILL trace to some sand, trace gravel, cobbles/boulders firm to hard  SS  SS  SS  SS  SS  SS  SS  SS  SS	oject Number: TP115086  oject Client: City of Brampton  Arterial Road Network within Highway 427 Secondary Plan Area (Area 47)  Brampton, Ontario  LITHOLOGY PROFILE  DESCRIPTION  Geodetic Ground Surface Elevation: 221.3 m of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the surface of the su	pject Number: TP115086  Dject Client: City of Brampton  Arterial Road Network within Highway 427 Industrice Secondary Plan Area (Area 47)  Brampton, Ontario  LITHOLOGY PROFILE  DESCRIPTION  DESCRIPTION  Geodetic Ground Surface Elevation: 221.3 m  about 150 mm ASPHALT  brown  Sand and Gravel FILL  moist  Cark grey  Silty Clay Clayey Silt FILL  trace sand, trace gravel, trace organics  cobbles/boulders  firm to hard  SS 1 100  SS 5 100  SS 6 100  SS 7 100	DESCRIPTION  DESCRIPTION  Geodetic Ground Surface Elevation: 221.3 m about 150 mm ASPHALT 221.2 brown 0.1 Sand and Gravel FILL moist 220.7 dark grey 0.6 Sitty Clay (Clayey Silt FILL 220.4 brown / brownish grey SILTY CLAY (CLAYEY SILT TILL trace to some sand, trace gravel, cobbles/boulders firm to hard  DESCRIPTION  Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47)  Brampton, Ontario  SOIL SAMPLING  (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%) OOW / (%	pject Number: TP115086  City of Brampton  Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47)  Brampton, Ontario  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESC	pject Number: TP115086 Drilling pject Client: City of Brampton Drilling pject Name: Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47) prampton, Ontario Date S  LITHOLOGY PROFILE SOIL SAMPLING  DESCRIPTION Solution: Solution Secondary Plan Area (Area 47) Description Surface Elevation: 221.3 m Solution Surface Elevation: 221.3 m Solution Surface Plant Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industrial Surface Silver Industria	pject Number:    City of Brampton	Drilling Location:   Country-side   City of Brampton   Drilling Method:   City of Brampton   Drilling Method:   Secondary Plan Area (Area 47)   Drilling Machine:   Track Mount   Secondary Plan Area (Area 47)   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:   Track Mount   Mar 27, 2020   Drilling Machine:	Secondaric Ground Surface Elevation: 2213 m   Solution   Surface Elevation: 2213 m   Solution   Surface Elevation: 2214   Solution   Sity Clay / Clayey Stiff Liu Clayey Stiff Liace to some sand, liace gravel, coublishes booking signey   SS   5   100   44   SS   30   30   30   30   30   30   30	Drilling Location:   Countryside Dr., WBL, Sta. 1+650 Ext	plect Number: TP115086

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD OF BOREHOLE N	BH	C24								wood	
Pro	oject Number: TP115086						Drilling	Location:	Countryside	Dr., WBL, Sta. 1+650 E:	604647	Logged by: MS
Pro	oject Client: City of Brampton						Drilling	Method:	N:4853568 150 mm Sol	lid Stem Augers		Compiled by: SN
Pro	oject Name: Arterial Road Network within F Secondary Plan Area (Area 47)	lighwa	ıy 427 l	ndustr	ial		Drilling	Machine:	Track Mounte	ed Drill		Reviewed by: SM / DP
Pro	oject Location: Brampton, Ontario	'					Date 9	Started:	Apr 1, 2020	Date Completed: Ap	r 1, 2020	Revision No.: 0, 2/8/21
	LITHOLOGY PROFILE	SC	DIL SA	MPLI	NG			FIELD	TESTING	LAB TESTING Soil Vapour Reading	_	
			L		(%)		Œ		tionTesting PPT • DCPT	▲ COV (LEL) ■ TOV (LEL) 2 4 6 8	INSTRUMENTATION INSTALLATION	COMMENTS &
Plot	DESCRIPTION	ype	Sample Number	(%)	SPT 'N' / RQD (%)	Ê		MTO Vane*		△ COV (ppm) □ TOV (ppm) 100 200 300 400	ATION	GRAIN SIZE DISTRIBUTION
Lithology Plot		Sample Type	nple N	Recovery (%)	ż	DEРТН (m)	ELEVATION	△ Intact ▲ Remould	◆ Remould	W _P W W _L	TALL	(%)
Ě	Geodetic Ground Surface Elevation: 220.9 m	San	San	Rec	SPT	DEF	<u> </u>	* Undrained She	ear Strength (kPa) 60 80	Plastic Liquid 20 40 60 80	SSN	GR SA SI CL
₩	Sand and Gravel FILL moist	SS	1	67	5	-				<b>3</b> )		
$\bowtie$	220.3					-	-					
$\bowtie$	dark grey 0.6 Silty Clay / Clayey Silt FILL					-						
₩	trace sand, trace gravel, trace organics 219.7	SS	2	100	15	<u> </u>	220 -	0	143			
X	brown 1.2 SILTY CLAY / CLAYEY SILT TILL					-						
	trace to some sand, trace gravel, cobbles/boulders	SS	3	58	22	_	-	0	6	1		
\$X	very stiff         219.1           END OF BOREHOLE         1.8					-						

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

	ECORD OF BOREHOLE N	BH (	C25									WO	od.	
	oject Number: TP115086							Location:	N:4853682		ta. 1+800 E:6	04747	_	<u>MS</u>
	oject Client: City of Brampton							Method:	150 mm Sol		gers			SN
	oject Name: Arterial Road Network within F Secondary Plan Area (Area 47)	lighwa	ay 427 I	ndustr	ial			Machine:	Track Mount		annulated No.	- 27 2020	Reviewed by: S	
PIO	oject Location: Brampton, Ontario						Date	Started:	Mar 27, 2020		ompleted: Ma	r 21, 2020	Revision No.: 0	), Z/0/Z1
	LITHOLOGY PROFILE	SC	OIL SA	MPLI	NG				TESTING	Soil Vap	ESTING our Reading	z	COMMENTS	s
Lithology Plot	DESCRIPTION  Geodetic Ground Surface Elevation: 220.9 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	ear Strength (kPa)	2 4 △ COV (ppm 100 200	W W _L ← Liquid	INSTRUMENTATION INSTALLATION	& GRAIN SIZE DISTRIBUTIO (%)	E ON
<b>***</b>	<b>about 150 mm ASPHALT</b> 220.7 brown 0.1					_	-							
	Sand and Gravel FILL moist 220.3 dark grey 0.6 Silty Clay / Clayey Silt FILL 210.0	SS	1	100	11	-	- - -	0	6	o ₄				
	trace gravel, trace organics 219.9 brown /brownish grey SILTY CLAY / CLAY / SILT TILL trace to some sand, trace gravel	SS	2	100	14	- - 1 -	220 -	0		12				
	stiff to hard	ss	3	100	25	-	-	0						
				100	25	- 2  	219 — - - -			°13				
		SS	4	100	46		218 —	(	)	°12				
<u> XX</u>	END OF BOREHOLE 3.0					<u> </u>	-							

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RI	ECORD OF BOREHOLE N	Ο.	BH	C27	' / Bl	H S	<u>7</u>						WC	000	4
⊃ro _.	ject Number: TP115086						Drilling	g Location:	Countryside N:4853816	Dr., WBL, Sta.	1+950 E:	604850	_ Logged by:	MS	
Pro	ject Client: City of Brampton						Drilling	g Method:		lid Stem Augers	s		Compiled by:	SN	
	ject Name: Arterial Road Network within F Secondary Plan Area (Area 47)	lighwa	ay 427	Indust	rial			g Machine:	Track Mount				_ Reviewed by:		
Pro _.	ject Location: Brampton, Ontario						Date :	Started:	Mar 26, 2020	Date Comp	oleted: Ma	r 26, 2020	_ Revision No.:	0, 4/1/2	1
	LITHOLOGY PROFILE	SC	OIL SA	MPLI	NG				TESTING	LAB TES Soil Vapour R		z	COMMEN	TQ	
			Ē		(%)		Œ	1	ationTesting PPT • DCPT	▲ COV (LEL) ■ 2 4 6	§ 8	INSTRUMENTATION	GRAIN SI		
/ Plot	DESCRIPTION	Type	Sample Number	у (%)	SPT 'N' / RQD (%)	Œ		MTO Vane* △ Intact	Nilcon Vane*  ♦ Intact	△ COV (ppm) □ 100 200 30	00 400	MENT	DISTRIBUT		
Lithology		Sample Type	ample	Recovery (%)	Ž	DEPTH (m)	ELEVATION	▲ Remould  * Undrained Sh	◆ Remould lear Strength (kPa)	W _P W ■ <del>O</del> Plastic	W _L ■ Liquid	STRU	(%)		
	Geodetic Ground Surface Elevation: 217.8 m   about 130 mm ASPHALT   217.6	ΐ	ű	Ř	S		□	20 40	60 80	20 40 6	0 80	▼1 ▼1	GR SA	SI	CL
▓	brown 0.1  Sand and Gravel FILL  trace to some silt					-									
▓	moist	SS	1	83	17	-	047	0		30 ₄					
$\stackrel{\otimes}{\otimes}$	216.9 dark brown / dark grey 0.9					<u>-</u> - 1	217 -				: : :				
▓	Silty Clay / Clayey Silt FILL some sand, trace to some gravel, trace organics	SS	2	100	11	-				22					
▓						-									
▓		ss	3	100	13	-	216 -			°23		=			
▓						— 2 - -									
	brown 2.2  SAND AND SILT TILL  trace clay, trace gravel					-									
	dense	SS	4	21	40	- Z	Z ₂₁₅ -			21			1 40	52	7
	brown 214.8 3.0					- 3	_								
	SILTY CLAY / CLAYEY SILT TILL trace to some sand, trace gravel, cobbles/boulders	SS	5	100	59					18					
	hard					-				10					
		SS	6	100	62 /	- - - 4	214 -		62	100					
					150mm	- 7		1	150 mm	10					
						F									
		ss	7	100	55 / 150mm	F	213 -		55 150 mm	0 17					
						— 5 -									
						F									
						-	212 -								
						_ 6	212								
	grey	-00		0.5	0.7	Ē									
		SS	8	25	67	-			O	21					
						F _	211 -								
						— 7 - -									
						Ē	210 -		_						
		SS	9	100	44	- 8			)····	26					
						Ē									
						F	209 -								
						- - - 9	209 -								
						Ē		<u> </u>							
		SS	10	67	50	Ē			· O · · · · · · · · · · · · · · · · · ·	18					
	208.0 END OF BOREHOLE 9.8														
Noo	od E&IS, a Division of Wood Groundwada Limited Groundw	vater en	counter	ed on co	ompletio	n of dri	lling on	3/26/2020 at a	depth of: <u>2.7 m</u>			I			
	/ogell Road, Units 3 & 4	ater de	pth obse	erved on	5/4/202	2 <u>0</u> at a	depth of	: <u>1.7 m</u> .							

Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

## RECORD OF BOREHOLE No. BH C27 / BH S7



Project Number:	TP115086	Project Name: Arterial Road Network within Highway 427 Industrial Secondary Plan Area
		(Area 47)

Project Location: Brampton, Ontario

Pro	oject Location: Brampton, Ontario										
	LITHOLOGY PROFILE	SC	IL SA	MPLI	NG			FIELD TESTING	LAB TESTING		
					(9)			PenetrationTesting	Soil Vapour Reading  ▲ COV (LEL) ■ TOV (LEL)	INSTRUMENTATION INSTALLATION	COMMENTS &
<u>+</u>	DESCRIPTION		pper	<u> </u>	%) Q		<u>E</u>	O SPT □ PPT ● DCPT	2 4 6 8  △ COV (ppm) □ TOV (ppm)	LTA ON	GRAIN SIZE
y Plo	DESCRIPTION	Type	Nun	ر» (%	/ RG	Œ	ĕ	MTO Vane* Nilcon Vane*  △ Intact ◇ Intact  ▲ Remould ◆ Remould	△ COV (ppm) □ TOV (ppm) 100 200 300 400	JME LATI	DISTRIBUTION
Lithology Plot		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	▲ Remould ◆ Remould  * Undrained Shear Strength (kPa)	$W_P$ $W$ $W_L$ Plastic Liquid	STRU	(%)
Ė	50 mm dia manitaring wall with flushmount	Sal	Sa	Re	SP	DE	ᆸ	20 40 60 80	20 40 60 80	Σ̈́Ξ	GR SA SI CL
	50 mm dia. monitoring well with flushmount protective casing installed (depth below ground surface):										
	Concrete: 0.0 - 0.3 m										
	Sand: 0.3 - 0.6 m Bentonite: 0.6 - 5.5 m										
	Sand Filter: 5.5 - 6.1 m										
	Screen: 6.1 - 9.1 m  Groundwater measurement in the monitoring well										
	(depth below ground):										
	24 Apr 2020: 1.7 m 4 May 2020: 1.7 m										
	4 May 2020: 1.7 m 12 May 2020: 1.9 m										

R	ECORD	OF BOREHOLE	E No	0.	BH (	C29	<u>-</u>							wood
Pro	ject Number:	TP115086							Drilling	Location:	Countryside N:4853935	Dr., EBL, Sta. 2+100 E:6	04945	Logged by: MS
Pro	ject Client:	City of Brampton							Drilling	Method:	150 mm So	lid Stem Augers		Compiled by: SN
Pro	ject Name:	Arterial Road Network wi Secondary Plan Area (Are			y 427 I	Industi	rial		Drilling	Machine:	Track Mount	ted Drill		Reviewed by: SM / DP
Pro	ject Location:	Brampton, Ontario	ea 41)						Date S	Started:	Mar 19, 2020	Date Completed: Ma	r 19, 2020	_ Revision No.: <u>0, 2/8/21</u>
	LITH	OLOGY PROFILE		SC	IL SA	MPLI	NG			FIELD	TESTING	LAB TESTING		
Lithology Plot	Goodatic Ground S	DESCRIPTION  Surface Elevation: 221.4 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	tionTesting  PPT	Soil Vapour Reading  A COV (LEL) ■ TOV (LEL) 2 4 6 8  A COV (ppm) □ TOV (ppm) 100 200 300 400  W _P W W _L ■ □ □ Plastic Liquid 20 40 60 80	INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
_	al	oout 150 mm ASPHALT	221.2 22 <b>0</b> .1	0)	0,		0)	-		20 40	: :	20 40 00 00 : : : : :		
	Sil	Sand and Gravel FILL moist dark grey /grey ty Clay / Clayey Silt FILL nd, trace gravel, trace organics	0.3	SS	1	100	18	<del>-</del> - - - - -	221 -	0		°20		
		brown	21 <u>9.9</u> 1.5	SS	2	83	11	1  -  -  -  -  -	220 -	0		23		
		to some sand, trace gravel hard		SS	3	100	36	- - - 2 -	- - - -	0		a o ₁₅		
				SS	4	100	55 / 150mm	- - - - - - 3	219 -		55 150 mm	13		
				SS	5	100	50 / 100mm	F	218 -	5	100 mm	° 12		
		grey		SS	6	100	50 / 100mm	4	217 —	5	0 100 mm	a o ₁₄		
					7	100	74 /	E	-		74			
XX		END OF BOREHOLE	216.5 4.9	SS	,	100	150mm	-	-		74 150 mm	12		
Woo	d E&IS. a Divis	ion of Wood					-	•			-		I	

 $\frac{\sqrt{2}}{2}$  No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD OF BOREHOLE N	<b>o.</b> ]	BH (	<u>C30</u>								wood
Pro	oject Number: TP115086						Drilling	Location:	Countryside I	Dr., EBL, Sta. 2+100 E:6	04944	Logged by: MS
Pro	oject Client: City of Brampton						Drilling	Method:		d Stem Augers		Compiled by: SN
Pro	oject Name: Arterial Road Network within H Secondary Plan Area (Area 47)	lighwa	ıy 427 I	ndustr	ial		Drilling	Machine:	Track Mounte	ed Drill		Reviewed by: SM / DP
Pro	oject Location: Brampton, Ontario						Date S	started:	Mar 19, 2020	Date Completed: Ma	r 19, 2020	Revision No.: <u>0, 2/8/21</u>
	LITHOLOGY PROFILE	SC	DIL SA	MPLI	NG			FIELD	TESTING	LAB TESTING Soil Vapour Reading	_	
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane* △ Intact ▲ Remould	PPT ● DCPT _ Nilcon Vane* ◇ Intact	△ COV (JEL) ■ TOV (LEL)  2 4 6 8  △ COV (ppm) 100 200 300 400  W _P W W _L Plastic Liquid	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
<u>≒</u> ₩	brown	Š	Š	, X	SF		<u> </u>	20 40	60 80	20 40 60 80	ZZ	GR SA SI CL
***	moist 220.7 moist 0.8 dark grey /brown Silty Clay / Claysy Silt FILL trace sand, trace gravel, trace organics	SS	1	83	10	-  -  -  -  -	-	0	es			
***	219.8	SS	2	100	19	- - 1	220 -	0	<b>.</b>			
	brown 1.2  SILTY CLAY / CLAYEY SILT TILL  trace to some sand, trace gravel  very stiff	SS	3	25	17	- - - - -	-	0	28			
<i>XX</i>	219.2 END OF BOREHOLE 1.8					-						
								: :				

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD	OF BOREHOLE	E No	<b>).</b>	вн	C31	•								WC	od.
Pro	ject Number:	TP115086							_ Drilling	g Location:	Countryside N:4854046	Dr., WBL,	Sta. 2+250 E:	605023	Logged by:	MS
Pro	ject Client:	City of Brampton							_ Drilling	g Method:	150 mm So	lid Stem A	ugers		Compiled by:	SN
Pro	ject Name:	Arterial Road Network with Secondary Plan Area (Area		ighwa	y 427	Industr	rial		_ Drilling	g Machine:	Track Mount	ted Drill			Reviewed by:	SM / DP
Pro	ject Location:	Brampton, Ontario							_ Date \$	Started:	Mar 19, 2020	Date (	Completed: Ma	r 19, 2020	Revision No.:	0, 2/8/21
	LITH	OLOGY PROFILE		SC	IL SA	MPLI	NG			FIELD	TESTING		TESTING			
Lithology Plot		DESCRIPTION  urface Elevation: 221.7 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □  MTO Vane* △ Intact ▲ Remould	tionTesting  PPT	▲ COV (LEL 2 4	n)	INSTRUMENTATION INSTALLATION	COMMEN & GRAIN SI: DISTRIBUT (%)	ZE
<b>**</b>	ab		221.6 0.1									: :	: :			
	Silt	Sand and Gravel FILL moist	221.1 0.6	SS	1	83	11	+ - - - - -	221 -	0		°5 °12				
$\overset{\times}{\otimes}$			220.2	SS	2	100	9	- - - -		0		a o 21				
	trace	brown SILTY SAND TILL to some clay, trace gravel dense to very dense wet to moist	1.5	SS	3	100	38	- - - - 2	☑ . = . 220 -	0		8 O 15			- 67	31 2
			218.7	SS	4	100	94	- - - - - - - - - - - - - - - - - - -	1 219 −		OI	a O 15				

Groundwater encountered on completion of drilling on 3/19/2020 at a depth of: 1.5 m. 
Cave in depth after removal of augers: 2.7 m.

N:4854047													
Proje	ect Number: TP115086						Drilling	g Location:	Countryside	Dr., WBI	_, Sta. 2+250 E	605023	Wood. Logged by: MS
Proje	ect Client: City of Brampton						Drilling	g Method:		lid Stem	Augers		Compiled by: SN
Proje	ect Name: Arterial Road Network within H Secondary Plan Area (Area 47)	lighwa	ıy 427 I	ndustr	ial		Drilling	g Machine:	Track Mount	ed Drill			Reviewed by: SM / DP
Proje	ect Location: Brampton, Ontario						Date 9	Started:	Mar 19, 2020	Date	e Completed: Ma	ar 19, 20	20 Revision No.: 0, 2/8/21
	LITHOLOGY PROFILE	SC	OIL SA	MPLII	NG			FIELD	TESTING		TESTING		
					(%				tionTesting	▲ COV (L	Vapour Reading .EL) ■ TOV (LEL)	NOIT	COMMENTS &
<u>t</u>	DESCRIPTION	90	Sample Number	(%	SPT 'N' / RQD (%)		E Z	O SPT   MTO Vane*	PPT • DCPT Nilcon Vane*		4 6 8 ppm) □ TOV (ppm) 200 300 400	NSTRUMENTATION INSTALLATION	GRAIN SIZE
Lithology Plot		le Tyl	le Nu	Recovery (%)	N'.R	DЕРТН (m)	ELEVATION	△ Intact ▲ Remould	Intact	W _P	W W _L	RUME ALLA:	DISTRIBUTION (%)
Lithol	Geodetic Ground Surface Elevation: 221.7 m	Sample Type	Samp	Reco	SPT '	DEP1	ELEV	* Undrained She 20 40	ear Strength (kPa) 60 80	Plastic 20	Liquid 40 60 80	INST.	GR SA SI CL
	brown Sand and Gravel FILL					-	-			:			
	moist	SS	1	50	8	-	-			3			
	dark grey 0.6 Silty Clay / Clayey Silt FILL					Ė	221 -						
	trace sand, trace gravel, trace organics	SS	2	100	13	- - 1	-	0		3			
₩.	220.5 brown 1.2					-	-						
M	SILTY SAND / SANDY SILT TILL trace to some clay, trace gravel	SS	3	100	33	-	-			3			
И,	dense wet 219.8					-	220 -						
	END OF BOREHOLE 1.8												
										:			
										:			
										:			
										:			
										:			
										:			
										:			
										:			
										:			
										:			
										:			

 $\frac{\textstyle \sum}{\textstyle -}$  No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD	OF BOREHO	LE No	o. <u>l</u>	BH (	<u> C33</u>										WO	od.
Pro	ject Number:	TP115086							Drilling	Location:	Countryside	Dr., EE	BL, Sta	. 2+400 E:6	05131	Logged by: M	
Pro	ject Client:	City of Brampton							Drilling	g Method:	N:4854170 150 mm Sc	lid Ster	n Auge	ers		Compiled by: S	N
Pro	ject Name:	Arterial Road Network	within H	ighwa	y 427 l	ndustr	ial		Drilling	g Machine:	Track Moun	ted Dril	ı			Reviewed by: S	M / DP
Pro	ject Location:	Secondary Plan Area ( Brampton, Ontario	(Area 47)						Date 9	Started:	Mar 19, 202	<b>)</b> Da	ate Cor	npleted: Ma	r 19, 202	20 Revision No.: 0	2/8/21
	LITH	OLOGY PROFILE		SO	IL SA	MPLII	NG			FIELD	TESTING		AB TE	STING Reading	7	0014451170	
Lithology Plot		DESCRIPTION  Burface Elevation: 221.8 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact ▲ Remould	<ul> <li>♦ Intact</li> <li>♦ Remould</li> </ul> ear Strength (kPa)	▲ COV	/ (LEL) 4 / (ppm) 200 W	■ TOV (LEL) 6 8 □ TOV (ppm) 300 400	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTIO (%)	į
_	al	bout 100 mm ASPHALT brown	221.7 0.1	0,	- O,		0,	-	-	20 10	: :	:	:	: :			
	Sill	Sand and Gravel FILL moist dark grey / brown ty Clay / Clayey Silt FILL nd, trace gravel, trace organi	221.3 ——0.5	SS	1	83	12	_ - - -	221 -	0		3					
	SILTY	brown  CLAY / CLAYEY SILT TILL to some sand, trace gravel very stiff	0.9	SS	2	100	22	- 1 - - - - -	-	0		8					
<u>a / l / </u>		END OF BOREHOLE	1.5														

 $\frac{\textstyle \sum}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD	OF BOREHO	DLE No	<b>o.</b>	BH (	<u>C35</u>													W	0	00	4
Pro	ject Number:	TP115086							Drilling	Location:	C	ountrysid	le Di	., WBL, S	Sta. 2	+550 E:	605211	[	ogged by		MS	_
Pro	ject Client:	City of Brampton							Drilling	Method:	<u>1</u>	:4854296 50 mm S	olid	Stem Au	gers			(	Compiled b	oy:	SN	
Pro	ject Name:	Arterial Road Networ	rk within H	lighwa	y 427 I	ndustr	ial		Drilling	Machine:	<u>T</u> 1	rack Mour	nted	Drill				F	Reviewed	by:	SM / DP	_
Pro	ect Location:	Secondary Plan Area Brampton, Ontario	(Area 47)						Date S	Started:	M	ar 19, 202	20	Date C	ompl	eted: Ma	r 19, 20	<b>20</b> F	Revision N	o.:	0, 2/8/2 ⁻	1
	LITH	OLOGY PROFILE		SC	IL SA	MPLII	NG			FIELD	TE	STING		LAB T Soil Vap			7		СОММ	ENIT	·c	
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □ MTO Vane △ Intact ▲ Remould	* N	Testing  DCP  ilcon Vane* Intact Remould  Strength (kPa) 60 80	Δ	COV (LEL) 2 4 COV (ppm 100 200 W _P Plastic 20 40	6 ) 300 W	TOV (ppm) 400 W _L Liquid	INSTRUMENTATION INSTALLATION	GR	GRAIN DISTRIE (%	SIZ SUTI	E ON	CL
	al	Surface Elevation: 220.6 m bout 100 mm ASPHALT	220.5 0.1	0)	0)	<u> </u>	0)	-	. ш	20 4	U		$^{+}$	20 40	- 00	60 :	==					
$\overset{\times\!\!\!\!\times}{\times}$		Sand and Gravel FILL moist dark grey /brown	220.2 ——————————————————————————————————	SS	1	100	10	- - -	220 -	0												
	t	ty Clay / Clayey Silt FILL trace sand, trace gravel brownish grey / CLAY / CLAYEY SILT TIL	219.7 0.9					- - - 1	-													
	trace	to some sand, trace grave hard	el 219.1	SS	2	100	45	- - -	-		O · ·		- <b>23</b> - ·									
		END OF BOREHOLE	1.5																			
												: :		1 1	:							

 $\frac{\textstyle \sum}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD OF BOREHOLE N	0.	BH (	<u>C37</u>									wood.
Pro	oject Number: TP115086						Drilling	Location:	Countrysid N:4854406	e Dr., WBL	., Sta. 2+700 E	:605295	Logged by: MS
Pro	oject Client: City of Brampton						Drilling	Method:	150 mm S	olid Stem	Augers		Compiled by: SN
	pject Name: Arterial Road Network within H Secondary Plan Area (Area 47)	lighwa	ay 427 I	Industr	ial		_	Machine:	Track Mour				Reviewed by: SM / DP
Pro	oject Location: Brampton, Ontario						Date S	Started:	Mar 19, 202	<b>0</b> Date	Completed: M	ar 19, 2020	Revision No.: <u>0, 2/8/21</u>
	LITHOLOGY PROFILE	SC	DIL SA	MPLII	NG			FIELD	TESTING		B TESTING Vapour Reading		COMMENTS
			<u></u>		(%)		(E)		tionTesting PPT • DCP1	▲ COV (L	.EL) ■ TOV (LEL) 4 6 8	NSTRUMENTATION INSTALLATION	COMMENTS &
Plot	DESCRIPTION	Гуре	Sample Number	(%) /	SPT 'N' / RQD (%)	Œ		MTO Vane* △ Intact	Nilcon Vane*  ♦ Intact	△ COV (p	pm) □ TOV (ppm 200 300 400	MENT	GRAIN SIZE DISTRIBUTION
Lithology Plot		Sample Type	mple	Recovery (%)	ž	DEРТН (m)	ELEVATION	▲ Remould	Remould	W _P ■ Plastic	W W _L → Liquid	STRU	(%)
<u>=</u>	Geodetic Ground Surface Elevation: 220.0 m about 90 mm ASPHALT 220.0	Sa	Sa	Re	R		<u> </u>	20 40	60 80		40 60 80	ŽŽ	GR SA SI CL
₩	Sand and Gravel FILL 219.6					-	-						
$\bowtie$	moist 0.4 brown Silty Clay / Clayey Silt FILL	SS	1	100	16	_		0		4			
<b>※</b>	trace sand, trace gravel 219.1  brown 0.9					- - - 1	-						
	SILTY CLAY / CLAYEY SILT TILL trace to some sand, trace gravel	SS	2	83	47	F '	219 -		<b>3</b>	<b>A</b>			
	hard 218.5  END OF BOREHOLE 1.5					<u> </u>	-				<u> </u>	1	
	END OF BUREFIOLE 1.5												
										:			
										:			
										:			
										:			
										:			
										:			
										:			
										:			
										:			
										:			
										:			
											: : :		

 $\frac{\textstyle \sum}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

	<b>ECORD</b> ject Number:	OF BOREHOLE N	lo.	<u>BH</u>	<u>S8</u>			Drillin	g Location:	Countryside	Dr., EBL, Sta. 1+950 E:0	604854	WOOC Logged by: MS	J.
	ject Client:	City of Brampton						Drillin	g Method:	N:4853824 150 mm So	lid Stem Augers		Compiled by: SN	
Pro	ject Name:	Arterial Road Network within	Highwa	ay 427	Indust	rial		Drillin	g Machine:	Track Mount	ted Drill		Reviewed by: SM / DF	<b>&gt;</b>
Pro	ject Location:	Secondary Plan Area (Area 47 Brampton, Ontario	<b>'</b> )					Date	Started:	Mar 26, 2020	Date Completed: Ma	ır 26, 2020	Revision No.: <u>0, 2/8/2</u>	1
	LITH	OLOGY PROFILE	sc	OIL SA	AMPLI	NG			FIELD	TESTING	LAB TESTING			
Lithology Plot		DESCRIPTION urface Elevation: 219.5 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	Penetra ○ SPT □  MTO Vane* △ Intact ▲ Remould	nationTesting  PPT	Soil Vapour Reading	INSTRUMENTATION INSTALLATION O	COMMENTS & GRAIN SIZE DISTRIBUTION (%)	CL
×	<u>a</u> t	brown <u>ASPHALT</u> 219.4 0.1	-				-			: :				
		Sand and Gravel FILL trace to some silt moist  218.6 dark brown y Clay / Clayey Silt FILL		1	42	15	- - - - - - - - -	219 -	0		012			
	some sand, t	ace to some gravel, trace organics	SS	2	92	6	- - - -	218 -	-		<b>1</b> 6			
			ss	3	83	6	- - - 2 -		0		°28			
		Y SAND / SANDY SILT TILL to some clay, trace gravel very dense moist 216.6	ss	4	100	56		☑ = 217 -		0	°9			
		brown 3.0  CLAY / CLAYEY SILT TILL to some sand, trace gravel, cobbles/boulders hard	SS	5	33	45	- 3 - - - - -	216 -		<b>3</b>	17			
			SS	6	100	72 / 150mm	- 4 			72 0 150 mm	18			
	trace	 e to some shale fragments	SS	7	100	50 / 80mm	-  -  -  -  -	215 -		50 0 80 mm	°12			
							- - 5 - - - -							
							- - - - 6	214 -						
		grey	ss	8	100	60	- - - -	213 -		0	17			
							- - - 7 - -							
					400		- - - -	212 -						
			SS	9	100	31	- 8 - -				28			
							- - - - - - 9	211 -						
		209.9	SS	10	100	50	-  -  -  -  -	210 -		.0.	a o			
<i>LX</i> .		END OF BOREHOLE 9.7								: :				
Noc	od E&IS, a Divis	on of Wood	water -	oourts.	od on i	ompletic	n of 🕮	illing ==	3/36/3030 =+ =	donth of 2.4				$\dashv$
	ada Limited	— Ground	water en	counter	ed on co	ompletio	n of dri	Illing on	<u>3/26/2020</u> at a	depth of: 2.4 m.				

RE	CORD OF BOREHOLE N	Ο.	BH	<u>S9</u>									V	<b>VOO</b>	d.
,	ect Number: TP115086						_ Drilling	Location:	Countryside N:4852848	Dr., WBL, S	Sta. 0+700 E:	604080	Logged b	y: <u>MS</u>	
Proje	ect Client: City of Brampton						_ Drilling	Method:	150 mm So	lid Stem Au	igers		Compiled	· —	
_	ect Name: Arterial Road Network within H Secondary Plan Area (Area 47)	lighwa	ıy 427	Industr	rial			Machine:	Track Mount					l by: <u><b>SM</b> /</u>	
Proje	ect Location: Brampton, Ontario						_ Date S	started:	Mar 18, 2020	Date C	Completed: Ma	r 18, 2020	Revision	No.: <u>0, 2/</u>	8/21
	LITHOLOGY PROFILE	SC	)IL SA	MPLI	NG			FIELD	TESTING		TESTING our Reading	_		451150	
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	EVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	tionTesting  PPT	△ COV (LEL)  2 4  △ COV (ppm 100 200	) ■ TOV (LEL) 6 8 i) □ TOV (ppm)	INSTRUMENTATION INSTALLATION	GRAI DISTRI (°	MENTS & N SIZE BUTION %)	
. <u>‡</u>	Geodetic Ground Surface Elevation: 214.4 m about 150 mm ASPHALT 214.3	Sa	Sa	Z.	SP	DE	<u> </u>	20 40		20 40	60 80	22	GR SA	SI	CL
	Sand and Gravel FILL trace to some silt moist dark brown Silty Clay / Clayey Silt FILL	SS	1	100	9		214 —	0		a O					
	trace to some sand, trace to some gravel	SS	2	83	8	- 1 - - -	213 —	0		23					
	brown to grey 1.8 SILTY CLAY / CLAYEY SILT TILL	- ss	3	100	7	- - - - - 2	- - - -	0		°19					
	trace sand to sandy, trace to some gravel, cobbles/boulders firm to hard	SS	4	100	53		212 —		0 1	a o ₁₈					
	grey		_			- - - 3 -	- - - -								
		SS	5	100	19 50 /		211 —	○	50	14					
		<del>SS</del>	8	U	30mm	- 4 - 4 -	210 —		30 mm						
	sandy	SS	7	100	50 / 80mm	- - - - - - - 5	210 - - - -	Ę	50 80 mm	<b>a 9</b>			12 32	47	9
							209 —								
		SS	8	100	50 / 100mm	- - - - - - - -	208 —		50 100 mm	⁰ 11					
						- - - - 7 - -	-								
		SS	9	100	65 / 150mm		207 —		65 0 150 mm	a o 14					
						- 8 - - - - -	206 —								
	205.0	ss	10	100	65 / 150mm	9	-		65 0 150 mm	a o 15					
	END OF BOREHOLE 9.4						<del>- 205</del>								
Wood	d E&IS, a Division of Wood	anding	groundv	water me	easured	in ope	en boreho	e on completi	ion of drilling.						
50 Vo Richn Cana	orgell Road, Units 3 & 4 nond Hill, Ontario, L4B 3K6 da Borehole details	as prese	ented, do	not cons	titute a th	orough	n understan	iding of all pote	ntial conditions pre	esent and requir	re interpretative ass	istance from		Scale	: 1 : 53
	lo.: (905) 415-2632 a qualified Geoter commissioned are	cnnical E nd the ac	:ngineer. :compan	. AISO, bo ying'Expl	renole inf anation o	ormati f Borel	on should l hole Log'.	oe read in conju	ınction with the geo	necnnical repor	τ ror wnich it was				1 of 1

RI	ECORD OF BOREHOLE N	<b>o.</b>	BH	<u>S10</u>									WC	ood	
Pro	ject Number: TP115086						_ Drillin	g Location:	Countryside	Dr., EBL, Sta.	0+700 E:6	04082	Logged by:	MS	,
Pro	ject Client: City of Brampton						Drilling	g Method:	N:4852848 150 mm Sol	lid Stem Auger	's		Compiled by:	SN	_
Pro	ject Name: Arterial Road Network within I	lighwa	ay 427	Industi	rial		Drilling	g Machine:	Track Mount	ed Drill			Reviewed by:	SM / DP	_
Pro	Secondary Plan Area (Area 47) ject Location: Brampton, Ontario	)					Date	Started:	Mar 18, 2020	Date Com	pleted: Ma	r 18, 2020	Revision No.:	0, 3/30/21	_
	LITHOLOGY PROFILE	SC	DIL SA	MPLI	NG			FIELD	TESTING	LAB TES					_
			١.		(%)		E		ationTesting	Soil Vapour F  COV (LEL)  4	TOV (LEL)	INSTRUMENTATION INSTALLATION O	COMMEN &	TS	
털	DESCRIPTION	l e	Sample Number	(%	00	2	E) N	MTO Vane*	PPT • DCPT  Nilcon Vane*	△ COV (ppm) □	T T	AT NOIT	GRAIN SIZ		
ogy F		le Ty	le N	very (	'N' / RQD	트	ATIC	<ul> <li>△ Intact</li> <li>▲ Remould</li> </ul>	Nilcon Vane*  ◇ Intact  ◆ Remould	W _P W	W _L	ALLA	(%)	ION	
Lithology Plot	Geodetic Ground Surface Elevation: 213.8 m	Sample Type	Samp	Recovery (%)	SPT	<b>DEPTH</b> (m)	ELEVATION	* Undrained Sh 20 40	near Strength (kPa) 60 80	Plastic	Liquid 50 80	LSNI TSNI G	R SA	SI CL	
	about 150 mm ASPHALT 213.6 brown 219.8					-						* *			
	Sand and Gravel FILL 0.3					ŧ									
▓	moist brown	SS	1	100	7			]0		o 16	ļ				
₩	Silty Clay / Clayey Silt FILL trace to some gravel					<u> </u>	213 -	-				<b>■</b>			
₩	S	SS	2	100	9	- 1 - -		] .		22					
₩	212.3					-				22					
	brown to grey 1.5 SILTY CLAY / CLAYEY SILT TILL					-	040								
	trace sand to sandy, trace to some gravel, cobbles/boulders	SS	3	83	19	_ _ 2	212 -	]		18					
	very stiff to hard					Ė		<u> </u>							
		00	١.		0.5	-		<b></b>			ļ <u>.</u>				
		SS	4	75	25		211 -	- 0		³ 015					
						_ 3		<b>-</b>							
	grey	SS	5	100	15			]							
		33	3	100	15			1		12					
	condy cobbles / boulders	-00		400	64 /	-	210 -	1	64				4 00	00 7	
	sandy, cobbles / boulders	SS	6	100	150mm	4		<u> </u>	150 mm	8		3	1 29	33 7	
						-		1			<u> </u>				
					F2 /	F			53		<u> </u>				
		SS	7	100	53 / 150mm	Ė	209 -	<b>]</b>	53 150 mm	o 16	ii				
						5 -									
						-		1			i i				
						-	208 -								
		SS	8	100	62 / 150mm	6		]	62 150 mm	19					
					10011111	1		<u> </u>	150 mm	: 19	ļ <u>.</u>				
						-		]							
						- - 7	207 -	]							
						- ·									
		SS	9	100	75 / 150mm	ŧ	206 -		75 150 mn	12					
						- 8	200	1							
							$\subseteq$	]							
						Ė		]			: : 				
						-	205 -	1			<u> </u>				
						- - 9		1							
	204.4	SS	10	100	50 / 100mm	Ł		<u> </u>	50 0 100 mm	13	<u> </u>				
	END OF BOREHOLE 9.4														
Woo	d E&IS, a Division of Wood ☐ Groundv	vater en	counter	ed on cr	ompletio	n of dri	illing on	3/18/2020 at a	depth of: <u>8.2 m</u> .						٦

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

▼ Groundwater depth observed on <u>5/4/2020</u> at a depth of: <u>0.9 m</u>.

## RECORD OF BOREHOLE No. BH S10



Project Number: TP115086 Project Name: Arterial Road Network within Highway 427 Industrial Secondary Plan Area

Project Location: Brampton, Ontario

LITHOLOGY PROFILE SOIL SAMPLING FIELD TESTING LAB TESTING Soil Vapour Reading **COMMENTS** INSTRUMENTATION INSTALLATION PenetrationTesting ▲ COV (LEL) ■ TOV (LEL)
2 4 6 8 Ξ O SPT □ PPT ● DCPT GRAIN SIZE DISTRIBUTION Sample Number SPT 'N' / RQD **DESCRIPTION** Lithology Plot Sample Type ELEVATION MTO Vane* Nilcon Vane* Ξ W_P W_L
Liquid
80 W (%) DEPTH * Undrained Shear Strength (kPa) 20 40 60 80 20 40 60 SA SI 50 mm dia. monitoring well with flushmount protective casing installed (depth below ground surface): Concrete: 0.0 - 0.3 m Sand: 0.3 - 0.6 m Bentonite: 0.6 - 5.5 m Sand Filter: 5.5 - 6.1 m Screen: 6.1 - 9.1 m Groundwater measurement in the monitoring well (depth below ground): 4 May 2020: 0.9 m 12 May 2020: 1.0 m

R	ECORD	OF BORE	HOLE N	<b>o.</b>	BH S	<u>S11</u>									W	OC	od.
Pro	ject Number:	TP115086							Drilling	g Location:	Countryside N:4852560	Dr., WBL, S	Sta. 0+350 E:	603849	_ Logged by	MS	
Pro	ject Client:	City of Brampton	1						Drilling	g Method:	150 mm So	lid Stem Au	gers		_ Compiled b	y: <b>SN</b>	
Pro	ject Name:	Arterial Road Net			y 427 I	ndustr	ial		Drilling	g Machine:	Track Mount	ted Drill			Reviewed	ру: <u><b>SM</b></u>	/ DP
Pro	ject Location:								Date S	Started:	Mar 24, 2020	Date C	ompleted: Ma	ar 24, 2020	_ Revision N	o.: <u>0, 2</u>	8/21
	LITH	OLOGY PROFIL	.E	SO	IL SA	MPLI	NG			FIELD	TESTING		ESTING				
							(%		=	1	tionTesting	Soil Vap  COV (LEL)  2 4	our Reading TOV (LEL) 6 8	NSTRUMENTATION INSTALLATION	COMM 8		
Jot		DESCRIPTION		фе	ımber	(%)	go (°	ء ا	E N	O SPT   MTO Vane*	PPT • DCPT Nilcon Vane*		)   TOV (ppm)	TION	GRAIN DISTRIE	SIZE	
Lithology Plot				Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION	<ul> <li>△ Intact</li> <li>▲ Remould</li> </ul>	<ul><li>♦ Intact</li><li>♦ Remould</li></ul>		W W _L	ALLA	(%		
Litho		Surface Elevation: 213.2 m		Sam	Sam	Reco	SPT	DEP	ELE	* Undrained She 20 40	ear Strength (kPa) 60 80	Plastic 20 40	Liquid 60 80	INST	GR SA	SI	CL
<b>***</b>	al	bout 200 mm ASPHAI	LT 					-	213 -								
$\bowtie$		Sand and Gravel FILI trace to some silt						Ē									
		moist dark grey/brown	0.6	SS	1	100	9	-				5					
$\bowtie$	Sil trace to	ty Clay / Clayey Silt For some gravel, trace o	rganics					- - 1									
₩				SS	2	83	7	_	212 -			a o 18					
$\bowtie$			-					-									
$\bowtie$				SS	3	100	16	-		0		21					
₩			211.0					<u> </u>	Z = 211 -								
1	SILTY SANI	brown to grey D / SANDY SILT / SAN TILL	ND AND SILT					-		<b>.</b>							
$\mathcal{V}$		trace clay, trace grave dense to very dense		SS	4	100	46	_			) ; ; (	°16					
X		moist to wet						- - 3									
1				SS	5	83	39	-	210 -			4 0 0					
$\mathcal{V}$				00		00	33	-				16					
X								-		1							
1)		grey		SS	6	83	44	4 -	200		) .	12			1 42	55	2
$\mathcal{V}$								-	209 -								
X																	
1)				SS	7	83	35	- - - 5				s o 15					
$\mathcal{V}$								<u> </u>	208 -								
X								-									
1)								-	•								
$\mathcal{V}$								6									
X				SS	8	88	35	-	207 -			a · · · o ; _ · · · · i ·					
1)								-	:			15		]			
$\mathcal{V}$								- - - 7									
X								- '	206 -								
1)								Ē	_								
1		arev	205.4 7.8	SS	9	100	55 / 150mm	‡ ₽	•		55 150 mm	12					
	trace sand	grey ' CLAY / CLAYEY SIL' d to sandy, trace to so	T TILL me gravel,					8			150 mm	12					
	cobble	es/boulders, shale frag hard	gments					_	205 -	1							
								-									
								Ε.									
		5UD 05	204.0	SS	10	100	50 / 80mm	— 9 - -	204 -	5	0	<b>3</b> 0		]			
		END OF BOREHOLE	9.2				CONTIN				80 mm	10					
161	4 E010 - 51 :	ion of 18/!															
Can	od E&IS, a Divis ada Limited		≟ Groundw	ater en	countere	ed on co	mpletio	n of dri	lling on	<u>3/24/2020</u> at a	depth of: 2.1 m	. 🖫 Cave i	in depth after rer	moval of auger	s: <u>7.6 m</u> .		
	/ogell Road, Uni imond Hill, Onta		Borehole detaile	as preso	nted do	not cone	titute a th	orough	undereta	nding of all note:	ntial conditions pro	esent and requir	e interpretative as	sistance from	Т		
Tel.	ada No.: (905) 415-2 /.woodplc.com	2632	a qualified Geoted commissioned an	chnical E	ngineer.	Also, box	rehole in	formatio	n should	be read in conju	nction with the geo	otechnical repor	t for which it was	o.o.unoo IIOIII			: 1 : 53
	,															Page:	ı UI I

	ECORD ject Number:	OF BOREHOLE NO	Ο.	<u>BH</u>	<u>S12</u>	1		Drillie	a Location:	Countraid	Dr EBI Sto 0±250 5:602057	WOOD. Logged by: MS
	ject Number: ject Client:	City of Brampton							g Location: g Method:	N:4852567	Dr., EBL, Sta. 0+350 E:603857 lid Stem Augers	Logged by: MS  Compiled by: SN
	ject Name:	Arterial Road Network within H	lighwa	av 427	Indust	rial		_	g Machine:	Track Mount	-	Reviewed by: SM / DP
	ject Location:	Secondary Plan Area (Area 47)		.y . <u></u>					Started:	Mar 24, 2020		
		OLOGY PROFILE		NI 0/	NADI I	NO	ı		FIELD			
Lithology Plot		OLOGY PROFILE  DESCRIPTION  Surface Elevation: 213.5 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	Penetra ○ SPT □  MTO Vane* △ Intact ▲ Remould	<ul> <li>Intact</li> <li>Remould</li> </ul> near Strength (kPa)	LAB TESTING  Soil Vapour Reading  A COV (LEL)  TOV (LEL)  2	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
_ >>>>		brown 213.3 0.1					-				₹ ₹	
	Sil	Sand and Gravel FILL trace to some silt moist 212.9 dark grey/ brown ty Clay / Clayey Silt FILL	SS	1	100	12	- - - - -	213 -	0			
	trace to	o some gravel, trace organics	SS	2	67	6	- 1 - - - -	212 -	0		¥	
			SS	3	83	7	- - - - 2		0			
		brown to grey / SAND / SANDY SILT TILL trace gravel compact to very dense moist to wet	SS	4	75	20	- - - - - - - 3	211 -	0	E	\$	
		grey	SS	5	83	36		210 -	0		\ \tag{\frac{1}{2}}	
			SS	6	100	91	- - 4 -			0		
			SS	7	100	104	- - - -	209 -		104		
		207.7 END OF BOREHOLE 5.8	- 33	8	100	50 /	5 - - - - - -	208 -		50 30 mm		
	50 mm dia	minated due to Auger refusal at 5.8 m depth.)  . monitoring well with flushmount ising installed (depth below ground surface):								SUMM		
	Sand: Bentonite Sand Filt	e: 0.0 - 0.3 m 0.3 - 0.6 m e: 0.6 - 2.1 m er: 2.1 - 2.7 m 2.7 - 5.8 m										
	Groundwater	measurement in the monitoring well (depth below ground):										
	4 May 20 12 May 2	120: 1.4 m 1020: 1.5 m										
Can	od E&IS, a Divis ada Limited	= No freesta							ole on complet	ion of drilling.		
50 \	ogell Road, Uni	ts 3 & 4	ater de	oth obse	erved on	5/4/202	20 at a	depth of	: <u>1.4 m</u> .			



## SECTION D CLARKWAY DRIVE (FROM CASTLEMORE ROAD TO MAYFIELD DRIVE, ~3 KM)

**RECORD OF BOREHOLES** 



RECORD OF BOREHOLE No. BH D1  Project Number: TP115086 Drilling Location: Clarkway Dr., NBL, Sta. 0+0														Wo	od.
Pro	oject Number: TP115086							Drilling	Location:	Clarkway Dr. N:4850676	., NBL, Sta	.0+000 E:606	251	_ Logged by:	MS
Pro	oject Client: City of Brampton							Drilling	Method:	150 mm So	lid Stem Au	ugers		Compiled by:	SN
Pro	oject Name: Arterial Road Network wit Secondary Plan Area (Are	thin H	ighwa	y 427 I	ndustr	ial		Drilling	Machine:	Track Mount	ed Drill			_ Reviewed by:	SM
Pro	oject Location: Clarkway Drive, Brampton	n, Ont	ario					Date S	Started:	Feb 18, 2020	Date (	Completed: Fel	18, 2020	Revision No.:	0, 3/25/21
	LITHOLOGY PROFILE		SO	IL SA	MPLI	NG			FIELD	TESTING		TESTING pour Reading	7	COMMENT	-6
				j.		(%)		(E)		tionTesting PPT • DCPT	COV (LEL	.) TOV (LEL)	INSTRUMENTATION INSTALLATION	&	
Plot	DESCRIPTION		уре	Sample Number	(%)	SPT 'N' / RQD (%)	Ê		MTO Vane*	Nilcon Vane*	△ COV (ppn 100 20	n) □ TOV (ppm) 0 300 400	ATIO	GRAIN SIZ DISTRIBUTI	
Lithology Plot			Sample Type	Λ eldι	Recovery (%)	ž	DEРТН (m)	ELEVATION	△ Intact ▲ Remould		W _P	W W _L	TALL	(%)	
Ė	Geodetic Ground Surface Elevation: 205.6 m		San	San	Rec	SPT	DEF		* Undrained She 20 40	ear Strength (kPa) 60 80	Plastic 20 40	Liquid ) 60 80	SN C	GR SA S	l CL
<b>***</b>	brown	205.5 0.1					Ė	-							
₩	Sand and Gravel FILL moist		SS	1	100	94	-	-		O	D.				
₩	2	204.8		,			Ė	205 —			3				
$\bowtie$	brown Silty Clay / Clayey Silt FILL	0.8					- - 1	-							
₩	trace sand, trace gravel		SS	2	100	29	Ē	-	0		17				
***	brown	204.1 1.5					Ė	204 -							
	SILTY CLAY / CLAYEY SILT TILL trace to some sand, trace gravel		SS	3	100	27	-	204 -			ı o .				
	very stiff to hard						_ 2	-			14				
							Ė	-							
		İ					-	203 —							
			SS	4	100	36	_		0		14				
<i>XX</i>	END OF BOREHOLE	3.0					- 3								
									: :		: :				

 $\frac{\textstyle \sum}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

RECORD OF BOREHOLE No. BH D2  Project Number: TP115086 Drilling Location: Clarkway Dr., NBL, Sta. 0+000 E:606254 L													WC	ood	ļ	
Pro	oject Number: TP115086						Drilling	g Location:	Clarkway Dr. N:4850680	, NBL, S	ta. 0+000 E:6	06254	ا	Logged by:	MS	_
Pro	oject Client: City of Brampton						Drilling	g Method:	150 mm Sol	id Stem	Augers		(	Compiled by:	SN	_
Pro	oject Name: Arterial Road Network within Secondary Plan Area (Area 47	Highwa	ay 427	Industr	ial		Drilling	g Machine:	Track Mounte	ed Drill				Reviewed by:	SM	_
Pro	oject Location: Clarkway Drive, Brampton, O	ntario					Date \$	Started:	Feb 18, 2020	Date	e Completed:	Feb 18, 202	<u>:0</u>	Revision No.:	0, 3/25/21	느
	LITHOLOGY PROFILE	SC	DIL SA	MPLI	NG			FIELD	TESTING		B TESTING Vapour Reading			2011151		
			_		(%)		Œ		tionTesting PPT ● DCPT	▲ COV (L	_EL) ■ TOV (LE 4 6 8	(a) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c		COMMEN &		
Plot	DESCRIPTION	ype	Sample Number	(%)	SPT 'N' / RQD (%)	Ê		MTO Vane*		△ COV (p	opm) □ TOV (pp 200 300 400	(m)		GRAIN SI DISTRIBUT		
Lithology		Sample Type	N eld	Recovery (%)	ž	DEРТН (m)	ELEVATION	△ Intact ▲ Remould	◆ Remould	W _P	W W _L	TRUN		(%)		
Ť.	Geodetic Ground Surface Elevation: 206.0 m		San	Rec	SPT	DEF	E E	* Undrained Sh 20 40	ear Strength (kPa) 60 80	Plastic 20	Liquid 40 60 80	SN SN	GR	SA	SI CL	L
$\overset{\otimes}{\otimes}$	about 50 mm TOPSOIL 205.9	1	1	75	6	-										
₩	Silty Clay / Clayey Silt FILL trace sand, trace gravel, trace organics 205.5	<u>[</u>	'	"		-		1	23							
$\stackrel{\sim}{\otimes}$	Sand and Gravel FILL 0.9	7				-										
$\overset{\otimes}{\otimes}$	brown Silty Clay / Clayey Silt FILL trace sand, trace gravel 204.8	SS	2	100	15	- - 1	205 -	0								
	brown 1.2 SILTY CLAY / CLAYEY SILT TILL trace to some sand, trace gravel, cobbles/boulders	ss	3	100	36	- - - -		0	65							
<i>VX</i> 2	hard 204.1 <b>END OF BOREHOLE</b> 1.8					-						$\dashv$ $\mid$				
										:						
										:						
										:						
										:						
										:						
										:						
										:						
										:						
										:						
										:						
										:						
										:						

		OF BOREHOL	E No	0.	BH_	<u>D3</u>								wood.
	ject Number:								_	Location:	N:4850776	, SBL, Sta. 0+150 E:606	138	Logged by: MS
	ject Client:	City of Brampton			40=				-	Method:		id Stem Augers		Compiled by: SN
	iject Name:	Arterial Road Network Secondary Plan Area (A Clarkway Drive, Bramp	rea 47)		ıy 427 i	naustr	ıaı			Machine: Started:	Track Mounte		h 18 2020	Revision No.: <b>SM</b> Revision No.: <b>0, 3/25/21</b>
			1			MDI	10		J 410 1				I I	<u> </u>
	LIIH	OLOGY PROFILE		SC	JIL SA	MPLII					TESTING ationTesting	LAB TESTING  Soil Vapour Reading  ▲ COV (LEL) ■ TOV (LEL)	l K	COMMENTS
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	PPT ● DCPT  Nilcon Vane*  ◇ Intact ◆ Remould  ear Strength (kPa)	2 4 6 8  △ COV (ppm) □ TOV (ppm) 100 200 300 400  W _p W W _L Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	& GRAIN SIZE DISTRIBUTION (%) R SA SI CL
_ ‱	ak	urface Elevation: 206.0 m nout 130 mm ASPHALT brown	205.8 0.1	0)	0)	ш.	0)	-		20 40	00 00	2,0 4,0 0,0 0,0		
		Sand and Gravel FILL moist brown y Clay / Clayey Silt FILL	205.4	SS	1	79	12	- - - <u>▽</u> - =	- - 7 - -	0				
***	tı	ace sand, trace gravel	204.6	SS	2	100	16	- 1 - - -	205 -	0				
<b>Z</b>	trace	brown CLAY / CLAYEY SILT TILL to some sand, trace gravel very stiff END OF BOREHOLE	20 <b>4</b> : <b>4</b> 1.5					_	-					
Noc	od E&IS, a Divisi	on of Wood							. ,		donth of: 0.6 m			

R	ECORD	OF BOREH	OLE N	0.	BH_	<u>D5</u>									wood
Pro	ject Number:	TP115086							Drilling	Location:	Clarkway Dr N:4850884	., NBL, Sta. 0	+300 E:6060	039	Logged by: MS
Pro	ject Client:	City of Brampton							Drilling	Method:	150 mm So	lid Stem Auge	ers		Compiled by: SN
Pro	ject Name:	Arterial Road Netwo	ork within H	lighwa	y 427	Industr	rial		Drilling	Machine:	Track Mount	ted Drill			Reviewed by: SM
Pro	ject Location:	Clarkway Drive, Bra							Date 9	Started:	Feb 18, 2020	Date Cor	mpleted: Fel	b 18, 2020	D Revision No.: 0, 3/25/21
	LITH	OLOGY PROFILE		SC	IL SA	MPLI	NG			FIELD	TESTING	LAB TE			
Lithology Plot	Geodetic Ground S	DESCRIPTION  Surface Elevation: 205.7 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	<ul> <li>♦ Intact</li> <li>♦ Remould</li> </ul> ear Strength (kPa)	Soil Vapour  COV (LEL)  2 4  △ COV (ppm)  100 200  W _P W  Plastic  20 40	TOV (LEL) 6 8 D TOV (ppm) 300 400	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
<b>***</b>		bout 110 mm ASPHALT brown	205.6_ 0.1					-	-						
	Sil	Sand and Gravel FILL moist brown ty Clay / Clayey Silt FILL	205.1 0.6	SS	1	100	20	-	205 —	0		°6			
	SILTY	brown/grey		SS	2	100	9	- 1 - - -	-	0		19			
	trace	to some sand, trace grav cobbles/boulders stiff	el,	SS	3	58	11	- - - - - 2	204 -	0		16			
				SS	4	0	9		203 —	0	1	<b>8</b>			
				SS	5	17	14	3	-	0		a o 22			
				SS	6	75	10	- - - 4 -	202 -	0		o ₂₁			
			200.7	SS	7	100	11		201 —	0		B O 15			
<u> </u>		END OF BOREHOLE	200.7 5.0					5.5	-						
	// No freestanding groundwater measured in open borehole on completion of drilling.												depth after rem	noval of au	gers: <u>5.0 m</u> .

RECORD OF BOREHOLE Project Number: TP115086				ο.	вн	<u>D6</u>									W	ood.
Pro	ject Number:	TP115086							Drilling	Location:	Clarkway Dr	., NBL, Sta.	0+300 E:606	040	Logged by:	MS
Pro	ject Client:	City of Brampton							Drilling	g Method:	N:4850886 150 mm So	lid Stem Au	ıgers		Compiled by:	SN
Pro	ject Name:	Arterial Road Network	within H	ighwa	y 427	Industr	ial		Drilling	Machine:	Track Mount	ted Drill			Reviewed by:	SM
	-	Secondary Plan Area (A Clarkway Drive, Brampt	rea 47)							Started:	Feb 18, 2020		Completed: Fel	o 18, 2020		
	LITH	OLOGY PROFILE		SC	IL SA	MPLI	NG			FIELD	TESTING		TESTING			
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould  * Undrained Sh	<ul> <li>♦ Intact</li> <li>♦ Remould</li> </ul> near Strength (kPa)	△ COV (LEL 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	n) □ TOV (ppm) 0 300 400  W W _L Liquid	INSTRUMENTATION INSTALLATION	COMMEI & GRAIN S DISTRIBU (%)	IZE
<u> </u>		brown	-	S	S	<u>«</u>	S	-	206 —	20 40	60 80	20 40	60 80	22	GK 5A	- OL
$\overset{\times}{\otimes}$	,	Sand and Gravel FILL moist	205.5	SS	1	100	17		Z :	0		8 8			36 49	(15)
		brown  CLAY / CLAYEY SILT TILL to some sand, trace gravel firm to stiff	0.6	SS	2	33	8	 - - 1 - 1	205 -	0		0 14				
		END OF BOREHOLE	204.3	SS	3	25	8	-	-	0		a o 13				

 $\frac{\nabla}{2}$  Groundwater encountered on completion of drilling on <u>2/18/2020</u> at a depth of: <u>0.6 m</u>.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RECORD OF BOREHOLE No. BH						<u>D7</u>												W	100	od.
Pro	oject Number:	TP115086							Drilling	Location:	C	arkway Dr. 4850986	., SBL, Sta	a. 0+45	0 E:605	935	L	ogged by	/: <u>MS</u>	<u> </u>
Pro	oject Client:	City of Brampton							Drilling	Method:	1	50 mm Sol	lid Stem A	Augers			c	ompiled	by: SN	
Pro	oject Name:	Arterial Road Network v Secondary Plan Area (A			y 427 I	ndustr	rial		Drilling	g Machine:	<u>Tr</u>	ack Mount	ed Drill				R	eviewed	by: SN	<u> </u>
Pro	oject Location:	Clarkway Drive, Brampt	ton, Ont	ario					Date 9	Started:	F	eb 18, 2020	Date	Compl	eted: Fe	b 18, 20	<b>20</b> R	evision N	No.: <u>0,</u>	3/25/21
	LITH	IOLOGY PROFILE		SO	IL SA	MPLI	NG			FIELD	) TE	STING		TEST apour Rea		_				
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane  △ Intact  ▲ Remould  * Undrained S	PPT  * N  ◇  I ◆  Shear S	Testing  DCPT  illcon Vane* Intact Remould	△ COV (LE 2 1 100 2 100 2 100 2 100 2 100 2 100 2 100 2 100 2 100 100	EL)   4      6 000      300 W	TOV (LEL)  8  TOV (ppm) 400  W _L Liquid	INSTRUMENTATION INSTALLATION	GR		& N SIZE BUTION	<b>l</b>
 XXX	Geodetic Ground	Surface Elevation: 205.9 m bout 100 mm ASPHALT	205.8 0.1	Ø	S	ır.	o o	-		20 4	10 (	60 80	20	40 60	80	==				
		Sand and Gravel FILL moist  dark grey ty Clay / Clayey Silt FILL	205.3	SS	1	100	36	-	-	С			3 O 11							
	trace sa	nd, trace gravel, trace organics	s ·	SS	2	100	10	- 1 - - - -	205 -	0			23							
			-	SS	3	100	6	- <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>	Z = 204 -	0		2	ı o 28							
	SILTY	brown  ( CLAY / CLAYEY SILT TILL  to some sand, trace gravel	203.7 2.3					-  -  -  -	-											
		very stiff  END OF BOREHOLE	202.9	SS	4	100	20	- - - - 3	203 -				15							

 $\frac{\nabla}{z}$  Groundwater encountered on completion of drilling on <u>2/18/2020</u> at a depth of: <u>1.8 m</u>.

RI	RECORD OF BOREHOLE No. BH D8													wood
Pro	ject Number: TP1150	86						Drilling	Location:	Clarkway Dr.	, SBL, Sta.	0+450 E:605	935	Logged by: MS
Pro	ject Client: City of I	Brampton						Drilling	Method:	N:4850984 150 mm Sol	id Stem Au	ugers		Compiled by: SN
Pro	ject Name: Arterial	Road Network within F ary Plan Area (Area 47)	lighwa	y 427 I	ndustr	rial		Drilling	Machine:	Track Mount	ed Drill			Reviewed by: SM
Pro	ject Location: Clarkwa	ay Drive, Brampton, On	tario					Date S	started:	Feb 18, 2020	Date 0	Completed: Fel	b 18, 20	20 Revision No.: 0, 3/25/21
	LITHOLOGY	PROFILE	SC	IL SA	MPLI	NG			FIELD	TESTING		TESTING pour Reading	_	
Lithology Plot	DESCR	RIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □  MTO Vane* △ Intact ▲ Remould	<ul> <li>♦ Intact</li> <li>♦ Remould</li> </ul> ear Strength (kPa)	▲ COV (LEL	D. TOV (LEL) 6 8 1) □ TOV (ppm) 0 300 400  W WL Liquid	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)  GR SA SI CL
$\overset{**}{\bowtie}$	Sand and trace of	own Gravel FILL cobbles pist	SS	1	83	22	- - -	-	0		<b>3</b> · · · · · · · · · · · · · · · · · · ·			
$\overset{**}{\bowtie}$			SS	2	0	NA	= = = =	205 -						
<b>XXX</b>	END OF B	204.7 OREHOLE 0.9					-							Borehole was terminated due to the
	Borehole was terminate ca	d due to the exisitng Bell ble.												existing utility cables.

 $\frac{\nabla}{z}$  Groundwater encountered on completion of drilling on <u>2/18/2020</u> at a depth of: <u>0.6 m</u>.

RI	RECORD OF BOREHOLE No. BH D9													WO	od.
Pro	ject Number:	-							Drilling	Location:	Clarkway Dr., N:4851092	, NBL, Sta. 0+600 E:605	832		MS
	ject Client:	City of Brampton							_	Method:	150 mm Soli	id Stem Augers			SN
	ject Name:	Arterial Road Network ( Secondary Plan Area (A	(rea 47)		y 427 I	ndustr	ial		_	Machine:	Track Mounte		h 40, 2020	Reviewed by:	,
FIO.		Clarkway Drive, Brampt	ion, Oni						Date	Started:	Feb 19, 2020	Date Completed: Fe	D 19, 2020	Revision No	0, 3/23/21
	LITH	OLOGY PROFILE		SO	IL SA	MPLI	NG				TESTING	LAB TESTING Soil Vapour Reading	z	COMMENT	's
Lithology Plot	Geodetic Ground S	DESCRIPTION Surface Elevation: 207.0 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	PPT ● DCPT	▲ COV (LEL)	INSTRUMENTATION INSTALLATION O	& GRAIN SIZ DISTRIBUTI (%)	E ON
<b>**</b>	al	bout 100 mm ASPHALT brown	206.9 0.1					-	-						
	; 	Sand and Gravel FILL moist	-	SS	1	75	27	-	- - -	0					
	Silt trace	grey ty Clay / Clayey Silt FILL sand, trace gravel, cobbles	0.9	SS	2	83	12	- 1 - 1	206 -	0	49				
▩		END OF BOREHOLE	205.5 1.5												
		ion of Wood													

 $\frac{\textstyle \bigvee}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

		OF BOREHOL	BH_	<u>D11</u>	•								wood.		
	oject Number:									Location:	N:4851199		a. 0+750 E:60	5720	Logged by: MS
	oject Client: oject Name:	City of Brampton  Arterial Road Network v	within H	iahwa	v 427 l	Industr	rial			g Method: g Machine:	150 mm So		Augers		Compiled by: SN  Reviewed by: SM
	oject Name.	Secondary Plan Area (A	Area 47)		y 421	iiiuusti	iai		. `	Started:	Feb 19, 2020		Completed: F	eb 19. 2020	
						MDL	NO	1	_				· -	1 1	
	LITH	OLOGY PROFILE		SC		MPLI			(E)	Penetr	TESTING  ationTesting  PPT ● DCPT	Soil V COV (LE	TESTING  Tapour Reading EL) ■ TOV (LEL  4 6 8	ATION A	COMMENTS & GRAIN SIZE
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION	MTO Vane  △ Intact  ▲ Remould  * Undrained S	<ul> <li>♦ Intact</li> <li>♦ Remould</li> </ul> hear Strength (kPa)	100 2 W _P ■ Plastic	om)	NSTRUMENTATION INSTALLATION	DISTRIBUTION (%)  GR SA SI CL
<u> </u>	Geodetic Ground S	Surface Elevation: 207.9 m sbout 90 mm ASPHALT brown	207.9 207.6	O	S S	I II	o	-	. ш	20 4	0 60 80	20	40 60 80	==	<u> </u>
	Sil	Sand and Gravel FILL moist brown ty Clay / Clayey Silt FILL	0.3	SS	1	75	38		-	0		ao. 6			
	ľ	race sand, trace gravel		SS	2	100	14	- - 1 - -	207 -	0		a o 15			
	SILTY trace	brown  CCLAY / CLAYEY SILT TILL to some sand, trace gravel stiff to very stiff	206.4 1.5	SS	3	83	11		206 -	0		a o 20			
		,		SS		400	11	- 2 - - - - -	- - - -						
				55	4	100	11	- - - 3	205 -	0		15			
				SS	5	100	22	-		0		16			
		grey		SS	6	92	19	- 4 - 4 	204 -	0	ſ	a 0 14			
			202.9	SS	7	100	16	- - - - - - 5	203 -	0		0 15			
		END OF BOREHOLE	5.0									:			
												:			
												:			
												:			
												:			
												:			
												:			
												:			
												:			
	ad ESIS a Divia											:			

 $\frac{\textstyle \sum}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD OF BOREHOLE N									wood			
Pro	ject Number: TP115086						Drilling	Location:	Clarkway Dr	., NBL, Sta	a. 0+900 E:605	607	Logged by: MS
Pro	ject Client: City of Brampton						Drilling	Method:	N:4851318 150 mm So	lid Stem A	ugers		Compiled by: SN
Pro	ject Name: Arterial Road Network within H Secondary Plan Area (Area 47)	lighwa	y 427 I	ndusti	rial		Drilling	Machine:	Track Moun	ted Drill			Reviewed by: SM
Pro	ject Location: Clarkway Drive, Brampton, Ont	tario					Date 9	Started:	Feb 19, 2020	<b>)</b> Date	Completed: Fe	o 19, 2020	Revision No.: <u>0, 3/25/21</u>
	LITHOLOGY PROFILE	SC	IL SA	MPLI	NG			FIELD	TESTING		TESTING		
					(%		=		ionTesting	▲ COV (LE	apour Reading (L) ■ TOV (LEL) 4 6 8	INSTRUMENTATION INSTALLATION	COMMENTS &
Jot	DESCRIPTION	фе	Sample Number	(%)	SPT 'N' / RQD (%)	(c	E) NO	O SPT   MTO Vane*	PPT • DCPT Nilcon Vane*	△ COV (pp	m)	TION	GRAIN SIZE DISTRIBUTION
Lithology Plot		Sample Type	ple N	Recovery (%)	, N	DEРТН (m)	ELEVATION	△ Intact ▲ Remould	<ul><li>♦ Intact</li><li>♦ Remould</li></ul>	W _P	W W _L	raum Palla	(%)
Lith	Geodetic Ground Surface Elevation: 209.3 m	San	Sarr	Reg	SPT	DEP		* Undrained She 20 40	ear Strength (kPa) 60 80	Plastic 20 4	Liquid 0 60 80	INS.	GR SA SI CL
	about 100 mm ASPHALT 209.2 brown 0.1 Sand and Gravel FILL					-	209 -		<u>.</u>				
$\bowtie$	moist	SS	1	100	50 / 150mm	_	-	5	0 0 150 mm	80 ₄			
						_	-						
	trace sand, trace gravel, cobbles/boulders					1 							
$\frac{2}{2}$	207.9 brown / grey 1.4	SS	2	83	10	-	208 -	0		13			
	SILTY CLAY / CLAYEY SILT TILL trace to some sand, trace gravel,					-							
	cobbles/boulders stiff to very stiff	SS	3	54	18	- - - 2	-	0		14			
						-	207 -						
						_							
		SS	4	100	19	-	-	0		14			
<i>XX</i>	206.2 END OF BOREHOLE 3.0					<u> </u>	-		: :	:			
										:			
										:			
										:			
										:			
										:			

 $\frac{\textstyle \sum}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

RI	ECORD	OF BORE	HOLE N	<b>o.</b>	BH	<u>D15</u>								WOO	od.
Pro	ject Number:	TP115086							Drilling	g Location:	Clarkway Dr. N:4851403	, SBL, Sta. 1+050 E:605	513	Logged by: MS	
Pro	ject Client:	City of Brampton							Drilling	g Method:		id Stem Augers		Compiled by: SN	
	ject Name:	Arterial Road Net Secondary Plan A	work within H Area (Area 47)	lighwa	y 427 I	ndustr	ial		Drilling	g Machine:	Track Mounte			Reviewed by: SM	
Pro _.	ject Location:	Clarkway Drive, E	Brampton, Ont	tario					Date 9	Started:	Feb 19, 2020	Date Completed: Fe	b 19, 2020	Revision No.: 0,3	3/25/21
	LITH	OLOGY PROFIL	E	SC	IL SA	MPLII	NG			FIELD	TESTING	LAB TESTING Soil Vapour Reading	_		
					_		(%)		Œ	1	ationTesting PPT • DCPT	▲ COV (LEL) ■ TOV (LEL) 2 4 6 8	INSTRUMENTATION INSTALLATION  0	COMMENTS &	
Blot		DESCRIPTION		ype	Sample Number	(%)	'N' / RQD (%)	Ê		MTO Vane*	Nilcon Vane*	△ COV (ppm) □ TOV (ppm) 100 200 300 400	ATION	GRAIN SIZE DISTRIBUTION	ı
ology				Sample Type	N eldu	Recovery (%)	,'N'	DEPTH (m)	ELEVATION	△ Intact ▲ Remould	<ul><li>♦ Intact</li><li>♦ Remould</li></ul>	W _P W W _L	TALL	(%)	
ا <del>ن</del>	Geodetic Ground S	urface Elevation: 209.5 m		San	San	Rec	SPT	DEF	E	* Undrained Sh 20 40	ear Strength (kPa) 60 80	Plastic Liquid 20 40 60 80	S S G	R SA SI	CL
$\bowtie$		brown Sand and Gravel FILL	0.1					-	-						
▓	`	moist		SS	1	100	44	-	209 -		)·····	, i i i i i i			
▓			208.6	33	'	100	44		- 7						
	Silt	dark grey y Clay / Clayey Silt FI	0.9 <b>LL</b>					1 =							
$\bowtie$	tr	ace sand, trace grave	1	SS	2	67	15		•		<b>4</b>	•			
***		END OF BOREHOLE	208.0 1.5						208 -						
Noo Can	d E&IS, a Divisi	on of Wood		ater en	counter	ed on co	mpletio	n of drill	ling on 2	<u>2/19/2020</u> at a	depth of: <u>0.9 m</u> .	■ Cave in depth after re	noval of augers	:: <u>1.4 m</u> .	

R	ECORD OF BOREHOLE N	lo.	BH	D17								wood
Pro	ject Number: TP115086						Drilling	g Location:	Clarkway Dr. N:4851532	., NBL, Sta. 1+200 E:605	385	Logged by: MS
Pro	ject Client: City of Brampton						Drilling	g Method:	150 mm So	lid Stem Augers		Compiled by: SN
	ject Name: Arterial Road Network within Secondary Plan Area (Area 47	Highwa ')	ay 427 I	Industr	rial			g Machine:	Track Mount			Reviewed by: SM
Pro	ject Location: Clarkway Drive, Brampton, O	ntario					Date S	Started:	Apr 1, 2020	Date Completed: Ap	r 1, 2020	Revision No.: <u>0, 3/25/21</u>
	LITHOLOGY PROFILE	SC	DIL SA	MPLI	NG			FIELD :	TESTING	LAB TESTING Soil Vapour Reading	7	COMMENTS
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	<b>DEPTH</b> (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact ▲ Remould	tionTesting  PPT	▲ COV (LEL) ■ TOV (LEL)  2 4 6 8  △ COV (ppm) □ TOV (ppm) 100 200 300 400  W ₂ W W ₄ ■ □ Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	GRAIN SIZE DISTRIBUTION (%)  GR SA SI CL
_ >>>>	Geodetic Ground Surface Elevation: 210.5 m   about 100 mm ASPHALT   210.4		0)		0)	-		20 40	00 00	20 40 00 00		
	Sand and Gravel FILL moist	SS	1	83	37		210 -	0		<b>1</b>		
	brown / dark grey 1.2 Silty Clay / Clayey Silt FILL trace sand, trace gravel, trace organics	- ss	2	92	9	- 1 - - - - -	209 -	0		<b>3</b>		
		ss	3	88	10	- - - 2 -	-	0	6			
		SS	4	100	11	- 3	208 -	0	E	<b>3</b>		
	206.7	SS	5	100	10		207 —	0				
	grey SILTY CLAY / CLAYEY SILT TILL trace to some sand, trace gravel stiff	SS	6	100	10	- 4 - 4 -		0	Ē	3		
	205.3	SS	7	83	11	- 5	206 - = .	0		1		
<i>AZX</i> 2	END OF BOREHOLE 5.2											
Woo	od E&IS, a Division of Wood	untor on				n of dri	illing on	1/1/2020 at a d	epth of: 4.6 m.		<u> </u>	

Canada Limited

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD	OF BOREHOLE N	lo.	<u>BH</u>	<u>D18</u>							wood.
	ject Number:	-							g Location:	N:4851534	, NBL, Sta. 1+200 E:60538	
	ject Client:	City of Brampton	Hadam	407	la di cata				g Method:		id Stem Augers	Compiled by: SN
	ject Name:	Arterial Road Network within Secondary Plan Area (Area 4 Clarkway Drive, Brampton, O	7)	ay 427	inaustr	ıaı			g Machine: Started:	Track Mounte Apr 1, 2020	Date Completed: Apr 1	Reviewed by: <u>SM</u> , 2020 Revision No.: 0, 3/25/21
	-			NI 04	NADI I	NO.	1	1				
	LIIH	OLOGY PROFILE	50	JIL SA	MPLI					TESTING ationTesting	LAB TESTING  Soil Vapour Reading  A COV (LEL) ■ TOV (LEL)	S COMMENTS
Lithology Plot		DESCRIPTION	Sample Type	Sample Number	Recovery (%)	T 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact ▲ Remould	PPT ● DCPT  Nilcon Vane*  ◇ Intact ◆ Remould	2 4 6 8  △ COV (ppm) □ TOV (ppm) 100 200 300 400  W _P W W _L Plastic Liquid	COMMENTS & GRAIN SIZE DISTRIBUTION (%)  GR SA SI CL
<u>∃</u> ₩		surface Elevation: 210.1 m brown	Sa	Sa	Re	SPT		<u> </u>	20 40	ear Strength (kPa) 60 80	20 40 60 80	ZZ GR SA SI CL
×		Sand and Gravel FILL moist	ss	1	83	12	-  -  -  -	- - -	0		1	
	e:ii	dark grey 1.		2	75	13	- 1 - 1 - \frac{\frac{1}{2}}{2}	209 <del>-</del>	0		1	
***	trace sai	ty Clay / Clayeý Silt FILL  nd, trace gravel, trace organics  208.	ss	3	63	8	-		0		3	
XXX		END OF BOREHOLE 1.8										
	d ERIS a Divia			1	1							

 $\frac{\nabla}{\pi}$  Groundwater encountered on completion of drilling on 4/1/2020 at a depth of: 1.2 m.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RI	ECORD	OF BOREHOL	E No	<b>o.</b> _	ВН	D19									W	ood.
Proj	ject Number:	TP115086							Drilling	Location:	Clarkway Dr.	SBL, S	ta. 1+350 E:605	5297	_ Logged by:	MS
Proj	ect Client:	City of Brampton							Drilling	Method:	N:4851614 150 mm Sol	id Stem	Augers		_ Compiled by:	SN
Proj	ect Name:	Arterial Road Network	within H	ighwa	y 427 l	Industr	ial		Drilling	Machine:	Track Mount	ed Drill			_ Reviewed by:	SM
Proj	ject Location:	Clarkway Drive, Bramp	ton, Ont	ario					Date S	started:	Feb 19, 2020	Date	Completed: Fe	eb 19, 2020	_ Revision No.:	0, 3/25/21
	LITH	OLOGY PROFILE		SO	IL SA	MPLI	NG			FIELD	TESTING		3 TESTING			
Lithology Plot	Geodetic Ground S	DESCRIPTION urface Elevation: 210.6 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	ear Strength (kPa)	△ COV (L 2 △ COV (F 100 W _P Plastic	Vapour Reading .EL) ■ TOV (LEL) 4 6 8 ypm) □ TOV (ppm) 200 300 400  W WL Liquid 40 60 80	STRUMENTAT	COMMEN & GRAIN SI DISTRIBUT (%)	ZE
<b>XX</b>		brown	210.5 8.1					-	=							
	Silt	brown / dark grey y Clay / Clayey Silt FILL ace sand, trace gravel	210.0 0.6 209.7	SS	1	100	47		210 -		O	°5				
	trace	grey SILTY CLAY TILL to some sand, trace gravel stiff to very stiff	0.5	SS	2	58	13	- 1 - 5 - 5 - 5	Z - = - - 209 -	0		019				
				SS	3	79	23	2	- - - -	0		16			2 22	49 27
			207.6	SS	4	83	29	3	208 -	0		°16				
		END OF BOREHOLE	3.0													

 $\frac{\nabla}{2}$  Groundwater encountered on completion of drilling on <u>2/19/2020</u> at a depth of: <u>1.2 m</u>.

RE	CORD	OF BOREHO	DLE No	<b>o.</b> !	BH	<u>D21</u>										W	00	d.
Proj	ect Number:	TP115086							Drilling	g Location:	Clarkway N:485171	/ Dr.,	NBL, Sta. 1+	-500 E:605	194	Logged by:	MS	_
Proj	ect Client:	City of Brampton							Drilling	g Method:	150 mm	Soli	d Stem Auge	ers		Compiled by:	SN	
Proj	ect Name:	Arterial Road Networ Secondary Plan Area	rk within H	ighwa	y 427 I	ndustr	ial		Drilling	g Machine:	Track Mo	ounte	d Drill			Reviewed by:	SM	
Proj	ect Location:	Clarkway Drive, Bran	npton, Ont	ario					Date S	Started:	Feb 19, 2	2020	Date Con	npleted: Fe	b 19, 2020	Revision No.:	0, 3/2	5/21_
	LITH	OLOGY PROFILE		SC	IL SA	MPLI	NG			FIELD	TESTING	i	LAB TES					
					L		(%		(E)		tionTesting		Soil Vapour COV (LEL)  2 4	TOV (LEL)	INSTRUMENTATION INSTALLATION	COMMEN &	ITS	
<u>Bot</u>		DESCRIPTION		уре	Sample Number	(%)	'N' / RQD (%)	Ê		MTO Vane*	Nilcon Va		COV (ppm) [		ENTA ATION	GRAIN S DISTRIBU	IZE ΓΙΟΝ	
lology				Sample Type	n əldı	Recovery (%)	ž	DEPTH (m)	ELEVATION	△ Intact ▲ Remould	<ul><li>♦ Intact</li><li>♦ Remou</li></ul>		W _P W	W _L	TRUM TALL/	(%)		
⇒ I	Geodetic Ground S	Surface Elevation: 209.0 m	200.0	San	San	Reo	SPT	DEF		* Undrained Sh 20 40	ear Strength (k	Pa)	Plastic 20 40	Liquid 60 80	SNS	GR SA	SI	CL
$\otimes$		brown Sand and Gravel FILL	209.0 8.1					-										
$\otimes$	•	cobbles/boulders moist		SS	1	79	48	_			0							
▓				33	į	15	40	-				Ī						
▓			İ					- - - -	208 -									
▩				SS	2	42	29	- =	<u> </u>			····as						
***		END OF BOREHOLE	207.5 1.5					_				$\dashv$						
		ion of Wood 7	7 0 1							: :								

 $\frac{\nabla}{2}$  Groundwater encountered on completion of drilling on <u>2/19/2020</u> at a depth of: <u>1.2 m</u>.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD	OF BOREHOL	E No	). <u>I</u>	<u> </u>	<u>D23</u>							wood.
Pro	ject Number:	TP115086							_ Drilling	Location:	Clarkway Dr.	, SBL, Sta. 1+650 E:605071	Logged by: MS
Pro	ject Client:	City of Brampton							Drilling	Method:	N:4851839 150 mm Sol	id Stem Augers	Compiled by: SN
Pro	ject Name:	Arterial Road Network v Secondary Plan Area (A	vithin H	ighwa	y 427 I	ndustr	ial		Drilling	Machine:	Track Mounte	ed Drill	Reviewed by: SM
Pro	ject Location:	Clarkway Drive, Brampt	on, Ont	ario					_ Date S	Started:	Feb 19, 2020	Date Completed: Feb 19	, 2020 Revision No.: 0, 3/25/21
	LITH	OLOGY PROFILE	I	SO	IL SA	MPLII	NG	1		FIELD	TESTING	LAB TESTING	
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	Penetra ○ SPT □  MTO Vane* △ Intact ▲ Remould	tionTesting  PPT	Soil Vapour Reading  A COV (LEL) TOV (LEL)  2 4 6 8  COV (ppm) TOV (ppm) 100 200 300 400  W _P W W _L Plastic Liquid 20 40 60 80 80	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
± ~~	Geodetic Ground S	bout 90 mm ASPHALT	209.1	S	Sa	Re	S	<u> </u>	<u> </u>	20 40	60 80	20 40 60 80 💆	Z GR SA SI CL
		brown Sand and Gravel FILL moist	208.3	SS	1	58	35	- - - - -	209 —	0		04	
<b>**</b>	Sil t	grey ty Clay / Clayey Silt FILL race sand, trace gravel	207.7	SS	2	75	11	- 1 - ; - ; -	208	0	6	°16	
		brown CLAY / CLAYEY SILT TILL to some sand, trace gravel hard to very stiff	1.5	SS	3	100	30	- - - - - 2	207 —	0		019	
		grey	-	SS	4	100	36	- - - - -	201	0	GS	° ₂₀	
			-	SS	5	100	22	- 3 - - - - - -	206 —	0	6	020	
			- -	SS	6	0	18	- - 4 - -	205 —	O	68	⁰ 19	
		END OF BOREHOLE	204.2	SS	7	22	19	- - - - - 5	-	0	, c	021	

 $\frac{\nabla}{z}$  Groundwater encountered on completion of drilling on  $\underline{2/19/2020}$  at a depth of:  $\underline{1.2 \text{ m}}$ .

R	ECORD	DRD OF BOREHOLE No. BH D25 umber: TP115086															wood.
Pro	ject Number:	TP115086							Drilling	Location:	: <u>C</u>	larkway Dr. I:4851935	, NBL, St	a. 1+800	E:604	975	Logged by: MS
Pro	ject Client:	City of Brampton							Drilling	Method:	1	150 mm Sol	lid Stem A	ugers			Compiled by: SN
Pro	ject Name:	Arterial Road Netw Secondary Plan Arc	ork within H	lighwa	ay 427	Industr	ial		Drilling	Machine:	<u> T</u>	rack Mount	ed Drill				Reviewed by: SM
Pro	ject Location:	Clarkway Drive, Bra	ampton, Ont	tario					Date S	Started:	<u>F</u>	eb 24, 2020	Date	Comple	ted: Fel	b 24, 20	20 Revision No.: 0, 3/25/21
	LITH	OLOGY PROFILE		SC	DIL SA	MPLI	NG			FIELI	D TE	STING		TESTI apour Read		_	
							(%		(E)			nTesting	▲ COV (LE	apourRead EL) ■ T 4 6	OV (LEL)	INSTRUMENTATION INSTALLATION	COMMENTS &
Jot		DESCRIPTION		эd	Sample Number	(%)	SPT 'N' / RQD (%)	<u> </u>		MTO Van	e* N	Nilcon Vane*	△ COV (pp		OV (ppm) 400	ENT/	GRAIN SIZE DISTRIBUTION
Lithology Plot				Sample Type	ple N	Recovery (%)	ž	DEРТН (m)	ELEVATION	△ Intact ▲ Remoul	ld ♦	Intact Remould	W _P	W	W _L	RUM ALL	(%)
Litho	Geodetic Ground S	Surface Elevation: 209.1 m		Sam	Sam	Rec	SPT	DEP	ELE			Strength (kPa) 60 80	Plastic 20	10 60	Liquid 80	LSNI	GR SA SI CL
<b>***</b>		brown	209.0- 8:1					-	-						:		
$\bowtie$		Sand and Gravel FILL moist						Ē	-								
$\bowtie$			200.4	SS	1	100	28	-	-				so 5				
	Sile	grey ty Clay / Clayey Silt FILL	208.1 0.9					<u> </u>	208 —				· · · · · · · · · · · · · · · · · · ·				
$\bowtie$	t	race sand, trace gravel		SS	2	100	12	- <u>-</u>	Z :	0			14				
***		grey ' CLAY / CLAYEY SILT 1	207.5 1.5					Ē	-								
	SILTY trace	to some sand, trace gra stiff to firm	riLL vel	SS	3	83	10	- - -	-	0 - 2			13				
		Still to IIIII						<u> </u>	207 —								
								-									
				SS	4	83	7	-	-	0							
			206.0		·			- - - 3	-				18				
		END OF BOREHOLE	3.0														
										:			:				
													:				
										-			:				
															į		
													:				
													:				
													:				
													:				
										:			:				
										:			:				
															-		
Woo	d E&IS, a Divis	ion of Wood	∑ Groundw	ater en	ıcounter	ed on co	mnletio	n of dri	illing on 3	//24/2020 a	t a de	nth of 12 m	. Cav	e in denth	after ren	noval of a	augers: 2.4 m.

Canada Limited

R	ECORD	OF BOREHOLE N	Ο.	<u>BH</u>	<u>D27</u>								WO	od.
Pro	ject Number:	TP115086						_	Location:	N:4852040	SBL, Sta. 1+950 E:6048	867		WS
	ject Client:	City of Brampton						_	g Method:	•	d Stem Augers		•	SN
	ject Name:	Arterial Road Network within F Secondary Plan Area (Area 47)	)	ay 427 I	Industr	ial		_	Machine:	Track Mounte			Reviewed by:	
Pro	ject Location:	Clarkway Drive, Brampton, On	tario					Date S	Started:	Feb 24, 2020	Date Completed: Fel	24, 2020	Revision No.: (	), 3/25/21
	LITH	IOLOGY PROFILE	SC	DIL SA	MPLII	NG			FIELD	TESTING	LAB TESTING Soil Vapour Reading	7	COMMENT	•
Lithology Plot	Coordatio Convent to	DESCRIPTION Surface Elevation: 208.6 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact ▲ Remould	PPT ● DCPT	\[ \begin{array}{c c c c c c c c c c c c c c c c c c c	INSTRUMENTATION INSTALLATION	COMMENT: & GRAIN SIZ DISTRIBUTIO (%)	E ON
_ ‱	a a	about 90 mm ASPHALT 208.5- brown	0)	0,	-	0)	Ē		20 40		20 40 00 00			
		Sand and Gravel FILL moist 207.7	SS	1	100	26		208 -	0	20				
***	Sil trace sa	dark grey 0.9 ty Clay / Clayey Silt FILL nd, trace gravel, trace organics	SS	2	100	7	1 - - - -	- - -	0	69				
-		END OF BOREHOLE 1.5												
	ad ESIS a Divis													

 $\frac{\textstyle \bigvee}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RECORD OF BOREHOLE No. BH D29														WC	ood.
Proj	ect Number:	TP115086							Drilling	Location:	Clarkway Dr. N:4852155	., NBL, Sta. 2+100 E:604	765	Logged by:	MM
Proj	ect Client:	City of Brampton							Drilling	g Method:	150 mm So	lid Stem Augers		Compiled by:	<u>SN</u>
Proj	ect Name:	Arterial Road Network w Secondary Plan Area (A	vithin Hi	ighwa	y 427 l	ndustr	ial		Drilling	g Machine:	Track Mount	ted Drill		Reviewed by:	SM
Proj	ect Location:	Clarkway Drive, Brampto	on, Ont	ario					Date S	Started:	Feb 25, 2020	Date Completed: Fe	b 25, 2020	Revision No.:	0, 3/25/21
	LITH	OLOGY PROFILE		SC	IL SA	MPLI	NG			FIELD	TESTING	LAB TESTING Soil Vapour Reading			
					L		(%)		Œ	1	ationTesting PPT • DCPT	COV (LEL) ■ TOV (LEL)     2 4 6 8	INSTRUMENTATION INSTALLATION	COMMEN &	
Plot		DESCRIPTION		ype	Sample Number	(%)	SPT 'N' / RQD (%)	Ê		MTO Vane*	Nilcon Vane*	△ COV (ppm) □ TOV (ppm) 100 200 300 400	ATION	GRAIN SIZ DISTRIBUT	ZE ION
ology				Sample Type	n əldı	Recovery (%)	ż	DЕРТН (m)	ELEVATION	△ Intact ▲ Remould	<ul><li>♦ Intact</li><li>♦ Remould</li></ul>	W _P W W _L	TALL	(%)	
⇒ I	Geodetic Ground S	surface Elevation: 211.7 m		San	San	Rec	SPT	DEF		* Undrained Sh 20 40	ear Strength (kPa) 60 80	Plastic Liquid 20 40 60 80	S S G	R SA S	SI CL
$\bowtie$		brown	211.6 0.2	SS	1	83	7	-							
燚	t t	ty Clay / Clayey Silt FILL race sand, trace gravel			•		•	-							
▓								Ē	211 -						
▩				SS	2	100	17	_ _ 1							
▩			ŀ					Ė							
▓				SS	3	92	20	-		0	E	<b>s</b>			
₩		END OF BOREHOLE	209.9 1.8					<u> </u>	210 -						
								L			<u></u> _				
Maa	d E&IS. a Divis	ion of Wood $ abla$													

 $\frac{\sqrt{2}}{2}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD OF BOREHOLE No. BH D31  ect Number: TP115086															wood.
Pro	ject Number:	TP115086							Drilling	Location:	Clarkway Di N:4852236	., SBL, S	ita. 2+25	0 E:604	668	Logged by: MD
Pro	ject Client:	City of Brampton							Drilling	g Method:	150 mm Sc	lid Stem	Augers			Compiled by: SN
	ject Name:	Arterial Road Network ( Secondary Plan Area (A	Area 47)		y 427	Industi	rial		Drilling	g Machine:	Track Moun					Reviewed by: SM
Pro	ject Location:	Clarkway Drive, Bramp	ton, Ont	ario					Date S	Started:	Feb 12, 2020	)Dat	e Compl	leted: Fe	b 12, 20	20 Revision No.: 0, 3/25/21
	LITH	OLOGY PROFILE		SC	DIL SA	MPLI	NG			FIELD	TESTING		B TEST Vapour Re		_	
					_		(%		Œ	1	ationTesting PPT • DCPT	▲ COV (	LEL)   4 6	TOV (LEL)	INSTRUMENTATION INSTALLATION	COMMENTS &
Jot		DESCRIPTION		/be	Sample Number	(%)	SPT 'N' / RQD (%)	Ê		MTO Vane*	Nilcon Vane*	△ COV (		TOV (ppm)	ENT/	GRAIN SIZE DISTRIBUTION
Lithology Plot				Sample Type	ple N	Recovery (%)	Ž	DEРТН (m)	ELEVATION	△ Intact ▲ Remould	<ul><li>♦ Intact</li><li>♦ Remould</li></ul>	W _P	W	W _L	IRUM FALL	(%)
Lith	Geodetic Ground	Surface Elevation: 210.0 m		Sam	Sam	Reg	SPT	DEP	E	* Undrained Sh 20 40	near Strength (kPa) 60 80	Plastic 20	40 60	Liquid 80	-SN-	GR SA SI CL
<b>***</b>		brown Sand and Gravel FILL	209.9 0.1					Ė								
$\bowtie$		moist	200.2	SS	1	94	68	_			0	⁸⁰ 4				
		dark brown Sandy Silt FILL	_ <u>209.3</u> 0.7					-								
₩	trac	e to some clay, trace gravel		SS	2	100	9	- - 1	209 -	0		14				
$\bowtie$								Ė								
$\bowtie$								Ė								
$\bowtie$				SS	3	100	9	-		0		23	3			
***			207.9 2.1					_ 2 - -	208 -							
		Y CLAY / ČLÁYEY SILT TILL e to some sand, trace gravel		SS	4	100	8	-		0		<b>1</b>				
		firm to stiff				100		Ė				°15				
								- 3	207 -							
				SS	5	100	9	-		0		13				
<i>XX</i>		END OF BOREHOLE	206.5 3.5					-					: :			
												:				
												:		-		
												:				
												:		:		
														-		
													. :	-		

 $\frac{\textstyle \sum}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RI	ECORD OF BOREHOLE N	Ο.	BH	D32									WC	od.
Pro	ject Number: TP115086						Drilling	Location:	Clarkway Dr. N:4852234	, SBL, Sta	a. 2+250 E:604	666	_ Logged by:	MD
Pro	ject Client: City of Brampton						Drilling	Method:	150 mm Sol	id Stem A	ugers		Compiled by:	SN
	ject Name: Arterial Road Network within F Secondary Plan Area (Area 47)	)	ay 427 l	Industr	ial		-	Machine:	Track Mount				_ Reviewed by:	
Pro	ject Location: Clarkway Drive, Brampton, On	itario					Date S	Started:	Feb 12, 2020	Date	Completed: Fel	b 12, 2020	_ Revision No.:	0, 3/25/21
	LITHOLOGY PROFILE	SC	OIL SA	MPLI	NG				resting	Soil V	TESTING apour Reading	z	COMMENT	Te
Lithology Plot	DESCRIPTION  Geodetic Ground Surface Elevation: 208.3 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	ionTesting  PPT	△ COV (LE 2	Liquid 0 60 80	INSTRUMENTATION INSTALLATION	& GRAIN SIZ DISTRIBUTI (%)	ZE
<b>***</b>	about 110 mm ASPHALT 208.1 brown 0.1					-	208 —			:				
	Sand and Gravel FILL   moist   207.6	SS	1	100	41	-	-	0		3				
	Sandy Silt FILL trace tclay, trace gravel moist	SS	2	92	10	_ 1	-	0		1				
$\overset{\sim}{\bowtie}$	207.0 brown 1.2 Silty Clay / Clayey Silt FILL						207 -							
	some sand, trace gravel	ss	3	83	13	_	-	0						
****	206.4 END OF BOREHOLE 1.8													
										:				
										:				
										:				
										:				
										:				

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

RI	ECORD	OF BOREHO	LE No	<b>).</b>	BH	<u>D33</u>								WO	od.
Pro	ject Number:	TP115086							Drilling	g Location:	Clarkway Dr., N:4852361	, NBL, Sta. 2+400 E:604	548	Logged by:	MD
	ject Client:	City of Brampton								g Method:	150 mm Soli	id Stem Augers			SN
	ject Name:	Arterial Road Network Secondary Plan Area (	(Area 47)		y 427 l	Industr	ial			g Machine:	Track Mounte			Reviewed by:	
Pro	ject Location:	Clarkway Drive, Bram	pton, Ont	ario					Date	Started:	Feb 13, 2020	Date Completed: Fe	b 13, 2020	Revision No.: <u>(</u>	), 3/25/21
_	LITH	OLOGY PROFILE		SC	IL SA	MPLII	NG				TESTING	LAB TESTING Soil Vapour Reading	z	COMMENT	9
Lithology Plot	Geodetic Ground	DESCRIPTION  Surface Elevation: 214.0 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact ▲ Remould	PPT ● DCPT	▲ COV (LEL)	INSTRUMENTATION INSTALLATION  O	& GRAIN SIZ DISTRIBUTIO (%)	E ON
	a a	bout 110 mm ASPHALT brown	213.9 0.1	SS	1	89	41	-		- : 0	1 1				
$\overset{\otimes}{\otimes}$		Sand and Gravel FILL moist	-		'	09		-							
$\overset{\times}{\otimes}$		dark brown ty Clay / Clayey Silt FILL	<u>213.3</u> 0.7					-							
	1	race sand, trace gravel	-	SS	2	100	14	1 - - - -	213 -	0	23				
			212.0	SS	3	100	20	-  -  -  -		0	63				
		END OF BOREHOLE	2.0												
	d ERIC a Divis		-					•		•	· ·				

 $\frac{\textstyle \sum}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD OF BOREHOLE N	<b>o.</b>	BH I	D35									wood
Pro	ject Number: TP115086						Drilling	Location:	Clarkway Dr. N:4852462	., SBL, Sta.	2+550 E:6044	158	Logged by: MD
Pro	ject Client: City of Brampton						Drilling	Method:	150 mm Sol		igers		Compiled by: SN
	ject Name: Arterial Road Network within H Secondary Plan Area (Area 47)		ıy 427 I	ndustr	ial			Machine:	Track Mount				Reviewed by: SM
Pro	ject Location: Clarkway Drive, Brampton, Ont	ario					Date S	Started:	Feb 12, 2020	Date C	Completed: Fel	12, 2020	Revision No.: <u>0, 3/25/21</u>
	LITHOLOGY PROFILE	SC	IL SA	MPLI	NG			FIELD	TESTING		TESTING oour Reading	7	COMMENTO
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane*  Δ Intact  ▲ Remould  * Undrained She	tionTesting  PPT	△ COV (LEL 2 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	D) ■ TOV (LEL)	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
<u> </u>	Geodetic Ground Surface Elevation: 212.9 m 212.8	Ø	Ö	œ	S	_	— —	20 40	60 80	20 40	60 80	<u> </u>	GR SA SI CL
<b>**</b>	Sand and Gravel FILL   moist   about 130 mm ASPHALT   212.2   grey   0.7	SS	1	89	46	- - -	-		) [	⁸⁰ 4			
	Silty Clay / Clayey Silt FILL trace to some sand, trace gravel, trace wood fragments in SS2	SS	2	100	11	- 1  -	212 -	0		³ °15			
		SS	3	67	5		211 —	0		s o 16			
		SS	4	89	9	_ 2 _ _ _ _	-	0		s °20			
$\bowtie$	210.0					E	210 —			20			
	brown 2.9  SILTY CLAY / CLAYEY SILT TILL  trace to some sand, trace gravel  very stiff to stiff	SS	5	89	16	.— 3 - - - -	-	0	E	s o 18			
						- - - - 4	209 —						
	grey					-  -  -  -	-						
	207.9	SS	6	89	14		208 -	0		15			
	END OF BOREHOLE 5.0	55	6	89	14		208 -			0 15			
Was	od E&IS. a Division of Wood												

Canada Limited

 $\stackrel{\underline{\vee}}{\underline{=}}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RI	ECORD OF BOREHOLE N	Ο.	<u>BH</u>				WC	ood.					
Pro	ject Number: TP115086						Drilling	g Location:	Clarkway Dr.,	, SBL, Sta. 2+550 E:604	137	_ Logged by:	MD
Pro	ject Client: City of Brampton						Drilling	g Method:	N:4852462 150 mm Soli	id Stem Augers		_ Compiled by:	SN
Pro	ject Name: Arterial Road Network within F Secondary Plan Area (Area 47)	lighwa	ıy 427	Industr	ial		Drilling	g Machine:	Track Mounte	ed Drill		_ Reviewed by:	SM
Pro	ject Location: Clarkway Drive, Brampton, On	tario					Date	Started:	Feb 12, 2020	Date Completed: Fell	12, 2020	_ Revision No.:	0, 3/25/21
	LITHOLOGY PROFILE	sc	IL SA	MPLI	NG			FIELD	TESTING	LAB TESTING			
			١.		(%		Œ		tionTesting PPT ● DCPT	Soil Vapour Reading  ▲ COV (LEL) ■ TOV (LEL)  2 4 6 8	NOIL	COMMEN &	TS
<u>B</u> ot	DESCRIPTION	d/be	Sample Number	(%)	SPT 'N' / RQD (%)	Ê		MTO Vane*		△ COV (ppm) □ TOV (ppm) 100 200 300 400	INSTALLATION	GRAIN SIZ DISTRIBUT	
Lithology		Sample Type	N eld	Recovery (%)	ż	DEРТН (m)	ELEVATION	1	◆ Remould	W _P W W _L	TALL	(%)	
ž Ž	Geodetic Ground Surface Elevation: 211.9 m	Sam	Sam	Reg	SPT	DEP		* Undrained Sho 20 40	ear Strength (kPa) 60 80	Plastic Liquid 20 40 60 80	SNS	GR SA	SI CL
▓	brown  Sand and Gravel FILL  moist	SS	1	75	34	-				1			
畿	211.3					-							
▓	grey 0.6 Silty Clay / Clayey Silt FILL			00	40	-	211 -						
▓	trace to some sand, trace gravel	SS	2	83	13	— 1 -	211		ľ				
❈						Ē							
▓	040.4	SS	3	75	13	_			***************************************	1			
₩	210.1 END OF BOREHOLE 1.8					_							

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

Pro	oject Name: Oject Name: Arterial Road Network within Scoondary Plan Area (Area 17		E No	0.	<u>BH</u>	D37				g Location: g Method:	N:4852470	r., NBL, Sta. 2 olid Stem Aug		335	Logged by: MD Compiled by: SN	d.
	-	Secondary Plan Area (A	Area 47)		y 427	Industr	ial		. `	g Machine:	Track Moun				_ Reviewed by: SM	
Pro		Clarkway Drive, Bramp	ton, Ont	ario					Date	Started:	Feb 13, 2020	Date Co	mpleted: Fe	b 13, 2020	_ Revision No.: <b>0, 3/2</b>	25/21
Lithology Plot		DESCRIPTION Surface Elevation: 214.5 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	Penetra ○ SPT □  MTO Vane* △ Intact ▲ Remould	<ul> <li>♦ Intact</li> <li>♦ Remould</li> </ul> ear Strength (kPa)	Soil Vapou   COV (LEL)   2	r Reading  ■ TOV (LEL)  6 8  □ TOV (ppm)  300 400	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)	CL
<b>***</b>	a	bout 110 mm ASPHALT brown Sand and Gravel FILL	214.3 0.1					-								
		moist	213.8 0.7	SS	1		17	-  -  -  -	214 -	0		45				
	-	ty Clay / Clayey Silt FILL trace sand, trace gravel		SS	2	100	9	- 1 - - -	213 -	0						
				SS	3	0	0	- - - - - - 2	-	Φ		<b>6</b> 3				
				SS	4	100	16	-	212	0		25				
XX			<u>211.6</u> 2.9					- - - - 3	-							
	SILTY trace	CLAY / CLAYEY SILT TILL to some sand, trace gravel very stiff	210.9	SS	5	22	27		211 —	0		<b>B</b>				
	od E&IS, a Divis	ion of Wood $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	No freesta	anding (	groundv	vater me	asured	in oper	n boreho	le on complet	ion of drilling.	Cave in	depth after ren	noval of auger	rs: <u>2.1 m</u> .	

RECORD OF BOREHOLE No. BH D38  Project Number: TP115086													wood.
	ject Number: TP115086							g Location:	N:4852567		2+700 E:604	336	Logged by: MD
	ject Client: City of Brampton							g Method:	150 mm Sol		igers		Compiled by: SN
	ject Name: Arterial Road Network within Secondary Plan Area (Area 47	7)	ay 427	Industr	rial			g Machine:	Track Mounte		Name al	- 40 000	Reviewed by: SM
Pro	ject Location: Clarkway Drive, Brampton, O					ı	Date	Started:	Feb 13, 2020		Completed: Fel	0 13, 202	20 Revision No.: 0, 3/25/21
	LITHOLOGY PROFILE	SC	DIL SA	MPLI	NG				resting ionTesting	Soil Va	DOUR Reading	Z	COMMENTS
Lithology Plot	DESCRIPTION  Geodetic Ground Surface Elevation: 215.3 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact ▲ Remould	PPT ● DCPT  Nilcon Vane*  ◇ Intact ◆ Remould  ear Strength (kPa)	2 4	n) □ TOV (ppm) 0 300 400  W W _L Liquid	INSTRUMENTATION INSTALLATION	& GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	brown <b>Sand and Gravel FILL</b> moist	SS		75	10	-	215 -	0					
$\bowtie$	moist 214.7		1	75	18	-	210						
	grey / brown 0.6  Silty Clay / Clayey Silt FILL  trace to some sand, trace gravel		2	83	12	- - - - - 1		0		ı			
$\bowtie$						F	214 -						
$\bowtie$		SS	3	75	9	-		0					
***	213.4 END OF BOREHOLE 1.8						-						
		1								: :			

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD	OF BOREHOL	E No	<b>).</b>	BH	D39								wood.
Pro	ject Number:								Drilling	Location:	Clarkway Dr. N:4852659	, SBL, Sta. 2+850 E:604	234	Logged by: MD
	ject Client:	City of Brampton							_	g Method:	150 mm Sol	lid Stem Augers		Compiled by: SN
	ject Name:	Arterial Road Network Secondary Plan Area (A	Area 47)		y 427 I	ndustr	ial			Machine:	Track Mount			Reviewed by: SM
Pro	ject Location:	Clarkway Drive, Bramp	ton, Ont	arıo					Date 8	Started:	Feb 12, 2020	Date Completed: Fe	b 12, 2020	Revision No.: <u>0, 3/25/21</u>
	LITH	OLOGY PROFILE		SC	IL SA	MPLI	NG				TESTING	LAB TESTING Soil Vapour Reading	z	COMMENTS
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact ▲ Remould	tionTesting  PPT	▲ COV (LEL) ■ TOV (LEL)  2 4 6 8  △ COV (ppm) □ TOV (ppm) 100 200 300 400  W _P W W _L ■ O Uquid	INSTRUMENTATION INSTALLATION	& GRAIN SIZE DISTRIBUTION (%)
Ë	Geodetic Ground S ab	urface Elevation: 213.0 m out 150 mm ASPHALT	212.9	Š	Se	Re	SF		<u> </u>	20 40	60 80	20 40 60 80	ZZ G	GR SA SI CL
$\overset{\otimes}{\otimes}$		brown Sand and Gravel FILL moist	0.1 212.3	SS	1	89	34		- - -	0	R	<b>3</b>		
	trace	dark brown / grey Sandy Silt FILL to some clay, trace gravel	0.7	SS	2	100	9	- - 1	212 -	0		<b>y</b>		
***								-	-					
፠		END OF BOREHOLE	211.0	SS	3	72	9	-	-	0		9		
Voc	d E&IS, a Divisi	on of Wood □ ▽ .								le en completi				

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com  $\frac{V}{2}$  No freestanding groundwater measured in open borehole on completion of drilling

R	ECORD OF BOREHOLE N	o.   !	BH	D40								wood
Pro	oject Number: TP115086						Drilling	Location:	N:4852764	, SBL, Sta. 2+850 E:604	138	Logged by: MD
Pro	eject Client: City of Brampton						Drilling	g Method:	150 mm Soli	id Stem Augers		Compiled by: SN
	oject Name: Arterial Road Network within F Secondary Plan Area (Area 47)	)	y 427 I	ndustr	ial		_	g Machine:	Track Mounte	ed Drill		Reviewed by: SM
Pro	oject Location: Clarkway Drive, Brampton, On	tario					Date 9	Started:	Feb 13, 2020	Date Completed: Fe	13, 2020	Revision No.: <u>0, 3/25/21</u>
	LITHOLOGY PROFILE	so	IL SA	MPLII	NG			FIELD	TESTING	LAB TESTING Soil Vapour Reading	7	COMMENTS
			<u></u>		(%)		<u>E</u>		PPT ● DCPT	▲ COV (LEL) ■ TOV (LEL) 2 4 6 8	N N	&
Bot	DESCRIPTION	lype	qunn	(%)/	RQD	Œ		MTO Vane*	Nilcon Vane*	△ COV (ppm) □ TOV (ppm) 100 200 300 400	MENT ATIO	GRAIN SIZE DISTRIBUTION
Lithology Plot		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEРТН (m)	ELEVATION		◆ Remould	W _P W W _L Plastic Liquid	NSTRUMENTATION NSTALLATION	(%)
ij	Geodetic Ground Surface Elevation: 212.9 m about 150 mm ASPHALT 212.8	Sa	Sa	8		<u> </u>	<u> </u>	20 40	60 80	20 40 60 80		R SA SI CL soil in the ditch ~ 216 mm thick.
$\bowtie$	brown 0.1 <b>Sand and Gravel FILL</b>	SS	1	100	<del>50 /</del> 150mm	-			0 150 mm			
$\overset{ imes}{ imes}$	moist					-						
$\overset{ imes}{ imes}$		SS	2	89	20	- - - 1	212 -					
$\overset{\sim}{\sim}$	211.5				20	- '						
$\overset{\sim}{\otimes}$	grey 211.5  grey 1.4  Silty Clay / Clayey Silt FILL  trace to some sand, trace gravel					-	-					
$\overset{ imes}{ imes}$	trace to some sand, trace gravel	SS	3	83	10			0	as as			
$\overset{ imes}{ imes}$						- 2 -	211 -					
$\overset{\otimes}{\otimes}$						-	-					
$\bowtie$		SS	4	56	7	- <u>z</u>	- 7 -	0	1			
$\overset{ imes}{ imes}$						- ⁻ - 3	210 -					
$\overset{x}{\otimes}$		SS	5	50	16	- 1	-		49			
$\bowtie$						Ė	-	-				
$\overset{\infty}{\otimes}$						-	-					
	grey					<u> </u>	209 -					
	SILTY CLAY / CLAYEY SILT TILL trace to some sand, trace gravel firm to stiff					-	-					
						-	-					
	207.9	SS	6	94	8	- - 5	208 -	0	8			
	END OF BOREHOLE 5.0											
	od E&IS, a Division of Wood ada Limited  Groundw	vater en	counter	ed on co	mpletio	n of dri	lling on 2	2/13/2020 at a	depth of: <u>2.7 m</u> .			

RECORD OF BOREHOLE No. BH D41													od.		
Proj	ject Number:	TP115086							Drilling	Location:	Clarkway Dr. N:4852766	., NBL, Sta. 3+000 E:6041	41	Logged by:	MD
Proj	ject Client:	City of Brampton							Drilling	Method:		lid Stem Augers		_ Compiled by:	SN
Proj	ject Name:	Arterial Road Network with Secondary Plan Area (Area	hin Hi	ighwa	y 427 l	ndustr	ial		Drilling	Machine:	Track Mount	ed Drill		_ Reviewed by:	SM
Proj	ject Location:	Clarkway Drive, Brampton		ario					Date S	Started:	Feb 13, 2020	Date Completed: Fet	13, 2020	Revision No.:	0, 3/25/21
	LITH	OLOGY PROFILE		so	IL SA	MPLII	NG			FIELD	TESTING	LAB TESTING Soil Vapour Reading	_	2014151	
Lithology Plot	Geodetic Ground S	DESCRIPTION urface Elevation: 213.9 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □  MTO Vane* △ Intact ▲ Remould	ear Strength (kPa)	Solv Vajavo reasing y  A COV (LEL) ■ TOV (LEL)  2 4 6 8  △ COV (ppm) □ TOV (ppm)  100 200 300 400  W _F W W _L ■ Plastic Liquid  20 40 60 80	INSTRUMENTATION INSTALLATION	COMMEN' & GRAIN SI: DISTRIBUT (%) GR SA	ZE
<b>XX</b>	ak	brown 2	13.8 0.1	SS	1	100	50/	-	-	5	0 150 mm	3D		35 50	13 2
▓	;	Sand and Gravel FILL moist	Ī				150mm	-	-		150 mm	4			
				SS	2	89	45	- - - - - 1	213 —	(	) [	30 7			
₩		<u> 2</u>	12.6 1.3						-						
▓	Silt trace	y Clay / Clayey Silt FILL to some sand, trace gravel	-					_	-						
▓				ss	3	100	12		212 —	0		16			
₩		END OF BOREHOLE	11.7 2.1					— 2 -	-						

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

Project Number: TP115086													wood.
									_	Location:	N:4852887	., SBL, Sta. 3+150 E:6040	
	oject Client: oject Name:	City of Brampton  Arterial Road Network	within U	iabwa	v 427 l	Inducti	ial		_	Method: Machine:	Track Mount	lid Stem Augers	Compiled by: SN  Reviewed by: SM
	-	Secondary Plan Area (A Clarkway Drive, Bramp	Area 47)		y 421	iiiuusii	ıaı			Started:	Feb 11, 2020		
	-				0.1								
	LITH	OLOGY PROFILE		SC	DIL SA	MPLI	NG				TESTING tionTesting	Soil Vapour Reading COV (LEL) TOV (LEL)	Z COMMENTS
Lithology Plot	Geodetic Ground S	DESCRIPTION  Surface Elevation: 217.5 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	PPT	2 4 6 8  △ COV (ppm) □ TOV (ppm) 100 200 300 400  W ₊ W  Plastic Liquid 20 40 60 80	COMMENTS  REALPATION INSTRUMENTATION STAFFTATION (%)  GR SA SI CL
***		bout 130 mm ASPHALT brown Sand and Gravel FILL	217.3 21 <del>9</del> :2 0.3	SS	1	83	12	-	-	0		<b>5</b> 0	
	Sili	moist  dark grey /brown  ty Clay / Clayey Silt FILL  race sand, trace gravel				00	12	-	217 -			4	
***			040.4	SS	2	100	12	<u> </u>	-	0		17	
	SILTY trace	brown  CLAY / CLAYEY SILT TILL  to some sand, trace gravel	_ <u>216.1</u> 1.4			400			216 -				
		very stiff to hard		SS	3	100	27	- - 2	- - -	0		a 0 15	
			-	ss	4	100	44	<u> </u>	215 -		) .	a o 14	
		 grey	-					3	-				
		END OF BOREHOLE	214.0 3.5	SS	5	89	44	-	214 -		) .	0 15	
Wor	od E&IS, a Divis	ion of Wood								le en completi			

R	RECORD OF BOREHOLE No. BH D44													wood.
Pro	ject Number:	TP115086						Drilling	g Location:	Clarkway D N:4852886	r., SBL, S	ta. 3+150 E:6	04007	Logged by: MD
Pro	ject Client:	City of Brampton						Drilling	g Method:	150 mm Sc	olid Stem	Augers		Compiled by: SN
Pro	ject Name:	Arterial Road Network within Secondary Plan Area (Area 4		ay 427	Indust	rial		Drilling	g Machine:	Track Moun	ted Drill			Reviewed by: SM
Pro	ject Location:	Clarkway Drive, Brampton, C	Ontario					Date	Started:	Feb 11, 202	<b>0</b> Date	e Completed: I	Feb 11, 20	20 Revision No.: 0, 3/25/21
	LITH	IOLOGY PROFILE	SC	OIL S/	MPLI	NG			FIELD	TESTING		3 TESTING		
Lithology Plot		DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane* △ Intact ▲ Remould	<ul><li>♦ Intact</li><li>♦ Remould</li></ul>	△ COV (I 2 △ COV (I 100 W _P	Vapour Reading  LEL) ■ TOV (LE  4 6 8  DPM) □ TOV (ppi  200 300 400  W WL	⊥kz	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
Ě	Geodetic Ground	Surface Elevation: 216.8 m Sand and Gravel FILL 216.		San	Rec	SPT	DEF	E	* Undrained Sh 20 40	ear Strength (kPa) 60 80	Plastic 20	40 60 80	NS IS	GR SA SI CL
	Sil	Sand and Gravel FILL 216 brown / dark grey ty Clay / Clayey Silt FILL e sand, trace gravel, trace organics	ss ss	1	83	8	-  -  -  -		0		<b>A</b>			
		215.	SS	2	75	16	- - - 1	216 -	0		45			
		brown 1.  / CLAY / CLAYEY SILT TILL  e to some sand, trace gravel very stiff	SS SS	3	88	27	- - - -		0		<b>25</b>			
<u> </u>		END OF BOREHOLE 1.					_	215 -						
											:			

 $\frac{\textstyle \sum}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

R	RECORD OF BOREHOLE No. BH D45																		V	VO	00	<b>J</b> .
Pro	oject Number:	TP115086							Drilling	Location	1:	Clarkway N:485298	Dr.,	NBL, St	a. 3+3	00 E:603	917	L	.ogged I	oy: <u>I</u>	/ID	
Pro	oject Client:	City of Brampton							Drilling	Method:		150 mm	Soli	d Stem A	Augers	j.			Compile	d by: §	SN	
Pro	oject Name:	Arterial Road Network			y 427 I	ndustr	ial		Drilling	g Machine	e:	Track Mo	unte	ed Drill				F	Reviewe	d by: §	SM	
Pro	oject Location:	Secondary Plan Area (A Clarkway Drive, Bramp	ton, Ont	ario					Date 9	Started:		Feb 11, 20	020	Date	Comp	leted: Fe	b 11, 20	<b>20</b> F	Revision	No.: <u>(</u>	), 3/25/2	21_
	LITH	OLOGY PROFILE		SO	IL SA	MPLI	NG			FIEL	D T	ESTING			TES		_				_	
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	1	□ P ne*	onTesting  PT ● DC  Nilcon Van  ◇ Intact  ◆ Remould	CPT ne*	▲ COV (LI 2 △ COV (pr	EL) <b>=</b> 4 6 om) □	TOV (LEL)	INSTRUMENTATION INSTALLATION		GRA DISTR	MENT: & IN SIZI IBUTIC [%]	E	
Litho	Geodetic Ground	Surface Elevation: 218.8 m	040.7	Sam	Sam	Reg	SPT	DEP	ELE	* Undrained	Shea 40	Strength (kF 60 80	Pa)	Plastic 20	40 60	Liquid ) 80	INS	GR	SA	SI		CL
<b>XX</b>		bout 130 mm ASPHALT Sand and Gravel FILL	218.7 218.5					-	-													
$\overset{\times}{\otimes}$	Sil	brown / grey ty Clay / Clayey Silt FILL trace sand, trace gravel	0.3	SS	1	100	9	-  -  -	240	0												
$\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}{\overset{x}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}{\overset{x}{\overset{x}}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}{\overset{x}}}{\overset{x}}}}}}}}}$			0.17.0	SS	2	83	14	- - 1	218 -	0												
	SILTY	brown / grey / CLAY / CLAYEY SILT TILL	217.6 1.2					Ė														
		to some sand, trace gravel hard	217.0	SS	3	100	36	-			0		· · · 🛦									
<u> </u>	1	END OF BOREHOLE	1.8					-	217 -		-		1	<del>-                                    </del>		:						
										:				:								
										:				:								
										:												
										:	:			i		-						

 $\frac{\textstyle \sum}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD C	F BOREHOL	E No	o. <u>l</u>	BH I	D47									wood
Pro	ject Number: <u>T</u>	P115086							Drilling	Location:	Clarkway Dr., N:4853079	, SBL, Sta.	3+450 E:6038	316	Logged by: MD
Pro	ject Client: C	City of Brampton							Drilling	Method:	150 mm Soli	id Stem Au	igers		Compiled by: SN
Pro	ject Name:	Arterial Road Network v Secondary Plan Area (A	within H	ighwa	y 427 I	ndustr	ial		Drilling	g Machine:	Track Mounte	ed Drill			Reviewed by: SM
Pro	ject Location:	Clarkway Drive, Brampt	ton, Ont	ario					Date 9	Started:	Feb 11, 2020	Date C	Completed: Fel	11, 202	20 Revision No.: 0, 3/25/21
	LITHO	LOGY PROFILE		SO	IL SA	MPLI	NG			FIELD '	TESTING		ESTING		
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane*  Δ Intact  ▲ Remould  * Undrained She	PPT ● DCPT  Nilcon Vane*  ◇ Intact  ◆ Remould  ear Strength (kPa)	△ COV (LEL)  2 4  △ COV (ppm 100 200  W _P Plastic	) □ TOV (ppm) ) 300 400  W W _L → Liquid	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
	abou	ace Elevation: 219.9 m ut 160 mm ASPHALT	219.8	S	S	ı ı	S	-	Ш	20 40	60 80	20 40	60 80	==	GIT GIT GE
	Silty	nd and Gravel FILL dark brown / grey Clay / Clayey Silt FILL ee sand, trace gravel	219: <del>6</del> 0.3	SS	1	83	8	-  -  -  -	-	0	CS	°21			
			218.5	SS	2	89	12	- 1 - 1 -	219 -	0	69	017			
	trace to	brown / grey LAY / CLAYEY SILT TILL some sand, trace gravel very stiff to hard	1.4	SS	3	100	18	-  -  -  -	218 —	0		°14			
				SS	4	100	41	2 _ _ _ _ _	-		pa pa				
			-		4	100	41	- - - - - 3	217 -			O 14			
			-	SS	5	100	37	-	-	0	GS.	014			
		grey						- - 4 - -	216 -						
	EN	ND OF BOREHOLE	214.9 5.0	SS	6	94	17	- - - - - 5	215 –	0		0			
Woo	od E&IS, a Division	of Wood $ abla$ .				<u> </u>	L	<u>.                                    </u>		le en completi		<u> </u>			

Canada Limited

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD OF BO												W	00	d.					
Pro	oject Number: TP115086							Drilling	g Locatio	n:	Clarkway N:485307	Dr.,	SBL, St	a. 3+4	50 E:603	814		Logged by:	MD	
Pro	oject Client: City of Bra							Drilling	g Method	: ,	150 mm	Soli	d Stem /	Augers	3			Compiled by	: <u>SN</u>	
	oject Name: Arterial Ro Secondary	ad Network within F Plan Area (Area 47)	lighwa	y 427	Industr	ial		•	g Machine		Track Mo							Reviewed by		
Pro	oject Location: Clarkway I	Orive, Brampton, On	tario					Date S	Started:		Feb 11, 2	020	Date	Comp	oleted: Fe	b 11, 20	20	Revision No	.: <u>0, 3/</u>	25/21
	LITHOLOGY PI	ROFILE	SC	OIL SA	MPLII	NG			FIEL	_D T	ESTING			TES		7		COMME	NTC	
				<u></u>		(%)		Ê	Pen O SPT		onTesting PT ● D0		▲ COV (L	EĹ) ■ 4 6	TOV (LEL)	INSTRUMENTATION INSTALLATION		COMME &		
<u>b</u>	DESCRIP	TION	ype	Sample Number	(%)	SPT 'N' / RQD (%)	Ê		MTO Va △ Intact	ne*	Nilcon Var	- 1.	△ COV (p)	pm) 🗆 200 30	TOV (ppm) 00 400	AENT		GRAIN S DISTRIBL	JTION	
Lithology			Sample Type	nple l	Recovery (%)	/ 'N' T	DЕРТН (m)	ELEVATION	▲ Remo	uld	Remouler Strength (kF		W _P ■ Plastic	W	W _L	TRU		(%)		
<u>=</u> ***	Geodetic Ground Surface Elevation:	219.9 m vel FILL 219.7_	Sar	Sar	Re	SP	DE		20	40	60 80	-a)		40 6	Liquid 0 80	22	GR	SA	SI	CL
$\otimes$	dark gre Silty Clay / Claye trace sand, trac		SS	1	75	4	-		0											
$\overset{\times}{\otimes}$	trace sand, trac	ce gravel					Ė													
$\overset{\otimes}{\otimes}$			SS	2	100	12		219 -												
$\overset{\otimes}{\otimes}$		218.6	00		100	12	— 1 -					Ī								
	brown SILTY CLAY / CLAY	1.2 EY SILT TILL					-													
	trace to some sand very sti	, trace gravel ff 218.0	SS	3	100	24	-					··· da								
<u> </u>	END OF BOR						-						:							
									:											
									:											
													:		-					
													:		-					
									:											
													:							
															-					
									:				:		-					
													:							
															=					
									:				:							
													:							
										i										

 $\frac{\textstyle \sum}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD OF BOREHOLE N	lo.	BH	D49	<u>.</u>					RECORD OF BOREHOLE No. BH D49  Project Number: TP115086 Drilling Location: Clarkway Dr., NBL, Sta. 3+600 E:603698 Logged by: MD													
Pro	pject Number: TP115086						Drilling	Location:	Clarkway Dr	., NBL, Sta.	3+600 E:6036	698	Logged by: N	<u>ID</u>									
Pro	pject Client: City of Brampton						Drilling	Method:	150 mm So	lid Stem Au	igers		Compiled by: S	<u> </u>									
Pro	oject Name: Arterial Road Network within Secondary Plan Area (Area 4		ay 427	Industi	rial		Drilling	Machine:	Track Mount	ted Drill			Reviewed by: §	М									
Pro	oject Location: Clarkway Drive, Brampton, O	ntario					Date 9	Started:	Feb 12, 2020	Date C	Completed: Fel	b 12, 202	Revision No.: 0	, 3/25/21									
	LITHOLOGY PROFILE	S	OIL SA	MPLI	NG			FIELD	TESTING		TESTING												
Lithology Plot	DESCRIPTION  Geodetic Ground Surface Elevation: 220.8 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	<ul> <li>Intact</li> <li>Remould</li> </ul> ear Strength (kPa)	△ COV (LEL 2 4 △ COV (ppm 100 200	n) □ TOV (ppm) 0 300 400  W W _L ← Liquid	NSTRUMENTATION NSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTIO (%) GR SA SI	E DN									
_ 	about 120 mm ASPHALT 220.6						-																
	Sand and Gravel FILL 228.  brown / grey  Silty Clay / Clayey Silt FILL  trace sand, trace gravel		1	83	6	-	-	0	ē	14													
$\overset{\times}{\otimes}$		SS	2	89	10	_ - - - 1	220 -	0	F	o 24													
$\overset{\otimes}{\otimes}$						- - - -	-																
$\overset{\otimes}{\otimes}$		SS	3	100	8	_ _ _ _ 2	219 -	0	<u> </u>	⁰ 16													
	brown 2.7 SILTY CLAY TILL	_				<u>-</u>	-																
	trace to some sand, trace gravel very stiff	ss	4	100	23		218 —	0	<b>.</b>	14													
	 grey					_ 3	-																
		ss	5	100	28	_	-	0	9	13			2 19 48	31									
XX	END OF BOREHOLE 3.6	-				_																	

 $\frac{\textstyle \sum}{\scriptstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

ECORD OF BOREHOLE N	<u>D50</u>								wood		
oject Number: TP115086						Drilling	Location:	Clarkway Dr.,	, NBL, Sta. 3+600 E:603	'00	Logged by: MD
ject Client: City of Brampton						Drilling	Method:	150 mm Soli	id Stem Augers		Compiled by: SN
ject Name: Arterial Road Network within F	lighwa	y 427 I	ndustr	ial		Drilling	Machine:	Track Mounte	ed Drill		Reviewed by: SM
ject Location: Clarkway Drive, Brampton, On	tario					Date S	started:	Feb 12, 2020	Date Completed: Fet	12, 2020	Revision No.: <u>0, 3/25/21</u>
LITHOLOGY PROFILE	SC	IL SA	MPLI	NG			FIELD	TESTING	LAB TESTING		
DESCRIPTION  Geodetic Ground Surface Elevation: 220.8 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	<b>ДЕРТН</b> (m)	ELEVATION (m)	O SPT □  MTO Vane* △ Intact ▲ Remould * Undrained She	PPT	▲ COV (LEL) ■ TOV (LEL) 2 4 6 8  △ COV (ppm) □ TOV (ppm) 100 200 300 400    W _P W W _L ■ □ Uquid	NSTRUMENTATION NSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)  GR SA SI CL
Sand and Gravel FILL 220.7					-	-	: :				
Silty Clay / Clayey Silt FILL trace sand, trace gravel, trace organics		1			- - - -	220 —	0	<b>43</b>			
219.6	SS	2	83	13	- - 1	-	0	**************************************			
brown 1.2  SILTY CLAY / CLAYEY SILT TILL  trace to some sand, trace gravel  very stiff	SS	3		24	- - -	- - - -	0	<b>a</b> s			
END OF BOREHOLE 1.8					_	219 -					
)	ject Number: TP115086  ject Client: City of Brampton  Arterial Road Network within In Secondary Plan Area (Area 47)  ject Location: Clarkway Drive, Brampton, On  LITHOLOGY PROFILE  DESCRIPTION  Geodetic Ground Surface Elevation: 220.8 m Sand and Gravel FILL 220.7  brown / grey 0.1  Silty Clay / Clayey Silt FILL trace sand, trace gravel, trace organics  219.6  brown 1.2  SILTY CLAY / CLAYEY SILT TILL trace to some sand, trace gravel very stiff 219.0	pject Number: TP115086  pject Client: City of Brampton  Arterial Road Network within Highwa Secondary Plan Area (Area 47)  pject Location: Clarkway Drive, Brampton, Ontario  LITHOLOGY PROFILE  DESCRIPTION  Geodetic Ground Surface Elevation: 220.8 m  Sand and Gravel FILL  brown / grey Silty Clay / Clayey Silt FILL  trace sand, trace gravel, trace organics  SS  SS  219.6  brown  SILTY CLAY / CLAYEY SILT TILL  trace to some sand, trace gravel very stiff  219.0	pject Number: TP115086  pject Client: City of Brampton  pject Name: Arterial Road Network within Highway 427 I Secondary Plan Area (Area 47)  pject Location: Clarkway Drive, Brampton, Ontario  LITHOLOGY PROFILE SOIL SA  DESCRIPTION  Beach Sand and Gravel FILL 220.7    Drown   Grey   Silty Clay / Clayey Silt FILL   trace sand, trace gravel, trace organics    Silty Clay / Clayey Silt FILL   trace to some sand, trace gravel very stiff   219.0	pject Number: TP115086  pject Client: City of Brampton  pject Name: Arterial Road Network within Highway 427 Industriate Secondary Plan Area (Area 47)  pject Location: Clarkway Drive, Brampton, Ontario  LITHOLOGY PROFILE SOIL SAMPLI  DESCRIPTION  DESCRIPTION  DESCRIPTION  Geodetic Ground Surface Elevation: 220.8 m Sand and Gravel FILL brown / grey Silty Clay / Clayey Silt FILL trace sand, trace gravel, trace organics  SS 2 83  219.6  Drown SILTY CLAY/CLAYEY SILT TILL trace to some sand, trace gravel very stiff 219.0	pject Number:    TP115086     City of Brampton     Secondary Plan Area (Area 47)     Clarkway Drive, Brampton, Ontario	pject Number:    City of Brampton	pject Number: TP115086 Drilling pject Client: City of Brampton Drilling pject Name: Secondary Plan Area (Area 47) pject Location: Clarkway Drive, Brampton, Ontario Drilling DESCRIPTION DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DE	pject Number: TP115086 Drilling Location:    Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Machine:   Secondary Plan Area (Area 47)   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   Date Started:   D	pject Number: TP115086  City of Brampton  Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47) Clarkway Drive, Brampton, Ontario  Drilling Method:  Track Mounte Secondary Plan Area (Area 47) Clarkway Drive, Brampton, Ontario  Date Started:  Date Started:  Feb 12, 2020  FIELD TESTING  Penetration Testing O SPT □ PPT ● DCPT  NITO Vane*	pject Number: TP115086    City of Brampton   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drill	piect Number: TP115086    Drilling Location: Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drilling Method:   Drill

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

R	ECORD	OF BOREHOL	E No	<b>o.</b>	BH	<u>D51</u>								WOOD	ļ.
Pro	ject Number:	TP115086							Drilling	g Location:	Clarkway Dr. N:4853290	, SBL, Sta. 3+750 E:603	599	Logged by: MD	_
Pro	ject Client:	City of Brampton								g Method:		id Stem Augers		Compiled by: SN	-
	ject Name:	Arterial Road Network v Secondary Plan Area (A	rea 47)		y 427 l	ndustr	ial			g Machine:	Track Mount			Reviewed by: SM	-
Pro	ject Location:	Clarkway Drive, Brampt	on, Ont	ario					Date S	Started:	Feb 11, 2020	Date Completed: Fe	b 11, 2020	Revision No.: <u>0, 3/25/2</u>	-
	LITH	OLOGY PROFILE		SC	IL SA	MPLII	NG	_		FIELD	TESTING	LAB TESTING Soil Vapour Reading	_	COMMENTS	
Ħ		DESCRIPTION		Φ	nber	(9)	(%) Q		E Z	O SPT 🗆	etionTesting PPT ● DCPT	△ COV (LEL) ■ TOV (LEL)  2 4 6 8  △ COV (ppm) □ TOV (ppm)	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE	
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	T 'N' / RQD (%)	DEРТН (m)	ELEVATION	MTO Vane* △ Intact ▲ Remould	Nilcon Vane*  ◇ Intact  ◆ Remould	100 200 300 400  W _P W W _L Plastic Liquid	STRUME	DISTRIBUTION (%)	
∄	Geodetic Ground S	urface Elevation: 221.5 m	221.4_	Sa	Sa	Re	SPT			20 40	ear Strength (kPa) 60 80	20 40 60 80	<u>22</u> G	GR SA SI CI	L
$\overset{\sim}{\approx}$		Sand and Gravel FILL dark brown	221.4 229:2 0.2	SS	1	89	9	-							
$\overset{\times}{\otimes}$	Silt tr	y Clay / Clayey Silt FILL race sand, trace gravel			·	00		F	221 -						
$\overset{\times\!\!\!\!\times}{\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$				SS	2	100	7	- - - 1							
$\overset{\times}{\otimes}$			220.1		_	100	,	<u> </u>							
	SILTY	brown / grey CLAY / CLAYEY SILT TILL	22 <u>0.1</u> 1.4					<u> </u>	220 -						
	trace	to some sand, trace gravel very stiff	219.5	SS	3	100	27	_		0		<b>5</b>			
<i>(//</i>		END OF BOREHOLE	2.0												
Noc	od E&IS, a Divisi	on of Wood $ abla$ .								ole on completi					

Project Number: TP115086									Drilling	. Location:	Clarkway Dr	NDI Sto 21000 E.CO2	wood.
	ject Client:	City of Brampton								g Location: g Method:	N:4853398	., NBL, Sta. 3+900 E:603	497 Logged by: MD  Compiled by: SN
	ject Name:	Arterial Road Network	within H	lighwa	v 427	Industi	rial		_	Machine:	Track Mount	-	Reviewed by: SM
	ject Location:	Secondary Plan Area (A	(rea 47						Date S	Started:	Feb 12, 2020		
	LITH	IOLOGY PROFILE		sc	II SA	MPLI	NG			FIFI D	TESTING	LAB TESTING	
Lithology Plot		DESCRIPTION Surface Elevation: 222.0 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	Penetra ○ SPT □  MTO Vane* △ Intact ▲ Remould	ntionTesting  PPT	Soil Vapour Reading  ▲ COV (LEL) ■ TOV (LEL)  2 4 6 8  △ COV (ppm) □ TOV (ppm)  100 200 300 400  W _P W W _L ■ OP (ppm)  Plastic Liquid  20 40 60 80	COMMENTS & GRAIN SIZE DISTRIBUTION (%)  GR SA SI CL
_ ‱	_ a	bout 130 mm ASPHALT Sand and Gravel FILL	221.9 221.7					ŧ -	-				
	Sil trace sa	brown / dark grey ity Clay / Clayey Silt FILL ind, trace gravel, trace organic	0.3	SS	1	94	13	-  -  -  -		0		6	
				SS	2	100	10	- 1 - 1 	221 –	0		°13	
				SS	3	100	16	- - - - -	-	0	ſ	a o ₁₅	
	SILTY	brown / grey  CLAY / CLAYEY SILT TILL to some sand, trace gravel	219.9 2.1					2	220 -				
		very stiff to hard		SS	4	100	29	3		0		°15	
		grey		SS	5	100	22		219 -	0	ı	a o 16	
								- - - 4 -	218 -				
				ss	6	100	36	-  -  -  -	-	0	ſ	a 0 13	
<i>XX</i>		END OF BOREHOLE	217.0 5.0					<u> </u>	<del>217 -</del>				
	od ERIS a Divia												

 $\frac{\textstyle \sum}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	RECORD OF BOREHOLE No. BH D54														wood.
	ject Number:	TP115086							Drilling	g Location:	N:4853399		. 3+900 E:603	3499	Logged by: MD
	ject Client:	City of Brampton							Drilling	g Method:	150 mm So		ugers		Compiled by: SN
	ject Name:	Arterial Road Network v Secondary Plan Area (A	(rea 47)		y 427 l	ndustr	rial		Drilling	g Machine:	Track Mount				Reviewed by: SM
Pro	ject Location:	Clarkway Drive, Brampt	ton, Ont	ario					Date 9	Started:	Feb 12, 2020	Date	Completed: Fe	b 12, 20	20 Revision No.: 0, 3/25/21
	LITH	OLOGY PROFILE		SC	IL SA	MPLI	NG			FIELD	TESTING		TESTING apour Reading	_	0014151150
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane* △ Intact ▲ Remould	Intact	▲ COV (LE	L) ■ TOV (LEL)	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
∄ ‱	Geodetic Ground	Surface Elevation: 221.7 m Sand and Gravel FILL	221.6	Sa	Sa	Re	R		<u> </u>	20 40	60 80	20 4		ŽŽ	GR SA SI CL
	Sil	brown / dark brown ty Clay / Clayey Silt FILL trace sand, trace gravel	221.1	SS	1	100	6	-  -  -  -	-	0		<b>3</b>			
		brown CLAY / CLAYEY SILT TILL to some sand, trace gravel firm to very stiff	0.6	SS	2	83	7	- - - - 1	221 -	0		<b>,</b>			
				SS	3	33	23	<u>+</u> - - -	-	0		3			
<b>X</b>		END OF BOREHOLE	219.9 1.8					-	220 -					-	
	ı		- 1		i .	i .	1	1		1					

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

Project Number: TP115086			E No	<b>o.</b>	<u>BH</u>	D55	_							wood.
										Location:	N:4853502	., SBL, Sta. 4+050 E:603		ogged by: MD
	ject Client: ject Name:	City of Brampton  Arterial Road Network	within U	iabwa	v 427	Inducti	rial		_	Method: Machine:	Track Mount	lid Stem Augers		ompiled by: SN eviewed by: SM
	-	Secondary Plan Area (A Clarkway Drive, Bramp	Area 47)		iy 427	iiiuusii	ııaı		- `	Started:	Feb 11, 2020			evision No.: <b>0, 3/25/21</b>
	-		1					1			,		1	<u>0,02021</u>
	LITH	OLOGY PROFILE		SC	DIL SA	MPLI	NG	-			TESTING	LAB TESTING Soil Vapour Reading	z	COMMENTS
Lithology Plot	Geodetic Ground S	DESCRIPTION Surface Elevation: 222.5 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	<ul> <li>♦ Intact</li> <li>♦ Remould</li> </ul> ear Strength (kPa)	△ COV (LEL) ■ TOV (LEL) 2 4 6 8  △ COV (ppm) □ TOV (ppm) 100 200 300 400  W _p W W _t ■ Plastic Liquid 20 40 60 80	INSTALLATION INSTALLATION B	& GRAIN SIZE DISTRIBUTION (%)
***	al	bout 150 mm ASPHALT Sand and Gravel FILL	222.4 22 <b>9</b> . <b>2</b>					-	-	: :				
	Sil	brown / grey ty Clay / Clayey Silt FILL trace sand, trace gravel	0.3	SS	1	89	12	-	222 -	0	•	5		
$\overset{\times\!\!\!\!\times}{\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$				ss	2	94	24	- 1 - 1	-	0		o 15		
	SILTY	brown  CLAY / CLAYEY SILT TILL	_ <u>221.1</u> 1.4					-  -  -  -	221 -					
	trace	to some sand, trace gravel hard		SS	3	100	30	2	-	0		⁸ 015		
				SS	4	100	59	- - -	220 -		0 1			
					4	100	39	-  -  -	-			010		
				ss	5	100	38	_ 3 - - -	-	0		a o		
XX		END OF BOREHOLE	219.0 3.5						-					
	od ERIC a Divia	ı												

 $\frac{\textstyle \sum}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	RECORD OF BOREHOLE			o. <u>l</u>	BH	<u>D56</u>												V	VO	od.	
Pro	oject Number:	TP115086							Drilling	Location:	Č	Clarkway Dr	., SBL, S	ta. 4+0	50 E:603	380	L	ogged by	y: <u>M</u> [		_
Pro	oject Client:	City of Brampton							Drilling	Method:	-	l:4853532 150 mm So	lid Stem	Auger	s		c	ompiled	by: <u><b>SN</b></u>		_
Pro	oject Name:	Arterial Road Network Secondary Plan Area (	within H	ighwa	y 427 l	Industr	ial		Drilling	Machine:	1	rack Mount	ted Drill				R	eviewed	by: <b>SN</b>	1	_
Pro	oject Location:	Clarkway Drive, Bramp	oton, Ont	ario					Date 9	Started:	Ē	eb 11, 2020	)Dat	e Com	pleted: Fe	b 11, 20	<b>20</b> R	evision I	No.: <u>0,</u>	3/25/21	_
	LITH	OLOGY PROFILE		SO	IL SA	MPLI	NG			FIEL	) TE	STING		3 TES	TING						
Lithology Plot		DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT  MTO Vane  △ Intact  ▲ Remoule	□ PF e* ! d •	nTesting PT   DCPT  Nilcon Vane* Intact Remould	△ COV ( 2 △ COV ( 100 W _P	DEL) ■ 4 ppm) □ 200 3 W	TOV (LEL) 6 8 TOV (ppm) 00 400 W _L	INSTRUMENTATION INSTALLATION	I	GRAII DISTRII	MENTS & N SIZE BUTION %)	N	
Ę.	Geodetic Ground	Surface Elevation: 222.0 m Sand and Gravel FILL	004.0	San	San	Reo	SPT	DEP		* Undrained 20	Shear 40	Strength (kPa) 60 80	Plastic 20		Liquid 80 80	SN.S.	GR	SA	SI	CL	_
	1	brown / dark brown ty Clay / Clayey Silt FILL nd, trace gravel, trace organio	221.9 0.2 cs 221.4	SS	1	75	8	-	-	0			<b>5</b>								
	SILTY trace	brown  CLAY / CLAYEY SILT TILL  to some sand, trace gravel stiff to very stiff	0.6	SS	2	92	15	- - - - 1	221 -	0			<b>3</b>								
			220.2	SS	3	46	26	- - - -		0			3								
XX	2	END OF BOREHOLE	220.2 1.8					-						:							
										:			:								
										:			:	:							
													:	:							
													:	:							
										:			:								
													:	:							
										:			:	:							
										:			:								
										:			:								
										:			:	:							

 $\frac{\textstyle \sum}{\textstyle =}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RECORD OF BOREHOLE No.  Project Number: TP115086		lo.	BH	<u>D57</u>								wood
Pro	ject Number: TP115086						Drilling	Location:	Clarkway Dr.,	, NBL, Sta. 4+200 E:603	286	Logged by: MD
Pro	ject Client: City of Brampton						Drilling	Method:	N:4853614 150 mm Soli	id Stem Augers		Compiled by: SN
Pro	ject Name: Arterial Road Network within Secondary Plan Area (Area 47	Highwa	ay 427 I	Industr	ial		Drilling	Machine:	Track Mounte	ed Drill		Reviewed by: SM
Pro	ject Location: Clarkway Drive, Brampton, Or	ntario					Date 9	Started:	Feb 12, 2020	Date Completed: Fel	12, 2020	0 Revision No.: 0, 3/25/21
	LITHOLOGY PROFILE	SC	DIL SA	MPLI	NG			FIELD '	TESTING	LAB TESTING		
			_		(%		(E)		tionTesting PPT ● DCPT _	Soil Vapour Reading  ▲ COV (LEL) ■ TOV (LEL)  2 4 6 8	INSTRUMENTATION INSTALLATION	COMMENTS &
Jot	DESCRIPTION	ed.	Sample Number	(%)	SPT 'N' / RQD (%)	<u> </u>		MTO Vane*	Nilcon Vane*  ♦ Intact	△ COV (ppm) □ TOV (ppm) 100 200 300 400	TION	GRAIN SIZE DISTRIBUTION
Lithology Plot		Sample Type	ble N	Recovery (%)	ž	DEРТН (m)	ELEVATION	△ Intact ▲ Remould	♦ Intact Remould	W _P W W _L	ALL/	(%)
Litho	Geodetic Ground Surface Elevation: 223.6 m		Sam	Rec	SPT	DEP	E.E.	* Undrained She 20 40	ear Strength (kPa) 60 80	Plastic Liquid 20 40 60 80	INSI	GR SA SI CL
= <u>-</u> -=	about 85 mm ASPHALT 223.5 about 180 mm CONCRETE 223.4					-	-					
$\bowtie$	dark grey 0.3  Silty Clay / Clayey Silt FILL	1 00	1	94	6	-	-	0	4			
***	trace sand, trace gravel 222.9 brown / grey 0.7	1				ŧ	223 -					
	SILTY CLAY / CLAYEY SILT TILL trace to some sand, trace gravel	ss	2	100	13	- 1	-	0	4			
	stiff to very stiff					Ē	-					
						Ė	222 -					
	2010	SS	3	89	20	_	-	0				
XX	221.6 END OF BOREHOLE 2.0											

 $\stackrel{\textstyle \nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

	ECORD OF BOREHOLE N  ject Number: TP115086	Ο.	BH	<u>S13</u>			Drilling	Location:	Clarkway Di	r., SBL, Sta	. 2+275 E:604	1621	Logged b		od.
Pro	ject Client: City of Brampton						– Drilling	g Method:	N:4852286 150 mm Sc				Compiled		
Pro	ject Name: Arterial Road Network within h		ıy 427	Indust	rial		– Drilling	g Machine:	Track Moun	ted Drill			Reviewed	by: SN	1
Pro	Secondary Plan Area (Area 47) ject Location: Clarkway Drive, Brampton, On	tario					_ Date \$	Started:	Feb 25, 2020	Date (	Completed: Fe	eb 25, 2020	Revision	No.: <b>0,</b>	3/30/21
	LITHOLOGY PROFILE	SC	OIL SA	MPLI	NG			FIELD	TESTING		TESTING				
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	T 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	tionTesting  PPT ● DCPT  Nilcon Vane*  ◇ Intact ◆ Remould  ear Strength (kPa)	▲ COV (LEL 2 4	n)   TOV (ppm)	STRUMENTAT	GRAI DISTRI (°	%)	
Ė.	Geodetic Ground Surface Elevation: 210.2 m about 80 mm ASPHALT 210.1	Sa	Sa	8	SPT	<u> </u>	<u> </u>	20 40		20 40		<u> </u>	GR SA	SI	CL
	brown Sand and Gravel FILL trace to some silt moist	SS	1	100	62	- - - - - -	210 -		0	80 4					
	greyish brown 1.0  Silty Clay / Clayey Silt FILL  trace to some sand, trace to some gravel, trace organics	ss	2	63	8	- 1 - - - - - - - - -	209 -	0		6		)   			
		SS	3	100	15	- - - 2 -	208 —	0		as o 14		· ·			
		SS	4	100	9	- 3		0		<b>△</b> °12					
		SS	5	100	7	-	207 -	0		15					
	grey SILTY CLAY TILL some sand, trace gravel very stiff					- 4 - 4 - :	206 - =								
		ss	6	100	27	- - - - 5 -	205 –	0		a o∎-• 12			3 16	50	31
	grey 204.6  SILTY SAND / SAND AND SILT TILL  trace clay, trace gravel, cobbles/boulders loose to very dense moist to wet					- 6									
	most to wet	SS	7	133	22	-	204 —	0		19					
						- 7 - - - - -	203 -								
		ss	8	100	9	- - - 8 - -	202 —	0		18					
					55./	- - - - - 9			-55						
	END OF BOREHOLE 9.3	SS	9	100	55 / 130mn	-	201 -		130 mm	14					
	od E&IS, a Division of Wood  Groundy	vater en	COUNTER	ed on c	nmoletic	n of d	rilling on	2/25/2020 at a	depth of: <u>4.3 m</u>	Cavo	in depth after re	moval of aug	ers: 15 m		
50 V Rich Can Tel.	/ogell Road, Units 3 & 4 mmond Hill, Ontario, L4B 3K6 ada  Borehole details	ater dep	oth obse	not cons	5/12/20	020 at	a depth on understation should	of: 1.4 m.	ntial conditions pr	esent and requi	re interpretative as			Scale	e: 1 : 53

Scale: 1 : 53 Page: 1 of 2

### RECORD OF BOREHOLE No. BH S13



Project Number: TP115086 Project Name: Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47)

Project Location: Clarkway Drive, Brampton, Ontario

	LITHOLOGY PROFILE	GY PROFILE SOIL SAMPLING						FIELD TESTING	LAB TESTING					
								PenetrationTesting	Soil Vapour Reading  ▲ COV (LEL) ■ TOV (LEL)	NOI		COMM &		
#	DESCRIPTION	Φ	nber	(9)	SPT 'N' / RQD (%)		ELEVATION (m)	O SPT □ PPT ● DCPT	2 4 6 8 △ COV (ppm) □ TOV (ppm) 100 200 300 400	INSTRUMENTATION INSTALLATION		GRAIN	SIZE	
gy Pl	Decoral How	е Тур	e Nur	ery (%	4' / RC	Œ H	ATIO	MTO Vane* Nilcon Vane*  △ Intact ◇ Intact  ▲ Remould ◆ Remould	W _P W W _I	UME		DISTRIB (%)	UTION .)	
Lithology Plot		Sample Type	Sample Number	Recovery (%)	Y T	ОЕРТН (m)	LEV.	* Undrained Shear Strength (kPa) 20 40 60 80	Plastic Liquid 20 40 60 80	NSTR NSTA	GR	SA	SI	CL
	50 mm dia. monitoring well with flushmount	0)	0)	ш	0)		ш	20 40 00 60	20 40 60 80	_==				
	protective casing installed (depth below ground surface):													
	Sand: 0.0 - 0.6 m Bentonite: 0.6 - 4.0 m Sand Filter: 4.0 - 7.6 m Screen: 4.6 - 9.1 m													
	Groundwater measurements in monitoring well (depth below ground surface):													
	12 May 2020: 1.4 m													

RI	ECORD OF BOREHOLE	No	o. <u>l</u>	ВН	<u>S14</u>								W	bod
Pro	ject Number: TP115086							Drilling	Location:	Clarkway Dr.	., NBL, Sta. 2+275 E:604	618	Logged by:	мм
Pro	ect Client: City of Brampton							Drilling	Method:	N:4852293 150 mm So	lid Stem Augers		Compiled by:	SN
Pro	ect Name: Arterial Road Network with		ighwa	y 427 l	ndustr	ial		Drilling	Machine:	Track Mount	ed Drill		Reviewed by:	SM
Pro	Secondary Plan Area (Area ect Location: Clarkway Drive, Brampton	4/) , Ont	ario					Date 9	Started:	Feb 25, 2020	Date Completed: Fe	b 25, 2020	Revision No.:	0, 3/25/21
	LITHOLOGY PROFILE	1	SO	IL SA	MPLI	NG	1		FIELD	TESTING	LAB TESTING			
										ationTesting	Soil Vapour Reading  ▲ COV (LEL) ■ TOV (LEL)	NO N	COMMEN	TS
#	DESCRIPTION		ø)	ber		%) Q		Œ.		PPT • DCPT	2 4 6 8 △ COV (ppm) □ TOV (ppm)	AT NO	& GRAIN SI	
gy Pic	DESCRIPTION		е Тур	e Nun	%) Kue	I'/RG	Ē	Į į	MTO Vane*  △ Intact  ▲ Remould	Nilcon Vane*  ◇ Intact  ◆ Remould	100 200 300 400 W _P W W _L	LLAT	DISTRIBUT (%)	TON
Lithology Plot			Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEРТН (m)	ELEVATION	1	near Strength (kPa)	Plastic Liquid 20 40 60 80	NSTRUMENTATION NSTALLATION		SI CL
 ‱	Geodetic Ground Surface Elevation: 210.0 m about 90 mm ASPHALT 2	09.9 8.7	0)	0)	ш.	U)	-	<u>, ш</u>	20 40		20 40 00 60			-
$\bowtie$	grey Sand and Gravel FILL trace to some silt		SS	1	100	67	-			0 •	ю ₄	1		
₩	moist	ŀ					F							
$\bowtie$			00				- - 1	209 -						
	brown to grev	08.7 1.2	SS	2	63	30			0		0 ₄ 11			
₩	Silty Clay / Clayey Silt FILL trace to some sand, trace to some gravel						-				<b>11</b>			
$\bowtie$			SS	3	92	14	-				15			
₩							2	208 -			15			
₩		ŀ					<u>-</u> -							
$\bowtie$			SS	4	63	6	E		0		s o ₁₄			
$\bowtie$		-					<b>-</b>	207 -						
₩		ı					— 3 - -	207						
₩			SS	5	100	10	-		0		12			
₩		ŀ					E							
₩	2	05.9					- - 4 -	206 - Z						
	grey SILTY CLAY / CLAYEY SILT TILL	4.1					- - - -							
	trace to some sand, trace gravel soft to stiff													
			SS	6	83	3	-				1 O			
							— 5 -	205 -			16			
							F							
							<u>-</u> -							
							6	204 -						
		ŀ			400	40	Ė Š							
			SS	7	133	13	F		0		22			
							- - -							
	2	02.8					7	203 -						
A	grey SILTY SAND / SAND AND SILT TILL	7.2					E							
$\langle \rangle$	trace clay, trace gravel dense to very dense moist to wet						-							
M	moist to wet		SS	8	67	31	F .	202 -			21	_	51	47 2
$\mathbb{Z}$							- 8 - -	202			21	Non-p	plastic	
1							-							
$\mathcal{M}$							-							
$\mathbb{M}$							_ _ 9	201 -						
44	2: END OF BOREHOLE	9.3	SS	9	100	60 / 150mm	<u> </u>			60 150 mm	13	1		
	LIND OF BUREFULE	5.3												
	d E&IS, a Division of Wood	undw	ater en	counter	ed on co	ompletio	n of dri	llina on 1	2/25/2020 at a	a depth of: <u>4.1 m</u> .				
50 V	ogell Road, Units 3 & 4		5110		_ 5.1 00	0.000 مر	. 5. 011	511	ut c					
Rich Can	mond Hill, Ontario, L4B 3K6 ada Borehole d	etails a	s presei	nted, do	not consi	titute a th	orough	understa	nding of all pote	ential conditions pre	sent and require interpretative as:	sistance from	,	Scale: 1 : 53
	No.: (905) 415-2632 a qualified commission	ned an	d the ac	company	/ing'Expl	anation o	f Boreh	ole Log'.	rodu ni cofiji	suon with the geo				age: 1 of 1

	ECORD OF BORE	HOLE N	0.	BH	<u>S15</u>			Deillin	u I aaatiau.	Clarkway Dr	CDI Ct- 21225 F.C04	100		od.
	oject Number: TP115086 oject Client: City of Brampto	n							g Location: g Method:	N:4852729	SBL, Sta. 3+325 E:604	103	Logged by: Compiled by:	MS SN
	oject Name: Arterial Road No		liahwa	w 427	Industi	rial			Machine:	Track Mounte			Reviewed by:	
	Secondary Plan  ject Location: Clarkway Drive,	Area (Area 47)		iy 427	iiiuusti	ıaı			Started:	Feb 24, 2020	Date Completed: Fel	h 24 2020	Revision No.:	
1 10	,							Date		<u> </u>		5 24, 2020	TCVISION TVO	0, 0/20/21
	LITHOLOGY PROFI	LE	SC	DIL SA	MPLI	NG			FIELD	TESTING	LAB TESTING Soil Vapour Reading	7	COMMEN	те
Lithology Plot	DESCRIPTION	I	Sample Type	Sample Number	Recovery (%)	'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane*  △ Intact  ▲ Remould	PPT	△ COV (LEL)	INSTRUMENTATION INSTALLATION	GRAIN SI DISTRIBUT (%)	ZE
Lith	Geodetic Ground Surface Elevation: 212.7		Sam	Sam	Rea	SPT	DEP	E	* Undrained Sh 20 40	ear Strength (kPa) 60 80	Plastic Liquid 20 40 60 80	S S GI	R SA	SI CL
×	about 100 mm ASPH/ grey Sand and Gravel FII						-							
	Sand and Gravel FII trace to some silt moist brown		ss	1	79	37	- - - - - - -	212 -	0	ac ac	3			
	Silty Clay / Clayey Silt trace to some sand, trace to s	FILL	SS	2	42	14	- ' - - -		0		016			
×		210.5	SS	3	100	8	- - - - 2	211 -	0	28	020			
	grey SILTY CLAY / CLAYEY SI trace sand to sandy, trace cobbles/boulders very stiff to hard	2.2 L <b>T TILL</b> gravel,	SS	4	185	25	- - - - -	210 -	0	<b>B</b>	20			
			SS	5	100	68 / 180mm	- - 3 - - -			68 180 mm	°16			
							- - - - - 4	209 -						
			SS	6	46	20	-		0		° ₁₁			
			SS	7	100	67 / 250mm	- - - 5 - - -	208 -		67 250 mm	918	6	31	46 17
							- - - - - - - 6	207 -						
			SS	8	100	92 / 250mm	- - - -			92   8   250	o mm18			
							- - - - 7 - - -	206 -						
			SS	9	89	94	- - - - - 8	205 -		Ois	o 22			
							- - - - - - - 9	204 —						
	END OF BOREHOL	203.2 E 9.4	SS	10	100	59 / 150mm	-			59 150 mm	19			
<b>Can</b> 50 V	od E&IS, a Division of Wood lada Limited /ogell Road, Units 3 & 4	∑ No freesta	anding (	groundv	vater me	easured	in oper	n boreho	le on complet	ion of drilling.	■ Cave in depth after ren	noval of augers	: <u>9.4 m</u> .	

R	ECORD OF BOREHOLE N	<b>o.</b>	BH :	<u>S16</u>									WC	bod
Pro	ject Number: TP115086						Drilling	Location:	Clarkway Dr. N:4852745	., NBL, Sta. 3+	325 E:6041	58	_ Logged by:	MS
Pro	ject Client: City of Brampton						Drilling	Method:		lid Stem Auge	rs		Compiled by:	SN
Pro	ject Name: Arterial Road Network within H Secondary Plan Area (Area 47)	lighwa	y 427 I	ndustr	ial		Drilling	g Machine:	Track Mount	ted Drill			_ Reviewed by:	<u>SM</u>
Pro	ject Location: Clarkway Drive, Brampton, Ont	tario					Date 9	Started:	Feb 24, 2020	Date Com	npleted: Feb	24, 2020	_ Revision No.:	0, 3/30/21
	LITHOLOGY PROFILE	SC	IL SA	MPLI	NG			FIELD	TESTING	LAB TES				
					(%		_	1	ationTesting	Soil Vapour  COV (LEL)	TOV (LEL)	INSTRUMENTATION INSTALLATION	COMMEN &	TS
Jot	DESCRIPTION	фе	Sample Number	(%)	SPT 'N' / RQD (%)	=	E N	MTO Vane*	PPT • DCPT  Nilcon Vane*	△ COV (ppm)	☐ TOV (ppm) 300 400	TION	GRAIN SIZ DISTRIBUT	
Lithology Plot		Sample Type	ple N	Recovery (%)	Ž.	DEPTH (m)	ELEVATION	<ul> <li>△ Intact</li> <li>▲ Remould</li> </ul>	<ul><li>♦ Intact</li><li>♦ Remould</li></ul>	W _P W	W _L	ALLA	(%)	ION
Litho	Geodetic Ground Surface Elevation: 213.0 m	Sam	Sam	Reco	SPT	DEP.	ELE	* Undrained Sh 20 40	ear Strength (kPa) 60 80	Plastic 20 40	Liquid 60 80		GR SA	SI CL
$\bowtie$	about 90 mm ASPHALT 213.0- grey Sand and Gravel FILL					Ė	-							
$\overset{ imes}{ imes}$	trace to some silt  moist	00		400	00	-								
$\overset{x}{\bowtie}$	212.1	SS	1	100	32	-		0		11				
$\overset{\sim}{\otimes}$	dark grey 0.9 Silty Clay / Clayey Silt FILL					- - 1	212 -							
$\overset{x}{\bowtie}$	trace to some sand, trace to some gravel	SS	2	83	14	_		0		12				
$\overset{\otimes}{\otimes}$						Ė								
$\overset{x}{\bowtie}$		SS	3	100	8	E _		0		o 24				
$\bigotimes$	210.8					— 2 - -	211 -							
	brown to grey 2.2  SILTY CLAY / CLAYEY SILT TILL  trace to some sand, trace gravel,					-								
	cobbles/boulders very stiff to hard	SS	4	100	22	_		0		°16				
	·					_ _ 3	210 -				.ii			
		SS	5	100	37	-						<u> </u>		
		00		100	37	-		Ĭ		14				
						1								
		SS	6	100	29	4 -	209 -	0		12				
						Ē								
						-								
	grey	SS	7	100	62	- - - 5	200		O	9				
							208 -							
						-	-				ļ			
						-								
					50 /	6	207 -	,	50					
		SS	8	100	100mm	-			50 100 mm	° 12				
						-								
						- - - 7								
						- '	206 -							
						-								
		SS	9	100	70 / 150mm	-			70 150 mm	a o				
					10011111	- - 8	205 -		150 mm					
						-								
						-								
						Ē								
						— 9 - -	204 -							
		SS	10	100	71	_			· · · · · · · · · · · · · · · · · · ·	16				
	203.3					-				10				
	END OF BOREHOLE 9.8									: :				

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com  $\frac{\nabla}{\overline{z}}$  No freestanding groundwater measured in open borehole on completion of drilling.

▼ Groundwater depth observed on <u>5/12/2020</u> at a depth of: <u>3.2 m</u>.

### RECORD OF BOREHOLE No. BH S16



Project Number: TP115086 Project Name: Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47)

Project Location: Clarkway Drive, Brampton, Ontario

	LITHOLOGY PROFILE	sc	IL SA	MPLI	NG			FIELD TESTING	LAB TESTING		
ology Plot	DESCRIPTION					РТН (m)	EVATION (m)	PenetrationTesting  ○ SPT □ PPT ● DCPT  MTO Vane* Nilcon Vane*  △ Intact ◇ Intact  ▲ Remould ◆ Remould	Soil Vapour Reading  ▲ COV (LEL) ■ TOV (LEL)  2	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
Lif	50 mm dia manifaring wall with flushers and	Sar	Sar	Re	SP.	DE	EL	20 40 60 80	Plastic Liquid 20 40 60 80	NS NS	GR SA SI CL
Lithology Plot	50 mm dia. monitoring well with flushmount protective casing installed (depth below ground surface):  Concrete: 0.0 - 0.3 m Sand: 0.3 - 0.6 m Bentonite: 0.6 - 5.5 m Sand Filter: 5.5 - 6.1 m Screen: 6.1 - 9.1 m  Groundwater measurements in monitoring well (depth below ground surface):  12 May 2020: 3.2 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	MTO Vane* Nilcon Vane*  △ Intact ◇ Intact	△ COV (ppm) □ TOV (ppm) 100 200 300 400  W _P W W _L Plastic Liquid	INSTRUMENTAT INSTALLATION	GRAIN SIZE DISTRIBUTION (%)



# SECTION E EAST – WEST ARTERIAL ROAD (FROM THE GORE ROAD TO COLERAINE DRIVE, ~2.4 KM)

**RECORD OF BOREHOLES** 



R	ECORD	OF BOREHOL													W	00	d					
Pro	ject Number:		Drilling	g Loca	tion:	E-W	Arterial	Road,	Sta. 0	+000 E	:60458	3 N:4850	0435	Logged by:	MS	•						
Pro	ject Client:	City of Brampton							Drilling	g Meth	od:	150	mm So	lid Ster	n Aug	jers				Compiled by:	ZF/K	<u>c</u>
Pro	ject Name:	Arterial Road Network v Plan Area (Area 47)	within Hi	ghway	/ 427 lr	dustria	al Seco	ndary	Drilling	y Mach	ine:	Truc	k Moun	ted Dril	<u> </u>					Reviewed by:	SM/D	<u>P</u>
Pro	ject Location:	Brampton, Ontario							Date S	Started	:	Jan.	11, 2022	<b>2</b> D	ate Co	mplete	d: <u><b>Jaı</b></u>	n. 11, 202	2	Revision No.:	0, 3/1	7/22
	LITI	HOLOGY PROFILE		SO	IL SA	MPLI	NG			F	ELD	TEST	ING			ESTIN						
							(%					itionTes	-	▲ CO	/ (LEL)	our Readir	V (LEL)	NOIT		COMMEN &	TS	
lot		DESCRIPTION		be	Sample Number	(%)	SPT 'N' / RQD (%)	_	E) N	O SP			DCPT  Vane*	2 △ CO ¹	4 / (ppm) 40	6 □ TC	V (ppm)	INSTRUMENTATION INSTALLATION		GRAIN SI		
Lithology Plot				Sample Type	le Nc	Recovery (%)	Ž.	DEРТН (m)	ELEVATION	Δ In	tact emould	♦ II	on Vane* ntact Remould	20 W _P		N PO	W _L	RUME		DISTRIBUT (%)	ION	
Lithol	Geodetic Ground	Surface Elevation: 203.0 m		Samp	Samp	Reco	SPT	DEP.	ELE		rained Sh 0 40		gth (kPa) 80	Plas 20		60 L	iquid 80	INST	GR	SA	SI	CL
		Surface Elevation: 203.0 m about 100 mm TOPSOIL brown	202.9 0.1					-	-			:		:	:							
	tra	Silty Clay FILL ace gravel, trace organics		SS	1	42	10	Ė		.0					22							
		<u>brown</u>	<u>202.4</u> 0.7					ŧ		1												
	SILT	Y CLAY / CLAYEY SILT TILL trace gravel, oxidation		SS	2	46	10	- - 1	202 -	0												
		firm to stiff		00		40	10	Ē		ļ				Īi`	25	• • • • • • • •						
								ŧ		<b></b>												
		grey		SS	3	75	7	ŀ		ļ				<b>A</b>	24 :							
			200.9					- 2	201 –	ļ		:	:		24 :	<u></u>	<u>:</u>					
		END OF BOREHOLE	2.1									:	:		:	:	:					
												:	:		:							
												:	:	:	:	:	:					
												:	:		:	:	:					
													:									
												:	:		:	:	:					
												:	:		:	:	:					
												:	:			:	:					
												:	:	:	:	:	:					
													:									
												:	:									
													:									
													:									
															:	:						
												:	:		:							
													:									
													:									
Was	d E&IS. a Divis	sion of Wood									•	•	•	<u> </u>	•	*	-					

 $\frac{\vee}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD	OF BOREHOLE No	). <u>I</u>	<u>3H E</u>	<u>=2</u>								WC	ood.
Pro	oject Number: TP115086								Location:	E-W Arterial	Road, Sta. 0+100 E:60464	1 N:4850507		MS
Pro	ject Client:	City of Brampton						Drilling	g Method:	150 mm So	lid Stem Augers		Compiled by:	ZF/KC
Pro	ject Name:	Arterial Road Network within Hi Plan Area (Area 47)	ghway	427 In	dustria	al Seco	ndary	Drillino	g Machine:	Track Mount	ed Drill		Reviewed by:	SM/DP
Pro	ject Location:	Brampton, Ontario						Date S	Started:	Jan. 11, 2022	Date Completed: Jai	n. 11, 2022	Revision No.:	0, 3/17/22
	LITH	OLOGY PROFILE	SC	IL SA	MPLI	NG			FIELD	TESTING	LAB TESTING			
1				ber		(%)		(E)	1	ionTesting PPT • DCPT	Soil Vapour Reading  ▲ COV (LEL) ■ TOV (LEL)  2 4 6 8	INSTRUMENTATION INSTALLATION	COMMEN & GRAIN SI	
Lithology Plot		DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD	Ē	ELEVATION	△ Intact	Nilcon Vane*  ♦ Intact	Δ COV (ppm) □ TOV (ppm) 20 40 60 80  W _P W W _L	JMEN LATIC	DISTRIBUT	
tholog			ample	ample	ecove	Ϋ́	DEРТН (m)	LEVA	* Undrained Sh	Remould ear Strength (kPa)	Plastic Liquid	ISTRU	(%)	CI CI
.⊐ <b>XXX</b>	Geodetic Ground	Surface Elevation: 204.6 m about 76 mm TOPSOIL 204.5	Ö	ΐ	Ř	Ø	-	Ш	20 40	60 80	20 40 60 80	22 6	R SA	SI CL
	trace	dark brown Silty Clay FILL gravel, trace cobbles, trace organics/rootlets 203.9	SS	1	38	7		204 -	0		o 28			
	trace s	brown 0.7  SILTY CLAY TILL sand, trace gravel, oxidation very stiff to hard	SS	2	100	15	- 1 - 1		0		<b>a</b> o _{1/4}			
		brownish grey					-  -  -  -	203 –						
			SS	3	50	26	- 2		· · ·		9 O 1/4			
			SS	4	100	44	- - - -	202 -		)	B 0 ₁₄			
		grey	SS	5	83	32	- 3 - -		0		a · o ₁₁			
							- - - - 4	201 -						
			SS	6	71	26			0		a o 13			
	about 100	mm of sandy seam with gravel 199.4	SS	7	79	29	- - - 5	200 -	O		o ₄			
<i>712</i> x		END OF BOREHOLE 5.2												
	d ESIS a Divisi													

 $\frac{\nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RECORD OF BOREHOLE No. BH E3														W	20	d	
Pro	ject Number:	TP115086						Drilling	g Location:	E-W Arterial	Road, Sta.	0+200 E:60470	3 N:4850	585 Lo		MS	•
Pro	ject Client:	City of Brampton						Drilling	g Method:	150 mm Sol	lid Stem A	ugers		C	ompiled by:	ZF/K	<u>.c</u>
Pro	ject Name:	Arterial Road Network within Hi	ghway	/ 427 Ir	ndustria	al Secor	ndary	Drilling	g Machine:	Track Mount	ted Drill			R	eviewed by:	SM/E	)P
Pro	ject Location:	Plan Area (Area 47) Brampton, Ontario						Date S	Started:	Jan. 11, 2022	2Date	Completed: <u>Jar</u>	n. 11, 2022	R	evision No.:	0, 3/1	7/22
	LITH	OLOGY PROFILE	SC	DIL SA	MPLI	NG			FIELD	TESTING		TESTING					
Lithology Plot		DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane* Δ Intact ▲ Remould * Undrained Sh	<ul> <li>♦ Intact</li> <li>♦ Remould</li> </ul> ear Strength (kPa)	△ COV (LE 2	apour Reading L)	INSTRUMENTATION INSTALLATION	<b>[</b> GR	COMMEN & GRAIN S DISTRIBU (%)	IZE	CL
<u> </u>	Geodetic Ground	Surface Elevation: 205.9 m about 76 mm TOPSOIL 205.8-	S	S	<u> </u>	S	-	_ ш	20 40	60 80	20 4	0 60 80	22	OIT	- Ort	-	
<b>**</b>		dark brown Silty Clay FILL nd, trace gravel, trace organics 205.2	SS	1	42	7	-	-	<b>O</b> · · · · · · ·		28						
		brown / brownish grey 0.7  SILTY CLAY TILL d to sandy, trace gravel, oxidation stiff to very stiff	SS	2	100	14	- - - 1 - - - -	205 —	0	1	a o ₁₇						
		203.7	SS	3	100	21	- - - - - 2	204 -	0		18 <b>29</b>			1	22	50	27

 $\frac{\nabla}{\overline{z}}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RE	ECORD	OF BOREHOLE No	o. <u>I</u>	<u> 3H E</u>	<u> </u>																W	20	d
Proj	ect Number:	TP115086						Drilling	Location	n:	E-V	V Arte	erial I	Road	, Sta.	0+30	0 E:6	0476	6 N:485	0663	Logged by:	MS	
Proj	ect Client:	City of Brampton			Drilling	Method	d:	150	0 mm	Soli	id Ste	em A	ugers	i				Compiled by:	ZF/K	<u>c </u>			
Proj	ect Name:	Arterial Road Network within Hi	ighway	/ 427 Ir	dustria	al Seco	ndary	Drilling	Machir	ne:	Tra	ck Me	ounte	ed Dr	ill						Reviewed by:	SM/E	)P
Proj	ect Location:	Plan Area (Area 47) Brampton, Ontario						Date S	tarted:		Jan	ı. 11, i	2022	!	Date (	Comp	leted:	<u>Jar</u>	ı. 11, 202	22	Revision No.:	0, 3/1	17/22
	LITH	OLOGY PROFILE	SC	IL SA	MPLI	NG			FIE	LD.	TES	TING	3			TES apour R	TING	i	7		00111151	то.	
Lithology Plot		DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEPTH (m)	ELEVATION (m)	O SPT  MTO \ △ Intac  A Ren  * Undrain	/ane*	PPT Nild	Intact Remoi ength (k	OCPT ane* uld :Pa)	△ CI 2  △ CI 2  VI	OV (LE OV (pp 0 4 V _p	(EL)	TOV 6 8 TOV 80 8 Liqu	(ppm) ) /L d	INSTRUMENTATION INSTALLATION	GR	GRAIN SI DISTRIBUT (%)	ZE	CL
***	Geodetic Ground	Surface Elevation:         205.1 m           about 76 mm TOPSOIL         205.0	0)	0)	<u> </u>	0)	-	205 —	20	40	60	9,0	_		0 4	io 6	0 8	,	==				
	trace sar	dark brown Silty Clay FILL  nd, trace gravel, trace organics	SS	1	79	7	- - -	- - -	0				· · · · · 2	3	O ₂₆								
	trace to so	brown 204.4 0.7 SILTY CLAY TILL me sand, trace gravel, oxidation stiff to hard	ss	2	100	12	- - - 1 - -	204 —	0					3 0	15								
			ss	3	100	21	- - - - - - 2	- - - -	0					· · · · · · · · · · · · · · · · · · ·	4								
		trace cobbles						203 —															
		202.0	SS	4	33	49	- - - 3	-			<b>⊙</b> · i		· · · · · g	ı ∙ o 1	4								
222		END OF BOREHOLE 3.0					- 3		:	<u>-</u> -		:						••••					
Woo	d E&IS, a Divis	on of Wood					dino					o of de	rilling										

Canada Limited

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

Borehole details as presented, do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified Geotechnical Engineer or Professional Geoscientist. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying Explanation of Borehole Log'.

RE	CORD	OF BOREHOLI	E No	. <u>E</u>	3H E	<u>=5</u>												W	00	Q.
Proj	ect Number:	TP115086							Drilling	Location:	Ē	-W Arterial	Road, Sta.	0+400	E:60482	8 N:485	0742		MS	
Proj	ect Client:	City of Brampton							Drilling	Method:	_	150 mm Sol	id Stem A	ugers				Compiled by:	ZF/K	<u>c</u>
Proj∉	ect Name:	Arterial Road Network with Plan Area (Area 47)	ithin Hig	hway	427 In	dustria	ıl Seco	ndary	Drilling	Machine:	Ţ	rack Mount	ed Drill					Reviewed by:	SM/D	)P
Proje	ect Location:	Brampton, Ontario							Date S	tarted:	J	an. 11, 2022	Date	Compl	eted: <u>Jaı</u>	n. 11, 202	22	Revision No.:	0, 3/1	7/22
_	LITH	OLOGY PROFILE		SO	IL SA	MPLI	NG			FIELD	) TE	STING		TES		_				
					_		(%)		Œ	1		nTesting	▲ COV (LE	apourke EL) ■ 4 6	TOV (LEL)	INSTRUMENTATION INSTALLATION		COMMEN &		
100		DESCRIPTION		ype	Sample Number	(%)	SPT 'N' / RQD (%)	<u> </u>		MTO Van	e* 1	Nilcon Vane*	△ COV (pp		TOV (ppm)	ENT/		GRAIN SI DISTRIBUT		
Lithology				Sample Type	N eldı	Recovery (%)	Ż	DEРТН (m)	ELEVATION	△ Intact ▲ Remould	d •		W _p	W	W _L	TRUN		(%)		
, Lift	Geodetic Ground	Surface Elevation: 203.2 m	200.4	Sam	Sam	Rec	SPT	DEF			Shear 40	Strength (kPa) 60 80	Plastic 20 4	40 60	Liquid 0 80	NS. NS.	GR	SA	SI	CL
	a	about 100 mm TOPSOIL dark brown / brown Silty Clay FILL	203.1 0.1	ss	1	83	7	Ė	203 —				<b>a</b> n							
▓	some sar	nd, trace gravel, trace organic					<u> </u>	F	-	]			3							
劉		brown	202.6 0.7					Ę	-											
N	trace	SANDY SILT TILL clay, trace gravel, oxidation clay seams in SS2		SS	2	100	6	1	-	0			ø 21		· · · · · · · · · · · · · · · · · · ·					
		loose to compact moist						}	202				Z1							
			-					Ē	-		: : :									
1				ss	3	100	29	Ė	-	0			 17		· · · · · · · · · · · · · · · · · · ·					
4		END OF BOREHOLE	201.1	$\dashv$				<u> </u>		ļ	<u>:</u>									
		END OF BUREHOLL	2.1												•					
															•					
													:		:					
											:				:					
												: :			:					
											:				:					
											:	: :			:					
											:				:					
															:					
											:				:					
															:					
											:									
											:				:					
											:				:					
											:				:					
															:					
											:	: :			:					
															:					
											:									
															:					
															:					
												: :			:					
															:					
															:					
															:					
											:									

 $\frac{\nabla}{\overline{z}}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RE	ECORD OF MONITORING	WE		No.	<u>BH</u>	<u>  S1</u>	<u>7</u>							1	NC	00	d.
Proj	ect Number: TP115086						Drilling	g Location:	E-W Arterial	Road, C	ulvert E	E:604874	N:4850797	_ Logged	by:	MS	_
Proj	ect Client: City of Brampton						Drillin	g Method:	150 mm So	id Stem	Augers			_ Compile	d by:	PR	
Proj	ect Name: Arterial Road Network within Secondary Plan Area (Area 47		y 427	Indust	rial		Drilling	g Machine:	Track Mount	ed Drill				_ Reviewe	ed by:	SM/DF	
Proj	ect Location: Brampton, Ontario	,					Date	Started:	Jan. 12, 202	Dat	e Compl	eted: <u>Ja</u> ı	n. 12, 2022	_ Revision	No.:	0, 5/2/	22
	LITHOLOGY PROFILE	SC	DIL SA	MPLI	NG		Τ	FIELD	TESTING		3 TEST						
					(%)		=		tionTesting	Soil  COV (	Vapour Rea LEL) ■ 4 6	ading TOV (LEL) 8	NOIT	CON	IMEN &	TS	
olot	DESCRIPTION	e e	ımber	(%	gg (	_	E N	O SPT   MTO Vane*	PPT • DCPT Nilcon Vane*		<u> </u>	TOV (ppm)	TION	GRA DISTR	IN SI		
Lithology Plot		Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	TH (m)	ELEVATION	<ul> <li>△ Intact</li> <li>▲ Remould</li> </ul>	<ul><li>♦ Intact</li><li>♦ Remould</li></ul>	W _P	W	WL	INSTRUMENTATI INSTALLATION		(%)	ION	
Litho	Geodetic Ground Surface Elevation: 202.6 m	Sam	Sam	Reco	SPT	DEPTH	ELE	* Undrained She 20 40	ear Strength (kPa) 60 80	Plastic 20	40 60	Liquid 80	TST	GR SA		SI	CL
	about 100 mm TOPSOIL 202.5 dark brown / brown Sandy Silt FILL	ss	1	100	9	-		0		17			=				
₩	trace clay, trace gravel, trace cobbles, trace organics 201.9					<u>-</u>	202 -										
$\mathcal{M}$	SILTY SAND / SANDY SILT TILL trace clay, trace gravel, trace cobbles, oxidation in	SS	2	100	68	_ _ 1			0 1	1 0 ₈							
$\mathcal{I}$	SS2 and SS3 very dense moist																
		SS	3	100	88	-	201 -		0 1	1.0							
						2				11							
M	grey	SS	4	100	50 / 150mm	-		_ :5 _ :5	0 150 mm	9							
						-	200 -										
$\mathcal{M}$		SS	5	100	50 / 100mm	3		5	0 100 mm	10,				7 41		49	3
						_											
$\mathcal{M}$				100	50/	-	199 -	5	0								
$/\!\!/$		SS	6	100	100mm	- - 4 -			0 100 mm	7							
$\mathcal{M}$						-	_										
1	 wet	SS	7	100	50 / 50mm	Ęż	Z = 198 −	5	0 50 mm	9							
$\mathcal{H}$						- 5 -											
						-		Ī : :				-					
	grey 5.5 <b>WEATHERED SHALE</b>					Ē	197 -										
						- - 6											
	maissand seithe mines and it	SS	8	100	72	-				7 :							
	mixed with clayey soil					Ė	196 -	<u> </u>		· · · · · · · · · · · · · · · · · · ·							
	195.6 END OF BOREHOLE 7.0	SS	9	100	60	_ _ 7_			0	06 :							
	50 mm dia. monitoring well with 1.0 m stick-up protective casing installed (depth below ground surface):																
	Bentonite: 0.0 - 3.4 m Sand Filter: 3.4 - 6.9 m									:		:					
	Screen: 3.8 - 6.9 m  Groundwater level measured in monitoring well:																
	26 Jan 2022: 3.3 m 1 Apr 2022 : 0.0 m																
										:		:					
									: :	:		:					
										:							
	d E&IS, a Division of Wood	vater leve	l el was ir	nferred f	rom soil	conditi	ions dur	ing drilling		-		-	<u> </u>				
50 V	ogell Road, Units 3 & 4																
Cana Tel. I	No.: (905) 415-2632 a qualified Geot	echnical E	Engineer	or Profes	ssional G	eoscient	tist. Also.	borehole inform	ntial conditions pre ation should be re	sent and re	quire interp	oretative ass	sistance from nical report		S	Scale: 1	: 53
www	.woodplc.com		.oneu all	a uie acc	Jiiipaliyl	. 9 Expli	anation 0	. Doronole Lug .							Pa	ige: 1	of 1

Page: 1 of 1

R	ECORD OF BOREHO	DLE N	o. <u> </u>	BH	<b>E6</b> /	<b>S18</b>	3												W	100	od.
Pro	ject Number: TP115086							Drillin	g Location:				Roac	l, Sta	. 0+5	00 E:604	885	L	ogged by	: <u>M</u>	И
										_1	50 mr	n Sol			uger	s			compiled	· —	
	Secondary Plan Area	k within H (Area 47)	ighwa	y 427 I	ndustr	ial		•							0	.1.41. 1.	40 00			' —	
PIO	Date Started: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Revision Date Started: Date Completed: Date Completed: Jan. 12, 2022 Revision Date Started: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Revision Date Started: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Revision Date Started: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Revision Date Started: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Revision Date Started: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 12, 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Completed: Jan. 2022 Date Complete														evision i	10.: <u>U,</u>	5/2/22				
	Complete   City of Brampton														COMN	ENTS					
t .	DESCRIPTION		0	iber	<u> </u>	(%) Qi			1		,	′ I	2		4 (	ρ Ą	NTATIO		GRAIN		
Lithology Plot	DESCRIPTION		е Туре	e Nur	ery (%	4. / RG	(ш) н	ATION	△ Intact	♦	Intact	.	2	0 4	10 6	0 80	RUME		DISTRIE (%		N
Litholc	Geodetic Ground Surface Elevation: 204.8 m		Sampl	Sampl	Recov	SPT 1	DEPT	ELEV,	* Undrained S	Shear S	trength	(kPa)			i0 6		INSTE INSTA	GR	SA	SI	CL
	dark brown / brown	204.7 0:7	99	1	100	6	_			:				. 0	:						
₩			33	'	100	Ü	Ė							29	)						
	SILTY CLAY TILL	0.7					-	204 -	<u> </u>												
		ion	SS	2	100	30	- 1 -					Ω	1:	2		· · · · · · · · · · · · · · · · · · ·					
							-		ļ <u>.</u>	: : :	:				:	:					
			SS	3	100	36	-	203 -	1	· ·		@	ı · · o .		<u>.</u>						
		202.6					_ 2		<u> </u>	: : :				4	: : :						
1	SILTY SAND / SANDY SILT TILI	2.2 L	SS	4	100		F		<u> </u>	.50 Q	mm	μ	10 ₇ .			: :					
//	SS5	didation in					Ē	202 =	<u> </u>		: : :				: : :	· · · · · · · · · · · · · · · · · · ·					
//	moist					50 /	_ 3	202	<u> </u>	:50 :											
//			SS	5	100		_		<u> </u>	80	mm		8								
$\mathbb{Z}$							_		<u> </u>	: : : · · · ·											
1	grey and wet		SS	6	100	84 /	- - 4 <u>-</u>		<u> </u>	: : : :	8	4	ı · · o ;		-						
$\mathbb{Z}$						TOOMM	-	-	ļ	: : :		100	mm 1	3							
1			cc	7	100	50 /	-		ļ	50											
$\mathcal{X}$			33	,	100	150mm	-	200 -	<u> </u>	15	0 mm		10								
							— 5 - -		Ī	· · · · · · · · ·	:				-		ļ				
$\mathcal{X}$							-		<u> </u>	: : : · · · ·											
							_	199 -	<u> </u>	: : :											
$\mathcal{U}$			SS	8	100		6		<u> </u>	: :6	: 64 .O		1 O_			: : : : : : : : : : : : : : : : : : : :					
1						150mm	E		<u> </u>		150	mm	8								
//							_	198 -	<u> </u>	: : :											
1/							- - 7		ļ <u>.</u>	: : :											
//							_		<u> </u>	: : :											
//			SS	9	100		<u>-</u> -	107	Ī	50 50	:		ı o					6	34	59	1
$\langle \cdot \rangle$						80mm	- - - 8	197 -	ļ <u>.</u>	: 80	:mm		1	4							
							-		ļ <u>.</u>	: : · · · · ·											
112							-		] <u>.</u>	: : :											
	Weathered SHALE						E 。	196 -		: : :											
		195.4	SS	10	100	50 / 50mm	<u> </u>		<u> </u>	50		<b>.</b>	10 ₇		-						
	END OF BOREHOLE	9.3				2211111				<del>- 50</del>	······································										
	d E&IS, a Division of Wood	Z Groundwa	ater leve	el was in	ferred f	rom soil	condit	ions dur	ng drilling					Cav	e in de	pth after re	moval of a	augers: <u>4</u>	<u>.6 m</u> .		
50 V	logell Road, Units 3 & 4 mond Hill, Ontario, L4B 3K6																				
Can Tel.	E&IS, a Division of Wood a Limited  □ Groundwater level was inferred from soil conditions during drilling □ Cave in depth after removal of augers: 4.6 m.    Groundwater level was inferred from soil conditions during drilling   Cave in depth after removal of augers: 4.6 m.    Groundwater level was inferred from soil conditions during drilling														e: 1 : 53						
	aprocessin																		- 1	Page:	1 of 1

RE	ECORD OF BOREHOLE	No.	<u>BH</u>	<u>E7</u>								W	ood.
Proje	ect Number: TP115086						_ Drillino	g Location:	E-W Arterial	I Road, Sta. 0+600 E:604	955 N:4850896		MS
Proje	ect Client: City of Brampton						Drillino	g Method:	150 mm So	olid Stem Augers		_ Compiled by:	ZF/KC
Proje	ect Name: Arterial Road Network with Plan Area (Area 47)	in Highwa	y 427 I	ndustri	al Seco	ondary	_ Drillino	g Machine:	Track Moun	ted Drill		_ Reviewed by:	SM/DP
Proje	ect Location: Brampton, Ontario						Date S	Started:	Jan. 12, 2022	2 Date Completed: J	an. 12, 2022	_ Revision No.:	0, 3/17/22
	LITHOLOGY PROFILE	SC	OIL S	AMPL	NG			FIELD	TESTING	LAB TESTING Soil Vapour Reading		201115	
			_		(%)		Ê	1	tionTesting PPT • DCPT	▲ COV (LEL) ■ TOV (LEL	INSTRUMENTATION INSTALLATION	COMMEN &	
Plot	DESCRIPTION	ype	Sample Number	(%)	3QD	Ē	NO NO	MTO Vane*	Nilcon Vane	Δ COV (ppm) □ TOV (ppn	O S O O	GRAIN S DISTRIBU	IZE TION
Lithology Plot		Sample Type	ble N	Recovery (%)	SPT 'N' / RQD	DEPTH (m)	ELEVATION	△ Intact ▲ Remould	♦ Intact Remould	W _P W W _L	ALLY	(%)	
Litho	Geodetic Ground Surface Elevation: 204.9 m		Sam	Reco	SPT	DEP		* Undrained She 20 40	ear Strength (kPa) 60 80	Plastic Liquid 20 40 60 80	ISNI ISNI	GR SA	SI CL
	dark brown / brown	4:8		1	_	ŀ							
▓	Silty Clay FILL some sand, trace gravel, trace organics	SS	1	33	5	Ē		10		27	1		
		0.7				ŧ					1		
	SILTY CLAY / CLAYEY SILT TILL some sand, trace gravel, oxidation very stiff to hard	SS	2	100	17	- 1	204 -						
	very stiff to hard	33	2	100	''	Ē				°13			
						‡		ŧ					
		ss	3	100	36	Ē				17 32	.] ]	5 17	46 32
	20	12.8		100		_ 2	203 -			14		0 11	40 32
77.5		2.1							: :		1		
									: :				
								: :					
										* * * * * * * * * * * * * * * * * * * *			
									: :				
									: :				

 $\frac{\nabla}{\overline{z}}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RE	ECORD	OF BOREHOLE N	o. <u>l</u>	<u>BH I</u>	<u>E23</u>														W	00	d
Proj	ect Number:	TP115086						Drilling	Loca	tion:	<u>E-\</u>	N Arte	erial l	Road, Sta	a. 2+2	00 E:60560	6 N:485	<b>2284</b>		MS	•
Proj	ect Client:	City of Brampton						Drilling	Meth	od:	15	0 mm	Sol	id Stem	Auger	s		′	Compiled by:	ZF/K	C
Proj	ect Name:	Arterial Road Network within H Plan Area (Area 47)	ighway	y 427 Ir	ndustria	al Seco	ndary	Drilling	Mach	nine:	Tra	ack Mo	ounte	ed Drill				!	Reviewed by:	SM/E	)P
Proj	ect Location:	Brampton, Ontario						Date S	tarted	:	Jai	n. 13, :	2022	Date	e Com	pleted: <u>Ja</u>	n. 13, 202	<u>22</u>	Revision No.:	<u>0, 3/1</u>	17/22
	LITH	IOLOGY PROFILE	SC	DIL SA	MPLI	NG			F	IELD	TES	STING	G			STING					
				_		(%)		=	O SP			esting				Reading TOV (LEL) 6 8	NOIT		COMMEN &	ITS	
Plot		DESCRIPTION	ype	Sample Number	(%)	SQD (	Ē	(m) NC	MTC	) Vane	* Nil	Icon V	ane*		opm) [	TOV (ppm) 60 80	INSTRUMENTATION INSTALLATION		GRAIN S DISTRIBU		
Lithology Plot			Sample Type	l ble N	Recovery (%)	SPT 'N' / RQD	DEРТН (m)	ELEVATION		emould		Intact Remo		W _p	w	W _L	IRUN PALL/		(%)		
Litho	Geodetic Ground	Surface Elevation: 210.7 m		Sam	Rec	SPT	E			rained S 0 4		rength (k 0 80		Plastic 20		Liquid 60 80	SN S	GR	SA	SI	CL
		about 76 mm TOPSOIL 210.6- dark brown / brown	ss	1	100	3	Ė		<u></u>												
₩	trace sar	Ity Clay / Clayey Silt FILL  nd, trace gravel, trace organics,  oxidation		'	100		-		ľ					• • • • • • • • • • • • • • • • • • •	.8						
****		brown / light brown  Y CLAY / CLAYEY SILT TILL					Ē	210 -													
	some sand	I to sandy, trace gravel, oxidation stiff to very stiff	SS	2	100	10	_ 1							0							
		oun to vory oun					Ė		1												
							F	209 -	ļ						• • • • • •						
			SS	3	100	27	Ē	203	<del> </del>	·O··			g	15 <b>25</b>		: :		1	28	51	20
		208.5 <b>END OF BOREHOLE</b> 2.1					<u> </u>	,	<b> </b>					·	÷	<del></del>					
															:						
														:	:						
														:	:						
														:	:						
															:						
															:						
														:	:						
															:						
														:	:						
														:	:						
														:	:						
														:	:						
															:						
															:						
														:	:						
														:	:	: :					
															:						
			1	1					1	: :				:	:	: :	I I				

 $\frac{\nabla}{\Delta}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RI	ECORD	OF BOREHOLE NO	o. [	<u> 3H F</u>	<u> E24</u>																W	0	0	d
Proj	ject Number:	TP115086				_ Drilling	g Loca	ation:	Ē	-W Art	terial	Road	, Sta.	2+30	0 E:6	30561	4 N:485	52383	Logged by:	_	MS			
Proj	ject Client:	City of Brampton				_ Drilling	g Meth	nod:		150 mn	n Sol	lid St	em A	ugers	<u>;                                    </u>				Compiled by:	<u>z</u>	ZF/KC			
Proj	ject Name:	Arterial Road Network within Hi Plan Area (Area 47)	ndustria	al Seco	ndary	_ Drillinç	g Mac	nine:	Ī	rack M	lount	ed Dr	<u>ill</u>						Reviewed by:	5	SM/DP	,		
Proj	ject Location:	Brampton, Ontario						_ Date S	Started	i:	J	an. 13,	2022	!	Date	Comp	oleted:	<u>Jar</u>	n. 13, 20	22	Revision No.:	0	<u>), 3/17/</u>	/22
	LITH	OLOGY PROFILE	SC	JIL SA	AMPLII	NG	$\Box$	$\top$	F	IELC	) TE	STIN	G	_			TING							
						(%)						nTestin	-		OV (LE	EL)	Reading TOV	(LEL)	NOIL		COMMEI &	NT	S	
olot	l	DESCRIPTION	be	Sample Number	(%)	3) dp;	٦	(m) NC	O SF	) Vane	e* 1	r⊤		Δ C	OV (pp	om) 🗆	6 8 I TOV 60 80	(ppm)	INSTRUMENTATION INSTALLATION		GRAIN S DISTRIBU			
Lithology Plot	l	!	Sample Type	ole Nt	Recovery (%)	SPT 'N' / RQD	DEРТН (m)	ELEVATION	△ II	ntact Remould	i {	Intact Remo	t		N _P	W 6		N _L	RUMF		(%)	- I IC	JΝ	I
Litho	Geodetic Ground	Surface Elevation: 210,7 m about 76 mm TOPSOIL 210,7-		Sami	Reco	SPT	DEP.	ELE	* Unc	drained S 20 4	Shear 40	Strength (	(kPa) 30		lastic 20 4	40 6	Liqui 60 80		INST	GR	R SA	SI		CL
‱		dark brown / brown	SS	1	100	10	F	-		:	:											_		
₩	trace sar	Ity Clay / Clayey Silt FILL nd, trace gravel, trace organics		1	100	10	E	-	]· O·	:	:		<u>r</u>	<b>a</b> · · · ·	26	:		.						I
		brown 210.1 0.7		二	#	<u> </u>	Ē	210 —	╡	:			: :		:	:		. 1						I
	trace to	Y CLAY / CLAYEY SILT TILL some sand, trace gravel, trace cobbles, oxidation	SS	2	100	22	F 1	-	<u> </u>	 O	:	:		• ° ₁		:		:						
	l	very stiff to hard				<u> </u>	Ē	-	<u> </u>	÷			: :	1	2 :	· · · · ·		<i>:</i> · · · · ·						
	ı		<u> </u>	<del> </del>	<del>                                     </del>		E	-	∄		: :							·····						
	l	!	SS	3	100	27	Ē	209 —	<del>]</del>	· O · ·				• • • • • • • • • • • • • • • • • • •	1		:	· · · · ·						
	l		<u> </u>	<u> </u>	<u> </u>	!	<u> </u>	-		<u>:</u>								<u>.</u>						
	l	!		<u> </u>	<u> </u>	<u> '</u>	Ē	-	<u> </u>	<u>:</u>		.;					;	<u>;</u>						I
		brownish grey	SS	4	100	36	Ē	208 —	<u> </u>				: : 	<b>A</b> .o.	:	<u>.</u>	: :	<u>.</u> J						I
	l	207.7					- - - 3		]	-	-			1	!	i								1
		END OF BOREHOLE 3.0								:	:													
																		· · · · · · · · · · · · · · · · · · ·						

 $\frac{\nabla}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD	OF BOREHOLE No	o. <u>I</u>	<u> 3H I</u>	<u> </u>																WO	00	d
Pro	ject Number:	TP115086						Drilling	Locati	on:	E-V	V Arte	rial F	Road,	Sta.	2+40	0 E:605	628 N	:485247	76 Logo		MS	<u> </u>
Pro	ject Client:	City of Brampton			Drilling	Metho	d:	150	) mm	Soli	id Ste	m Au	ıgers				_ Com	piled by:	ZF/K	<u>.c</u>			
Pro	ject Name:	Arterial Road Network within Hi Plan Area (Area 47)	ighway	/ 427 Ir	ndustria	l Seco	ndary	Drilling	Machi	ne:	Tra	ck Mo	unte	ed Dri	II					_ Revi	ewed by:	SM/E	)P
Pro	ject Location:	Brampton, Ontario						Date S	tarted:		Jan	. 13, 2	2022		Date (	Comp	leted:	lan. 13	, 2022	_ Revi	sion No.:	0, 3/	17/22
	LITH	IOLOGY PROFILE	SC	OIL SA	MPLII	NG			FI	ELD	TES	TING	;				TING						
gy Plot		DESCRIPTION	е Туре	Sample Number	ery (%)	N' / RQD (%)	н (ш)	ATION (m)	O SPT	□ Vane*	PPT Nile	Intact	CPT ane*	▲ CC 2	OV (LE DV (ppi DV 4	L) <b>I</b> 1 (m) <b>I</b>	eading TOV (LE 6 8 TOV (ppi 60 80 W _L	_  ⊱	LLATION	G	OMMEN & GRAIN SI STRIBUT (%)	ZE	
itholo			sampl	sampl	Secov	۱۲ TA	EPTI	i.EV	* Undra	ined Sh	ear Str	ength (kF	Pa)	Pla 20	astic 0 4	0 6	Liquid i0 80	NSTR	NSTA	GR		SI	CL
	DESCRIPTION    A														J 4		0 80	╅	=				
	Si trace sar	Ity Clay / Clayey Silt FILL nd, trace gravel, trace organics 208.6	SS	1	100	11		209 —	0			•••••			°30								
	SILTY trace to	Y CLAY / CLAYEY SILT TILL some sand, trace gravel, trace cobbles, oxidation	SS	2	100	12	- - - 1 -	208 -	0				 G	o 1,	3								
		sandy/silty seams	SS	3	100	32	-	-						ı · ⊙ 13									
		207.2					_ 2							13	3								
														-									
														•									
														•									
	ad E818 a Divisi									•	•	•		-									

 $\frac{\nabla}{\Xi}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RI	ECORD	OF BOREHOLE No	). <u>I</u>	<u> 3H E</u>	<u> </u>								WC	ood.
Proj	ject Number:	TP115086						Drilling	g Location:	E-W Arterial	Road, Sta. 2+500 E:60565	N:4852571		MS
Proj	ject Client:	City of Brampton						Drilling	g Method:	150 mm So	lid Stem Augers		Compiled by:	ZF/KC
Proj	ject Name:	Arterial Road Network within Hi	ghway	/ 427 In	ndustria	al Seco	ndary	Drilling	g Machine:	Track Mount	ed Drill		Reviewed by:	SM/DP
Proj	ject Location:	Plan Area (Area 47) Brampton, Ontario						Date S	Started:	Jan. 13, 2022	Date Completed: Jan	. 13, 2022	Revision No.:	0, 3/17/22
	LITH	OLOGY PROFILE	SC	IL SA	MPLI	NG			FIELD	TESTING	LAB TESTING			
				_		(%)		=	1	tionTesting	Soil Vapour Reading  ▲ COV (LEL) ■ TOV (LEL)  2 4 6 8	INSTRUMENTATION INSTALLATION	COMMEN &	TS
olot		DESCRIPTION	/be	Sample Number	(%)	SQD (	<u>-</u>	(E) NO	MTO Vane*	Nilcon Vane*	△ COV (ppm) □ TOV (ppm) 20 40 60 80	A NOTE	GRAIN SIZ DISTRIBUT	
Lithology Plot			Sample Type	ole N	Recovery (%)	SPT 'N' / RQD	DEРТН (m)	ELEVATION	△ Intact ▲ Remould	♦ Intact Remould	W _p W W _L	ALLA	(%)	1014
Litho	Geodetic Ground	Surface Elevation: 210.0 m about 76 mm TOPSOIL 209.9-	Sam	Sam	Reco	SPT	DEP	ELE	* Undrained She 20 40	ear Strength (kPa) 60 80	Plastic Liquid 20 40 60 80	TSNI G	R SA	SI CL
		dark brown / brown					-			: :				
₩	<b>Si</b> trace sar	ty Clay / Clayey Silt FILL nd, trace gravel, trace organics	SS	1	100	12					22			
****		<del>brown</del> <u>209.3</u> 0.7												
	SILT' trace to son	CLAY / CLAYEY SILT TILL ne sand, trace gravel, oxidation to	SS	2	100	17	- 1	209 -						
		SS5 very stiff to hard	33		100	17			1		as o 13			
							-		<del>-</del>					
			SS	3	100	20					<b>2</b>			
						20	_ 2	208 -	<u> </u>		a · · o · · · · · · · · · · · · · · · ·			
							-							
			SS	4	100	40					<b>a</b> 0			
							Ė				12 : : : : : : : : : : : : : : : : : : :			
							_ 3 _	207 -						
		grey	SS	5	100	23					a · o			
		206.3					-		<u> </u>		12 : : : : : : : : : : : : : : : : : : :			
A		grey 3.7 SANDY SILT TILL												
///	trace clay,	race gravel, dense to very dense moist to wet	SS	6	100	55	— 4 -	206 -		0	<b>a</b> o ₁₁			
							-							
И														
W		clayey seams	SS	7	79	37	- - - 5	205 -	0		a o 12			
<i>X</i> 1:		204.8 <b>END OF BOREHOLE</b> 5.2							<del> </del>					
		<u>.</u>							: :	: :	* * * * * * * * * * * * * * * * * * * *			
10/	d E&IS. a Divisi	on of Wood												

 $\frac{\bigvee}{=}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RE	CORD	OF BOREHOLE No	). <u>[</u>	<u>3H E</u>	<u> </u>								WC	ood.
Proje	ct Number:	TP115086						Drilling	Location:	E-W Arterial	Road, Sta. 2+600 E:60568	0 N:4852668		MS
Proje	ct Client:	City of Brampton						Drilling	Method:	150 mm Sol	lid Stem Augers		Compiled by:	ZF/KC
Proje	ct Name:	Arterial Road Network within Hi Plan Area (Area 47)	ghway	427 In	ndustria	l Seco	ndary	Drilling	Machine:	Track Mount	ted Drill		Reviewed by:	SM/DP
Proje	ct Location:	Brampton, Ontario						Date S	tarted:	Jan. 13, 2022	Date Completed: Jai	. 13, 2022	Revision No.:	0, 3/17/22
	LITH	OLOGY PROFILE	SO	IL SA	MPLII	NG			FIELD :	TESTING	LAB TESTING			
Lithology Plot		DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEРТН (m)	ELEVATION (m)	O SPT □  MTO Vane* Δ Intact ▲ Remould	ppt	Soil Vapour Reading  Δ COV (LEL) ■ TOV (LEL)  2 4 6 8  Δ COV (ppm) □ TOV (ppm)  20 40 60 80  W _p W W _L ■ 0  Plastic Liquid  20 40 60 80	INSTRUMENTATION INSTALLATION 6	COMMEN & GRAIN SI DISTRIBUT (%)	ZE
G	eodetic Ground	Surface Elevation: 211.1 m bout 100 mm TOPSOIL 211.0	0)	0)	<u> </u>	0)	-	211 —	20 40	÷ ÷	2,0 4,0 0,0 0,0	==		
	trace sar	Silty Clay FILL ad, trace gravel, trace organics 210.4	SS	1	75	5	-	- - -	0		a			
	SILT' trace to	brown 0.7  CLAY / CLAYE SILT TILL some sand, trace gravel, trace cobbles, oxidation very stiff	SS	2	100	21	- - - 1 -	210 —	O	ı	a o 12			
			ss	3	100	27	-  -  -  -	- - -	· · · · · · ·		<b>a</b> ○ 11			
		208.9					<u> </u>	209 —			11 : : :			
		END OF BOREHOLE 2.1												

 $\frac{\nabla}{\Xi}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD OF BOREHOLE N	o. <u>I</u>	BH E	<u> </u>									WC	ood.
Pro	ect Number: TP115086						Drilling	Location:	E-W Arterial	Road, Sta.	2+700 E:60571	4 N:4852764		MS
Pro	ect Client: City of Brampton						Drilling	Method:	150 mm So	lid Stem Au	ugers		Compiled by:	ZF/KC
Pro	ect Name: Arterial Road Network within H Plan Area (Area 47)	ighway	/ 427 In	dustria	al Seco	ndary	Drilling	Machine:	Track Mount	ed Drill			_ Reviewed by:	SM/DP
Pro	ect Location: Brampton, Ontario						Date S	tarted:	Jan. 13, 2022	Pate 0	Completed: <u>Jar</u>	. 13, 2022	_ Revision No.:	0, 3/17/22
	LITHOLOGY PROFILE	SC	OIL SA	MPLI	NG			FIELD	TESTING		TESTING			
					(%)			1	tionTesting	▲ COV (LE	apour Reading L) ■ TOV (LEL) 4 6 8	INSTRUMENTATION	COMMEN &	TS
lot	DESCRIPTION	e d	Sample Number	(%)	OD (	2	E N		PPT ● DCPT  Nilcon Vane*	△ COV (ppi	4 6 8 m) □ TOV (ppm) 0 60 80	ATNII	GRAIN SI	
Lithology Plot		Sample Type	le N	Recovery (%)	SPT 'N' / RQD	ОЕРТН (m)	ELEVATION	△ Intact ▲ Remould	♦ Intact ♠ Remould	W _P	W W _L	ALLA	(%)	ION
Litho	Geodetic Ground Surface Elevation: 212.4 m	Sam	Sam	Reco	SPT	DEP"	ELE	* Undrained SI 20 40	ear Strength (kPa) 60 80	Plastic 20 4	Liquid 0 60 80	INST INST	GR SA	SI CL
	Geodetic Ground Surface Elevation: 212.4 m   about 100 mmTOPSOIL   212.3   dark brown / brown   0.1					-	-							
	Silty Clay / Clayey Silt FILL trace sand, trace gravel, trace cobbles	SS	1	83	3		212 -			<b>a</b> · · · · · o	36			
	<u>brown</u> <u>211.7</u>						-							
	SILTY CLAY / CLAYEY SILT TILL trace to some sand, trace gravel, trace	SS	2	100	12	- 1	-			<b>a</b> 0 ₁₄				
	cobbles, oxidation sandy pockets in SS2 stiff to hard		_	100	'-		-			14				
	oun to mare					Ė	211 -							
		SS	3	13	32		-	0.		<b>a</b> o 14				
						— 2 -	-							
							210 -							
					40	-	-							
	209.4	SS	4	8	40	- - - 3	-	6		a · ∘ 13				
6.7.V.X.	END OF BOREHOLE 3.0							: :	: :					
									: :					
									: :					
									: :					
											: :			

 $\frac{\nabla}{\Xi}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

K	ECORD	OF BOREHOLE No	). <u>E</u>	<u>3H E</u>	<u> E29</u>														WC	00	d
Pro	ject Number:	TP115086						Drilling	Locatio	n:	<u>E-W A</u>	Arterial	Road,	Sta. 2	+800	E:60574	3 N:48528			MS	•
Pro	ject Client:	City of Brampton						Drilling	Method	l:	150 n	nm Sol	id Ste	m Aug	jers			Comp	iled by:	ZF/K	<u>c</u>
Pro	ject Name:	Arterial Road Network within Hi Plan Area (Area 47)	ghway	427 Ir	ndustria	l Seco	ndary	Drilling	Machin	e:	Track	Mount	ed Dril	II				Review	wed by:	SM/D	P
Pro	ject Location:	Brampton, Ontario						Date S	tarted:		<u>Jan. 1</u>	3, 2022		ate Co	omple	ted: <u>Jar</u>	. 13, 2022	Revisi	on No.:	0, 3/1	7/22
	LITH	OLOGY PROFILE	SO	IL SA	MPLI	NG			FIE	LD 1	ESTI	NG		AB T							
Lithology Plot		DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DEРТН (m)	ELEVATION (m)	O SPT  MTO V  Δ Intac  A Rem	□ F ane* t ould		DCPT  No Vane* act emould	▲ CC 20 W,	4 V (ppm) 40	<b>6</b>	TOV (LEL)  8 TOV (ppm) 80  W _L Liquid	INSTRUMENTATION INSTALLATION	GF DIS	OMMEN & RAIN SI TRIBUT (%)	ZE TON	
± XXXX	Geodetic Ground	Surface Elevation: 213.5 m about 76 mm TOPSOIL 213.4	- 5	<u> </u>	20	40	60	80	2,0 :		60 :	80	ŽŽ	GR	SA	SI	CL				
		dark brown / brown  Ity Clay / Clayey Silt FILL  ad, trace gravel, trace organics	SS	1	92	9	- - - -	213 -	.0				g ;	^O 28							
	SILTY trace to so	brown 0.7  ( CLAY / CLAYEY SILT TILL  me sand, trace gravel, oxidation  very stiff	SS	2	100	15	- 1 - 1	- - - -	0				011								
			SS	3	100	20	-	212 -	ø				12 ·····								
		211.3					<u> </u>	-					12								
		END OF BOREHOLE 2.1																			

 $\frac{\nabla}{\Xi}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

R	ECORD (	OF BOREHOLE N	o. <u>I</u>	<u> 3H E</u>	<u> </u>											V	VC	00	d
Pro	ject Number:	TP115086						Drilling	Location:	E-W Arter	rial R	Road, Sta.	2+900	E:60574	9 N:485296	5 Logged b	y:	MS	
Pro	ject Client:	City of Brampton						Drilling	Method:	150 mm	Soli	d Stem A	ugers			_ Compiled	by:	ZF/KC	<u>c</u>
Pro		Arterial Road Network within Hi Plan Area (Area 47)	ighway	/ 427 In	dustria	l Seco	ndary	<u>Drilling</u>	Machine:	Track Mou	unte	d Drill				_ Reviewed	l by:	SM/D	<u>P</u>
Pro		Brampton, Ontario						_ Date S	tarted:	Jan. 13, 20	022	Date	Compl	eted: <u>Jar</u>	n. 13, 2022	_ Revision l	No.:	0, 3/1	7/22
	LITHO	DLOGY PROFILE	SC	IL SA	MPLI	NG			FIELD :	FESTING		LAB	TES	TING					
lot		DESCRIPTION	be	mber	(%	QD (%)	_	(m) N	1	ionTesting PPT ● DC Nilcon Var	CPT	▲ COV (LE 2 △ COV (pp	4 € om) □	TOV (LEL) 8 8 TOV (ppm)	INSTRUMENTATION INSTALLATION	GRAI DISTR	& IN SI	ZE	
Lithology Plot	Goodatic Ground S	urface Elevation: 214.3 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD	DEРТН (m)	ELEVATION	△ Intact △ Remould  * Undrained She 20 40	♦ Intact Remould	d	W _p ■ Plastic	W 0 6	W _L	INSTRUME INSTALLA		(%)	SI	CL
***	al	cout 76 mm TOPSOIL 214.3- dark brown / brown					<u> </u>												
	Silt	y Clay / Clayey Silt FILL I, trace gravel, trace organics 213.7	SS	1	100	6	-	214 -	0		• • • • •	26							
	<b>SILTY</b> some sand t	brown 0.7 CLAY / CLAYEY SILT TILL o sandy, trace gravel, oxidation very stiff to hard	SS	2	100	17	- - - 1 - - -	213	0		 83	o _{1:4}							
			SS	3	100	20	- - - - - 2	- - - -	Ø · · ·			012							
			SS	4	100	33		212 —	0			0,2							
				4	100		- - - 3	-				12							
		greyish brown	SS	5	100	28	- - - -	211 —	0		a	12							
		grey	SS	6	100	23	- - 4 - - -	210 —	O		 ES	13 <u>24</u> 13				1 24		52	23
		209.2	SS	7	100	20	- - - - 5	- - - - -				· ° 11							
		END OF BOREHOLE 5.2																	

 $\frac{\nabla}{\overline{z}}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RE	ECORD OF	BOREHOLE No	o. <u>F</u>	<u>3H F</u>	<u>E31</u>								WC	ood.
Proj	ject Number: TP1	115086						Drilling	Location:	E-W Arterial	I Road, Sta. 3+000 E:60572	N:4853064		MS
Proj	ect Client: City	of Brampton						_ Drilling	Method:	150 mm So	olid Stem Augers		Compiled by:	ZF/KC
Proj	ject Name: Arte	erial Road Network within Hi n Area (Area 47)	ighway	<i>ı</i> 427 lr	ndustria	al Seco	ndary	Drilling	Machine:	Track Mount	ted Drill		Reviewed by:	SM/DP
Proj		mpton, Ontario						Date S	tarted:	Jan. 13, 2022	2Date Completed:	. 13, 2022	Revision No.:	0, 3/17/22
	LITHOLO	SC	SOIL SAMPLING			T	FIELD	TESTING	LAB TESTING					
Lithology Plot		SCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' / RQD (%)	DЕРТН (m)	ELEVATION (m)	O SPT □  MTO Vane* Δ Intact ▲ Remould * Undrained Sh	tionTesting  PPT   DCPT  Nilcon Vane*  Intact Remould ear Strength (kPa)	*	INSTALLATION  INSTALLATION	COMMEN' & GRAIN SI DISTRIBUT (%)	ZE
	Geodetic Ground Surface about 7			- O	12	- o	-	<u>, ш</u>	20 40	60 80	20 40 60 80	== -		<u> </u>
	dark l <b>Silty Cla</b> y trace sand, trac	brown / brown  y/ Clayey Silt FILL  ce gravel, trace organics	SS	1	100	10		- - - -	0		29			
	trace to some sa	brown 0.7  Y/CLAYEY SILT TILL and, trace gravel, oxidation very stiff	ss	2	100	19	- - - 1	214 —	<b>O</b>		B 0			
		,					-  -  -  -	- - -						
	END (	212.7 OF BOREHOLE 2.1	SS	3	100	20	_ 2	213 —			a o			
	d E818 a Division of N								: :					

 $\frac{\nabla}{\Xi}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com

RI	ECORD	OF BOREHOLE No	o. J	<u>BH [</u>	<u> </u>																W	0	od.
Proj	ject Number:	TP115086						_ Drilling	j Loca	ation:	Ē	-W Art	terial	Road	, Sta.	3+10	0 E:€	30568	3 N:48	53156	Logged by:	<u>M</u>	
Pro	ject Client:	City of Brampton						Drilling	y Meth	nod:	_1	150 mn	n Sol	id Ste	m A	ugers					Compiled by:	<u>Z</u> F	F/KC
Proj	ject Name:	Arterial Road Network within Hi Plan Area (Area 47)	ighway	<u>/ 427 lr</u>	ndustri	al Seco	ndary	_ Drilling	, Macl	nine:	Ţ	rack N	lount	ed Dr	ill						Reviewed by:	<u>SI</u>	M/DP
Pro	ject Location:	Brampton, Ontario						_ Date S	tarted	i:	<u>J</u>	an. 13,	2022		Date (	Comp	leted:	<u>Jar</u>	n. 13, 20	22	Revision No.:	<u>0,</u>	3/17/22
	LITH	OLOGY PROFILE	SC	OIL SA	MPLI	NG			_ <u>F</u>	IELC	) TE	STIN	G	L			TING	;					
						(%)	ĺ	=				nTestin	-	<b>A</b> 0	OV (LE		teading TOV ( 6 8		NOE_		COMMEI &	NTS	•
olot	ı	DESCRIPTION	ed/	Sample Number	(%)	3QD (	٥	(m) NC	O SF	) Vane	e* N	r ● Nilcon \	/ane*	Δ C	OV (pp	m) 🗆	р ў TOV ( 60 80	(ppm)	INSTRUMENTATION INSTALLATION		GRAIN S DISTRIBU		
Lithology Plot	ı	1	Sample Type	ple N	Recovery (%)	SPT 'N' / RQD	DEРТН (m)	ELEVATION	△ Ir	ntact Remould	<b>4</b>	> Intac Remo	t		V _P	W	W		RUM.		(%)	110	14
Litho	Geodetic Ground	Surface Elevation: 215.0 m about 76 mm TOPSOIL 214.9-		Sam	Recc	SPT	DEP	ELE	* Und	drained S 20 4	Shear: 40	Strength (	(kPa) 30		astic 0 4	io 6	Liqui 0 80		INST	GF	R SA	SI	CL
₩		dark brown / brown	SS	1	100	5	F		<u></u>	:	:				_						<del>_</del>	_	
▓	trace sand,	Ity Clay / Clayey Silt FILL trace gravel, trace cobbles, trace		1	100	5	F	-	]O··	:	:	:			°26			.					
		organics 214.3 brown 0.7	匚	=	#	$\blacksquare$	Ē		ļ	:	:	:		• • • • •									
	SIL I some sa	Y CLAY / CLAYEY SILT TILL and, trace gravel, trace cobbles, oxidation	SS	2	100	17	_ 1	214 -	]	; ;	:	:		• ° ₁									
	ı	very stiff to hard					F	-	<u> </u>				: :	1									
	ı	1		<del></del>	$\vdash$	$\vdash$	Ē	-	<u> </u>	<u>:</u>	: :		: :										
	1		SS	3	100	18	Ē	-	<b>]</b> c					a · ·o ₁									
	ı		<u> </u>	—	↓		<u> </u>	213 —		<u>.</u>			<u>.</u>					· · · · ·					
	ı	brownish grey	<u> </u>	<u> </u>			F	-	<u> </u>				:					, <b>.</b> ]					
	I	blownish grey	SS	4	100	33	Ē		<u> </u>	:	:							]					
	ı	211.9		4	100	33	- - - 3	212 —		··· O·			•	1				.					
22		END OF BOREHOLE 3.0					Ĭ			:	:	:	:				: :						
	ı	1					İ			:	:	:	:					:					
	ı						İ			:	:	:	:					.					
	ı						İ			:	:	:	:					.					
	ı						İ					:	:					.					
	1											:	:					.					
	ı						İ					:						.					
	ı						İ					:						.					
	1						ĺ					:	:					.					
	1						ĺ					:	:					.					
	1									:	:	:	:					.					
	ı						İ			:	:	:	:					.					
	1						ĺ											.					
	1						ĺ					:	:					.					
	ı						İ					:	:					.					
	ı						İ					:	:					.					
	1						ĺ											.					
	1																	.					
	ı						İ																
	ı	l					ĺ						•					.					
	1	l																.					
	ı						İ			:	:	:	:					;					
	1						ĺ			:	:	:	:					.					
	ı		1				İ					:	:					.					
	ı		1				İ			:		:	:					.					
	ı		1				İ			:		:	:					.					
	d ERIC a Divisi		Щ	Ь—			Ь			-		•								Ь			

 $\frac{\nabla}{\Xi}$  No freestanding groundwater measured in open borehole on completion of drilling.

50 Vogell Road, Units 3 & 4 Richmond Hill, Ontario, L4B 3K6 Canada Tel. No.: (905) 415-2632 www.woodplc.com



### **APPENDIX A**

**VISUAL PAVEMENT CONDITION SURVEY** 

wood.



# SECTION A COLERAINE DRIVE (FROM ARTERIAL A2 TO MAYFIELD DRIVE, ~3 KM)

#### **APPENDIX A-A**

**VISUAL PAVEMENT CONDITION SURVEY** 



Coleraine Dr. - Major Mackenile Dr To Gundysta.

### FLEXIBLE PAVEMENT CONDITION EVALUATION FOR

Section Length: Direction of B: Both Directions WBL SBL Traffic Survey Date: F: Freeway, C: Connecting Link, A: Major Arterial M: Minor Arteria Class of Rd Severity of Distress (Si) Density of Distress (Di) 1.0 2.0 3.0 4.0 0.5 1.0 2.0 3.0 4.0 Ride Throughout ntermittent Extensive Condition Frequent Severe **/ery Slight** Few Moderate Severe Slight Rating Very : @ 80 km/hr Wi = Weight of disress 10-20% 20-50% 50-80% 80-100% **Pavement Distress** Wi **Surface Defects** Ravelling & coarse aggregate loss 3.0 0.5 Flushing **Surface Deformation** Rippling and Shoving 1.0 Wheel Track Rutting 3.0 Distortion 3.0 Longitudinal Wheel Track Single and Multiple 1.0 Alligator 3.0 Centerline Single / Multiple 0.5 Surface Cracking Alligator 2.0 Pavement Edge Cracking Single / Multiple 0.5 Alligator 1.5 **Transverse Cracking** Single / Multiple 1.0 3.0 Alligator Longitudinal -Meander or 1.0

Comments:

Poor Condition to

#### Calculating the PCI

midlane Мар

The numerical rating for the severity of the distress and for the density of the distress are combined and for the density of the distress are combined and then multiplied then multiplied by its weight. TDMI The sum of all the distresses gives the DMI (Distress Manifestation Index) for the road section.

0.5

 $DMI = \sum Wi \times (Si + Di)$ 

# Coleraine Dr - Country side Dr to Mayfield Rd, N-S ~ 1,2 Km amec

Sec	tion Length: Dire	ction of	Г	B: Bo	oth Dire	ctions	SE	3L	V	VBL		
Sur		s of Rd		F: Fr	eeway,	C: Co	nnectin	g Link,	A: Majo	or Arteria	l M: M	inor Arteri
		1	Sev	erity o	f Distr	ess (	Si)		Densit	of Dis	stress	(Di)
			0.5	1.0	2.0	3.0	4.0	0.5	1.0	2.0	3.0	4.0
	Ride 10 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8		Very Slight	Slight	Moderate	Severe	Very Severe	Few	Intermittent	Frequent	Extensive	Throughout
	VVi =	Weigh	t of dis	ress				<10%	10-20%	20-50%	50-80%	80-100%
C	Pavement Distress	Wi										
	elling & coarse aggregate loss	3.0				1			1			
	hing	0.5	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		***************************************							
	face Deformation	10.01				7 - 2						
	oling and Shoving	1.0			1		T		1/			
	eel Track Rutting	3.0				1/	******		1			
	ortion	3.0				V						
	Longitudinal Wheel Track						-	-				
	Single and Multiple	1.0			V		T			V		
	Alligator	3.0			V				***************************************	V		
	Centerline				100							-
_	Single / Multiple	0.5			V					V		
king	Alligator	2.0			1/				1/			
Surface Cracking	Pavement Edge Cracking								V			
e C	Single / Multiple	0.5			V		/			V		
fac	Alligator	1.5				1/						
Sur	Transverse Cracking											
	Single / Multiple	1.0				1					/	
	Alligator	3.0				/					/	
	Longitudinal -Meander or midlane	1.0			V				V	1		
	Мар	0.5							V			

Comments: From 280m S of Mayfield to Mayfield, asph in good Condition.

Calculating the PCI From 280m S of Mayfield to Country Side, tairly poor - Poor Constitution.

The numerical rating for the severity of the distress and for the density of the distress are combined and

The numerical rating for the severity of the distress and for the density of the distress are combined and for the density of the distress are combined and then multiplied then multiplied by its weight. TDMI The sum of all the distresses gives the DMI (Distress Manifestation Index) for the road section.

 $DMI = \sum Wi \times (Si + Di)$ 



# SECTION C COUNTRYSIDE DRIVE (FROM CLARKWAY DRIVE TO RR 50, ~3 KM)

#### **APPENDIX A-C**

**VISUAL PAVEMENT CONDITION SURVEY** 



Combyside Orive-Clarknay to Coleroine Pr.

### FLEXIBLE PAVEMENT CONDITION EVALUATION FOR

amec®

Sec	tion Length: 1, 5 MM Dire		f 📙	B: B	oth Dire	ctions	SE	BL	V	VBL		
Sur	Trafi vey Date: Ayy (), Wy Clas			F: F	reeway,	C: Co	nnectin	g Link,	A: Majo	or Arteria	i M: M	inor Arteri
		1	Sev	erity o	f Distr	ess (	Si)		Densit	of Di	stress	(Di)
	()		0.5	1.0	2.0	3.0	4.0	0.5	1.0	2.0	3.0	4.0
	Ride 10 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8		Very Slight	Slight	Moderate	Severe	Very Severe	Few	Intermittent	Frequent	Extensive	Throughout
	VVi =	Weigh	t of dis	ress	5			<10%	10-20%	20-50%	50-80%	80-100%
-	Pavement Distress	Wi										
	face Defects	1201										- 1
	elling & coarse aggregate loss	3.0										
_	hing face Deformation	0.5										
		Las		_		T T						
	oling and Shoving	1.0				ļ						
27.0	eel Track Rutting	3.0										
Dist	ortion	3.0										
	Longitudinal Wheel Track	_						/	/			7.2.4
-	Single and Multiple	1.0				ļ		1				
	Alligator	3.0										
	Centerline											
6	Single / Multiple	0.5			1/							1
kin	Alligator	2.0		V		4						V
Surface Cracking	Pavement Edge Cracking											
e C	Single / Multiple	0.5		V								
fac	Alligator	1.5							***************************************			
Sur	Transverse Cracking											10
	Single / Multiple	1.0		1/			T		1/			
	Alligator	3.0	***************************************									
	Longitudinal -Meander or midlane	1.0										
	Мар	0.5										-

### Calculating the PCI

Comments:

The numerical rating for the severity of the distress and for the density of the distress are combined and for the density of the distress are combined and then multiplied then multiplied by its weight. TDMI

The sum of all the distresses gives the DMI (Distress Manifestation Index) for the road section.

Good Condition to fairly Good Condition

 $DMI = \sum Wi \times (Si + Di)$ 

Country side Or - Colevaine Dr - Huy 50 E-4 2780m

### FLEXIBLE PAVEMENT CONDITION EVALUATION FOR

Section Lauret TALL Division

amec®

Sur		ffic ss of Rd	П	F: Fr	eeway	C. Co.	nection	a Link	A. Maia	r Arteria	1 10- 10	inor A -
oui	vey bate.	55 UI NU	ш	F. FI	eeway,	C. CO	mecun	g Link,	A. Wajo	r Arteria	I IVI. IVI	Inor Art
			Sev	erity o	f Distr	ess (	Si)		ensity	of Dis	stress	(Di)
	- (ii)	)	0.5	1.0	2.0	3.0	4.0	0.5	1.0	2.0	3.0	4.0
	Ride		Very Slight	Slight	Moderate	Severe	Very Severe	Few	Intermittent	Frequent	Extensive	Throughout
	Pavement Distress	- Weigh	t of dis	ress				<10%	10-20%	20-50%	50-80%	80-100
Sur	face Defects	1001				125						
Rave	elling & coarse aggregate loss	3.0										
	hing	0.5										
Sur	face Deformation											
Ripp	ling and Shoving	1.0										
Whe	eel Track Rutting	3.0										
Dist	ortion	3.0										
	Longitudinal Wheel Trac	7							/			
	Single and Multiple	1.0						~				
	Alligator	3.0										
	Centerline											
6	Single / Multiple	0.5								/		
Surface Cracking	Alligator	2.0										
Srac	Pavement Edge Cracking											
Ge C	Single / Multiple	0.5							/			
rfa	Alligator	1.5										
S	Transverse Cracking								-			
	Single / Multiple	1.0		V					V			
	Alligator	3.0										
	Longitudinal -Meander or midlane	1.0		1 7								
	Мар	0.5										

### Calculating the PCI

The numerical rating for the severity of the distress and for the density of the distress are combined and for the density of the distress are combined and then multiplied then multiplied by its weight. TDMI The sum of all the distresses gives the DMI (Distress Manifestation Index) for the road section.

 $DMI = \sum Wi \times (Si + Di)$ 



# SECTION D CLARKWAY DRIVE (FROM CASTLEMORE ROAD TO MAYFIELD DR, ~3 KM)

#### **APPENDIX A-D**

**VISUAL PAVEMENT CONDITION SURVEY** 



	C MARTINU	1 0	1	K. C	_	9 1	17			Y		
	Clarking		/	-5		5.1	Kn	1	turnet, and part		ame	20
	FLEXIBLE P	AVEI	VIENT	CON	DITIO	N EV	ALU	AIIOI	4 FOR			
				P	dor	1	On	dita	Des			
Sec	tion Length: 3, 1 Km Direct	ction of	П	B: B	oth Direc	ctions	SI			VBL		
	Traff			D. D.	Jai Diio	otions	101	JE		VOL		
Sur	vey Date: Avg (U, WWClas	s of Rd		F: Fr	eeway,	C: Co	nnectin	g Link,	A: Majo	r Arteria	l M: Mi	nor Arte
		1		erity o		-	_				stress	
	Ride 10	- 1	0.5	1.0	2.0	3.0	4.0	0.5	1.0	2.0	3.0	4.0
	Ride 10 8								ent	=	ø	out
`	Rating		light	ħ.	ate	9	vere	Few	nitte	nei	nsiv	gho
	4		Very Slight	Slight	Moderate	Severe	Very Severe	II.	ntermittent	Frequent	Extensive	Throughout
@	9 80 km/hr		8		2	0,	Ver		프		ш	卢
	0 Wi =	Weight	t of dis	ress				<10%	10-20%	20-50%	50-80%	80-1009
	Pavement Distress	Wi										
_	ace Defects	1201										
	elling & coarse aggregate loss hing	0.5										
_	ace Deformation	0.5						ш				-
	oling and Shoving	1.0				Г						
	el Track Rutting	3.0		\ /								
	ortion	3.0		V					<u></u>			
	Longitudinal Wheel Track									7		
	Single and Multiple	1.0			V	/		T		2	1	
	Alligator	3.0			V	Ü				~	1	
	Centerline											1
-	Single / Multiple	0.5			V	V	T			V	V	
king	Alligator	2.0			V	V				~	V	***************************************
rac	Pavement Edge Cracking								4			
Surface Cracking	Single / Multiple	0.5			V	/				V	V	
rfac	Alligator	1.5										
Su	Transverse Cracking				- 1							
	Single / Multiple	1.0			V	~				V	1	
	Alligator	3.0			V	1				1/	V	
	Longitudinal -Meander or midlane	1.0			V	V				V	V	
									_			

The numerical rating for the severity of the distress and for the density of the distress are combined and for the density of the distress are combined and then multiplied then multiplied by its weight. TDMI

The sum of all the distresses gives the DMI (Distress Manifestation Index) for the road section.

Pour Condition remainder,

 $DMI = \sum Wi \times (Si + Di)$ 

Calculating the PCI

Clarking Drive - Countryside Dr. to Mayheld. W-5 ~ 1.23 Km

# FLEXIBLE PAVEMENT CONDITION EVALUATION FOR

		1 1/11	14	1	00.		Col	re con o	10-			
Sec	tion Length: (23 Km Dire	ction o	F 🗌	B: Bo	oth Dire	ctions	SI	BL	1	NBL		
	Traf	fic										
Sur	vey Date: Avg 10, w 20 Clas	s of Rd		F: Fr	eeway,	C: Co	nnectin	g Link,	A: Majo	or Arteria	al M: N	linor Arteri
			Sev	erity o	f Distr	ess (	Si)		Densit	y of Di	stress	(Di)
	A		0.5	1.0	2.0	3.0	4.0	0.5	1.0	2.0	3.0	4.0
	Ride 10 8 7 8 7 8 8 7 8 8 8 8 8 8 8 8 8 8 8 8		Very Slight	Slight	Moderate	Severe	Very Severe	Few	Intermittent	Frequent	Extensive	Throughout
		Weigh	t of dis	ress				<10%	10-20%	20-50%	50-80%	80-100%
	Pavement Distress	Wi										
	face Defects											
	elling & coarse aggregate loss	3.0		***************************************								
Flushing 0.5												
Sur	face Deformation	- 10	1	1.0								
Ripp	oling and Shoving	1.0										
Whe	eel Track Rutting	3.0			1/			1/	***************************************			
Dist	ortion	3.0			***************************************					ļ		
	Longitudinal Wheel Track	K										
	Single and Multiple	1.0				1/				1		
	Alligator	3.0								V		
	Centerline											7.9
	Single / Multiple	0.5			1/							
ing	Alligator	2.0			1/			-		V		
ack	Pavement Edge Cracking											
Ö	Single / Multiple	0.5				. /	T					
Irface Cracking	Alligator					V				V	ć	
Ting.		1.5				V						
S	Transverse Cracking	I a a I					-					
	Single / Multiple	1.0								V		
	Alligator Longitudinal -Meander or	3.0	_							V		
	midlane	1.0			/					1		
	Мар	0.5			V					V	1	

Comments:

Partched Will From 50-100m NOX Country 5/2e, Q 125m-150m. Partched From Nom 5 of May Kill to 100m 5 of May Field.

Calculating the PCI

The numerical rating for the severity of the distress and for the density of the distress are combined and for the density of the distress are combined and then multiplied then multiplied by its weight. TDMI The sum of all the distresses gives the DMI (Distress Manifestation Index) for the road section.

Coleraine Dr. - Major Mackenile Dr To Gundysta.

#### FLEXIBLE PAVEMENT CONDITION EVALUATION FOR

Section Length: Direction of B: Both Directions WBL SBL Traffic Survey Date: F: Freeway, C: Connecting Link, A: Major Arterial M: Minor Arteria Class of Rd Severity of Distress (Si) Density of Distress (Di) 1.0 2.0 3.0 4.0 0.5 1.0 2.0 3.0 4.0 Ride Throughout ntermittent Extensive Condition Frequent Severe **/ery Slight** Few Moderate Severe Slight Rating Very : @ 80 km/hr Wi = Weight of disress 10-20% 20-50% 50-80% 80-100% **Pavement Distress** Wi **Surface Defects** Ravelling & coarse aggregate loss 3.0 0.5 Flushing **Surface Deformation** Rippling and Shoving 1.0 Wheel Track Rutting 3.0 Distortion 3.0 Longitudinal Wheel Track Single and Multiple 1.0 Alligator 3.0 Centerline Single / Multiple 0.5 Surface Cracking Alligator 2.0 Pavement Edge Cracking Single / Multiple 0.5 Alligator 1.5 **Transverse Cracking** Single / Multiple 1.0 3.0 Alligator Longitudinal -Meander or 1.0

Comments:

Poor Condition to

#### Calculating the PCI

midlane Мар

The numerical rating for the severity of the distress and for the density of the distress are combined and for the density of the distress are combined and then multiplied then multiplied by its weight. TDMI The sum of all the distresses gives the DMI (Distress Manifestation Index) for the road section.

0.5

# Coleraine Dr - Country side Dr to Mayfield Rd, N-S ~ 1,2 Km amec

Sec	tion Length: Dire	ction of	Г	B: Bo	oth Dire	ctions	SE	3L	V	VBL		
Sur		s of Rd		F: Fr	eeway,	C: Co	nnectin	g Link,	A: Majo	or Arteria	al M: M	inor Arteri
		1	Sev	erity o	f Distr	ess (	Si)		Densit	v of Di	stress	(Di)
			0.5	1.0	2.0	3.0	4.0	0.5	1.0	2.0	3.0	4.0
	Ride 10 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8		Very Slight	Slight	Moderate	Severe	Very Severe	Few	Intermittent	Frequent	Extensive	Throughout
	VVi =	Weigh	t of dis	ress				<10%	10-20%	20-50%	50-80%	80-100%
C	Pavement Distress	Wi										
	elling & coarse aggregate loss	3.0				1			1		_	
	hing	0.5	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		***************************************							
	face Deformation	10.01				7 - 2						
	oling and Shoving	1.0			1		T		1/			
	eel Track Rutting	3.0				1/	******		1			
	ortion	3.0		*************		V						
	Longitudinal Wheel Track						-	-				
	Single and Multiple	1.0			V		T			V		
	Alligator	3.0			V				***************************************	V		
	Centerline				100							
_	Single / Multiple	0.5			V					V		
king	Alligator	2.0			1/				1/			
Surface Cracking	Pavement Edge Cracking											
e C	Single / Multiple	0.5			V		/			V		
fac	Alligator	1.5				1/						
Sur	Transverse Cracking											
	Single / Multiple	1.0				1					/	
	Alligator	3.0				/					V	1
	Longitudinal -Meander or midlane	1.0			V				V	- 1		
	Мар	0.5							V			

Comments: From 280m S of Mayfield to Mayfield, asph in good Condition.

Calculating the PCI From 280m S of Mayfield to Country Side, tairly poor - Poor Constitution.

The numerical rating for the severity of the distress and for the density of the distress are combined and

The numerical rating for the severity of the distress and for the density of the distress are combined and for the density of the distress are combined and then multiplied then multiplied by its weight. TDMI The sum of all the distresses gives the DMI (Distress Manifestation Index) for the road section.

Combyside Orive-Clarknay to Coleroine Pr.

#### FLEXIBLE PAVEMENT CONDITION EVALUATION FOR

amec®

Sec	tion Length: 1, 5 MM Dire		f 📙	B: B	oth Dire	ctions	SE	BL	V	VBL		
Sur	Trafi vey Date: Ayy (), Wy Clas			F: F	reeway,	C: Co	nnectin	g Link,	A: Majo	or Arteria	i M: M	inor Arteri
		1	Sev	erity o	f Distr	ess (	Si)		Densit	of Di	stress	(Di)
	()		0.5	1.0	2.0	3.0	4.0	0.5	1.0	2.0	3.0	4.0
	Ride 10 8 10 8 10 8 10 8 10 8 10 8 10 8 10			Slight	Moderate	Severe	Very Severe	Few	Intermittent	Frequent	Extensive	Throughout
	VVi =	_	t of dis	ress	5			<10%	10-20%	20-50%	50-80%	80-100%
-	Pavement Distress	Wi										
	face Defects	1201										- 1
	elling & coarse aggregate loss	3.0										
_	hing face Deformation	0.5										
		Las		_		T T						
	Rippling and Shoving 1.0					ļ						
27.0	eel Track Rutting	3.0				ļ						
Dist	ortion	3.0										
	Longitudinal Wheel Track	_						/	/			7 - 1
-	Single and Multiple	1.0				ļ		1				
	Alligator	3.0										
	Centerline											
6	Single / Multiple	0.5			1/							1
kin	Alligator	2.0		V								1/
Surface Cracking	Pavement Edge Cracking											
e C	Single / Multiple	0.5		V					/			
fac	Alligator	1.5							***************************************			
Sur	Transverse Cracking											10
	Single / Multiple	1.0		1/			T		1/			
	Alligator	3.0										
	Longitudinal -Meander or midlane	1.0										
	Мар	0.5										-

#### Calculating the PCI

Comments:

The numerical rating for the severity of the distress and for the density of the distress are combined and for the density of the distress are combined and then multiplied then multiplied by its weight. TDMI

The sum of all the distresses gives the DMI (Distress Manifestation Index) for the road section.

Good Condition to fairly Good Condition

Country side Or - Colevaine Dr - Huy 50 E-4 2780m

### FLEXIBLE PAVEMENT CONDITION EVALUATION FOR

Section Lauret TALL Division

amec®

Sur		ffic ss of Rd	П	F: Fr	eeway	C. Co.	nnectin	a Link	A. Maia	r Arteria	1 10- 10	inor A -
oui	vey bate.	55 UI NU	ш	F. FI	eeway,	C. CO	mecun	g Link,	A. Wajo	r Arteria	I IVI. IVI	Inor Art
			Sev	erity o	f Distr	ess (	Si)		ensity	of Dis	stress	(Di)
	- (11)	)	0.5	1.0	2.0	3.0	4.0	0.5	1.0	2.0	3.0	4.0
	Ride		Very Slight	Slight	Moderate	Severe	Very Severe	Few	Intermittent	Frequent	Extensive	Throughout
-	Pavement Distress	- Weight	t of dis	ress				<10%	10-20%	20-50%	50-80%	80-100
Sur	face Defects	1441				125						
Rave	elling & coarse aggregate loss	3.0										
	hing	0.5										
Sur	face Deformation											
Ripp	oling and Shoving	1.0										
Whe	eel Track Rutting	3.0										
Dist	ortion	3.0										
	Longitudinal Wheel Trac	7	/						/			
	Single and Multiple	1.0						~				
	Alligator	3.0										
	Centerline	, ,										
6	Single / Multiple	0.5								/		
Surface Cracking	Alligator	2.0										
Srac	Pavement Edge Cracking											
Ge C	Single / Multiple	0.5							/			
rfa	Alligator	1.5										
S	Transverse Cracking	-		-					- /			
	Single / Multiple	1.0		V					V			
	Alligator	3.0										
	Longitudinal -Meander or midlane	1.0										
	Мар	0.5										

#### Calculating the PCI

The numerical rating for the severity of the distress and for the density of the distress are combined and for the density of the distress are combined and then multiplied then multiplied by its weight. TDMI The sum of all the distresses gives the DMI (Distress Manifestation Index) for the road section.



#### **APPENDIX B**

#### **SOIL LABORATORY TEST RESULTS**

wood.

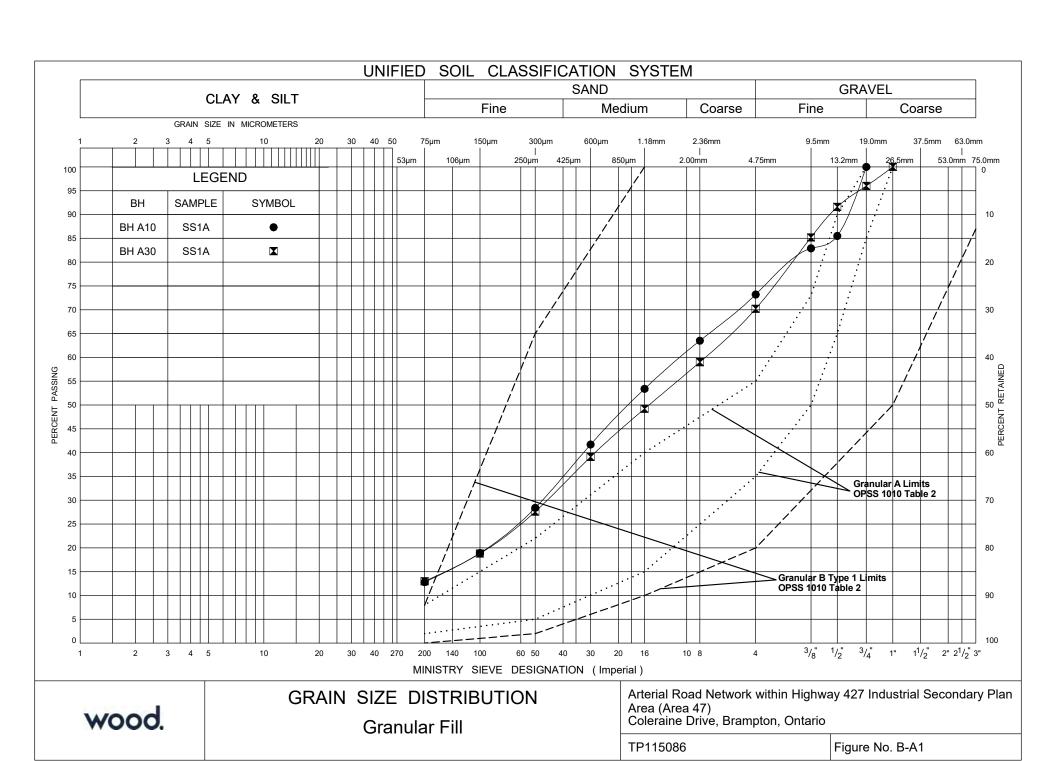


# SECTION A COLERAINE DRIVE (FROM ARTERIAL A2 TO MAYFIELD DRIVE, ~3 KM)

#### **APPENDIX B-A**

**SOIL LABORATORY TEST RESULTS** 

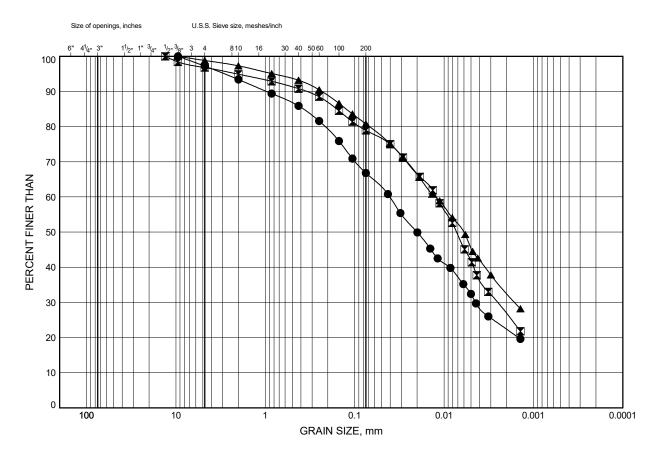






## GRAIN SIZE DISTRIBUTION SILTY CLAY / CLAYEY SILT TILL

FIGURE No. B-A2



						<u> </u>
COBBLE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT and CLAY
SIZE	GRAVEL		SAND			FINE GRAINED

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	ELEVATION (m)
•	BH A1	SS6	4.1	211.4
lacktriangle	BH A3	SS4	2.7	213.6
<b>A</b>	BH A23 / BH S1	SS5	3.4	219.4

Date December 2020

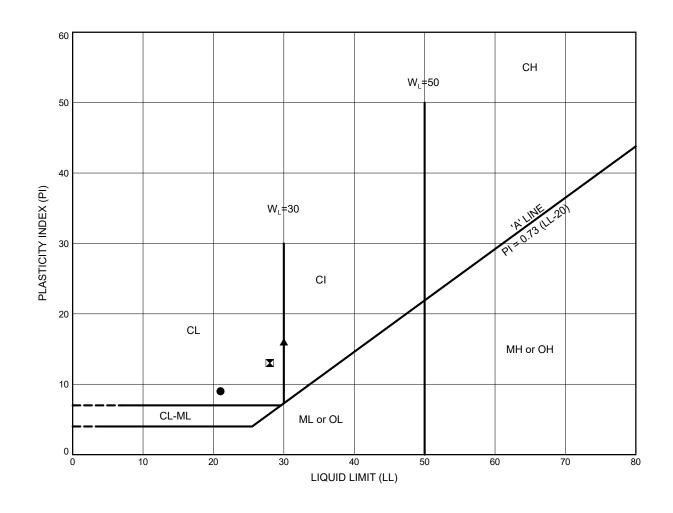
Project TP115086

Prep'd WA

Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47)

## ATTERBERG LIMIT TEST RESULTS SILTY CLAY / CLAYEY SILT TILL

FIGURE No. B-A3



BOREHOLE	SAMPLE D	DEPTH (m) E	ELEVATION (m)	LL	PL	<u> PI</u>	
BH A1	SS6	4.1	211.4	21	12	9	
BH A3	SS4	2.7	213.6	28	15	13	
BH A23 / BH S1	SS5	3.4	219.4	30	14	16	
	BH A1 BH A3	BH A1 SS6 BH A3 SS4	BH A1 SS6 4.1 BH A3 SS4 2.7	BH A1 SS6 4.1 211.4 BH A3 SS4 2.7 213.6	BH A1 SS6 4.1 211.4 21 BH A3 SS4 2.7 213.6 28	BH A1 SS6 4.1 211.4 21 12 BH A3 SS4 2.7 213.6 28 15	BH A1 SS6 4.1 211.4 21 12 9 BH A3 SS4 2.7 213.6 28 15 13

Date December 2020

Project TP115086

Prep'd SI

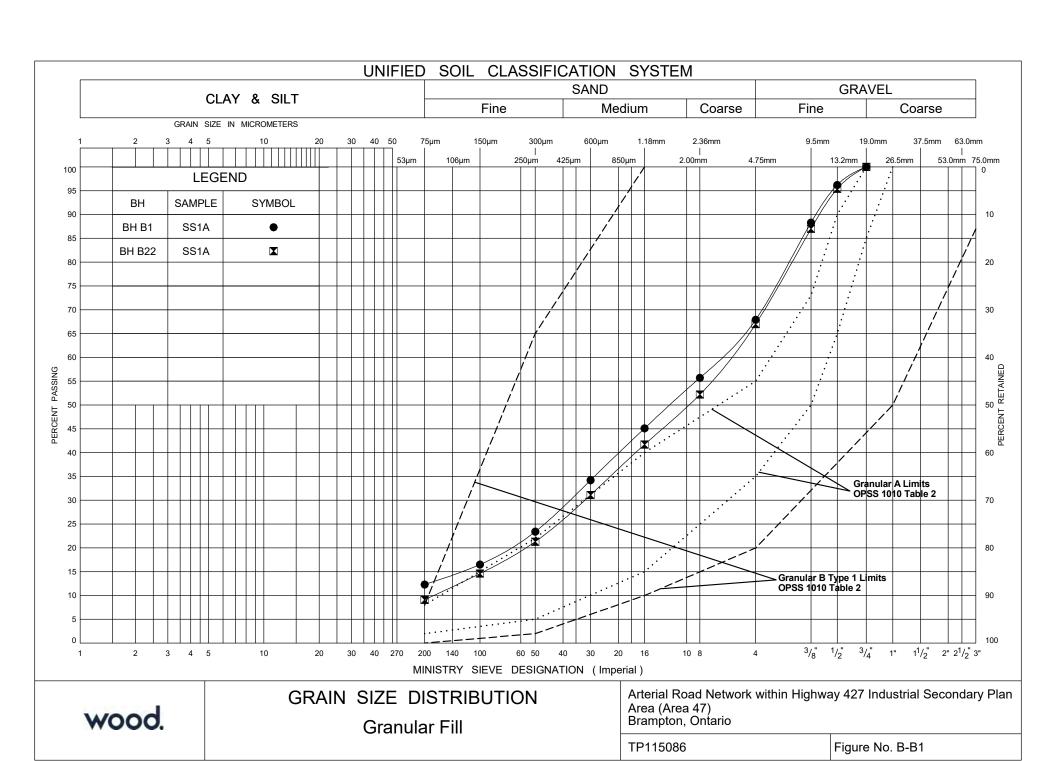


#### SECTION B ARTERIAL A2 (FROM MAYFIELD ROAD TO MAJOR MACKENZIE DRIVE / RR 50, $\sim$ 3.4 KM)

#### **APPENDIX B-B**

**SOIL LABORATORY TEST RESULTS** 

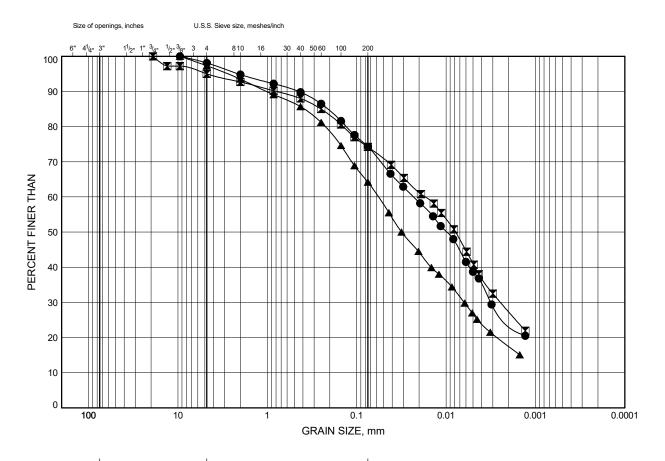






## GRAIN SIZE DISTRIBUTION SILTY CLAY / CLAYEY SILT TILL

FIGURE No. B-B2



COBBLE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT and CLAY
SIZE	GRA	AVEL		SAND		FINE GRAINED

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	ELEVATION (m)
•	BH B11	SS3	1.8	210.5
	BH B17	SS3	1.8	216.6
<b>A</b>	BH S3	SS 6	4.1	206.5

Date December 2020

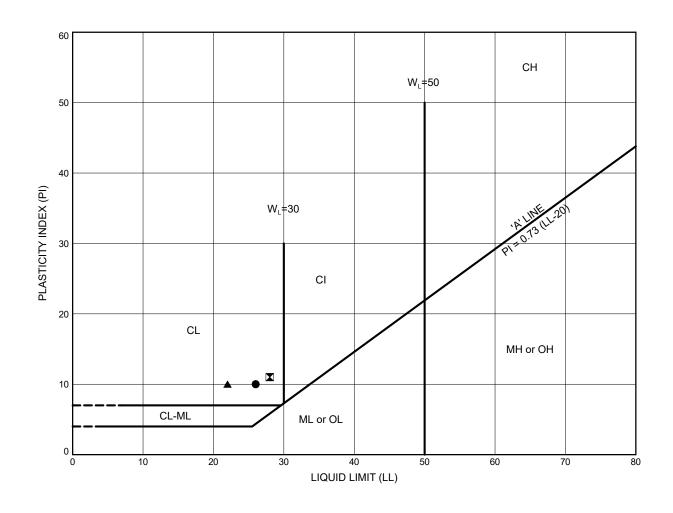
Project TP115086

Prep'd WA

Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47)

## ATTERBERG LIMIT TEST RESULTS SILTY CLAY / CLAYEY SILT TILL

FIGURE No. B-B3



		( ) === •	/ (III)		1 L	ГІ
BH B11	SS3	1.8	210.5	26	16	10
BH B17	SS3	1.8	216.6	28	17	11
BH S3	SS 6	4.1	206.5	22	12	10
	BH B11 BH B17	BH B11 SS3 BH B17 SS3	BH B11 SS3 1.8 BH B17 SS3 1.8	BH B11 SS3 1.8 210.5 BH B17 SS3 1.8 216.6	BH B11         SS3         1.8         210.5         26           BH B17         SS3         1.8         216.6         28	BH B17 SS3 1.8 216.6 28 17

Date December 2020

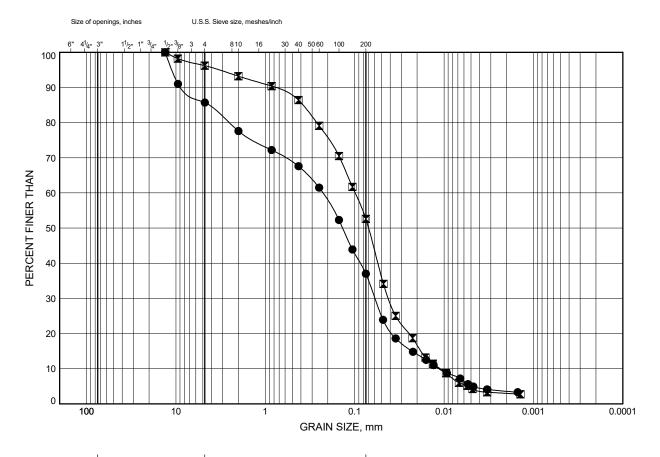
Project TP115086

Prep'd CZ



## GRAIN SIZE DISTRIBUTION SILTY SAND / SAND AND SILT TILL

FIGURE No. B-B4



COBBLE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT and CLAY
SIZE	GRA	GRAVEL SAND			FINE GRAINED	

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	ELEVATION (m)
•	BH B2	SS5	3.4	206.9
	BH B7 / BH S5	SS6	4.1	205.2

Date December 2020

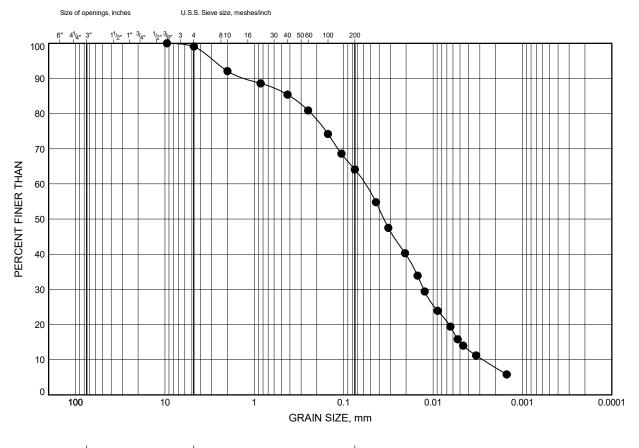
Project TP115086

Prep'd WA



## GRAIN SIZE DISTRIBUTION SILTY SAND / SANDY SILT TILL

FIGURE No. B-B5



COBBLE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT and CLAY
SIZE	GRA	AVEL		SAND		FINE GRAINED

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	ELEVATION (m)
•	BH S3	SS 9	7.8	202.8

Date December 2020

Project TP115086

Prep'd WA

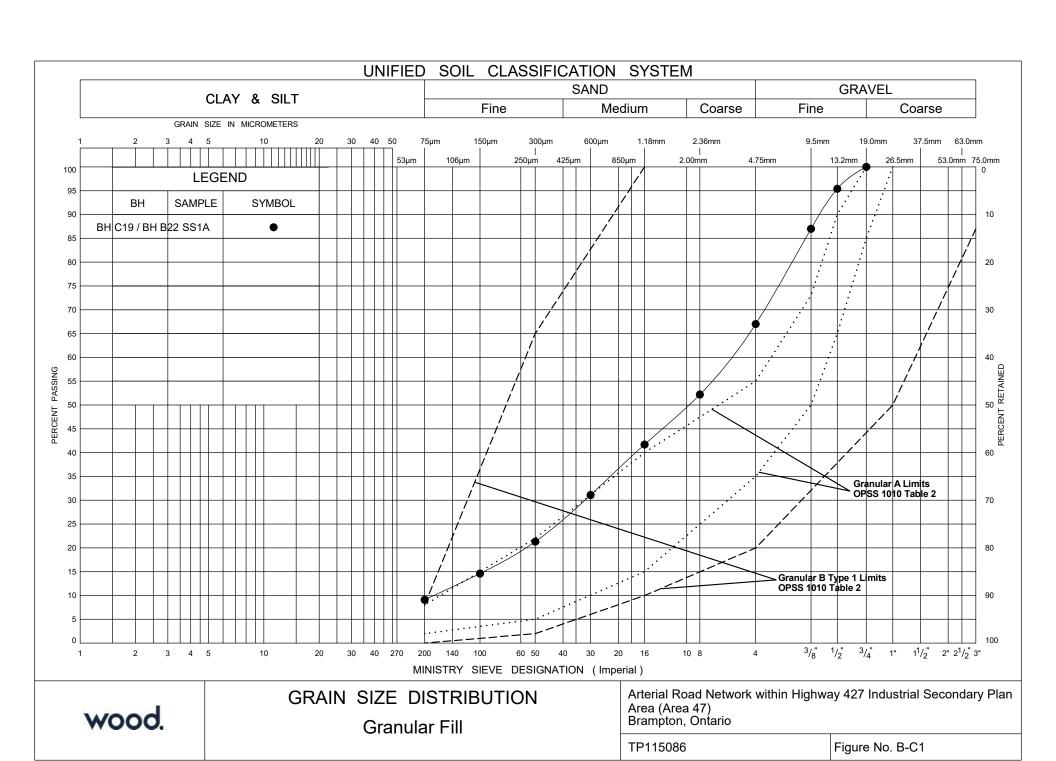


# SECTION C COUNTRYSIDE DRIVE (FROM CLARKWAY DRIVE TO RR 50, ~3 KM)

#### **APPENDIX B-C**

**SOIL LABORATORY TEST RESULTS** 

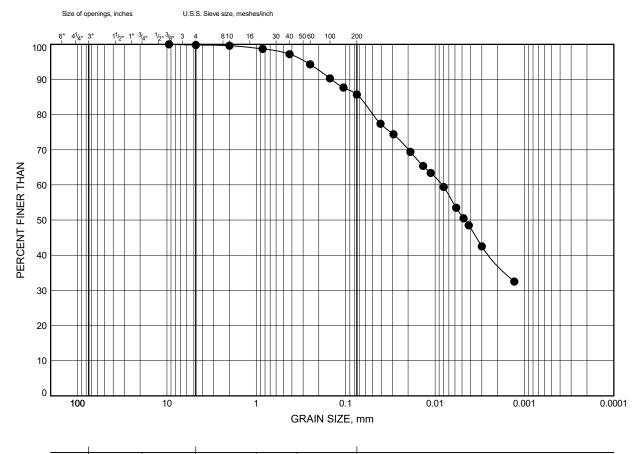






# GRAIN SIZE DISTRIBUTION Silty Clay Fill

FIGURE No. B-C2



COBBLE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT and CLAY
SIZE	GRA	VEL		SAND		FINE GRAINED

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	ELEVATION (m)
•	BH C1	SS3	1.8	214.0

Date December 2020

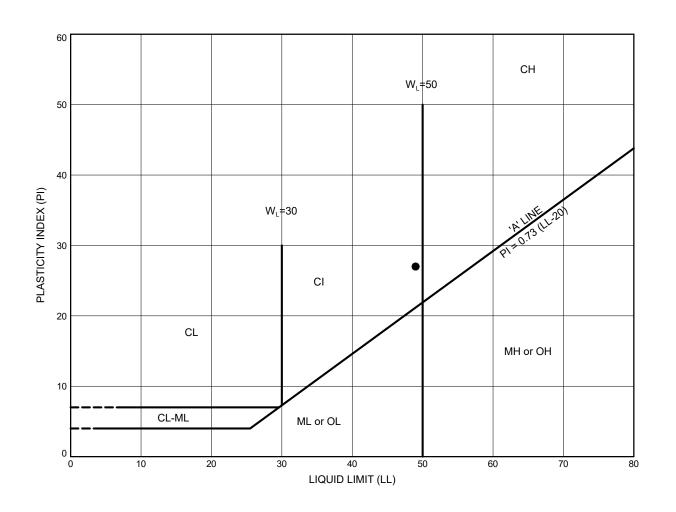
Project TP115086

Prep'd WA

Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47)

# ATTERBERG LIMIT TEST RESULTS Silty Clay Fill

FIGURE No. B-C3



SYMBOL	BOREHOLE	SAMPLE D	EPTH (m)	ELEVATION (m)	LL	PL	PI
•	BH C1	SS3	1.8	214.0	49	22	27

Date December 2020

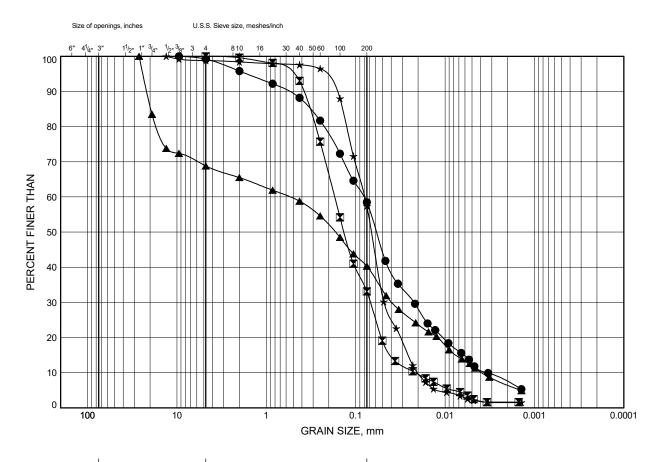
Project TP115086

Prep'd CZ



## GRAIN SIZE DISTRIBUTION SILTY SAND / SANDY SILT / SAND AND SILT TILL

FIGURE No. B-C4



COBBLE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT and CLAY
SIZE	GRA	AVEL		SAND		FINE GRAINED

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	ELEVATION (m)
•	BH C27 / BH S7	SS4	2.6	215.2
	BH C31	SS3	1.8	219.9
<b>A</b>	BH S10	SS6	4.1	209.7
*	BH S11	SS6	4.1	209.1

Date December 2020

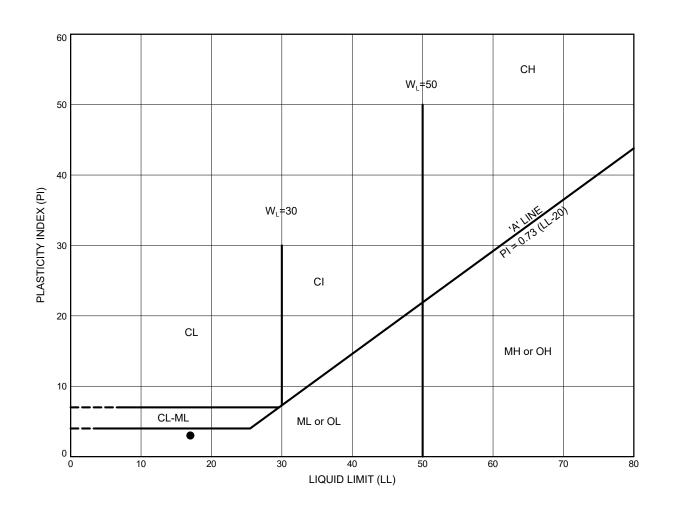
Project TP115086

Prep'd WA

Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47)

## ATTERBERG LIMIT TEST RESULTS SILTY SAND / SANDY SILT / SAND AND SILT TILL

FIGURE No. B-C5



SYMBOL	BOREHOLE	SAMPLE D	EPTH (m)	ELEVATION (m)	LL	PL	PI
•	BH C27 / BH S7	SS4	2.6	215.2	17	14	3

Date December 2020

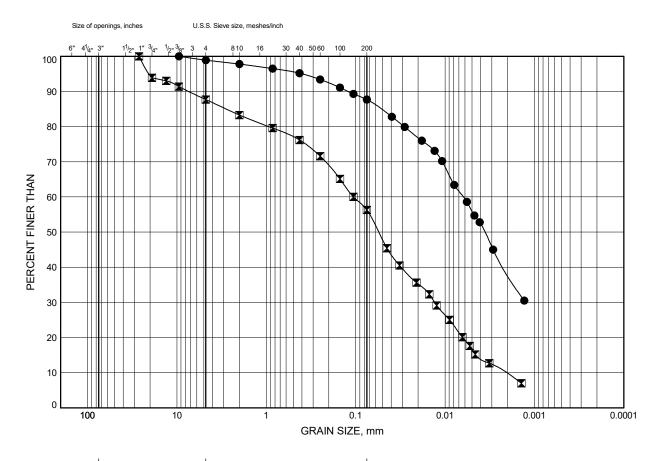
Project TP115086

Prep'd CZ



## GRAIN SIZE DISTRIBUTION SILTY CLAY / CLAYEY SILT TILL

FIGURE No. B-C6



COBBLE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT and CLAY
SIZE	GRA	AVEL		SAND		FINE GRAINED

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	ELEVATION (m)
•	BH C17	SS7	4.8	215.1
	BH S9	SS7	4.7	209.8

Date December 2020

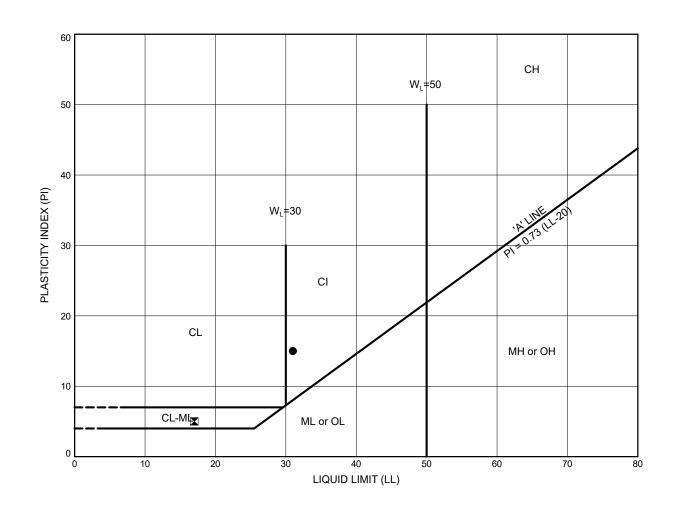
Project TP115086

Prep'd WA

Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47)

## ATTERBERG LIMIT TEST RESULTS SILTY CLAY / CLAYEY SILT TILL

FIGURE No. B-C7



SYMBOL	BOREHOLE	SAMPLE D	EPTH (m)	ELEVATION (m)	LL	PL	PI
•	BH C17	SS7	4.8	215.1	31	16	15
	BH S9	SS7	4.7	209.8	17	12	5

Date December 2020

Project TP115086

Prep'd CZ

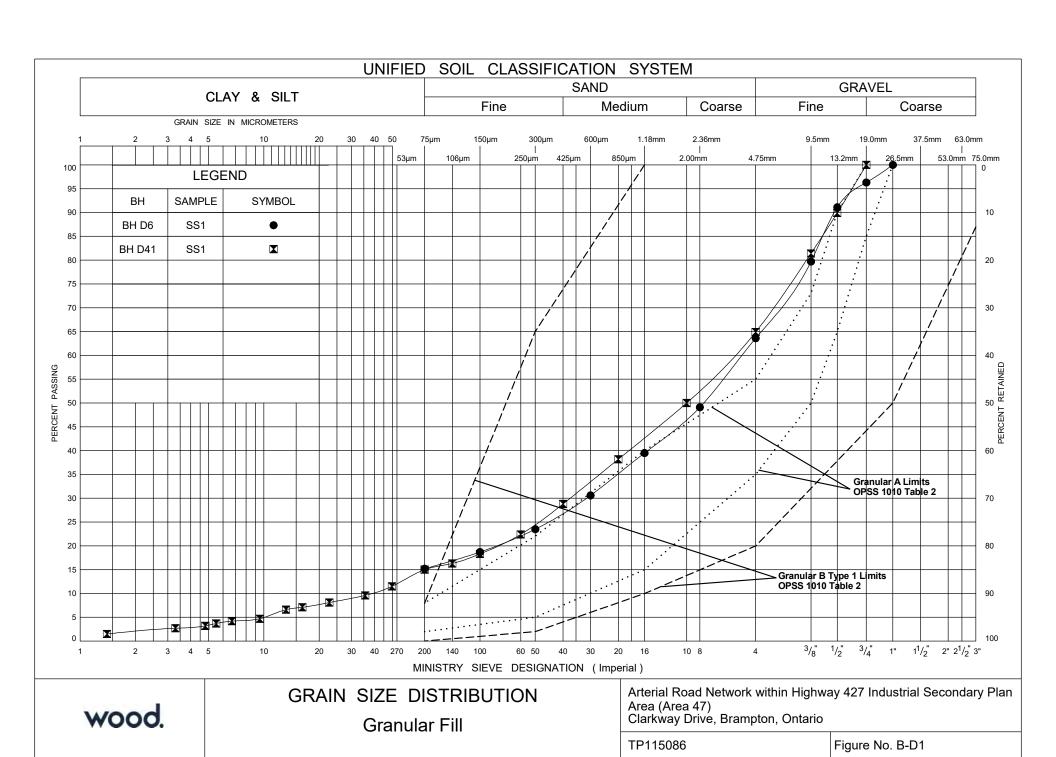


# SECTION D CLARKWAY DRIVE (FROM CASTLEMORE ROAD TO MAYFIELD DR, ~3 KM)

#### **APPENDIX B-D**

**SOIL LABORATORY TEST RESULTS** 

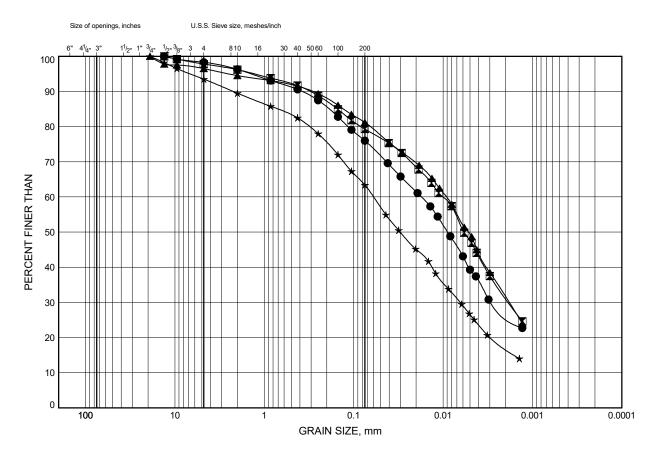






## GRAIN SIZE DISTRIBUTION SILTY CLAY / CLAYEY SILT TILL

FIGURE No. B-D2



COBBLE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT and CLAY
SIZE	GR/	AVEL		SAND		FINE GRAINED

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	ELEVATION (m)
•	BH D19	SS3	1.8	208.8
	BH D49	SS5	3.3	217.5
<b>A</b>	BH S13	SS6	7.9	202.3
*	BH S15	SS7	4.8	207.9

Date December 2020

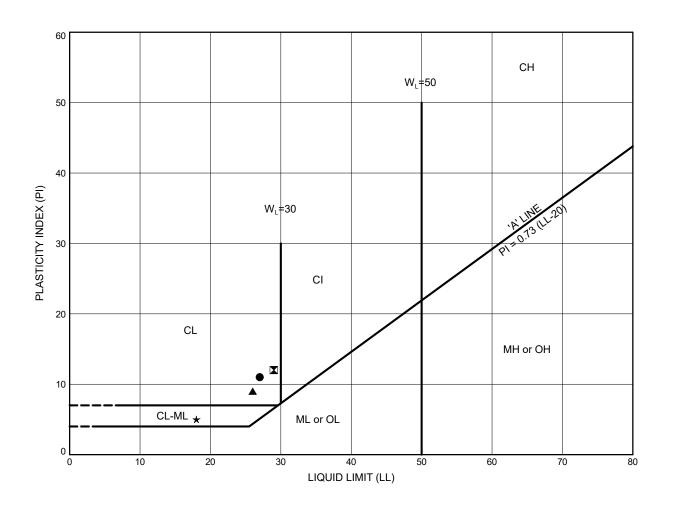
Project TP115086

Prep'd WA

Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47)

## ATTERBERG LIMIT TEST RESULTS SILTY CLAY / CLAYEY SILT TILL

FIGURE No. B-D3



SYMBOL	BOREHOLE	SAMPLE L	DEPTH (m) E	LEVATION (m)	LL	PL	<u> </u>
•	BH D19	SS3	1.8	208.8	27	16	11
	BH D49	SS5	3.3	217.5	29	17	12
<b>A</b>	BH S13	SS6	7.9	202.3	26	17	9
*	BH S15	SS7	4.8	207.9	18	13	5

Date December 2020

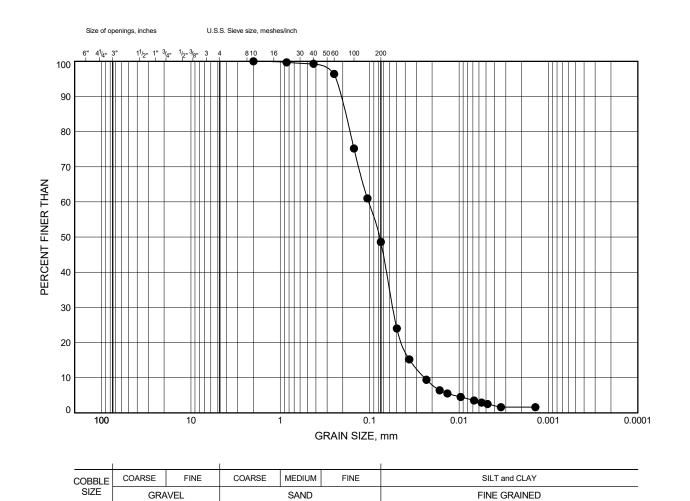
Project TP115086

Prep'd CZ

### Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47)

### GRAIN SIZE DISTRIBUTION SILTY SAND / SAND AND SILT TILL

FIGURE No. B-D4



SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	ELEVATION (m)
•	BH S14	SS8	7.9	202.0

Date December 2020

Project TP115086

Prep'd WA



# SECTION E EAST – WEST ARTERIAL RAOD (FROM THE GORE ROAD TO COLERAINE DRIVE, ~2.4 KM)

#### **APPENDIX B-E**

**SOIL LABORATORY TEST RESULTS** 

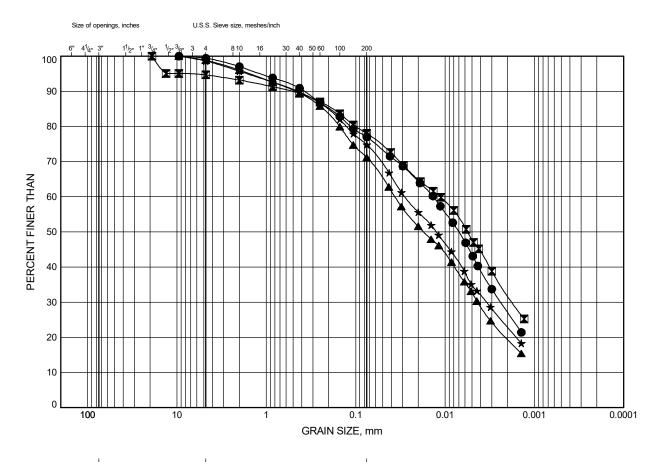




### **GRAIN SIZE DISTRIBUTION**

Silty Clay / Clayey Silt Till

FIGURE No. B-E1



COBBLE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT and CLAY	
SIZE	GRAVEL		SAND			FINE GRAINED	

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	ELEVATION (m)
•	BH E3	SS3	1.8	204.0
$\blacksquare$	BH E7	SS3	1.8	203.1
<b>A</b>	BH E23	SS3	1.8	208.8
*	BH E30	SS6	4.1	210.2

Date March 2022

Project TP115086

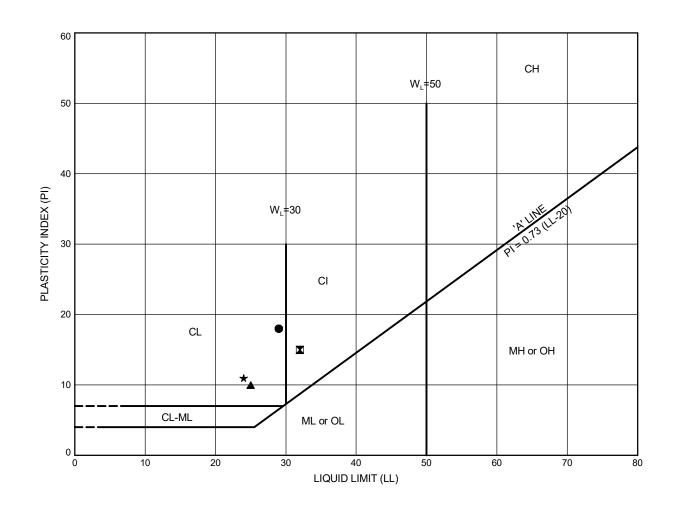
Prep'd .....

Chkd. .....

Arterial Road Network within Highway 427 Industrial Secondary Plan Area (Area 47)

# ATTERBERG LIMIT TEST RESULTS Silty Clay / Clayey Silt Till

FIGURE No. B-E2



SYMBOL	BOREHOLE	SAMPLE [	DEPTH (m) E	ELEVATION (m)	LL	PL	PI
•	BH E3	SS3	1.8	204.0	29	11	18
	BH E7	SS3	1.8	203.1	32	17	15
<b>A</b>	BH E23	SS3	1.8	208.8	25	15	10
*	BH E30	SS6	4.1	210.2	24	13	11

Date March 2022

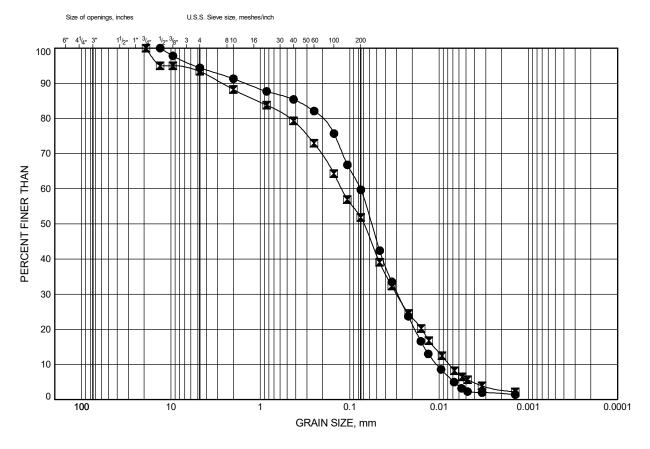
Project TP115086

Prep'd ....CZ

### **GRAIN SIZE DISTRIBUTION**

Silty Sand / Sandy Silt Till

FIGURE No. B-E3



						<u> </u>
COBBLE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT and CLAY
SIZE	GRA	AVEL		SAND		FINE GRAINED

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	ELEVATION (m)
•	BH E6 / S18	SS9	7.9	196.9
	BH S17	SS5	3.4	199.3

Date March 2022

Project TP115086

Prep'd .....

Chkd. .....



#### **APPENDIX C**

#### **SOIL ANALYTICAL RESULTS**

wood.



# SECTION A COLERAINE DRIVE (FROM ARTERIAL A2 TO MAYFIELD DRIVE, ~3 KM)

#### **APPENDIX C-A**

**SOIL ANALYTICAL RESULTS** 





# Table 1A - Soil Chemical Analyses Metal and Inorganic Parameters

Sample Location		Borehole BHA3	Borehol	Borehole BHA13			
Sample ID				A3 SS4	A9 SS1	DUP1	A13 SS1
				Silty			
Soil Type				Clay/Clayey Silt	Silty Clay FILL	Silty Clay FILL	Silty Clay FILL
Son Type				Till	Sirty Clay FILE	Sifty Clay FILL	Sifty Clay File
Field Vapour (ppm)				0/0	0/0	0/0	0/0
Sample Depth (mbgs)				2.4-3.0	0.3-0.9	0.3-0.9	0.3-0.9
Sampling Date				21-Jan-20	21-Jan-20	21-Jan-20	21-Jan-20
Latest Analyzed Date				12-Feb-20	12-Feb-20	12-Feb-20	12-Feb-20
Laboratory ID				884523	884525	884531	884529
Certificate of Analysis No.				20T566860	20T566860	20T566860	20T566860
	Lowest						
	Detectio	Table 1	Table 3				
	n Limit						
		scs	scs				
Antimony (Sb)	0.8	1.3	50	<0.8	<0.8	<0.8	<0.8
Arsenic (As)	0.8	1.3	18	<0.8 5.0	<0.8 4.0	<0.8 4.0	<0.8 4.0
Barium (Ba)	1	220	670	66.0	96.0	111.0	100.0
, ,	0.5	2.5	10	0.50	0.60	0.60	0.60
Beryllium (Be) Boron (B)	5	36	120	8.0	9.0	8.0	8.0
Boron (B), Hot Water Ext.	0.1	NV	2	0.11	0.12	0.17	0.17
Cadmium (Cd)	0.1	1.2	1.9	<0.5	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	18.0	24.0	27.0	23.0
Cobalt (Co)	1	21	100	9.2	9.8	11.2	8.6
Copper (Cu)	1	92	300	22.0	21.0	24.0	19.0
Lead (Pb)	1	120	120	9	9	11	10
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	340	19.0	19.0	22.0	19.0
Selenium (Se)	0.4	1.5	5.5	<0.4	<0.4	0.60	<0.4
Silver (Ag)	0.2	0.5	50	<0.2	<0.2	<0.2	<0.2
Thallium (Tl)	0.4	1	3	<0.4	<0.4	<0.4	<0.4
Uranium (U)	0.5	2.5	33	0.60	0.60	0.60	0.50
Vanadium (V)	1	86	86	23.0	34.0	38.0	31.0
Zinc (Zn)	5	290	340	48.0	52.0	57.0	49.0
Chromium (VI)	0.2	0.66	10	<0.2	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.040	<0.040	<0.040	<0.040
Mercury (Hg)	0.1	0.27	20	<0.10	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	0.35	1.34	1.46	0.81
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	0.23	2.92	3.10	1.62
pH (unitless)	0.1	NA	NA	7.57	7.61	7.65	7.29

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (<1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



# Table 1A - Soil Chemical Analyses Metal and Inorganic Parameters

Sample Location		Borehole BHA17	Borehole BHA20	Borehole BHA28	Borehole BHA31		
Sample ID				BH A17 SS3	BH A20 SS2	BH A28 SS2	BH A31 SS2
Soil Type				Silty Clay/Clayey Silt Till	Silty Cly FILL and Silty Clay/Clayey Silt Till	Silty Clay FILL	Silty Clay FILL
Field Vapour (ppm) Sample Depth (mbgs) Sampling Date Latest Analyzed Date Laboratory ID				0/0 1.5-2.1 22-Jan-20 12-Feb-20 890298	0/0 0.6-1.2 23-Jan-20 12-Feb-20 890260	0/0 0.6-1.2 22-Jan-20 12-Feb-20 890308	0/0 0.9-1.5 22-Jan-20 12-Feb-20 890310
Certificate of Analysis No.				20T567508	20T567556	20T567508	20T567508
	Lowest Detectio n Limit	Table 1	Table 3				
Antimony (Sb)	0.8	1.3	50	<0.8	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	4.0	5.0	5.0	4.0
Barium (Ba)	1	220	670	64.0	92.0	66.0	96.0
Beryllium (Be)	0.5	2.5	10	<0.5	0.60	0.50	0.60
Boron (B)	5	36	120	6.0	8.0	9.0	6.0
Boron (B), Hot Water Ext.	0.1	NV	2	0.11	0.13	0.11	0.17
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	18.0	24.0	21.0	23.0
Cobalt (Co)	1	21	100	8.7	10.3	8.5	8.2
Copper (Cu)	1	92	300	18.0	22.0	21.0	15.0
Lead (Pb)	1	120	120	8	11	8	12
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5	0.50
Nickel (Ni)	1	82	340	17.0	21.0	18.0	15.0
Selenium (Se)	0.4	1.5	5.5	< 0.4	<0.4	<0.4	0.60
Silver (Ag)	0.2	0.5	50	<0.2	<0.2	<0.2	<0.2
Thallium (Tl)	0.4	1	3	<0.4	<0.4	<0.4	<0.4
Uranium (U)	0.5	2.5	33	< 0.5	0.50	<0.5	0.60
Vanadium (V)	1	86	86	24.0	32.0	28.0	35.0
Zinc (Zn)	5	290	340	44.0	55.0	42.0	78.0
Chromium (VI)	0.2	0.66	10	<0.2	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.040	< 0.040	<0.040	<0.040
Mercury (Hg)	0.1	0.270	20	<0.10	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.570	1.4	0.50	1.87	1.49	2.31
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	1.26	6.21	24.00	6.74
pH (unitless)	0.1	NA	NA	7.42	7.45	7.78	7.39

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



# Table 2A - Soil Chemical Analyses Metal and Inorganic Parameters

Sample Location		Borehole BHA3	Borehol	Borehole BHA13			
Sample ID				A3 SS4	A9 SS1	DUP1	A13 SS1
				Silty			
Soil Type				Clay/Clayey Silt	Silty Clay FILL	Silty Clay FILL	Silty Clay FILL
Son Type				Till	Silty Clay FILL	Silty Clay FILL	Silty Clay FILL
				1111			
Field Vapour (ppm)				0/0	0/0	0/0	0/0
Sample Depth (mbgs)				2.4-3.0	0.3-0.9	0.3-0.9	0.3-0.9
Sampling Date				21-Jan-20	21-Jan-20	21-Jan-20	21-Jan-20
Latest Analyzed Date				12-Feb-20	12-Feb-20	12-Feb-20	12-Feb-20
Laboratory ID				884523	884525	884531	884529
Certificate of Analysis No.				20T566860	20T566860	20T566860	20T566860
	Lowest						
	Detectio	Table 1	Table 3.1				
	n Limit						
		new SCS	new SCS				
Antimony (Sb)	8.0	1.3	40	<0.8	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	5.0	4.0	4.0	4.0
Barium (Ba)	1	220	670	66.0	96.0	111.0	100.0
Beryllium (Be)	0.5	2.5	8	0.50	0.60	0.60	0.60
Boron (B)	5	36	120	8.0	9.0	8.0	8.0
Boron (B), Hot Water Ext.	0.1	NV	2	0.11	0.12	0.17	0.17
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	18.0	24.0	27.0	23.0
Cobalt (Co)	1	21	80	9.2	9.8	11.2	8.6
Copper (Cu)	1	92	230	22.0	21.0	24.0	19.0
Lead (Pb)	1	120	120	9	9	11	10
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	270	19.0	19.0	22.0	19.0
Selenium (Se)	0.4	1.5	5.5	<0.4	<0.4	0.60	<0.4
Silver (Ag)	0.2	0.5	40	<0.2	<0.2	<0.2	<0.2
Thallium (TI)	0.4	1	3.3	<0.4	<0.4	<0.4	<0.4
Uranium (U)	0.5	2.5	33	0.60	0.60	0.60	0.50
Vanadium (V)	1	86	86	23.0	34.0	38.0	31.0
Zinc (Zn)	5	290	340	48.0	52.0	57.0	49.0
Chromium (VI)	0.2	0.66	8	<0.2	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.040	<0.040	<0.040	<0.040
Mercury (Hg)	0.1	0.27	0.27	<0.10	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	0.35	1.34	1.46	0.81
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	0.23	2.92	3.10	1.62
pH (unitless)	0.1	NA	NA	7.57	7.61	7.65	7.29

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 new SCS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 new SCS). Table 1 exceedances indicated in **BOLD** and Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



# Table 2A - Soil Chemical Analyses Metal and Inorganic Parameters

Sample Location		Borehole BHA17	Borehole BHA20	Borehole BHA28	Borehole BHA31		
Sample ID				BH A17 SS3	BH A20 SS2	BH A28 SS2	BH A31 SS2
Soil Type				Silty Clay/Clayey Silt Till	Silty Cly FILL and Silty Clay/Clayey Silt Till	Silty Clay FILL	Silty Clay FILL
Field Vapour (ppm) Sample Depth (mbgs) Sampling Date Latest Analyzed Date Laboratory ID Certificate of Analysis No.		0/0 1.5-2.1 22-Jan-20 12-Feb-20 890298 20T567508	0/0 0.6-1.2 23-Jan-20 12-Feb-20 890260 20T567556	0/0 0.6-1.2 22-Jan-20 12-Feb-20 890308 20T567508	0/0 0.9-1.5 22-Jan-20 12-Feb-20 890310 20T567508		
er tilled te or milarysis i to	Lowest Detectio n Limit	Table 1	Table 3.1		201307330	201007000	251307335
Antino and (Ch.)	0.0	new SCS	new SCS	.0.0	.0.0	.0.0	.0.0
Antimony (Sb)	0.8	1.3	40	<0.8	<0.8	<0.8	<0.8
Arsenic (As) Barium (Ba)	1	18 220	18 670	4.0 64.0	5.0 92.0	5.0 66.0	4.0 96.0
' '	0.5						
Beryllium (Be) Boron (B)	5	2.5 36	8	<0.5 6.0	0.60 8.0	0.50 9.0	0.60 6.0
Boron (B), Hot Water Ext.	0.1	NV	2	0.11	0.13	0.11	0.17
Cadmium (Cd)	0.1	1.2	1.9	<0.5	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	1.9	18.0	24.0	21.0	23.0
Cobalt (Co)	1	21	80	8.7	10.3	8.5	8.2
Copper (Cu)	1	92	230	18.0	22.0	21.0	15.0
Lead (Pb)	1	120	120	8	11	8	13.0
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5	0.50
Nickel (Ni)	1	82	270	17.0	21.0	18.0	15.0
Selenium (Se)	0.4	1.5	5.5	<0.4	<0.4	<0.4	0.60
Silver (Ag)	0.4	0.5	40	<0.4	<0.4	<0.4	<0.2
Thallium (TI)	0.4	1	3.3	<0.4	<0.4	<0.4	<0.4
Uranium (U)	0.5	2.5	33	<0.5	0.50	<0.5	0.60
Vanadium (V)	1	86	86	24.0	32.0	28.0	35.0
Zinc (Zn)	5	290	340	44.0	55.0	42.0	78.0
Chromium (VI)	0.2	0.66	8	<0.2	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.040	<0.040	<0.040	<0.040
Mercury (Hg)	0.04	0.031	0.031	<0.10	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	0.50	1.87	1.49	2.31
Sodium Adsorption Ratio (unitless)	0.04	2.4	1.4	1.26	6.21	24.00	6.74
pH (unitless)	0.1	NA	NA	7.42	7.45	7.78	7.39
pri (dilidess)	0.1	1 1/-1	14/3	7.72	7.33	7.70	7.55

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 new SCS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 new SCS). Table 1 exceedances indicated in **BOLD** and Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



#### Table 3A - Ontario Regulation 347/90 Leachate Analyses Waste Classification

Sample ID	TCLP COMP2		
Sampling Date			24-Jan-20
Laboratory ID			918885
Certificate of Analysis No.			20T569148
	DL	Schedule 4	
Arsenic (As)	0.01	3	<0.010
Barium (Ba)	0.1	100	0.484
Boron (B)	0.05	500	0.056
Cadmium (Cd)	0.01	0.5	<0.010
Chromium (Cr)	0.01	5	<0.010
Lead (Pb)	0.01	5	<0.010
Selenium (Se)	0.01	1	<0.010
Silver (Ag)	0.01	5	< 0.010
Uranium (U)	0.05	10	<0.05
Fluoride	0.1	150	0.23
Mercury	0.01	0.1	<0.01
Cyanide	0.05	20	< 0.05
Nitrite + Nitrate	0.7	100	<0.70
Heptachlor + Heptachlor Epoxide	0.0003	0.3	<0.0003
Aldrin + Dieldrin	0.0007	0.07	<0.0007
DDT + Metabolites	0.0007	3	<0.003
Methoxychlor	0.003	90	<0.09
Chlordane (Total)	0.0007	0.7	<0.0007
Aldrin	0.0007	0.07	<0.0007
alpha - chlordane	0.0004	NV	<0.0001
gamma-Chlordane	0.0003	NV	<0.0002
Oxychlordane	0.0002	NV	<0.0002
pp'-DDE	0.0005	NV	<0.0005
pp'-DDD	0.0015	NV	<0.0015
op'-DDT	0.0015	NV	<0.0015
pp'-DDT	0.0005	NV	<0.0005
Dieldrin	0.0005	0.07	<0.0005
Heptachlor	0.0001	0.3	<0.0001
Heptachlor Epoxide	0.0002	0.3	<0.0002
Lindane	0.0004	0.4	<0.0004
Endrin	0.0004	0.02	<0.0004
Toxaphene	0.0005	0.5	<0.0005
PCB's	0.0002	0.3	<0.0002
Vinyl Chloride	0.03	0.2	<0.030
1,1 Dichloroethene	0.02	1.4	<0.020
Dichloromethane	0.03	5	<0.030
Methyl Ethyl Ketone	0.09	200	<0.090
Chloroform	0.02	10	<0.020
1,2-Dichloroethane	0.02	0.5	<0.020
Carbon Tetrachloride	0.02	0.5	<0.020
Benzene	0.02	0.5	<0.020
Trichloroethene	0.02	5	<0.020
Tetrachloroethene	0.05	3	<0.050
Chlorobenzene	0.01	8	<0.010
1,2-Dichlorobenzene	0.01	20	<0.010
1,4-Dichlorobenzene	0.01	0.5	<0.010
			-

Notes: Ontario Regulation 347/90, Schedule 4 Leachate Criteria. All results reported in mg/L except for Ignitability and flammability which have no units. "RDL" means reportable detection limit. "<" indicates not detected above RDL as shown. Schedule 4 exceedances indicated in **BOLD underlined**. "NV" means no value. "NA" means not applicable / not analyzed.



#### Table 4A - Ontario Regulation 406/19 Leachate Analyses Waste Classification

Sample ID Sampling Date Laboratory ID Certificate of Analysis No.			TCLP COMP2 24-Jan-20 918885 20T569148
	DL	Appendix 2 Table 3.1	
Arsenic (As)	0.01	NV	<0.010
Barium (Ba)	0.1	4600000	0.484
Boron (B)	0.05	NV	0.056
Cadmium (Cd)	0.01	NV	<0.010
Chromium (Cr)	0.01	130000	< 0.010
Lead (Pb)	0.01	NV	< 0.010
Selenium (Se)	0.01	10000	< 0.010
Silver (Ag)	0.01	300	< 0.010
Uranium (U)	0.05	66000	<0.05
Fluoride	0.1	NV	0.23
Mercury	0.01	NV	< 0.01
Cyanide	0.05	NV	< 0.05
Nitrite + Nitrate	0.7	NV	<0.70
Heptachlor + Heptachlor Epoxide	0.0003	NV	<0.0003
Aldrin + Dieldrin	0.0007	0.000097	<0.0007
DDT + Metabolites	0.003	NV	<0.003
Methoxychlor	0.090	NV	<0.09
Chlordane (Total)	0.0007	NV	<0.0007
Aldrin	0.0004	NV	<0.0002
alpha - chlordane	0.0005	NV	<0.0001
gamma-Chlordane	0.0002	NV	<0.0002
Oxychlordane	0.0004	NV	<0.0004
pp'-DDE	0.0005	NV	<0.0005
pp'-DDD	0.0015	NV	<0.0015
op'-DDT	0.0015	NV	< 0.0015
pp'-DDT	0.0005	NV	< 0.0005
Dieldrin	0.0005	NV	< 0.0005
Heptachlor	0.0001	NV	<0.0001
Heptachlor Epoxide	0.0002	0.00001	<0.0002
Lindane	0.0004	NV	<0.0004
Endrin	0.0004	0.000062	<0.0004
Toxaphene	0.0005	NV	<0.0005
PCB's	0.0002	NV	<0.0002
Vinyl Chloride	0.03	NV	<0.030
1,1 Dichloroethene	0.02	500.0	<0.020
Dichloromethane	0.03	NV	<0.030
Methyl Ethyl Ketone	0.09	NV	<0.090
Chloroform	0.02	NV	<0.020
1,2-Dichloroethane	0.02	NV	<0.020
Carbon Tetrachloride	0.02	200.0	<0.020
Benzene	0.02	NV	<0.020
Trichloroethene	0.02	500	<0.020
Tetrachloroethene	0.05	500	<0.050
Chlorobenzene	0.01	NV	<0.010
1,2-Dichlorobenzene	0.01	NV	<0.010
1,4-Dichlorobenzene	0.01	NV	<0.010

Notes: Ontario Regulation 406/19, Appendix 2 - Generic Leachate Screening Levels for Excess Soil Reuse - Table 3.1: Leachate Screening Levels for Full Depth Excess Soil in a Non-Potable Ground Water condition, Volume Independent,

Industrial/Commercial/Community Property Use. All results reported in mg/L except for Ignitability and flammability which have no units. "RDL" means reportable detection limit. "<" indicates not detected above RDL as shown. Table 3.1 exceedances indicated in **BOLD underlined**. "NV" means no value. "NA" means not applicable / not analyzed.



# SECTION B ARTERIAL A2 (FROM MAYFIELD ROAD TO MAJOR MACKENZIE DRIVE / RR 50, ~3.4 KM)

#### **APPENDIX C-B**

**SOIL ANALYTICAL RESULTS** 





#### Table 1B - Soil Chemical Analyses Metal and Inorganic Parameters

Sample Location				Borehole B2	Borehole B5	Borehole B9	Borehole B11
Sample ID				BH B2 SS5	BH B5 SS4	BH B9 SS5	BH B11 SS2
Soil Type				Silty Sand/Sandy Silt	Silty Clay/Clayey Silt Till	Silty Clay/Clayey Silt Till	Silty Clay/Clayey Silt Till
Field Vapour (ppm)				0/0	0/0	0/0	0/0
Sample Depth (mbgs)				3.05-3.6	2.3-2.9	4.6-5.0	0.8-1.4
Sampling Date				23-Jan-20	23-Jan-20	20-Feb-20	20-Feb-20
Latest Analyzed Date				12-Feb-20	12-Feb-20	3-Mar-20	3-Mar-20
Laboratory ID				890263	890268	969395	969397
Certificate of Analysis No.				20T567556	20T567556	20T577996	20T577996
	Lowest						
	Detection	Table 1	Table 3				
	Limit						
	- 	scs	scs				
	  -						
Antimony (Sb)	0.8	1.3	50	<0.8	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	4	4	2	4
Barium (Ba)	1	220	670	40	78	25	80
Beryllium (Be)	0.5	2.5	10	<0.5	<0.5	<0.5	0.6
Boron (B)	5	36	120	5	8	<5	11
Boron (B), Hot Water Ext.	0.1	NV	2	0.16	0.15	0.18	0.13
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	10	19	9	22
Cobalt (Co)	1	21	100	5.4	10.3	3.6	9.4
Copper (Cu)	1	92	300	20	21	14	20
Lead (Pb)	1	120	120	8	9	4	8
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	340	10	20	7	20
Selenium (Se)	0.4	1.5	5.5	<0.4	< 0.4	<0.4	<0.4
Silver (Ag)	0.2	0.5	50	<0.2	<0.2	<0.2	<0.2
Thallium (Tl)	0.4	1	3	<0.4	< 0.4	<0.4	<0.4
Uranium (U)	0.5	2.5	33	<0.5	0.5	<0.5	0.6
Vanadium (V)	1	86	86	16	25	17	32
Zinc (Zn)	5	290	340	34	51	22	44
Chromium (VI)	0.2	0.66	10	<0.2	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.040	<0.040	<0.040	<0.040
Mercury (Hg)	0.1	0.27	20	<0.10	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	0.166	0.164	0.172	0.246
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	0.25	0.163	0.282	0.75
pH (unitless)	0.1	NA	NA	7.93	7.84	7.94	7.85
	-						

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



# Table 1B - Soil Chemical Analyses Metal and Inorganic Parameters

Sample Location		Borehole B17	Borehole B22	Borehole B23	Borehole S3		
Sample ID				BH B17 SS3	BH B22 SS1	BH B23 SS1	BH S3 SS3
				Silty Clay/Clayey	Sand and		Silty Caly
Soil Type				Silty Clay/Clayey	<b>Gravel and Silty</b>	Silty Clay FILL	FILL
					Clay FILL		FILL
Field Vapour (ppm)				0/0	0/0	0/0	NA
Sample Depth (mbgs)				1.5-2.1	0.3-0.9	Surface-0.6	1.5-2.1
Sampling Date				24-Jan-20	23-Jan-20	26-Jan-22	10-Jan-20
Latest Analyzed Date				12-Feb-20	12-Feb-20	7-Feb-22	20-Jan-20
Laboratory ID		918798	890269	3464483	862686		
Certificate of Analysis No.				20T569148	20T567556	22T858487	20T563670
	Lowest						
	Detection	Table 1	Table 3				
	Limit						
		SCS	SCS				
Antimony (Sb)	0.8	1.3	50	<0.8	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	5	5	3	5
Barium (Ba)	1	220	670	85	175	72.3	131
Beryllium (Be)	0.5	2.5	10	0.5	1.1	0.5	0.7
Boron (B)	5	36	120	10	10	7	10
Boron (B), Hot Water Ext.	0.1	NV	2	<0.10	0.1	0.44	1.26
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	23	39	22	30
Cobalt (Co)	1	21	100	9.7	16.6	9	10.7
Copper (Cu)	1	92	300	20	28	19.8	27
Lead (Pb)	1	120	120	13	16	12	54
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5	0.5
Nickel (Ni)	1	82	340	20	34	17	22
Selenium (Se)	0.4	1.5	5.5	<0.4	<0.4	<0.8	0.7
Silver (Ag)	0.2	0.5	50	<0.2	<0.2	<0.5	<0.2
Thallium (Tl)	0.4	1	3	<0.4	<0.4	<0.5	<0.4
Uranium (U)	0.5	2.5	33	0.5	0.6	0.52	0.7
Vanadium (V)	1	86	86	30	47	32.6	39
Zinc (Zn)	5	290	340	48	83	56	103
Chromium (VI)	0.2	0.66	10	<0.2	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.040	<0.040	<0.040	<0.040
Mercury (Hg)	0.1	0.27	20	<0.10	<0.10	<0.10	0.21
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	0.236	0.918	0.359	5.52
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	0.205	1.24	0.644	45.3
pH (unitless)	0.1	NA	NA	7.58	7.6	7.23	7.58

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



#### Table 2B - Soil Chemical Analyses Petroleum Parameters

Sample Location				Borehole B2	Borehole B28
Sample ID				BH B2 SS1	BH B28 SS2
Soil Type		Silty Clay FILL	Silty Clay/Clayey Silt Till		
Field Vapour (ppm)				20/0	0/0
Sample Depth (mbgs)				0.3-0.6	0.7-1.4
Sampling Date				23-Jan-20	26-Jan-22
Latest Analyzed Date				12-Feb-20	7-Feb-22
Laboratory ID				890263	3464492.00
Certificate of Analysis No.				20T567556	22T858487
	Lowest				
	Detection	Table 1	Table 3		
	Limit				
		SCS	scs		
PHC F1 (C6-C10 less BTEX)	5	25	65	< 5.0	< 5.0
PHC F2 (>C10-C16)	10	10	250	<10	<10
PHC F3 (>C16-C34)	50	240	2500	<50	<50
PHC F4 (>C34)	50	120	6600	<50	<50
PHC F4 (>C34)*	50	120	6600	-	-
•					

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "F" means fraction. * If F4 analysis by GC/FID did not reach baseline, F4 gravimetric analysis was conducted. Higher of two F4 values shown. "-" means not analyzed. Detection Limits higher than SCS are in *ITALIC*.



### Table 3B - Soil Chemical Analyses Volatile Organic Compounds

Sample Location				Borehole B2	Borehole B28
Sample ID				BH B2 SS1	BH B28 SS2
Soil Type				Silty Clay FILL	Silty Clay/Clayey Silt Till
Field Vapour (ppm)				20/0	0/0
Sample Depth (mbgs)				0.3-0.6	0.7-1.4
Sampling Date				23-Jan-20	26-Jan-22
Latest Analyzed Date				12-Feb-20	7-Feb-22
Laboratory ID				890263	3464492.00
Certificate of Analysis No.				20T567556	22T858487
	Lowest	Table 1	Table 3		
		SCS	scs		
	Detection				
	Limit				
Dichlorodifluoromethane	0.05	0.05	25	<0.050	<0.050
Vinyl chloride	0.02	0.02	0.25	<0.020	<0.020
Bromomethane	0.05	0.05	0.05	<0.050	<0.050
Trichlorofluoromethane	0.05	0.25	5.8	<0.050	<0.050
Acetone	0.50	0.5	28	<0.50	<0.50
1,1-Dichloroethylene	0.05	0.05	0.48	<0.050	<0.050
Methylene Chloride	0.05	0.05	2	<0.050	<0.050
trans-1,2-Dichloroethylene	0.05	0.05	9.3	< 0.050	< 0.050
MTBE	0.05	0.05	3.2	< 0.050	< 0.050
1,1-Dichloroethane	0.05	0.05	21	<0.050	< 0.050
Methyl Ethyl Ketone	0.50	0.5	88	<0.50	<0.50
cis-1,2-Dichloroethylene	0.02	0.05	37	<0.02	<0.02
Chloroform	0.04	0.05	0.18	< 0.04	< 0.04
1,2-Dichloroethane	0.03	0.05	0.05	< 0.03	<0.03
1,1,1-Trichloroethane	0.05	0.05	12	< 0.050	<0.050
Carbon tetrachloride	0.05	0.05	1.5	<0.050	<0.050
Benzene	0.02	0.02	0.4	< 0.02	< 0.02
1,2-Dichloropropane	0.03	0.05	0.68	< 0.03	< 0.03
Trichloroethylene	0.03	0.05	0.61	< 0.03	< 0.03
Bromodichloromethane	0.05	0.05	18	<0.050	< 0.050
Methyl Isobutyl Ketone	0.50	0.5	210	<0.50	<0.50
1,1,2-Trichloroethane	0.04	0.05	0.11	< 0.04	< 0.04
Toluene	0.05	0.2	78	< 0.05	< 0.05
Dibromochloromethane	0.05	0.05	13	<0.050	<0.050
1,2-Dibromoethane	0.04	0.05	0.05	< 0.04	<0.04
Tetrachloroethylene	0.05	0.05	21	<0.050	<0.050
1,1,1,2-Tetrachloroethane	0.04	0.05	0.11	<0.04	<0.04
Chlorobenzene	0.05	0.05	2.7	<0.050	<0.050
Ethylbenzene	0.05	0.05	19	<0.050	<0.050
m+p-Xylenes	0.05	NV	NV	<0.050	<0.050
Bromoform	0.05	0.05	1.7	<0.050	<0.050
Styrene	0.05	0.05	43	<0.050	<0.050
1,1,2,2-Tetrachloroethane	0.05	0.05	0.094	<0.050	<0.050
o-Xylene	0.05	NV	NV	<0.050	<0.050
1,3-Dichlorobenzene	0.05	0.05	12	<0.050	<0.050
1,4-Dichlorobenzene	0.05	0.05	0.84	<0.050	<0.050
1,2-Dichlorobenzene	0.05	0.05	8.5	<0.050	<0.050
Xylenes (Total)	0.05	0.05	30	<0.050	<0.050
1,3-Dichloropropene (cis & trans)	0.04	0.05	0.21	< 0.04	<0.04
n-Hexane	0.05	0.05	88	<0.050	<0.050
	1				

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "-" means not analyzed. Detection Limits higher than SCS are in *ITALIC*.

#### Table 4B - Soil Chemical Analyses Organochlorine Pesticides



Sample Location				Borehole B2	Borehole B5	Borehole B8	Borehole B12
•							
Sample ID				BH B2 SS1	BH B5 SS1	BH B8 SS1	BH B12 SS1
Soil Type				Silty Clay FILL	Silty Clay FILL	Topsoil and	Topsoil and
Soil Type				Silty Clay FILL	Sifty Clay FILL	Silty Clay FILL	Silty Clay FILL
Field Vapour (ppm)			20/0	10/1	0/0	0/0	
Sample Depth (mbgs)				0.3-0.6	0.3-0.6	Surface-0.6	Surface-0.6
Sampling Date				23-Jan-20	23-Jan-20	20-Feb-20	20-Feb-20
Latest Analyzed Date				11-Feb-20	11-Feb-20	2-Mar-20	2-Mar-20
Laboratory ID				890263	890267	969393	969400
Certificate of Analysis No.				20T567556	20T567556	20T577996	20T577996
	Lowest	Table 1	Table 3				
		SCS	SCS				
Hexachloroethane	0.010	0.01	0.66	<0.01	<0.01	<0.01	<0.01
gamma-hexachlorocyclohexane	0.005	0.01	0.063	< 0.005	< 0.005	< 0.005	< 0.005
Heptachlor	0.005	0.05	0.19	< 0.005	< 0.005	< 0.005	< 0.005
Aldrin	0.005	0.05	0.11	< 0.005	< 0.005	< 0.005	< 0.005
Heptachlor Epoxide	0.005	0.05	0.05	< 0.005	< 0.005	< 0.005	< 0.005
Endosulfan (Total)	0.005	0.04	0.38	< 0.005	<0.005	< 0.005	< 0.005
Chlordane (Total)	0.007	0.05	0.05	< 0.007	<0.007	< 0.007	< 0.007
Total DDE	0.007	0.05	0.65	<0.007	<0.007	< 0.007	<0.007
Total DDD	0.007	0.05	4.6	< 0.007	<0.007	< 0.007	< 0.007
Total DDT	0.007	1.4	1.4	< 0.007	<0.007	< 0.007	< 0.007
Dieldrin	0.005	0.05	0.11	< 0.005	<0.005	<0.005	<0.005
Endrin	0.005	0.04	0.04	< 0.005	<0.005	<0.005	< 0.005
Methoxychlor	0.005	0.05	1.6	< 0.005	<0.005	<0.005	<0.005
Hexachlorobenzene	0.005	0.01	0.66	< 0.005	<0.005	<0.005	<0.005
Hexachlorobutadiene	0.010	0.01	0.095	<0.01	<0.01	<0.01	<0.01

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for

residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "-" means not analyzed. Detection Limits higher than SCS are in *ITALIC*.

#### Table 4B - Soil Chemical Analyses Organochlorine Pesticides



Sample Location				Borehole B15	Borehole B17	Borehole B21	Borehole B25
Sample ID				BH B15 SS1	BH B17 SS1	BH B21 SS1	BH B25 SS1
Soil Type				Topsoil and Silty Clay FILL	Topsoil and Silty Clay FILL	Topsoil and Silty Clay FILL	Silty Clay FILL
Field Vapour (ppm)				0/0	0/0	0/0	0/0
Sample Depth (mbgs)			Surface-0.6	Surface-0.6	Surface-0.6	Surface-0.6	
Sampling Date				24-Jan-20	24-Jan-20	24-Jan-20	26-Jan-22
Latest Analyzed Date			10-Feb-20	10-Feb-20	10-Feb-20	7-Feb-22	
Laboratory ID				918801	918797	918790	3464486
Certificate of Analysis No.				20T569148	20T569148	20T569148	22T858487
	Lowest	Table 1	Table 3				
		SCS	SCS				
Hexachloroethane	0.010	0.01	0.66	<0.01	<0.01	<0.01	<0.01
gamma-hexachlorocyclohexan	0.005	0.01	0.063	<0.005	<0.005	<0.005	<0.005
Heptachlor	0.005	0.05	0.19	<0.005	<0.005	<0.005	<0.005
Aldrin	0.005	0.05	0.11	<0.005	<0.005	<0.005	<0.005
Heptachlor Epoxide	0.005	0.05	0.05	<0.005	<0.005	<0.005	<0.005
Endosulfan (Total)	0.005	0.04	0.38	<0.005	<0.005	<0.005	<0.005
Chlordane (Total)	0.007	0.05	0.05	<0.007	<0.007	<0.007	<0.007
Total DDE	0.007	0.05	0.65	<0.007	<0.007	<0.007	<0.007
Total DDD	0.007	0.05	4.6	<0.007	<0.007	<0.007	<0.007
Total DDT	0.007	1.4	1.4	<0.007	< 0.007	< 0.007	<0.007
Dieldrin	0.005	0.05	0.11	< 0.005	< 0.005	<0.005	< 0.005
Endrin	0.005	0.04	0.04	<0.005	<0.005	<0.005	<0.005
Methoxychlor	0.005	0.05	1.6	<0.005	<0.005	<0.005	<0.005
Hexachlorobenzene	0.005	0.01	0.66	< 0.005	<0.005	< 0.005	< 0.005
Hexachlorobutadiene	0.010	0.01	0.095	<0.01	<0.01	<0.01	<0.01
					, i		

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for

residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "-" means not analyzed. Detection Limits higher than SCS are in *ITALIC*.



### Table 5B - Soil Chemical Analyses Metal and Inorganic Parameters

Sample Location	Borehole B2	Borehole B5	Borehole B9	Borehole B11			
Sample ID				BH B2 SS5	BH B5 SS4	вн в9 SS5	BH B11 SS2
Soil Type	Silty Sand/Sandy Silt	Silty Clay/Clayey Silt Till	Silty Clay/Clayey Silt Till	Silty Clay/Clayey Silt Till			
Field Vapour (ppm) Sample Depth (mbgs) Sampling Date Latest Analyzed Date Laboratory ID Certificate of Analysis No.	0/0 3.05-3.6 23-Jan-20 12-Feb-20 890263 20T567556	0/0 2.3-2.9 23-Jan-20 12-Feb-20 890268 20T567556	0/0 4.6-5.0 20-Feb-20 3-Mar-20 969395 20T577996	0/0 0.8-1.4 20-Feb-20 3-Mar-20 969397 20T577996			
	Lowest Detection Limit	Table 1	Table 3.1				
		ESQS	ESQS				
Antimony (Sb)	0.8	1.3	40	<0.8	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	4	4	2	4
Barium (Ba)	1	220	670	40	78	25	80
Beryllium (Be)	0.5	2.5	8	<0.5	<0.5	<0.5	0.6
Boron (B)	5	36	120	5	8	<5	11
Boron (B), Hot Water Ext.	0.1	NV	2	0.16	0.15	0.18	0.13
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	10	19	9	22
Cobalt (Co)	1	21	80	5.4	10.3	3.6	9.4
Copper (Cu)	1	92	230	20	21	14	20
Lead (Pb)	1	120	120	8	9	4	8
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	270	10	20	7	20
Selenium (Se)	0.4	1.5	5.5	<0.4	<0.4	<0.4	<0.4
Silver (Ag)	0.2	0.5	40	<0.2	<0.2	<0.2	<0.2
Thallium (Tl)	0.4	1	3.3	<0.4	<0.4	<0.4	<0.4
Uranium (U)	0.5	2.5	33	<0.5	0.5	<0.5	0.6
Vanadium (V)	1	86	86	16	25	17	32
Zinc (Zn)	5	290	340	34	51	22	44
Chromium (VI)	0.2	0.66	8	<0.2	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.040	<0.040	<0.040	<0.040
Mercury (Hg)	0.1	0.27	0.27	<0.10	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	0.166	0.164	0.172	0.246
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	0.25	0.163	0.282	0.75
pH (unitless)	0.1	NA	NA	7.93	7.84	7.94	7.85

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 ESQS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 ESQS). Table 1 exceedances indicated in **BOLD** and Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



### Table 5B - Soil Chemical Analyses Metal and Inorganic Parameters

Sample Location	Borehole B17	Borehole B22	Borehole B23	Borehole S3			
Sample ID				BH B17 SS3	BH B22 SS1	BH B23 SS1	BH S3 SS3
Soil Type				Silty Clay/Clayey Silt Till	Sand and Gravel and Silty Clay FILL	Silty Clay FILL	Silty Caly FILL
Field Vapour (ppm) Sample Depth (mbgs) Sampling Date Latest Analyzed Date Laboratory ID Certificate of Analysis No.	0/0 1.5-2.1 24-Jan-20 12-Feb-20 918798 20T569148	0/0 0.3-0.9 23-Jan-20 12-Feb-20 890269 20T567556	0/0 Surface-0.6 26-Jan-22 7-Feb-22 3464483 22T858487	NA 1.5-2.1 10-Jan-20 20-Jan-20 862686 20T563670			
	Lowest Detection Limit	Table 1	Table 3.1				
Antimony (Sb)	8.0	1.3	40	<0.8	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	5	5	3	5
Barium (Ba)	1	220	670	85	175	72.3	131
Beryllium (Be)	0.5	2.5	8	0.5	1.1	0.5	0.7
Boron (B)	5	36	120	10	10	7	10
Boron (B), Hot Water Ext.	0.1	NV	2	<0.10	0.1	0.44	1.26
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	23	39	22	30
Cobalt (Co)	1	21	80	9.7	16.6	9	10.7
Copper (Cu)	1	92	230	20	28	19.8	27
Lead (Pb)	1	120	120	13	16	12	54
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5	0.5
Nickel (Ni)	1	82	270	20	34	17	22
Selenium (Se)	0.4	1.5	5.5	<0.4	<0.4	<0.8	0.7
Silver (Ag)	0.2	0.5	40	<0.2	<0.2	<0.5	<0.2
Thallium (Tl)	0.4	1	3.3	<0.4	<0.4	<0.5	<0.4
Uranium (U) Vanadium (V)	0.5 1	2.5 86	33 86	0.5 30	0.6 47	0.52 32.6	0.7 39
` '	5	290				32.6 56	
Zinc (Zn) Chromium (VI)	0.2	0.66	340 8	48 <0.2	83 <0.2	<0.2	103 <0.2
Cyanide	0.2	0.051	0.051	<0.2	<0.2	<0.2	<0.2
Mercury (Hg)	0.04	0.031	0.031	<0.040	<0.040	<0.040	0.040
Electrical Conductivity (mS/cm)	0.1	0.27	1.4	0.236	0.10	0.359	5.52
Sodium Adsorption Ratio (unitless)	0.04	2.4	1.4	0.236	1.24	0.539	45.3
pH (unitless)	0.1	VA NA	NA	7.58	7.6	7.23	<b>45.3</b> 7.58
pri (unitiess)	0.1	INA	INA	1.30	0.1	1.43	1.30

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 ESQS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 ESQS). Table 1 exceedances indicated in BOLD and Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



### Table 6B - Soil Chemical Analyses Petroleum Parameters

Sample Location				Borehole B2	Borehole B28
Sample ID				BH B2 SS1	BH B28 SS2
Soil Type				Silty Clay FILL	Silty Clay/Clayey Silt Till
Field Vapour (ppm)				20/0	0/0
Sample Depth (mbgs)				0.3-0.6	0.7-1.4
Sampling Date				23-Jan-20	26-Jan-22
Latest Analyzed Date				12-Feb-20	7-Feb-22
Laboratory ID				890263	3464492.00
Certificate of Analysis No.				20T567556	22T858487
	Lowest				
	Detection	Table 1	Table 3.1		
	Limit				
		ESQS	ESQS		
PHC F1 (C6-C10 less BTEX)	5	25	25	< 5.0	< 5.0
PHC F2 (>C10-C16)	10	10	26	<10	<10
PHC F3 (>C16-C34)	50	240	1700	<50	<50
PHC F4 (>C34)	50	120	3300	<50	<50
PHC F4 (>C34)*	50	120	3300	-	-

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 ESQS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 ESQS). Table 1 exceedances indicated in BOLD, Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "F" means fraction. * If F4 analysis by GC/FID did not reach baseline, F4 gravimetric analysis was conducted. Higher of two F4 values shown. "-" means not analyzed. Detection Limits higher than SCS are in ITALIC.



### Table 7B - Soil Chemical Analyses Volatile Organic Compounds

Sample Location				Borehole B2	Borehole B28
Sample ID	BH B2 SS1	BH B28 SS2			
•					Silty Clay/Clayey
Soil Type				Silty Clay FILL	Silt Till
Field Vapour (ppm)				20/0	0/0
Sample Depth (mbgs)				0.3-0.6	0.7-1.4
Sampling Date				23-Jan-20	26-Jan-22
Latest Analyzed Date				12-Feb-20	7-Feb-22
Laboratory ID				890263	3464492.00
Certificate of Analysis No.	20T567556	22T858487			
	Lowest	Table 1	Table 3.1		
	Detection	ESQS	ESQS		
	Limit				
Dichlorodifluoromethane	0.05	0.05	1.8	<0.050	<0.050
Vinyl chloride	0.03	0.03	0.02	<0.030	<0.030
Bromomethane	0.02	0.02	0.02	<0.050	<0.050
Trichlorofluoromethane	0.05	0.05	0.05	<0.050	<0.050
Acetone	0.03	0.25	1.8	<0.030	<0.50
1,1-Dichloroethylene	0.50	0.05	0.05	<0.050	<0.50 <0.050
Methylene Chloride	0.05	0.05	0.03	<0.050	<0.050
trans-1,2-Dichloroethylene	0.05	0.05	0.05	<0.050	<0.050
MTBE	0.05	0.05	0.05	<0.050	<0.050
1,1-Dichloroethane	0.05	0.05	0.57	<0.050	<0.050
Methyl Ethyl Ketone	0.50	0.03	26	<0.50	<0.50
cis-1,2-Dichloroethylene	0.02	0.05	0.05	<0.02	<0.02
Chloroform	0.02	0.05	0.26	<0.04	<0.04
1,2-Dichloroethane	0.03	0.05	0.05	<0.03	<0.03
1,1,1-Trichloroethane	0.05	0.05	0.4	<0.050	<0.050
Carbon tetrachloride	0.05	0.05	0.05	<0.050	<0.050
Benzene	0.02	0.02	0.034	<0.02	<0.02
1,2-Dichloropropane	0.03	0.05	0.05	<0.03	< 0.03
Trichloroethylene	0.03	0.05	0.05	<0.03	<0.03
Bromodichloromethane	0.05	0.05	5.8	< 0.050	<0.050
Methyl Isobutyl Ketone	0.50	0.5	17	<0.50	<0.50
1,1,2-Trichloroethane	0.04	0.05	0.05	<0.04	< 0.04
Toluene	0.08	0.2	7.8	<0.05	< 0.05
Dibromochloromethane	0.05	0.05	5.5	< 0.050	< 0.050
1,2-Dibromoethane	0.04	0.05	0.05	<0.04	<0.04
Tetrachloroethylene	0.05	0.05	0.05	< 0.050	< 0.050
1,1,1,2-Tetrachloroethane	0.04	0.05	0.05	<0.04	< 0.04
Chlorobenzene	0.05	0.05	0.28	< 0.050	< 0.050
Ethylbenzene	0.05	0.05	1.9	< 0.050	< 0.050
m+p-Xylenes	0.05	NV	NV	<0.050	<0.050
Bromoform	0.05	0.05	2.5	< 0.050	< 0.050
Styrene	0.05	0.05	6.8	<0.050	<0.050
1,1,2,2-Tetrachloroethane	0.05	0.05	0.05	<0.050	<0.050
o-Xylene	0.02	NV	NV	< 0.050	<0.050
1,3-Dichlorobenzene	0.05	0.05	6.8	<0.050	<0.050
1,4-Dichlorobenzene	0.05	0.05	0.05	< 0.050	<0.050
1,2-Dichlorobenzene	0.05	0.05	6.8	< 0.050	<0.050
Xylenes (Total)	0.05	0.05	3	< 0.050	<0.050
1,3-Dichloropropene (cis & trans)	0.04	0.05	0.05	<0.04	< 0.04
n-Hexane	0.05	0.05	2.5	< 0.050	<0.050

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 ESQS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 ESQS). Table 1 exceedances indicated in **BOLD**, Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "-" means not analyzed. Detection Limits higher than SCS are in *ITALIC*.

#### Table 8B - Soil Chemical Analyses Organochlorine Pesticides



				1			
Sample Location				Borehole B2	Borehole B5	Borehole B8	Borehole B12
Sample ID				BH B2 SS1	BH B5 SS1	BH B8 SS1	BH B12 SS1
Soil Type	Silty Clay FILL	Silty Clay FILL	Topsoil and Silty Clay FILL	Topsoil and Silty Clay FILL			
Field Vapour (ppm)				20/0	10/1	0/0	0/0
Sample Depth (mbgs)				0.3-0.6	0.3-0.6	Surface-0.6	Surface-0.6
Sampling Date				23-Jan-20	23-Jan-20	20-Feb-20	20-Feb-20
Latest Analyzed Date				11-Feb-20	11-Feb-20	2-Mar-20	2-Mar-20
Laboratory ID				890263	890267	969393	969400
Certificate of Analysis No.				20T567556	20T567556	20T577996	20T577996
	Lowest	Table 1	Table 3.1				
	Detection	ESQS	ESQS				
	Limit	ESQS	ESQS				
Hexachloroethane	0.010	0.01	0.13	<0.01	<0.01	<0.01	<0.01
gamma-hexachlorocyclohexane	0.005	0.01	0.01	< 0.005	<0.005	<0.005	< 0.005
Heptachlor	0.005	0.05	0.072	<0.005	< 0.005	< 0.005	<0.005
Aldrin	0.005	0.05	0.088	< 0.005	<0.005	<0.005	< 0.005
Heptachlor Epoxide	0.005	0.05	0.05	< 0.005	<0.005	<0.005	< 0.005
Endosulfan (Total)	0.005	0.04	0.04	< 0.005	<0.005	<0.005	< 0.005
Chlordane (Total)	0.007	0.05	0.05	< 0.007	< 0.007	< 0.007	< 0.007
Total DDE	0.007	0.05	0.52	<0.007	<0.007	<0.007	< 0.007
Total DDD	0.007	0.05	4.6	<0.007	<0.007	<0.007	< 0.007
Total DDT	0.007	1.4	1.4	< 0.007	< 0.007	< 0.007	< 0.007
Dieldrin	0.005	0.05	0.088	< 0.005	< 0.005	< 0.005	< 0.005
Endrin	0.005	0.04	0.04	< 0.005	<0.005	< 0.005	< 0.005
Methoxychlor	0.005	0.05	0.19	< 0.005	<0.005	< 0.005	< 0.005
Hexachlorobenzene	0.005	0.01	0.66	< 0.005	< 0.005	< 0.005	< 0.005
Hexachlorobutadiene	0.010	0.01	0.01	<0.01	<0.01	<0.01	<0.01

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 ESQS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 ESQS). Table 1 exceedances indicated in BOLD, Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "-" means not tested. Detection Limits higher than SCS are in *ITALIC*.

#### Table 8B - Soil Chemical Analyses Organochlorine Pesticides



Sample Location				Borehole B15	Borehole B17	Borehole B21	Borehole B25
•							
Sample ID				BH B15 SS1	BH B17 SS1	BH B21 SS1	BH B25 SS1
C-11 T				Topsoil and	psoil and Topsoil and Topsoil and	511 GL FILL	
Soil Type				Silty Clay FILL	Silty Clay FILL	Silty Clay FILL	Silty Clay FILL
Field Vapour (ppm)				0/0	0/0	0/0	0/0
Sample Depth (mbgs)				Surface-0.6	Surface-0.6	Surface-0.6	Surface-0.6
Sampling Date				24-Jan-20	24-Jan-20	24-Jan-20	26-Jan-22
Latest Analyzed Date				10-Feb-20	10-Feb-20	10-Feb-20	7-Feb-22
Laboratory ID				918801	918797	918790	3464486
Certificate of Analysis No.				20T569148	20T569148	20T569148	22T858487
	Lowest	Table 1	Table 3.1				
	Detection	ESQS	ESQS				
	Limit	EJQJ	ESQS				
Hexachloroethane	0.010	0.01	0.13	<0.01	<0.01	<0.01	<0.01
gamma-hexachlorocyclohexane	0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005
Heptachlor	0.005	0.05	0.072	< 0.005	<0.005	< 0.005	< 0.005
Aldrin	0.005	0.05	0.088	< 0.005	<0.005	< 0.005	< 0.005
Heptachlor Epoxide	0.005	0.05	0.05	< 0.005	< 0.005	< 0.005	< 0.005
Endosulfan (Total)	0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	< 0.005
Chlordane (Total)	0.007	0.05	0.05	< 0.007	< 0.007	< 0.007	< 0.007
Total DDE	0.007	0.05	0.52	<0.007	<0.007	<0.007	<0.007
Total DDD	0.007	0.05	4.6	< 0.007	< 0.007	< 0.007	< 0.007
Total DDT	0.007	1.4	1.4	<0.007	< 0.007	< 0.007	< 0.007
Dieldrin	0.005	0.05	0.088	< 0.005	< 0.005	< 0.005	< 0.005
Endrin	0.005	0.04	0.04	< 0.005	<0.005	<0.005	< 0.005
Methoxychlor	0.005	0.05	0.19	< 0.005	<0.005	< 0.005	< 0.005
Hexachlorobenzene	0.005	0.01	0.66	< 0.005	< 0.005	< 0.005	< 0.005
Hexachlorobutadiene	0.010	0.01	0.01	<0.01	<0.01	<0.01	<0.01

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 ESQS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 ESQS). Table 1 exceedances indicated in BOLD, Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "-" means not tested. Detection Limits higher than SCS are in ITALIC.



#### Table 9B - Ontario Regulation 347/90 Leachate Analyses Waste Classification

Sample ID			Comp 1 TCLP B	BH26 SS1
Sampling Date	20-Feb-20	26-Jan-22		
Laboratory ID			1028261	3464488
Certificate of Analysis No.	20T584983	22T858487		
,	DL	Schedule 4		
Arsenic (As)	0.01	3	<0.010	<0.010
Barium (Ba)	0.1	100	0.41	0.466
Boron (B)	0.05	500	0.051	<0.050
Cadmium (Cd)	0.01	0.5	<0.010	<0.010
Chromium (Cr)	0.01	5	<0.010	<0.010
Lead (Pb)	0.01	5	<0.010	<0.010
Selenium (Se)	0.01	1	<0.010	<0.010
Silver (Ag)	0.01	5	<0.010	<0.010
Uranium (U)	0.05	10	<0.05	< 0.05
Fluoride	0.1	150	0.24	0.18
Mercury	0.01	0.1	<0.01	<0.01
Cyanide	0.05	20	<0.05	< 0.05
Nitrite + Nitrate	0.7	100	<0.70	<0.70
Benzo(a)pyrene	0.001	0.001	-	<0.001
Heptachlor + Heptachlor Epoxide	0.0003	0.3	<0.0003	-
Aldrin + Dieldrin	0.0007	0.07	<0.0007	-
DDT + Metabolites	0.003	3.0	< 0.003	-
Methoxychlor	0.090	90.0	<0.09	-
Chlordane (Total)	0.0007	0.7	<0.0007	-
Endrin	0.0004	0.02	<0.0004	-
Toxaphene	0.0005	0.5	<0.0005	-
PCB's	0.0002	0.3	<0.0002	<0.005
Vinyl Chloride	0.03	0.2	<0.030	<0.030
1,1 Dichloroethene	0.02	1.4	<0.020	<0.020
Dichloromethane	0.03	5	<0.030	<0.030
Methyl Ethyl Ketone	0.09	200	<0.090	<0.090
Chloroform	0.02	10	<0.020	<0.020
1,2-Dichloroethane	0.02	0.5	<0.020	<0.020
Carbon Tetrachloride	0.02	0.5	<0.020	<0.020
Benzene	0.02	0.5	<0.020	<0.020
Trichloroethene	0.02	5	<0.020	<0.020
Tetrachloroethene	0.05	3	<0.050	<0.050
Chlorobenzene	0.01	8	<0.010	<0.010
1,2-Dichlorobenzene	0.01	20	<0.010	<0.010
1,4-Dichlorobenzene	0.01	0.5	<0.010	<0.010

Notes: Ontario Regulation 347/90, Schedule 4 Leachate Criteria. All results reported in mg/L except for Ignitability and flammability which have no units. "RDL" means reportable detection limit. "<" indicates not detected above RDL as shown. Schedule 4 exceedances indicated in **BOLD underlined**. "NV" means no value. "NA" means not applicable / not analyzed.



#### Table 10B - Ontario Regulation 416/09 Leachate Analyses Waste Classification

Sample ID			Comp 1 TCLP B	BH26 SS1
Sampling Date Laboratory ID Certificate of Analysis No.			20-Feb-20 1028261	26-Jan-22 3464488
Certificate of Analysis No.	DL	Appendix 2	20T584983	22T858487
	<b>DL</b>	Table 3.1		
Arsenic (As)	0.01	NV	<0.010	<0.010
Barium (Ba)	0.1	4600000	0.41	0.466
Boron (B)	0.05	NV	0.051	<0.050
Cadmium (Cd)	0.01	NV	<0.010	<0.010
Chromium (Cr)	0.01	130000	<0.010	<0.010
Lead (Pb)	0.01	NV	<0.010	<0.010
Selenium (Se)	0.01	10000	<0.010	<0.010
Silver (Ag)	0.01	300	<0.010	<0.010
Uranium (U)	0.05	66000	<0.05	< 0.05
Fluoride	0.1	NV	0.24	0.18
Mercury	0.01	NV	<0.01	<0.01
Cyanide	0.01	NV	<0.05	<0.05
Nitrite + Nitrate	0.7	NV	<0.70	<0.70
Ponzo(a) nurono	0.001	NV		<0.001
Benzo(a)pyrene	0.001	INV	-	<0.001
Heptachlor + Heptachlor Epoxide	0.0003	NV	<0.0003	-
Aldrin + Dieldrin	0.0007	0.000097	<0.0007	-
DDT + Metabolites	0.003	NV	<0.003	-
Methoxychlor	0.090	NV	<0.09	-
Chlordane (Total)	0.0007	NV	<0.0007	-
Aldrin	0.0004	NV	<0.0002	-
alpha - chlordane	0.0005	NV	<0.0001	-
gamma-Chlordane	0.0002	NV	<0.0002	-
Oxychlordane	0.0004	NV	<0.0004	-
pp'-DDE	0.0005	NV	<0.0005	-
pp'-DDD	0.0015	NV	<0.0015	-
op'-DDT	0.0015	NV	<0.0015	-
pp'-DDT	0.0005	NV	<0.0005	-
Dieldrin	0.0005	NV	<0.0005	-
Heptachlor	0.0001	NV	<0.0001	-
Heptachlor Epoxide	0.0002	0.00001	<0.0002	-
Lindane	0.0004	NV	<0.0004	-
Endrin	0.0004	0.000062	<0.0004	-
Toxaphene	0.0005	NV	<0.0005	-
PCB's	0.0002	NV	<0.0002	<0.005
Vinyl Chloride	0.5	NV	<0.030	<0.030
1,1 Dichloroethene	0.2	500.0	<0.020	<0.020
Dichloromethane	1	NV	<0.030	<0.030
Methyl Ethyl Ketone	0.2	NV	<0.090	<0.090
Chloroform	0.5	NV	<0.020	<0.020
1,2-Dichloroethane	0.5	NV	<0.020	<0.020
Carbon Tetrachloride	0.5	200.0	<0.020	<0.020
Benzene	0.5	NV	<0.020	<0.020
Trichloroethene	0.5	500	<0.020	<0.020
Tetrachloroethene	0.5	500	<0.050	<0.050
Chlorobenzene	0.5	NV	<0.010	<0.010
1,2-Dichlorobenzene	0.5	NV	<0.010	<0.010
1,4-Dichlorobenzene	0.3	NV	<0.010	<0.010
THE DICTIONODE TIZETIE	0.2	147	\0.010	\0.010

Notes: Ontario Regulation 406/19, Appendix 2 - Generic Leachate Screening Levels for Excess Soil Reuse - Table 3.1: Leachate Screening Levels for Full Depth Excess Soil in a Non-Potable Ground Water condition, Volume Independent, Industrial/Commercial/Community Property Use. All results reported in mg/L except for Ignitability and flammability which have no units. "RDL" means reportable detection limit. "<" indicates not detected above RDL as shown. Table 3.1 exceedances indicated in **BOLD underlined**. "NV" means no value. "NA" means not applicable / not analyzed.



# SECTION C COUNTRYSIDE DRIVE (FROM CLARKWAY DRIVE TO RR 50, ~3 KM)

#### **APPENDIX C-C**

**SOIL ANALYTICAL RESULTS** 





# Table 1C - Soil Chemical Analyses Metal and Inorganic Parameters

Sample Location				Borehole BH C1	Borehole BH C6	Borehole BH C12
Sample ID				BH C1 SS4	BH C6 SS2	BH C12 SS2
Soil Type		Silty Clay/Clayey Silt Till	Silty Clay/Clayey Silt FILL	Silty Clay/Clayey Silt FILL		
Field Vapour (ppm) Sample Depth (mbgs) Sampling Date Latest Analyzed Date Laboratory ID Certificate of Analysis No.				0/0 2.3-3.9 25-Mar-20 3-Apr-20 1055899 20T588871	0/0 0.6-12 25-Mar-20 3-Apr-20 1055906 20T588871	0/0 0.6-1.2 25-Mar-20 3-Apr-20 1055904 20T588871
	Lowest Detectio	Table 1	Table 3			
	n Limit	scs	scs			
Antimony (Sb)	0.8	1.3	50	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	3	3	3
Barium (Ba)	1	220	670	96	44	78
Beryllium (Be)	0.5	2.5	10	0.6	<0.5	<0.5
Boron (B)	5	36	120	9	6	7
Boron (B), Hot Water Ext.	0.1	NV	2	<0.10	<0.10	0.2
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	21	11	18
Cobalt (Co)	1	21	100	12.4	5.8	9.3
Copper (Cu)	1	92	300	19	16	16
Lead (Pb)	1	120	120	9	5	11
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	340	24	10	17
Selenium (Se)	0.4	1.5	5.5	<0.4	<0.4	0.4
Silver (Ag)	0.2	0.5	50	<0.2	<0.2	<0.2
Thallium (TI)	0.4	1	3	<0.4	<0.4	<0.4
Uranium (U)	0.5	2.5	33	0.5	<0.5	<0.5
Vanadium (V)	1	86	86	33	22	32
Zinc (Zn)	5	290	340	52	29	47
Chromium (VI)	0.2	0.66	10	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.040	<0.040	<0.040
Mercury (Hg)	0.1	0.27	20	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	0.312	1.19	1.94
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	0.811	14.3	23.1
pH (unitless)	0.1	NA	NA	7.81	8.05	7.79

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



# Table 1C - Soil Chemical Analyses Metal and Inorganic Parameters

Sample Location				Borehole BH C13	Borehole BH C17	Borehole BH C24
Sample ID				BH C13 SS3	BH C17 SS1	BH C24 SS2
Soil Type				Silty Clay/Clayey Silt Till	Silty Clay/Clayey Silt FILL	Silty Clay/Clayey Silt FILL
Field Vapour (ppm) Sample Depth (mbgs) Sampling Date Latest Analyzed Date Laboratory ID Certificate of Analysis No.				0/0 1.5-2.1 27-Mar-20 3-Apr-20 1056574 20T588920	0/0 0.3-0.9 27-Mar-20 3-Apr-20 1056577 20T588920	0/0 0.6-1.2 1-Apr-20 13-Apr-20 1066586 20T590525
	Lowest Detectio n Limit	Table 1	Table 3			
Antimony (Sb)	0.8	1.3	50	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	5	4	4
Barium (Ba)	1	220	670	96	65	74
Beryllium (Be)	0.5	2.5	10	0.6	<0.5	0.6
Boron (B)	5	36	120	12	7	8
Boron (B), Hot Water Ext.	0.1	NV	2	0.43	0.21	<0.10
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	23	17	20
Cobalt (Co)	1	21	100	11.3	7.3	9.4
Copper (Cu)	1	92	300	19	18	19
Lead (Pb)	1	120	120	9	8	9
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	340	25	16	19
Selenium (Se)	0.4	1.5	5.5	<0.4	<0.4	<0.4
Silver (Ag)	0.2	0.5	50	<0.2	<0.2	<0.2
Thallium (TI)	0.4	1	3	<0.4	<0.4	<0.4
Uranium (U)	0.5	2.5	33	0.6	<0.5	0.5
Vanadium (V)	1	86	86	35	28	29
Zinc (Zn)	5	290	340	52	44	46
Chromium (VI)	0.2	0.66	10	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.040	<0.040	<0.040
Mercury (Hg)	0.1	0.27	20	< 0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	1.45	0.552	0.83
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	3.85	1.6	4.19
pH (unitless)	0.1	NA	NA	7.75	7.71	7.88

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the

allowed value for surface soil (<1.5 mbg).



# Table 1C - Soil Chemical Analyses Metal and Inorganic Parameters

Sample Location		Borehole I	BH C25	Borehole BH C29 Borehole BH C37			
Sample ID				BH C25 SS3	DUP	BH C29 SS1	BH C37 SS1
Soil Type		Silty Clay/Clayey Silt Till	Silty Clay/Claye y Silt Till	Silty Clay/Clayey Silt FILL	Sand and Gravel and Silty Calay/Clayey Silt FILL		
Field Vapour (ppm) Sample Depth (mbgs) Sampling Date Latest Analyzed Date Laboratory ID Certificate of Analysis No.				0/0 1.5-2.1 27-Mar-20 3-Apr-20 1056587 20T588920	0/0 1.5-2.1 27-Mar-20 3-Apr-20 1056591 20T588920	0/0 0.3-0.9 19-Mar-20 30-Mar-20 1046517 20T587352	0/0 0.3-0.9 19-Mar-20 30-Mar-20 1046494 20T587352
	Lowest Detectio	Table 1	Table 3				
	n Limit	scs	scs				
Antimony (Sb)	0.8	1.3	50	<0.8	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	4	4	3	5
Barium (Ba)	1	220	670	77	78	119	79
Beryllium (Be)	0.5	2.5	10	<0.5	<0.5	0.6	0.6
Boron (B)	5	36	120	9	9	8	9
Boron (B), Hot Water Ext.	0.1	NV	2	0.25	0.25	0.5	<0.10
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	19	19	21	21
Cobalt (Co)	1	21	100	8.6	8.9	8.3	10
Copper (Cu)	1	92	300	17	18	15	23
Lead (Pb)	1	120	120	7	8	10	10
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	340	19	19	17	23
Selenium (Se)	0.4	1.5	5.5	<0.4	<0.4	0.6	<0.4
Silver (Ag)	0.2	0.5	50	<0.2	<0.2	<0.2	<0.2
Thallium (Tl)	0.4	1	3	<0.4	<0.4	<0.4	<0.4
Uranium (U)	0.5	2.5	33	0.6	0.6	1	<0.5
Vanadium (V)	1	86	86	29	29	31	28
Zinc (Zn)	5	290	340	44	45	67	51
Chromium (VI)	0.2	0.66	10	<0.2	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.040	<0.040	<0.040	<0.040
Mercury (Hg)	0.1	0.27	20	<0.10	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	1.57	1.42	2.06	1.33
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	4.76	3.98	8.09	3.2
pH (unitless)	0.1	NA	NA	7.88	7.93	7.27	7.73

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



### Table 2C - Soil Chemical Analyses Petroleum Parameters

Sample Location				Borehole BH C29	Borehole BH C33	Borehole BH S11
Sample ID			BH C29 SS1	BH C33 SS1	BH S11 SS5	
					Sand and Gravel	
Cail Toma				Silty Clay/Clayey	and Silty	Silty Sand/Sandy
Soil Type				Silt FILL	Calay/Clayey Silt	Silt
					FILL	
Field Vapour (ppm)				0/0	0/0	NA
Sample Depth (mbgs)				0.3-0.9	0.3-0.9	3.05-3.7
Sampling Date				19-Mar-20	19-Mar-20	25-Mar-20
Latest Analyzed Date			27-Mar-20	27-Mar-20	2-Apr-20	
Laboratory ID			1046517	1046509	1055912	
Certificate of Analysis No.				20T587352	20T587352	20T587352
	Lowest					
	Detection	Table 1	Table 3			
	Limit					
		SCS	scs			
PHC F1 (C6-C10 less BTEX)	5	25	65	<5.0	<5.0	<5.0
PHC F2 (>C10-C16)	10	10	250	<10	<10	<10
PHC F3 (>C16-C34)	50	240	2500	<50	<50	<50
PHC F4 (>C34)	50	120	6600	<50	<50	<50
PHC F4 (>C34)*	50	120	6600	-	-	-

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for

residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "F" means fraction. * If F4 analysis by GC/FID did not reach baseline, F4 gravimetric analysis was conducted. Higher of two F4 values shown. "-" means not analyzed. Detection Limits higher than SCS are in *ITALIC*.



### Table 3C - Soil Chemical Analyses Volatile Organic Compounds

Sample Location				Borehole BH C29	Borehole BH C33	Borehole BH S11
Sample ID		BH C29 SS1	BH C33 SS1	BH S11 SS5		
Sap.0 12				211 020 002	Sand and Gravel	5.1.022.000
				Silty Clay/Clayey	and Silty	Silty Sand/Sandy
Soil Type			Silt FILL	Calay/Clayey Silt	Silt	
			5	FILL	5	
Field Vapour (ppm)			0/0	0/0	NA	
Sample Depth (mbgs)			0.3-0.9	0.3-0.9	3.05-3.7	
Sampling Date				27-Mar-20	27-Mar-20	25-Mar-20
Latest Analyzed Date				0/0	0/0	NA
Laboratory ID				1046517	1046509	1055912
Certificate of Analysis No.				20T587352	20T587352	20T587352
	Lowest	Table 1	Table 3			
	Detection	SCS	scs			
	Limit					
Dichlorodifluoromethane	0.05	0.05	25	<0.050	<0.050	-
Vinyl chloride	0.02	0.02	0.25	<0.020	<0.020	-
Bromomethane	0.05	0.05	0.05	<0.050	< 0.050	-
Trichlorofluoromethane	0.05	0.25	5.8	<0.050	<0.050	-
Acetone	0.50	0.5	28	<0.50	<0.50	-
1,1-Dichloroethylene	0.05	0.05	0.48	<0.050	< 0.050	-
Methylene Chloride	0.05	0.05	2	<0.050	< 0.050	-
trans-1,2-Dichloroethylene	0.05	0.05	9.3	<0.050	<0.050	-
MTBE	0.05	0.05	3.2	<0.050	< 0.050	-
1,1-Dichloroethane	0.05	0.05	21	<0.050	< 0.050	-
Methyl Ethyl Ketone	0.50	0.5	88	<0.50	<0.50	-
cis-1,2-Dichloroethylene	0.02	0.05	37	<0.02	<0.02	-
Chloroform	0.04	0.05	0.18	<0.04	<0.04	-
1,2-Dichloroethane	0.03	0.05	0.05	< 0.03	< 0.03	-
1,1,1-Trichloroethane	0.05	0.05	12	<0.050	< 0.050	-
Carbon tetrachloride	0.05	0.05	1.5	<0.050	< 0.050	-
Benzene	0.02	0.02	0.4	<0.02	<0.02	<0.02
1,2-Dichloropropane	0.03	0.05	0.68	< 0.03	< 0.03	-
Trichloroethylene	0.03	0.05	0.61	< 0.03	< 0.03	-
Bromodichloromethane	0.05	0.05	18	<0.050	< 0.050	-
Methyl Isobutyl Ketone	0.50	0.5	210	<0.50	<0.50	-
1,1,2-Trichloroethane	0.04	0.05	0.11	<0.04	<0.04	-
Toluene	0.05	0.2	78	< 0.05	< 0.05	< 0.05
Dibromochloromethane	0.05	0.05	13	<0.050	< 0.050	-
1,2-Dibromoethane	0.04	0.05	0.05	<0.04	<0.04	-
Tetrachloroethylene	0.05	0.05	21	<0.050	< 0.050	-
1,1,1,2-Tetrachloroethane	0.04	0.05	0.11	<0.04	<0.04	-
Chlorobenzene	0.05	0.05	2.7	< 0.050	< 0.050	-
Ethylbenzene	0.05	0.05	19	< 0.050	< 0.050	<0.050
m+p-Xylenes	0.05	NV	NV	< 0.050	< 0.050	-
Bromoform	0.05	0.05	1.7	< 0.050	< 0.050	-
Styrene	0.05	0.05	43	< 0.050	< 0.050	-
1,1,2,2-Tetrachloroethane	0.05	0.05	0.094	<0.050	<0.050	-
o-Xylene	0.05	NV	NV	<0.050	<0.050	-
1,3-Dichlorobenzene	0.05	0.05	12	<0.050	<0.050	-
1,4-Dichlorobenzene	0.05	0.05	0.84	<0.050	<0.050	-
1,2-Dichlorobenzene	0.05	0.05	8.5	<0.050	<0.050	-
Xylenes (Total)	0.05	0.05	30	<0.050	<0.050	<0.050
1,3-Dichloropropene (cis & trans)	0.04	0.05	0.21	<0.04	<0.04	-
n-Hexane	0.05	0.05	88	<0.050	<0.050	-

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in  $\mu$ g/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "-" means not analyzed. Detection Limits higher than SCS are in *ITALIC*.



# **Table 4C - Soil Chemical Analyses Polycyclic Aromatic Hydrocarbons**

Sample Location				Borehole BH C29	Borehole BH C33
Sample ID				BH C29 SS1	BH C33 SS1
•		Sand and Gravel			
	Silty Clay/Clayey	and Silty			
Soil Type	Silt FILL	Calay/Clayey Silt			
		FILL			
Field Vapour (ppm)				0/0	0/0
Sample Depth (mbgs)				0.3-0.9	0.3-0.9
Sampling Date				19-Mar-20	19-Mar-20
Latest Analyzed Date				30-Mar-20	30-Mar-20
Laboratory ID				1046517	1046509
Certificate of Analysis No.				20T587352	20T587352
	Lowest	Table 1	Table 3		
	Detectio	scs	scs		
	n Limit	SCS	SCS		
Naphthalene	0.05	0.09	28	<0.05	<0.05
Acenaphthylene	0.05	0.093	0.17	<0.05	<0.05
Acenaphthene	0.05	0.072	96	<0.05	<0.05
Fluorene	0.05	0.12	69	<0.05	<0.05
Phenanthrene	0.05	0.69	16	<0.05	<0.05
Anthracene	0.05	0.16	0.74	<0.05	<0.05
Fluoranthene	0.05	0.56	9.6	< 0.05	<0.05
Pyrene	0.05	1	96	< 0.05	<0.05
Benzo(a)anthracene	0.05	0.36	0.96	<0.05	<0.05
Chrysene	0.05	2.8	9.6	<0.05	<0.05
Benzo(b)fluoranthene	0.05	0.47	0.96	<0.05	<0.05
Benzo(k)fluoranthene	0.05	0.48	0.96	<0.05	<0.05
Benzo(a)pyrene	0.05	0.3	0.3	<0.05	<0.05
Indeno(1,2,3-cd)pyrene	0.05	0.23	0.95	<0.05	<0.05
Dibenz(a,h)anthracene	0.05	0.1	0.1	<0.05	<0.05
Benzo(g,h,i)perylene	0.05	0.68	9.6	<0.05	<0.05
Methylnaphthalene, 2-(1-)	0.05	0.59	85	<0.05	<0.05

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS ). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in  $\mu$ g/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "-" means not analyzed. Detection Limits higher than SCS are in *ITALIC* .



# Table 5C - Soil Chemical Analyses Metal and Inorganic Parameters

Sample Location		Borehole BH C1	Borehole BH C6	Borehole BH C12		
Sample ID		BH C1 SS4	BH C6 SS2	BH C12 SS2		
Soil Type		Silty Clay/Clayey Silt Till	Silty Clay/Clayey Silt FILL	Silty Clay/Clayey Silt FILL		
Field Vapour (ppm) Sample Depth (mbgs) Sampling Date Latest Analyzed Date Laboratory ID Certificate of Analysis No.		0/0 2.3-3.9 25-Mar-20 3-Apr-20 1055899 20T588871	0/0 0.6-12 25-Mar-20 3-Apr-20 1055906 20T588871	0/0 0.6-1.2 25-Mar-20 3-Apr-20 1055904 20T588871		
	Lowest Detectio n Limit		Table 3.1			
		new SCS	new SCS			
Antimony (Sb)	0.8	1.3	40	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	3	3	3
Barium (Ba)	1	220	670	96	44	78
Beryllium (Be)	0.5	2.5	8	0.6	<0.5	<0.5
Boron (B)	5	36	120	9	6	7
Boron (B), Hot Water Ext.	0.1	NV	2	<0.10	<0.10	0.2
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	21	11	18
Cobalt (Co)	1	21	80	12.4	5.8	9.3
Copper (Cu)	1	92	230	19	16	16
Lead (Pb)	1	120	120	9	5	11
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	270	24	10	17
Selenium (Se)	0.4	1.5	5.5	<0.4	<0.4	0.4
Silver (Ag)	0.2	0.5	40	<0.2	<0.2	<0.2
Thallium (Tl)	0.4	1	3.3	<0.4	<0.4	<0.4
Uranium (U)	0.5	2.5	33	0.5	<0.5	<0.5
Vanadium (V)	1	86	86	33	22	32
Zinc (Zn)	5	290	340	52	29	47
Chromium (VI)	0.2	0.66	8	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.040	<0.040	<0.040
Mercury (Hg)	0.1	0.27	0.27	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	0.312	1.19	1.94
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	0.811	14.3	23.1
pH (unitless)	0.1	NA	NA	7.81	8.05	7.79

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 new SCS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 new SCS). Table 1 exceedances indicated in BOLD and Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (<1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



### Table 5C - Soil Chemical Analyses Metal and Inorganic Parameters

Sample Location		Borehole BH C13 Borehole BH C17 Borehole BH C24				
Sample ID		BH C13 SS3	ВН С17 SS1	BH C24 SS2		
Soil Type		Silty Clay/Clayey Silt Till	Silty Clay/Clayey Silt FILL	Silty Clay/Clayey Silt FILL		
Field Vapour (ppm) Sample Depth (mbgs) Sampling Date Latest Analyzed Date Laboratory ID Certificate of Analysis No.				0/0 1.5-2.1 27-Mar-20 3-Apr-20 1056574 20T588920	0/0 0.3-0.9 27-Mar-20 3-Apr-20 1056577 20T588920	0/0 0.6-1.2 1-Apr-20 13-Apr-20 1066586 20T590525
	Lowest Detectio n Limit	new	Table 3.1			
Antimony (Sb)	0.8	<b>SCS</b> 1.3	40	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	5	4	4
Barium (Ba)	1	220	670	96	65	74
Beryllium (Be)	0.5	2.5	8	0.6	<0.5	0.6
Boron (B)	5	36	120	12	7	8
Boron (B), Hot Water Ext.	0.1	NV	2	0.43	0.21	<0.10
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	23	17	20
Cobalt (Co)	1	21	80	11.3	7.3	9.4
Copper (Cu)	1	92	230	19	18	19
Lead (Pb)	1	120	120	9	8	9
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	270	25	16	19
Selenium (Se)	0.4	1.5	5.5	<0.4	<0.4	<0.4
Silver (Ag)	0.2	0.5	40	<0.2	<0.2	<0.2
Thallium (Tl)	0.4	1	3.3	<0.4	<0.4	<0.4
Uranium (U)	0.5	2.5	33	0.6	<0.5	0.5
Vanadium (V)	1	86	86	35	28	29
Zinc (Zn)	5	290	340	52	44	46
Chromium (VI)	0.2	0.66	8	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.040	<0.040	<0.040
Mercury (Hg)	0.1	0.27	0.27	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	1.45	0.552	0.83
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	3.85	1.6	4.19
pH (unitless)	0.1	NA	NA	7.75	7.71	7.88

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 new SCS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 new SCS). Table 1 exceedances indicated in BOLD and Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



# Table 5C - Soil Chemical Analyses Metal and Inorganic Parameters

Sample Location	Borehole	BH C25	Borehole BH C29	Borehole BH C37			
Sample ID	BH C25 SS3	DUP	BH C29 SS1	BH C37 SS1 Sand and Gravel			
Soil Type	Silty Clay/Clayey Silt Till	Silty Clay/Claye y Silt Till	Silty Clay/Clayey Silt FILL				
Field Vapour (ppm) Sample Depth (mbgs) Sampling Date Latest Analyzed Date Laboratory ID				0/0 1.5-2.1 27-Mar-20 3-Apr-20 1056587	0/0 1.5-2.1 27-Mar-20 3-Apr-20 1056591	0/0 0.3-0.9 19-Mar-20 30-Mar-20 1046517	0/0 0.3-0.9 19-Mar-20 30-Mar-20 1046494
Certificate of Analysis No.				20T588920	20T588920		20T587352
ecrimente of Analysis No.	Lowest Detectio n Limit		Table 3.1		201300320	201307332	201307332
		new SCS	new SCS				
Antimony (Sb)	0.8	1.3	40	<0.8	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	4	4	3	5
Barium (Ba)	1	220	670	77	78	119	79
Beryllium (Be)	0.5	2.5	8	<0.5	<0.5	0.6	0.6
Boron (B)	5	36	120	9	9	8	9
Boron (B), Hot Water Ext.	0.1	NV	2	0.25	0.25	0.5	<0.10
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	19	19	21	21
Cobalt (Co)	1	21	80	8.6	8.9	8.3	10
Copper (Cu)	1	92	230	17	18	15	23
Lead (Pb)	1	120	120	7	8	10	10
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	270	19	19	17	23
Selenium (Se)	0.4	1.5	5.5	<0.4	<0.4	0.6	<0.4
Silver (Ag)	0.2	0.5	40	<0.2	<0.2 <0.4	<0.2	<0.2
Thallium (TI) Uranium (U)	0.4 0.5	2.5	3.3	<0.4 0.6	<0.4 0.6	<0.4	<0.4 <0.5
Vanadium (V)	0.5	2.5 86	86	29	29	31	<0.5 28
Zinc (Zn)	5	290	340	44	45	67	28 51
Chromium (VI)	0.2	0.66	8	<0.2	<0.2	<0.2	<0.2
Cyanide	0.2	0.00	0.051	<0.2	<0.040	<0.040	<0.240
Mercury (Hg)	0.04	0.031	0.031	<0.10	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.27	1.4	1.57	1.42	2.06	1.33
Sodium Adsorption Ratio (unitless)	0.04	2.4	12	4.76	3.98	8.09	3.2
pH (unitless)	0.1	NA	NA	7.88	7.93	7.27	7.73
pri (dindess)	0.1	INA	INA	7.00	1.55	1.21	7.73

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 new SCS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 new SCS). Table 1 exceedances indicated in **BOLD** and Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



### Table 6C - Soil Chemical Analyses Petroleum Parameters

Sample Location				Borehole BH C29	Borehole BH C33	Borehole BH S11
Sample ID				BH C29 SS1	BH C33 SS1	BH S11 SS5
					Sand and Gravel	
Soil Type				Silty Clay/Clayey	and Silty	Silty Sand/Sandy
Son Type				Silt FILL	Calay/Clayey Silt	Silt
					FILL	
Field Vapour (ppm)				0/0	0/0	NA
Sample Depth (mbgs)				0.3-0.9	0.3-0.9	3.05-3.7
Sampling Date				19-Mar-20	19-Mar-20	25-Mar-20
Latest Analyzed Date				27-Mar-20	27-Mar-20	2-Apr-20
Laboratory ID				1046517	1046509	1055912
Certificate of Analysis No.				20T587352	20T587352	20T587352
	Lowest					
	Detection	Table 1	Table 3.1			
	Limit					
		new SCS	new SCS			
PHC F1 (C6-C10 less BTEX)	5	25	25	<5.0	<5.0	<5.0
PHC F2 (>C10-C16)	10	10	26	<10	<10	<10
PHC F3 (>C16-C34)	50	240	1700	<50	<50	<50
PHC F4 (>C34)	50	120	3300	<50	<50	<50
PHC F4 (>C34)*	50	120	3300	-	-	-

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 new SCS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 new SCS). Table 1 exceedances indicated in **BOLD**, Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "F" means fraction. * If F4 analysis by GC/FID did not reach baseline, F4 gravimetric analysis was conducted. Higher of two F4 values shown. "-" means not analyzed. Detection Limits higher than SCS are in *ITALIC* .



### Table 7C - Soil Chemical Analyses Volatile Organic Compounds

Sample Location				Borehole BH C29	Borehole BH C33	Borehole BH S11	
Sample ID				BH C29 SS1	BH C33 SS1	BH S11 SS5	
Sample 1D				BH C29 331	Sand and Gravel	PH 211 222	
				Silty Clay/Clayey	and Silty	Cile Con LC	
Soil Type				Silty Clay/Clayey Silt FILL	•	Silty Sand/Sandy Silt	
				SIIT FILL	Calay/Clayey Silt	SIIT	
			2.0	FILL			
Field Vapour (ppm)				0/0	0/0	NA	
Sample Depth (mbgs)				0.3-0.9	0.3-0.9	3.05-3.7	
Sampling Date				19-Mar-20	19-Mar-20	25-Mar-20	
Latest Analyzed Date				27-Mar-20	27-Mar-20	2-Apr-20	
Laboratory ID				1046517	1046509	1055912	
Certificate of Analysis No.		- 11 4	<b>-</b> 11 34	20T587352	20T587352	20T587352	
	Lowest	Table 1	Table 3.1				
	Detection	new SCS	new SCS				
	Limit	new 3C3	new scs				
Dichlorodifluoromethane	0.05	0.05	1.8	< 0.050	< 0.050	-	
Vinyl chloride	0.02	0.02	0.02	<0.020	<0.020	-	
Bromomethane	0.05	0.05	0.05	<0.050	<0.050	-	
Trichlorofluoromethane	0.05	0.25	0.46	<0.050	<0.050	-	
Acetone	0.50	0.5	1.8	<0.50	<0.50	-	
1,1-Dichloroethylene	0.05	0.05	0.05	< 0.050	< 0.050	-	
Methylene Chloride	0.05	0.05	0.2	< 0.050	< 0.050	-	
trans-1,2-Dichloroethylene	0.05	0.05	0.05	< 0.050	< 0.050	-	
MTBE	0.05	0.05	0.05	< 0.050	< 0.050	-	
1,1-Dichloroethane	0.05	0.05	0.57	< 0.050	< 0.050	-	
Methyl Ethyl Ketone	0.50	0.5	26	<0.50	<0.50	-	
cis-1,2-Dichloroethylene	0.02	0.05	0.05	<0.02	<0.02	-	
Chloroform	0.04	0.05	0.26	<0.04	<0.04	-	
1,2-Dichloroethane	0.03	0.05	0.05	< 0.03	<0.03	-	
1,1,1-Trichloroethane	0.05	0.05	0.4	< 0.050	<0.050	-	
Carbon tetrachloride	0.05	0.05	0.05	< 0.050	< 0.050	-	
Benzene	0.02	0.02	0.034	<0.02	<0.02	< 0.02	
1,2-Dichloropropane	0.03	0.05	0.05	< 0.03	< 0.03	-	
Trichloroethylene	0.03	0.05	0.05	< 0.03	< 0.03	-	
Bromodichloromethane	0.05	0.05	5.8	<0.050	< 0.050	-	
Methyl Isobutyl Ketone	0.50	0.5	17	< 0.50	<0.50	-	
1,1,2-Trichloroethane	0.04	0.05	0.05	<0.04	<0.04	-	
Toluene	0.08	0.2	7.8	< 0.05	<0.05	< 0.05	
Dibromochloromethane	0.05	0.05	5.5	<0.050	< 0.050	-	
1,2-Dibromoethane	0.04	0.05	0.05	<0.04	<0.04	-	
Tetrachloroethylene	0.05	0.05	0.05	< 0.050	< 0.050	-	
1,1,1,2-Tetrachloroethane	0.04	0.05	0.05	<0.04	<0.04	-	
Chlorobenzene	0.05	0.05	0.28	< 0.050	< 0.050	-	
Ethylbenzene	0.05	0.05	1.9	< 0.050	< 0.050	< 0.050	
m+p-Xylenes	0.05	NV	NV	<0.050	< 0.050	-	
Bromoform	0.05	0.05	2.5	<0.050	< 0.050	-	
Styrene	0.05	0.05	6.8	<0.050	<0.050	-	
1,1,2,2-Tetrachloroethane	0.05	0.05	0.05	< 0.050	<0.050	-	
o-Xylene	0.02	NV	NV	<0.050	<0.050	-	
1,3-Dichlorobenzene	0.05	0.05	6.8	<0.050	<0.050	-	
1,4-Dichlorobenzene	0.05	0.05	0.05	<0.050	<0.050	-	
1,2-Dichlorobenzene	0.05	0.05	6.8	<0.050	<0.050	-	
Xylenes (Total)	0.05	0.05	3	<0.050	<0.050	<0.050	
1,3-Dichloropropene (cis & trans)	0.04	0.05	0.05	<0.04	<0.04	-	
n-Hexane	0.05	0.05	2.5	<0.050	<0.050	-	

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 new SCS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 new SCS). Table 1 exceedances indicated in **BOLD**, Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "-" means not analyzed. Detection Limits higher than SCS are in *ITALIC*.



# **Table 8C - Soil Chemical Analyses Polycyclic Aromatic Hydrocarbons**

Sample Location				Borehole BH C29	<b>Borehole BH C33</b>
Sample ID				BH C29 SS1	BH C33 SS1
					Sand and Gravel
				Silty Clay/Clayey	and Silty
Soil Type				Silt FILL	Calay/Clayey Silt
					FILL
Field Vapour (ppm)				0/0	0/0
Sample Depth (mbgs)				0.3-0.9	0.3-0.9
Sampling Date				19-Mar-20	19-Mar-20
Latest Analyzed Date				30-Mar-20	30-Mar-20
Laboratory ID				1046517	1046509
Certificate of Analysis No.				20T587352	20T587352
	Lowest	Table 1	Table 3.1		
		Table 1	Table 5.1		
	Detection				
	Limit	new	new SCS		
Naphthalene	0.05	0.09	1.8	< 0.05	<0.05
Acenaphthylene	0.05	0.093	0.093	< 0.05	<0.05
Acenaphthene	0.05	0.072	15	< 0.05	<0.05
Fluorene	0.05	0.12	6.8	< 0.05	<0.05
Phenanthrene	0.05	0.69	12	< 0.05	< 0.05
Anthracene	0.05	0.16	0.16	< 0.05	< 0.05
Fluoranthene	0.05	0.56	70	< 0.05	< 0.05
Pyrene	0.05	1	70	< 0.05	< 0.05
Benzo(a)anthracene	0.05	0.36	1	< 0.05	< 0.05
Chrysene	0.05	2.8	14	<0.05	<0.05
Benzo(b)fluoranthene	0.05	0.47	7	<0.05	<0.05
Benzo(k)fluoranthene	0.05	0.48	7	<0.05	<0.05
Benzo(a)pyrene	0.05	0.3	0.7	< 0.05	<0.05
Indeno(1,2,3-cd)pyrene	0.05	0.23	0.76	< 0.05	< 0.05
Dibenz(a,h)anthracene	0.05	0.1	0.7	< 0.05	< 0.05
Benzo(g,h,i)perylene	0.05	0.68	13	< 0.05	< 0.05
Methylnaphthalene, 2-(1-)	0.05	0.59	8.7	< 0.05	< 0.05

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 new SCS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 new SCS). Table 1 exceedances indicated in BOLD, Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "-" means not analyzed. Detection Limits higher than SCS are in *ITALIC*.



#### Table 9C - Ontario Regulation 347/90 Leachate Analyses Waste Classification

Sample ID Sampling Date Laboratory ID Certificate of Analysis No.			Comp. TCLP C 01-Apr-20 1066587 20T590525
	DL	Schedule 4	
Arsenic (As)	0.01	3	< 0.01
Barium (Ba)	0.1	100	0.51
Boron (B)	0.05	500	0.084
Cadmium (Cd)	0.01	0.5	< 0.01
Chromium (Cr)	0.01	5	< 0.01
Lead (Pb)	0.01	5	< 0.01
Selenium (Se)	0.01	1	< 0.01
Silver (Ag)	0.01	5	< 0.01
Uranium (U)	0.05	10	<0.05
Fluoride	0.1	150	0.16
Mercury	0.01	0.1	< 0.01
Cyanide	0.05	20	< 0.05
Nitrite + Nitrate	0.70	100	<0.70
PCB's	0.050	0.3	<0.05
Vinyl Chloride	0.5	0.2	<0.030
1,1 Dichloroethene	0.2	1.4	<0.020
Dichloromethane	1	5	< 0.030
Methyl Ethyl Ketone	0.2	200	< 0.090
Chloroform	0.5	10	<0.020
1,2-Dichloroethane	0.5	0.5	<0.020
Carbon Tetrachloride	0.5	0.5	<0.020
Benzene	0.5	0.5	<0.020
Trichloroethene	0.5	5	<0.020
Tetrachloroethene	0.5	3	< 0.050
Chlorobenzene	0.5	8	<0.010
1,2-Dichlorobenzene	0.5	20	< 0.010
1,4-Dichlorobenzene	0.2	0.5	<0.010

Notes: Ontario Regulation 347/90, Schedule 4 Leachate Criteria. All results reported in mg/L except for Ignitability and flammability which have no units. "RDL" means reportable detection limit. "<" indicates not detected above RDL as shown. Schedule 4 exceedances indicated in **BOLD underlined**. "NV" means no value. "NA" means not applicable / not analyzed.



# Table 10C - Ontario Regulation 406/19 Leachate Analyses Waste Classification

Arsenic (As)  Arsenic (As)  Barium (Ba)  Barium (BB)  Cadmium (Cd)  Chromium (Cr)  Lead (Pb)  Silver (Ag)  Uranium (U)  Cyanide  Nitrite + Nitrate  O.70  PCB's  Vinyl Chloride  1,1 Dichloroethane  D.1 A600000  Appendix 2 Table 3.1  Arbe 3.1  Appendix 2 Table 3.1  Appendix 2 Table 3.1  NV  <0.01  A600000  0.51  Boron (B)  0.0.1  Afeonomous (Co)  NV  <0.01  NV  <0.01  NV  <0.01  Appendix 2 Table 3.1  Afeonomous (Co)  NV  <0.01  Afeonomous (Co)  NV  <0.01  NV  <0.01  Afeonomous (Co)  NV  <0.01  NV  <0.01  NV  <0.05  NV  <0.05  NV  <0.05  NV  <0.05  NV  <0.05  NV  <0.030  1,1 Dichloroethene  0.2  Dichloromethane  1  NV  <0.030  Methyl Ethyl Ketone  0.5  NV  <0.020  Chloroform  0.5  NV  <0.020  Carbon Tetrachloride  0.5  NV  <0.020  Trichloroethene  0.5  NV  <0.020  Trichloroethene  0.5  NV  <0.020  Trichloroethene  0.5  NV  <0.020  Trichloroethene  0.5  NV  <0.020  Tetrachloroethene  0.5  NV  <0.020  Tetrachloroethene  0.5  NV  <0.010  1,2-Dichlorobenzene  0.5  NV  <0.010  1,2-Dichlorobenzene  0.5  NV  <0.010  1,2-Dichlorobenzene  0.5  NV  <0.010  1,4-Dichlorobenzene  0.2  NV  <0.010	Sample ID Sampling Date Laboratory ID Certificate of Analysis No.			Comp. TCLP C 01-Apr-20 1066587 20T590525
Barium (Ba)         0.1         4600000         0.51           Boron (B)         0.05         NV         0.084           Cadmium (Cd)         0.01         NV         <0.01           Chromium (Cr)         0.01         130000         <0.01           Lead (Pb)         0.01         NV         <0.01           Selenium (Se)         0.01         10000         <0.01           Silver (Ag)         0.01         300         <0.01           Uranium (U)         0.05         66000         <0.05           Fluoride         0.1         NV         <0.01           Mercury         0.01         NV         <0.01           Cyanide         0.05         NV         <0.05           Nitrite + Nitrate         0.70         NV         <0.05           Nitrite + Nitrate         0.70         NV         <0.05           Vinyl Chloride         0.5         NV         <0.05           Vinyl Chloride         0.5         NV         <0.030           1,1 Dichloroethene         1         NV         <0.030           Chloroform         0.5         NV         <0.020           Chloroform         0.5         NV         <0.020 <th></th> <th>DL DL</th> <th></th> <th></th>		DL DL		
Boron (B)	Arsenic (As)	0.01	NV	<0.01
Cadmium (Cd)         0.01         NV         < 0.01           Chromium (Cr)         0.01         130000         < 0.01	Barium (Ba)	0.1	4600000	0.51
Chromium (Cr)         0.01         130000         < 0.01           Lead (Pb)         0.01         NV         < 0.01	Boron (B)	0.05	NV	0.084
Lead (Pb)         0.01         NV         <0.01           Selenium (Se)         0.01         10000         <0.01	Cadmium (Cd)	0.01	NV	<0.01
Selenium (Se)         0.01         10000         < 0.01           Silver (Ag)         0.01         300         < 0.01	Chromium (Cr)	0.01	130000	<0.01
Silver (Ag)         0.01         300         < 0.01           Uranium (U)         0.05         66000         < 0.05	Lead (Pb)	0.01	NV	<0.01
Uranium (U)         0.05         66000         <0.05           Fluoride         0.1         NV         0.16           Mercury         0.01         NV         <0.01	Selenium (Se)	0.01	10000	<0.01
Fluoride         0.1         NV         0.16           Mercury         0.01         NV         <0.01	Silver (Ag)	0.01	300	<0.01
Mercury         0.01         NV         <0.01           Cyanide         0.05         NV         <0.05	Uranium (U)	0.05	66000	<0.05
Mercury         0.01         NV         <0.01           Cyanide         0.05         NV         <0.05	Fluoride	0.1	NV	0.16
Cyanide         0.05         NV         <0.05           Nitrite + Nitrate         0.70         NV         <0.70		0.01	NV	<0.01
Nitrite + Nitrate         0.70         NV         <0.70           PCB's         0.050         NV         <0.05		0.05	NV	<0.05
Vinyl Chloride         0.5         NV         <0.030           1,1 Dichloroethene         0.2         500         <0.020		0.70	NV	<0.70
1,1 Dichloroethene         0.2         500         <0.020	PCB's	0.050	NV	<0.05
Dichloromethane         1         NV         < 0.030           Methyl Ethyl Ketone         0.2         NV         < 0.090	Vinyl Chloride	0.5	NV	<0.030
Methyl Ethyl Ketone         0.2         NV         < 0.090           Chloroform         0.5         NV         < 0.020	1,1 Dichloroethene	0.2	500	<0.020
Chloroform         0.5         NV         <0.020           1,2-Dichloroethane         0.5         NV         <0.020	Dichloromethane	1	NV	<0.030
1,2-Dichloroethane         0.5         NV         <0.020	Methyl Ethyl Ketone	0.2	NV	<0.090
Carbon Tetrachloride         0.5         200         <0.020           Benzene         0.5         NV         <0.020	Chloroform	0.5	NV	<0.020
Benzene         0.5         NV         < 0.020           Trichloroethene         0.5         500         < 0.020	1,2-Dichloroethane	0.5	NV	<0.020
Trichloroethene         0.5         500         < 0.020           Tetrachloroethene         0.5         500         < 0.050	Carbon Tetrachloride	0.5	200	<0.020
Tetrachloroethene         0.5         500         < 0.050           Chlorobenzene         0.5         NV         < 0.010	Benzene	0.5	NV	
Chlorobenzene         0.5         NV         < 0.010           1,2-Dichlorobenzene         0.5         NV         < 0.010				
1,2-Dichlorobenzene 0.5 NV <0.010	Tetrachloroethene	0.5	500	<0.050
-,	Chlorobenzene	0.5	NV	<0.010
1,4-Dichlorobenzene 0.2 NV <0.010	1,2-Dichlorobenzene	0.5	NV	<0.010
	1,4-Dichlorobenzene	0.2	NV	<0.010

Notes: Ontario Regulation 406/19, Appendix 2 - Generic Leachate Screening Levels for Excess Soil Reuse - Table 3.1: Leachate Screening Levels for Full Depth Excess Soil in a Non-Potable Ground Water condition, Volume Independent,

Industrial/Commercial/Community Property Use. All results reported in mg/L except for Ignitability and flammability which have no units. "RDL" means reportable detection limit. "<" indicates not detected above RDL as shown. Table 3.1 exceedances indicated in **BOLD underlined**. "NV" means no value. "NA" means not applicable / not analyzed.



# SECTION D CLARKWAY DRIVE (FROM CASTLEMORE ROAD TO MAYFIELD DR, ~3 KM)

**APPENDIX C-D** 

**SOIL ANALYTICAL RESULTS** 





Sample Location				Borehole D5	Borehole D17	Borehole D18	Borehole D25
Sample ID				BH D5 SS6	BH D17 SS2	BH D18 SS3	BH D25 SS3
					Sand and		
				Silty	Gravel and	Silty	Silty
Soil Type				Clay/Clayey	Silty	Clay/Clayey	Clay/Clayey
				Silt Till	Clay/Clayey	Silt FILL	Silt Till
					Silt FILL		
Field Vapour (ppm)				0/0	0/0	0/0	0/0
Sample Depth (mbgs)				3.8-4.4	0.9-1.5	1.2-1.8	1.5-2.1
Sampling Date				18-Feb-20	1-Apr-20	1-Apr-20	24-Feb-20
Latest Analyzed Date				27-Feb-20	13-Apr-20	13-Apr-20	4-Mar-20
Laboratory ID				957661	1066582	1066581	976171
Certificate of Analysis No.				20T576304	20T590525	20T590525	20T0578836
	Lowest						
	Detectio	Table 1	Table 3				
	n Limit						
		SCS	SCS				
Antimony (Sb)	0.8	1.3	50	<0.8	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	5	12	5	5
Barium (Ba)	1	220	670	86	14	70	64
Beryllium (Be)	0.5	2.5	10	<0.5	<0.5	0.5	0.6
Boron (B)	5	36	120	10	14	11	11
Boron (B), Hot Water Ext.	0.1	NV	2	0.26	0.3	0.32	0.29
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	23	6	19	20
Cobalt (Co)	1	21	100	10.2	5.1	8.1	8.3
Copper (Cu)	1	92	300	20	11	17	20
Lead (Pb)	0.5	120	120	9 <0.5	18	10	13 0.6
Molybdenum (Mo)		_	40		0.9	< 0.5	
Nickel (Ni)	1	82	340 5.5	21	8	17	18 <0.4
Selenium (Se)	0.4	1.5 0.5	5.5	<0.4 <0.2	<0.4 <0.2	<0.4 <0.2	<0.4
Silver (Ag) Thallium (Tl)		0.5	3		V		<0.2
Uranium (II)	0.4	2.5	33	<0.4 0.7	<0.4 <0.5	<0.4 0.6	0.5
Vanadium (V)	0.5	2.5 86	86	32	<0.5 9	29	26
Zinc (Zn)	5	290	340	51	79	48	46
Chromium (VI)	0.2	0.66	10	<0.2	<0.2	<0.2	<0.2
Cyanide	0.2	0.00	0.051	<0.240	<0.240	<0.040	<0.040
Mercury (Hg)	0.04	0.031	20	<0.10	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	1.9	1.68	1.25	2.1
Sodium Adsorption Ratio (unitless)	0.04	2.4	1.4	5.64	12.4	4.37	8.71
pH (unitless)	0.1	NA	NA	7.74	8.12	7.83	8.02
p. r. (dilidess)	0.1	14/	1477	7.77	0.12	7.05	0.02

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for

residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



			Borehole D27	Borehole D31	Borehole D35	Borehole D37
			BH D27 SS2	BH D31 SS3	BH D35 SS2	BH D37 SS4
Soil Type					Silty Clay/Clayey Silt FILL	Silty Clay/Clayey Silt FILL
			0/0	0/0	0/0	0/0
			0.9-1.5	1.6-2.0	0.8-1.2	2.3-2.7
			24-Feb-20	12-Feb-20	12-Feb-20	12-Feb-20
			4-Mar-20	24-Feb-20	24-Feb-20	24-Feb-20
			976172	940831	940834	940838
			20T0578836	20T574535	20T574535	20T574535
	Table 1	Table 3				
n Limit						
	SCS	SCS				
0.8	1.3	50	<0.8	<0.8	<0.8	<0.8
1	18	18	4	4	5	5
1	220	670	85	63	62	76
0.5	2.5	10	0.7	0.5	<0.5	<0.5
5	36	120	12	6	8	9
0.1	NV	2	0.42	0.22	0.41	0.25
	1.2		<0.5	<0.5	<0.5	<0.5
						19
						8.5
			_		_	20
			_		-	11
	_					<0.5
			_		_	19
						<0.4
						<0.2
						<0.4
						0.6
_			_			25
						48
		-				<0.2
						<0.040
						<0.10
						1.28
				-		<b>5.47</b>
0.1	INA	INA	7.49	7.00	7./3	1.1
	1 1 0.5 5	Detection I Limit         Table 1           0.8         1.3           1         18           1         220           0.5         2.5           5         36           0.1         NV           0.5         1.2           1         70           1         21           1         92           1         120           0.5         2           1         82           0.4         1.5           0.2         0.5           0.4         1           0.5         2.5           1         86           5         290           0.2         0.66           0.04         0.051           0.1         0.27           0.04         0.57           0.1         2.4	Detection I Limit         Table 1         Table 3           0.8         1.3         50           1         18         18           1         220         670           0.5         2.5         10           5         36         120           0.1         NV         2           0.5         1.2         1.9           1         70         160           1         21         100           1         92         300           1         120         120           0.5         2         40           1         82         340           0.4         1.5         5.5           0.4         1.5         5.5           0.4         1         3           0.5         2.5         33           1         86         86           5         290         340           0.2         0.66         10           0.04         0.051         0.051           0.04         0.051         0.051           0.04         0.57         1.4           0.1         2.4         12 <td>  Silty   Clay/Clayey   Silt FILL    </td> <td>  Silty Clay/Clayery Silt FILL</td> <td>  Silty   Clay/Clayey   Silt FILL   Clay/Clayey   Silt FILL   O/0   0.9-1.5   1.6-2.0   1.2-Feb-20   24-Feb-20   940831   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T5</td>	Silty   Clay/Clayey   Silt FILL	Silty Clay/Clayery Silt FILL	Silty   Clay/Clayey   Silt FILL   Clay/Clayey   Silt FILL   O/0   0.9-1.5   1.6-2.0   1.2-Feb-20   24-Feb-20   940831   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T574535   20T5

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for

residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



Sample Location				Borehole D41	Borehole D44	Borehole D47
Sample ID				BH D41 SS3	BH D44 SS1	BH D47 SS4
Soil Type				Silty Clay/Clayey Silt FILL	Sand and Gravel and Silty Clay/Clayey Silt FILL	Silty Clay/Clayey Silt Till
Field Vapour (ppm)				0/0	10/0	0/1
Sample Depth (mbgs)				1.5-2.1	Surface-0.6	2.3-2.7
Sampling Date				12-Feb-20	11-Feb-20	11-Feb-20
Latest Analyzed Date				24-Feb-20	21-Feb-20	21-Feb-20
Laboratory ID				940843	939194	939197
Certificate of Analysis No.				20T574535	20T574091	20T574091
	Lowest					
	Detectio n Limit	Table 1	Table 3			
		scs	scs			
Antimony (Sb)	0.8	1.3	50	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	4	4	5
Barium (Ba)	1	220	670	63	71	88
Beryllium (Be)	0.5	2.5	10	<0.5	<0.5	0.6
Boron (B)	5	36	120	8	8	10
Boron (B), Hot Water Ext.	0.1	NV	2	0.43	0.19	0.14
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	17	17	21
Cobalt (Co)	1	21	100	6.9	7.6	11.6
Copper (Cu)	1	92	300	16	20	20
Lead (Pb)	1	120	120	7	10	9
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	340	15	16	25
Selenium (Se)	0.4	1.5	5.5	<0.4	<0.4	<0.4
Silver (Ag)	0.2	0.5	50	<0.2	<0.2	<0.2
Thallium (Tl)	0.4	1	3	<0.4	<0.4	<0.4
Uranium (U)	0.5	2.5	33	0.5	<0.5	0.6
Vanadium (V)	1	86	86	23	24	27
Zinc (Zn)	5	290	340	42	43	50
Chromium (VI)	0.2	0.66	10	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.040	<0.040	<0.040
Mercury (Hg)	0.1	0.27	20	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	1.13	1.51	0.429
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	3.64	12.2	0.989
pH (unitless)	0.1	NA	NA	7.71	7.79	7.74

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for

residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



Sample Location				Borehole D50	Borehole D55	Borehole D57
Sample ID				BH D50 SS3	BH D55 SS2	BH D57 SS1
						Asphalt,
				Silty	Silty	Concrete.
Soil Type				Clay/Clayey	Clay/Clayey Silt	Silty
Son Type				Silt Till	FILL	Clay/Clayey
				SIICTIII	FILL	Silt Till
Field Vapour (ppm)				0/0	10/0	0/0
Sample Depth (mbgs)				1.2-1.8	0.8-1.2	Surface-0.5
Sampling Date				12-Feb-20	11-Feb-20	12-Feb-20
Latest Analyzed Date				24-Feb-20	21-Feb-20	24-Feb-20
Laboratory ID				940845	939200	940849
Certificate of Analysis No.				20T574535	20T574091	20T574535
	Lowest					
	Detectio	Table 1	Table 3			
	n Limit					
		scs	scs			
Antimony (Sb)	0.8	1.3	50	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	4	5	4
Barium (Ba)	1	220	670	70	86	126
Beryllium (Be)	0.5	2.5	10	<0.5	0.6	0.8
Boron (B)	5	36	120	8	9	7
Boron (B), Hot Water Ext.	0.1	NV	2	<0.10	<0.10	0.41
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	17	23	28
Cobalt (Co)	1	21	100	8.4	11	12.5
Copper (Cu)	1	92	300	19	30	20
Lead (Pb)	1	120	120	9	14	14
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	340	18	22	24
Selenium (Se)	0.4	1.5	5.5	<0.4	<0.4	0.6
Silver (Ag)	0.2	0.5	50	<0.2	<0.2	<0.2
Thallium (Tl)	0.4	2.5	3	<0.4 0.5	<0.4 <0.5	<0.4 0.6
Uranium (U) Vanadium (V)	0.5	2.5 86	33 86	0.5	<0.5 29	0.6 38
. ,	5	290	340	43	51	65
Zinc (Zn) Chromium (VI)	0.2	0.66	10	<0.2	<0.2	<0.2
Cyanide	0.2	0.051	0.051	<0.2	<0.2	<0.2
Mercury (Hg)	0.04	0.051	20	<0.040	<0.040	<0.040
Electrical Conductivity (mS/cm)	0.1	0.27	1.4	1.37	0.10	1.16
Sodium Adsorption Ratio (unitless)	0.04	2.4	1.4	17.5	2.64	3.59
pH (unitless)	0.1	NA	NA	7.9	7.61	8.0
pri (dindess)	0.1	INA	INA	7.5	7.01	0.0

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



#### Table 2D - Soil Chemical Analyses Petroleum Parameters

Sample Location				Borehole D17
Sample ID				BH D17 SS2
				Sand and Gravel
Soil Type				and Silty
Son Type				Clay/Clayey Silt
				FILL
Field Vapour (ppm)				0/0
Sample Depth (mbgs)				0.9-1.5
Sampling Date				1-Apr-20
Latest Analyzed Date				9-Apr-20
Laboratory ID				1066582
Certificate of Analysis No.				20T590525
	Lowest			
	Detection	Table 1	Table 3	
	Limit			
		SCS	SCS	
PHC F1 (C6-C10 less BTEX)	5	25	65	<5.0
PHC F2 (>C10-C16)	10	10	250	<10
PHC F3 (>C16-C34)	50	240	2500	72
PHC F4 (>C34)	50	120	6600	62
PHC F4 (>C34)*	50	120	6600	-

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS ). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in  $\mu$ g/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "F" means fraction. * If F4 analysis by GC/FID did not reach baseline, F4 gravimetric analysis was conducted. Higher of two F4 values shown. "-" means not analyzed. Detection Limits higher than SCS are in *ITALIC*.



#### Table 3D - Soil Chemical Analyses Volatile Organic Compounds

Sample Location				Borehole D17
Sample ID				BH D17 SS2
•				Sand and Gravel
Soil Type				and Silty
7,1				Clay/Clayey Silt FILI
Field Vapour (ppm)				0/0
Sample Depth (mbgs)				0.9-1.5
Sampling Date				1-Apr-20
Latest Analyzed Date				9-Apr-20
Laboratory ID				1066582
Certificate of Analysis No.				20T590525
	Lowest	Table 1	Table 3	
	Detection	SCS	SCS	
	Limit			
Dichlorodifluoromethane	0.05	0.05	25	<0.050
Vinyl chloride	0.02	0.02	0.25	<0.020
Bromomethane	0.05	0.05	0.05	<0.050
Trichlorofluoromethane	0.05	0.25	5.8	<0.050
Acetone	0.50	0.5	28	<0.50
1,1-Dichloroethylene	0.05	0.05	0.48	<0.050
Methylene Chloride	0.05	0.05	2	<0.050
trans-1,2-Dichloroethylene	0.05	0.05	9.3	<0.050
MTBE	0.05	0.05	3.2	<0.050
1,1-Dichloroethane	0.05	0.05	21	<0.050
Methyl Ethyl Ketone	0.50	0.5	88	<0.50
cis-1,2-Dichloroethylene	0.02	0.05	37	<0.02
Chloroform	0.04	0.05	0.18	<0.04
1,2-Dichloroethane	0.03	0.05	0.05	< 0.03
1,1,1-Trichloroethane	0.05	0.05	12	<0.050
Carbon tetrachloride	0.05	0.05	1.5	<0.050
Benzene	0.02	0.02	0.4	< 0.02
1,2-Dichloropropane	0.03	0.05	0.68	< 0.03
Trichloroethylene	0.03	0.05	0.61	< 0.03
Bromodichloromethane	0.05	0.05	18	<0.050
Methyl Isobutyl Ketone	0.50	0.5	210	<0.50
1,1,2-Trichloroethane	0.04	0.05	0.11	<0.04
Toluene	0.05	0.2	78	< 0.05
Dibromochloromethane	0.05	0.05	13	<0.050
1,2-Dibromoethane	0.04	0.05	0.05	<0.04
Tetrachloroethylene	0.05	0.05	21	< 0.050
1,1,1,2-Tetrachloroethane	0.04	0.05	0.11	<0.04
Chlorobenzene	0.05	0.05	2.7	<0.050
Ethylbenzene	0.05	0.05	19	<0.050
m+p-Xylenes	0.05	NV	NV	<0.050
Bromoform	0.05	0.05	1.7	<0.050
Styrene	0.05	0.05	43	<0.050
1,1,2,2-Tetrachloroethane	0.05	0.05	0.094	<0.050
o-Xylene	0.05	NV	NV	<0.050
1,3-Dichlorobenzene	0.05	0.05	12	<0.050
1,4-Dichlorobenzene	0.05	0.05	0.84	<0.050
1,2-Dichlorobenzene	0.05	0.05	8.5	<0.050
Xylenes (Total)	0.05	0.05	30	<0.050
1,3-Dichloropropene (cis & trans)	0.04	0.05	0.21	<0.04
n-Hexane	0.05	0.05	88	< 0.050

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS ). Table 1 exceedances indicated in BOLD and Table 3 exceedances indicated in SHADING. All values reported in  $\mu g/g$  dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "--" means not analyzed. Detection Limits higher than SCS are in *ITALIC* .

#### Table 4D - Soil Chemical Analyses Organochlorine Pesticides



Sample Location				Borehole D17
Sample ID				BH D17 SS2
				Sand and
Call Tama				<b>Gravel and Silty</b>
Soil Type				Clay/Clayey Silt
				FILL
Field Vapour (ppm)				0/0
Sample Depth (mbgs)				0.9-1.5
Sampling Date				1-Apr-20
Latest Analyzed Date				13-Apr-20
Laboratory ID				1066582
Certificate of Analysis No.				20T590525
	Lowest	Table 1	Table 3	
		SCS	SCS	
Hexachloroethane	0.010	0.01	0.66	<0.01
gamma-hexachlorocyclohexane	0.005	0.01	0.063	<0.005
Heptachlor	0.005	0.05	0.19	<0.005
Aldrin	0.005	0.05	0.11	<0.005
Heptachlor Epoxide	0.005	0.05	0.05	< 0.005
Endosulfan (Total)	0.005	0.04	0.38	< 0.005
Chlordane (Total)	0.007	0.05	0.05	<0.007
Total DDE	0.007	0.05	0.65	<0.007
Total DDD	0.007	0.05	4.6	<0.007
Total DDT	0.007	1.4	1.4	<0.007
Dieldrin	0.005	0.05	0.11	<0.005
Endrin	0.005	0.04	0.04	<0.005
Methoxychlor	0.005	0.05	1.6	<0.005
Hexachlorobenzene	0.005	0.01	0.66	<0.005
Hexachlorobutadiene	0.010	0.01	0.095	<0.01

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS ). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in  $\mu$ g/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "-" means not



Sample Location				Borehole D5	Borehole D17	Borehole D18	Borehole D25
Sample ID	BH D5 SS6	BH D17 SS2	BH D18 SS3	BH D25 SS3			
					Sand and		
				Silty	Gravel and	Silty	Silty
Soil Type			Clay/Clayey	Silty	Clay/Clayey	Clay/Clayey	
3,00		Silt Till	Clay/Clayey	Silt FILL	Silt Till		
				J	Silt FILL	5	5
Field Vapour (ppm)				0/0	0/0	0/0	0/0
Sample Depth (mbgs)				3.8-4.4	0.9-1.5	1.2-1.8	1.5-2.1
Sampling Date				18-Feb-20	1-Apr-20	1-Apr-20	24-Feb-20
Latest Analyzed Date				27-Feb-20	13-Apr-20	13-Apr-20	4-Mar-20
Laboratory ID				957661	1066582	1066581	976171
Certificate of Analysis No.				20T576304	20T590525	20T590525	20T0578836
	Lowest						
	Detectio	Table 1	Table 3.1				
	n Limit						
			new SCS				
Antimony (Sb)	1	1.3	40	<0.8	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	5	12	5	5
Barium (Ba)	1	220	670	86	14	70	64
Beryllium (Be)	0.5	2.5	8	<0.5	<0.5	0.5	0.6
Boron (B)	5	36	120	10	14	11	11
Boron (B), Hot Water Ext.	0.1	NV 1.2	2	0.26	0.3	0.32	0.29
Cadmium (Cd) Chromium (Cr)	0.5	1.2 70	1.9	<0.5 23	<0.5 6	<0.5 19	<0.5 20
Cobalt (Co)	1.0	21	160 80	10.2	5.1	8.1	8.3
Copper (Cu)	1.0	92	230	20	11	17	20
Lead (Pb)	1.0	120	120	9	18	10	13
Molybdenum (Mo)	1.0	2	40	<0.5	0.9	<0.5	0.6
Nickel (Ni)	1.0	82	270	21	8	17	18
Selenium (Se)	1.0	1.5	5.5	<0.4	<0.4	<0.4	<0.4
Silver (Ag)	0.2	0.5	40	<0.2	<0.2	<0.2	<0.2
Thallium (TI)	0.5	1	3.3	<0.4	<0.4	<0.4	<0.4
Uranium (U)	1.0	2.5	33	0.7	<0.5	0.6	0.5
Vanadium (V)	1.0	86	86	32	9	29	26
Zinc (Zn)	5	290	340	51	79	48	46
Chromium (VI)	0.2	0.66	8	<0.2	<0.2	<0.2	<0.2
Cyanide	0.05	0.051	0.051	<0.040	<0.040	<0.040	<0.040
Mercury (Hg)	0.01	0.27	0.27	<0.10	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.00	0.57	1.4	1.9	1.68	1.25	2.1
Sodium Adsorption Ratio (unitless)	0.10	2.4	12	5.64	12.4	4.37	8.71
pH (unitless)	0.10	NA	NA	7.74	8.12	7.83	8.02

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 new SCS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 new SCS). Table 1 exceedances indicated in BOLD and Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



Sample Location	Borehole D27	Borehole D31	Borehole D35	Borehole D37			
Sample ID				BH D27 SS2	BH D31 SS3	BH D35 SS2	BH D37 SS4
Soil Type	Silty Clay/Clayey Silt FILL	Sandy Silt FILL	Silty Clay/Clayey Silt FILL	Silty Clay/Clayey Silt FILL			
Field Vapour (ppm)				0/0	0/0	0/0	0/0
Sample Depth (mbgs)				0.9-1.5	1.6-2.0	0.8-1.2	2.3-2.7
Sampling Date				24-Feb-20	12-Feb-20	12-Feb-20	12-Feb-20
Latest Analyzed Date				4-Mar-20	24-Feb-20	24-Feb-20	24-Feb-20
Laboratory ID				976172	940831	940834	940838
Certificate of Analysis No.				20T0578836	20T574535	20T574535	20T574535
	Lowest						
	Detectio	Table 1	Table 3.1				
	n Limit						
		new SCS	new SCS				
Antimony (Sb)	0.8	1.3	40	<0.8	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	4	4	5	5
Barium (Ba)	1	220	670	85	63	62	76
Beryllium (Be)	0.5	2.5	8	0.7	0.5	<0.5	<0.5
Boron (B)	5	36	120	12	6	8	9
Boron (B), Hot Water Ext.	0.1	NV	2	0.42	0.22	0.41	0.25
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	21	19	19	19
Cobalt (Co)	1	21	80	8.7	9.9	8.2	8.5
Copper (Cu)	1	92	230	19	21	19	20
Lead (Pb)	1	120	120	13	11	9	11
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	270	19	22	18	19
Selenium (Se)	0.4	1.5	5.5	<0.4	<0.4	<0.4	<0.4
Silver (Ag)	0.2	0.5	40	<0.2	<0.2	<0.2	<0.2
Thallium (TI)	0.4	1	3.3	<0.4	<0.4	<0.4	<0.4
Uranium (U)	0.5	2.5	33	0.6	< 0.5	0.5	0.6
Vanadium (V)	5	86 290	86 340	31 53	27 56	25 47	25 48
Zinc (Zn) Chromium (VI)	0.2	0.66	340 8	<0.2	< 0.2	<0.2	48 <0.2
				<0.2			
Cyanide Marsum (Ha)	0.04	0.051	0.051		<0.040	<0.040	<0.040
Mercury (Hg)	0.1	0.27 0.57		<0.10 <b>1.43</b>	<0.10 <b>1.28</b>	<0.10 <b>2.02</b>	<0.10 <b>1.28</b>
Electrical Conductivity (mS/cm) Sodium Adsorption Ratio (unitless)	0.04	2.4	1.4 12	5.89	2.11	19.9	1.28 5.47
pH (unitless)	0.1	NA	NA	7.49	7.66	7.73	7.7
pπ (unidess)	0.1	IVA	INA	7.49	7.00	1.13	1.1

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 new SCS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 new SCS). Table 1 exceedances indicated in **BOLD** and Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



Sample Location				Borehole D41	Borehole D44	Borehole D47
Sample ID				BH D41 SS3	BH D44 SS1	BH D47 SS4
Soil Type				Silty Clay/Clayey Silt FILL	Sand and Gravel and Silty Clay/Clayey Silt FILL	Silty Clay/Clayey Silt Till
Field Vapour (ppm)				0/0	10/0	0/1
Sample Depth (mbgs)				1.5-2.1	Surface-0.6	2.3-2.7
Sampling Date				12-Feb-20	11-Feb-20	11-Feb-20
Latest Analyzed Date				24-Feb-20	21-Feb-20	21-Feb-20
Laboratory ID				940843	939194	939197
Certificate of Analysis No.				20T574535	20T574091	20T574091
	Lowest					
	Detectio	Table 1	Table 3.1			
	n Limit					
			new SCS			
Antimony (Sb)	0.8	1.3	40	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	4	4	5
Barium (Ba)	1	220	670	63	71	88
Beryllium (Be)	0.5	2.5	8	<0.5	<0.5	0.6
Boron (B)	5	36	120	8	8	10
Boron (B), Hot Water Ext.	0.1	NV	2	0.43	0.19	0.14
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	17	17	21
Cobalt (Co)	1	21	80	6.9	7.6	11.6
Copper (Cu)	1	92	230	16	20	20
Lead (Pb)	1	120	120	7	10	9
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	270	15	16	25
Selenium (Se)	0.4	1.5	5.5	<0.4	<0.4	<0.4
Silver (Ag)	0.2	0.5	40	<0.2	<0.2	<0.2
Thallium (TI) Uranium (U)	0.4	2.5	3.3 33	<0.4 0.5	<0.4 <0.5	<0.4 0.6
Vanadium (V)	1	2.5 86	86	23	< 0.5 24	0.6 27
Zinc (Zn)	5	290	340	42	43	50
Chromium (VI)	0.2	0.66	8	<0.2	<0.2	<0.2
Cyanide	0.2	0.00	0.051	<0.2	<0.040	<0.040
Mercury (Hg)	0.04	0.031	0.031	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.1	0.57	1.4	1.13	1.51	0.429
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	3.64	12.2	0.989
pH (unitless)	0.1	NA	NA	7.71	7.79	7.74
F (31110033)	U.1	14/7	14/1	7.7.1	7.73	,,,¬

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 new SCS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 new SCS). Table 1 exceedances indicated in **BOLD** and Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface



Sample Location				Borehole D50	Borehole D55	Borehole D57
Sample ID				BH D50 SS3	BH D55 SS2	BH D57 SS1
						Asphalt,
				Silty	Silty	Concrete.
Soil Type				Clay/Clayey	Clay/Clayey Silt	Silty
Son Type				Silt Till	FILL	Clay/Clayey
				Siit III	1122	Silt Till
Field Vapour (ppm)				0/0	10/0	0/0
Sample Depth (mbgs)				1.2-1.8	0.8-1.2	Surface-0.5
Sampling Date				12-Feb-20	11-Feb-20	12-Feb-20
Latest Analyzed Date				24-Feb-20	21-Feb-20	24-Feb-20
Laboratory ID				940845	939200	940849
Certificate of Analysis No.				20T574535	20T574091	20T574535
	Lowest					
	Detectio	Table 1	Table 3.1			
	n Limit					
			new SCS			
Antimony (Sb)	0.8	1.3	40	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	4	5	4
Barium (Ba)	1	220	670	70	86	126
Beryllium (Be)	0.5	2.5	8	<0.5	0.6	0.8
Boron (B)	5	36	120	8	9	7
Boron (B), Hot Water Ext.	0.1	NV	2	<0.10	<0.10	0.41
Cadmium (Cd)	0.5	1.2	1.9	< 0.5	<0.5	<0.5
Chromium (Cr)	1	70 21	160	17	23 11	28 12.5
Cobalt (Co) Copper (Cu)	1	92	80 230	8.4 19	30	20
Lead (Pb)	1	120	120	9	14	14
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	270	18	22	24
Selenium (Se)	0.4	1.5	5.5	<0.4	<0.4	0.6
Silver (Ag)	0.4	0.5	40	<0.2	<0.2	<0.2
Thallium (TI)	0.4	1	3.3	<0.4	<0.4	<0.4
Uranium (U)	0.5	2.5	33	0.5	<0.5	0.6
Vanadium (V)	1	86	86	24	29	38
Zinc (Zn)	5	290	340	43	51	65
Chromium (VI)	0.2	0.66	8	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.040	<0.040	<0.040
Mercury (Hg)	0.1	0.27	0.27	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	1.37	0.995	1.16
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	17.5	2.64	3.59
pH (unitless)	0.1	NA	NA	7.9	7.61	8.0
			-			

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 new SCS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 new SCS). Table 1 exceedances indicated in BOLD and Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is



#### Table 6D - Soil Chemical Analyses Petroleum Parameters

Sample Location				Borehole D17
Sample ID				BH D17 SS2
				Sand and Gravel
Cail Toma				and Silty
Soil Type				Clay/Clayey Silt
				FILL
Field Vapour (ppm)				0/0
Sample Depth (mbgs)				0.9-1.5
Sampling Date				1-Apr-20
Latest Analyzed Date				9-Apr-20
Laboratory ID				1066582
Certificate of Analysis No.				20T590525
	Lowest			
	Detection	Table 1	Table 3.1	
	Limit			
		new SCS	new SCS	
PHC F1 (C6-C10 less BTEX)	5	25	25	<5.0
PHC F2 (>C10-C16)	10	10	26	<10
PHC F3 (>C16-C34)	50	240	1700	72
PHC F4 (>C34)	50	120	3300	62
PHC F4 (>C34)*	50	120	3300	-

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for

residential/parkland/institutional/industrial/commercial/community property use (Table 1 new SCS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 new SCS). Table 1 exceedances indicated in BOLD, Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "F" means fraction. * If F4 analysis by GC/FID did not reach baseline, F4 gravimetric analysis was conducted. Higher of two F4 values shown. "-" means not analyzed. Detection Limits higher than SCS are in *ITALIC*.



#### Table 7D - Soil Chemical Analyses Volatile Organic Compounds

Sample Location				Borehole D17
Sample ID				BH D17 SS2
Sample 10				Sand and Gravel
c :: -				
Soil Type				and Silty
				Clay/Clayey Silt FILL
Field Vapour (ppm)				0/0
Sample Depth (mbgs)				0.9-1.5
Sampling Date				1-Apr-20
Latest Analyzed Date				9-Apr-20
Laboratory ID				1066582
Certificate of Analysis No.				20T590525
	Lowest	Table 1	Table 3.1	
	Detection			
	Limit	new SCS	new SCS	
Dichlorodifluoromethane	0.05	0.05	1.8	<0.050
Vinyl chloride	0.02	0.02	0.02	<0.020
Bromomethane	0.05	0.05	0.05	<0.050
Trichlorofluoromethane	0.05	0.25	0.46	<0.050
Acetone	0.50	0.5	1.8	<0.50
1,1-Dichloroethylene	0.05	0.05	0.05	<0.050
Methylene Chloride	0.05	0.05	0.03	<0.050
trans-1,2-Dichloroethylene	0.05	0.05	0.2	<0.050
MTBE	0.05	0.05	0.05	<0.050
	0.05	0.05	0.03	
1,1-Dichloroethane	0.03			<0.050
Methyl Ethyl Ketone	0.50	0.5	26	<0.50
cis-1,2-Dichloroethylene		0.05	0.05	<0.02
Chloroform	0.04	0.05	0.26	<0.04
1,2-Dichloroethane	0.03	0.05	0.05	<0.03
1,1,1-Trichloroethane	0.05	0.05	0.4	<0.050
Carbon tetrachloride	0.05	0.05	0.05	<0.050
Benzene	0.02	0.02	0.034	<0.02
1,2-Dichloropropane	0.03	0.05	0.05	< 0.03
Trichloroethylene	0.03	0.05	0.05	<0.03
Bromodichloromethane	0.05	0.05	5.8	< 0.050
Methyl Isobutyl Ketone	0.50	0.5	17	< 0.50
1,1,2-Trichloroethane	0.04	0.05	0.05	< 0.04
Toluene	0.08	0.2	7.8	< 0.05
Dibromochloromethane	0.05	0.05	5.5	< 0.050
1,2-Dibromoethane	0.04	0.05	0.05	< 0.04
Tetrachloroethylene	0.05	0.05	0.05	< 0.050
1,1,1,2-Tetrachloroethane	0.04	0.05	0.05	< 0.04
Chlorobenzene	0.05	0.05	0.28	< 0.050
Ethylbenzene	0.05	0.05	1.9	< 0.050
m+p-Xylenes	0.05	NV	NV	<0.050
Bromoform	0.05	0.05	2.5	<0.050
Styrene	0.05	0.05	6.8	<0.050
1,1,2,2-Tetrachloroethane	0.05	0.05	0.05	<0.050
o-Xylene	0.02	NV	NV	<0.050
1,3-Dichlorobenzene	0.05	0.05	6.8	<0.050
1,4-Dichlorobenzene	0.05	0.05	0.05	<0.050
1,2-Dichlorobenzene	0.05	0.05	6.8	<0.050
Xylenes (Total)	0.05	0.05	3	<0.050
1,3-Dichloropropene (cis & trans)	0.03	0.05	0.05	<0.04
1 ± 1 2	0.0-		5.03	\U.U <del>\</del>
n-Hexane	0.05	0.05	2.5	< 0.050

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for

residential/parkland/institutional/industrial/commercial/community property use (Table 1 new SCS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 new SCS). Table 1 exceedances indicated in **BOLD**, Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total

TT186014 Page 1 of 1

#### Table 8D - Soil Chemical Analyses Organochlorine Pesticides



Sample Location				Borehole D17
Sample ID				BH D17 SS2
				Sand and
Soil Type				<b>Gravel and Silty</b>
Son Type				Clay/Clayey Silt
				FILL
Field Vapour (ppm)				0/0
Sample Depth (mbgs)				0.9-1.5
Sampling Date				1-Apr-20
Latest Analyzed Date				13-Apr-20
Laboratory ID				1066582
Certificate of Analysis No.				20T590525
	Lowest	Table 1	Table 3.1	
	Detection			
	Limit			
		new SCS	new SCS	
Hexachloroethane	0.010	0.01	0.13	<0.01
gamma-hexachlorocyclohexane	0.005	0.01	0.01	<0.005
Heptachlor	0.005	0.05	0.072	<0.005
Aldrin	0.005	0.05	0.088	<0.005
Heptachlor Epoxide	0.005	0.05	0.05	<0.005
Endosulfan (Total)	0.005	0.04	0.04	<0.005
Chlordane (Total)	0.007	0.05	0.05	<0.007
Total DDE	0.007	0.05	0.52	<0.007
Total DDD	0.007	0.05	4.6	<0.007
Total DDT	0.007	1.4	1.4	<0.007
Dieldrin	0.005	0.05	0.088	<0.005
Endrin	0.005	0.04	0.04	<0.005
Methoxychlor	0.005	0.05	0.19	<0.005
Hexachlorobenzene	0.005	0.01	0.66	<0.005
Hexachlorobutadiene	0.010	0.01	0.01	<0.01

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for

residential/parkland/institutional/industrial/commercial/community property use (Table 1 new SCS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 new SCS). Table 1 exceedances indicated in **BOLD**, Table 3.1 exceedances indicated in SHADING. All values reported in  $\mu$ g/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "-" means not tested. Detection Limits higher than SCS are in *ITALIC* .



#### Table 9D - Ontario Regulation 347/90 Leachate Analyses Waste Classification

Sample ID Sampling Date Laboratory ID Certificate of Analysis No.			Comp 1 TCLP D 24-Feb-20 1028257 20T584983
	DL	Schedule 4	
Antimony (Sb)	0.01	NV	<0.010
Barium (Ba)	0.1	100	0.738
Boron (B)	0.05	500	0.056
Cadmium (Cd)	0.01	0.5	<0.010
Chromium (Cr)	0.01	5	< 0.010
Lead (Pb)	0.01	5	<0.010
Selenium (Se)	0.01	1	<0.010
Silver (Ag)	0.01	5	< 0.010
Uranium (U)	0.05	10	<0.05
Fluoride	0.1	150	0.32
Mercury	0.01	0.1	< 0.01
Cyanide	0.05	20	< 0.05
Nitrite + Nitrate	0.7	100	<0.70
Heptachlor + Heptachlor Epoxide	0.0003	0.3	<0.0003
Aldrin + Dieldrin	0.0007	0.07	< 0.0007
DDT + Metabolites	0.0003	3	< 0.003
Methoxychlor	0.090	90	< 0.09
Chlordane (Total)	0.0007	0.7	< 0.0007
Aldrin	0.0002	0.07	<0.0002
alpha - chlordane	0.0001	NV	<0.0001
gamma-Chlordane	0.0002	NV	<0.0002
Oxychlordane	0.0004	NV	<0.0004
pp'-DDE	0.0005	NV	<0.0005
pp'-DDD	0.0015	NV	<0.0015
op'-DDT	0.0015	NV	<0.0015
pp'-DDT	0.0005	NV	<0.0005
Dieldrin	0.0005	0.07	<0.0005
Heptachlor	0.0001	0.3	<0.0001
Heptachlor Epoxide	0.0002	0.3	<0.0002
Lindane	0.0004	0.4	<0.0004
Endrin	0.0004	0.02	<0.0004
Toxaphene	0.0005	0.5	<0.0005
PCB's	0.0002	0.3	<0.0002
Vinyl Chloride	0.03	0.2	<0.030
1,1 Dichloroethene	0.02	1.4	<0.020
Dichloromethane	0.03	5	<0.030
Methyl Ethyl Ketone	0.09	200	<0.090
Chloroform	0.02	10	<0.020
1,2-Dichloroethane	0.02	0.5	<0.020
Carbon Tetrachloride	0.02	0.5	<0.020
Benzene	0.02	0.5	<0.020
Trichloroethene	0.02	5	<0.020
Tetrachloroethene	0.05	3	<0.050
Chlorobenzene	0.01	8	<0.010
1,2-Dichlorobenzene	0.01	20	<0.010
1,4-Dichlorobenzene	0.01	0.5	<0.010

Notes: Ontario Regulation 347/90, Schedule 4 Leachate Criteria. All results reported in mg/L except for Ignitability and flammability which have no units. "RDL" means reportable detection limit. "<" indicates not detected above RDL as shown. Schedule 4 exceedances indicated in **BOLD underlined**. "NV" means no value. "NA" means not applicable / not analyzed.



#### Table 10D - Ontario Regulation 406/19 Leachate Analyses Waste Classification

Sample ID Sampling Date Laboratory ID Certificate of Analysis No.	24-Feb-20 1028257 20T584983		
,	DL	Appendix 2 Table 3.1	201301303
Antimony (Sb)	0.01	NV	<0.010
Barium (Ba)	0.1	4600000	0.738
Boron (B)	0.05	NV	0.056
Cadmium (Cd)	0.01	NV	<0.010
Chromium (Cr)	0.01	130000	<0.010
Lead (Pb)	0.01	NV	<0.010
Selenium (Se)	0.01	10000	<0.010
Silver (Ag)	0.01	300	<0.010
Uranium (U)	0.01	66000	<0.010
oranium (o)	0.05	00000	V0.03
Fluoride	0.1	NV	0.32
Mercury	0.01	NV	<0.01
Cyanide	0.05	NV	< 0.05
Nitrite + Nitrate	0.7	NV	<0.70
Heptachlor + Heptachlor Epoxide	0.0003	NV	<0.0003
Aldrin + Dieldrin	0.0007	0.000097	<0.0007
DDT + Metabolites	0.0007	NV	<0.003
Methoxychlor	0.090	NV	<0.09
Chlordane (Total)	0.0007	NV	<0.0007
Aldrin	0.0007	NV	<0.0007
alpha - chlordane	0.0002	NV	<0.0002
gamma-Chlordane	0.0001	NV	<0.0001
Oxychlordane	0.0002	NV	<0.0002
pp'-DDE	0.0004	NV	<0.0004
• •	0.0003	NV	<0.0003
pp'-DDD op'-DDT		NV	<0.0015
•	0.0015	NV	<0.0013
pp'-DDT	0.0005		<0.0005
Dieldrin	0.0005	NV	
Heptachlor	0.0001	NV	<0.0001
Heptachlor Epoxide	0.0002	0.00001	<0.0002
Lindane	0.0004	NV	<0.0004
Endrin	0.0004	0.000062	<0.0004
Toxaphene	0.0005	NV	<0.0005
PCB's	0.0002	NV	<0.0002
Vinyl Chloride	0.5	NV	<0.030
1,1 Dichloroethene	0.2	500.0	<0.020
Dichloromethane	1	NV	<0.030
Methyl Ethyl Ketone	0.2	NV	<0.090
Chloroform	0.5	NV	<0.020
1,2-Dichloroethane	0.5	NV	<0.020
Carbon Tetrachloride	0.5	200.0	<0.020
Benzene	0.5	NV	<0.020
Trichloroethene	0.5	500	<0.020
Tetrachloroethene	0.5	500	<0.050
Chlorobenzene	0.5	NV	<0.010
1,2-Dichlorobenzene	0.5	NV	<0.010
1,4-Dichlorobenzene	0.3	NV	<0.010
I, I DIGITOTODETIZETIE	0.2	147	- 5.510

Notes: Ontario Regulation 406/19, Appendix 2 - Generic Leachate Screening Levels for Excess Soil Reuse - Table 3.1: Leachate Screening Levels for Full Depth Excess Soil in a Non-Potable Ground Water condition, Volume Independent,

Industrial/Commercial/Community Property Use. All results reported in mg/L except for Ignitability and flammability which have no units. "RDL" means reportable detection limit. "<" indicates not detected above RDL as shown. Table 3.1 exceedances indicated in **BOLD underlined**. "NV" means no value. "NA" means not applicable / not analyzed.



# SECTION E EAST – WEST ARTERIAL RAOD (FROM THE GORE ROAD TO COLERAINE DRIVE, ~2.4 KM)

#### **APPENDIX C-E**

**SOIL ANAYLYTICAL RESULTS** 





Sample Location				Borehole E1	Borehole E2	Borehole E3
Sample ID				E1 SS1	E2 SS1	E3 SS1
				Tamasiland	Tamasil and	Tamadand
Soil Type	Topsoil and	Topsoil and	Topsoil and			
				Silty Clay FILL	Silty Clay FILL	Silty Clay FILL
Field Vapour (ppm)				0/0	0/0	0/0
Sample Depth (mbgs)				0-0.6	0-0.6	0-0.6
Sampling Date				11-Jan-22	11-Jan-22	11-Jan-22
Latest Analyzed Date				25-Jan-22	25-Jan-22	25-Jan-22
Laboratory ID				3429023	3429025	3429028
Certificate of Analysis No.				22T853869	22T853869	22T853869
, , , , , , , , , , , , , , , , , , ,	Lowest					
	Detection	Table 1	Table 3			
	Limit					
		scs	scs			
Antimony (Sb)	0.8	1.3	50	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	5	5	5
Barium (Ba)	1	220	670	99	96	125
Beryllium (Be)	0.5	2.5	10	0.8	0.8	0.8
Boron (B)	5	36	120	10	10	10
Boron (B), Hot Water Ext.	0.1	NV	2	<0.10	<0.10	<0.10
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	30	30	33
Cobalt (Co)	1	21	100	10.8	13.2	14.8
Copper (Cu)	1	92	300	24.1	26.4	27.8
Lead (Pb)	1	120	120	16	11	13
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	340	23	26	29
Selenium (Se)	0.4	1.5	5.5	<0.8	<0.8	<0.8
Silver (Ag)	0.2	0.5	50	<0.5	<0.5	<0.5
Thallium (TI)	0.4	1	3	<0.5	<0.5	<0.5
Uranium (U)	0.5	2.5	33	0.9	0.64	0.77
Vanadium (V)	1	86	86	39.1	40	46.9
Zinc (Zn)	5	290	340	94	67	72
Chromium (VI)	0.2	0.66	10	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.04	<0.04	<0.04
Mercury (Hg)	0.1	0.27	20	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	0.304	0.227	0.26
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	0.508	0.343	0.423
pH (unitless)	0.1	NA	NA	7.1	7.24	7.37

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for

residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



Sample Location				Borehole E5	Borehole E7	Borehole E23
Sample ID				E5 SS2	E7 SS1	E23 SS1
						Topsoil and
C-11 T				Camala Cile Till	Topsoil and	Silty
Soil Type	Sandy Silt Till	Silty Clay FILL	Clay/Clayey			
			Silt FILL			
Field Vapour (ppm)				0/0	0/0	0/0
Sample Depth (mbgs)				0.8-1.4	0-0.6	0-0.6
Sampling Date				11-Jan-22	11-Jan-22	13-Jan-22
Latest Analyzed Date				25-Jan-22	25-Jan-22	24-Jan-22
Laboratory ID				3429040	3429041	3428908
Certificate of Analysis No.				22T853869	22T853869	22T853859
	Lowest					
	Detection	Table 1	Table 3			
	Limit					
		scs	scs			
Antimony (Sb)	0.8	1.3	50	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	4	5	4
Barium (Ba)	1	220	670	40.2	94	105
Beryllium (Be)	0.5	2.5	10	0.5	0.8	0.7
Boron (B)	5	36	120	<5	8	7
Boron (B), Hot Water Ext.	0.1	NV	2	<0.10	<0.10	<0.10
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	16	28	26
Cobalt (Co)	1	21	100	5.3	11.5	9
Copper (Cu)	1	92	300	14.9	23.1	15.8
Lead (Pb)	1	120	120	6	10	11
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	340	12	24	18
Selenium (Se)	0.4	1.5	5.5	<0.8	<0.8	<0.8
Silver (Ag)	0.2	0.5	50	<0.5	<0.5	<0.5
Thallium (Tl)	0.4	1	3	<0.5	<0.5	<0.5
Uranium (U)	0.5	2.5	33	0.55	0.63	0.76
Vanadium (V)	1	86	86	27.5	37.9	40.2
Zinc (Zn)	5	290	340	35	59	46
Chromium (VI)	0.2	0.66	10	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.04	<0.04	<0.04
Mercury (Hg)	0.1	0.27	20	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	0.167	0.211	0.206
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	0.127	0.235	0.368
pH (unitless)	0.1	NA	NA	7.24	7.33	7.58

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for

residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



Sample Location				Borehole E25	Borehole E27	Borehole E29
Sample ID				E25 SS1	E27 SS1	E29 SS1
Soil Type		Topsoil and Silty Clay/Clayey Silt FILL	Topsoil and Silty Clay FILL	Topsoil and Silty Clay/Clayey Silt FILL		
Field Vapour (ppm) Sample Depth (mbgs) Sampling Date Latest Analyzed Date Laboratory ID Certificate of Analysis No.				0/0 0-0.6 13-Jan-22 24-Jan-22 3428911 22T853859	0/0 0-0.6 13-Jan-22 24-Jan-22 3428915 22T853859	0/0 0-0.6 13-Jan-22 24-Jan-22 3428919 22T853859
	Lowest Detection Limit	Table 1	Table 3			
Antimony (Sb)	0.8	1.3	50	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	5	5	4
Barium (Ba)	1	220	670	90.6	166	151
Beryllium (Be)	0.5	2.5	10	0.7	1	0.7
Boron (B)	5	36	120	10	9	11
Boron (B), Hot Water Ext.	0.1	NV	2	0.28	0.12	<0.10
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	29	38	34
Cobalt (Co)	1	21	100	14	14.3	12.2
Copper (Cu)	1	92	300	23.7	25.4	20.5
Lead (Pb)	1	120	120	13	15	11
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	340	31	30	25
Selenium (Se)	0.4	1.5	5.5	<0.8	<0.8	<0.8
Silver (Ag)	0.2	0.5	50	<0.5	<0.5	<0.5
Thallium (Tl)	0.4	1	3	<0.5	<0.5	<0.5
Uranium (U)	0.5	2.5	33	0.58	1.62	0.67
Vanadium (V)	1	86	86	40.3	54	45.4
Zinc (Zn)	5	290	340	62	104	58
Chromium (VI)	0.2	0.66	10	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.04	<0.04	<0.04
Mercury (Hg)	0.1	0.27	20	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	0.221	0.245	0.218
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	0.767	0.304	0.237
pH (unitless)	0.1	NA	NA	7.35	7.28	6.72

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



Sample Location	Borehole E30	Borehole E32				
Sample ID				E30 SS1	E32 SS1	DUP1
•				Topsoil and	Topsoil and	Topsoil and
				Silty	Silty	Silty
Soil Type	_	Clay/Clayey Silt	Clay/Clayey			
	FILL	FILL	Silt FILL			
Field Vapour (ppm)				0/0	0/0	0/0
Sample Depth (mbgs)				0-0.6	0-0.6	0-0.6
Sampling Date				13-Jan-22	13-Jan-22	13-Jan-22
Latest Analyzed Date				24-Jan-22	24-Jan-22	24-Jan-22
Laboratory ID				3428927	3428933	3428935
Certificate of Analysis No.				22T853859	22T853859	22T853859
	Lowest					
	Detection	Table 1	Table 3			Field duplicate
	Limit					of sample E32
		scs	scs			SS1
Antimony (Sb)	0.8	1.3	50	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	4	3	3
Barium (Ba)	1	220	670	137	78.5	79.4
Beryllium (Be)	0.5	2.5	10	0.7	0.5	0.6
Boron (B)	5	36	120	10	7	7
Boron (B), Hot Water Ext.	0.1	NV	2	<0.10	<0.10	<0.10
Cadmium (Cd)	0.5	1.2	1.9	< 0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	36	23	25
Cobalt (Co)	1	21	100	14.3	7.5	8
Copper (Cu)	1	92	300	23.8	14.4	16.5
Lead (Pb)	1	120	120	13	8	9
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	340	28	17	19
Selenium (Se)	0.4	1.5	5.5	<0.8	<0.8	<0.8
Silver (Ag)	0.2	0.5	50	<0.5	<0.5	<0.5
Thallium (Tl)	0.4	1	3	<0.5	<0.5	<0.5
Uranium (U)	0.5	2.5	33	0.7	0.59	0.59
Vanadium (V)	1	86	86	51	34.9	35.8
Zinc (Zn)	5	290	340	67	43	46
Chromium (VI)	0.2	0.66	10	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.04	<0.04	<0.04
Mercury (Hg)	0.1	0.27	20	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	0.25	0.244	0.263
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	0.266	0.809	0.815
pH (unitless)	0.1	NA	NA	7.06	7.09	7.11

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for

residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. *To apply generic SCS, pH of soil is to be between 5 and 9 for surface soil (<1.5 mbg) and between 5 and 11 for subsurface soil (>1.5 mbg). "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



#### Table 2E - Soil Chemical Analyses Petroleum Parameters

Sample Location			Borehole E2	Boreh	ole E27	
Sample ID				E2 SS2	E27 SS2	DUP3
Soil Type				Silty Clay Till	Silty Clay/Clayey Silt Till	Silty Clay/Clayey
Field Vapour (ppm)				0/0	0/0	Silt Till 0/0
Sample Depth (mbgs)				0.8-1.4	0.8-1.4	0.8-1.4
Sampling Date				11-Jan-22	13-Jan-22	13-Jan-22
Latest Analyzed Date				25-Jan-22	24-Jan-22	24-Jan-22
Laboratory ID				3429027	3428916	3428937
Certificate of Analysis No.				22T853869	22T853859	22T853859
	Lowest					
	Detection	Table 1	Table 3			Field duplicate of
	Limit					sample E27 SS2
		SCS	SCS			
PHC F1 (C6-C10 less BTEX)	5	25	65	< 5.0	< 5.0	< 5.0
PHC F2 (>C10-C16)	10	10	250	<10	<10	<10
PHC F3 (>C16-C34)	50	240	2500	<50	<50	<50
PHC F4 (>C34)	50	120	6600	<50	<50	<50
PHC F4 (>C34)*	50	120	6600	-	-	-

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medicum/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in BOLD and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in prounds of the soft organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "F" means fraction. * If F4 analysis by GC/FID did not reach baseline, F4 gravimetric analysis was conducted. Higher of two F4 values shown. "-" means not analyzed. Detection Limits higher than SCS are in ITALIC.



#### Table 3E - Soil Chemical Analyses Volatile Organic Compounds

Sample Location				Borehole E2	Boreh	ole E27
Sample ID				E2 SS2	E27 SS2	DUP3
·					Silty Clay/Clayey	Silty Clay/Clayey
Soil Type				Silty Clay Till	Silt Till	Silt Till
Field Vapour (ppm)				0/0	0/0	0/0
Sample Depth (mbgs)				0.8-1.4	0.8-1.4	0.8-1.4
Sampling Date				11-Jan-22	13-Jan-22	13-Jan-22
Latest Analyzed Date				25-Jan-22	24-Jan-22	24-Jan-22
Laboratory ID				3429027	3428916	3428937
Certificate of Analysis No.				22T853869	22T853859	22T853859
-	Lowest	Table 1	Table 3			
	Detection	SCS	SCS			Field duplicate of
	Limit					sample E27 SS2
Dichlorodifluoromethane	0.05	0.05	25	<0.050	<0.050	<0.050
Vinyl chloride	0.02	0.02	0.25	<0.020	<0.020	<0.020
Bromomethane	0.05	0.05	0.05	<0.050	<0.050	<0.050
Trichlorofluoromethane	0.05	0.25	5.8	<0.050	<0.050	<0.050
Acetone	0.50	0.5	28	< 0.50	< 0.50	< 0.50
1,1-Dichloroethylene	0.05	0.05	0.48	<0.050	<0.050	<0.050
Methylene Chloride	0.05	0.05	2	< 0.050	< 0.050	< 0.050
trans-1,2-Dichloroethylene	0.05	0.05	9.3	<0.050	<0.050	<0.050
MTBE	0.05	0.05	3.2	< 0.050	<0.050	< 0.050
1,1-Dichloroethane	0.05	0.05	21	< 0.050	<0.050	< 0.050
Methyl Ethyl Ketone	0.50	0.5	88	< 0.50	< 0.50	< 0.50
cis-1,2-Dichloroethylene	0.02	0.05	37	< 0.02	<0.02	< 0.02
Chloroform	0.04	0.05	0.18	< 0.04	< 0.04	< 0.04
1,2-Dichloroethane	0.03	0.05	0.05	< 0.03	< 0.03	< 0.03
1,1,1-Trichloroethane	0.05	0.05	12	< 0.050	< 0.050	< 0.050
Carbon tetrachloride	0.05	0.05	1.5	< 0.050	< 0.050	< 0.050
Benzene	0.02	0.02	0.4	< 0.02	< 0.02	< 0.02
1,2-Dichloropropane	0.03	0.05	0.68	< 0.03	< 0.03	< 0.03
Trichloroethylene	0.03	0.05	0.61	< 0.03	< 0.03	< 0.03
Bromodichloromethane	0.05	0.05	18	< 0.050	< 0.050	< 0.050
Methyl Isobutyl Ketone	0.50	0.5	210	< 0.50	< 0.50	< 0.50
1,1,2-Trichloroethane	0.04	0.05	0.11	< 0.04	< 0.04	< 0.04
Toluene	0.05	0.2	78	< 0.05	< 0.05	< 0.05
Dibromochloromethane	0.05	0.05	13	< 0.050	<0.050	<0.050
1,2-Dibromoethane	0.04	0.05	0.05	< 0.04	< 0.04	< 0.04
Tetrachloroethylene	0.05	0.05	21	<0.050	<0.050	<0.050
1,1,1,2-Tetrachloroethane	0.04	0.05	0.11	<0.04	< 0.04	<0.04
Chlorobenzene	0.05	0.05	2.7	<0.050	<0.050	<0.050
Ethylbenzene	0.05	0.05	19	<0.050	<0.050	<0.050
m+p-Xylenes	0.05	NV	NV	<0.050	<0.050	<0.050
Bromoform	0.05	0.05	1.7	<0.050	<0.050	<0.050
Styrene	0.05	0.05	43	<0.050	<0.050	<0.050
1,1,2,2-Tetrachloroethane	0.05	0.05	0.094	<0.050	<0.050	<0.050
o-Xylene	0.05	NV	NV	<0.050	<0.050	<0.050
1,3-Dichlorobenzene	0.05	0.05	12	<0.050	<0.050	<0.050
1,4-Dichlorobenzene	0.05	0.05	0.84	<0.050	<0.050	<0.050
1,2-Dichlorobenzene	0.05	0.05	8.5	<0.050	<0.050	<0.050
Xylenes (Total)	0.05	0.05	30	<0.050	<0.050	<0.050
1,3-Dichloropropene (cis & trans)	0.04	0.05	0.21	<0.04	<0.04	<0.04
n-Hexane	0.05	0.05	88	< 0.050	< 0.050	< 0.050

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for

residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in  $\mu$ g/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "-" means not analyzed. Detection Limits higher than SCS are in *ITALIC*.

#### Table 4E - Soil Chemical Analyses Organochlorine Pesticides



Sample Location				Borehole E2	Borehole E3	Borehole E24	Borehole E26
Sample ID			E2 SS1	E3 SS2	E24 SS1	E26 SS1	
•					Topsoil and	Topsoil and	
				Topsoil and	au. a. =	Silty	Silty
Soil Type				Silty Clay FILL	Silty Clay Till	Clay/Clayey	Clay/Clayey
						Silt FILL	Silt FILL
Field Vapour (ppm)				0/0	0/0	0/0	0/0
Sample Depth (mbgs)				0-0.6	0.8-1.4	0-0.6	0-0.6
Sampling Date				11-Jan-22	11-Jan-22	13-Jan-22	13-Jan-22
Latest Analyzed Date				25-Jan-22	25-Jan-22	24-Jan-22	24-Jan-22
Laboratory ID				3429025	3429029	3428909	3428912
Certificate of Analysis No.				22T853869	22T853869	22T853859	22T853859
	Lowest	Table 1	Table 3				
		scs	scs				
Hexachloroethane	0.010	0.01	0.66	<0.01	<0.01	<0.01	<0.01
gamma-hexachlorocyclohexane	0.005	0.01	0.063	<0.005	<0.005	<0.005	<0.005
Heptachlor	0.005	0.05	0.19	< 0.005	< 0.005	< 0.005	< 0.005
Aldrin	0.005	0.05	0.11	< 0.005	< 0.005	< 0.005	< 0.005
Heptachlor Epoxide	0.005	0.05	0.05	< 0.005	< 0.005	< 0.005	< 0.005
Endosulfan (Total)	0.005	0.04	0.38	<0.005	<0.005	<0.005	<0.005
Chlordane (Total)	0.007	0.05	0.05	<0.007	< 0.007	< 0.007	<0.007
Total DDE	0.007	0.05	0.65	<0.007	< 0.007	< 0.007	<0.007
Total DDD	0.007	0.05	4.6	<0.007	< 0.007	< 0.007	<0.007
Total DDT	0.007	1.4	1.4	<0.007	< 0.007	< 0.007	<0.007
Dieldrin	0.005	0.05	0.11	< 0.005	< 0.005	< 0.005	< 0.005
Endrin	0.005	0.04	0.04	<0.005	<0.005	<0.005	<0.005
Methoxychlor	0.005	0.05	1.6	<0.005	<0.005	<0.005	<0.005
Hexachlorobenzene	0.005	0.01	0.66	< 0.005	< 0.005	< 0.005	< 0.005
Hexachlorobutadiene	0.010	0.01	0.095	<0.01	<0.01	<0.01	<0.01

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in **BOLD** and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "-" means not analyzed. Detection Limits higher than SCS are in *ITALIC*.

#### Table 4E - Soil Chemical Analyses Organochlorine Pesticides



Sample Location		Boreh	ole E28	Borehole E32		
Sample ID		E28 SS2	DUP2	E32 SS2		
Soil Type		Silty Clay/Clayey Silt Till	Silty Clay/Clayey Silt Till	Silty Clay/Clayey Silt Till		
Field Vapour (ppm)				0/0	0/0	0/0
Sample Depth (mbgs)				0.8-1.4	0.8-1.4	0.8-1.4
Sampling Date				13-Jan-22	13-Jan-22	13-Jan-22
Latest Analyzed Date				24-Jan-22	24-Jan-22	24-Jan-22
Laboratory ID				3428918	3428936	3428934
Certificate of Analysis No.				22T853859	22T853859	22T853859
	Lowest	Table 1 SCS	Table 3 SCS		Field duplicate of sample E28 SS2	
Hexachloroethane	0.010	0.01	0.66	<0.01	<0.01	<0.01
gamma-hexachlorocyclohexane	0.005	0.01	0.063	< 0.005	< 0.005	< 0.005
Heptachlor	0.005	0.05	0.19	< 0.005	< 0.005	< 0.005
Aldrin	0.005	0.05	0.11	< 0.005	< 0.005	< 0.005
Heptachlor Epoxide	0.005	0.05	0.05	< 0.005	< 0.005	< 0.005
Endosulfan (Total)	0.005	0.04	0.38	< 0.005	< 0.005	< 0.005
Chlordane (Total)	0.007	0.05	0.05	<0.007	< 0.007	< 0.007
Total DDE	0.007	0.05	0.65	<0.007	< 0.007	< 0.007
Total DDD	0.007	0.05	4.6	<0.007	< 0.007	< 0.007
Total DDT	0.007	1.4	1.4	<0.007	< 0.007	<0.007
Dieldrin	0.005	0.05	0.11	<0.005	<0.005	<0.005
Endrin	0.005	0.04	0.04	<0.005	<0.005	<0.005
Methoxychlor	0.005	0.05	1.6	<0.005	<0.005	<0.005
Hexachlorobenzene	0.005	0.01	0.66	< 0.005	< 0.005	<0.005
Hexachlorobutadiene	0.010	0.01	0.095	<0.01	<0.01	<0.01

Notes: Ontario Regulation 153/04, as amended, Table 1 (Background) SCS for residential/parkland/institutional/industrial/commercial/community property use (Table 1 SCS) and Table 3 (non-potable ground water) SCS for industrial/commercial/community property use and medium/fine textured soils (Table 3 SCS). Table 1 exceedances indicated in BOLD and Table 3 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "-" means not analyzed. Detection Limits higher than SCS are in *ITALIC*.



Sample Location				Borehole E1	Borehole E2	Borehole E3
Sample ID				E1 SS1	E2 SS1	E3 SS1
Soil Type				Topsoil and	Topsoil and	Topsoil and
Son Type	Silty Clay FILL	Silty Clay FILL	Silty Clay FILL			
Field Vapour (ppm)	0/0	0/0	0/0			
Sample Depth (mbgs)				0-0.6	0-0.6	0-0.6
Sampling Date				11-Jan-22	11-Jan-22	11-Jan-22
Latest Analyzed Date				25-Jan-22	25-Jan-22	25-Jan-22
Laboratory ID				3429023	3429025	3429028
Certificate of Analysis No.				22T853869	22T853869	22T853869
	Lowest					
	Detection	Table 1	Table 3.1			
	Limit					
		ESQS	ESQS			
Antino and (Ch.)	0.0	1.2	40	.0.0	.0.0	.0.0
Antimony (Sb)	0.8	1.3	40	<0.8	<0.8 5	<0.8 5
Arsenic (As)	1	18	18	5 99	96	125
Barium (Ba)		220	670			
Beryllium (Be)	0.5 5	2.5	8	0.8	0.8	0.8
Boron (B) Boron (B), Hot Water Ext.	0.1	36 NV	120	10 <0.10	10 <0.10	10 <0.10
Cadmium (Cd)	0.1	1.2	1.9	<0.10	<0.10	<0.10
Chromium (Cr)	0.5	70	160	<0.5 30	<0.5 30	33
Cobalt (Co)	1	21	80	10.8	13.2	14.8
Copper (Cu)	1	92	230	24.1	26.4	27.8
Lead (Pb)	1	120	120	16	20.4	13
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	270	23	26	29
Selenium (Se)	0.4	1.5	5.5	<0.8	<0.8	<0.8
Silver (Ag)	0.2	0.5	40	<0.5	<0.5	<0.5
Thallium (TI)	0.4	1	3.3	<0.5	<0.5	<0.5
Uranium (U)	0.5	2.5	33	0.9	0.64	0.77
Vanadium (V)	1	86	86	39.1	40	46.9
Zinc (Zn)	5	290	340	94	67	72
Chromium (VI)	0.2	0.66	8	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.04	<0.04	<0.04
Mercury (Hg)	0.1	0.27	0.27	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	0.304	0.227	0.26
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	0.508	0.343	0.423
pH (unitless)	0.1	NA	NA	7.1	7.24	7.37

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 ESQS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 ESQS). Table 1 exceedances indicated in **BOLD** and Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



Sample Location				Borehole E5	Borehole E7	Borehole E23
Sample ID	E5 SS2	E7 SS1	E23 SS1			
						Topsoil and
Soil Type				Sandy Silt Till	Topsoil and	Silty
Soil Type				Sandy Silt Till	Silty Clay FILL	Clay/Clayey
						Silt FILL
Field Vapour (ppm)	0/0	0/0	0/0			
Sample Depth (mbgs)				0.8-1.4	0-0.6	0-0.6
Sampling Date				11-Jan-22	11-Jan-22	13-Jan-22
Latest Analyzed Date				25-Jan-22	25-Jan-22	24-Jan-22
Laboratory ID				3429040	3429041	3428908
Certificate of Analysis No.				22T853869	22T853869	22T853859
	Lowest					
	Detection	Table 1	Table 3.1			
	Limit					
		ESQS	ESQS			
Antimony (Sb)	0.8	1.3	40	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	4	5	4
Barium (Ba)	1	220	670	40.2	94	105
Beryllium (Be)	0.5	2.5	8	0.5	0.8	0.7
Boron (B)	5	36	120	<5	8	7
Boron (B), Hot Water Ext.	0.1	NV	2	<0.10	<0.10	<0.10
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	16	28	26
Cobalt (Co)	1	21	80	5.3	11.5	9
Copper (Cu)	1	92	230	14.9	23.1	15.8
Lead (Pb)	1	120	120	6	10	11
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	270	12	24	18
Selenium (Se)	0.4	1.5	5.5	<0.8	<0.8	<0.8
Silver (Ag)	0.2	0.5	40 3.3	<0.5 <0.5	<0.5	<0.5 <0.5
Thallium (Tl) Uranium (U)	0.4	2.5	3.3	0.55	<0.5 0.63	0.76
` '	0.5	86	86			40.2
Vanadium (V)	5	290	340	27.5 35	37.9 59	40.2
Zinc (Zn) Chromium (VI)	0.2	0.66	340 8	<0.2	< 0.2	46 <0.2
Cyanide	0.2		0.051	<0.2	<0.2	<0.2
Mercury (Hg)	0.04	0.051	0.051	<0.04	<0.04	<0.04
Electrical Conductivity (mS/cm)	0.1	0.27	1.4	0.10	<0.10 0.211	0.206
•	0.04	2.4	1.4	0.167	0.211	0.206
Sodium Adsorption Ratio (unitless)		NA	NA			7.58
pH (unitless)	0.1	INA	INA	7.24	7.33	7.58

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 ESQS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 ESQS). Table 1 exceedances indicated in **BOLD** and Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



Sample Location				Borehole E25	Borehole E27	Borehole E29
Sample ID	E25 SS1	E27 SS1	E29 SS1			
				Topsoil and Silty		Topsoil and Silty
Soil Type				Clay/Clayey Silt	Topsoil and Silty	Clay/Clayey Silt
Son Type	FILL	Clay FILL	FILL			
Field Vapour (ppm)				0/0	0/0	0/0
Sample Depth (mbgs)				0-0.6	0-0.6	0-0.6
Sampling Date				13-Jan-22	13-Jan-22	13-Jan-22
Latest Analyzed Date				24-Jan-22	24-Jan-22	24-Jan-22
Laboratory ID				3428911	3428915	3428919
Certificate of Analysis No.				22T853859	22T853859	22T853859
	Lowest					
	Detection	Table 1	Table 3.1			
	Limit					
		ESQS	ESQS			
Antimony (Sb)	0.8	1.3	40	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	5	5	4
Barium (Ba)	1	220	670	90.6	166	151
Beryllium (Be)	0.5	2.5	8	0.7	1	0.7
Boron (B)	5	36	120	10	9	11
Boron (B), Hot Water Ext.	0.1	NV	2	0.28	0.12	<0.10
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	29	38	34
Cobalt (Co)	1	21	80	14	14.3	12.2
Copper (Cu)	1	92	230	23.7	25.4	20.5
Lead (Pb)	1	120	120	13	15	11
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	270	31	30	25
Selenium (Se)	0.4	1.5	5.5	<0.8	<0.8	<0.8
Silver (Ag)	0.2	0.5	40	<0.5	<0.5	<0.5
Thallium (TI)	0.4	1	3.3	<0.5	<0.5	<0.5
Uranium (U)	0.5	2.5	33	0.58	1.62	0.67
Vanadium (V)	1	86	86	40.3	54	45.4
Zinc (Zn)	5	290	340	62	104	58
Chromium (VI)	0.2	0.66	8	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.04	<0.04	<0.04
Mercury (Hg)	0.1	0.27	0.27	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	0.221	0.245	0.218
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	0.767	0.304	0.237
pH (unitless)	0.1	NA	NA	7.35	7.28	6.72

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 ESQS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 ESQS). Table 1 exceedances indicated in **BOLD** and Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. "- " means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



Sample Location	Borehole E30	Borehole E32				
Sample ID	E30 SS1	E32 SS1	DUP1			
				Topsoil and	Topsoil and	Topsoil and
Soil Tune				Silty	Silty	Silty
Soil Type				Clay/Clayey Silt	Clay/Clayey Silt	Clay/Clayey
				FILL	FILL	Silt FILL
Field Vapour (ppm)				0/0	0/0	0/0
Sample Depth (mbgs)				0-0.6	0-0.6	0-0.6
Sampling Date				13-Jan-22	13-Jan-22	13-Jan-22
Latest Analyzed Date				24-Jan-22	24-Jan-22	24-Jan-22
Laboratory ID				3428927	3428933	3428935
Certificate of Analysis No.				22T853859	22T853859	22T853859
	Lowest					
	Detection	Table 1	Table 3.1			Field duplicate
	Limit					of sample E32
		ESQS	ESQS			SS1
Antimony (Sb)	0.8	1.3	40	<0.8	<0.8	<0.8
Arsenic (As)	1	18	18	4	3	3
Barium (Ba)	1	220	670	137	78.5	79.4
Beryllium (Be)	0.5	2.5	8	0.7	0.5	0.6
Boron (B)	5	36	120	10	7	7
Boron (B), Hot Water Ext.	0.1	NV	2	<0.10	<0.10	<0.10
Cadmium (Cd)	0.5	1.2	1.9	<0.5	<0.5	<0.5
Chromium (Cr)	1	70	160	36	23	25
Cobalt (Co)	1	21	80	14.3	7.5	8
Copper (Cu)	1	92	230	23.8	14.4	16.5
Lead (Pb)	1	120	120	13	8	9
Molybdenum (Mo)	0.5	2	40	<0.5	<0.5	<0.5
Nickel (Ni)	1	82	270	28	17	19
Selenium (Se)	0.4	1.5	5.5	<0.8	<0.8	<0.8
Silver (Ag)	0.2	0.5	40	<0.5	<0.5	<0.5
Thallium (Tl)	0.4	1	3.3	<0.5	<0.5	<0.5
Uranium (U)	0.5	2.5	33	0.7	0.59	0.59
Vanadium (V)	1	86	86	51	34.9	35.8
Zinc (Zn)	5	290	340	67	43	46
Chromium (VI)	0.2	0.66	8	<0.2	<0.2	<0.2
Cyanide	0.04	0.051	0.051	<0.04	<0.04	<0.04
Mercury (Hg)	0.1	0.27	0.27	<0.10	<0.10	<0.10
Electrical Conductivity (mS/cm)	0.04	0.57	1.4	0.25	0.244	0.263
Sodium Adsorption Ratio (unitless)	0.1	2.4	12	0.266	0.809	0.815
pH (unitless)	0.1	NA	NA	7.06	7.09	7.11
		<u> </u>				

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 ESQS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 ESQS). Table 1 exceedances indicated in **BOLD** and Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detecting Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NV" means no value. "NA" means not applicable. "-" means not tested. In red is indicated a value of pH above the allowed value for surface soil (<1.5 mbg).



#### Table 6E - Soil Chemical Analyses Petroleum Parameters

Sample Location		Borehole E2	Boreh	ole E27		
Sample ID				E2 SS2	E27 SS2	DUP3
Soil Type				Silty Clay Till	Silty Clay/Clayey Silt Till	Silty Clay/Clayey Silt Till
Field Vapour (ppm)				0/0	0/0	0/0
Sample Depth (mbgs)				0.8-1.4	0.8-1.4	0.8-1.4
Sampling Date				11-Jan-22	13-Jan-22	13-Jan-22
Latest Analyzed Date				25-Jan-22	24-Jan-22	24-Jan-22
Laboratory ID				3429027	3428916	3428937
Certificate of Analysis No.				22T853869	22T853859	22T853859
	Lowest					
	Detection	Table 1	Table 3.1			Field duplicate of
	Limit					Borehole E27
		ESQS	ESQS			
PHC F1 (C6-C10 less BTEX)	5	25	25	<5.0	< 5.0	< 5.0
PHC F2 (>C10-C16)	10	10	26	<10	<10	<10
PHC F3 (>C16-C34)	50	240	1700	<50	<50	<50
PHC F4 (>C34)	50	120	3300	<50	<50	<50
PHC F4 (>C34)*	50	120	3300	-	-	-

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 ESQS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 ESQS). Table 1 exceedances indicated in **BOLD**, Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "F" means fraction. * If F4 analysis by GC/FID did not reach baseline, F4 gravimetric analysis was conducted. Higher of two F4 values shown. "-" means not analyzed. Detection Limits higher than SCS are in *ITALIC*.



#### Table 7E - Soil Chemical Analyses Volatile Organic Compounds

Sample Location				Borehole E2	Borehole E27		
Sample ID				E2 SS2	E27 SS2	DUP3	
Soil Type			Silty Clay Till	Silty Clay/Clayey Silt Till	Silty Clay/Clayey Silt Till		
Field Vapour (ppm) Sample Depth (mbgs) Sampling Date Latest Analyzed Date Laboratory ID Certificate of Analysis No.		0/0 0.8-1.4 11-Jan-22 25-Jan-22 3429027 22T853869	0/0 0.8-1.4 13-Jan-22 24-Jan-22 3428916 22T853859	0/0 0.8-1.4 13-Jan-22 24-Jan-22 3428937 22T853859			
certificate of Analysis No.	Lowest	Table 1	Table 3.1	221033003	221033033	221033033	
	Detection	ESQS	ESQS			Field duplicate of	
			_			Borehole E27	
	Limit						
Dichlorodifluoromethane	0.05	0.05	1.8	<0.050	<0.050	<0.050	
Vinyl chloride	0.02	0.02	0.02	<0.020	<0.020	<0.020	
Bromomethane	0.05	0.05	0.05	<0.050	<0.050	<0.050	
Trichlorofluoromethane	0.05	0.25	0.46	<0.050	<0.050	<0.050	
Acetone 1,1-Dichloroethylene	0.50	0.5	1.8	<0.50	<0.50	<0.50	
,	0.05	0.05	0.05	<0.050	<0.050	<0.050	
Methylene Chloride	0.05	0.05	0.2	<0.050 <0.050	<0.050	<0.050	
trans-1,2-Dichloroethylene	0.05	0.05	0.05		<0.050	<0.050	
MTBE 1,1-Dichloroethane	0.05	0.05	0.05	<0.050	<0.050	<0.050	
,	0.05 0.50	0.05 0.5	0.57 26	<0.050 <0.50	<0.050 <0.50	<0.050 <0.50	
Methyl Ethyl Ketone cis-1,2-Dichloroethylene	0.50	0.05	0.05	<0.02	<0.02	<0.50 <0.02	
Chloroform	0.02	0.05	0.05	<0.02	<0.02	<0.02	
1.2-Dichloroethane	0.04	0.05	0.26	<0.04	<0.04	<0.04	
1,1,1-Trichloroethane	0.03	0.05	0.05	<0.050	<0.050	<0.050	
Carbon tetrachloride	0.05	0.05	0.05	<0.050	<0.050	<0.050	
Benzene	0.03	0.03	0.034	<0.030	<0.02	<0.030	
1,2-Dichloropropane	0.02	0.02	0.054	<0.02	<0.02	<0.02	
Trichloroethylene	0.03	0.05	0.05	<0.03	<0.03	<0.03	
Bromodichloromethane	0.05	0.05	5.8	<0.050	<0.050	<0.050	
Methyl Isobutyl Ketone	0.50	0.03	17	<0.50	<0.50	<0.50	
1,1,2-Trichloroethane	0.04	0.05	0.05	<0.04	<0.04	<0.04	
Toluene	0.04	0.03	7.8	<0.05	<0.05	<0.05	
Dibromochloromethane	0.05	0.05	5.5	<0.050	<0.050	<0.050	
1.2-Dibromoethane	0.04	0.05	0.05	<0.04	<0.04	<0.04	
Tetrachloroethylene	0.05	0.05	0.05	<0.050	<0.050	<0.050	
1.1.1.2-Tetrachloroethane	0.04	0.05	0.05	<0.04	<0.04	<0.04	
Chlorobenzene	0.05	0.05	0.28	<0.050	<0.050	<0.050	
Ethylbenzene	0.05	0.05	1.9	<0.050	<0.050	<0.050	
m+p-Xylenes	0.05	NV	NV	<0.050	<0.050	<0.050	
Bromoform	0.05	0.05	2.5	<0.050	<0.050	<0.050	
Styrene	0.05	0.05	6.8	<0.050	<0.050	<0.050	
1,1,2,2-Tetrachloroethane	0.05	0.05	0.05	<0.050	<0.050	<0.050	
o-Xylene	0.02	NV	NV	<0.050	<0.050	<0.050	
1,3-Dichlorobenzene	0.05	0.05	6.8	<0.050	<0.050	<0.050	
1,4-Dichlorobenzene	0.05	0.05	0.05	<0.050	<0.050	<0.050	
1,2-Dichlorobenzene	0.05	0.05	6.8	<0.050	<0.050	<0.050	
Xylenes (Total)	0.05	0.05	3	<0.050	<0.050	<0.050	
1,3-Dichloropropene (cis & trans)	0.04	0.05	0.05	<0.04	<0.04	<0.04	
n-Hexane	0.05	0.05	2.5	<0.050	<0.050	<0.050	

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 ESQS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 ESQS). Table 1 exceedances indicated in **BOLD**, Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "-" means not analyzed. Detection Limits higher than SCS are in *ITALIC*.

#### Table 8E - Soil Chemical Analyses Organochlorine Pesticides



Sample Location				Borehole E2	Borehole E3	Borehole E24	Borehole E26
Sample ID				E2 SS1	E3 SS2	E24 SS1	E26 SS1
Soil Type  Field Vapour (ppm)  Sample Depth (mbgs)  Sampling Date	Topsoil and Silty Clay FILL  0/0 0-0.6 11-Jan-22	0/0 0.8-1.4 11-Jan-22	Topsoil and Silty Clay/Clayey Silt FILL 0/0 0-0.6 13-Jan-22	Topsoil and Silty Clay/Clayey Silt FILL 0/0 0-0.6 13-Jan-22			
Latest Analyzed Date				25-Jan-22	25-Jan-22	24-Jan-22	24-Jan-22
Laboratory ID				3429025	3429029	3428909	3428912
Certificate of Analysis No.				22T853869	22T853869	22T853859	22T853859
	Lowest	Table 1	Table 3.1				
	Detection Limit	ESQS	ESQS				
Hexachloroethane	0.010	0.01	0.13	<0.01	<0.01	<0.01	<0.01
gamma-hexachlorocyclohexan	0.005	0.01	0.01	<0.005	< 0.005	<0.005	<0.005
Heptachlor	0.005	0.05	0.072	< 0.005	< 0.005	< 0.005	< 0.005
Aldrin	0.005	0.05	0.088	< 0.005	< 0.005	< 0.005	< 0.005
Heptachlor Epoxide	0.005	0.05	0.05	< 0.005	< 0.005	< 0.005	< 0.005
Endosulfan (Total)	0.005	0.04	0.04	<0.005	< 0.005	<0.005	<0.005
Chlordane (Total)	0.007	0.05	0.05	<0.007	<0.007	<0.007	<0.007
Total DDE	0.007	0.05	0.52	<0.007	< 0.007	< 0.007	< 0.007
Total DDD	0.007	0.05	4.6	<0.007	<0.007	<0.007	<0.007
Total DDT	0.007	1.4	1.4	<0.007	< 0.007	< 0.007	< 0.007
Dieldrin	0.005	0.05	0.088	< 0.005	< 0.005	< 0.005	< 0.005
Endrin	0.005	0.04	0.04	<0.005	<0.005	<0.005	<0.005
Methoxychlor	0.005	0.05	0.19	<0.005	<0.005	<0.005	<0.005
Hexachlorobenzene	0.005	0.01	0.66	<0.005	<0.005	<0.005	<0.005
Hexachlorobutadiene	0.010	0.01	0.01	<0.01	<0.01	<0.01	<0.01

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 ESQS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 ESQS). Table 1 exceedances indicated in BOLD, Table 3.1 exceedances indicated in SHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "-" means not tested. Detection Limits higher than SCS are in ITALIC.

#### Table 8E - Soil Chemical Analyses Organochlorine Pesticides



Sample Location	Boreh	ole E28	Borehole E32			
Sample ID				E28 SS2	DUP2	E32 SS2
Soil Type		Silty Clay/Clayey Silt Till	Silty Clay/Clayey Silt Till	Silty Clay/Clayey Silt Till		
Field Vapour (ppm)				0/0	0/0	0/0
Sample Depth (mbgs)				0.8-1.4	0.8-1.4	0.8-1.4
Sampling Date				13-Jan-22	13-Jan-22	13-Jan-22
Latest Analyzed Date				24-Jan-22	24-Jan-22	24-Jan-22
Laboratory ID				3428918	3428936	3428934
Certificate of Analysis No.				22T853859	22T853859	22T853859
	Lowest	Table 1	Table 3.1		Field duplicate	
	Detection	ESQS	ESQS		of sample E28	
	Limit	Logo	Logo		SS2	
Hexachloroethane	0.010	0.01	0.13	<0.01	<0.01	<0.01
gamma-hexachlorocyclohexane	0.010	0.01	0.13	<0.005	<0.005	<0.01
Heptachlor	0.005	0.01	0.072	<0.005	<0.005	<0.005
Aldrin	0.005	0.05	0.072	<0.005	<0.005	<0.005
Heptachlor Epoxide	0.005	0.05	0.05	<0.005	<0.005	<0.005
Endosulfan (Total)	0.005	0.04	0.04	<0.005	<0.005	<0.005
Chlordane (Total)	0.007	0.05	0.05	<0.007	< 0.007	<0.007
Total DDE	0.007	0.05	0.52	< 0.007	< 0.007	< 0.007
Total DDD	0.007	0.05	4.6	<0.007	<0.007	<0.007
Total DDT	0.007	1.4	1.4	<0.007	<0.007	<0.007
Dieldrin	0.005	0.05	0.088	<0.005	< 0.005	<0.005
Endrin	0.005	0.04	0.04	<0.005	<0.005	<0.005
Methoxychlor	0.005	0.05	0.19	< 0.005	< 0.005	< 0.005
Hexachlorobenzene	0.005	0.01	0.66	< 0.005	< 0.005	< 0.005
Hexachlorobutadiene	0.010	0.01	0.01	<0.01	<0.01	<0.01
				, and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second		

Notes: Ontario Regulation 406/19, Appendix 1-Generic Excess Soil Quality Standards, Table 1 (Full Depth Background Site Condition Standards) for residential/parkland/institutional/industrial/commercial/community property use (Table 1 ESQS) and Table 3.1 (Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition, Volume Independent) for industrial/commercial/community property use (Table 3.1 ESQS). Table 1 exceedances indicated in BOLD, Table 3.1 exceedances indicated in BHADING. All values reported in µg/g dry weight basis, unless otherwise noted. "<" indicates not detected above the laboratory Reporting Detection Limit (RDL). "ppm" means parts per million. Field vapour readings shown in ppm unless otherwise noted. Field vapour readings shown as combustible organic vapour (COV) / total organic vapour (TOV). "NA" means not applicable. "-" means not tested. Detection Limits higher than SCS are in *ITALIC*.



#### Table 9E - Ontario Regulation 347/90 Leachate Analyses Waste Classification

Sample ID			E5 SS1
Sampling Date			11-Jan-22
Laboratory ID			3429039
Certificate of Analysis No.	22T853869		
	DL	Schedule 4	
Arsenic (As)	0.01	3	<0.01
Barium (Ba)	0.1	100	0.25
Boron (B)	0.05	500	<0.05
Cadmium (Cd)	0.01	0.5	<0.01
Chromium (Cr)	0.01	5	<0.05
Lead (Pb)	0.01	5	<0.01
Selenium (Se)	0.01	1	<0.01
Silver (Ag)	0.01	5	<0.01
Uranium (U)	0.05	10	< 0.05
Fluoride	0.1	150	<0.1
Mercury	0.01	0.1	<0.01
Cyanide	0.05	20	< 0.05
Nitrite + Nitrate	0.7	100	<0.70
Benzo(a)pyrene	0.001	0.001	<0.001
PCB's	0.0002	0.3	<0.005
Vinyl Chloride	0.03	0.2	<0.03
1.1 Dichloroethene	0.03	1.4	<0.02
Dichloromethane	0.02	5	<0.03
Methyl Ethyl Ketone	0.09	200	<0.09
Chloroform	0.02	10	<0.02
1.2-Dichloroethane	0.02	0.5	<0.02
Carbon Tetrachloride	0.02	0.5	<0.02
Benzene	0.02	0.5	<0.02
Trichloroethene	0.02	5	<0.02
Tetrachloroethene	0.05	3	<0.05
Chlorobenzene	0.01	8	<0.01
1,2-Dichlorobenzene	0.01	20	<0.01
1,4-Dichlorobenzene	0.01	0.5	<0.01

Notes: Ontario Regulation 347/90, Schedule 4 Leachate Criteria. All results reported in mg/L except for Ignitability and flammability which have no units. "RDL" means reportable detection limit. "<" indicates not detected above RDL as shown. Schedule 4 exceedances indicated in **BOLD underlined**. "NV" means no value. "NA" means not applicable / not analyzed.



#### Table 10E - Ontario Regulation 416/09 Leachate Analyses Waste Classification

Sample ID Sampling Date Laboratory ID Certificate of Analysis No.	E5 SS1 11-Jan-22 3429039 22T853869		
	DL	Appendix 2 Table 3.1	
Arsenic (As)	0.01	NV	<0.01
Barium (Ba)	0.1	4600000	0.25
Boron (B)	0.05	NV	<0.05
Cadmium (Cd)	0.01	NV	<0.01
Chromium (Cr)	0.01	130000	<0.05
Lead (Pb)	0.01	NV	<0.01
Selenium (Se)	0.01	10000	<0.01
Silver (Ag)	0.01	300	<0.01
Uranium (U)	0.05	66000	<0.05
Fluoride	0.1	NV	<0.1
Mercury	0.01	NV	<0.01
Cyanide	0.05	NV	<0.05
Nitrite + Nitrate	0.7	NV	<0.70
Benzo(a)pyrene	0.001	NV	<0.001
PCB's	0.0002	NV	<0.005
Vinyl Chloride	0.5	NV	<0.03
1,1 Dichloroethene	0.2	500.0	<0.02
Dichloromethane	1	NV	<0.03
Methyl Ethyl Ketone	0.2	NV	<0.09
Chloroform	0.5	NV	<0.02
1,2-Dichloroethane	0.5	NV	<0.02
Carbon Tetrachloride	0.5	200.0	<0.02
Benzene	0.5	NV	<0.02
Trichloroethene	0.5	500	<0.02
Tetrachloroethene	0.5	500	<0.05
Chlorobenzene	0.5	NV	<0.01
1,2-Dichlorobenzene	0.5	NV	<0.01
1,4-Dichlorobenzene	0.2	NV	<0.01

Notes: Ontario Regulation 406/19, Appendix 2 - Generic Leachate Screening Levels for Excess Soil Reuse - Table 3.1: Leachate Screening Levels for Full Depth Excess Soil in a Non-Potable Ground Water condition, Volume Independent, Industrial/Commercial/Community Property Use. All results reported in mg/L except for Ignitability and flammability which have no units. "RDL" means reportable detection limit. "<" indicates not detected above RDL as shown. Table 3.1 exceedances indicated in **BOLD underlined**. "NV" means no value. "NA" means not applicable / not analyzed.



#### **APPENDIX D**

**CERTIFICATES OF ANALYSIS** 

wood.



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4
RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Shami Malla PROJECT: TP115086.1.6000

AGAT WORK ORDER: 20T563670

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Lab Manager

DATE REPORTED: Nov 13, 2020

PAGES (INCLUDING COVER): 8

VERSION*: 1

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

<u>*Notes</u>

#### Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
  incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other
  third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
  services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
  merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
  contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Page 1 of 8

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA)



AGAT WORK ORDER: 20T563670

PROJECT: TP115086.1.6000

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

5835 COOPERS AVENUE

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

ATTENTION TO: Shami Malla

SAMPLED BY:

DATE RECEIVED: 2020-01-14							DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH S3 SS3	
					SAMPLE TYPE:	Soil	
				I	DATE SAMPLED:	2020-01-10	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	862686	
ntimony	μg/g	40	0.8	2020-01-17	2020-01-17	<0.8	
rsenic	μg/g	18	1	2020-01-17	2020-01-17	5	
arium	μg/g	670	2	2020-01-17	2020-01-17	131	
eryllium	μg/g	8	0.5	2020-01-17	2020-01-17	0.7	
oron	μg/g	120	5	2020-01-17	2020-01-17	10	
oron (Hot Water Soluble)	μg/g	2	0.10	2020-01-20	2020-01-20	1.26	
admium	μg/g	1.9	0.5	2020-01-17	2020-01-17	<0.5	
Chromium	μg/g	160	2	2020-01-17	2020-01-17	30	
Cobalt	μg/g	80	0.5	2020-01-17	2020-01-17	10.7	
Copper	μg/g	230	1	2020-01-17	2020-01-17	27	
ead	μg/g	120	1	2020-01-17	2020-01-17	54	
olybdenum	μg/g	40	0.5	2020-01-17	2020-01-17	0.5	
lickel	μg/g	270	1	2020-01-17	2020-01-17	22	
elenium	μg/g	5.5	0.4	2020-01-17	2020-01-17	0.7	
ilver	μg/g	40	0.2	2020-01-17	2020-01-17	<0.2	
hallium	μg/g	3.3	0.4	2020-01-17	2020-01-17	<0.4	
Iranium	μg/g	33	0.5	2020-01-17	2020-01-17	0.7	
'anadium	μg/g	86	1	2020-01-17	2020-01-17	39	
inc	μg/g	340	5	2020-01-17	2020-01-17	103	
chromium VI	μg/g	8	0.2	2020-01-20	2020-01-20	<0.2	
Syanide	μg/g	0.051	0.040	2020-01-20	2020-01-20	<0.040	
1ercury	μg/g	3.9	0.10	2020-01-17	2020-01-17	0.21	
lectrical Conductivity	mS/cm	1.4	0.005	2020-01-17	2020-01-17	5.52	
odium Adsorption Ratio	NA	12	NA	2020-01-17	2020-01-17	45.3	
H, 2:1 CaCl2 Extraction	pH Units	5.0-9.0	NA	2020-01-20	2020-01-20	7.58	





AGAT WORK ORDER: 20T563670

PROJECT: TP115086.1.6000

ATTENTION TO: Shami Malla

SAMPLED BY:

http://www.agatlabs.com

5835 COOPERS AVENUE

MISSISSAUGA, ONTARIO CANADA L4Z 1Y2

> TEL (905)712-5100 FAX (905)712-5122

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

862686

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

DATE RECEIVED: 2020-01-14 DATE REPORTED: 2020-11-13

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

EC was 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. SAR is a calculated parameter.

Analysis performed at AGAT Toronto (unless marked by *)

Juanjot Bhells Amment Bela & CHEMIST CHEMIST



### **Exceedance Summary**

AGAT WORK ORDER: 20T563670

PROJECT: TP115086.1.6000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

ATTENTION TO: Shami Malla

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
862686	BH S3 SS3	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity	mS/cm	1.4	5.52
862686	BH S3 SS3	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Sodium Adsorption Ratio	NA	12	45.3



### Quality Assurance

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE AGAT WORK ORDER: 20T563670 PROJECT: TP115086.1.6000 ATTENTION TO: Shami Malla

SAMPLING SITE: SAMPLED BY:

				Soi	l Ana	alysis	3								
RPT Date: Nov 13, 2020			Г	UPLICATI		.,, 510	REFEREN	NCE MA	TERIAI	METHOD	BLANK	SPIKE	МАТ	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured	Acce	ptable nits	Recovery	Acce	ptable	Recovery	Acce	ptable
TANGUMETER	Date.	ld	- Sup	2 up "2	5		Value	Lower	Upper		Lower	Upper	11000101	Lower	Upper
O. Reg. 153(511) - Metals & Inorg	anics (Soil)														
Antimony	862858		<0.8	<0.8	NA	< 0.8	149%	70%	130%	92%	80%	120%	75%	70%	130%
Arsenic	862858		5	6	18.2%	< 1	119%	70%	130%	110%	80%	120%	122%	70%	130%
Barium	862858		157	157	0.0%	< 2	108%	70%	130%	101%	80%	120%	100%	70%	130%
Beryllium	862858		0.9	0.9	NA	< 0.5	100%	70%	130%	118%	80%	120%	78%	70%	130%
Boron	862858		13	13	NA	< 5	78%	70%	130%	115%	80%	120%	71%	70%	130%
Boron (Hot Water Soluble)	861768		2.12	2.15	1.4%	< 0.10	119%	60%	140%	102%	70%	130%	NA	60%	140%
Cadmium	862858		<0.5	<0.5	NA	< 0.5	96%	70%	130%	103%	80%	120%	100%	70%	130%
Chromium	862858		33	34	3.0%	< 2	100%	70%	130%	104%	80%	120%	98%	70%	130%
Cobalt	862858		15.1	15.1	0.0%	< 0.5	101%	70%	130%	102%	80%	120%	97%	70%	130%
Copper	862858		25	25	0.0%	< 1	94%	70%	130%	109%	80%	120%	90%	70%	130%
Lead	862858		14	15	6.9%	< 1	110%	70%	130%	105%	80%	120%	100%	70%	130%
Molybdenum	862858		0.5	0.6	NA	< 0.5	108%	70%	130%	106%	80%	120%	103%	70%	130%
Nickel	862858		31	31	0.0%	< 1	105%	70%	130%	104%	80%	120%	94%	70%	130%
Selenium	862858		0.5	< 0.4	NA	< 0.4	123%	70%	130%	101%	80%	120%	99%	70%	130%
Silver	862858		<0.2	<0.2	NA	< 0.2	95%	70%	130%	98%	80%	120%	92%	70%	130%
Thallium	862858		<0.4	<0.4	NA	< 0.4	113%	70%	130%	100%	80%	120%	98%	70%	130%
Uranium	862858		8.0	0.9	NA	< 0.5	114%	70%	130%	97%	80%	120%	100%	70%	130%
Vanadium	862858		46	47	2.2%	< 1	103%	70%	130%	98%	80%	120%	95%	70%	130%
Zinc	862858		75	75	0.0%	< 5	104%	70%	130%	108%	80%	120%	96%	70%	130%
Chromium VI	862859		< 0.2	< 0.2	NA	< 0.2	84%	80%	120%	86%	70%	130%	90%	70%	130%
Cyanide	867012		<0.040	<0.040	NA	< 0.040	100%	70%	130%	93%	80%	120%	99%	70%	130%
Mercury	862858		<0.10	<0.10	NA	< 0.10	125%	70%	130%	96%	80%	120%	97%	70%	130%
Electrical Conductivity	863278		0.593	0.656	10.1%	< 0.005	101%	90%	110%	NA			NA		
Sodium Adsorption Ratio	863278		0.452	0.440	2.7%	NA	NA			NA			NA		
pH, 2:1 CaCl2 Extraction	867009		5.80	5.85	0.9%	NA	100%	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

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

QA Qualifier for metals - Antimony: Reference recovery is outside method's acceptance limit by more than an absolute maximum of 10% however, all other QCs i.e. duplicate, blank, blank spike and matrix spike are within method's QC acceptance criteria

franjot Bheld

Certified By:

AGAT QUALITY ASSURANCE REPORT (V1)

Page 5 of 8



#### **QA** Violation

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T563670 PROJECT: TP115086.1.6000 ATTENTION TO: Shami Malla

RPT Date: Nov 13, 2020			REFEREN	ICE MAT	ΓERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPII	KE
PARAMETER	Sample Id	Sample Description	Measured	Acceptable Limits		Recovery	Acceptable Limits		Recovery	l lim	ptable nits
	,		Value	Lower	Upper		Lower	Upper	,	Lower	Upper

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

Antimony BH S3 SS3 70% 130% 92% 80% 120% 70% 130%

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

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

QA Qualifier for metals - Antimony: Reference recovery is outside method's acceptance limit by more than an absolute maximum of 10% however, all other QCs i.e. duplicate, blank, blank spike and matrix spike are within method's QC acceptance criteria

# Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE AGAT WORK ORDER: 20T563670 PROJECT: TP115086.1.6000 ATTENTION TO: Shami Malla

SAMPLING SITE: SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis	·		
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron (Hot Water Soluble)	MET-93-6104	EPA SW 846 6010C; MSA, Part 3, Ch.21	ICP/OES
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Zinc	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium VI	INOR-93-6068	SW 846 Method 3060A; Method 7196A	SPECTROPHOTOMETER
Cyanide	INOR-93-6052	MOE CN-3015 & E 3009 A;SM 4500 CN	TECHNICON AUTO ANALYZER
Mercury	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	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	CP/OES
pH, 2:1 CaCl2 Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	PH METER



5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2 Ph: 905 712 5100 Fax: 905 712 5122 webearth agatlabs.com

<b>Laboratory Use</b>	Only		
Work Order #: 20	156	3670	)
Cooler Quantity:	Jou	~~	
Arrival Temperatures:	3.4	30	139
Custody Seal Intact: Notes:	□Yes	□No	DNA

## Chain of Custody Record

Report Information Company:	mation: Wood					Regulatory Requirements:		No F	egula	tory Re	quir	eme	ent	С	usto	dy Se	al Inta	act:	6	SQ ]Yes	-		5	I. Y
Contact:	Alessandro Pellerito				_									N	lotes									
Address:	50 Vogell Road, Units 3	3 and 4, Richmor	nd Hill, ON			▼ Regulation 153/04 Sew				Regulatio CCME	n 558			Turnaround Time (TAT) Required:										
Phone: Reports to be sent to:	905-415-2632 a.pellerito@woodplc.co	Fax:				☑Ind/Com □Sta □Res/Park □Sta □Agriculture	-			Prov. Wat Objective:					_	ar T <i>i</i> TAT (	AT Rush Si	urchar			7 Bus	siness [	ays	
Email:     Email:	shami.malla@woodplc.				=	☑ Coarse	ite One	-		Other						3 Bu Days	isines	ss		2 B Day	usines 's	s [	□ Nex	xt Busine y
E. Ellion.						☐ Fine ☐ MISA		1	>=	Indicat	e One					OR	Date I	Requ	ired (	Rush	Surch	arges N	1ау Арр	oly):
Project Inform	mation:					Is this submission for a		Re	port	Guldell	ne o	n												
Project:	TP115086.1.6000					Record of Site Condition?		Cer	tifica	te of A	nalys	sis				P	lease	prov	ide p	rior n	otifica	tion for	rush T	AT
Site Location:	SP47 Arterial Road					☐ Yes ☑ No		V	Yes	Г	J N	0				*TAT	is exc	lusiv	e of v	veeke	nds a	nd statu	itory ho	ılidays
Sampled By:	Mohammad Safarpanah	7						Ξ							For '	Same	Day	' ana	lysis	, plea	se cor	tact yo	ur AGA	T CPM
AGAT Quote #:	305848	PO:				Sample Matrix Legend			O. Reg	153				T	-	F				BS				T
	Please note: If quotation numb	per is not provided, client	will be billed full price	for analysis.		B Biota	S		des											□PCBs				
Invoice Inform	mation:		Bill To Same:	Yes □ No		GW Ground Water	弄		rides					Σ						□ B(a)P				10.00
Company:	Wood				11	O Oil	tals,		Hyd (Incl.	8		,,	OTKN	HT I								1 1		
Contact:	Shami Malla					P Paint	ĕ	,,	etals	그문		etals	S_					OIS	des	ABNS				
Address:	50 Vogell Road, Units 3	3 and 4, Richmon	nd Hill, ON			<b>S</b> Soil	- Gd	anics	letals 53 M	2 2		Σ	NE ON	=				□ Aroclors	stici					
Email:	GTA East@Woodplc.c	com			1.1	SD Sediment SW Surface Water	Field Filtered - Metals, Hg, CrVI	Inorganics	☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals ☐ 153 Metals (Incl. Hydrides)	ORPs: □B-HWS □CI □CN □CN □CN □CN □CN □CO □ Hg	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐TP ☐NH, ☐ ☐NO, ☐NO, ☐NO, ☐NO, ☐NO, ☐NO, ☐NO, ☐	□ voc	4			/_ le	Organochlorine Pesticides	□M& □vocs				
		Dete	T -				Fie	s and	etals I		etals	ation,	is:	es:	F1 - F			□ Total	ochlo	JM&	nse n			
Sample	e Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix		Y/N	Metals	☐ All Metals ☐ Hydride M	ORPS	Full M	Regul	Nutrie No.	Volatiles:	PHCs F1 - F4	ABNs	PAHs	PCBs	Organ	TCLP.	Sewer Use			
BH S4 SS3		01/10/2020	11:25am	4	Soil	HOLD	N																	
BH S4 Comp I		01/10/2020	NA	4	Soil	HOLD	N																-	
BH S3 SS3		01/10/2020	2:20pm	4	Soil	15052	N	V										-	+	-	-	++	-	++
BH S3 Comp 2		01/10/2020	2:25pm	4	Soil	HOLD	N	1									-			-		-	-	-
BH B1 SS1		01/10/2020	9:30am	4	Soil	HOLS	N				-						-	$\rightarrow$	-	-	-	-		++
BH B1 SS2		01/10/2020	9:40am	4	Soil	HOLD	N	H						-			-		-	-	-			
BH B1 Comp 1		01/10/2020		4	Soil	HOLD	N										-		-		-		-	
					Don	1(0/1)	IN										-		1	+	+	+	+	-
							1																	
			1,-		-																			
iamples Relinquished By (Prin		6 Reli	Date	Tim		Samples Received By (Print Name and Sign)		_				Date	h	- 6		me								
Alessandro Pellerit	nt Name and Sign	w (cons	13 Jan		:43	Samples Received Rt (Print Nach and Case		/				7	AN	14/2	21	0	0	1						
Samples Relinguished By (Prin	nt than and Stone		D.M.	14/20	314	Samples Received By (Print Name and Sign):			)			Date		9	Ti	me		1		P	age _	c	f	
																			Nº:					



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4
RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Alessandro Pellerito

PROJECT: TP115086 AGAT WORK ORDER: 20T566860

SOIL ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

DATE REPORTED: Nov 13, 2020

PAGES (INCLUDING COVER): 10 VERSION*: 1

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

*Notes	
L	

#### Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
  incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other
  third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
  services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
  merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
  contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Page 1 of 10

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. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

## Certificate of Analysis

AGAT WORK ORDER: 20T566860

PROJECT: TP115086

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:

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

				•	•	•	` '			
DATE RECEIVED: 2020-01-22									DATE REPORTED	: 2020-11-13
				SAMPL	E DESCRIPTION:	A3 SS4	A9 SS1	A13 SS1	DUP1	
					SAMPLE TYPE:	Soil	Soil	Soil	Soil	
					DATE SAMPLED:	2020-01-21	2020-01-21	2020-01-21	2020-01-21	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	884523	884525	884529	884531	
Antimony	μg/g	40	0.8	2020-02-11	2020-02-11	<0.8	<0.8	<0.8	<0.8	
Arsenic	μg/g	18	1	2020-02-11	2020-02-11	5	4	4	4	
Barium	μg/g	670	2	2020-02-11	2020-02-11	66	96	100	111	
Beryllium	μg/g	8	0.5	2020-02-11	2020-02-11	0.5	0.6	0.6	0.6	
Boron	μg/g	120	5	2020-02-11	2020-02-11	8	9	8	8	
Boron (Hot Water Extractable)	μg/g	2	0.10	2020-02-11	2020-02-11	0.11	0.12	0.17	0.17	
Cadmium	μg/g	1.9	0.5	2020-02-11	2020-02-11	<0.5	<0.5	<0.5	<0.5	
Chromium	μg/g	160	2	2020-02-11	2020-02-11	18	24	23	27	
Cobalt	μg/g	80	0.5	2020-02-11	2020-02-11	9.2	9.8	8.6	11.2	
Copper	μg/g	230	1	2020-02-11	2020-02-11	22	21	19	24	
Lead	μg/g	120	1	2020-02-11	2020-02-11	9	9	10	11	
Molybdenum	μg/g	40	0.5	2020-02-11	2020-02-11	<0.5	<0.5	<0.5	<0.5	
Nickel	μg/g	270	1	2020-02-11	2020-02-11	19	19	19	22	
Selenium	μg/g	5.5	0.4	2020-02-11	2020-02-11	<0.4	<0.4	<0.4	0.6	
Silver	μg/g	40	0.2	2020-02-11	2020-02-11	<0.2	<0.2	<0.2	<0.2	
Thallium	μg/g	3.3	0.4	2020-02-11	2020-02-11	<0.4	<0.4	<0.4	<0.4	
Uranium	μg/g	33	0.5	2020-02-11	2020-02-11	0.6	0.6	0.5	0.6	
Vanadium	μg/g	86	1	2020-02-11	2020-02-11	23	34	31	38	
Zinc	μg/g	340	5	2020-02-11	2020-02-11	48	52	49	57	
Chromium VI	μg/g	8	0.2	2020-02-12	2020-02-12	<0.2	<0.2	<0.2	<0.2	
Cyanide	μg/g	0.051	0.040	2020-02-07	2020-02-07	<0.040	<0.040	<0.040	<0.040	
Mercury	μg/g	3.9	0.10	2020-02-11	2020-02-11	<0.10	<0.10	<0.10	<0.10	
Electrical Conductivity	mS/cm	1.4	0.005	2020-02-11	2020-02-11	0.347	1.34	0.814	1.46	
Sodium Adsorption Ratio	NA	12	NA	2020-02-11	2020-02-11	0.229	2.92	1.62	3.10	
pH, 2:1 CaCl2 Extraction	pH Units	5.0-9.0	NA	2020-02-12	2020-02-12	7.57	7.61	7.29	7.65	

Certified By:



5835 COOPERS AVENUE

MISSISSAUGA, ONTARIO CANADA L4Z 1Y2

http://www.agatlabs.com

TEL (905)712-5100 FAX (905)712-5122



AGAT WORK ORDER: 20T566860

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:

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

DATE RECEIVED: 2020-01-22 DATE REPORTED: 2020-11-13

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

EC was 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. SAR is a calculated parameter.

884523-884531

Analysis performed at AGAT Toronto (unless marked by *)

CHARTERED CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF C



### **Exceedance Summary**

AGAT WORK ORDER: 20T566860

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

ATTENTION TO: Alessandro Pellerito

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
884531	DUP1	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity	mS/cm	1.4	1.46



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE AGAT WORK ORDER: 20T566860
PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

				Soi	l Ana	alysis	3								
RPT Date: Nov 13, 2020				UPLICATE			REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		eptable mits	Recovery	Lie	ptable	Recovery	Lie	ptable
		la la		,			Value	Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inorg	ganics (Soi	l)				,									
Antimony	884525	884525	<0.8	<0.8	NA	< 0.8	103%	70%	130%	94%	80%	120%	71%	70%	130%
Arsenic	884525	884525	4	4	NA	< 1	104%	70%	130%	99%	80%	120%	100%	70%	130%
Barium	884525	884525	96	96	0.3%	< 2	117%	70%	130%	102%	80%	120%	109%	70%	130%
Beryllium	884525	884525	0.6	0.6	NA	< 0.5	98%	70%	130%	114%	80%	120%	87%	70%	130%
Boron	884525	884525	9	9	NA	< 5	80%	70%	130%	112%	80%	120%	77%	70%	130%
Boron (Hot Water Extractable)	884525	884525	0.12	0.13	NA	< 0.10	112%	60%	140%	98%	70%	130%	99%	60%	140%
Cadmium	884525	884525	<0.5	<0.5	NA	< 0.5	99%	70%	130%	101%	80%	120%	103%	70%	130%
Chromium	884525	884525	24	24	1.1%	< 2	102%	70%	130%	106%	80%	120%	102%	70%	130%
Cobalt	884525	884525	9.8	9.6	2.3%	< 0.5	98%	70%	130%	104%	80%	120%	98%	70%	130%
Copper	884525	884525	21	21	0.1%	< 1	98%	70%	130%	110%	80%	120%	96%	70%	130%
Lead	884525	884525	9	9	0.4%	< 1	106%	70%	130%	109%	80%	120%	102%	70%	130%
Molybdenum	884525	884525	<0.5	< 0.5	NA	< 0.5	101%	70%	130%	102%	80%	120%	103%	70%	130%
Nickel	884525	884525	19	19	3.1%	< 1	101%	70%	130%	105%	80%	120%	97%	70%	130%
Selenium	884525	884525	< 0.4	0.4	NA	< 0.4	102%	70%	130%	104%	80%	120%	104%	70%	130%
Silver	884525	884525	<0.2	<0.2	NA	< 0.2	98%	70%	130%	100%	80%	120%	93%	70%	130%
Thallium	884525	884525	<0.4	<0.4	NA	< 0.4	100%	70%	130%	96%	80%	120%	99%	70%	130%
Uranium	884525	884525	0.6	0.6	NA	< 0.5	119%	70%	130%	102%	80%	120%	107%	70%	130%
Vanadium	884525	884525	34	34	0.6%	< 1	102%	70%	130%	103%	80%	120%	99%	70%	130%
Zinc	884525	884525	52	52	0.8%	< 5	104%	70%	130%	110%	80%	120%	102%	70%	130%
Chromium VI	892870		<0.2	<0.2	NA	< 0.2	90%	80%	120%	86%	70%	130%	107%	70%	130%
Cyanide	892870		<0.040	<0.040	NA	< 0.040	99%	70%	130%	98%	80%	120%	97%	70%	130%
Mercury	884525	884525	<0.10	<0.10	NA	< 0.10	110%	70%	130%	103%	80%	120%	105%	70%	130%
Electrical Conductivity	884525	884525	1.34	1.32	0.8%	< 0.005	101%	90%	110%						
Sodium Adsorption Ratio	884525	884525	2.92	3.01	3.1%	NA									
pH, 2:1 CaCl2 Extraction	892870		7.90	8.00	1.3%	NA	100%	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

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

O. Reg. 153(511) - Metals & Inor	ganics (Soil)													
Antimony	918638	<0.8	<0.8	NA	< 0.8	140%	70%	130%	99%	80%	120%	94%	70%	130%
Arsenic	918638	<1	<1	NA	< 1	113%	70%	130%	102%	80%	120%	102%	70%	130%
Barium	918638	23	23	1.4%	< 2	113%	70%	130%	98%	80%	120%	103%	70%	130%
Beryllium	918638	<0.5	<0.5	NA	< 0.5	94%	70%	130%	99%	80%	120%	90%	70%	130%
Boron	918638	<5	<5	NA	< 5	75%	70%	130%	98%	80%	120%	89%	70%	130%
Boron (Hot Water Extractable)	916607	0.26	0.30	NA	< 0.10	108%	60%	140%	95%	70%	130%	93%	60%	140%
Cadmium	918638	<0.5	<0.5	NA	< 0.5	112%	70%	130%	97%	80%	120%	95%	70%	130%
Chromium	918638	6	6	NA	< 5	94%	70%	130%	94%	80%	120%	90%	70%	130%
Cobalt	918638	1.9	1.9	NA	< 0.5	89%	70%	130%	91%	80%	120%	84%	70%	130%

#### AGAT QUALITY ASSURANCE REPORT (V1)

Page 5 of 10



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T566860

PROJECT: TP115086

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

			<u> </u>	A 1		<u> </u>		1.\							
	Soil Analysis (Continued)														
RPT Date: Nov 13, 2020			С	UPLICATI			REFERE	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MATRIX SPIKE		
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery	1 1 1 1 1	ptable nits	Recovery	ما ا	ptable nits
		ld	·	,			Value	Lower	Upper	,	Lower	Upper	,	Lower	Upper
Copper	918638		4	4	NA	< 1	93%	70%	130%	100%	80%	120%	84%	70%	130%
Lead	918638		7	7	0.1%	< 1	106%	70%	130%	90%	80%	120%	84%	70%	130%
Molybdenum	918638		<0.5	<0.5	NA	< 0.5	103%	70%	130%	100%	80%	120%	98%	70%	130%
Nickel	918638		3	3	NA	< 1	89%	70%	130%	95%	80%	120%	86%	70%	130%
Selenium	918638		< 0.4	< 0.4	NA	< 0.4	116%	70%	130%	98%	80%	120%	99%	70%	130%
Silver	918638		<0.2	<0.2	NA	< 0.2	100%	70%	130%	95%	80%	120%	87%	70%	130%
Thallium	918638		<0.4	<0.4	NA	< 0.4	101%	70%	130%	97%	80%	120%	92%	70%	130%
Uranium	918638		<0.5	< 0.5	NA	< 0.5	101%	70%	130%	98%	80%	120%	96%	70%	130%
Vanadium	918638		12	12	0.4%	< 1	88%	70%	130%	84%	80%	120%	83%	70%	130%
Zinc	918638		15	15	NA	< 5	104%	70%	130%	104%	80%	120%	86%	70%	130%
Chromium VI	921217		<0.2	<0.2	NA	< 0.2	88%	70%	130%	89%	80%	120%	87%	70%	130%
Cyanide	890298		<0.040	<0.040	NA	< 0.040	101%	70%	130%	92%	80%	120%	112%	70%	130%
Mercury	918638		<0.10	< 0.10	NA	< 0.10	108%	70%	130%	103%	80%	120%	101%	70%	130%
Electrical Conductivity	916607		0.307	0.300	2.3%	< 0.005	100%	90%	110%						
Sodium Adsorption Ratio	916607		0.077	0.083	7.4%	NA									
pH, 2:1 CaCl2 Extraction	916689		7.49	7.55	0.8%	NA	100%	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 pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

Antimony: For a multi-element scan for lab control standards and matrix spikes, up to 10% of analytes may exceed the quoted limits by up to 10% absolute and it is considered acceptable.

OMARIERED S OMARIERED S ONNINE BASILY O ONNINE BASILY O ONNINE BASILY ON STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF T



#### **QA** Violation

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T566860
ATTENTION TO: Alessandro Pellerito

RPT Date: Nov 13, 2020			REFEREN	ICE MAT	ERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPII	KE
PARAMETER	Sample Id	ld Sample Description			eptable mits Recove		Acceptable Limits		Recovery	Acceptabl Limits	
			Value	Lower	Upper	, ,		Upper	,	Lower	Upper

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

Antimony A3 SS4 140% 70% 130% 99% 80% 120% 94% 70% 130%

Comments: NA signifies Not Applicable.

PROJECT: TP115086

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 pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

Antimony: For a multi-element scan for lab control standards and matrix spikes, up to 10% of analytes may exceed the quoted limits by up to 10% absolute and it is considered acceptable.

# Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T566860

PROJECT: TP115086

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

SAMPLING SITE.		SAIVIF LLD DT.	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron (Hot Water Extractable)	MET-93-6104	modified from EPA 6010D and MSA PART 3, CH 21	ICP/OES
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Zinc	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium VI	INOR-93-6068	modified from EPA 3060 and EPA 7196	SPECTROPHOTOMETER
Cyanide	INOR-93-6052	MOE CN-3015 & E 3009 A;SM 4500 CN	TECHNICON AUTO ANALYZER
Mercury	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	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-846010C	⁶ ICP/OES
pH, 2:1 CaCl2 Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	PH METER



**Chain of Custody Record** 

Wood

Alessandro Pellerito

**Report Information:** 

Company:

Contact:

5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2 Ph: 905.712.5100 Fax: 905.712.5122 webearth.agatlabs.com

Regulation 558

**Regulatory Requirements:** 

No Regulatory Requirement

Sewer Use

**Laboratory Use Only** 

Work Order #: 20T5 66860

	THE REAL PROPERTY.		
Cooler Quantity:	Ge	-	-
Arrival Temperatures:	4.7	3-8	12+
100	8.3	25	25
Custody Seal Intact:	□Voc	DNo	CIN/A

Address:	50 Vogell Road, Units 3 and 4			Table 2   CCME					-14	Turnaround Time (TAT) Requ					quire	;a:								
	Richmond Hill					Indicate One Sat	nitary		Пс	CME			-11	Reg	ula	TAT	•		<b>₹</b>	6 to 7	Busines	s Days		
Phone:	6479826220	Fax:				☐Res/Park ☐Sto	rm			rov. Wate				Rush TAT (Rush Surcharges Apply)					•					
Reports to be sent to:  1. Email:	a.pellerito@woodplc.com				s	oil Texture (Check One) Region	ate One	-	0   	bjectives ther	(PWQ	0)		Г		Busi avs	ness			2 Busir Days	ness		Next Busi Dav	iness
2. Email:	shami.malla@woodplc.com				_	☑Coarse ☐Fine ☐MISA			-	Indicate	One	_				-,-	ite Re	equire		-	rcharge		,	
Project Inforr	mation:					Is this submission for a				uleblu					-	DI-					g	£	L TAT	
Project:	TP115086				_	Record of Site Condition?		Cer	tmca	e of An	-		Ш		*7						fication s and st		n iAi holidays	j
Site Location:	SP47 Arterial Road					☐ Yes   ☑ No			Yes		N	)			or 15.	ıma l	hav' s	anah	vele n	leace	contac	t vour /	AGAT CPN	an .
Sampled By:	Mohammad Safarpanah				_  _			ur							01 34	T	Jay c	anaiy	-		Tomac	, your A	T	
AGAT Quote #:	305848	PO:			_     •	Sample Matrix Legend	_	H	O. Reg	153									D CBs	3				1
	Please note: If quotation number is not	t provided, client v	vill be billed full price	for analysis.			CrV		s) rides)											1				
Invoice Infori	mation:		Bill To Same:	Yes □ No		Ground Water	, H		Hydrides) Incl. Hydride				z	THM					□ B(a)P	1 1				Al .
Company:	Wood					Oil	etals			OC DHE		<u>s</u>	o LIKN					رم در		2				4
Contact:	Shami Malla				P	Paint	Ž	y;	als (excl Metals	5 5		Metals		Пвтех				☐ Aroclors	ticides	1				
Address:					S		ared .	anic	33 te	_ 5		Ę I	18					Aro	esti	3				1
Email:	GTA East@woodplc.com					SW Surface Water	Field Filtered - Metals, Hg,	and Inorganics	ls   153	JB-HWS EC	als Scan	Regulation/Custom	S: LITP	: □ voc	F1 - F4			Total	Organochlorine Pesticides TCLP: □ M&I □ VOCs □ ABN					
Samp	le Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y/N	Metals	☐ All Metz	ORPs: □B-HWS □Cr* □EC □F	Full Metals	Regulati	Nutrients: LITP LINH, L  LINO, LINO, LINO, +NO,	Volatiles:	PHCs F1	ABNS	PAHS	PCBs:	Organochio	Sewer Use				
A2 SS2	2	21 Jan 202(	9:10	1	s	HOLD																		
A1 SS2	2	21 Jan 2020	9:35	1	S	HOLD											1							
A2 SS3	2	21 Jan 2020	9:40	1	S	HOLD														100				
A3 SS2	2	21 Jan 2020	10:50	1	S	HOLD											16							
A3 SS4	2	21 Jan 2020	11:10	1	S	HOLD																		
A5 SS1	2	21 Jan 2020	11:25	1	S	HOLD																		
A9 SS1	2	21 Jan 2020	12:10	1	S			V																
A9 SS3	2	21 Jan 2020	12:25	1	S	HOLD																		
A11 SSI	2	21 Jan 2020	1:30	1	s	HOLD																		
A11 SS3	2	21 Jan 2020	1:40	1	S	HOLD																		
A13 SS1	2	21 Jan 2020	2:15	1	S	HOLD																		
Alessandro Peller	ito Kleepgla fel	W	Date 22 Jan	2020 Tim	:05	Samples Acceived By (Print trace and Sign):					(	Dhta (	ut	3/0	Tir	1	8	6			1		2	
amples Relinquished By (Pr	int lame and Sign):		Date	23/m	3:1	Samules Received BMPrint Name and Signi					1	Pate		1	Tir	bu 3				Pag	ge	of _	_	
amples Relinquished By 1Pr	int Name and Sign):		D	Tin	ie	Samples Received By (Print Name and Sign):						Date			Tit	ne			Nº:					
			1	4		1						1			1				1					

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

Regulation 153/04



5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2 Ph: 905.712.5100 Fax: 905.712.5122 webearth.agatlabs.com

Regulation 558

Prov. Water Quality

Objectives (PWQO)

ССМЕ

Other

**Regulatory Requirements:** 

No Regulatory Requirement

Sewer Use

Sanitary

Storm

Indicate One

Region

Samples Received By (Print Name and Sign)

✓ Regulation 153/04

Table 2 Indicate One

☑Ind/Com ☐Res/Park

Agriculture

Soil Texture (Check One)

5 2 + 28 0No 0N/A
equired:
Business Days
iness Next Busines Day urcharges May Apply):
dification for rush TAT ds and statutory holidays contact your AGAT CPM

#### **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:** Wood Company: Alessandro Pellerito Contact: 50 Vogell Road, Units 3 and 4 Address: Richmond Hill 6479826220 Phone: Reports to be sent to: a.pellerito@woodplc.com 1. Email: shami.malla@woodplc.com 2. Email: **Project Information:** TP115086 Project: SP47 Arterial Road Site Location: Mohammad Safarpanah Sampled By: 305848 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 ☑

Date

Sampled

21 Jan 2020

Klew

21 Jan 2020 2:45

Time

Sampled

# of

Containers

3:05

22 Jan 2020

Wood

Sample Identification

Shami Malla

GTA East@woodplc.com

Company:

Contact: Address:

Email:

A13 SS4

Samples Relinquished By (Print Name/b)

Alessandro Pellerito

DUP 1

	☑Coarse ☐Fine	□MISA			7-	Indicate	One	_				OR [		Requ		, Da (Rusi	-	charg		→ Day ay App	
R	Is this submission tecord of Site Con				tificat	Guidelin te of An	alys	ils				*TAT	is exc	lusiv	e of v	veek	ends	and	statui	rush Tr tory ho ur AGA	olidays
Sa B GW O P S SD SW	Oil Paint Soil Sediment	gend	Field Filtered - Metals, Hg, CrVI	and Inorganics	□ All Metals □ 153 Metals (excl. Hydrides) O □ Hydrides □ Hydrides □ Hydrides □ □ 153 Metals (Incl. Hydrides) □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	HWS CICH CICN:	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH, ☐ TKN ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO,	s: □voc □BTEX □THM	1-F4			] Total □ Aroclors	Organochlorine Pesticides	M&I □ VOCs □ ABNs □ B(a)P □PCBs	Jse				
ole rix	Commer Special Instr	•	Y/N	Metals	☐ All Meta	ORPs: □B-H □Crf+ □EC	Full Met	Regulati	Nutrient No.	Volatiles:	PHCs F1	ABNs	PAHs	PCBs: □ Total	Organoc	TCLP: □ M&I	Sewer Use				
	HOLD			<b>V</b>																	
															7						
	0	-0																			

Nº:



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4
RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Alessandro Pellerito

PROJECT: TP115086 AGAT WORK ORDER: 20T567508

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Lab Manager

DATE REPORTED: Nov 13, 2020

PAGES (INCLUDING COVER): 8

VERSION*: 1

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

<u>*Notes</u>

#### Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
  incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other
  third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
  services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
  merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
  contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Page 1 of 8

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. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.



AGAT WORK ORDER: 20T567508

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE:SP47 Arterial Road

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammad Safarpanah

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

DATE RECEIVED: 2020-01-24									DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH A17 SS3	BH A28 SS2	BH A31 SS2	
					SAMPLE TYPE:	Soil	Soil	Soil	
				I	DATE SAMPLED:	2020-01-22	2020-01-22	2020-01-22	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	890298	890308	890310	
Antimony	μg/g	40	0.8	2020-02-11	2020-02-11	<0.8	<0.8	<0.8	
Arsenic	μg/g	18	1	2020-02-11	2020-02-11	4	5	4	
Barium	μg/g	670	2	2020-02-11	2020-02-11	64	66	96	
Beryllium	μg/g	8	0.5	2020-02-11	2020-02-11	<0.5	0.5	0.6	
Boron	μg/g	120	5	2020-02-11	2020-02-11	6	9	6	
Boron (Hot Water Extractable)	μg/g	2	0.10	2020-02-11	2020-02-11	0.11	0.11	0.17	
Cadmium	μg/g	1.9	0.5	2020-02-11	2020-02-11	<0.5	<0.5	<0.5	
Chromium	μg/g	160	5	2020-02-11	2020-02-11	18	21	23	
Cobalt	μg/g	80	0.5	2020-02-11	2020-02-11	8.7	8.5	8.2	
Copper	μg/g	230	1	2020-02-11	2020-02-11	18	21	15	
Lead	μg/g	120	1	2020-02-11	2020-02-11	8	8	12	
Molybdenum	μg/g	40	0.5	2020-02-11	2020-02-11	<0.5	<0.5	0.5	
Nickel	μg/g	270	1	2020-02-11	2020-02-11	17	18	15	
Selenium	μg/g	5.5	0.4	2020-02-11	2020-02-11	<0.4	<0.4	0.6	
Silver	μg/g	40	0.2	2020-02-11	2020-02-11	<0.2	<0.2	<0.2	
Thallium	μg/g	3.3	0.4	2020-02-11	2020-02-11	<0.4	<0.4	<0.4	
Uranium	μg/g	33	0.5	2020-02-11	2020-02-11	<0.5	<0.5	0.6	
Vanadium	μg/g	86	1	2020-02-11	2020-02-11	24	28	35	
Zinc	μg/g	340	5	2020-02-11	2020-02-11	44	42	78	
Chromium, Hexavalent	μg/g	8	0.2	2020-02-12	2020-02-12	<0.2	<0.2	<0.2	
Cyanide	μg/g	0.051	0.040	2020-02-07	2020-02-07	< 0.040	<0.040	< 0.040	
Mercury	μg/g	3.9	0.10	2020-02-11	2020-02-11	<0.10	<0.10	<0.10	
Electrical Conductivity	mS/cm	1.4	0.005	2020-02-12	2020-02-12	0.498	1.49	2.31	
Sodium Adsorption Ratio	NA	12	NA	2020-02-12	2020-02-12	1.26	24.0	6.74	
pH, 2:1 CaCl2 Extraction	pH Units	5.0-9.0	NA	2020-02-12	2020-02-12	7.42	7.78	7.39	





AGAT WORK ORDER: 20T567508

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE: SP47 Arterial Road

ATTENTION TO: Alessandro Pellerito SAMPLED BY: Mohammad Safarpanah

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

DATE RECEIVED: 2020-01-24 DATE REPORTED: 2020-11-13

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

EC was 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. SAR is a calculated

parameter

890298-890310

Analysis performed at AGAT Toronto (unless marked by *)

mayot Bhells AMMENT BHELD & CHEMIST OF CHEMIST



### **Exceedance Summary**

AGAT WORK ORDER: 20T567508

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

ATTENTION TO: Alessandro Pellerito

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
890308	BH A28 SS2	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity	mS/cm	1.4	1.49
890308	BH A28 SS2	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Sodium Adsorption Ratio	NA	12	24.0
890310	BH A31 SS2	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity	mS/cm	1.4	2.31



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:SP47 Arterial Road

PROJECT: TP115086

AGAT WORK ORDER: 20T567508
ATTENTION TO: Alessandro Pellerito
SAMPLED BY:Mohammad Safarpanah

OAMI EINO SITE. SI 47 AREHA NOAU															
				Soi	l Ana	alysis	3								
RPT Date: Nov 13, 2020				DUPLICATI	E		REFEREN	NCE MA	TERIAL	METHOD	BLAN	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Value		eptable mits	Recovery	Lie	ptable	Recovery	Lin	ptable
		la la		.			value	Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inor	ganics (Soi	l)				,									
Antimony	918798		<0.8	<0.8	NA	< 0.8	100%	70%	130%	90%	80%	120%	87%	70%	130%
Arsenic	918798		5	5	0.0%	< 1	103%	70%	130%	95%	80%	120%	102%	70%	130%
Barium	918798		85	84	1.2%	< 2	113%	70%	130%	98%	80%	120%	93%	70%	130%
Beryllium	918798		0.5	0.5	NA	< 0.5	102%	70%	130%	107%	80%	120%	90%	70%	130%
Boron	918798		10	11	NA	< 5	105%	70%	130%	102%	80%	120%	80%	70%	130%
Boron (Hot Water Extractable)	916607		0.26	0.30	NA	< 0.10	108%	60%	140%	95%	70%	130%	93%	60%	140%
Cadmium	918798		<0.5	< 0.5	NA	< 0.5	110%	70%	130%	100%	80%	120%	94%	70%	130%
Chromium	918798		23	23	NA	< 5	98%	70%	130%	99%	80%	120%	91%	70%	130%
Cobalt	918798		9.7	9.9	2.0%	< 0.5	101%	70%	130%	87%	80%	120%	85%	70%	130%
Copper	918798		20	21	4.9%	< 1	94%	70%	130%	95%	80%	120%	82%	70%	130%
Lead	918798		13	13	0.0%	< 1	97%	70%	130%	86%	80%	120%	89%	70%	130%
Molybdenum	918798		<0.5	< 0.5	NA	< 0.5	109%	70%	130%	99%	80%	120%	103%	70%	130%
Nickel	918798		20	21	4.9%	< 1	94%	70%	130%	89%	80%	120%	86%	70%	130%
Selenium	918798		< 0.4	< 0.4	NA	< 0.4	98%	70%	130%	93%	80%	120%	96%	70%	130%
Silver	918798		<0.2	<0.2	NA	< 0.2	106%	70%	130%	92%	80%	120%	87%	70%	130%
Thallium	918798		<0.4	<0.4	NA	< 0.4	99%	70%	130%	95%	80%	120%	92%	70%	130%
Uranium	918798		0.5	0.5	NA	< 0.5	98%	70%	130%	96%	80%	120%	97%	70%	130%
Vanadium	918798		30	30	0.0%	< 1	108%	70%	130%	84%	80%	120%	87%	70%	130%
Zinc	918798		48	49	2.1%	< 5	104%	70%	130%	99%	80%	120%	87%	70%	130%
Chromium, Hexavalent	921217		< 0.2	< 0.2	NA	< 0.2	87%	70%	130%	88%	80%	120%	92%	70%	130%
Cyanide	890298	890298	<0.040	<0.040	NA	< 0.040	101%	70%	130%	108%	80%	120%	112%	70%	130%
Mercury	918798		<0.10	<0.10	NA	< 0.10	106%	70%	130%	98%	80%	120%	98%	70%	130%
Electrical Conductivity	921516		0.163	0.168	3.0%	< 0.005	100%	90%	110%	NA			NA		
Sodium Adsorption Ratio	921031		0.110	0.101	8.5%	NA	NA			NA			NA		
pH, 2:1 CaCl2 Extraction	916689		7.49	7.55	0.8%	NA	100%	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

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.



Certified By:

AGAT QUALITY ASSURANCE REPORT (V1)

Page 5 of 8

# Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086 SAMPLING SITE:SP47 Arterial Road AGAT WORK ORDER: 20T567508
ATTENTION TO: Alessandro Pellerito
SAMPLED BY:Mohammad Safarpanah

SAMPLING STL.SF47 Afterial Road		OAMI EED DT.MO	Hallillau Salaipallali
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron (Hot Water Extractable)	MET-93-6104	modified from EPA 6010D and MSA PART 3, CH 21	ICP/OES
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Zinc	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium, Hexavalent	INOR-93-6068	modified from EPA 3060 and EPA 7196	SPECTROPHOTOMETER
Cyanide	INOR-93-6052	MOE CN-3015 & E 3009 A;SM 4500 CN	TECHNICON AUTO ANALYZER
Mercury	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	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	GICP/OES
pH, 2:1 CaCl2 Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	PH METER



5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2 Ph: 905,712.5100 Fax: 905.712.5122 webearth.agatlabs.com

Laboratory Use Only
Work Order #: 207567508

Coole	r Quantity:	10an	1	# 74
Arriva	Temperatures:	3:2	2/	134
Custo Notes	dy Seal Intact:	□Yes	□No	□N/A
Turns	round Time	/TATI Dogui	luad.	
	around inne	e (TAT) Requi	irea:	
	ar TAT	5 to 7 Busin		i
Regul		5 to 7 Busin		i
Regul	ar TAT	5 to 7 Busin		: Next Busines Day
Regul	TAT (Rush Surcharge 3 Business Days	5 to 7 Business	ness Days	Next Busines Day

analysis. es □ No [	S S S S S S S S S	Table	Litered - Metals, Hg. CrVI	Cer	epport (rtiffication of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the continue of the co		Qualitic	IKN	Re	gula sh Ta	AT (Rus 3 Busin Days OR Da Plea TAT is	iness ate Re	harges in the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control	Apply)  2 Da d (Rus	Business ays h Surcha notificat cends an	s arges Mag	Next Busine Day / Apply):
		Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indicate One Indic	IStorm	Cer	Hydrides Yes  O. Rem (sepilar)  O. Rem (sepilar)	indicate  Guidelinte of An	e on alysis	IKN	Re	gula sh Ta	AT (Rus 3 Busin Days OR Da Plea TAT is	iness ate Re	harges in the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control	Apply)  2 Da d (Rus	Business ays h Surcha notificat cends an	s arges Mag	Next Busine Day / Apply): // Apply: // Apply: // Apply: // Apply: // Apply:
		☑Ind/Com  ☐Res/Park ☐Agriculture  Soil Texture (Check one) ☑Coarse ☐Fine ☐ Is this submission for a  Record of Site Condition? ☐ Yes ☑ No  Sample Matrix Legend B Biota GW Ground Water O Oil P Paint S Soil	IStorm	Cer	Hydrides Yes  O. Rem (sepilar)  O. Rem (sepilar)	indicate  Guidelinte of An	e on alysis	IKN	Rus	3h T/	AT (Rus 3 Busin Days OR Da OR Da TAT is	iness ate Re	quired rovide sive of	Apply)  2 Date of (Ruse prior f week	Business ays h Surcha notificat cends an	s arges Mar tion for ru d statuto	Next Busine Day / Apply): // Apply: // Apply: // Apply: // Apply: // Apply:
		□ Agriculture  Soil Texture (Check One) □ Coarse □ Fine □ Is this submission for a  Record of Site Condition? □ Yes □ No  Sample Matrix Legend B Biota GW Ground Water 0 Oil P Paint S Soil	IIISA	Cer	epport ( rtifical Yes  O. Reg (Sep)	indicate  Guidelin te of An	e on alysis	IKN		= 3 1 1	3 Busin Days OR Da OR Da Plea	iness ate Re ase p exclu	quired rovide sive o	2 Da d (Rus	h Surche notificat cends an	arges Mag tion for ru ad statuto	Day Apply): Ish TAT ry holidays
			CA	Cer	Hydrides Yes	indicate Guidelin te of An	e on alysis	IKN		*	Oays  OR Da  Plea  TAT is	ate Re	rovide sive o	Dad (Rus	h Surche notificat cends an	arges Mag tion for ru ad statuto	Day Apply): Ish TAT ry holidays
		Is this submission for a Record of Site Condition?  Yes No  Sample Matrix Legend B Biota GW Ground Water O Oil P Paint S Soil	CA	Cer	Hydrides Yes	Indicate Guidelin te of An	e on alysis	TKN		*	Oays  OR Da  Plea  TAT is	ate Re	rovide sive o	Dad (Rus	h Surche notificat cends an	arges Mag tion for ru ad statuto	Day Apply): Ish TAT ry holidays
		Is this submission for a  Record of Site Condition?  Yes No  Sample Matrix Legend B Biota GW Ground Water O Oil P Paint S Soil	CIVI	Cer	Yes O. Reg (sapinder, Hydrides)	Guldelin te of An	e on alysis	TKN		*	<b>Plea</b> TAT is	ase p exclu	rovide sive o	e prior f week	notificat cends an	tion for ru	sh TAT ry holidays
		Yes No  Sample Matrix Legend B Biota GW Ground Water O Oil P Paint S Soil		Cer	Yes O. Reg (sapinder, Hydrides)	te of An	No	TKN			TAT is	exclu	sive o	f week	cends an	d statuto	ry holidays
		Sample Matrix Legend B Biota GW Ground Water O Oil P Paint S Soil		F	Yes O. Reg	153	No	TKN						ls, ple			
		Sample Matrix Legend B Biota GW Ground Water O Oil P Paint S Soil		F	Hydrides) 0. O. Bear Incl. Hydrides)	153		TKN		or 'S	ame (	Day' a	nalys	□PCBs	ase con	tact you	AGAT CPM
		B Biota GW Ground Water O Oil P Paint S Soil			Hydrides) Incl. Hydrides)			TKN	ТНМ					)P □PCBs			
		B Biota GW Ground Water O Oil P Paint S Soil			Hyd Incl.	ICN		TKN	THM					P □			
es□ No [		GW Ground Water O Oil P Paint S Soil	ed - Metals, Hg,		Hyd Incl.	CN R		TKN	THM					<u>P</u>		11	
	-   S	P Paint S Soil	ed - Metals,		als (Incl.	S CN		돌	唐日					l e			
	_   s	<b>S</b> Soil	ed - Me		5 × ×			0 1 -						s □ B(a)P			
	- s		8		s (e	후 다		E L	O BITEX		-1	1	esticides	ABN			
	11	SD Sediment	5	anic	Metak 153 N	ㅁ읝		Om Meta				]	Pirch estic	2		1 1	
		SW Surface Water	<u>#</u>	Inorganics	☐ 153 Metais (excletais ☐ 153 Metais (	S _N □	Scan	on/custo	000				J e	100		11	
		Surface Water	<u>=</u>	Pu	Meta	☐ B-HWS ☐ EC ☐ F ☐ SAR	als S			-74		1	Hori,	§	Use	1.4	
	Sample Matrix		Y/N	1 8	☐ All Metals ☐ 15 ☐ Hydride Metals ☐	ORPs: □B-H □Cr ⁶⁺ □Ec □pH □SAR	Full Metals	Nutrients: TP NH, DNO. NO. NO. NO.	Volatiles:	PHCs F1.	ABNS	PAHs PCBc: Cl Total	Organochlorine Pesticides	TCLP: \$\tag{\text{M&I}}\$ \$\text{VOCs}\$ \$\text{DABNs}\$	Sewer Us		
	S	HOLD						1			+		+	+	07	1	+++
	S										1	+	-			+	
	S			-						-	-	+	+			+	+++
	S			1				-		-	+	+	+	-		++	
-	S			1			-	-		-	-	+	+	-			
_	S			-				0		-	-	-	+			+	
				-	-		-	-		-	-	-	+			1	+
							-	-		-	+	+	+		_	++	
			_	-			-		7	-	-	+	+			++	
				-				-									
		V		h									1				
	S																
		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	S S S	S S S	S S S	S S S	S S S	S S S	S S S S	S S S S S S S S S S S S S S S S S S S	S S S S S	S S S S S S S S S S S S S S S S S S S	S S S S S S S S S S S S S S S S S S S	S S S S S S S S S S S S S S S S S S S	S S S S S S S S S S S S S S S S S S S	S S S S S S S S S S S S S S S S S S S	S S S S S S S S S S S S S S S S S S S

Samples Received By (Print Name and Sign):



5835 Coopers Avenue Ph: 905.712.5100 Fax: 905.712.5122

**Laboratory Use Only** Mississauga, Ontario L4Z 1Y2 Work Order #: webearth.agatlabs.com

Report Inform	nation:					Regulatory Requirements:			_	d by huma		me	nt		ustody	. 6	al lest		4	2.1	110	0,	1 1.8
Company:	Wood					(Please check all applicable boxes)			ОБин	itory ito	quii	J111C		1	otes:	Sea	al irita	act:	L	]Yes		□No	□N/A
Contact:	Alessandro Pellerito					Regulation 153/04 Sewe	r Use	1	П	Regulation	558												
Address:	50 Vogell Road, Units	s 3 and 4				Table 2					Tu	rnaı	oui	nd '	Tim	e (T	AT)	Requi	red:				
	Richmond Hill					Indicate One ☐Sar	itary		П	CCME				Re	gula	r TA	<b>Λ</b> Τ		171	E +0	7 Busin	nen Des	
Phone:	6479826220	Fax:				☐Res/Park ☐Sto	m		ПЕ	Prov. Wate	er Oua	lity			sh T				_		/ Dusin	ass Day	/S
Reports to be sent to: 1. Email:	a.pellerito@woodplc.	com				Soil Texture (Check One) Region	te One	_		Objectives Other					_ 3		sines		_		ısiness	_	Next Busines
2. Email:	shami.malla@woodpl	c.com				☐Coarse ☐MISA	ile One		-	Indicate	One	-			Ц,	ays			ired (	Days		∐ ges Ma	Day
Project Inform						Is this submission for a				Guldell					_								
Project:	TP115086				_	Record of Site Condition?		Cer	tifica	te of A	nalys	ls			*						tificatio		ish TAT ry holidays
Site Location:	SP47 Arterial Road	- t				☐ Yes   ☑ No			Yes		] N	0											
Sampled By:	Mohammad Safarpan 305848				_		-	Til .			_				FOR S	ame	Day	' ana	lysis,	pleas	e conta	ct your	AGAT CPM
AGAT Quote #:	Please note: If quotation nu	mber is not provided, client	will be hilled full price	for analysis		Sample Matrix Legend	=		O. Reg	153	-									DPCBs			
			min de dined fan prie	ror analysis.	=	B Biota	5		s) Irides														
Invoice Inform			Bill To Same:	Yes □ No	o 🗆 📗	GW Ground Water	S, T		Hydrides) (Incl. Hydride	_			2	THM						□ B(a)P			
Company:	Wood					O Oil	eta			S 日 学		8	OTKN							<u>~</u>			
Contact:	Shami Malla					P Paint S Soil	Σ	8	als (e) Meta			Meta	ONH, C	Овтех	1			☐ Aroclors	Pesticides	ABNS			
Address:	50 Vogell Road, Units				_	SD Sediment	erec	gani	Meta 153		1	E O	E S					Aro	esti	ខ			
Email:	GTA East@woodplc	.com			-	SW Surface Water	Field Filtered - Metals, Hg, CrVI	and Inorganics	s   153	B-HWS	s Scan	n/Cust	No TP (	□ voc	F4			otal		Nocs □			
Sampl	e Identification	Date Sampled	Time Sampled	# of Containers	Samp	-	Y/N	Metals a	☐ All Metals ☐ 153 Metals (excl	ORPs: □B-HWS □Cre•□EC □F	Full Metals	Regulation/Custom Metals	Nutrients:	Volatiles:	PHCs F1 -	ABNS	PAHs	PCBs: Total	Organochlorine	TCLP:   M&I	Sewer Ose		
BH A27 SS3	-	22 Jan 2020	12:50	1	S	MOCA				0				-	-	+	-	-	-	- 0	0		
BH A28 SS2		22 Jan 2020	1:25	1	S											+	$\dashv$		-	+			
BH A29 SS2		22 Jan 2020	1:40	1	S										-	-	-	-	-	+	-		
BH A31 SS2		22 Jan 2020	2:05	1	S							-				+	-					-	
BH A31 SS3				1	S							-			_	-			-	4	-		
DUP 2		22 Jan 2020	2.10	1	S													4					
		22 Juli 2020		1	3	V																	
				1																			
						1	8	1								1				7			
samples Relinquished By (Prin	NV a	All	Date	Tim		Samples Received By (Print Name and Sign):	1	7		-		Date		1	Tipe	En /	~	21	1	_			
Alessandro Pellerit	0 ULL Name and Sign	ecu	23 Jan	Total	pm	> May by					1	Ki	112	相	) 7	1	d				-	>	2
Dou	N		finz	4/20 "	3.0	Samples Received By 18 int Nation and Signi:		1				Date		7	Tim	n		1		Pa	ge (	_of	
amales Relinatished By (Inn	t Name and Sign):		Date	1/	-	Samples Received By (Print Name and Sign):						1											



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4
RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Alessandro Pellerito

PROJECT: TP115086.1 AGAT WORK ORDER: 20T567556

SOIL ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

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

DATE REPORTED: Nov 13, 2020

PAGES (INCLUDING COVER): 17 VERSION*: 1

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

<u>*Notes</u>

#### Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
  incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other
  third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
  services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
  merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
  contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Page 1 of 17

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. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.



AGAT WORK ORDER: 20T567556

PROJECT: TP115086.1

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE:Leslie/Sheppard

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammhad Safarpanah

O. Reg. 153(511) - Metals & Ino	rganics (Soil)
---------------------------------	----------------

				• •			. ,			
DATE RECEIVED: 2020-01-24									DATE REPORTED	D: 2020-11-13
				SAMPL	E DESCRIPTION:	BH A20 SS2	BH B2 SS5	BH B5 SS4	BH B22 SS1	
					SAMPLE TYPE:	Soil	Soil	Soil	Soil	
					DATE SAMPLED:	2020-01-23	2020-01-23	2020-01-23	2020-01-23	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	890260	890263	890268	890269	
Antimony	μg/g	40	8.0	2020-02-12	2020-02-12	<0.8	<0.8	<0.8	<0.8	
Arsenic	μg/g	18	1	2020-02-12	2020-02-12	5	4	4	5	
Barium	μg/g	670	2	2020-02-12	2020-02-12	92	40	78	175	
Beryllium	μg/g	8	0.5	2020-02-12	2020-02-12	0.6	<0.5	<0.5	1.1	
Boron	μg/g	120	5	2020-02-12	2020-02-12	8	5	8	10	
Boron (Hot Water Extractable)	μg/g	2	0.10	2020-02-12	2020-02-12	0.13	0.16	0.15	0.10	
Cadmium	μg/g	1.9	0.5	2020-02-12	2020-02-12	<0.5	<0.5	<0.5	<0.5	
Chromium	μg/g	160	5	2020-02-12	2020-02-12	24	10	19	39	
Cobalt	μg/g	80	0.5	2020-02-12	2020-02-12	10.3	5.4	10.3	16.6	
Copper	μg/g	230	1	2020-02-12	2020-02-12	22	20	21	28	
Lead	μg/g	120	1	2020-02-12	2020-02-12	11	8	9	16	
Molybdenum	μg/g	40	0.5	2020-02-12	2020-02-12	<0.5	<0.5	<0.5	<0.5	
Nickel	μg/g	270	1	2020-02-12	2020-02-12	21	10	20	34	
Selenium	μg/g	5.5	0.4	2020-02-12	2020-02-12	<0.4	<0.4	<0.4	<0.4	
Silver	μg/g	40	0.2	2020-02-12	2020-02-12	<0.2	<0.2	<0.2	<0.2	
Thallium	μg/g	3.3	0.4	2020-02-12	2020-02-12	<0.4	<0.4	<0.4	<0.4	
Uranium	μg/g	33	0.5	2020-02-12	2020-02-12	0.5	<0.5	0.5	0.6	
Vanadium	μg/g	86	1	2020-02-12	2020-02-12	32	16	25	47	
Zinc	μg/g	340	5	2020-02-12	2020-02-12	55	34	51	83	
Chromium, Hexavalent	μg/g	8	0.2	2020-02-12	2020-02-12	<0.2	<0.2	<0.2	<0.2	
Cyanide	μg/g	0.051	0.040	2020-02-10	2020-02-10	<0.040	< 0.040	< 0.040	<0.040	
Mercury	μg/g	3.9	0.10	2020-02-12	2020-02-12	<0.10	<0.10	<0.10	<0.10	
Electrical Conductivity	mS/cm	1.4	0.005	2020-02-12	2020-02-12	1.87	0.166	0.164	0.918	
Sodium Adsorption Ratio	NA	12	NA	2020-02-12	2020-02-12	6.21	0.250	0.163	1.24	
pH, 2:1 CaCl2 Extraction	pH Units	5.0-9.0	NA	2020-02-12	2020-02-12	7.45	7.93	7.84	7.60	





AGAT WORK ORDER: 20T567556

PROJECT: TP115086.1

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:Leslie/Sheppard

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammhad Safarpanah

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

DATE RECEIVED: 2020-01-24 DATE REPORTED: 2020-11-13

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

EC was 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. SAR is a calculated

parameter

890260-890269

Analysis performed at AGAT Toronto (unless marked by *)

8 CHARTERS OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CHAMST OF CH



AGAT WORK ORDER: 20T567556

PROJECT: TP115086.1

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE:Leslie/Sheppard

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammhad Safarpanah

					VOCs (S	oil)	
DATE RECEIVED: 2020-01-24							DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH B2 SS1	
					SAMPLE TYPE:	Soil	
					DATE SAMPLED:	2020-01-23	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	890262	
Dichlorodifluoromethane	μg/g	16	0.05	2020-02-12	2020-02-12	< 0.05	
Vinyl Chloride	ug/g	0.032	0.02	2020-02-12	2020-02-12	< 0.02	
Bromomethane	ug/g	0.05	0.05	2020-02-12	2020-02-12	< 0.05	
Trichlorofluoromethane	ug/g	4	0.05	2020-02-12	2020-02-12	< 0.05	
Acetone	ug/g	16	0.50	2020-02-12	2020-02-12	< 0.50	
1,1-Dichloroethylene	ug/g	0.064	0.05	2020-02-12	2020-02-12	< 0.05	
Methylene Chloride	ug/g	1.6	0.05	2020-02-12	2020-02-12	< 0.05	
Trans- 1,2-Dichloroethylene	ug/g	1.3	0.05	2020-02-12	2020-02-12	< 0.05	
Methyl tert-butyl Ether	ug/g	1.6	0.05	2020-02-12	2020-02-12	< 0.05	
1,1-Dichloroethane	ug/g	0.47	0.02	2020-02-12	2020-02-12	< 0.02	
Methyl Ethyl Ketone	ug/g	70	0.50	2020-02-12	2020-02-12	< 0.50	
Cis- 1,2-Dichloroethylene	ug/g	1.9	0.02	2020-02-12	2020-02-12	< 0.02	
Chloroform	ug/g	0.47	0.04	2020-02-12	2020-02-12	< 0.04	
1,2-Dichloroethane	ug/g	0.05	0.03	2020-02-12	2020-02-12	< 0.03	
1,1,1-Trichloroethane	ug/g	6.1	0.05	2020-02-12	2020-02-12	< 0.05	
Carbon Tetrachloride	ug/g	0.21	0.05	2020-02-12	2020-02-12	< 0.05	
Benzene	ug/g	0.32	0.02	2020-02-12	2020-02-12	< 0.02	
1,2-Dichloropropane	ug/g	0.16	0.03	2020-02-12	2020-02-12	< 0.03	
Trichloroethylene	ug/g	0.55	0.03	2020-02-12	2020-02-12	< 0.03	
Bromodichloromethane	ug/g	1.5	0.05	2020-02-12	2020-02-12	< 0.05	
Methyl Isobutyl Ketone	ug/g	31	0.50	2020-02-12	2020-02-12	< 0.50	
1,1,2-Trichloroethane	ug/g	0.05	0.04	2020-02-12	2020-02-12	< 0.04	
Toluene	ug/g	6.4	0.05	2020-02-12	2020-02-12	< 0.05	
Dibromochloromethane	ug/g	2.3	0.05	2020-02-12	2020-02-12	< 0.05	
Ethylene Dibromide	ug/g	0.05	0.04	2020-02-12	2020-02-12	< 0.04	
Tetrachloroethylene	ug/g	1.9	0.05	2020-02-12	2020-02-12	< 0.05	
1,1,1,2-Tetrachloroethane	ug/g	0.087	0.04	2020-02-12	2020-02-12	< 0.04	
Chlorobenzene	ug/g	2.4	0.05	2020-02-12	2020-02-12	< 0.05	
Ethylbenzene	ug/g	1.1	0.05	2020-02-12	2020-02-12	< 0.05	
m & p-Xylene	ug/g		0.05	2020-02-12	2020-02-12	< 0.05	





AGAT WORK ORDER: 20T567556

PROJECT: TP115086.1

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:Leslie/Sheppard

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammhad Safarpanah

					VOCs (S	oil)	
DATE RECEIVED: 2020-01-24							DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH B2 SS1	
					SAMPLE TYPE:	Soil	
				I	DATE SAMPLED:	2020-01-23	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	890262	
Bromoform	ug/g	0.61	0.05	2020-02-12	2020-02-12	< 0.05	
Styrene	ug/g	34	0.05	2020-02-12	2020-02-12	< 0.05	
1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05	2020-02-12	2020-02-12	< 0.05	
o-Xylene	ug/g		0.05	2020-02-12	2020-02-12	< 0.05	
1,3-Dichlorobenzene	ug/g	9.6	0.05	2020-02-12	2020-02-12	< 0.05	
1,4-Dichlorobenzene	ug/g	0.2	0.05	2020-02-12	2020-02-12	< 0.05	
1,2-Dichlorobenzene	ug/g	1.2	0.05	2020-02-12	2020-02-12	< 0.05	
Xylene Mixture	ug/g	26	0.05	2020-02-12	2020-02-12	< 0.05	
1,3-Dichloropropene (Cis + Trans)	μg/g	0.059	0.04	2020-02-12	2020-02-12	< 0.04	
n-Hexane	μg/g	46	0.05	2020-02-12	2020-02-12	< 0.05	
Surrogate	Unit	Acceptab	le Limits				
Toluene-d8	% Recovery	50-1	40	2020-02-12	2020-02-12	98	
4-Bromofluorobenzene	% Recovery	50-1	40	2020-02-12	2020-02-12	90	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

890262 The soil sample was prepared in the lab using the Methanol extraction technique. The sample was not field preserved with methanol and an Encore was not provided for analysis.

The sample was analyzed 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.

Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene + o-Xylene.

1,3-Dichloropropene total is a calculated parameter. The calculated value is the sum of Cis-1,3-Dichloropropene and Trans-1,3-Dichloropropene.

Analysis performed at AGAT Toronto (unless marked by *)





AGAT WORK ORDER: 20T567556

PROJECT: TP115086.1

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE:Leslie/Sheppard

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammhad Safarpanah

O/ WIT EIN O OTTE. Econic/Ortop	para						O/ (WII LED D	1.Monamina Garapanan
				O. Reg. 15	53(511) - OC	Pesticides	(Soil)	
DATE RECEIVED: 2020-01-24								DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH B2 SS1	BH B5 SS1	
					SAMPLE TYPE:	Soil	Soil	
					DATE SAMPLED:	2020-01-23	2020-01-23	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	890262	890267	
Hexachloroethane	μg/g	0.21	0.01	2020-02-07	2020-02-11	<0.01	<0.01	
Gamma-Hexachlorocyclohexane	μg/g	0.056	0.005	2020-02-07	2020-02-11	<0.005	<0.005	
Heptachlor	μg/g	0.19	0.005	2020-02-07	2020-02-11	< 0.005	< 0.005	
Aldrin	μg/g	0.088	0.005	2020-02-07	2020-02-11	< 0.005	<0.005	
Heptachlor Epoxide	μg/g	0.05	0.005	2020-02-07	2020-02-11	< 0.005	< 0.005	
Endosulfan	μg/g	0.3	0.005	2020-02-07	2020-02-11	<0.005	<0.005	
Chlordane	μg/g	0.05	0.007	2020-02-07	2020-02-11	<0.007	<0.007	
DDE	μg/g	0.52	0.007	2020-02-07	2020-02-11	< 0.007	< 0.007	
DDD	μg/g	4.6	0.007	2020-02-07	2020-02-11	< 0.007	< 0.007	
DDT	μg/g	1.4	0.007	2020-02-07	2020-02-11	< 0.007	< 0.007	
Dieldrin	μg/g	0.088	0.005	2020-02-07	2020-02-11	< 0.005	< 0.005	
Endrin	μg/g	0.04	0.005	2020-02-07	2020-02-11	<0.005	< 0.005	
Methoxychlor	μg/g	1.6	0.005	2020-02-07	2020-02-11	< 0.005	< 0.005	
Hexachlorobenzene	μg/g	0.66	0.005	2020-02-07	2020-02-11	< 0.005	< 0.005	
Hexachlorobutadiene	μg/g	0.031	0.01	2020-02-07	2020-02-11	<0.01	<0.01	
Moisture Content	%		0.1	2020-02-07	2020-02-11	16.8	16.3	
Surrogate	Unit	Acceptab	le Limits					
TCMX	%	50-1	140	2020-02-07	2020-02-11	91	91	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

2020-02-07

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

98

95

2020-02-11

890262-890267 Results are based on the dry weight of the soil.

Decachlorobiphenyl

DDT total is a calculated parameter. The calculated value is the sum of op'DDT and pp'DDT. DDD total is a calculated parameter. The calculated value is the sum of op'DDD and pp'DDD. DDE total is a calculated parameter. The calculated value is the sum of op'DDE and pp'DDE.

60-130

Endosulfan total is a calculated parameter. The calculated value is the sum of Endosulfan I and Endosulfan II.

Chlordane total is a calculated parameter. The calculated value is the sum of Alpha-Chlordane and Gamma-Chlordane.

Analysis performed at AGAT Toronto (unless marked by *)





AGAT WORK ORDER: 20T567556

PROJECT: TP115086.1

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:Leslie/Sheppard

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammhad Safarpanah

			PHC	Cs F1 - F4 (-B	TEX) (Soil)	
DATE RECEIVED: 2020-01-24						DATE REPORTED: 2020-11-13
			SAMP	LE DESCRIPTION:	BH B2 SS1	
				SAMPLE TYPE:	Soil	
				DATE SAMPLED:	2020-01-23	
Parameter	Unit	G/S RE	L Date Prepared	Date Analyzed	890262	
F1 (C6 to C10)	μg/g	55 5	2020-02-12	2020-02-12	<5	
F1 (C6 to C10) minus BTEX	μg/g	55 5	2020-02-12	2020-02-12	<5	
F2 (C10 to C16)	μg/g	230 1	2020-02-07	2020-02-10	<10	
F3 (C16 to C34)	μg/g	1700 5	2020-02-07	2020-02-10	<50	
F4 (C34 to C50)	μg/g	3300 5	2020-02-07	2020-02-10	<50	
Gravimetric Heavy Hydrocarbons	μg/g	3300 5	)		NA	
Moisture Content	%	0.	1 2020-02-06	2020-02-06	16.8	
Surrogate	Unit	Acceptable Lim	its			
Terphenyl	%	60-140	2020-02-07	2020-02-10	118	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

890262 The soil sample was prepared in the lab using the Methanol extraction technique. The sample was not field preserved with methanol and an Encore was not provided for analysis.

Results are based on sample dry weight.

The C6-C10 fraction is calculated using toluene response factor.

C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX.

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 contribution.

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.

Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Analysis performed at AGAT Toronto (unless marked by *)



### **Exceedance Summary**

AGAT WORK ORDER: 20T567556

PROJECT: TP115086.1

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

ATTENTION TO: Alessandro Pellerito

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
890260	BH A20 SS2	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity	mS/cm	1.4	1.87



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:Leslie/Sheppard

PROJECT: TP115086.1

ATTENTION TO: Alessandro Pellerito SAMPLED BY: Mohammhad Safarpanah

AGAT WORK ORDER: 20T567556

										1.1010114					
Soil Analysis															
RPT Date: Nov 13, 2020			DUPLICATE		REFEREI		NCE MATERIAL METHOI		METHOD	D BLANK SPIKE		MATRIX SPIKE		KE	
PARAMETER	Batch Samp	Sample		Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
		lu						Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inorganics (Soil)						,									
Antimony	918268		<0.8	<0.8	NA	< 0.8	135%	70%	130%	88%	80%	120%	89%	70%	130%
Arsenic	918268		7	7	1.4%	< 1	118%	70%	130%	90%	80%	120%	93%	70%	130%
Barium	918268		62	63	1.8%	< 2	112%	70%	130%	94%	80%	120%	83%	70%	130%
Beryllium	918268		1.0	1.0	NA	< 0.5	84%	70%	130%	107%	80%	120%	91%	70%	130%
Boron	918268		20	21	NA	< 5	80%	70%	130%	100%	80%	120%	74%	70%	130%
Boron (Hot Water Extractable)	918268		0.17	0.16	NA	< 0.10	96%	60%	140%	93%	70%	130%	99%	60%	140%
Cadmium	918268		<0.5	<0.5	NA	< 0.5	111%	70%	130%	96%	80%	120%	95%	70%	130%
Chromium	918268		23	23	NA	< 5	96%	70%	130%	111%	80%	120%	85%	70%	130%
Cobalt	918268		16.5	16.7	0.9%	< 0.5	87%	70%	130%	85%	80%	120%	81%	70%	130%
Copper	918268		9	10	1.8%	< 1	95%	70%	130%	92%	80%	120%	79%	70%	130%
Lead	918268		15	16	2.8%	< 1	107%	70%	130%	85%	80%	120%	89%	70%	130%
Molybdenum	918268		<0.5	< 0.5	NA	< 0.5	105%	70%	130%	97%	80%	120%	91%	70%	130%
Nickel	918268		30	31	0.5%	< 1	89%	70%	130%	87%	80%	120%	79%	70%	130%
Selenium	918268		< 0.4	< 0.4	NA	< 0.4	129%	70%	130%	96%	80%	120%	95%	70%	130%
Silver	918268		<0.2	<0.2	NA	< 0.2	98%	70%	130%	92%	80%	120%	89%	70%	130%
Thallium	918268		<0.4	<0.4	NA	< 0.4	95%	70%	130%	93%	80%	120%	90%	70%	130%
Uranium	918268		<0.5	< 0.5	NA	< 0.5	100%	70%	130%	91%	80%	120%	92%	70%	130%
Vanadium	918268		28	28	1.0%	< 1	91%	70%	130%	83%	80%	120%	74%	70%	130%
Zinc	918268		73	73	0.5%	< 5	113%	70%	130%	98%	80%	120%	89%	70%	130%
Chromium, Hexavalent	921217		< 0.2	< 0.2	0.0%	< 0.2	87%	70%	130%	88%	80%	120%	92%	70%	130%
Cyanide	915854		<0.040	<0.040	NA	< 0.040	104%	70%	130%	98%	80%	120%	108%	70%	130%
Mercury	918268		<0.10	<0.10	NA	< 0.10	93%	70%	130%	83%	80%	120%	83%	70%	130%
Electrical Conductivity	916749		1.27	1.28	0.9%	< 0.005	100%	90%	110%						
Sodium Adsorption Ratio	916749		6.27	6.26	0.0%	NA									
pH, 2:1 CaCl2 Extraction	916689		7.49	7.55	0.8%	NA	100%	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

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

Antimony: For a multi-element scan for lab control standards and matrix spikes, up to 10% of analytes may exceed the quoted limits by up to 10% absolute and it is considered acceptable.





# **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1 SAMPLING SITE:Leslie/Sheppard

ATTENTION TO: Alessandro Pellerito SAMPLED BY: Mohammhad Safarpanah

AGAT WORK ORDER: 20T567556

SAMPLING SITE.Leslie/Sitep	- uiu		Trac	e Org	gani	cs Ar				T.IVIOTIAI		u Jai	ai pailail		
RPT Date: Nov 13, 2020				UPLICATI		T T	REFEREN		TEDIAI	METHOD	BI ANK	, SDIKE	МАТ	RIX SPI	KE
RFT Date. NOV 13, 2020			L	DOPLICATI	=	Method	KEFEKEI		ptable	WETHOD		ptable	IVIA		ptable
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Blank	Measured Value	Lim	nits	Recovery	Lir	upper	Recovery		Upper
O. Reg. 153(511) - OC Pesticides	(Soil)							Lower	Оррсі		Lower	Оррсі		LOWCI	Оррсі
Hexachloroethane	901570		< 0.01	< 0.01	NA	< 0.01	94%	50%	140%	92%	50%	140%	99%	50%	140%
Gamma-Hexachlorocyclohexane	901570		< 0.005	< 0.005	NA	< 0.005	109%		140%	98%	50%	140%	94%	50%	140%
Heptachlor	901570		< 0.005	< 0.005	NA	< 0.005	105%		140%	94%	50%	140%	102%	50%	140%
Aldrin	901570		< 0.005	< 0.005	NA	< 0.005	105%		140%	103%	50%	140%	103%	50%	140%
Heptachlor Epoxide	901570		< 0.005	< 0.005	NA	< 0.005	102%		140%	106%	50%	140%	102%	50%	140%
Endosulfan	901570		< 0.005	< 0.005	NA	< 0.005	106%	50%	140%	103%	50%	140%	105%	50%	140%
Chlordane	901570		< 0.007	< 0.007	NA	< 0.007	108%	50%	140%	108%	50%	140%	103%	50%	140%
DDE	901570		< 0.007	< 0.007	NA	< 0.007	106%	50%	140%	102%	50%	140%	106%	50%	140%
DDD	901570		< 0.007	< 0.007	NA	< 0.007	107%	50%	140%	104%	50%	140%	108%	50%	140%
DDT	901570		< 0.007	< 0.007	NA	< 0.007	102%	50%	140%	98%	50%	140%	102%	50%	140%
Dieldrin	901570		< 0.005	< 0.005	NA	< 0.005	101%	50%	140%	107%	50%	140%	105%	50%	140%
Endrin	901570		< 0.005	< 0.005	NA	< 0.005	106%	50%	140%	106%	50%	140%	104%	50%	140%
Methoxychlor	901570		< 0.005	< 0.005	NA	< 0.005	109%	50%	140%	99%	50%	140%	103%	50%	140%
Hexachlorobenzene	901570		< 0.005	< 0.005	NA	< 0.005	101%	50%	140%	96%	50%	140%	98%	50%	140%
Hexachlorobutadiene	901570		< 0.01	< 0.01	NA	< 0.01	101%	50%	140%	97%	50%	140%	107%	50%	140%
VOCs (Soil)															
Dichlorodifluoromethane	922949		< 0.05	< 0.05	NA	< 0.05	110%	50%	140%	102%	50%	140%	94%	50%	140%
Vinyl Chloride	922949		< 0.02	< 0.02	NA	< 0.02	82%	50%	140%	92%	50%	140%	103%	50%	140%
Bromomethane	922949		< 0.05	< 0.05	NA	< 0.05	102%	50%	140%	117%	50%	140%	97%	50%	140%
Trichlorofluoromethane	922949		< 0.05	< 0.05	NA	< 0.05	82%	50%	140%	105%	50%	140%	109%	50%	140%
Acetone	922949		< 0.50	< 0.50	NA	< 0.50	107%	50%	140%	117%	50%	140%	85%	50%	140%
1,1-Dichloroethylene	922949		< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	104%	60%	130%	81%	50%	140%
Methylene Chloride	922949		< 0.05	< 0.05	NA	< 0.05	114%	50%	140%	97%	60%	130%	120%	50%	140%
Trans- 1,2-Dichloroethylene	922949		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	92%	60%	130%	81%	50%	140%
Methyl tert-butyl Ether	922949		< 0.05	< 0.05	NA	< 0.05	79%	50%	140%	80%	60%	130%	87%	50%	140%
1,1-Dichloroethane	922949		< 0.02	< 0.02	NA	< 0.02	116%	50%	140%	98%	60%	130%	95%	50%	140%
Methyl Ethyl Ketone	922949		< 0.50	< 0.50	NA	< 0.50	106%	50%	140%	111%	50%	140%	72%	50%	140%
Cis- 1,2-Dichloroethylene	922949		< 0.02	< 0.02	NA	< 0.02	88%	50%	140%	104%	60%	130%	76%	50%	140%
Chloroform	922949		< 0.04	< 0.04	NA	< 0.04	93%	50%	140%	104%	60%	130%	75%	50%	140%
1,2-Dichloroethane	922949		< 0.03	< 0.03	NA	< 0.03	98%	50%	140%	107%	60%	130%	87%	50%	140%
1,1,1-Trichloroethane	922949		< 0.05	< 0.05	NA	< 0.05	100%	50%	140%	82%	60%	130%	106%	50%	140%
Carbon Tetrachloride	922949		< 0.05	< 0.05	NA	< 0.05	101%		140%	83%	60%	130%	105%	50%	140%
Benzene	922949		< 0.02	< 0.02	NA	< 0.02	94%	50%	140%	107%	60%	130%	84%	50%	140%
1,2-Dichloropropane	922949		< 0.03	< 0.03	NA	< 0.03	96%	50%	140%	105%	60%	130%	76%	50%	140%
Trichloroethylene	922949		< 0.03	< 0.03	NA	< 0.03	87%		140%	103%		130%	84%	50%	
Bromodichloromethane	922949		< 0.05	< 0.05	NA	< 0.05	82%	50%	140%	91%	60%	130%	119%	50%	140%
Methyl Isobutyl Ketone	922949		< 0.50	< 0.50	NA	< 0.50	103%	50%	140%	116%	50%	140%	85%	50%	140%
1,1,2-Trichloroethane	922949		< 0.04	< 0.04	NA	< 0.04	99%	50%	140%	105%	60%	130%	78%	50%	140%
Toluene	922949		< 0.05	< 0.05	NA	< 0.05	97%	50%	140%	106%	60%	130%	82%	50%	140%

AGAT QUALITY ASSURANCE REPORT (V1)

Page 10 of 17

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. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.



# **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:Leslie/Sheppard

PROJECT: TP115086.1

AGAT WORK ORDER: 20T567556
ATTENTION TO: Alessandro Pellerito
SAMPLED BY:Mohammhad Safarpanah

SAMPLING SITE. Lestie/Sitepp	Jaiu						•	SAIVIPI	-ED B	r.ivional	111111116	iu Sala	arpanan		
		Ггасе	Orga	anics	Ana	alysis	(Coı	ntin	ued	)					
RPT Date: Nov 13, 2020				DUPLICAT	E		REFERE	NCE MA	TERIAL	METHOD	BLAN	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Value		ptable nits	Recovery	1 1:	ptable nits	Recovery		ptable nits
		la	·	·			value	Lower	Upper		Lower	Upper	,	Lower	Upper
Dibromochloromethane	922949		< 0.05	< 0.05	NA	< 0.05	76%	50%	140%	81%	60%	130%	107%	50%	140%
Ethylene Dibromide	922949		< 0.04	< 0.04	NA	< 0.04	91%	50%	140%	98%	60%	130%	104%	50%	140%
Tetrachloroethylene	922949		< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	103%	60%	130%	73%	50%	140%
1,1,1,2-Tetrachloroethane	922949		< 0.04	< 0.04	NA	< 0.04	76%	50%	140%	83%	60%	130%	119%	50%	140%
Chlorobenzene	922949		< 0.05	< 0.05	NA	< 0.05	97%	50%	140%	106%	60%	130%	80%	50%	140%
Ethylbenzene	922949		< 0.05	< 0.05	NA	< 0.05	90%	50%	140%	100%	60%	130%	75%	50%	140%
m & p-Xylene	922949		< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	101%	60%	130%	79%	50%	140%
Bromoform	922949		< 0.05	< 0.05	NA	< 0.05	74%	50%	140%	79%	60%	130%	106%	50%	140%
Styrene	922949		< 0.05	< 0.05	NA	< 0.05	83%	50%	140%	90%	60%	130%	108%	50%	140%
1,1,2,2-Tetrachloroethane	922949		< 0.05	< 0.05	NA	< 0.05	110%	50%	140%	113%	60%	130%	118%	50%	140%
o-Xylene	922949		< 0.05	< 0.05	NA	< 0.05	92%	50%	140%	103%	60%	130%	79%	50%	140%
1,3-Dichlorobenzene	922949		< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	101%	60%	130%	72%	50%	140%
1,4-Dichlorobenzene	922949		< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	103%	60%	130%	79%	50%	140%
1,2-Dichlorobenzene	922949		< 0.05	< 0.05	NA	< 0.05	94%	50%	140%	100%	60%	130%	76%	50%	140%
1,3-Dichloropropene (Cis + Trans)	922949		< 0.04	< 0.04	NA	< 0.04	103%	50%	140%	76%	60%	130%	107%	50%	140%
n-Hexane	922949		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	102%	60%	130%	72%	50%	140%
PHCs F1 - F4 (-BTEX) (Soil)															
F1 (C6 to C10)	928130		< 5	< 5	NA	< 5	100%	60%	130%	102%	85%	115%	90%	70%	130%
F2 (C10 to C16)	918607		< 10	< 10	NA	< 10	113%	60%	130%	120%	80%	120%	77%	70%	130%
F3 (C16 to C34)	918607		< 50	< 50	NA	< 50	108%	60%	130%	117%	80%	120%	75%	70%	130%
F4 (C34 to C50)	918607		< 50	< 50	NA	< 50	88%	60%	130%	105%	80%	120%	107%	70%	130%

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:

Jung



#### **QA** Violation

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T567556
ATTENTION TO: Alessandro Pellerito

RPT Date: Nov 13, 2020			REFEREN	ICE MAT	ERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPII	KE
PARAMETER	Sample Id	Sample Description	Measured	Accep Limi	ite	Recovery	Lin	ptable nits	Recovery	Lin	ptable nits
			Value	Lower	Upper	, ,		Upper	,	Lower	Upper

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

Antimony BH A20 SS2 135% 70% 130% 88% 80% 120% 89% 70% 130%

Comments: NA signifies Not Applicable.

PROJECT: TP115086.1

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 pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

Antimony: For a multi-element scan for lab control standards and matrix spikes, up to 10% of analytes may exceed the quoted limits by up to 10% absolute and it is considered acceptable.

# Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1 SAMPLING SITE:Leslie/Sheppard AGAT WORK ORDER: 20T567556
ATTENTION TO: Alessandro Pellerito
SAMPLED BY:Mohammhad Safarpanah

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron (Hot Water Extractable)	MET-93-6104	modified from EPA 6010D and MSA PART 3, CH 21	ICP/OES
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Zinc	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium, Hexavalent	INOR-93-6068	modified from EPA 3060 and EPA 7196	SPECTROPHOTOMETER
Cyanide	INOR-93-6052	MOE CN-3015 & E 3009 A;SM 4500 CN	TECHNICON AUTO ANALYZER
Mercury	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	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	CP/OES
pH, 2:1 CaCl2 Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	PH METER

# Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1

SAMPLING SITE:Leslie/Sheppard

AGAT WORK ORDER: 20T567556

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:Mohammhad Safarpanah

6AT S.O.P 02 02 02 02 02 02 02 02 02 02	EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D	(P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS
02 02 02 02 02 02 02 02 02	EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D	(P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS
02 02 02 02 02 02 02 02 02	EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D	(P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS
02 02 02 02 02 02 02 02	EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D	(P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS
02 02 02 02 02 02 02	EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D	(P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS
02 02 02 02 02 02	EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D	(P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS
02 02 02 02 02	EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D	(P&T)GC/MS (P&T)GC/MS (P&T)GC/MS (P&T)GC/MS
02 02 02 02	EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D	(P&T)GC/MS (P&T)GC/MS (P&T)GC/MS
02 02 02	EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D	(P&T)GC/MS (P&T)GC/MS
02 02	EPA SW-846 5035 & 8260D	(P&T)GC/MS
02		` '
	EPA SW-846 5035 & 8260D	(DOT)CC/MC
02		(P&T)GC/MS
	EPA SW-846 5035 & 8260D	(P&T)GC/MS
02	EPA SW-846 5035 & 8260D	(P&T)GC/MS
02	EPA SW-846 5035 & 8260D	(P&T)GC/MS
02	EPA SW-846 5035 & 8260D	(P&T)GC/MS
02	EPA SW-846 5035 & 8260D	(P&T)GC/MS
	EPA SW-846 5035 & 8260D	(P&T)GC/MS
02	EPA SW-846 5035 & 8260D	(P&T)GC/MS
02	EPA SW-846 5035 & 8260D	(P&T)GC/MS
02	EPA SW-846 5035 & 8260D	(P&T)GC/MS
02	EPA SW-846 5035 & 8260D	(P&T)GC/MS
02	EPA SW-846 5035 & 8260D	(P&T)GC/MS
02	EPA SW-846 5035 & 8260D	(P&T)GC/MS
		GC/ECD
	·	GC/ECD
	•	GC/ECD
	·	GC/ECD
	002 002 002 002 002 002 002 002 002 002	EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8260D EPA SW-846 5035 & 8000 EPA SW-



## **Method Summary**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1

SAMPLING SITE:Leslie/Sheppard

AGAT WORK ORDER: 20T567556

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:Mohammhad Safarpanah

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
DDE	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
DDD	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
DDT	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
Dieldrin	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
Endrin	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
Methoxychlor	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
Hexachlorobenzene	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
Hexachlorobutadiene	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
TCMX	ORG-91-5112	EPA SW-846 3541,3620 & 8081	GC/ECD
Decachlorobiphenyl	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
Moisture Content		MOE E3139	BALANCE
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method, SW846 5035	P&T GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method, SW846 5035	P&T GC/FID
F2 (C10 to C16)	VOL-91-5009	CCME Tier 1 Method	GC/FID
F3 (C16 to C34)	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	CCME Tier 1 Method	GC/FID



5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2 Ph: 905.712.5100 Fax: 905.712.5122

webearth.agatlabs.com

**Laboratory Use Only** 

Cooler Quantity:

Work Order #: 20T5 67556

	act: Alessandro Pellerito ess: 50 Vogell Road, Units 3 and 4 Richmond Hill				11 15	Regulatory Requirements:		No F	Pegula	tory Red	muira	ma	nt	_ C.	stody	Cont I	ntoot	4.	-				□ N1 (A
Company:					(P	lease check all applicable boxes)	ш	140 1	сБина	tory ite	quiic	ille	"		otes:	odai i	IIIaci	ι,	□Ye	3		10	□N/A
Contact:	Alessandro Pellerito					Regulation 153/04 Sew	er Lise	1		Regulation	558		1										
Address:	50 Vogell Road, Units	3 and 4				Table 2				_	000		- 10	Tu	rnard	une	d Ti	me	(TAT	) Red	quired	1:	
	Richmond Hill					☑Ind/Com	nitary			CCME				Re	gular	TAT		i	71.5	to 7 Bi	usiness I	Davs	
Phone:	6479826220	Fax:				☐Res/Park ☐Sto	rm			rov. Wate				Ru	sh TA	T (Rust	h Surci		_			,-	
Reports to be sent to:  1. Email:	a.pellerito@woodplc.c	om			S	oil Texture (Check One) Region	ate One	_		Objectives Other	(PWQ	0)			3	Busir		]	_ 2	Busine	ess		xt Business
2. Email:	shami.malla@woodplo	c.com				☐Fine ☐MIS/			,	Indicate	One	_				ays <b>R</b> Dat	te Re	quire		ays sh Surc	harges l	Da	•
Project Inform	nation:					Is this submission for a		Re	port	Guldellr	e or	1											
Project:	TP115086.1					Record of Site Condition?		Cei	rtifica	te of An	alys	İs			*T						ation fo		
Site Location:	Leslie/Sheppard					☐ Yes			Yes		N	0										•	•
Sampled By:	Mohammhad Safarpar	nah			_  _			н					-		ror sa	me D	ay a	inalys	-	ase co	ontact y	our AGA	II CPWI
AGAT Quote #:	305848 Please note: If quotation num	PO:	uill he billed full price	o for analysis	_ s	iample Matrix Legend		-	O. Rej	153	1	7 3							□PCBs				
		iber is not provided, client v	viii de dilled foli prici	e for analysis	В		ပြီ		rides) Hydrides)										e				
Invoice Inform			Bill To Same:	Yes □ No		W Ground Water	S, H		. Hydride (Incl. Hy	>			Z.	THM					□ B(a)P				
Company:	Wood				_    0 P	690	Neta		(excl. H	S 므		als	□TKN				١	S 8	- 10				
Contact:	Shami Malla	2 - 14			_ s			S.	Metals (e 153 Meta			Met	□ NH3 □	□ BTEX			1 2	L Arociors Pesticides	□ABNs				
Address:	50 Vogell Road, Units GTA East@woodplc.				S		Itere	rgan	3 Me	3 D D	_	stom		0				P S	క్ర				
Email:	GIA East(@woodpic.	com			_ s	W Surface Water	Field Filtered - Metals, Hg, CrVI	and Inorganics	Is 015	B-HW EC L	als Sca	on/Cus	No.	: □ voc	- F4		100	lotal		9			
Samp	e identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y/N	Metals	☐ All Metals ☐ 153 h ☐ Hydride Metals ☐ 1	ORPs: DB-HWS Crt DEC DF	Full Metals Scan	Regulation/Custom Metals	Nutrients: TP C	Volatiles:	PHCs F1 - F4	ABINS	PCB2: Tatal	Pubs: L. lotal L.	TCLP: 🗆 M&I	Sewer Use			
BH A8 SS2		23 Jan 2020	9:05	1	S	HOLD																	
BH A10 SS2		23 Jan 2020	9:35	1	S	HOLD	20																
BH A20 SS2		23 Jan 2020	10:10	1	S	HOLD																	
BH A30 SS2		23 Jan 2020	10:35	1	S	HOLD											1	+	+				
BH B2 SS1		23 Jan 2020	12:55	1	s	HOLD										+			$\top$				
BH B2 SS5		23 Jan 2020	1:20	1	S	HOLD		T												$\Box$			
BH B3 SS1		23 Jan 2020	1:55	1	S	HOLD														H			
BH B3 SS2		23 Jan 2020	2:00	1	S	HOLD							-		-	+		+					-
BH B4 SS1		23 Jan 2020		1	S	HOLD					H					+	+		+		-	+	-
BH B5 SS1		23 Jan 2020		1	S	HOLD						+			-		+	+	1 1			$\vdash$	
BH B5 SS4	. 0	23 Jan 2020		1	S	HOLD											-	+	+	$\vdash$	+		
Samples Relinquished By (Pr	LATE CONTRACTOR	Don.	Date	Tim		Samples Received By (Print Name and Sign):		-				Date			Tim	0		~					
Alessandro Pelleri Samples Helingushed By (Pri	to All	HUV	24 Jan	2020 9	:00am	Mont						de	un:	24/2		4	0	14					
X Ou			Levi	24/2	3'01	Samples Received By (Print Name and Sum):						Gate		1	Tirri			,		Page		of	
Samples Relinationed by (Fritt Name and Sign):			7 0	Samples Received By (Print Name and Sign):			Date	_	Time No:														



Ph: 905.712.5100 Fax: 905.712.5122 webearth.agatlabs.com

#### **Laboratory Use Only** 5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2

	V	Vork	Orde	r#:	_				_					_
	1	coole		pera	tures		- Ric	CAL S	30	3	3	6		3
nt		usto lotes				e ·	_↓ □Ye	s			No			N/A
	Re	gul	ar T	ΆΤ	Tin Surcha	Į.	<b>7</b> 5	_			<b>d:</b> Day:	6		
			OR F	Date	Requ	vide	□ Da	noti	rcha	rges ion f	or rus	Day Apply		ness
													CPM	1
Nutrents: O IP ONH, O IKN	Volaties: □ VOC □ BTEX □ THM	PHCs F1 - F4	ABNS	PAHS	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐PCBs	Sewer Use						
				7 10										
														-
														-
		170	mac											
W	24	0	me C	17.73	1	-					_			
-	- 1	Yi	me	-	-	No.	_	rage	_	=	of _			_

Chain of C	ustody Reco	rd If this is	s a Drinking W	ater sample,	please us	se Drinking Water Chain of Cu	<b>ustody Form</b> (po	otable v	vater co	nsume	ed by huma	ins)			A	rriva	Tem	pera	4 40		3	.3	0 3	2	27
Report Inform Company: Contact: Address:  Phone: Reports to be sent to: 1. Email: 2. Email:  Project Inform Project: Site Location: Sampled By:	Wood Alessandro Pellerito 50 Vogell Road, Units 3 Richmond Hill 6479826220 a.pellerito@woodplc.co shami.malla@woodplc.co	Fax: m				Regulatory Require (Please check all applicable boxes)  Regulation 153/04  Table 2 Indicate One Ind/Com Res/Park Agriculture	Sewer Sanita Storm egion Indicate MISA for a	Use ary	No Re	gula	Regulation COME Prov. Wate Objectives Indicate Guidellite of Air	equir n 558 er Qua s (PW)	ality 20) n	ent	Tu Re Ru	irna irna gul ish	IFOU TAT ( 3 Bu Days OR	Ind Ind Ind Ind Ind Ind Ind Ind Ind Ind	Tim Surcha ss Requi	Te (	7 5 t pphy) 2 i Da (Rusi prior i week	Busines ays h Surch notificate tends a	narges l atlon fo	No  I:  Days  Ne Da May App	ext Busines
AGAT Quote #:	305848 Please note: If quotation number	PO:	will be billed full pric	ce for analysis.		Sample Matrix Leger B Biota	nd	CrVI		O. Reg	153	T				For	Samo	e Day	y ana	alysis	s, plea	ase co	ntact ye	our AG/	AT CPM
Invoice Inform Company: Contact: Address: Email:	Mation: Wood Shami Malla 50 Vogell Road, Units 3 GTA East@woodplc.co	om	Bill To Same:	Yes □ No		GW Ground Water O Oil P Paint S Soil SD Sediment SW Surface Water		Field Filtered - Metals, Hg,	Metals and Inorganics	L All Metals L 153 Metals (excl. Hydrides) ☐ Hycride Metals ☐ 153 Metals (Incl. Hydrides)	□ B-HWS □ Cr □ CN· □ Ec □ FOC □ Hg	stals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH3 ☐ TKN ☐ NO2 ☐ NO3 ☐ NO3 ☐ NO2	S: □VOC □BTEX □THM	1-F4			☐ Total ☐ Aroclors	Organochlorine Pesticides	M&I □VOCs □ABNs □B(a)P	)se			
Sample	e Identification	Date Sampled	Time Sampled	# of Containers	Sampl Matrix		1	Y/N	Metals	Hyeric	ORPs: BH	Full Metals	Regula	Nutrien □ No.	Volatiles:	PHCs F1 - F4	ABNS	PAHs	PCBs: [	Organo	TCLP: \$\Bar{\text{M&I}}\$	Sewe- Use			
BH B22 SS2		23 Jan 2020	11:35	1	S	HOLD																			
Samples Relinquished By (Prin Alessandro Pellerit Samples Relinquished By (Prin	o Atran	aw	Date 24 Jan	/ Time	:00am	> xna	ame and Sign):						Date	LINK.	24	0 "	me C	2.10	1			Dago			
Samples Relinquished By (Prin	Name and Signi:		D=10	Time	f	Samples Received By (Print No.	ime and Gign):						Date		- 1	Ti	me		7	Nº:	_	Page _		of	



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4
RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Alessandro Pellerito

PROJECT: TP115086 AGAT WORK ORDER: 20T569148

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Lab Manager

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

DATE REPORTED: Nov 13, 2020

PAGES (INCLUDING COVER): 18 VERSION*: 2

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

<u>*Notes</u>
VERSION 2: SUPERSEDES VERSION 1, ISSUED FEBRUARY 12, 2020. CHROMIUM LEACHATE RESULT ADDED.

#### Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
  incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other
  third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
  services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
  merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
  contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V2)

Page 1 of 18

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. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

## Certificate of Analysis

AGAT WORK ORDER: 20T569148

PROJECT: TP115086

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:

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

DATE RECEIVED: 2020-01-30							DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH B17 SS3	
					SAMPLE TYPE:	Soil	
				1	DATE SAMPLED:	2020-01-24	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	918798	
Antimony	μg/g	40	0.8	2020-02-11	2020-02-11	<0.8	
Arsenic	μg/g	18	1	2020-02-11	2020-02-11	5	
Barium	μg/g	670	2	2020-02-11	2020-02-11	85	
Beryllium	μg/g	8	0.5	2020-02-11	2020-02-11	0.5	
Boron	μg/g	120	5	2020-02-11	2020-02-11	10	
Boron (Hot Water Extractable)	μg/g	2	0.10	2020-02-11	2020-02-11	<0.10	
Cadmium	μg/g	1.9	0.5	2020-02-11	2020-02-11	<0.5	
Chromium	μg/g	160	5	2020-02-11	2020-02-11	23	
Cobalt	μg/g	80	0.5	2020-02-11	2020-02-11	9.7	
Copper	μg/g	230	1	2020-02-11	2020-02-11	20	
ead	μg/g	120	1	2020-02-11	2020-02-11	13	
Molybdenum	μg/g	40	0.5	2020-02-11	2020-02-11	<0.5	
Nickel	μg/g	270	1	2020-02-11	2020-02-11	20	
Selenium	μg/g	5.5	0.4	2020-02-11	2020-02-11	<0.4	
Silver	μg/g	40	0.2	2020-02-11	2020-02-11	<0.2	
Гhallium	μg/g	3.3	0.4	2020-02-11	2020-02-11	<0.4	
Jranium	μg/g	33	0.5	2020-02-11	2020-02-11	0.5	
√anadium	μg/g	86	1	2020-02-11	2020-02-11	30	
Zinc	μg/g	340	5	2020-02-11	2020-02-11	48	
Chromium, Hexavalent	μg/g	8	0.2	2020-02-12	2020-02-12	<0.2	
Cyanide	μg/g	0.051	0.040	2020-02-06	2020-02-06	<0.040	
Mercury	μg/g	3.9	0.10	2020-02-11	2020-02-11	<0.10	
Electrical Conductivity	mS/cm	1.4	0.005	2020-02-12	2020-02-12	0.236	
Sodium Adsorption Ratio	NA	12	NA	2020-02-12	2020-02-12	0.205	
pH, 2:1 CaCl2 Extraction	pH Units	5.0-9.0	NA	2020-02-12	2020-02-12	7.58	

Certified By:



5835 COOPERS AVENUE

MISSISSAUGA, ONTARIO CANADA L4Z 1Y2

http://www.agatlabs.com

TEL (905)712-5100 FAX (905)712-5122



Certificate of Analysis

AGAT WORK ORDER: 20T569148

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:

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

DATE RECEIVED: 2020-01-30 DATE REPORTED: 2020-11-13

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

918798 EC was 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. SAR is a calculated parameter.

Analysis performed at AGAT Toronto (unless marked by *)

mayot Bhells AMMERTERED CHEMIST



## Certificate of Analysis

AGAT WORK ORDER: 20T569148

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

ATTENTION TO: Alessandro Pellerito SAMPLED BY:

O.R	ea. 558	Metals	and	Inorganics	
-----	---------	--------	-----	------------	--

DATE RECEIVED: 2020-01-30							DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	TCLP COMP2	
					SAMPLE TYPE:	Soil	
					DATE SAMPLED:	2020-01-24	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	918885	
Arsenic Leachate	mg/L	2.5	0.010	2020-02-07	2020-02-07	<0.010	
Barium Leachate	mg/L	100	0.100	2020-02-07	2020-02-07	0.484	
Boron Leachate	mg/L	500	0.050	2020-02-07	2020-02-07	0.056	
Cadmium Leachate	mg/L	0.5	0.010	2020-02-07	2020-02-07	<0.010	
Chromium Leachate	mg/L	5	0.010	2020-02-07	2020-02-07	<0.010	
_ead Leachate	mg/L	5	0.010	2020-02-07	2020-02-07	<0.010	
Mercury Leachate	mg/L	0.1	0.01	2020-02-07	2020-02-07	<0.01	
Selenium Leachate	mg/L	1	0.010	2020-02-07	2020-02-07	<0.010	
Silver Leachate	mg/L	5	0.010	2020-02-07	2020-02-07	<0.010	
Jranium Leachate	mg/L	10	0.050	2020-02-07	2020-02-07	<0.050	
Fluoride Leachate	mg/L	150	0.05	2020-02-07	2020-02-07	0.23	
Cyanide Leachate	mg/L	20	0.05	2020-02-07	2020-02-07	<0.05	
Nitrate + Nitrite) as N Leachate	mg/L	1000	0.70	2020-02-07	2020-02-07	<0.70	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria

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.

918885 Revised 2020 March 13

Revision: This report replaces the Certificate of Analysis issued on 2020 Feb 12. The certificate of analysis has been revised to include Chromium Leachate results that was acquired in the initial ICPMS

metal scan.

Analysis performed at AGAT Toronto (unless marked by *)

Juanjot Bhells Amment Bela & CHEMIST CHEMIST

Certified By:



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

#### Certificate of Analysis

AGAT WORK ORDER: 20T569148

PROJECT: TP115086

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:

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

O. Reg. 153(511) - OC Pesticides (Soil)

				O. Neg. 1	33(311) - 00	i esticides	5 (3011)			
DATE RECEIVED: 2020-01-30									DATE REPORTED	0: 2020-11-13
				SAMPL	E DESCRIPTION:	BH B21 SS1	BH B19 SS1	BH B17 SS1	BH B15 SS1	
					SAMPLE TYPE:	Soil	Soil	Soil	Soil	
					DATE SAMPLED:	2020-01-24	2020-01-24	2020-01-24	2020-01-24	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	918790	918794	918797	918801	
Hexachloroethane	μg/g	0.21	0.01	2020-02-07	2020-02-10	<0.01	<0.01	<0.01	<0.01	
Gamma-Hexachlorocyclohexane	μg/g	0.056	0.005	2020-02-07	2020-02-10	< 0.005	< 0.005	< 0.005	< 0.005	
Heptachlor	μg/g	0.19	0.005	2020-02-07	2020-02-10	< 0.005	<0.005	< 0.005	<0.005	
Aldrin	μg/g	0.088	0.005	2020-02-07	2020-02-10	< 0.005	<0.005	<0.005	<0.005	
Heptachlor Epoxide	μg/g	0.05	0.005	2020-02-07	2020-02-10	< 0.005	<0.005	< 0.005	<0.005	
Endosulfan	μg/g	0.3	0.005	2020-02-07	2020-02-10	< 0.005	< 0.005	< 0.005	< 0.005	
Chlordane	μg/g	0.05	0.007	2020-02-07	2020-02-10	< 0.007	< 0.007	< 0.007	< 0.007	
DDE	μg/g	0.52	0.007	2020-02-07	2020-02-10	< 0.007	<0.007	<0.007	<0.007	
DDD	μg/g	4.6	0.007	2020-02-07	2020-02-10	< 0.007	<0.007	<0.007	<0.007	
DDT	μg/g	1.4	0.007	2020-02-07	2020-02-10	< 0.007	<0.007	<0.007	< 0.007	
Dieldrin	μg/g	0.088	0.005	2020-02-07	2020-02-10	< 0.005	< 0.005	< 0.005	< 0.005	
Endrin	μg/g	0.04	0.005	2020-02-07	2020-02-10	< 0.005	< 0.005	< 0.005	< 0.005	
Methoxychlor	μg/g	1.6	0.005	2020-02-07	2020-02-10	< 0.005	<0.005	< 0.005	<0.005	
Hexachlorobenzene	μg/g	0.66	0.005	2020-02-07	2020-02-10	< 0.005	< 0.005	<0.005	< 0.005	
Hexachlorobutadiene	μg/g	0.031	0.01	2020-02-07	2020-02-10	<0.01	<0.01	<0.01	<0.01	
Moisture Content	%		0.1	2020-02-07	2020-02-10	<0.1	<0.1	<0.1	<0.1	
Surrogate	Unit	Acceptab	le Limits							
TCMX	%	50-1	140	2020-02-07	2020-02-10	87	93	95	97	
Decachlorobiphenyl	%	60-1	130	2020-02-07	2020-02-10	92	97	109	99	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

918790-918801 Results are based on the dry weight of the soil.

DDT total is a calculated parameter. The calculated value is the sum of op'DDT and pp'DDT. DDD total is a calculated parameter. The calculated value is the sum of op'DDD and pp'DDD. DDE total is a calculated parameter. The calculated value is the sum of op'DDE and pp'DDE.

Endosulfan total is a calculated parameter. The calculated value is the sum of Endosulfan I and Endosulfan II.

Chlordane total is a calculated parameter. The calculated value is the sum of Alpha-Chlordane and Gamma-Chlordane.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Jung



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

60-130

2020-02-12

## Certificate of Analysis

AGAT WORK ORDER: 20T569148

PROJECT: TP115086

http://www.agatlabs.com

5835 COOPERS AVENUE

MISSISSAUGA, ONTARIO CANADA L4Z 1Y2

TEL (905)712-5100 FAX (905)712-5122

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE:							SAMPLED BY:
				O. Reg. 5	558 - OC Pes	ticides & F	PCBs
DATE RECEIVED: 2020-01-30							DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	TCLP COMP2	
					SAMPLE TYPE:	Soil	
				İ	DATE SAMPLED:	2020-01-24	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	918885	
Heptachlor + Heptachlor Epoxide	mg/L	0.3	0.0003	2020-02-12	2020-02-12	<0.0003	
Aldrin + Dieldrin	mg/L	0.07	0.0007	2020-02-12	2020-02-12	<0.0007	
DDT + Metabolites	mg/L	3.0	0.003	2020-02-12	2020-02-12	<0.003	
Methoxychlor	mg/L	90.0	0.09	2020-02-12	2020-02-12	< 0.09	
Chlordane (Total)	mg/L	0.7	0.0007	2020-02-12	2020-02-12	<0.0007	
Aldrin	mg/L		0.0002	2020-02-12	2020-02-12	<0.0002	
alpha - chlordane	mg/L		0.0001	2020-02-12	2020-02-12	<0.0001	
gamma-Chlordane	mg/L		0.0002	2020-02-12	2020-02-12	<0.0002	
Oxychlordane	mg/L		0.0004	2020-02-12	2020-02-12	<0.0004	
pp'-DDE	mg/L		0.0005	2020-02-12	2020-02-12	< 0.0005	
pp'-DDD	mg/L		0.0015	2020-02-12	2020-02-12	< 0.0015	
op'-DDT	mg/L		0.0015	2020-02-12	2020-02-12	< 0.0015	
pp'-DDT	mg/L		0.0005	2020-02-12	2020-02-12	< 0.0005	
Dieldrin	mg/L		0.0005	2020-02-12	2020-02-12	< 0.0005	
Heptachlor	mg/L		0.0001	2020-02-12	2020-02-12	<0.0001	
Heptachlor Epoxide	mg/L		0.0002	2020-02-12	2020-02-12	<0.0002	
Lindane	mg/L		0.0004	2020-02-12	2020-02-12	<0.0004	
Endrin	mg/L	0.02	0.0004	2020-02-12	2020-02-12	<0.0004	
Toxaphene	mg/L	0.5	0.0005	2020-02-12	2020-02-12	<0.0005	
PCB's	mg/L	0.3	0.0002	2020-02-12	2020-02-12	<0.0002	
OC/PCB Pest Extr	NA			2020-02-12	2020-02-12	Υ	
Surrogate	Unit	Acceptab	le Limits				

Certified By:

90



Decachlorobiphenyl

2020-02-12



## Certificate of Analysis

AGAT WORK ORDER: 20T569148

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:

O. Reg. 558 - OC Pesticides & PCBs

DATE RECEIVED: 2020-01-30 DATE REPORTED: 2020-11-13

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria

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.

918885 The sample was leached according to Regulation 558 protocol. Analysis was performed after extraction of the leachate.

Heptachlor + Heptachlor Epoxide is a calculated parameter. The calculated value is the sum of Heptachlor and Heptachlor Epoxide.

Aldrin + Dieldrin is a calculated parameter. The calculated value is the sum of Aldrin and Dieldrin.

PCB total is a calculated parameter. The calculated value is the sum of Aroclor 1242, Aroclor 1248, Aroclor 1254 and Aroclor 1260.

DDT + Metabolites is a calculated parameter. The calculated value is the sum of op'DDT, pp'DDT, pp'DDE and pp'DDD.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:





Certificate of Analysis

AGAT WORK ORDER: 20T569148

PROJECT: TP115086

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

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

	O. Reg. 558 - VOCs												
DATE RECEIVED: 2020-01-30							DATE REPORTED: 2020-11-13						
				SAMPL	E DESCRIPTION:	TCLP COMP2							
					SAMPLE TYPE:	Soil							
				1	DATE SAMPLED:	2020-01-24							
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	918885							
Vinyl Chloride	mg/L	0.2	0.030	2020-02-12	2020-02-12	<0.030							
1,1 Dichloroethene	mg/L	1.4	0.020	2020-02-12	2020-02-12	<0.020							
Dichloromethane	mg/L	5.0	0.030	2020-02-12	2020-02-12	< 0.030							
Methyl Ethyl Ketone	mg/L	200	0.090	2020-02-12	2020-02-12	<0.090							
Chloroform	mg/L	10.0	0.020	2020-02-12	2020-02-12	<0.020							
1,2-Dichloroethane	mg/L	0.5	0.020	2020-02-12	2020-02-12	<0.020							
Carbon Tetrachloride	mg/L	0.5	0.020	2020-02-12	2020-02-12	<0.020							
Benzene	mg/L	0.5	0.020	2020-02-12	2020-02-12	<0.020							
Trichloroethene	mg/L	5.0	0.020	2020-02-12	2020-02-12	<0.020							
Tetrachloroethene	mg/L	3.0	0.050	2020-02-12	2020-02-12	< 0.050							
Chlorobenzene	mg/L	8.0	0.010	2020-02-12	2020-02-12	<0.010							
1,2-Dichlorobenzene	mg/L	20.0	0.010	2020-02-12	2020-02-12	<0.010							
1,4-Dichlorobenzene	mg/L	0.5	0.010	2020-02-12	2020-02-12	<0.010							
Surrogate	Unit	Acceptab	le Limits										
Toluene-d8	% Recovery	60-1	130	2020-02-12	2020-02-12	98							

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria

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.

918885 Sample was prepared using Regulation 558 protocol and a zero headspace extractor.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:





## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086

AGAT WORK ORDER: 20T569148

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

G, (IVII 21173 0112)								, (1411		••					
				Soi	l Ana	alysis	5								
RPT Date: Nov 13, 2020				UPLICATI	E		REFEREN	NCE MA	ATERIAL	METHOD	BLAN	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Value		eptable mits	Recovery	Lie	ptable nits	Recovery	Lin	eptable mits
		l lu					value	Lowe	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inor	ganics (Soi	l)													
Antimony	918798	918798	<0.8	<0.8	NA	< 0.8	100%	70%	130%	90%	80%	120%	87%	70%	130%
Arsenic	918798	918798	5	5	0.0%	< 1	103%	70%	130%	95%	80%	120%	102%	70%	130%
Barium	918798	918798	85	84	1.2%	< 2	113%	70%	130%	98%	80%	120%	93%	70%	130%
Beryllium	918798	918798	0.5	0.5	NA	< 0.5	102%	70%	130%	107%	80%	120%	90%	70%	130%
Boron	918798	918798	10	11	NA	< 5	105%	70%	130%	102%	80%	120%	80%	70%	130%
Boron (Hot Water Extractable)	921516		0.16	0.12	NA	< 0.10	80%	60%	140%	90%	70%	130%	88%	60%	140%
Cadmium	918798	918798	<0.5	<0.5	NA	< 0.5	110%	70%	130%	100%	80%	120%	94%	70%	130%
Chromium	918798	918798	23	23	NA	< 5	98%	70%	130%	99%	80%	120%	91%	70%	130%
Cobalt	918798	918798	9.7	9.9	2.0%	< 0.5	101%	70%	130%	87%	80%	120%	85%	70%	130%
Copper	918798	918798	20	21	4.9%	< 1	94%	70%	130%	95%	80%	120%	82%	70%	130%
Lead	918798	918798	13	13	0.0%	< 1	97%	70%	130%	86%	80%	120%	89%	70%	130%
Molybdenum	918798	918798	<0.5	<0.5	NA	< 0.5	109%	70%	130%	99%	80%	120%	103%	70%	130%
Nickel	918798	918798	20	21	4.9%	< 1	94%	70%	130%	89%	80%	120%	86%	70%	130%
Selenium	918798	918798	<0.4	<0.4	NA	< 0.4	98%	70%	130%	93%	80%	120%	96%	70%	130%
Silver	918798	918798	<0.2	<0.2	NA	< 0.2	106%	70%	130%	92%	80%	120%	87%	70%	130%
Thallium	918798	918798	<0.4	<0.4	NA	< 0.4	99%	70%	130%	95%	80%	120%	92%	70%	130%
Uranium	918798	918798	0.5	0.5	NA	< 0.5	98%	70%	130%	96%	80%	120%	97%	70%	130%
Vanadium	918798	918798	30	30	0.0%	< 1	108%	70%	130%	84%	80%	120%	87%	70%	130%
Zinc	918798	918798	48	49	2.1%	< 5	104%	70%	130%	99%	80%	120%	87%	70%	130%
Chromium, Hexavalent	921217		< 0.2	< 0.2	NA	< 0.2	87%	70%	130%	88%	80%	120%	92%	70%	130%
Cyanide	905868		<0.040	<0.040	NA	< 0.040	106%	70%	130%	93%	80%	120%	98%	70%	130%
Mercury	918798	918798	<0.10	<0.10	NA	< 0.10	106%	70%	130%	98%	80%	120%	98%	70%	130%
Electrical Conductivity	921516		0.163	0.168	3.0%	< 0.005	100%	90%	110%						
Sodium Adsorption Ratio	921516		0.077	0.080	3.8%	NA									
pH, 2:1 CaCl2 Extraction	916689		7.49	7.55	0.8%	NA	100%	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 pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

#### O. Reg. 558 Metals and Inorganics

- 3	3													
Arsenic Leachate	901505	< 0.010	<0.010	NA	< 0.010	104%	70%	130%	96%	80%	120%	98%	70%	130%
Barium Leachate	901505	0.519	0.496	NA	< 0.100	104%	70%	130%	94%	80%	120%	92%	70%	130%
Boron Leachate	901505	0.259	0.247	NA	< 0.050	95%	70%	130%	96%	80%	120%	80%	70%	130%
Cadmium Leachate	901505	< 0.010	<0.010	NA	< 0.010	101%	70%	130%	98%	80%	120%	95%	70%	130%
Chromium Leachate	916231	<0.010	<0.010	NA	< 0.010	95%	70%	130%	97%	80%	120%	94%	70%	130%
Lead Leachate	901505	<0.010	<0.010	NA	< 0.010	100%	70%	130%	96%	80%	120%	88%	70%	130%
Mercury Leachate	901505	< 0.01	<0.01	NA	< 0.01	103%	70%	130%	96%	80%	120%	99%	70%	130%
Selenium Leachate	901505	< 0.010	<0.010	NA	< 0.010	106%	70%	130%	102%	80%	120%	103%	70%	130%
Silver Leachate	901505	< 0.010	<0.010	NA	< 0.010	89%	70%	130%	92%	80%	120%	80%	70%	130%

#### AGAT QUALITY ASSURANCE REPORT (V2)

Page 9 of 18

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. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.



# **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE AGAT WORK ORDER: 20T569148
PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

			Soil	Analy	/sis	(Cont	tinue	d)							
RPT Date: Nov 13, 2020				UPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery	Lin	ptable nits	Recovery	Lin	ptable nits
		ld		·			Value	Lower	Upper	,	Lower	Upper	ĺ	Lower	Upper
Uranium Leachate	901505		<0.050	<0.050	NA	< 0.050	99%	70%	130%	101%	80%	120%	100%	70%	130%
Fluoride Leachate	901505		0.36	0.36	0.0%	< 0.05	100%	90%	110%	101%	90%	110%	92%	70%	130%
Cyanide Leachate	901505		< 0.05	< 0.05	NA	< 0.05	101%	90%	110%	108%	90%	110%	97%	70%	130%
(Nitrate + Nitrite) as N Leachate	901505		< 0.70	< 0.070	NA	< 0.70	104%	80%	120%	104%	80%	120%	100%	70%	130%

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

Amayot Bhelle Amanus Helle Officer

Certified By:



# **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086

AGAT WORK ORDER: 20T569148

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

SAMPLING SITE.									LED D	Ι.					
			Trac	e Or	gani	cs Ar	alys	is							
RPT Date: Nov 13, 2020			С	DUPLICATI	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Value		eptable mits	Recovery	Lie	ptable nits	Recovery	Lin	ptable nits
							14.40	Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - OC Pesticides	(Soil)														
Hexachloroethane	901570		< 0.01	< 0.01	NA	< 0.01	94%	50%	140%	92%	50%	140%	99%	50%	140%
Gamma-Hexachlorocyclohexane	901570		< 0.005	< 0.005	NA	< 0.005	109%	50%	140%	98%	50%	140%	94%	50%	140%
Heptachlor	901570		< 0.005	< 0.005	NA	< 0.005	105%	50%	140%	94%	50%	140%	102%	50%	140%
Aldrin	901570		< 0.005	< 0.005	NA	< 0.005	105%	50%	140%	103%	50%	140%	103%	50%	140%
Heptachlor Epoxide	901570		< 0.005	< 0.005	NA	< 0.005	102%	50%	140%	106%	50%	140%	102%	50%	140%
Endosulfan	901570		< 0.005	< 0.005	NA	< 0.005	106%	50%	140%	103%	50%	140%	105%	50%	140%
Chlordane	901570		< 0.007	< 0.007	NA	< 0.007	108%	50%	140%	108%	50%	140%	103%	50%	140%
DDE	901570		< 0.007	< 0.007	NA	< 0.007	106%	50%	140%	102%	50%	140%	106%	50%	140%
DDD	901570		< 0.007	< 0.007	NA	< 0.007	107%	50%	140%	104%	50%	140%	108%	50%	140%
DDT	901570		< 0.007	< 0.007	NA	< 0.007	102%	50%	140%	98%	50%	140%	102%	50%	140%
Dieldrin	901570		< 0.005	< 0.005	NA	< 0.005	101%	50%	140%	107%	50%	140%	105%	50%	140%
Endrin	901570		< 0.005	< 0.005	NA	< 0.005	106%	50%	140%	106%	50%	140%	104%	50%	140%
Methoxychlor	901570		< 0.005	< 0.005	NA	< 0.005	109%	50%	140%	99%	50%	140%	103%	50%	140%
Hexachlorobenzene	901570		< 0.005	< 0.005	NA	< 0.005	101%	50%	140%	96%	50%	140%	98%	50%	140%
Hexachlorobutadiene	901570		< 0.01	< 0.01	NA	< 0.01	101%	50%	140%	97%	50%	140%	107%	50%	140%
O. Reg. 558 - OC Pesticides & PC	CBs														
Heptachlor + Heptachlor Epoxide	908399		< 0.0003	< 0.0003	NA	< 0.0003	95%	60%	140%	90%	60%	140%	NA	60%	140%
Aldrin + Dieldrin	908399		< 0.0007	< 0.0007	NA	< 0.0007	96%	60%	140%	92%	60%	140%	NA	60%	140%
DDT + Metabolites	908399		< 0.003	< 0.003	NA	< 0.003	108%	60%	140%	103%	60%	140%	NA	60%	140%
Methoxychlor	908399		< 0.09	< 0.09	NA	< 0.09	98%	60%	140%	102%	60%	140%	NA	60%	140%
Chlordane (Total)	908399		< 0.0007	< 0.0007	NA	< 0.0007	94%	60%	140%	93%	60%	140%	NA	60%	140%
Aldrin	908399		< 0.0002	< 0.0002	NA	< 0.0002	95%	60%	140%	90%	60%	140%	NA	60%	140%
alpha - chlordane	908399		< 0.0001	< 0.0001	NA	< 0.0001	95%	60%	140%	93%	60%	140%	NA	60%	140%
gamma-Chlordane	908399		< 0.0002	< 0.0002	NA	< 0.0002	94%	60%	140%	92%	60%	140%	NA	60%	140%
Oxychlordane	908399		< 0.0004	< 0.0004	NA	< 0.0004	104%	60%	140%	89%	60%	140%	NA	60%	140%
pp'-DDE	908399		< 0.0005	< 0.0005	NA	< 0.0005	100%	60%	140%	100%	60%	140%	NA	60%	140%
pp'-DDD	908399		< 0.0015	< 0.0015	NA	< 0.0015	86%	60%	140%	91%	60%	140%	NA	60%	140%
op'-DDT	908399		< 0.0015	< 0.0015	NA	< 0.0015	109%	60%	140%	100%	60%	140%	NA	60%	140%
pp'-DDT	908399		< 0.0005	< 0.0005	NA	< 0.0005	107%	60%	140%	105%	60%	140%	NA	60%	140%
Dieldrin	908399		< 0.0005	< 0.0005	NA	< 0.0005	96%	60%	140%	94%	60%	140%	NA	60%	140%
Heptachlor	908399		< 0.0001	< 0.0001	NA	< 0.0001	96%	60%	140%	87%	60%	140%	NA	60%	140%
Heptachlor Epoxide	908399		< 0.0002	< 0.0002	NA	< 0.0002	94%	60%	140%	93%	60%	140%	NA	60%	140%
Lindane	908399		< 0.0004	< 0.0004	NA	< 0.0004	91%	60%	140%	83%	60%	140%	NA	60%	140%
Endrin	908399		< 0.0004	< 0.0004	NA	< 0.0004	92%	60%	140%	90%	60%	140%	NA	60%	140%
Toxaphene	908399		< 0.0005	< 0.0005	NA	< 0.0005	NA NA	60%		86%	60%	140%	NA	60%	140%
PCB's	908399		< 0.0002	< 0.0002	NA	< 0.0002	101%	60%	140%	97%	60%	140%	NA	60%	140%
O. Reg. 558 - VOCs															
Vinyl Chloride	911836		< 0.030	< 0.030	NA	< 0.030	82%	60%	140%	95%	60%	140%	114%	60%	140%
1,1 Dichloroethene	911836		< 0.020	< 0.020	NA	< 0.020	91%	70%	130%	104%	70%	130%	83%	60%	140%

AGAT QUALITY ASSURANCE REPORT (V2)

Page 11 of 18

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. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.



# **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086

AGAT WORK ORDER: 20T569148

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

OAMI LING OITE.								J/ NIVII		1.					
	7	Ггасе	Orga	anics	Ana	alysis	(Cor	ntin	ued	l)					
RPT Date: Nov 13, 2020				UPLICATI	E		REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		IKE
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value		ptable nits	Recovery	1 1 1 1 1	ptable nits	Recovery	Lie	eptable mits
		lu lu					value	Lower	Upper		Lower	Upper		Lower	Upper
Dichloromethane	911836		< 0.030	< 0.030	NA	< 0.030	114%	70%	130%	97%	70%	130%	98%	60%	140%
Methyl Ethyl Ketone	911836		< 0.090	< 0.090	NA	< 0.090	106%	70%	130%	111%	70%	130%	79%	60%	140%
Chloroform	911836		< 0.020	< 0.020	NA	< 0.020	93%	70%	130%	104%	70%	130%	91%	60%	140%
1,2-Dichloroethane	911836		< 0.020	< 0.020	NA	< 0.020	98%	70%	130%	107%	70%	130%	106%	60%	140%
Carbon Tetrachloride	911836		< 0.020	< 0.020	NA	< 0.020	101%	70%	130%	83%	70%	130%	80%	60%	140%
Benzene	911836		< 0.020	< 0.020	NA	< 0.020	94%	70%	130%	107%	70%	130%	98%	60%	140%
Trichloroethene	911836		< 0.020	< 0.020	NA	< 0.020	87%	70%	130%	103%	70%	130%	90%	60%	140%
Tetrachloroethene	911836		< 0.050	< 0.050	NA	< 0.050	85%	70%	130%	106%	70%	130%	89%	60%	140%
Chlorobenzene	911836		< 0.010	< 0.010	NA	< 0.010	97%	70%	130%	106%	70%	130%	95%	60%	140%
1,2-Dichlorobenzene	911836		< 0.010	< 0.010	NA	< 0.010	94%	70%	130%	100%	70%	130%	93%	60%	140%
1,4-Dichlorobenzene	911836		< 0.010	< 0.010	NA	< 0.010	93%	70%	130%	103%	70%	130%	93%	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:

Jung

# Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086

AGAT WORK ORDER: 20T569148

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE:		SAMPLED BY:	,
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron (Hot Water Extractable)	MET-93-6104	modified from EPA 6010D and MSA PART 3, CH 21	ICP/OES
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Zinc	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium, Hexavalent	INOR-93-6068	modified from EPA 3060 and EPA 7196	SPECTROPHOTOMETER
Cyanide	INOR-93-6052	MOE CN-3015 & E 3009 A;SM 4500 CN	TECHNICON AUTO ANALYZER
Mercury	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	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	ICF/OE3
pH, 2:1 CaCl2 Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	PH METER
Arsenic Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Barium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Boron Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Cadmium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Chromium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Lead Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS



# **Method Summary**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086

AGAT WORK ORDER: 20T569148

ATTENTION TO: Alessandro Pellerito

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Mercury Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Selenium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Silver Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Uranium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Fluoride Leachate	INOR-93-6018	EPA 1311 & modified from SM4500-F-C	ION SELECTIVE ELECTRODE
Cyanide Leachate	INOR-93-6052	EPA 1311 & modified from MOE 3015 & SM 4500 CN-I	TECHNICON AUTO ANALYZER
(Nitrate + Nitrite) as N Leachate	INOR-93-6053	EPA 1311 & modified from SM 4500-NO3-I	LACHAT FIA

# Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086

AGAT WORK ORDER: 20T569148

ATTENTION TO: Alessandro Pellerito

PARAMETER	
Hexachloroethane	<b>NIQUE</b>
Gamma-Hexachlorocyclohexane         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Heptachlor         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Aldrin         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Heptachlor Epoxide         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Endosulfan         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           DDE         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           DDD         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           DDD         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           DDT         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Dieldrin         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Endrin         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Beddrin         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Hexachlorobenzene         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Hexachlorobutadiene         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD	
Heptachlor	
Aldrin         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Heptachlor Epoxide         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Endosulfan         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Chlordane         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           DDE         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           DDT         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           DDT         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           DDT         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Dieldrin         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Methoxychlor         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Methoxychlor         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Hexachlorobutadiene         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Hexachlorobutadiene         ORG-91-5112         EPA SW-846 3541,3620 & 8081         GC/ECD           Decachlorobiphenyl         ORG-91-5112         EPA SW-846 3541,3620 & 8081         GC/ECD	
Heptachlor Epoxide	
Endosulfan	
Endosulfan	
Chlordane         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           DDE         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           DDD         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           DDT         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Dieldrin         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Endrin         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Methoxychlor         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Hexachlorobenzene         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Hexachlorobutadiene         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           TCMX         ORG-91-5112         EPA SW-846 3541,3620 & 8081         GC/ECD           Moisture Content         MOE 931-5112         EPA SW-846 3541,3620 & 8081         GC/ECD           Moisture Content         MOE 931-5112         EPA SW-846 3550 & 8081         GC/ECD           Methoxychlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           DDT + Metabolites         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD	
DDD ORG-91-5113 EPA SW-846 3541,3620 & 8081 GC/ECD DDT ORG-91-5113 EPA SW-846 3541,3620 & 8081 GC/ECD Dieldrin ORG-91-5113 EPA SW-846 3541,3620 & 8081 GC/ECD Endrin ORG-91-5113 EPA SW-846 3541,3620 & 8081 GC/ECD Endrin ORG-91-5113 EPA SW-846 3541,3620 & 8081 GC/ECD Methoxychlor ORG-91-5113 EPA SW-846 3541,3620 & 8081 GC/ECD Hexachlorobenzene ORG-91-5113 EPA SW-846 3541,3620 & 8081 GC/ECD Hexachlorobutadiene ORG-91-5113 EPA SW-846 3541,3620 & 8081 GC/ECD TCMX ORG-91-5112 EPA SW-846 3541,3620 & 8081 GC/ECD Decachlorobiphenyl ORG-91-5113 EPA SW-846 3541,3620 & 8081 GC/ECD Decachlorobiphenyl ORG-91-5113 EPA SW-846 3541,3620 & 8081 GC/ECD Moisture Content Beptachlor Epoxide ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD Aldrin + Dieldrin ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD DDT + Metabolites ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD DDT + Metabolites ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD Aldrin (Total) ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD Aldrin ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD Aldrin ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD Aldrin ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD Chlordane (Total) ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD DDT + Metabolites ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD DDT + SW-846 3550 & 8081 GC/ECD DDT + Metabolites ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD DDT + Metabolites ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD DDT + DDT ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD DDT + DDT ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD DDT + DDT ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD DP'-DDD ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD DP'-DDD ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD DP'-DDT ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD DP'-DDT ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD DP'-DDT ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD DP'-DDT ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD DP'-DDT ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD Dieldrin ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD Dieldrin ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD Dieldrin ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD Endrin ORG	
DDT         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Dieldrin         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Endrin         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Methoxychlor         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Hexachlorobenzene         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Hexachlorobutadiene         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Decachlorobiphenyl         ORG-91-5112         EPA SW-846 3541,3620 & 8081         GC/ECD           Moisture Content         MCE 23139         BALANCE           Heptachlor + Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin + Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           DDT + Metabolites         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Methoxychlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Chlordane (Total)         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Oxychlorda	
Dieldrin         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Endrin         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Methoxychlor         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Hexachlorobenzene         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Hexachlorobutadiene         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           TCMX         ORG-91-5112         EPA SW-846 3541,3620 & 8081         GC/ECD           Decachlorobiphenyl         ORG-91-5112         EPA SW-846 3541,3620 & 8081         GC/ECD           Moisture Content         MCE E3139         BALANCE           Heptachlor + Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin + Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           DDT + Metabolites         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Methoxychlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Chlordane (Total)         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Agrama-C	
Dieldrin         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Endrin         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Methoxychlor         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Hexachlorobenzene         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Hexachlorobutadiene         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           TCMX         ORG-91-5112         EPA SW-846 3541,3620 & 8081         GC/ECD           Decachlorobiphenyl         ORG-91-5112         EPA SW-846 3541,3620 & 8081         GC/ECD           Moisture Content         MOE E3139         BALANCE           Heptachlor + Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin + Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           DDT + Metabolites         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Methoxychlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           apha - chlordane <td></td>	
Methoxychlor         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Hexachlorobenzene         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Hexachlorobutadiene         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           TCMX         ORG-91-5112         EPA SW-846 3541,3620 & 8081         GC/ECD           Decachlorobiphenyl         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Moisture Content         MOE E3139         BALANCE           Heptachlor + Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin + Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Methoxychlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Methoxychlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112 </td <td></td>	
Methoxychlor         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Hexachlorobenzene         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Hexachlorobutadiene         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           TCMX         ORG-91-5112         EPA SW-846 3541,3620 & 8081         GC/ECD           Decachlorobiphenyl         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Moisture Content         MOE E3139         BALANCE           Heptachlor + Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin + Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Methoxychlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Methoxychlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112 </td <td></td>	
Hexachlorobenzene	
Hexachlorobutadiene   ORG-91-5113   EPA SW-846 3541,3620 & 8081   GC/ECD	
TCMX         ORG-91-5112         EPA SW-846 3541,3620 & 8081         GC/ECD           Decachlorobiphenyl         ORG-91-5113         EPA SW-846 3541,3620 & 8081         GC/ECD           Moisture Content         MOE E3139         BALANCE           Heptachlor + Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin + Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           DDT + Metabolites         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Methoxychlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Chlordane (Total)         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           gamma-Chlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Oxychlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDE         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDT         ORG-91-5112	
Decachlorobiphenyl	
Moisture Content         MOE E3139         BALANCE           Heptachlor + Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin + Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           DDT + Metabolites         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Methoxychlor         ORG-91-5112         EPA SW-846 8081A & 8082         GC/ECD           Chlordane (Total)         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           alpha - chlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           gamma-Chlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Oxychlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDE         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDD         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDT         ORG-91-5112         EP	
Heptachlor + Heptachlor Epoxide   ORG-91-5112   EPA SW-846 3550 & 8081   GC/ECD	
Aldrin + Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           DDT + Metabolites         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Methoxychlor         ORG-91-5112         EPA SW-846 8081A & 8082         GC/ECD           Chlordane (Total)         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           alpha - chlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           gamma-Chlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Oxychlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Op'-DDE         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Op'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Op'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor         ORG-91-5112<	
DDT + Metabolites         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Methoxychlor         ORG-91-5112         EPA SW-846 8081A & 8082         GC/ECD           Chlordane (Total)         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           alpha - chlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           gamma-Chlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Oxychlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDE         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDD         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           op'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Lindane         ORG-91-5112	
Methoxychlor         ORG-91-5112         EPA SW-846 8081A & 8082         GC/ECD           Chlordane (Total)         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           alpha - chlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           gamma-Chlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Oxychlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDE         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDD         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           op'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Lindane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Endrin         ORG-91-5112 <td< td=""><td></td></td<>	
Chlordane (Total)         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           alpha - chlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           gamma-Chlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Oxychlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDE         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDD         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           op'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Lindane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Endrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD	
Aldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           alpha - chlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           gamma-Chlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Oxychlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDE         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDD         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           op'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Lindane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Endrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD	
alpha - chlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           gamma-Chlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Oxychlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDE         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDD         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           op'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Lindane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Endrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD	
gamma-Chlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Oxychlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDE         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDD         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           op'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Lindane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Endrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD	
Oxychlordane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDE         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDD         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           op'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Lindane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Endrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD	
pp'-DDE         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDD         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           op'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Lindane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Endrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD	
pp'-DDD         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           op'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Lindane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Endrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD	
Op'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           pp'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Lindane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Endrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD	
pp'-DDT         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Lindane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Endrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD	
Dieldrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Lindane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Endrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD	
Heptachlor         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Lindane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Endrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD	
Heptachlor Epoxide         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Lindane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Endrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD	
Lindane         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD           Endrin         ORG-91-5112         EPA SW-846 3550 & 8081         GC/ECD	
Endrin ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD	
PCB's ORG-91-5112 EPA SW-846 3550 & 8082 GC/ECD	
Decachlorobiphenyl ORG-91-5112 EPA SW-846 3550 & 8081 GC/ECD	
OC/PCB Pest Extr	
Vinyl Chloride VOL-91-5001 EPA SW-846 5030C & 8260D (P&T)GC/MS	
1,1 Dichloroethene VOL-91-5001 EPA SW-846 5030C & 8260D (P&T)GC/MS	
Dichloromethane VOL-91-5001 EPA SW-846 5030C & 8260D (P&T)GC/MS	
Methyl Ethyl Ketone VOL-91-5001 EPA SW-846 5030C & 8260D (P&T)GC/MS	
Chloroform VOL-91-5001 EPA SW-846 5030C & 8260D (P&T)GC/MS	
1,2-Dichloroethane VOL-91-5001 EPA SW-846 5030C & 8260D (P&T)GC/MS	
Carbon Tetrachloride VOL-91-5001 EPA SW-846 5030C & 8260D (P&T)GC/MS	
Benzene VOL-91-5001 EPA SW-846 5030C & 8260D (P&T)GC/MS	
Trichloroethene VOL-91-5001 EPA SW-846 5030C & 8260D (P&T)GC/MS	



# **Method Summary**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086

AGAT WORK ORDER: 20T569148

ATTENTION TO: Alessandro Pellerito

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Tetrachloroethene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Chlorobenzene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Toluene-d8	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS



5835 Coopers Avenue

**Laboratory Use Only** 

Mississauga, Ontario L4Z 1Y2 Ph: 905.712.5100 Fax: 905.712,5122 webearth.agatlabs.com

#### Cooler Quantity: Arrival Temperatures: **Chain of Custody Record** If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans) **Regulatory Requirements:** No Regulatory Requirement **Custody Seal Intact:** ☐Yes □No **Report Information:** (Please check all applicable boxes) Wood Notes: Company: Alessandro Pellerito Contact: Regulation 153/04 Regulation 558 Sewer Use **Turnaround Time (TAT) Required:** 50 Vogell Road Units 3 and 4 Address: Пссме Indicate One ☐ Sanitary **Regular TAT** ☑Ind/Com 5 to 7 Business Days Richmond Hill, ON Res/Park Prov. Water Quality Storm Rush TAT (Rush Surcharges Apply) 6479826220 Fax: Phone: ✓ Agriculture Objectives (PWQO) Reports to be sent to: Region Other 3 Business 2 Business **Next Business** a.pellerito@woodplc.com Soil Texture (Check One) 1. Email: Indicate One Davs √ Coarse shami.malla@woodplc.com OR Date Required (Rush Surcharges May Apply): 2. Email: ☐ Fine MISA Indicate One Is this submission for a Report Guldeline on **Project Information:** Please provide prior notification for rush TAT **Record of Site Condition? Certificate of Analysis** TP115086 *TAT is exclusive of weekends and statutory holidays Project: ☐ No ✓ No ☐ Yes SP47, Bramptom ☐ Yes Site Location: For 'Same Day' analysis, please contact your AGAT CPM Mohammad Safarpanah Sampled By: **™**PCBs O. Reg 153 305848 AGAT Quote #: PO: Sample Matrix Legend CrZ des) Please note: If quotation number is not provided, client will be billed full price for analysis. B(a)P Biota 퓼 THM Invoice Information: gw **Ground Water** Bill To Same: Yes ✓ No □ □ TKN ☐ All Metals ☐ 153 Metals (excl. Hydr. ☐ Hydride Metals ☐ 153 Metals (Incl. h Z Field Filtered - Metals, . 이 다 일 일 0 Oil □ ABNs Regulation/Custom Metals Organochlorine Pesticides Company: Nutrients: TP DNH, C DBTEX □ Aroclors ö □ Paint Shami Malla Contact: ORPs: □B-HWS □CI-□Cr* □EC □FOC □ □pH □SAR Metals and Inorganics S Soil ☑ VOCs Address: **☑** 000 SD Sediment GTA EAST@woodplc.com PCBs: N Total Email: Surface Water PHCs F1 - F4 M& Full Metals Volatiles: ABNS Comments/ PAHS Date Time # of Sample TCLP: Y/N Sample Identification Containers Sampled Matrix Special Instructions Sampled 1 1 V S HOLD 9:45 BH B21 SS1 24 Jan 2020 V $\checkmark$ **V** ✓ V $\overline{\mathbf{Z}}$ S HOLD BH B21 SS4 24 Jan 2020 10:00 **V** S HOLD BH B20 SS2 10:45 24 Jan 2020 BH B19 SS1 24 Jan 2020 11:00 S HOLD S HOLD BH B19 SS4 24 Jan 2020 11:15 S HOLD BH B18 SS2 24 Jan 2020 11:50 S HOLD BH B17 SS1 24 Jan 2020 12:05 S HOLD **BH B17 SS3** 12:15 24 Jan 2020 HOLD S BH B16 SS1 24 Jan 2020 1:00 S HOLD 24 Jan 2020 1:05 **BH B14 SS1** S **BH B15 SS1** 24 Jan 2020 1:25 HOLD Samples Relinguished By (Print Name and Sign 10:45 Jan 29, 2020 Alessandro Pellerito Page Samples Received By (Print Name and Sign): Nº:



5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2 Ph: 905.712.5100 Fax: 905.712.5122 webearth.agatlabs.com

Work Order #:	
Cooler Quantity:	10. u ~
Arrival Temperat	tures: 3.73589
Custody Seal Int	tact: Yes No NA
Turnaround	Time (TAT) Required:
Regular TAT	5 to 7 Business Days
Rush TAT (Ruch S	jurcharges Apply)
3 Busines	ss
OR Date	Required (Rush Surcharges May Apply):
_	e provide prior notification for rush TAT
	clusive of weekends and statutory nondays
*TAT is ex	y' analysis, please contact your AGAT CPM

Report Information Company:	Wood				_	Regulatory Req	uirements:		No R	egulat	ory Red	quire	me	nt		stody otes:_	Sea	l Inta	ict:		res		]No	□N/A
Contact:	Alessandro Pellerito				_	Regulation 153/04	Sewe	er Use		R	egulation	558			T				F1	/TA	T\ D		al.	
Address:	50 Vogell Road Units 3	and 4			_	Table	∏Sar	itan		Пс	CME				IUI	rnai	oui	1 <b>a</b> i	IIME	; (IA	I) K	equire	a:	
	Richmond Hill, ON				_	☑Ind/Com	_	•			OIVIL			- 10	Re	gula	r TA	T		7	5 to 7	Business	Days	
Phone:	6479826220	Fax:				☐ Res/Park  ☑ Agriculture	□Sto	rm			rov. Wate				Rus	sh T	AT (R	ush Su	rcharge	s Apply	)			
Reports to be sent to:  1. Email:	a.pellerito@woodplc.co	om				Soil Texture (Check One)	Regionindic	ate One	-		bjectives ther	(PWQ	0)				3 Bus Days	sines	s		2 Bus Davs	iness		xt Busines
2. Email:	shami.malla@woodplc.	.com				☐Fine	MISA		d	>-	Indicate	One	-				-	ate F	Requi		- 3 -	ırcharge:	□ Day May App	•
Project Infor						ls this submiss Record of Site C				-	uldelir e of An					-	Ple	ease	provi	de pri	or not	ification	for rush T/	AT .
Project:	TP115086											•				*							atutory ho	
Site Location:	SP47, Bramptom	L				☐ Yes ☐	2 No		Ц	Yes		I N	0		- (	For 'S	ame	Day'	anal	ysis, p	loase	contact	your AGA	AT CPM
Sampled By:	Mohammad Safarpanal 305848				- 1					O. Reg	153	T					1	T		T	s I	1-1	1	
AGAT Quote #:	Please note: If quotation number	PO: ber is not provided, client v	will be billed full price	e for analysis	-	Sample Matrix Lo	egend	Cr		8											82.4			
Invoice Information Company: Contact: Address: Email:	Shami Malla  GTA EAST@woodple		Bill To Same:	Yes 🗹 No		GW Ground Water O Oil P Paint S Soil SD Sediment		Field Filtered - Metals, Hg,	Inorganics	☐ 153 Metals (excl. Hydrides) etals ☐ 153 Metals (incl. Hydrid	ORPs: DB-HWS DCI DCNI Coff DEC DFOC DHg	can	Regulation/Custom Metals	TP ONH3 OTKN	NOC DETEX DTHM				I ☐ Aroclors		ICLP: ID M&I ID VOCS LIABNS IN B(a)P			
Linaii.						SW Surface Water		Field	and	als 🗆	□B-HN □EC	tals So	ion/C	LS:		1 - F4			Total	chlorir	Se se			
Samp	le Identification	Date Sampled	Time Sampled	# of Containers	Samp Matri			Y/N	Metals	☐ All Metals ☐ 15 ☐ Hydride Metals [	ORPs:	Full Metals Scan	Regulat	Nutrients: ☐ TP ☐ No. ☐ ☐ No. ☐ ☐ No. ☐ C	Volatiles:	PHCs F1 - F4	ABNS	PAHS	PCBs: ☑ Total	Organo	Sewer Use			
BH B15 SS4		24 Jan 2020	1:45	1	S	HOLD			Ø						Ø	$   \boxed{2} $		Ø	-	<b>7</b>				
TCLP COMP1		24 Jan 2020		2	S	HOLD			V							☑		Ø		<b>V</b>				
TCLP COMP2		24 Jan 2020		2	S	HOLD			Ø						Ø	Ø		Ø		Ø				
																					II.			
																				6	7			
								0																
Samples Relinquished By (P		/	Date	01.77	me 10.45	Samples Received By	(Print Name and Sign)	И	-				14		20	1	me )	1.		T			-	)
Alessandro Peller Sumples Relinguished By IP			Jan 29	, 2020	10:45	Samples Received B	YPrint Name and Sign):	M					0	un	24	20	me	_			Pa	de /	of C	
416	UNV		now	SULL	2).	20		1							1						га	P. C	_0	



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4 RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Alessandro Pellerito

PROJECT: TP115086 AGAT WORK ORDER: 20T574091

SOIL ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

DATE REPORTED: Nov 13, 2020

PAGES (INCLUDING COVER): 8

VERSION*: 1

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

<u>*Notes</u>			

#### Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
  incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other
  third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
  services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
  merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
  contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Page 1 of 8

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. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

## Certificate of Analysis

AGAT WORK ORDER: 20T574091

PROJECT: TP115086

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:

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

				J (	,		, ,		
DATE RECEIVED: 2020-02-13									DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH D44 SS1	BH D47 SS4	BH D55 SS2	
					SAMPLE TYPE:	Soil	Soil	Soil	
					DATE SAMPLED:	2020-02-11	2020-02-11	2020-02-11	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	939194	939197	939200	
Antimony	μg/g	40	0.8	2020-02-20	2020-02-20	<0.8	<0.8	<0.8	
Arsenic	μg/g	18	1	2020-02-20	2020-02-20	4	5	5	
Barium	μg/g	670	2	2020-02-20	2020-02-20	71	88	86	
Beryllium	μg/g	8	0.5	2020-02-20	2020-02-20	<0.5	0.6	0.6	
Boron	μg/g	120	5	2020-02-20	2020-02-20	8	10	9	
Boron (Hot Water Extractable)	μg/g	2	0.10	2020-02-20	2020-02-20	0.19	0.14	<0.10	
Cadmium	μg/g	1.9	0.5	2020-02-20	2020-02-20	<0.5	<0.5	<0.5	
Chromium	μg/g	160	5	2020-02-20	2020-02-20	17	21	23	
Cobalt	μg/g	80	0.5	2020-02-20	2020-02-20	7.6	11.6	11.0	
Copper	μg/g	230	1	2020-02-21	2020-02-21	20	20	30	
Lead	μg/g	120	1	2020-02-20	2020-02-20	10	9	14	
Molybdenum	μg/g	40	0.5	2020-02-20	2020-02-20	<0.5	<0.5	<0.5	
Nickel	μg/g	270	1	2020-02-20	2020-02-20	16	25	22	
Selenium	μg/g	5.5	0.4	2020-02-20	2020-02-20	<0.4	<0.4	<0.4	
Silver	μg/g	40	0.2	2020-02-20	2020-02-20	<0.2	<0.2	<0.2	
Thallium	μg/g	3.3	0.4	2020-02-20	2020-02-20	<0.4	<0.4	<0.4	
Uranium	μg/g	33	0.5	2020-02-20	2020-02-20	<0.5	0.6	<0.5	
Vanadium	μg/g	86	1	2020-02-20	2020-02-20	24	27	29	
Zinc	μg/g	340	5	2020-02-20	2020-02-20	43	50	51	
Chromium, Hexavalent	μg/g	8	0.2	2020-02-20	2020-02-20	<0.2	<0.2	<0.2	
Cyanide	μg/g	0.051	0.040	2020-02-21	2020-02-21	<0.040	<0.040	<0.040	
Mercury	μg/g	3.9	0.10	2020-02-20	2020-02-20	<0.10	<0.10	<0.10	
Electrical Conductivity	mS/cm	1.4	0.005	2020-02-20	2020-02-20	1.51	0.429	0.995	
Sodium Adsorption Ratio	NA	12	NA	2020-02-20	2020-02-20	12.2	0.989	2.64	
pH, 2:1 CaCl2 Extraction	pH Units	5.0-9.0	NA	2020-02-21	2020-02-21	7.79	7.74	7.61	

Certified By:



5835 COOPERS AVENUE

MISSISSAUGA, ONTARIO CANADA L4Z 1Y2

http://www.agatlabs.com

TEL (905)712-5100 FAX (905)712-5122



#### Certificate of Analysis

AGAT WORK ORDER: 20T574091

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:

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

DATE RECEIVED: 2020-02-13 DATE REPORTED: 2020-11-13

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

EC was 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. SAR is a calculated

parameter.

939194-939200

Analysis performed at AGAT Toronto (unless marked by *)

S CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST OF CHAMIST O



#### **Exceedance Summary**

AGAT WORK ORDER: 20T574091

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

ATTENTION TO: Alessandro Pellerito

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
939194	BH D44 SS1	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity	mS/cm	1.4	1.51
939194	BH D44 SS1	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Sodium Adsorption Ratio	NA	12	12.2



# **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T574091

PROJECT: TP115086

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

				Soi	l Ana	alysis	3								
RPT Date: Nov 13, 2020				UPLICATI			REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		eptable mits	Recovery	Lie	ptable	Recovery	Lie	ptable
		ld		.			Value	Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inor	ganics (Soi	l)													
Antimony	939194	939194	<0.8	<0.8	NA	< 0.8	125%	70%	130%	99%	80%	120%	79%	70%	130%
Arsenic	939194	939194	4	4	NA	< 1	117%	70%	130%	106%	80%	120%	107%	70%	130%
Barium	939194	939194	71	70	0.6%	< 2	113%	70%	130%	100%	80%	120%	90%	70%	130%
Beryllium	939194	939194	<0.5	<0.5	NA	< 0.5	93%	70%	130%	110%	80%	120%	92%	70%	130%
Boron	939194	939194	8	8	NA	< 5	82%	70%	130%	118%	80%	120%	90%	70%	130%
Boron (Hot Water Extractable)	939194	939194	0.19	0.19	NA	< 0.10	99%	60%	140%	93%	70%	130%	94%	60%	140%
Cadmium	939194	939194	<0.5	<0.5	NA	< 0.5	114%	70%	130%	99%	80%	120%	96%	70%	130%
Chromium	939194	939194	17	18	NA	< 5	106%	70%	130%	98%	80%	120%	95%	70%	130%
Cobalt	939194	939194	7.6	7.7	1.3%	< 0.5	91%	70%	130%	93%	80%	120%	89%	70%	130%
Copper	939194	939194	20	20	0.0%	< 1	100%	70%	130%	102%	80%	120%	88%	70%	130%
Lead	939194	939194	10	10	0.8%	< 1	109%	70%	130%	92%	80%	120%	82%	70%	130%
Molybdenum	939194	939194	<0.5	< 0.5	NA	< 0.5	109%	70%	130%	109%	80%	120%	109%	70%	130%
Nickel	939194	939194	16	16	2.1%	< 1	95%	70%	130%	99%	80%	120%	91%	70%	130%
Selenium	939194	939194	<0.4	<0.4	NA	< 0.4	142%	70%	130%	103%	80%	120%	105%	70%	130%
Silver	939194	939194	<0.2	<0.2	NA	< 0.2	109%	70%	130%	98%	80%	120%	87%	70%	130%
Thallium	939194	939194	<0.4	<0.4	NA	< 0.4	95%	70%	130%	100%	80%	120%	94%	70%	130%
Uranium	939194	939194	<0.5	< 0.5	NA	< 0.5	99%	70%	130%	102%	80%	120%	99%	70%	130%
Vanadium	939194	939194	24	24	0.7%	< 1	89%	70%	130%	88%	80%	120%	87%	70%	130%
Zinc	939194	939194	43	49	12.9%	< 5	109%	70%	130%	99%	80%	120%	92%	70%	130%
Chromium, Hexavalent	938204	938204	< 0.2	< 0.2	0.0%	< 0.2	86%	70%	130%	88%	80%	120%	73%	70%	130%
Cyanide	951249		<0.040	<0.040	NA	< 0.040	104%	70%	130%	86%	80%	120%	91%	70%	130%
Mercury	939194	939194	<0.10	<0.10	NA	< 0.10	110%	70%	130%	102%	80%	120%	100%	70%	130%
Electrical Conductivity	939194	939194	1.51	1.50	0.5%	< 0.005	100%	90%	110%						
Sodium Adsorption Ratio	939194	939194	12.2	12.0	1.7%	NA									
pH, 2:1 CaCl2 Extraction	951249		9.00	9.00	0.0%	NA	100%	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

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

Selenium Reference recovery is outside method's acceptance limit by more than an absolute maximum of 10% however, all other QCs i.e. duplicate, blank, blank spike and matrix spike are within method's QC acceptance criteria.

Certified By:





#### **QA** Violation

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T574091
ATTENTION TO: Alessandro Pellerito

RPT Date: Nov 13, 2020			REFEREN	ICE MAT	ERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPII	KE
PARAMETER Sample Id Sample I		Sample Description	Measured	Accep Limi	ite	Recovery	Lin	ptable nits	Recovery	Lin	ptable nits
			Value	Lower	Upper	, ,		Upper	,	Lower	Upper

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

Selenium 939194 BH D44 SS1 142% 70% 130% 103% 80% 120% 105% 70% 130%

Comments: NA signifies Not Applicable.

PROJECT: TP115086

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 pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

Selenium Reference recovery is outside method's acceptance limit by more than an absolute maximum of 10% however, all other QCs i.e. duplicate, blank, blank spike and matrix spike are within method's QC acceptance criteria.

# **Method Summary**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086

AGAT WORK ORDER: 20T574091

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE.		SAMFLED BT.	T			
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE			
Soil Analysis						
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS			
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS			
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS			
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS			
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS			
Boron (Hot Water Extractable)	MET-93-6104	modified from EPA 6010D and MSA PART 3, CH 21	ICP/OES			
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS			
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS			
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS			
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS			
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS			
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS			
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS			
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS			
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS			
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS			
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS			
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS			
Zinc	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS			
Chromium, Hexavalent	INOR-93-6068	modified from EPA 3060 and EPA 7196	SPECTROPHOTOMETER			
Cyanide	INOR-93-6052	MOE CN-3015 & E 3009 A;SM 4500 CN	TECHNICON AUTO ANALYZER			
Mercury	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	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	SICP/OES			
pH, 2:1 CaCl2 Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	PH METER			



**Laboratory Use Only** Work Order #: 20T5 74.09

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain	of Cus	tody	Record
Chain	or Cus	toay	Kecor

Report Information Company:	mation: Wood					Regulatory Requirements:		No F	Regula	tory Re	quire	eme	nt	Cı	ustody	/ Seal	/( Inta		□Y ₀	es	1 1	ONO ONE	ON
Contact:	Alessandro Pellerito					<u>L</u>								N	otes:							-	
Address:	50 Vogell Road Units	3 and 4			- 1		er Use			Regulatio	1558			Tu	rnai	OHE	d T	ima	/TA1	r\ pc	- Culie	nd:	
	Richmond Hill, ON					Table 2 Indicate One ☐ Sa ☑Ind/Com ☐ ☐ Sa	nitary			CCME				Turnaround Time (TAT) Required:  Regular TAT									
	6479826220			_	- 1	☐Res/Park ☐St	orm.		_				- 40	Re	gula	r TA	Т		<b>7</b> 5	to 7 E	Busines	s Days	
Phone: Reports to be sent to: 1_ Email:	a.pellerito@woodplc.c	eom				☐ Agriculture  Soil Texture (Check One) Region			(	Prov. Wate Objectives Other	er Qua (PWQ	ity O)		Ru		AT (Ru 3 Bus		charges	_ 2	2 Busin	ness		ext Busines
2. Email:	shami.malla@woodplo	c.com				☑Coarse ☐MIS	cate One			Indicate	One	_			Ц,	Days				Days		Da Ba May Apı	ау
Project Inform	mation:					Is this submission for a		R	anort	Guldell	ne oi							·					F-37-
Project:	TP115086					<b>Record of Site Condition?</b>				te of A					-	Ple	ase j	orovid	le prio	r notif	ication	for rush 1	TAT
Site Location:	SP47					☐ Yes ☑ No			Yes		] N				*	TAT is	excl	usive (	of wee	kends	and sta	atutory h	olidays
Sampled By:	Moctar Diallo								103		] 14	0			For 'S	ame	Day'	analy	sis, pl	ease (	ontact	your AG	AT CPM
AGAT Quote #:	305848	PO:							O. Rej	153							T		100			T	
	Please note: If quotation num	nber is not provided, client	will be billed full pric	e for analysis.		Sample Matrix Legend  B Biota	C.S.		des)										PCBs				
Invoice Information Company:			Bill To Same:	Yes 🗹 No		GW Ground Water O Oil	Field Filtered - Metals, Hg,		(excl. Hydrides) tals (Incl. Hydrides)	S P		sls	TKN	ПТНМ					S B(a)P				
Contact:	Shami Malla					P Paint S Soil	Ξ.	l s		- D		Meta	ONH, CINO,	□ BTEX				clor	□ ABNs				
Address:	dm. n. m.				100	S Soil SD Sediment	terec	ganie	53 Metals (excl		_	mo	ĘŠ.					☐ Aroclors	S S				
Email:	GTA EAST@woodpl	c.com				SW Surface Water	ield Fili	and Inorganics	Is 153 Metals Metals 153 Me	DEC DE	lls Scan	on/Cust	NO I	□ voc	- F4					۵			
Samp	le Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix		Y/N	Metals a	☐ All Metals ☐ 15 ☐ Hydride Metals ☐	ORPs:	Full Metals	Regulation/Custom Metals	Nutrients: ☐ TP ☐ ☐ NO, ☐ NO, ☐ □ NO, ☐ □ NO, ☐ □ NO, ☐ □ NO, ☐ □ NO, ☐ □ NO, ☐ □ NO, ☐ □ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐	Volatiles:	PHCs F1.	ABNs	PAHS	PCBs: Total	TCLP: M&I	Sewer Use			
BH D43 SS2		11 Feb 2020	1:10	1	S	HOLD																	
BH D43 SS4		11 Feb 2020	1:30	1	S	HOLD																	
BH D44 SS1		11 Feb 202	2:10	1	S										1		-					++	
BH D45 SS2		11 Feb 202	3:06	1	S	HOLD		1									-					++	
BH D47 SS1		11 Feb 202	11:35	1	s	HOLD							-	-			+	+	+	1		++	
BH D47 SS4		11 Feb 202	11:45	1	S												-	+					
BH D48 SS2		11 Feb 202	12:40	1	S	HOLD									-	+	-	+	+		- 12	-	
BH D51 SS2		11 Feb 202	11:10	1	S	HOLD		-				-					-			$\vdash$		+++	
BH D55 SS2		11 Feb 202	9:10	1	S	TIOLD .						+				-	-	4	+	$\vdash$		++	
		11 Feb 202	9:45	1	S	HOLD		Ø		-	-	-		-	-	+	-	+					-
BH D55 SS4				1	S	HOLD	-	-				-						+					1
		1   Heb 202						III .			1												
BH D55 SS4 BH D56 SS3 Samples Relinquished By (Pri	int Name and Sign):	11 Feb 202		[Tio		0/1	1						_	_		_		-	1				4
BH D56 SS3 Samples Relinquished By (Pri	iten	11 Feb 202	Date Feb 12	, 2020 Tin		Sampler Received By (Print Name and Sign):					1 1	Date	1/1	3/9	7) Tin	<u>ี</u> ไก	1	3					
BH D56 \$S3	ite	11 Feb 202	Date		ne	0/1	1					Date	610	3/2	7 Tin	D	18	3		Page		_ of	



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4
RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Alessandro Pellerito

PROJECT: TP115086 AGAT WORK ORDER: 20T574535

SOIL ANALYSIS REVIEWED BY: Yris Verastegui, Report Reviewer

DATE REPORTED: Nov 13, 2020

PAGES (INCLUDING COVER): 11 VERSION*: 1

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

*Notes	

#### Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
  incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other
  third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
  services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
  merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
  contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Page 1 of 11

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. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.



## Certificate of Analysis

AGAT WORK ORDER: 20T574535

PROJECT: TP115086

CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

5835 COOPERS AVENUE

MISSISSAUGA, ONTARIO

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

ATTENTION TO: Alessandro Pellerito SAMPLED BY:

 	 <b>D</b> -	- 1	 	/	 D1	\	

Corrosivity Package (Excl. Redox)								
DATE RECEIVED: 2020-02-14							DATE REPORTED: 2020-11-13	
				SAMPL	E DESCRIPTION:	BH D53 SS3		
					SAMPLE TYPE:	Soil		
				1	DATE SAMPLED:	2020-02-12		
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	940847		
Chloride (2:1)	μg/g		4	2020-02-24	2020-02-24	660		
Sulphate (2:1)	μg/g		4	2020-02-24	2020-02-24	31		
pH (2:1)	pH Units		NA	2020-02-02	2020-02-02	7.97		
Resistivity (2:1) (Calculated)	ohm.cm		1	2020-02-21	2020-02-21	763		

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

940847 EC, pH, Chloride and Sulphate were determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water: 1 part soil). Resistivity is a calculated parameter.

Elevated RDLs indicate the degree of sample dilutions prior to the analysis to keep analytes within the calibration range, reduce matrix interference and/or to avoid contaminating the instrument.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Iris Verastegui



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

## Certificate of Analysis

AGAT WORK ORDER: 20T574535

PROJECT: TP115086

SAMPLED BY:

ATTENTION TO: Alessandro Pellerito

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

DATE RECEIVED: 2020-02-14								[	DATE REPORTE	ED: 2020-11-13	
				SAMPL	E DESCRIPTION:	BH D31 SS3	BH D35 SS2	BH D37 SS4	BH D41 SS3	BH D50 SS3	BH D57 SS1
					SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil
					DATE SAMPLED:	2020-02-12	2020-02-12	2020-02-12	2020-02-12	2020-02-12	2020-02-12
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	940831	940834	940838	940843	940845	940849
Antimony	μg/g	40	8.0	2020-02-21	2020-02-21	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Arsenic	μg/g	18	1	2020-02-21	2020-02-21	4	5	5	4	4	4
Barium	μg/g	670	2	2020-02-21	2020-02-21	63	62	76	63	70	126
Beryllium	μg/g	8	0.5	2020-02-21	2020-02-21	0.5	<0.5	<0.5	<0.5	<0.5	0.8
Boron	μg/g	120	5	2020-02-21	2020-02-21	6	8	9	8	8	7
Boron (Hot Water Extractable)	μg/g	2	0.10	2020-02-21	2020-02-21	0.22	0.41	0.25	0.43	<0.10	0.41
Cadmium	μg/g	1.9	0.5	2020-02-21	2020-02-21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	μg/g	160	5	2020-02-21	2020-02-21	19	19	19	17	17	28
Cobalt	μg/g	80	0.5	2020-02-21	2020-02-21	9.9	8.2	8.5	6.9	8.4	12.5
Copper	μg/g	230	1	2020-02-21	2020-02-21	21	19	20	16	19	20
Lead	μg/g	120	1	2020-02-21	2020-02-21	11	9	11	7	9	14
Molybdenum	μg/g	40	0.5	2020-02-21	2020-02-21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel	μg/g	270	1	2020-02-21	2020-02-21	22	18	19	15	18	24
Selenium	μg/g	5.5	0.4	2020-02-21	2020-02-21	<0.4	<0.4	<0.4	<0.4	<0.4	0.6
Silver	μg/g	40	0.2	2020-02-21	2020-02-21	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	μg/g	3.3	0.4	2020-02-21	2020-02-21	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Uranium	μg/g	33	0.5	2020-02-21	2020-02-21	<0.5	0.5	0.6	0.5	0.5	0.6
Vanadium	μg/g	86	1	2020-02-21	2020-02-21	27	25	25	23	24	38
Zinc	μg/g	340	5	2020-02-21	2020-02-21	56	47	48	42	43	65
Chromium, Hexavalent	μg/g	8	0.2	2020-02-20	2020-02-20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cyanide	μg/g	0.051	0.040	2020-02-24	2020-02-24	<0.040	<0.040	< 0.040	<0.040	< 0.040	< 0.040
Mercury	μg/g	3.9	0.10	2020-02-21	2020-02-21	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Electrical Conductivity	mS/cm	1.4	0.005	2020-02-21	2020-02-21	1.28	2.02	1.28	1.13	1.37	1.16
Sodium Adsorption Ratio	NA	12	NA	2020-02-21	2020-02-21	2.11	19.9	5.47	3.64	17.5	3.59
pH, 2:1 CaCl2 Extraction	pH Units	5.0-9.0	NA	2020-02-24	2020-02-24	7.66	7.73	7.70	7.71	7.90	8.00

Certified By:

Yris Verastegui

5835 COOPERS AVENUE

MISSISSAUGA, ONTARIO CANADA L4Z 1Y2

http://www.agatlabs.com

TEL (905)712-5100 FAX (905)712-5122



AGAT WORK ORDER: 20T574535

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

940831-940849

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:

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

DATE RECEIVED: 2020-02-14 DATE REPORTED: 2020-11-13

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

EC was 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. SAR is a calculated

parameter.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Tris Verastegui



#### **Exceedance Summary**

AGAT WORK ORDER: 20T574535

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

ATTENTION TO: Alessandro Pellerito

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
940834	BH D35 SS2	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity	mS/cm	1.4	2.02
940834	BH D35 SS2	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Sodium Adsorption Ratio	NA	12	19.9
940845	BH D50 SS3	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Sodium Adsorption Ratio	NA	12	17.5



#### Quality Assurance

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T574535

PROJECT: TP115086

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

	Soil Analysis  PPT Date: Nov 13, 2020 DUPLICATE REFERENCE MATERIAL METHOD BLANK SPIKE MATRIX SPIKE														
RPT Date: Nov 13, 2020				DUPLICAT	E		REFERE	NCE MA	TERIAL	METHOD	BLANK	( SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Value		eptable mits	Recovery		eptable mits	Recovery		eptable mits
		lu					value	Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inor	ganics (Soi	I)													
Antimony	942696		<0.8	<0.8	NA	< 0.8	135%	70%	130%	101%	80%	120%	77%	70%	130%
Arsenic	942696		6	6	0.0%	< 1	113%	70%	130%	103%	80%	120%	105%	70%	130%
Barium	942696		49	52	5.9%	< 2	110%	70%	130%	97%	80%	120%	106%	70%	130%
Beryllium	942696		0.6	0.6	NA	< 0.5	86%	70%	130%	105%	80%	120%	84%	70%	130%
Boron	942696		12	13	NA	< 5	73%	70%	130%	99%	80%	120%	79%	70%	130%
Boron (Hot Water Extractable)	940831	940831	0.22	0.21	NA	< 0.10	117%	60%	140%	92%	70%	130%	91%	60%	140%
Cadmium	942696		<0.5	<0.5	NA	< 0.5	114%	70%	130%	100%	80%	120%	101%	70%	130%
Chromium	942696		21	22	NA	< 5	101%	70%	130%	92%	80%	120%	93%	70%	130%
Cobalt	942696		10.7	11.1	3.7%	< 0.5	85%	70%	130%	88%	80%	120%	86%	70%	130%
Copper	942696		36	37	2.7%	< 1	93%	70%	130%	99%	80%	120%	84%	70%	130%
Lead	942696		11	11	0.0%	< 1	105%	70%	130%	92%	80%	120%	88%	70%	130%
Molybdenum	942696		< 0.5	< 0.5	NA	< 0.5	94%	70%	130%	96%	80%	120%	95%	70%	130%
Nickel	942696		23	23	0.0%	< 1	93%	70%	130%	97%	80%	120%	91%	70%	130%
Selenium	942696		< 0.4	< 0.4	NA	< 0.4	113%	70%	130%	98%	80%	120%	99%	70%	130%
Silver	942696		<0.2	<0.2	NA	< 0.2	102%	70%	130%	100%	80%	120%	94%	70%	130%
Thallium	942696		<0.4	<0.4	NA	< 0.4	96%	70%	130%	99%	80%	120%	96%	70%	130%
Uranium	942696		0.7	0.7	NA	< 0.5	98%	70%	130%	103%	80%	120%	104%	70%	130%
Vanadium	942696		27	28	3.6%	< 1	88%	70%	130%	83%	80%	120%	85%	70%	130%
Zinc	942696		57	58	1.7%	< 5	105%	70%	130%	96%	80%	120%	90%	70%	130%
Chromium, Hexavalent	940391		< 0.2	< 0.2	NA	< 0.2	86%	70%	130%	88%	80%	120%	89%	70%	130%
Cyanide	946392		<0.040	<0.040	NA	< 0.040	101%	70%	130%	90%	80%	120%	85%	70%	130%
Mercury	942696		<0.10	<0.10	NA	< 0.10	98%	70%	130%	88%	80%	120%	88%	70%	130%
Electrical Conductivity	940831	940831	1.28	1.27	0.8%	< 0.005	100%	90%	110%	NA			NA		
Sodium Adsorption Ratio 946727 0.860 0.883 2.6% NA NA NA NA															
pH, 2:1 CaCl2 Extraction	940843	940843	7.71	7.72	0.1%	NA	100%	80%	120%	NA			NA		
up to 10% absolute and it is conside	omments: QA Qualifier for metals – Antimony: For a multi-element scan for lab control standards and matrix spikes, up to 10% of analytes may exceed the quoted limits by o to 10% absolute and it is considered acceptable.														

Chloride (2:1) 940831 940831 521 534 2.5% < 2 92% 80% 120% 112% 80% 120% NA 70% 130% Sulphate (2:1) 940831 940831 217 218 0.5% < 2 103% 80% 120% 107% 80% 120% 105% 70% 130% pH (2:1) 940847 940847 7.97 8.05 1.0% NA 100% 90% 110% 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

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

Matrix spike: Spike level < native concentration. Matrix spike acceptance limits do not apply.

Certified By:

Tris Verástegui

AGAT QUALITY ASSURANCE REPORT (V1)

Page 6 of 11



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T574535

PROJECT: TP115086

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

			Soil	Anal	ysis	(Con	tinue	d)							
RPT Date: Nov 13, 2020				DUPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPII	KE
PARAMETER	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		otable nits	Recovery	Lin	ptable nits	Recovery	Lin	ptable nits	
		ld		'			Value	Lower	Upper		Lower	Upper		Lower	Upper



#### **QA** Violation

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T574535
ATTENTION TO: Alessandro Pellerito

RPT Date: Nov 13, 2020			REFEREN	ICE MAT	ERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPII	KE
PARAMETER	Sample Id	Sample Description	Measured	Accep Limi	ite	Recovery	Lin	ptable nits	Recovery	Lin	ptable nits
			Value	Lower	Upper	, ,		Upper	,	Lower	Upper

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

PROJECT: TP115086

Antimony BH D31 SS3 135% 70% 130% 101% 80% 120% 77% 70% 130%

Comments: QA Qualifier for metals – Antimony: For a multi-element scan for lab control standards and matrix spikes, up to 10% of analytes may exceed the quoted limits by up to 10% absolute and it is considered acceptable.

# Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T574535

PROJECT: TP115086

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

Chloride (2:1)   INOR-33-6004   McKeague 4.12 & SM 4110 B   DN CHROMATOGRAPH	SAMPLING SITE:		SAMPLED BY:	
Chloride (2:1)   INOR-33-6004   McKeague 4.12 & SM 4110 B   DN CHROMATOGRAPH	PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
NOR-93-8004   McKeague 4.12 & SM 4110 B   DIN CHROMATOGRAPH   PH 2:11   INOR 93-6031   MSA part 3 & SM 4500-H+ B   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH METER   PH M	Soil Analysis			
MSA part 3 & SM 4500-H+ B	Chloride (2:1)	INOR-93-6004	_	ION CHROMATOGRAPH
Resistivity (2:1) (Calculated)         INOR-83-6036         McKeague 4.12, SM 2510 B.SSA #5 Part 3         CALCULATION           Antimony         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC Modified from EPA 3050B and EPA 6020B and ON MOECC Modified from EPA 3050B and EPA 6020B and ON MOECC MOEMS modified from EPA 3050B and EPA 6020B and ON MOECC MOEMS modified from EPA 3050B and EPA 6020B and ON MOECC MOEMS modified from EPA 3050B and EPA 6020B and ON MOECC MOEMS modified from EPA 3050B and EPA 6020B and ON MOECC MOEMS modified from EPA 3050B and EPA 6020B and ON MOECC MOEMS modified from EPA 3050B and EPA 6020B and ON MOECC MOEMS modified from EPA 3050B and EPA 6020B and ON MOECC MOEMS modified from EPA 3050B and EPA 6020B and ON MOECC MOEMS modified from EPA 3050B and EPA 6020B and ON MOEC		INOR-93-6004	· ·	
MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6104   MET-93-6104   MET-93-6104   MET-93-6104   MET-93-6104   MET-93-6104   MET-93-6104   MET-93-6104   MET-93-6104   MET-93-6103   MET-93-6104   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103   MET-93-6103	pH (2:1)	INOR 93-6031	•	PH METER
Arsenic MET-93-6103 6020B and ON MOECC ICP-MS Arsenic MET-93-6103 modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and EPA 6020B and ON MOECC modified from EPA 3050B and	Resistivity (2:1) (Calculated)	INOR-93-6036		CALCULATION
Arisenic         MET-93-6103         6020B and ON MOECC         ICP-MS           Barium         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Boron         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Boron (Hot Water Extractable)         MET-93-6104         modified from EPA 3050B and EPA 6010D and MSA PATT 3, CH 21         ICP-MS           Cadmium         MET-93-6103         modified from EPA 3050B and EPA 6010D and MSA 6020B and ON MOECC         ICP-MS           Chromium         MET-93-6103         modified from EPA 3050B and EPA 6010D and MSA 6020B and ON MOECC         ICP-MS           Chromium         MET-93-6103         modified from EPA 3050B and EPA 6010D and MSA 6020B and ON MOECC         ICP-MS           Cobalt         MET-93-6103         modified from EPA 3050B and EPA 6010D and MSA 6020B and ON MOECC         ICP-MS           Copper         MET-93-6103         modified from EPA 3050B and EPA 6020B and EPA 6020B and ON MOECC         ICP-MS           Molybdenum         MET-93-6103         modified from EPA 3050B and EPA 6020B and EPA 6020B and ON MOECC         ICP-MS           Nickel         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Silver         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-	Antimony	MET-93-6103		ICP-MS
Barlum         MET-93-6103         6020B and ON MOECC         ICP-MS           Boron         MET-93-6103         modified from EPA 3050B and EPA 6020B and EPA 6020B and ON MOECC         ICP-MS           Boron (Hot Water Extractable)         MET-93-6104         modified from EPA 6010D and MSA PAT 3, CH 21         ICP-MS           Cadmitum         MET-93-6103         6020B and ON MOECC         ICP-MS           Chromium         MET-93-6103         6020B and ON MOECC         ICP-MS           Chromium         MET-93-6103         modified from EPA 3050B and EPA 6020B and EPA 6020B and ON MOECC         ICP-MS           Cobalt         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Copper         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Molybdenum         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Molybdenum         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Nickel         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Selenium         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Siliver         MET-93-6103         modified from EPA 3050B and EPA 6020B	Arsenic	MET-93-6103		ICP-MS
Beryllulm         MET-93-6103         6020B and ON MOECC         ICP-MS           Boron         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Boron (Hot Water Extractable)         MET-93-6104         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Cadmium         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Chromium         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Cobalt         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Copper         MET-93-6103         modified from EPA 3050B and EPA 6020B and EPA 6020B and ON MOECC         ICP-MS           Molybdenum         MET-93-6103         modified from EPA 3050B and EPA 6020B and EPA 6020B and ON MOECC         ICP-MS           Molybdenum         MET-93-6103         modified from EPA 3050B and EPA 6020B and EPA 6020B and ON MOECC         ICP-MS           Nickel         MET-93-6103         modified from EPA 3050B and EPA 6020B and EPA 6020B and ON MOECC         ICP-MS           Silver         MET-93-6103         modified from EPA 3050B and EPA 6020B and EPA 6020B and ON MOECC         ICP-MS           Silver         MET-93-6103         modified from EPA 3050B and EPA 6020B and EPA 6020B and ON MOECC         ICP-MS <td>Barium</td> <td>MET-93-6103</td> <td></td> <td>ICP-MS</td>	Barium	MET-93-6103		ICP-MS
Boron         MET-93-6103         6020B and ON MOECC         ICP-MS           Boron (Hot Water Extractable)         MET-93-6104         modified from EPA 8010D and MSA PART 3, CH 21         ICP/OES           Cadmium         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Chromium         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Cobalt         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Copper         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Lead         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Molybdenum         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Nickel         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Selenium         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Silver         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Uranium         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Vanadium         MET-93-6103         modifi	Beryllium	MET-93-6103		ICP-MS
PART 3, CH 21   CP-MS	Boron	MET-93-6103		ICP-MS
Chromium	Boron (Hot Water Extractable)	MET-93-6104		ICP/OES
Chromium         MET-93-6103         6020B and ON MOECC         ICP-MS           Cobalt         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Copper         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Lead         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Molybdenum         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Nickel         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Selenium         MET-93-6103         modified from EPA 3050B and EPA 6020B and EPA 6020B and ON MOECC         ICP-MS           Silver         MET-93-6103         modified from EPA 3050B and EPA 6020B and EPA 6020B and ON MOECC         ICP-MS           Uranium         MET-93-6103         modified from EPA 3050B and EPA 6020B and EPA 6020B and ON MOECC         ICP-MS           Uranium         MET-93-6103         modified from EPA 3050B and EPA 6020B and EPA 6020B and ON MOECC         ICP-MS           Uranium         MET-93-6103         modified from EPA 3050B and EPA 6020B and EPA 6020B and ON MOECC         ICP-MS           Zinc         MET-93-6103         modified from EPA 3050B and EPA 7196         ICP-MS           Chromium, Hexavalent <td>Cadmium</td> <td>MET-93-6103</td> <td></td> <td>ICP-MS</td>	Cadmium	MET-93-6103		ICP-MS
CP-MS	Chromium	MET-93-6103		ICP-MS
Copper	Cobalt	MET-93-6103		ICP-MS
Met	Copper	MET-93-6103		ICP-MS
Met	Lead	MET-93-6103		ICP-MS
MET-93-6103   6020B and ON MOECC   ICP-MS	Molybdenum	MET-93-6103		ICP-MS
Selenium         MET-93-6103         6020B and ON MOECC         ICP-MS           Silver         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Thallium         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Uranium         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Vanadium         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Zinc         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Chromium, Hexavalent         INOR-93-6068         modified from EPA 3060 and EPA 7196         SPECTROPHOTOMETER           Cyanide         INOR-93-6052         MOE CN-3015 & E 3009 A;SM 4500 CN         TECHNICON AUTO ANALYZER CN           Mercury         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Electrical Conductivity         INOR-93-6036         McKeague 4.12 & 3.26 & EPA SW-846 6010C         ICP-MS           Sodium Adsorption Ratio         INOR-93-6007         McKeague 4.12 & 3.26 & EPA SW-846 6010C         ICP/OES	Nickel	MET-93-6103		ICP-MS
MET-93-6103   6020B and ON MOECC   ICP-MS	Selenium	MET-93-6103		ICP-MS
Inallium         MET-93-6103         6020B and ON MOECC         ICP-MS           Uranium         MET-93-6103         6020B and ON MOECC         ICP-MS           Vanadium         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Zinc         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Chromium, Hexavalent         INOR-93-6068         modified from EPA 3060 and EPA 7196         SPECTROPHOTOMETER           Cyanide         INOR-93-6052         MOE CN-3015 & E 3009 A;SM 4500 CN         TECHNICON AUTO ANALYZER           Mercury         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         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	Silver	MET-93-6103		ICP-MS
Oranium         MET-93-6103         6020B and ON MOECC         ICP-MS           Vanadium         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Zinc         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         ICP-MS           Chromium, Hexavalent         INOR-93-6068         modified from EPA 3060 and EPA 7196         SPECTROPHOTOMETER           Cyanide         INOR-93-6052         MOE CN-3015 & E 3009 A;SM 4500 CN         TECHNICON AUTO ANALYZER           Mercury         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         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	Thallium	MET-93-6103		ICP-MS
Vanadium         MET-93-6103         6020B and ON MOECC         ICP-MS           Zinc         MET-93-6103         6020B and ON MOECC         ICP-MS           Chromium, Hexavalent         INOR-93-6068         modified from EPA 3050B and EPA 7196         SPECTROPHOTOMETER           Cyanide         INOR-93-6052         MOE CN-3015 & E 3009 A; SM 4500 CN         TECHNICON AUTO ANALYZER           Mercury         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         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	Uranium	MET-93-6103		ICP-MS
CP-MS   Chromium, Hexavalent   INOR-93-6068   INOR-93-6068   MOE CN-3015 & E 3009 A;SM 4500   TECHNICON AUTO ANALYZER	Vanadium	MET-93-6103	00000 101110500	ICP-MS
Controllium, Hexavalent         INOR-93-6068         7196         SPECTROPHOTOMETER           Cyanide         INOR-93-6052         MOE CN-3015 & E 3009 A;SM 4500 CN         TECHNICON AUTO ANALYZER           Mercury         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         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	Zinc	MET-93-6103		ICP-MS
Cyanide         INOR-93-6052         CN         TECHNICON A010 ANALYZER           Mercury         MET-93-6103         modified from EPA 3050B and EPA 6020B and ON MOECC         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	Chromium, Hexavalent	INOR-93-6068		SPECTROPHOTOMETER
MET-93-6103 6020B and ON MOECC Electrical Conductivity INOR-93-6036 McKeague 4.12, SM 2510 B EC METER McKeague 4.12 & 3.26 & EPA SW-846 6010C	Cyanide	INOR-93-6052		TECHNICON AUTO ANALYZER
Sodium Adsorption Ratio INOR-93-6007 McKeague 4.12 & 3.26 & EPA SW-846 ICP/OES 6010C	Mercury	MET-93-6103		ICP-MS
Sodium Adsorption Ratio INOR-93-0007 6010C	Electrical Conductivity	INOR-93-6036		
pH, 2:1 CaCl2 Extraction INOR-93-6031 MSA part 3 & SM 4500-H+ B PH METER	Sodium Adsorption Ratio	INOR-93-6007		CP/OES
	pH, 2:1 CaCl2 Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	PH METER





5835 Coopers Avenue

Mississauga, Ontario L4Z 1Y2 Ph: 905.712,5100 Fax: 905.712.5122 webearth.agatlabs.com

Chain	of	Custody	Record
-------	----	---------	--------

Report Information Company:	mation: Wood					se Drinking Water Chain of Custody For Regulatory Requirements (Please check all applicable boxes)								1				tures:	-	5.	01	5.1	15.2
Company:	Alessandro Pellerito					(Please check all applicable boxes)		1110	wegi	iiatory F	requ	irem	ent	1.1			eal in	tact:		Yes		□No	
Address:	50 Vogell Road Units	3 and 4				Regulation 153/04	wer Use		Ьπ	Regulati	on 55	0		_	Note	S:							
	Richmond Hill, ON	J Lind 4		_		Table 2 Indicate One			l.		011 32	О		T	urn	aroi	und	Tim	e (T	AT)	Reau	iired:	
Dhone	6479826220					☑Ind/Com ☐Res/Park	Sanitary		-	ССМЕ			- 7		egu								
Phone:  Reports to be sent to:  1. Email:	a.pellerito@woodplc.c	com				☐Agriculture  Soil Texture (Check One)  Region	itorm			Prov. Wa	ter Qu es (PV	ality /QO)			_			Surcharg			/ Busi	ness Da	ays
2. Email:	shami.malla@woodplo	c.com				☑Coarse Inc	licate One		-	_Other			- V			3 B	usine s	ss		2 Bu Days	siness	Ε	Next Busine
Project Inform	mation:					Is this submission for a	SA .	- 1			te One					OR	Date	Requi	red (F	Rush S	Surcha	rges Ma	y Apply):
Project:	TP115086				- 11	Record of Site Condition?		R	epor	t Guidel	Ine d	n		1									
Site Location:	SP47					☐ Yes ☑ No				ate of A						F *TAT	lease is ex	provi	de pr	lor no	tificati	on for r	ush TAT ory holidays
Sampled By:	Moctar Diallo					□ les ☑ NO			] Ye	s [	1	10											
AGAT Quote #:	305848	PO:					1	T	0. R	eg 153	+	_		-	TOI	Jann	e Day	anai	ysis, į	please	conta	act you	AGAT CPM
	Please note: If quotation num	nber is not provided, client	will be billed full pric	e for analysis.		Sample Matrix Legend  B Biota	CrZ													ZPCBs			
Invoice Inform	nation:		Bill To Same:	Yes 🗷 N	0 🗆	GW Ground Water	Hg. (		Hydrides)					-		1 8				G.			4 1 1
Company:	-					O Oil	tals,		Hydri	S	1		TKN	THM					į	<b>1</b> B(a)P			
Contact:	Shami Malla					P Paint	Filtered - Metals,					stals	_ o_	M M				2		3Ns			
Address:	CTA FACTO					S Soil	Je d	anics	letals 53 Me	FOC D		M Me	NO3+NO2	O BTEX				roclo	Pesticides	∐ ABNs			
Email:	GTA EAST@woodple	c.com			11	SD Sediment SW Surface Water	d Filte	Inorganics	] 153 A	WS F	Scan	Sustor	<u>م</u> 🗆	□ voc				□ Aroclors	le Pe	SOO Z			
Sample	e Identification	Date	Time	# of	Sample		Field	als and	☐ All Metals ☐ 153 Metals (excl	s: DB-HWS	als	Regulation/Custom Metals	Nutrients:	Volatiles:	F1-F4			PCBs: D Total	ochlo Mg.	L Use			
BH D31 SS2		Sampled	Sampled	Containers	Matrix	Special Instructions	Y/N	Metals	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	ORPs: [	Ē	Regu	N S	/olat	PHCs	ABNs	PAHS	CBs	Urgar TCLP-1	ewe			
BH D31 SS3		12 Feb 2020	2:30	1	S	HOLD									_		-		+	- 0			
BH D32 SS1		12 Feb 2020		1	S			V									-		+	+	-	-	
BH D33 SS2		12 Feb 202	3:20	1	S	HOLD											-	-	+	+			
BH D35 SS2		13 Feb 202	9:30	1	S	HOLD											-		+	+	+++	-	
BH D35 SS2		12 Feb 202	1:10	1	S			V	-								-	-	+	-			
		12 Feb 202	1:25	1	S	HOLD											-	-	+	+			
BH D36 SS1 BH D37 SS1		12 Feb 202	2:00	1	S	HOLD						-	-		-	-	-	-	-	-		_	
		12 Feb 202	10:10	1	S	HOLD						-	-			+	-	-	_	-			
BH D37 SS4		12 Feb 202	10:25	1	S			Ø					-		-1	4	-	-					
BH D38 SS2		13 Feb 202	10:45	1	S	HOLD		N.	-				-	_									
BH D39 SS2	10	12 Feb 202	12:35	1	S	HOLD					-						14						
amples Relinquished By (Print	130 1 110 11	1./	Date	Time	9	Samples Received By (Print Name and Sign)		-	1														
Alessandro Pellerito amples Rejinquished By (Print	Name and Sign):	1	Feb 13,		00PM	I A SON	00	10-	2/10	1		Date			Tim	1	1	5					
amples Helinguished By (Print	0 20 20/02	414		7	:35	Samples Received By (Print Name and Signt:						Date			Tim	n	_	-		_	-1		2
The same same same and strains	TRUMP CHU SIZIII;		Date	Time		Samples Received By (Print Name and Sign):	-		-			Date			Tim	in .				Page	_	of	
			Tr.	1		1									100			N	Vo:				

Laboratory Use Only
Work Order #: 20T5 74535

Work Order #:

Cooler Quantity:



5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2

Ph: 905.712.5100 Fax: 905.712.5122 webearth.agatlabs.com **Laboratory Use Only** 

Work Order #: _

Cooler Quantity:

Chain of Custody Pecord

Report Inforn	nation:					Pagulatory Paguiromento		_	_											5 1	21:	5.1	5.1
Company:	Wood					Regulatory Requirements: (Please check all applicable boxes)		No I	Regula	atory Re	equir	eme	nt			-	al Inta	ect:		Yes		□No	□N/A
Contact:	Alessandro Pellerito					Regulation 153/04		1							lotes:								
Address:	50 Vogell Road Units	s 3 and 4				Table 2	er Use		Ц	Regulatio	n 558		- 1	Tu	rna	rou	nd 1	[ime	- (TA	T) B	equir	od:	
	Richmond Hill, ON					Indicate One ☐Sa ☑Ind/Com	nitary			CCME				1									
Phone:	6479826220	Fax:				□Res/Park □St	orm			Prov. Wat	25 Out	. 124.				ar T/					Busine	ss Days	
Reports to be sent to:  1. Email:	a.pellerito@woodplc.					Agriculture  Soil Texture (Check One)  Region	cate One	_	'	Objective: Other				Ru			sines		es Apply	) 2 Bus	iness		Novt Ducinas
2. Email:	shami.malla@woodpl	lc.com				☑Coarse ☐MIS	_			To dia a	- 0					Days				Days			Next Busines: Day
Project Inforn	nation:					Is this submission for a		R	anort	Indicat Guldell		h				UKL	Date H	Requir	ed (R	ush Sı	ırcharge	es May A	pply):
Project:	TP115086					Record of Site Condition?				te of A						PI	ease	provi	de ori	or not	fication	for rush	TAT
Site Location:	SP47					☐ Yes     ✓ No			Yes		] N				,	TAT is	s excl	usive	of we	ekena	s and s	tatutory	holidays
Sampled By:	Moctar Diallo								103		1 14	U			For 'S	Same	Day'	analy	ysle, p	lease	contac	t your A	GAT CPM
AGAT Quote #:	305848	PO:				Sample Matrix Legend			O. Rej	153					-				-	-			
	Please note: If quotation nu	imber is not provided, client	will be billed full pric	e for analysis.		B Biota	Crv		rides) Hydrides)										E COOL				
Invoice Inform	nation:		Bill To Same:	Yes 🗹 No		GW Ground Water	Filtered - Metals, Hg,		drides Hydr				-	Σ					9	700			
Company:						<b>O</b> Oil	stals		H. Hy	S CN		S	TKN	THM						1			
Contact:	Shami Malla					P Paint	Ž	y,	ls (exc	등 다		fetal	1, C	П втех				lors :	Pesticides	ě			
Address:	CEA FACE					S Soil SD Sediment	ered	anic	Metal 153 N	50.00		E	N S					□ Aroclors	e stic	]			
Email:	GTA EAST@woodp	olc.com				SW Surface Water	Field Filt	d Inorganics	☐ 153	□ B-HWS	Scan	/Custo	0,0	□ voc	4								
Sample	e Identification	Date Sampled	Time Sampled	# of Containers	Sample	Comments/ Special Instructions	Y/N	Metals and	☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydrides ☐ Hydride Metals ☐ 153 Metals (Incl. Hydric	ORPs: B+	Full Metals Scan	Regulation/Custom Metals	Nutrients: CIP CINH, CONO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CINO, CIN	Volatiles:	PHCs F1 - I	ABNs	PAHs	PCBs: Total	Organochiorine	Sewer Use			
BH D40 SS2		13 Feb 2020	10:55	1	S	HOLD		Σ		0 0	교	œ	ž 🗆	8	효	AB	₫	8 6	5 2	Se			
BH D40 SS4		13 Feb 2020		1	S	HOLD		-															
BH D41 SS3		12 Feb 202	11:45	1	S	HOLD		_															
BH D49 SS4		12 Feb 202	9:20	1	S	HOLD		Ø	(														
BH D50 SS3		12 Feb 202	9:45	1	S	HOLD																	
BH D53 SS1		12 Feb 202	10:05	1	S	HOLD																	
BH D53 SS3		12 Feb 202	10:20	1	S	HOLD																	
3H D54 SS2		12 Feb 202	11:00	1	S	HOLD																	
BH D57 SS1		12 Feb 202	11:30	1	S	HOLD																	
		12 1 00 202	11.30	1	3																		
amples Relinguished By (Print	t Name Adago: 1	0	Date	l'and																			
Alessandro Pellerito	· Klento	teph	Feb 13,	2020 5	:00PM	Samples Received By (Print Name and Sign):	020	1	2/	14		Date			Tin	1	12	<					0
imples Relinquished By (Print	Name and Sign):	2-114	Date	Ting	2:35	Samples Received By (Print Name and Sign):						Date		_	Tim		-	-3	-	_	-	2	6
males Rehouished By (Print			Dota	Tim		Samples Received By (Print Name and Sign):						Date			-					Page		_ of	
			-1-	1								- And			Tim	W.		1	Nº:				



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4
RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Alessandro Pellerito

PROJECT: TP115086 AGAT WORK ORDER: 20T576304

SOIL ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

DATE REPORTED: Nov 13, 2020

PAGES (INCLUDING COVER): 8

VERSION*: 1

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

<u>*Notes</u>

#### Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
  incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other
  third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
  services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
  merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
  contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Page 1 of 8

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA)



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

## Certificate of Analysis

AGAT WORK ORDER: 20T576304

PROJECT: TP115086

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:

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

DATE RECEIVED: 2020-02-20							DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH D5 SS6	
					SAMPLE TYPE:	Soil	
					DATE SAMPLED:	2020-02-18	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	957661	
Antimony	μg/g	40	0.8	2020-02-25	2020-02-25	<0.8	
Arsenic	μg/g	18	1	2020-02-25	2020-02-25	5	
Barium	μg/g	670	2	2020-02-25	2020-02-25	86	
Beryllium	μg/g	8	0.5	2020-02-25	2020-02-25	<0.5	
Boron	μg/g	120	5	2020-02-25	2020-02-25	10	
Boron (Hot Water Extractable)	μg/g	2	0.10	2020-02-25	2020-02-25	0.26	
Cadmium	μg/g	1.9	0.5	2020-02-25	2020-02-25	<0.5	
Chromium	μg/g	160	5	2020-02-25	2020-02-25	23	
Cobalt	μg/g	80	0.5	2020-02-25	2020-02-25	10.2	
Copper	μg/g	230	1	2020-02-25	2020-02-25	20	
Lead	μg/g	120	1	2020-02-25	2020-02-25	9	
Molybdenum	μg/g	40	0.5	2020-02-25	2020-02-25	<0.5	
Nickel	μg/g	270	1	2020-02-25	2020-02-25	21	
Selenium	μg/g	5.5	0.4	2020-02-25	2020-02-25	<0.4	
Silver	μg/g	40	0.2	2020-02-25	2020-02-25	<0.2	
Thallium	μg/g	3.3	0.4	2020-02-25	2020-02-25	<0.4	
Jranium	μg/g	33	0.5	2020-02-25	2020-02-25	0.7	
/anadium	μg/g	86	1	2020-02-25	2020-02-25	32	
Zinc	μg/g	340	5	2020-02-25	2020-02-25	51	
Chromium, Hexavalent	μg/g	8	0.2	2020-02-26	2020-02-26	<0.2	
Cyanide	μg/g	0.051	0.040	2020-02-27	2020-02-27	<0.040	
Mercury	μg/g	3.9	0.10	2020-02-25	2020-02-25	<0.10	
Electrical Conductivity	mS/cm	1.4	0.005	2020-02-25	2020-02-25	1.90	
Sodium Adsorption Ratio	NA	12	NA	2020-02-25	2020-02-25	5.64	
pH, 2:1 CaCl2 Extraction	pH Units	5.0-9.0	NA	2020-02-27	2020-02-27	7.74	

Certified By:



5835 COOPERS AVENUE

MISSISSAUGA, ONTARIO CANADA L4Z 1Y2

http://www.agatlabs.com

TEL (905)712-5100 FAX (905)712-5122



AGAT WORK ORDER: 20T576304

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:

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

DATE RECEIVED: 2020-02-20 DATE REPORTED: 2020-11-13

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

EC was 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. SAR is a calculated parameter.

957661

Analysis performed at AGAT Toronto (unless marked by *)

CHARTERED S NYME BASHY O CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST



#### **Exceedance Summary**

AGAT WORK ORDER: 20T576304

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

ATTENTION TO: Alessandro Pellerito

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
957661	BH D5 SS6	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity	mS/cm	1.4	1.90



### **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE AGAT WORK ORDER: 20T576304
PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

				Soi	l Ana	alysis	3								
RPT Date: Nov 13, 2020				UPLICATI	E		REFERE	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured	Acceptable Limits		Recovery	Lin	ptable nits	Recovery	Lir	ptable nits
		ld		.		Value Lo		Lower	Lower Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inor	ganics (Soi	I)										•		•	•
Antimony	957661	957661	<0.8	<0.8	NA	< 0.8	132%	70%	130%	97%	80%	120%	74%	70%	130%
Arsenic	957661	957661	5	5	0.0%	< 1	111%	70%	130%	95%	80%	120%	94%	70%	130%
Barium	957661	957661	86	85	1.2%	< 2	101%	70%	130%	99%	80%	120%	99%	70%	130%
Beryllium	957661	957661	<0.5	0.6	NA	< 0.5	95%	70%	130%	98%	80%	120%	87%	70%	130%
Boron	957661	957661	10	11	NA	< 5	80%	70%	130%	100%	80%	120%	87%	70%	130%
Boron (Hot Water Extractable)	960952		0.20	0.19	NA	< 0.10	107%	60%	140%	100%	70%	130%	107%	60%	140%
Cadmium	957661	957661	<0.5	< 0.5	NA	< 0.5	106%	70%	130%	98%	80%	120%	101%	70%	130%
Chromium	957661	957661	23	23	NA	< 5	99%	70%	130%	105%	80%	120%	100%	70%	130%
Cobalt	957661	957661	10.2	10.1	1.0%	< 0.5	101%	70%	130%	101%	80%	120%	98%	70%	130%
Copper	957661	957661	20	20	0.0%	< 1	91%	70%	130%	101%	80%	120%	81%	70%	130%
Lead	957661	957661	9	10	10.5%	< 1	99%	70%	130%	100%	80%	120%	92%	70%	130%
Molybdenum	957661	957661	<0.5	<0.5	NA	< 0.5	102%	70%	130%	99%	80%	120%	99%	70%	130%
Nickel	957661	957661	21	20	4.9%	< 1	97%	70%	130%	97%	80%	120%	89%	70%	130%
Selenium	957661	957661	<0.4	<0.4	NA	< 0.4	119%	70%	130%	100%	80%	120%	98%	70%	130%
Silver	957661	957661	<0.2	<0.2	NA	< 0.2	94%	70%	130%	97%	80%	120%	91%	70%	130%
Thallium	957661	957661	<0.4	<0.4	NA	< 0.4	103%	70%	130%	102%	80%	120%	98%	70%	130%
Uranium	957661	957661	0.7	0.7	NA	< 0.5	111%	70%	130%	106%	80%	120%	107%	70%	130%
Vanadium	957661	957661	32	32	0.0%	< 1	108%	70%	130%	101%	80%	120%	99%	70%	130%
Zinc	957661	957661	51	50	2.0%	< 5	102%	70%	130%	101%	80%	120%	94%	70%	130%
Chromium, Hexavalent	954001		< 0.2	< 0.2	NA	< 0.2	87%	70%	130%	86%	80%	120%	91%	70%	130%
Cyanide	960998		<0.040	<0.040	NA	< 0.040	105%	70%	130%	105%	80%	120%	96%	70%	130%
Mercury	957661	957661	<0.10	<0.10	NA	< 0.10	122%	70%	130%	100%	80%	120%	98%	70%	130%
Electrical Conductivity	957661	957661	1.90	1.93	1.6%	< 0.005	100%	90%	110%						
Sodium Adsorption Ratio	957661	957661	5.64	5.85	3.7%	NA									
pH, 2:1 CaCl2 Extraction	960901		7.55	7.63	1.1%	NA	100%	80%	120%						

Comments: NA signifies Not Applicable.

If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

Antimony: For a multi-element scan for lab control standards and matrix spikes, up to 10% of analytes may exceed the quoted limits by up to 10% absolute and it is considered acceptable.

Certified By:





#### **QA** Violation

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T576304 PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito

RPT Date: Nov 13, 2020			REFEREN	ICE MAT	ΓERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPII	KE
PARAMETER	Sample Id	Sample Description	Measured	Accep Lim	ite	Recovery	Lin	ptable nits	Recovery	l lim	ptable nits
	,		Value	Lower	Upper		Lower	Upper	,	Lower	Upper

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

957661 BH D5 SS6 132% 70% 130% 80% 120% 70% 130%

Comments: NA signifies Not Applicable.

If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

Antimony: For a multi-element scan for lab control standards and matrix spikes, up to 10% of analytes may exceed the quoted limits by up to 10% absolute and it is considered acceptable.

# Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE AGAT WORK ORDER: 20T576304
PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

SAMIFLING SITE.		SAMFLED BT.					
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE				
Soil Analysis							
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Boron (Hot Water Extractable)	MET-93-6104	modified from EPA 6010D and MSA PART 3, CH 21	ICP/OES				
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Zinc	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Chromium, Hexavalent	INOR-93-6068	modified from EPA 3060 and EPA 7196	SPECTROPHOTOMETER				
Cyanide	INOR-93-6052	MOE CN-3015 & E 3009 A;SM 4500 CN	TECHNICON AUTO ANALYZER				
Mercury	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	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	GICP/OES				
pH, 2:1 CaCl2 Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	PH METER				



5835 Coopers Avenue Mississauga Ontario L4Z 1Y2

**Laboratory Use Only** 

Cooler Quantity:

Work Order #: 201

Ph: 905.712.5100 Fax: 905.712.5122 webearth.agatlabs.com

Report Inform	nation: Wood					e Drinking Water Chain of Custody Form  Regulatory Requirements:				atory R		eme	ent	,	Custo	dv Se	al in	tact.		Yes		2.1	1241
Company: Contact:	Alessandro Pellerito		_			(Please check all applicable boxes)									Votes		a	iaci.	_	res		□No	□N/A
Address:	50 Vogell Road Units	3 and 4			-	Regulation 153/04	er Use			Regulatio	n 558	3											
1,557,555.	Richmond Hill, ON	S une 1			-	Table 2   Indicate One   Sa	nitarv			CCME				Tu	ırna	rou	ınd	Tim	e (T/	AT) F	Requ	ired:	
	6479826220					Poo /Port	·			001112			- 1	Re	egul	ar T	AT		<b>7</b>	5 to	7 Busir	ness Day	s
Phone: Reports to be sent to: 1. Email:	a.pellerito@woodplc.c					☐ Resy Fark ☐ Ste ☐ Agriculture  Soil Texture (Check One) Region	orm			Prov. Wat Objective				Rı	ısh 1	<b>FAT</b> (	Rush S	iurehar	ges Appl			,	
2. Email:	shami.malla@woodplo					☐ Goarse Indice   MISA	ate One			Other						3 Bu Days	ŝ			Days			Next Busines Day
Project Inform	nation:					Is this submission for a		D		Indicat						OR	Date	Requ	ired (F	≀ush S	urchar	ges May	Apply):
Project:	TP115086				- 41	Record of Site Condition?				Guidell te of A						P	lease	nrov	ilde ni	lor no	tificati	on for ru	ch TAT
Site Location;	SP47				_	☐ Yes ☑ No									7	*TAT	is ex	clusiv	e of w	eeken	ds and	statuto	y holidays
Sampled By:	Moctar Diallo								] Yes	L	] /	0			For 's	Same	Day	' ana	lysis,	pleas	e conta	ict your	AGAT CPM
AGAT Quote #:	305848	PO:							O. Re	g 153	T										1		
	Please note: If quotation num	ber is not provided, client	will be billed full pric	e for analysis.		Sample Matrix Legend  B Biota	SZ.		les)											<b>™</b> PCBs			
Invoice Inforn	nation:		Bill To Same:	Yes ☑ No		GW Ground Water	Ä		Hydrides) (Incl. Hydrid					₹						☐ B(a)P			
Company:					- 11	O Oil	tals,	1	Hyd (Incl.	CN.		6	OTKN	HT D					i	<u>a</u>			
Contact:	Shami Malla					P Paint	Me		als (excl. Metals (	등 다		etal						□ Aroclors	des	□ ABNS			
Address:	-				-11/1	S Soil	pared	anic	Met.			Ē	□NH3 □	□ BTEX		18		Aroc	stici				
Email:	GTA EAST@woodpl	c.com				SD Sediment SW Surface Water	Field Filtered - Metals, Hg,	and Inorganics	s   153     letals   7	□ B-HWS	s Scan	n/Custo		□ voc	F4			■ Total □	orine Pe	Z AOC			
Sample	e Identification	Date Sampled	Time Sampled	# of Containers	Sample		Y/N	Metals a	☐ All Metals ☐ 153 / ☐ Hydride Metals ☐ 1	ORPs: DB-	Full Metals	Regulation/Custom Metals	Nutrients: TP	Volatiles:	PHCs F1 - F4	ABNS	PAHs	PCBs: 🖪 T	Organochlorine Pesticides	TCLP: IS M&I IS VOCS			
BH D1 SS1		18 Feb 2020	9:35	1	S	HOLD		F	100	ОЦІ	-	-	20	>	Δ.	<	4	۵	0	2 0	+		
BH D1 SS3		18 Feb 2020	9:50	1	S	HOLD		H			$\vdash$				-	-							
BH D2 SS2		18 Feb 202	10:25	1	S	HOLD															-		
BH D3 SS2		18 Feb 202	11:00	1	S	HOLD				-						-			-	1			
BH D5 SS2		18 Feb 202	11:35	1	S	HOLD										-				-			
BH D5 SS6		18 Feb 202	12:05	1	S	TIGED							_						-				
BH D6 SS1		18 Feb 202	12:35	1	S	HOLD					-						-						
BH D7 SS2		18 Feb 202	1:10	1	S	HOLD		-			-						_			1			
BH D7 SS3		18 Feb 202	1:20	1	S	HOLD											4						
					-	HOLD																	
							7													1			
Samples Relinquished By (Prin	t Name and Sen):		Itate	Time																			
Alessandro Pellerit	· Mary H	w	Feb 19.	2020 7	:15AM	Samples Received By (Print Name and Ship)	V					Date	/20	151	7	ne (1)	40-	2					1
Sampled Relinquished by (Brin	( Numer and Sign):		Date 28	1A Tim	1:110	Samples Received by (Paril Name and State			)			Date	- Lu	100	1	ne	T	Ψ			-		1
samples Relinquished by Trim	t Name and Signi.		Darie	Tim	-7/	Samples Received By (Print Name and Sign):						Date								Pag	e	of _	_
1				Į.	1							Pare			Tin	ne ·			No:				
															1			119	5.50			Page 8	of 8



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4 RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Alessandro Pellerito

PROJECT: TP115086 AGAT WORK ORDER: 20T577996

SOIL ANALYSIS REVIEWED BY: Yris Verastegui, Report Reviewer

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

DATE REPORTED: Nov 13, 2020

PAGES (INCLUDING COVER): 9 VERSION*: 1

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

*Notes	

#### Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
  incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other
  third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
  services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
  merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
  contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Page 1 of 9

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA)



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

## Certificate of Analysis

AGAT WORK ORDER: 20T577996

PROJECT: TP115086

SAMPLED BY:

ATTENTION TO: Alessandro Pellerito

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

				<u> </u>	,		,	
DATE RECEIVED: 2020-02-25								DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH B9 SS5	BH B11 SS2	
					SAMPLE TYPE:	Soil	Soil	
					DATE SAMPLED:	2020-02-20	2020-02-20	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	969395	969397	
Antimony	µg/g	40	0.8	2020-02-27	2020-02-27	<0.8	<0.8	
Arsenic	μg/g	18	1	2020-02-27	2020-02-27	2	4	
Barium	μg/g	670	2	2020-02-27	2020-02-27	25	80	
Beryllium	μg/g	8	0.5	2020-02-27	2020-02-27	<0.5	0.6	
Boron	μg/g	120	5	2020-02-27	2020-02-27	<5	11	
Boron (Hot Water Extractable)	μg/g	2	0.10	2020-02-27	2020-02-27	0.18	0.13	
Cadmium	μg/g	1.9	0.5	2020-02-27	2020-02-27	<0.5	<0.5	
Chromium	μg/g	160	5	2020-02-27	2020-02-27	9	22	
Cobalt	μg/g	80	0.5	2020-02-27	2020-02-27	3.6	9.4	
Copper	μg/g	230	1	2020-02-27	2020-02-27	14	20	
Lead	μg/g	120	1	2020-02-27	2020-02-27	4	8	
Molybdenum	μg/g	40	0.5	2020-02-27	2020-02-27	<0.5	<0.5	
Nickel	μg/g	270	1	2020-02-27	2020-02-27	7	20	
Selenium	μg/g	5.5	0.4	2020-02-27	2020-02-27	<0.4	<0.4	
Silver	μg/g	40	0.2	2020-02-27	2020-02-27	<0.2	<0.2	
Thallium	μg/g	3.3	0.4	2020-02-27	2020-02-27	<0.4	<0.4	
Uranium	μg/g	33	0.5	2020-02-27	2020-02-27	<0.5	0.6	
Vanadium	μg/g	86	1	2020-02-27	2020-02-27	17	32	
Zinc	μg/g	340	5	2020-02-27	2020-02-27	22	44	
Chromium, Hexavalent	μg/g	8	0.2	2020-03-02	2020-03-02	<0.2	<0.2	
Cyanide	μg/g	0.051	0.040	2020-03-03	2020-03-03	< 0.040	<0.040	
Mercury	μg/g	3.9	0.10	2020-02-27	2020-02-27	<0.10	<0.10	
Electrical Conductivity (2:1)	mS/cm	1.4	0.005	2020-02-27	2020-02-27	0.172	0.246	
Sodium Adsorption Ratio	NA	12	NA	2020-02-27	2020-02-27	0.282	0.750	
pH, 2:1 CaCl2 Extraction	pH Units	5.0-9.0		2020-02-28	2020-02-28	7.94	7.85	

Certified By:

Yris Verastegui

5835 COOPERS AVENUE

MISSISSAUGA, ONTARIO CANADA L4Z 1Y2

http://www.agatlabs.com

TEL (905)712-5100 FAX (905)712-5122



AGAT WORK ORDER: 20T577996

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

969395-969397

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:

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

DATE RECEIVED: 2020-02-25 DATE REPORTED: 2020-11-13

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

EC was 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. SAR is a calculated

parameter.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Tris Verástegui



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

#### Certificate of Analysis

AGAT WORK ORDER: 20T577996

PROJECT: TP115086

TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

5835 COOPERS AVENUE

MISSISSAUGA, ONTARIO CANADA L4Z 1Y2

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:

O. Reg. 153(511) - OC Pesticides (Soil)

DATE RECEIVED: 2020-02-25								DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH B8 SS1	BH B12 SS1	
					SAMPLE TYPE:	Soil	Soil	
					DATE SAMPLED:	2020-02-20	2020-02-20	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	969393	969400	
Hexachloroethane	μg/g	0.21	0.01	2020-03-02	2020-03-02	<0.01	<0.01	
Gamma-Hexachlorocyclohexane	μg/g	0.056	0.005	2020-03-02	2020-03-02	< 0.005	< 0.005	
Heptachlor	μg/g	0.19	0.005	2020-03-02	2020-03-02	<0.005	<0.005	
Aldrin	μg/g	0.088	0.005	2020-03-02	2020-03-02	<0.005	<0.005	
Heptachlor Epoxide	μg/g	0.05	0.005	2020-03-02	2020-03-02	<0.005	<0.005	
Endosulfan	μg/g	0.3	0.005	2020-03-02	2020-03-02	<0.005	<0.005	
Chlordane	μg/g	0.05	0.007	2020-03-02	2020-03-02	<0.007	<0.007	
DDE	μg/g	0.52	0.007	2020-03-02	2020-03-02	<0.007	<0.007	
DDD	μg/g	4.6	0.007	2020-03-02	2020-03-02	<0.007	<0.007	
DDT	μg/g	1.4	0.007	2020-03-02	2020-03-02	<0.007	<0.007	
Dieldrin	μg/g	0.088	0.005	2020-03-02	2020-03-02	< 0.005	< 0.005	
Endrin	μg/g	0.04	0.005	2020-03-02	2020-03-02	< 0.005	< 0.005	
Methoxychlor	μg/g	1.6	0.005	2020-03-02	2020-03-02	<0.005	<0.005	
Hexachlorobenzene	μg/g	0.66	0.005	2020-03-02	2020-03-02	< 0.005	< 0.005	
Hexachlorobutadiene	μg/g	0.031	0.01	2020-03-02	2020-03-02	<0.01	<0.01	
Moisture Content	%		0.1	2020-03-02	2020-03-02	22.9	22.8	
Surrogate	Unit	Acceptab	le Limits					
TCMX	%	50-	140	2020-03-02	2020-03-02	100	75	
Decachlorobiphenyl	%	50-1	140	2020-03-02	2020-03-02	107	92	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

969393-969400 Results are based on the dry weight of the soil.

DDT total is a calculated parameter. The calculated value is the sum of op'DDT and pp'DDT. DDD total is a calculated parameter. The calculated value is the sum of op'DDD and pp'DDD. DDE total is a calculated parameter. The calculated value is the sum of op'DDE and pp'DDE.

Endosulfan total is a calculated parameter. The calculated value is the sum of Endosulfan I and Endosulfan II.

Chlordane total is a calculated parameter. The calculated value is the sum of Alpha-Chlordane and Gamma-Chlordane.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Jung



ATTENTION TO: Alessandro Pellerito

#### **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE AGAT WORK ORDER: 20T577996 PROJECT: TP115086

SAMPLING SITE: SAMPLED BY:

				Soi	l Ana	alysis	3								
RPT Date: Nov 13, 2020				UPLICATI	<u> </u>		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank			eptable mits	Recovery	Lin	ptable nits	Recovery	Lie	ptable
		la la		.			value	Lower	Upper		Lower	Upper	,	Lower	Upper
O. Reg. 153(511) - Metals & Inorg	ganics (Soi	l)													
Antimony	967735		<0.8	<0.8	NA	< 0.8	122%	70%	130%	100%	80%	120%	91%	70%	130%
Arsenic	967735		2	2	NA	< 1	110%	70%	130%	99%	80%	120%	101%	70%	130%
Barium	967735		24	24	0.0%	< 2	111%	70%	130%	101%	80%	120%	99%	70%	130%
Beryllium	967735		<0.5	<0.5	NA	< 0.5	95%	70%	130%	93%	80%	120%	107%	70%	130%
Boron	967735		<5	<5	NA	< 5	93%	70%	130%	101%	80%	120%	110%	70%	130%
Boron (Hot Water Extractable)	967735		0.17	0.16	NA	< 0.10	111%	60%	140%	102%	70%	130%	102%	60%	140%
Cadmium	967735		< 0.5	< 0.5	NA	< 0.5	108%	70%	130%	99%	80%	120%	101%	70%	130%
Chromium	967735		9	9	NA	< 5	103%	70%	130%	98%	80%	120%	103%	70%	130%
Cobalt	967735		3.2	3.3	3.1%	< 0.5	94%	70%	130%	96%	80%	120%	98%	70%	130%
Copper	967735		6	6	0.0%	< 1	90%	70%	130%	109%	80%	120%	99%	70%	130%
Lead	967735		5	5	0.0%	< 1	104%	70%	130%	94%	80%	120%	94%	70%	130%
Molybdenum	967735		<0.5	<0.5	NA	< 0.5	99%	70%	130%	99%	80%	120%	100%	70%	130%
Nickel	967735		6	7	15.4%	< 1	95%	70%	130%	97%	80%	120%	100%	70%	130%
Selenium	967735		<0.4	<0.4	NA	< 0.4	124%	70%	130%	98%	80%	120%	102%	70%	130%
Silver	967735		<0.2	<0.2	NA	< 0.2	93%	70%	130%	97%	80%	120%	97%	70%	130%
Thallium	967735		<0.4	<0.4	NA	< 0.4	98%	70%	130%	96%	80%	120%	97%	70%	130%
Uranium	967735		<0.5	<0.5	NA	< 0.5	101%	70%	130%	97%	80%	120%	97%	70%	130%
Vanadium	967735		19	19	0.0%	< 1	110%	70%	130%	103%	80%	120%	110%	70%	130%
Zinc	967735		20	21	NA	< 5	98%	70%	130%	104%	80%	120%	101%	70%	130%
Chromium, Hexavalent	967735		< 0.2	< 0.2	NA	< 0.2	87%	70%	130%	87%	80%	120%	89%	70%	130%
Cyanide	967735		<0.040	<0.040	NA	< 0.040	103%	70%	130%	105%	80%	120%	101%	70%	130%
Mercury	967735		<0.10	<0.10	NA	< 0.10	105%	70%	130%	98%	80%	120%	102%	70%	130%
Electrical Conductivity (2:1)	969395	969395	0.172	0.174	1.2%	< 0.005	100%	80%	120%	NA			NA		
Sodium Adsorption Ratio	969395	969395	0.282	0.292	3.5%	NA	NA			NA					
pH, 2:1 CaCl2 Extraction	967735		7.49	7.43	0.8%	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

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

Certified By:





### **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE AGAT WORK ORDER: 20T577996
PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

OAWI LING OITL.								, (IVII I		••					
			Trac	e Org	gani	cs Ar	nalys	is							
RPT Date: Nov 13, 2020				UPLICATI	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	up #2 RPD		Measured Value		ptable	Recovery	1 1:00	ptable	Recovery		ptable
		lu lu					14.40	Lower	Upper		Lower	Upper	r	Lower	Upper
O. Reg. 153(511) - OC Pesticides	(Soil)														
Hexachloroethane	963503		< 0.01	< 0.01	NA	< 0.01	96%	50%	140%	92%	50%	140%	96%	50%	140%
Gamma-Hexachlorocyclohexane	963503		< 0.005	< 0.005	NA	< 0.005	106%	50%	140%	91%	50%	140%	89%	50%	140%
Heptachlor	963503		< 0.005	< 0.005	NA	< 0.005	102%	50%	140%	88%	50%	140%	96%	50%	140%
Aldrin	963503		< 0.005	< 0.005	NA	< 0.005	106%	50%	140%	93%	50%	140%	96%	50%	140%
Heptachlor Epoxide	963503		< 0.005	< 0.005	NA	< 0.005	102%	50%	140%	93%	50%	140%	95%	50%	140%
Endosulfan	963503		< 0.005	< 0.005	NA	< 0.005	105%	50%	140%	90%	50%	140%	92%	50%	140%
Chlordane	963503		< 0.007	< 0.007	NA	< 0.007	106%	50%	140%	87%	50%	140%	88%	50%	140%
DDE	963503		< 0.007	< 0.007	NA	< 0.007	103%	50%	140%	97%	50%	140%	86%	50%	140%
DDD	963503		< 0.007	< 0.007	NA	< 0.007	109%	50%	140%	84%	50%	140%	86%	50%	140%
DDT	963503		< 0.007	< 0.007	NA	< 0.007	106%	50%	140%	89%	50%	140%	98%	50%	140%
Dieldrin	963503		< 0.005	< 0.005	NA	< 0.005	110%	50%	140%	89%	50%	140%	92%	50%	140%
Endrin	963503		< 0.005	< 0.005	NA	< 0.005	114%	50%	140%	98%	50%	140%	96%	50%	140%
Methoxychlor	963503		< 0.005	< 0.005	NA	< 0.005	98%	50%	140%	104%	50%	140%	102%	50%	140%
Hexachlorobenzene	963503		< 0.005	< 0.005	NA	< 0.005	107%	50%	140%	93%	50%	140%	96%	50%	140%
Hexachlorobutadiene	963503		< 0.01	< 0.01	NA	< 0.01	107%	50%	140%	104%	50%	140%	107%	50%	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:

Jung

# **Method Summary**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086

AGAT WORK ORDER: 20T577996

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

SAMPLING SITE.		SAIVIPLED DT.					
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE				
Soil Analysis							
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Boron (Hot Water Extractable)	MET-93-6104	modified from EPA 6010D and MSA PART 3, CH 21	ICP/OES				
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Zinc	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Chromium, Hexavalent	INOR-93-6068	modified from EPA 3060 and EPA 7196	SPECTROPHOTOMETER				
Cyanide	INOR-93-6052	modified from ON MOECC E3015 and SM 4500-CN- $\mbox{\rm I}$	TECHNICON AUTO ANALYZER				
Mercury	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS				
Electrical Conductivity (2:1)	INOR-93-6036	modified from MSA PART 3, CH 14 and 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	modified from EPA 9045D and MCKEAGUE 3.11	PH METER				

# **Method Summary**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086

AGAT WORK ORDER: 20T577996

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE				
	,	ANALYTICAL TECHNIQUE				
ORG-91-5113	modified from EPA SW-846 3541,3620 & 8081					
ORG-91-5113	& 8081					
ORG-91-5113	& 8081					
ORG-91-5113	& 8081					
ORG-91-5113	& 8081					
	& 8081					
ORG-91-5113	& 8081					
ORG-91-5113	& 8081					
ORG-91-5113	& 8081					
ORG-91-5113	& 8081					
ORG-91-5113	& 8081					
ORG-91-5113	& 8081					
ORG-91-5113	& 8081					
ORG-91-5113	Q 000 I					
ORG-91-5113	& 8081					
ORG-91-5112	& 8081					
ORG-91-5113	modified from EPA SW-846 3541,3620 & 8081	GC/ECD				
	MOE E3139	BALANCE				
	ORG-91-5113 ORG-91-5113 ORG-91-5113 ORG-91-5113 ORG-91-5113 ORG-91-5113 ORG-91-5113 ORG-91-5113 ORG-91-5113 ORG-91-5113 ORG-91-5113 ORG-91-5113 ORG-91-5113 ORG-91-5113 ORG-91-5113	ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081  ORG-91-5113 modified from EPA SW-846 3541,3620 & 8081				



5835 Coopers Mississauga, Ontario L Ph: 905.712.5100 Fax: 905.713 webearth.agatla

Sewer Use

Sanitary

Storm

5835 Coopers Avenue sissauga, Ontario L4Z 1Y2 5100 Fax: 905.712.5122 webearth.agatlabs.com	Work Order #: 20T5 77996  Cooler Quantity: 1000000000000000000000000000000000000
sumed by humans)	Arrival Temperatures: 3.5 3.5
gulatory Requirement	Custody Seal Intact:   Yes   No   Notes:
Regulation 558  CCME  Prov. Water Quality Objectives (PWQO) Other	Turnaround Time (TAT) Required:  Regular TAT
ort Guideline on ficate of Analysis	Please provide prior notification for rush TAT  *TAT is exclusive of weekends and statutory holidays  For 'Same Day' analysis, please contact your AGAT CPM
ORPs: □B-HWS □Cr □CN □CN □CH □CN □CH □CC □ □CN □CC □ □CN □CT □CN □CH □CN □CH □CN □CN □CN □CN □CN □CN □CN □CN □CN □CN	

**Laboratory Use Only** 

#### **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:** Regulatory Requirements: No Regulatory Requirements: Wood (Please check all applicable boxes) Company: Alessandro Pellerito Contact: Regulation 153/04 50 Vogell Road Units 3 and 4 Table 2 Indicate One ✓ Ind/Com Address: Richmond Hill, ON Res/Park 6479826220 Phone: Agriculture Reports to be sent to: a.pellerito@woodplc.com 1. Email:

Project Info	rmation:		
Project:	TP115086		
Site Location:	SP47		
Sampled By:	Moctar Diallo		
AGAT Quote #:	305848	PO:	
	Please note: If quotation num	ber is not provided, client will be billed full price for analysis.	
Invoice Info	rmation:	Bill To Same: Yes ☑ No	o [
Company:			
Contact:	Shami Malla		
Address:			
Email:	GTA EAST@woodpl	2 dom	

Date

Sampled

20 Feb 2020 12:45

20 Feb 202 11:45

Time

Sampled

# of

Containers

S

shami.malla@woodplc.com

Sample Identification

2. Email:

BH B8 SS1

BH B9 SS2

-   30	IT Texture (Check One)  ☑ Coarse ☐ Fine	Indicate MISA	ne One			ther Indicate	One					Days			Lired	J Da	Busir ays h Su <i>i</i>		es Ma	Next Day y Apply)	Business
R	Is this submission Record of Site Con  Yes	dition?			-	Guldelin te of An	alys	ils				P TAT	lease is exc	prov	vide p	orlor week	<b>notif</b> ends	icatio	n for ru statuto	ush TAT ory holid	lays
Sa B GW O P S SD SW	Oil Paint Soil Sediment	1	Field Filtered - Metals, Hg, CrvI	Metals and Inorganics	☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals ☐ 153 Metals (incl. Hydrides)	ORPs: □B·HWS □Cl □CN· □Co* □EC □FOC □Hg □ DH □SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH, ☐ TKN ☐ NO, ☐ NO, ☐ NO,+NO,	Volatiles: □ VOC □ BTEX □ THM	SF1-F4	S	S	PCBs: ■ Total □ Aroclors	Organochlorine Pesticides	TCLP: M M&I N VOCs ABNs B(a)P PPCBs	Sewer Use	CORROSIVITY			
Matrix	Special Instru		Y/N	Met	E E	9 0 0 0	₫	Reg	N N N	Vola	PHCs	ABNs	PAHS	PCB	Orga	TCLP	Sewi	5			
															V						
	HOLD																		16		
				V																	
	HOLD																				
				Ø																	
	HOLD																				
															Ø						
	HOLD					-					-										
	HOLD					- 1											= 4				
	1	-	7/																		
					-					1											
PM	Sample Received By (Print	t Name and Sign	1					Dat	1/25	12	1	me	.0	K							

BH B9 SS5	20 Feb 202	12:15	1	S				
BH B10 SS1	20 Feb 202	11:20	1	S	HOLD			
BH B11 SS2	20 Feb 202	10:55	1	S				
BH B11 SS3	20 Feb 202	11:05	1	S	HOLD	V		
BH B12 SS1	20 Feb 202	10:15	1	S				
BH B13 SS1	20 Feb 202	9:20	1	S	HOLD			
BH B13 SS4	20 Feb 202	9:35	1	S	HOLD			
					0	11		
Samples Relinquished By (Print Name and Sign)  Acssandro Pellerito  Samules Relinquished By (Print Name and Sign):	~		1, 2020	me 2:15PM	Sampley Breelived By (Print Name and Stev)  Samples Rechived By (Print Name and Stev)	K	Date 25/20 Time 28	Page of

Samples Received By (Print Name and Sign):



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4
RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Alessandro Pellerito

PROJECT: TP115086 AGAT WORK ORDER: 20T578836

SOIL ANALYSIS REVIEWED BY: Yris Verastegui, Report Reviewer

DATE REPORTED: Nov 13, 2020

PAGES (INCLUDING COVER): 10 VERSION*: 1

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

<u>*Notes</u>

#### Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
  incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other
  third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
  services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
  merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
  contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Page 1 of 10

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA)



AGAT WORK ORDER: 20T578836

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE: SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Moctar Diallo

	Corrosivity Package								
DATE RECEIVED: 2020-02-27									DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH S14 SS4	BH S16 SS5	BH S6 SS5	
					SAMPLE TYPE:	Soil	Soil	Soil	
					DATE SAMPLED:	2020-02-25	2020-02-24	2020-02-26	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	976165	976169	976177	
Chloride (2:1)	μg/g	NA	2	2020-03-03	2020-03-03	107	242	13	
Sulphate (2:1)	μg/g		2	2020-03-03	2020-03-03	208	26	24	
pH (2:1)	pH Units		NA	2020-04-03	2020-04-03	8.00	8.12	8.20	
Electrical Conductivity (2:1)	mS/cm	1.4	0.005	2020-03-03	2020-03-03	0.554	0.575	0.145	
Resistivity (2:1) (Calculated)	ohm.cm		1	2020-03-03	2020-03-03	1810	1740	6900	
Redox Potential 1	mV		NA	2020-03-02	2020-03-02	272	160	114	
Redox Potential 2	mV		NA	2020-03-02	2020-03-02	250	158	98	
Redox Potential 3	mV		NA	2020-03-02	2020-03-02	232	152	110	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

976165-976177 EC, pH, Chloride and Sulphate were determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water: 1 part soil). Resistivity is a calculated parameter.

Redox potential measured on as received sample. Due to the potential for rapid change in sample equilibrium chemistry with exposure to oxidative/reduction conditions laboratory results may differ from

field measured results.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Tris Verastegui



AGAT WORK ORDER: 20T578836

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE: SP47

NA

pH Units

12

5.0-9.0

NA

2020-03-03

2020-03-04

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Moctar Diallo

57 (IIII 21110 0112:01 17							O/ ((()))	ota. Biano
			C	D. Reg. 153(	511) - Metals	& Inorgan	ics (Soil)	
DATE RECEIVED: 2020-02-27								DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH D25 SS3	BH D27 SS2	
					SAMPLE TYPE:	Soil	Soil	
					DATE SAMPLED:	2020-02-24	2020-02-24	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	976171	976172	
Antimony	μg/g	40	0.8	2020-03-03	2020-03-03	<0.8	<0.8	
Arsenic	μg/g	18	1	2020-03-03	2020-03-03	5	4	
Barium	μg/g	670	2	2020-03-03	2020-03-03	64	85	
Beryllium	μg/g	8	0.5	2020-03-03	2020-03-03	0.6	0.7	
Boron	μg/g	120	5	2020-03-03	2020-03-03	11	12	
Boron (Hot Water Extractable)	μg/g	2	0.10	2020-03-03	2020-03-03	0.29	0.42	
Cadmium	μg/g	1.9	0.5	2020-03-03	2020-03-03	<0.5	<0.5	
Chromium	μg/g	160	5	2020-03-03	2020-03-03	20	21	
Cobalt	μg/g	80	0.5	2020-03-03	2020-03-03	8.3	8.7	
Copper	μg/g	230	1	2020-03-03	2020-03-03	20	19	
Lead	μg/g	120	1	2020-03-03	2020-03-03	13	13	
Molybdenum	μg/g	40	0.5	2020-03-03	2020-03-03	0.6	<0.5	
Nickel	μg/g	270	1	2020-03-03	2020-03-03	18	19	
Selenium	μg/g	5.5	0.4	2020-03-03	2020-03-03	<0.4	<0.4	
Silver	μg/g	40	0.2	2020-03-03	2020-03-03	<0.2	<0.2	
Thallium	μg/g	3.3	0.4	2020-03-03	2020-03-03	<0.4	<0.4	
Uranium	μg/g	33	0.5	2020-03-03	2020-03-03	0.5	0.6	
Vanadium	μg/g	86	1	2020-03-03	2020-03-03	26	31	
Zinc	μg/g	340	5	2020-03-03	2020-03-03	46	53	
Chromium, Hexavalent	μg/g	8	0.2	2020-03-04	2020-03-04	<0.2	<0.2	
Cyanide	μg/g	0.051	0.040	2020-03-04	2020-03-04	< 0.040	<0.040	
Mercury	μg/g	3.9	0.10	2020-03-03	2020-03-03	<0.10	<0.10	
Electrical Conductivity (2:1)	mS/cm	1.4	0.005	2020-03-03	2020-03-03	2.10	1.43	

Certified By:

8.71

8.02

5.89

7.49

Tris Verastegui

Sodium Adsorption Ratio

pH, 2:1 CaCl2 Extraction

2020-03-03

2020-03-04



AGAT WORK ORDER: 20T578836

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:SP47

976171-976172

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Moctar Diallo

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

DATE RECEIVED: 2020-02-27 DATE REPORTED: 2020-11-13

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

EC was 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. SAR is a calculated

parameter

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Tris Verastegui



#### **Exceedance Summary**

AGAT WORK ORDER: 20T578836

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

ATTENTION TO: Alessandro Pellerito

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
976171	BH D25 SS3	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity (2:1)	mS/cm	1.4	2.10
976172	BH D27 SS2	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity (2:1)	mS/cm	1.4	1.43



AGAT WORK ORDER: 20T578836

#### **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SP47 SAMPLED BY: Moctar Diallo

SAMI LING SITE. SI 47	IL EINO GITE. SI 47														
				Soi	l Ana	alysis	6								
RPT Date: Nov 13, 2020				UPLICATI	E		REFERENCE MATERIAL			METHOD BLANK SPIKE			МАТ	RIX SPI	IKE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Value		eptable mits	Recovery		ptable nits	Recovery	Lie	ptable mits
		lu lu		.			value	Lower	Upper		Lower	Upper		Lower	Uppei
Corrosivity Package															
Chloride (2:1)	976244		252	247	2.0%	< 2	91%	70%	130%	101%	80%	120%	NA	70%	130%
Sulphate (2:1)	976244		25	25	0.0%	< 2	108%	70%	130%	94%	80%	120%	108%	70%	130%
pH (2:1)	972879		8.12	8.18	0.7%	NA	100%	90%	110%	NA			NA		
Electrical Conductivity (2:1)	978407		0.482	0.435	10.3%	< 0.005	114%	80%	120%	NA			NA		
O. Reg. 153(511) - Metals & Inor	ganics (Soil	)													
Antimony	976076		2.8	2.8	NA	< 0.8	119%	70%	130%	103%	80%	120%	81%	70%	130%
Arsenic	976076		8	8	0.0%	< 1	114%	70%	130%	102%	80%	120%	99%	70%	130%
Barium	976076		121	120	0.8%	< 2	108%	70%	130%	100%	80%	120%	87%	70%	130%
Beryllium	976076		<0.5	<0.5	NA	< 0.5	117%	70%	130%	111%	80%	120%	105%	70%	130%
Boron	976076		9	9	NA	< 5	94%	70%	130%	104%	80%	120%	97%	70%	130%
Boron (Hot Water Extractable)	976056		0.29	0.26	NA	< 0.10	93%	60%	140%	94%	70%	130%	95%	60%	140%
Cadmium	976076		<0.5	<0.5	NA	< 0.5	111%	70%	130%	99%	80%	120%	90%	70%	130%
Chromium	976076		12	12	NA	< 5	105%	70%	130%	94%	80%	120%	83%	70%	130%
Cobalt	976076		3.1	3.2	3.2%	< 0.5	94%	70%	130%	96%	80%	120%	85%	70%	130%
Copper	976076		48	48	0.0%	< 1	97%	70%	130%	102%	80%	120%	92%	70%	130%
Lead	976076		150	150	0.0%	< 1	108%	70%	130%	93%	80%	120%	91%	70%	130%
Molybdenum	976076		0.9	1.0	NA	< 0.5	101%	70%	130%	102%	80%	120%	101%	70%	130%
Nickel	976076		9	9	0.0%	< 1	97%	70%	130%	101%	80%	120%	87%	70%	130%
Selenium	976076		0.7	0.9	NA	< 0.4	130%	70%	130%	98%	80%	120%	96%	70%	130%
Silver	976076		<0.2	<0.2	NA	< 0.2	102%	70%	130%	98%	80%	120%	81%	70%	130%
Thallium	976076		<0.4	<0.4	NA	< 0.4	100%	70%	130%	99%	80%	120%	86%	70%	130%
Uranium	976076		<0.5	< 0.5	NA	< 0.5	99%	70%	130%	100%	80%	120%	94%	70%	130%
Vanadium	976076		13	13	0.0%	< 1	102%	70%	130%	94%	80%	120%	90%	70%	130%
Zinc	976076		215	219	1.8%	< 5	104%	70%	130%	101%	80%	120%	95%	70%	130%
Chromium, Hexavalent	976133		< 0.2	< 0.2	NA	< 0.2	87%	70%	130%	88%	80%	120%	83%	70%	130%
Cyanide	976171	976171	<0.040	<0.040	NA	< 0.040	99%	70%	130%	99%	80%	120%	107%	70%	130%
Mercury	976076		0.28	0.25	NA	< 0.10	107%	70%	130%	102%	80%	120%	96%	70%	130%
Electrical Conductivity (2:1)	978407		0.482	0.435	10.3%	< 0.005	114%	80%	120%	NA			NA		
Sodium Adsorption Ratio	976076		2.13	2.13	0.0%	NA	NA			NA					
pH, 2:1 CaCl2 Extraction	978166		7.64	7.64	0.0%	NA	100%	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

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

Matrix spike: Spike level < native concentration. Matrix spike acceptance limits do not apply.

Certified By:



AGAT QUALITY ASSURANCE REPORT (V1)

Page 6 of 10

## **Method Summary**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T578836

PROJECT: TP115086

SAMPLING SITE:SP47

AGAT WORK ORDER: 20T578836

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:Moctar Diallo

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Chloride (2:1)	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate (2:1)	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
pH (2:1)	INOR 93-6031	MSA part 3 & SM 4500-H+ B	PH METER
Electrical Conductivity (2:1)	INOR-93-6036	modified from MSA PART 3, CH 14 and SM 2510 B	EC METER
Resistivity (2:1) (Calculated)	INOR-93-6036	McKeague 4.12, SM 2510 B,SSA #5 Part 3	CALCULATION
Redox Potential 1	INOR-93-6066	G200-09, SM 2580 B	REDOX POTENTIAL ELECTRODE
Redox Potential 2	INOR-93-6066	G200-09, SM 2580 B	REDOX POTENTIAL ELECTRODE
Redox Potential 3	INOR-93-6066	G200-09, SM 2580 B	REDOX POTENTIAL ELECTRODE
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron (Hot Water Extractable)	MET-93-6104	modified from EPA 6010D and MSA PART 3, CH 21	ICP/OES
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Zinc	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium, Hexavalent	INOR-93-6068	modified from EPA 3060 and EPA 7196	SPECTROPHOTOMETER
Cyanide	INOR-93-6052	modified from ON MOECC E3015 and SM 4500-CN- I	TECHNICON AUTO ANALYZER
Mercury	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS



# **Method Summary**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE AGAT WORK ORDER: 20T578836

PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito

SAMPLING SITE:SP47 SAMPLED BY:Moctar Diallo

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
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	modified from EPA 9045D and MCKEAGUE 3.11	PH METER



**Chain of Custody Record** 

Wood

**Report Information:** 

Company:

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

5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2

Ph: 905.712.5100 Fax: 905.712.5122 webearth.agatlabs.com

Laborator	y Use	Only
Mork Order to	10	TCH

Work Order #: 20	C3 108.30
Cooler Quantity:	
Arrival Temperatures:	4.9 150 150

Cooler Quantity	y:		-			
Arrival Tempera	atures;		4.9	15	100 I	5.0
Custody Seal II	ntact:	ĺ	_ <del>7 ` </del> ∦ ⊒Yes		7 · 7   □No	□N/A
Turnaround	l Time	e (1	TAT) R	equi	red:	
Regular TAT		7	5 to 7	Busine	ess Days	
Rush TAT (Rush	Surcharge	06 <b>A</b> p	pły)			
					es May Ap	
	xclusive	of v	weekend	is and s	statutory h	olidays
MHT			☐ B(a)P ☐P	1		

	Regulatory Req	ulrements:		No R	legula	tory Red	quir	eme	ent		ustoc lotes:	-	al Int	act:		□Ye	s		□No		□N/A	
	I Regulation 153/04       Sewer         Table 2 Indicate One       Sanit         Ind/Com       Storn         Res/Park       Storn         Agriculture       Region         Indicate       Indicate         Indicate       Indicate         Is this submission for a       Record of Site Condition?         Yes       No			L]CCME					Turnaround Time (TAT) Required:  Regular TAT													
-					O. Reg	152			Ш		For '	Samo	e Day	' ana	alysk		ase	contac	t your	AGAT	СРМ	
	Sample Matrix Le B Biota GW Ground Water O Oil P Paint S Soil SD Sediment SW Surface Water	gend	Field Filtered - Metals, Hg, CrVI	Metals and Inorganics	☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals ☐ 153 Metals (Incl. Hydrides)	ORPs: DB-HWS DCI DCN: Cc** DEC DFOC DHg DPH DSAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH, ☐ TKN ☐ NO, ☐ NO, ☐ NO, ☐ NO,	S: □VOC □BTEX □THM	1 - F4			PCBs: ■ Total □ Aroclors	Organochlorine Pesticides	M&I ■ VOCs □ ABNs □ B(a)P ■PCBs	esi	CORROSIVITY				
Sam			Y/N	Metals	All Me	ORPs:	Full Me	Regula	Nutrier No.	Volatiles:	PHCs F1 - F4	ABNs	PAHs	PCBs:	Organo	TCLP: M&I	Sewer Use	COF				
S	HOLD																					
S	HOLD																					
S	HOLD																					
S																		V				
S	HOLD																					
S	HOLD																			1 / 9		
S	HOLD																					
S																		Ø				
S	HOLD				1																	
S				V													I					
S				Ø																		

Contact:	Alessandro Pellerito					[7] S. J. J. J. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J. S. J.			14						-	_									_					
Address:	50 Vogell Road Units 3 a	nd 4				Regulation 153/04	Sewe	er Use		LJF	Regulatio	า 558			Tu	rnai	OUT	d T	ime	/TAT	) Re	·ouir	ad.							
	Richmond Hill, ON	79826220				Table <u>Indicate One</u> ✓ Ind/Com	□Sar	nitary			CCME				10		around Time (TAT) Required:													
Phone:	6479826220	Fax:				Res/Park	□Sto	]Storm		П	itv			Regular TAT Rush TAT (Rush Surcha				5 to 7 Business Days												
Reports to be sent to:  1. Email:	a.pellerito@woodplc.com					□Agriculture Soil Texture (Check One)	Region			Objectives (PWQO) Other					Ru		<b>A.I</b> (Ru				Busin	2291		Next Bu	nino					
2. Email:	shami.malla@woodplc.co	@woodplc.com			ni.malla@woodplc.com		shami.malla@woodplc.com				☑Coarse ☐Fine	MISA	ate One		1.2	Indicat	One	_			ш,	Days		Ĺ	L D	ays			Day	5111622
Project Inform						Is this submissio		1			Guideli	ne or				_				2 (1103	iii ouii	onarge.	s ividy A	трріу).						
Project:	TP115086					Record of Site Co			Cer	tifica	te of A	nalys	s			*							for rust	h TAT holiday						
Site Location:	SP47					☐ Yes ☑	No			Yes	Ε	] N	)		Π.									-						
Sampled By:	Moctar Diallo 305848				_  -			-				_	_			For 'S	ame I	Day' a	inalys	ls, ple	ase c	ontact	your A	GAT CP	M					
AGAT Quote #:	Please note: If quotation number	PO:	will be billed full pric	a for analysis	-1:	Sample Matrix Leg	end	=		O. Reg	153									<b>™</b> PCBs										
Invoice Inform		Cr. Tale of Signature	Bill To Same:			B Biota GW Ground Water O Oil		Field Filtered - Metals, Hg, CrVI		(excl. Hydrides) stals (Incl. Hydrides)	ĊŃ			NAT C	DTHM					☐ B(a)P										
Contact:	Shami Malla					P Paint		Mei		etals	CI CI CI		etals	° °	<u>ă</u>				des des	□ABNs										
Address:						S Soil		- pa	anics	Metals 153 Me	8 0		Σ	INO3+NO2	O BTEX				☐ Aroclors Pesticides	ļ į		Z								
Email:	GTA EAST@woodplc.c	om				SD Sediment SW Surface Water		Filte	Inorganics	☐ 153 N etals ☐ 1	□ B-HWS □ C □ EC □ FOC [	Scan	usto	_ _ _	0 voc				) e e	NOCs		SI	/ 0							
						Surface Water		ield	nd I	Is	: 084 050	als S	2	□ o²		- F4	1		lotar lorir	Z	0	8								
Sample	eldentification	Date Sampled	Time Sampled	# of Containers	Sample Matrix		•	Y/N	Metals and	☐ All Metals ☐ 153 Metals ( ☐ Hydride Metals ☐ 153 Met	ORPs: DB-	Full Metals	Regulation/Custom Metals	Nutrients: TP [	Volatiles:	PHCs F1 - F4	ABNS	PAHS	PCBS: N lotal   Organochlorine	TCLP: M&I	Sewer Use	CORROSIVITY								
BH S13 SS1		25 Feb 2020	9:45	1	S	HOLD										-			-	+	0,									
BH S13 SS3		25 Feb 2020	9:50	1	S	HOLD			10									+				-	+		1					
BH S14 SS2		25 Feb 202	11:10	1	S	HOLD																+			1					
BH S14 SS4		25 Feb 202	11:15	1	S											$\dashv$	+		+	+		<b>V</b>	+		-					
BH S15 SS2		24 Feb 202	9:00	1	S	HOLD					-		-				+	+		-			+							
BH S15 SS4		24 Feb 202	9:15	1	S	HOLD														+			-		1					
BH S16 SS2		24 Feb 202	10:50	1	S	HOLD													+	+		+	+		+					
BH S16 SS5		24 Feb 202	11:15	1	S								1					+	-			<b>7</b>			+					
BH D25 SS2		24 Feb 202	1:20	1	S	HOLD									+			+	+			-	1		+					
BH D25 SS3		24 Feb 202	1:25	1	S				V							+	+	-	-				1		-					
BH D27 SS2		24 Feb 202	12:55	1	S							Н	-				+	+	1											
Samples Relinquished By (Prin	114 11111	/	Date	Tim		Samples Received by (Prin	nt Name and Sign):	^		1	1	1_1	Date			Tim	0		+					/-						
Alessandro Pellerito Samples Religiolismos By (Prin		/	Feb 26	, 2020 8	:15AM	Sampled Referent by (Pri	nt Name and Signi-	10	20,	102	127		Date					1	1-			1		7						
Samples Relinquished By (Prin	1 20 20/02/	27	Data	1	3:10		Vices American Pr						Date			Пп	IN				Page		_ of _	0						
	and desired		Linn	Tim	Ø:	Samples Received By (Prin	nt Name and Sign):						Date			Tim	e		N	۷°:										



125

5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2

Ph: 905.712.5100 Fax: 905.712.5122 webearth.agatlabs.com

#### **Laboratory Use Only**

Work Order #:			
Cooler Quantity:	1.0		
Arrival Temperatures:	4.9	18.9	13.0 V.9
Custody Seal Intact:	□Yes	□No	□N/A

Report Information:	Chain of C	<b>Sustody Rec</b>	ord If this is	a Drinking Wa	ater sample, (	please us	e Drinking Water Chain o	f Custody Form	(potable	water	consum	ed by hum	ans)			A	Arriva	l Tem	pera	tures	:	4	2	15		1.0	
Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual Advisual A		Wood					Regulatory Requirements:   No Regulatory Requirement (Please check all applicable boxes)																	0 N/			
So Vocal Road Claits 3 and 4	Contact:						Regulation 153/04	∏ Sew	er I leo	-1		Portulatio	- EEG	,	775003												
Richmod Hill. ON	Address:	50 Vogell Road Units	s 3 and 4				Table 2							Tu	ırna	arol	ınd	Tim	ie (1	ΓAT)	Re	auire	d:				
Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Project   Proj		Richmond Hill, ON					Indicate One Sanitani CCMF								1												
2. Email:   a-peller10(g)woodplc.com		6479826220	Fax:			_)/	_ ′	□Sto	orm							▼ 5 to 7 Business							Days				
Project Information:   This is the submission for a Report Audidaline on Certificate of Analysis   This is submission for a Report of Site Condition?   The Sample of Site Location: SP47   This is submission for a Report of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of Site Condition?   The Sample of		shami.malla@woodplc.com							cate One											ess							
Project   TP15086   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   SP47   Section   S	2. Email:						_	MISA		Indicate One							_	-		Requ	uired	Day					
Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No   Yes   No	Project Inform	nation:							1	Re	eport	Guidel	ne o	n													
Sample   Moctar Diallo   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sistematic   Sist	Project:	TP115086					Record of Site Co	ndition?		Cei	rtifica	te of A	naly	sis				F	leas	e pro	vide p	orlor r	notific	ation f	or rush	TAT	
Sample (dartification   Date   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification   Sample (dartification	Site Location:	SP47																*TAT	ls ex	clusiv	e of	weeke	ands a	and sta	tutory h	olidays	
Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property   Property	Sampled By:	Moctar Diallo									100		_ ''				For '	Sam	e Da	y' ana	alysis	, plea	ase co	ontact	your AG	AT CPM	
Invoice Information:	AGAT Quote #:	305848	PO:				C				O. Re	g 153					1		1			8		T	TI		
Invoice Information:		Please note: If quotation nu	umber is not provided, client v	vill be billed full pric	e for analysis.			gend	Ę.		les)											2					
Sampled Impulse Sampled Sampled Containers Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sam		nation:		Bill To Same:	Yes 🗹 No	- 11	<b>GW</b> Ground Water		IS, Hg,		ydrides) cl. Hydrk	ż			Ş	MHT						I B(a)P					
Sampled Impulse Sampled Sampled Containers Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sam		Ch. 134 II						eta		s (In	S	1	SE	L .					ر س	ι _ω	8		$\succ$				
Sampled Impulse Sampled Sampled Containers Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sam		Snami Mana				-	S Soil							Met	H-K	910				clor	icide	JABI					
Sampled Impulse Sampled Sampled Containers Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sam		CTA FASTRO1							tere	gani	Met.	l D 원		u u	E S		1			JAro	Pesti	8		$\geq$			
Sampled Impulse Sampled Sampled Containers Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sampled Sam	Email:	GIA EASI(@woodp	oic.com			-/			ield Fil	nd Inor	s 🗆 153	B-HWS	ls Scar	n/Cust	NO.	00	4				lorine {	0 Z	0	SOS			
BH D29 SS2  25 Feb 2021 12:20  1	Sample	e Identification								Metals a	☐ All Meta	ORPs:	-ull Meta	Regulation	futrients	olatiles:	HCs F1	BNS	AHS	CBs: 🖪 1	rganoch	CLP: M	ewer Us	SOR			
Samples Relinquished By (Print Name and Sign):  Alessandro Pellerio Menu Mare    Date   Time   Samples Received By (Print Name and Sign):   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Ti			25 Feb 2020	12:20	1	S	HOLD				"				20		1	4	-	H	0	F	S	_			
Samples Relinquished By (Print Name and Sign):  Alessandro Pellerio Menu Mare    Date   Time   Samples Received By (Print Name and Sign):   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Time   Ti	DH B7/59	5 551	76FAB 40	9-20	L	2			1				-				-						-		++	-	
Samples Relinquished By (Print Name and Sign):  Alessandro Pellerito  Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time Feb 26, 2020  Time					-								-								-				-		
Samples Relinquished By (Print Name and Sign):  Alessandro Pellerito  Feb 26, 2020  Sistomer Refinquished By (Print Name and Sign):  Feb 26, 2020  Sistomer Refinquished By (Print Name and Sign):  Alessandro Pellerito  Time  Feb 26, 2020  Time  Feb 26, 2020  Sistomer Refinquished By (Print Name and Sign):  Alessandro Pellerito  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  Time  T	BH 56				1	-					-																
Samples Relinquished By (Print Name and Sign):  Alessandro Pellerito  Feb 26, 2020  8:15AM  Samples Resemed By (Print Name and Sign):  70 70 70 70 70 70 70 70 70 70 70 70 70 7	BU SC	800	1		+ ;		MOLS		-		1	-											- 4				
Alessandro Pellerito Feb 26, 2020 8:15AM  Date    Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   D	011 28			11-57	1																			X			
Alessandro Pellerito Feb 26, 2020 8:15AM  Date    Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   D																							10				
Alessandro Pellerito Feb 26, 2020 8:15AM  Date    Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   D																											
Alessandro Pellerito Feb 26, 2020 8:15AM  Date    Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   D															- 1												
Alessandro Pellerito Feb 26, 2020 8:15AM  Date    Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   D																					-	-	-			-	
Alessandro Pellerito Feb 26, 2020 8:15AM  Date    Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   D																		-					_		-		
Alessandro Pellerito Feb 26, 2020 8:15AM  Date    Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   D										-																	
Alessandro Pellerito Feb 26, 2020 8:15AM  Date    Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   Date   D	Samples Relinquished Rd /Pris	of Marrie and Sister:		In-a		Į.																					
Sampley, Arthropythed By (Print Name and Sign):  Date  Time  Samples Ancound By (Print Name and Sign):  Date  Time	the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon	1100	_		200		Samples Received By (Pri	nt Name and Sign):	1.1	1.	1/2	-		Date /	1	***	T	ime			T						
	Sampley Primayished By (Prin	Name and Side	10-	and the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of th		-	Samples Heceived By IPrin	nt Name and Sign):	10	0	-1 -	/	_	Date	<u>.</u>	1		ime			-			7	-7		

Samples Received By (Print Name and Sign):

Nº:



5623 McADAM ROAD MISSISSAUGA, ONTARIO CANADA L4Z 1N9 TEL (905)501-9998 FAX (905)501-0589 http://www.agatlabs.com

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4 RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Alessandro Pellerito

PROJECT: 20T578836

AGAT WORK ORDER: 20T580259

SOLID ANALYSIS REVIEWED BY: Sherin Moussa, Senior Technician

DATE REPORTED: Mar 04, 2020

PAGES (INCLUDING COVER): 5

Should you require any information regarding this analysis please contact your client services representative at (905) 501-9998

1		
1		
1		
1		
- 1		
- 1		
- 1		
1		
- 1		
- 1		
- 1		
- 1		
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		

All samples are stored at no charge for 90 days. Please contact the lab if you require additional sample storage time.

*NOTES



AGAT WORK ORDER: 20T580259

PROJECT: 20T578836

ATTENTION TO: Alessandro Pellerito

5623 McADAM ROAD MISSISSAUGA, ONTARIO CANADA L4Z 1N9 TEL (905)501-9998 FAX (905)501-0589 http://www.agatlabs.com

CLIENT NAME: WO	OOD ENVIRO	NMENT & INF	RASTRUCTURE	ATTENTION TO: Alessandro Pellerito										
	(201-042) Sulfide													
DATE SAMPLED: Ma	ar 02, 2020		DATE RECEIVED: Mar 03, 2020	DATE REPORTED: Mar 04, 2020	SAMPLE TYPE: Soil									
	Analyte:	Sulfide												
	Unit:	%												
Sample ID (AGAT ID)	RDL:	0.05												
BH S14 SS4 (984917)		0.14												
BH S16 SS5 (984918)		<0.05												
BH S6 SS5 (984919)		0.22												

Analysis performed at AGAT 5623 McAdam Rd., Mississauga, ON (unless marked by *)

RDL - Reported Detection Limit

Comments:





Quality Assurance - Replicate AGAT WORK ORDER: 20T580259

PROJECT: 20T578836

5623 McADAM ROAD MISSISSAUGA, ONTARIO CANADA L4Z 1N9 TEL (905)501-9998 FAX (905)501-0589 http://www.agatlabs.com

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

ATTENTION TO: Alessandro Pellerito

	(201-042) Sulfide															
REPLICATE #1 REPLICATE #2																
Parameter	Sample ID Original Replicate RPD Sample ID Original Replicate RPD															
S	984917	0.137	0.139	1.4%	984919	0.215	0.21	2.4%								
Sulfate	984917	< 0.01	< 0.01	0.0%	984919	< 0.01	< 0.01	0.0%								
Sulfide	984917	0.14	0.14	0.0%	984919	0.22	0.21	4.7%								



Quality Assurance - Certified Reference materials AGAT WORK ORDER: 20T580259

PROJECT: 20T578836

5623 McADAM ROAD MISSISSAUGA, ONTARIO CANADA L4Z 1N9 TEL (905)501-9998 FAX (905)501-0589 http://www.agatlabs.com

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

ATTENTION TO: Alessandro Pellerito

	(201-042) Sulfide															
CRM #1 CRM #2																
Parameter	Parameter Expect Actual Recovery Limits Expect Actual Recovery Limits															
S	0.80	0.81	101%	90% - 110%	0.80	0.79	98%	90% - 110%								
Sulfate	0.01	0.01	100%	90% - 110%	0.01	0.01	100%	90% - 110%								
Sulfide	0.80	0.80	100%	90% - 110%	0.80	0.78	97%	90% - 110%								



5623 McADAM ROAD MISSISSAUGA, ONTARIO CANADA L4Z 1N9 TEL (905)501-9998 FAX (905)501-0589 http://www.agatlabs.com

# **Method Summary**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T580259 ATTENTION TO: Alessandro Pellerito

PROJECT: 20T578836

SAMPLING SITE:	SAMPLED BY:								
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE						
Solid Analysis									
Sulfide	MIN-200-12037		LECO						



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4
RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Alessandro Pellerito

PROJECT: TP115086

AGAT WORK ORDER: 20T584983

SOIL ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

DATE REPORTED: Nov 13, 2020

PAGES (INCLUDING COVER): 11 VERSION*: 1

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

*Notes	

#### Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
  incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other
  third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
  services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
  merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
  contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Page 1 of 11

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. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.



AGAT WORK ORDER: 20T584983

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE:SP47

mg/L

mg/L

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammod Safarpanah

#### O. Reg. 558 Metals and Inorganics

DATE RECEIVED: 2020-03-16								DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION: (	Comp 1 TCLP D	Comp 1 TCLP B	
					SAMPLE TYPE:	Soil	Soil	
					DATE SAMPLED:	2020-02-24	2020-02-20	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1028257	1028261	
Arsenic Leachate	mg/L	2.5	0.010	2020-03-23	2020-03-23	<0.010	<0.010	
Barium Leachate	mg/L	100	0.100	2020-03-23	2020-03-23	0.738	0.410	
Boron Leachate	mg/L	500	0.050	2020-03-23	2020-03-23	0.056	0.051	
Cadmium Leachate	mg/L	0.5	0.010	2020-03-23	2020-03-23	<0.010	<0.010	
Chromium Leachate	mg/L	5	0.010	2020-03-23	2020-03-23	<0.010	<0.010	
Lead Leachate	mg/L	5	0.010	2020-03-23	2020-03-23	<0.010	<0.010	
Mercury Leachate	mg/L	0.1	0.01	2020-03-23	2020-03-23	<0.01	<0.01	
Selenium Leachate	mg/L	1	0.010	2020-03-23	2020-03-23	<0.010	<0.010	
Silver Leachate	mg/L	5	0.010	2020-03-23	2020-03-23	<0.010	<0.010	
Uranium Leachate	mg/L	10	0.050	2020-03-23	2020-03-23	<0.050	<0.050	
Fluoride Leachate	mg/L	150	0.05	2020-03-23	2020-03-23	0.32	0.24	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria

1000

0.05

0.70

2020-03-23

2020-03-23

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.

< 0.05

<0.70

< 0.05

< 0.70

2020-03-23

2020-03-23

Analysis performed at AGAT Toronto (unless marked by *)

Cyanide Leachate

(Nitrate + Nitrite) as N Leachate





AGAT WORK ORDER: 20T584983

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE: SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammod Safarpanah

O. Reg. 558 - OC Pesticides & PCBs
------------------------------------

DATE RECEIVED: 2020-03-16								DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION: (	Comp 1 TCLP D	Comp 1 TCLP B	
					SAMPLE TYPE:	Soil	Soil	
					DATE SAMPLED:	2020-02-24	2020-02-20	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1028257	1028261	
Heptachlor + Heptachlor Epoxide	mg/L	0.3	0.0003	2020-03-23	2020-03-23	<0.0003	<0.0003	
Aldrin + Dieldrin	mg/L	0.07	0.0007	2020-03-23	2020-03-23	< 0.0007	< 0.0007	
DDT + Metabolites	mg/L	3.0	0.003	2020-03-23	2020-03-23	< 0.003	< 0.003	
Methoxychlor	mg/L	90.0	0.09	2020-03-23	2020-03-23	< 0.09	< 0.09	
Chlordane (Total)	mg/L	0.7	0.0007	2020-03-23	2020-03-23	< 0.0007	<0.0007	
Aldrin	mg/L		0.0002	2020-03-23	2020-03-23	< 0.0002	<0.0002	
alpha - chlordane	mg/L		0.0001	2020-03-23	2020-03-23	<0.0001	<0.0001	
gamma-Chlordane	mg/L		0.0002	2020-03-23	2020-03-23	< 0.0002	<0.0002	
Oxychlordane	mg/L		0.0004	2020-03-23	2020-03-23	<0.0004	<0.0004	
pp'-DDE	mg/L		0.0005	2020-03-23	2020-03-23	< 0.0005	<0.0005	
pp'-DDD	mg/L		0.0015	2020-03-23	2020-03-23	< 0.0015	<0.0015	
op'-DDT	mg/L		0.0015	2020-03-23	2020-03-23	<0.0015	<0.0015	
op'-DDT	mg/L		0.0005	2020-03-23	2020-03-23	< 0.0005	<0.0005	
Dieldrin	mg/L		0.0005	2020-03-23	2020-03-23	< 0.0005	<0.0005	
Heptachlor	mg/L		0.0001	2020-03-23	2020-03-23	<0.0001	<0.0001	
Heptachlor Epoxide	mg/L		0.0002	2020-03-23	2020-03-23	<0.0002	<0.0002	
_indane	mg/L		0.0004	2020-03-23	2020-03-23	<0.0004	<0.0004	
Endrin	mg/L	0.02	0.0004	2020-03-23	2020-03-23	<0.0004	<0.0004	
Гохарhene	mg/L	0.5	0.0005	2020-03-23	2020-03-23	<0.0005	<0.0005	
PCB's	mg/L	0.3	0.0002	2020-03-23	2020-03-23	<0.0002	<0.0002	
OC/PCB Pest Extr	NA			2020-03-23		Υ	Υ	
Surrogate	Unit	Acceptal	ole Limits					
Decachlorobiphenyl	%	60-	130	2020-03-23	2020-03-23	92	85	

Certified By:

MPoprukolof



AGAT WORK ORDER: 20T584983

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammod Safarpanah

O. Reg. 558 - OC Pesticides & PCBs

DATE RECEIVED: 2020-03-16 DATE REPORTED: 2020-11-13

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria

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.

1028257-1028261 The sample was leached according to Regulation 558 protocol. Analysis was performed after extraction of the leachate.

Heptachlor + Heptachlor Epoxide is a calculated parameter. The calculated value is the sum of Heptachlor and Heptachlor Epoxide.

Aldrin + Dieldrin is a calculated parameter. The calculated value is the sum of Aldrin and Dieldrin.

PCB total is a calculated parameter. The calculated value is the sum of Aroclor 1242, Aroclor 1248, Aroclor 1254 and Aroclor 1260.

DDT + Metabolites is a calculated parameter. The calculated value is the sum of op'DDT, pp'DDT, pp'DDE and pp'DDD.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

NPopukolof



AGAT WORK ORDER: 20T584983

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE:SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammod Safarpanah

					3			
DATE RECEIVED: 2020-03-16								DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION: (			
					SAMPLE TYPE:	Soil	Soil	
					DATE SAMPLED:	2020-02-24	2020-02-20	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1028257	1028261	
Vinyl Chloride	mg/L	0.2	0.030	2020-03-20	2020-03-23	<0.030	< 0.030	
1,1 Dichloroethene	mg/L	1.4	0.020	2020-03-20	2020-03-23	< 0.020	<0.020	
Dichloromethane	mg/L	5.0	0.030	2020-03-20	2020-03-23	< 0.030	< 0.030	
Methyl Ethyl Ketone	mg/L	200	0.090	2020-03-20	2020-03-23	< 0.090	< 0.090	
Chloroform	mg/L	10.0	0.020	2020-03-20	2020-03-23	<0.020	<0.020	
1,2-Dichloroethane	mg/L	0.5	0.020	2020-03-20	2020-03-23	< 0.020	< 0.020	
Carbon Tetrachloride	mg/L	0.5	0.020	2020-03-20	2020-03-23	<0.020	<0.020	
Benzene	mg/L	0.5	0.020	2020-03-20	2020-03-23	<0.020	<0.020	
Trichloroethene	mg/L	5.0	0.020	2020-03-20	2020-03-23	<0.020	<0.020	
Tetrachloroethene	mg/L	3.0	0.050	2020-03-20	2020-03-23	< 0.050	< 0.050	
Chlorobenzene	mg/L	8.0	0.010	2020-03-20	2020-03-23	<0.010	<0.010	
1,2-Dichlorobenzene	mg/L	20.0	0.010	2020-03-20	2020-03-23	<0.010	<0.010	
1,4-Dichlorobenzene	mg/L	0.5	0.010	2020-03-20	2020-03-23	<0.010	<0.010	
Surrogate	Unit	Acceptab	le Limits					
Toluene-d8	% Recovery	60-	130	2020-03-20	2020-03-23	117	110	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria

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.

1028257-1028261 Sample was prepared using Regulation 558 protocol and a zero headspace extractor.

Analysis performed at AGAT Toronto (unless marked by *)





AGAT WORK ORDER: 20T584983

#### **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito SAMPLING SITE:SP47 SAMPLED BY:Mohammod Safarpanah

7. III Elito Gile. Gi 47															
	Soil Analysis														
RPT Date: Nov 13, 2020		REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE							
PARAMETER	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits			
	Batch	ld	·				value	Lower	Upper		Lower	Upper	,	Lower	Upper
O. Reg. 558 Metals and Inorganic	cs														
Arsenic Leachate	1031799		<0.010	<0.010	NA	< 0.010	102%	70%	130%	104%	80%	120%	111%	70%	130%
Barium Leachate	1031799		0.116	0.121	NA	< 0.100	104%	70%	130%	105%	80%	120%	112%	70%	130%
Boron Leachate	1031799		< 0.050	< 0.050	NA	< 0.050	98%	70%	130%	99%	80%	120%	82%	70%	130%
Cadmium Leachate	1031799		<0.010	<0.010	NA	< 0.010	99%	70%	130%	97%	80%	120%	96%	70%	130%
Chromium Leachate	1031799		<0.010	<0.010	NA	< 0.010	103%	70%	130%	106%	80%	120%	111%	70%	130%
Lead Leachate	1031799		<0.010	<0.010	NA	< 0.010	98%	70%	130%	92%	80%	120%	87%	70%	130%
Mercury Leachate	1031799		<0.01	<0.01	NA	< 0.01	100%	70%	130%	107%	80%	120%	112%	70%	130%
Selenium Leachate	1031799		<0.010	< 0.010	NA	< 0.010	98%	70%	130%	97%	80%	120%	102%	70%	130%
Silver Leachate	1031799		<0.010	<0.010	NA	< 0.010	98%	70%	130%	101%	80%	120%	91%	70%	130%
Uranium Leachate	1031799		<0.050	<0.050	NA	< 0.050	98%	70%	130%	103%	80%	120%	104%	70%	130%
Fluoride Leachate	1031799		0.16	0.16	NA	< 0.05	102%	90%	110%	107%	90%	110%	106%	70%	130%
Cyanide Leachate	1031799		< 0.05	< 0.05	NA	< 0.05	95%	70%	130%	107%	80%	120%	100%	70%	130%
(Nitrate + Nitrite) as N Leachate	1031799		<0.70	<0.70	NA	< 0.70	96%	80%	120%	102%	80%	120%	103%	70%	130%

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

MARTERED S NIVER BASHY C CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST

#### **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE AGAT WORK ORDER: 20T584983

PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito SAMPLING SITE:SP47 SAMPLED BY:Mohammod Safarpanah

			Trac	e Or	gani	cs Ar	alys	is							
RPT Date: Nov 13, 2020				DUPLICATI	E		REFERE	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value		ptable	Recovery		ptable	Recovery	Lie	ptable
		lu					value	Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 558 - VOCs															
Vinyl Chloride	1026673		< 0.030	< 0.030	NA	< 0.030	98%	60%	140%	83%	60%	140%	116%	60%	140%
1,1 Dichloroethene	1026673		< 0.020	< 0.020	NA	< 0.020	106%	70%	130%	108%	70%	130%	106%	60%	140%
Dichloromethane	1026673		< 0.030	< 0.030	NA	< 0.030	106%	70%	130%	102%	70%	130%	76%	60%	140%
Methyl Ethyl Ketone	1026673		< 0.090	< 0.090	NA	< 0.090	73%	70%	130%	91%	70%	130%	103%	60%	140%
Chloroform	1026673		< 0.020	< 0.020	NA	< 0.020	106%	70%	130%	103%	70%	130%	92%	60%	140%
1,2-Dichloroethane	1026673		< 0.020	< 0.020	NA	< 0.020	87%	70%	130%	105%	70%	130%	108%	60%	140%
Carbon Tetrachloride	1026673		< 0.020	< 0.020	NA	< 0.020	79%	70%	130%	77%	70%	130%	78%	60%	140%
Benzene	1026673		< 0.020	< 0.020	NA	< 0.020	84%	70%	130%	86%	70%	130%	91%	60%	140%
Trichloroethene	1026673		< 0.020	< 0.020	NA	< 0.020	84%	70%	130%	96%	70%	130%	90%	60%	140%
Tetrachloroethene	1026673		< 0.050	< 0.050	NA	< 0.050	96%	70%	130%	107%	70%	130%	106%	60%	140%
Chlorobenzene	1026673		< 0.010	< 0.010	NA	< 0.010	100%	70%	130%	111%	70%	130%	104%	60%	140%
1,2-Dichlorobenzene	1026673		< 0.010	< 0.010	NA	< 0.010	103%	70%	130%	105%	70%	130%	94%	60%	140%
1,4-Dichlorobenzene	1026673		< 0.010	< 0.010	NA	< 0.010	102%	70%	130%	109%	70%	130%	98%	60%	140%
O. Reg. 558 - OC Pesticides & PC	CBs														
Heptachlor + Heptachlor Epoxide	908399		< 0.0003	< 0.0003	NA	< 0.0003	95%	60%	140%	90%	60%	140%	NA	60%	140%
Aldrin + Dieldrin	908399		< 0.0007	< 0.0007	NA	< 0.0007		60%	140%	92%	60%	140%	NA	60%	140%
DDT + Metabolites	908399		< 0.003	< 0.003	NA	< 0.003	108%	60%	140%	103%	60%	140%	NA	60%	140%
Methoxychlor	908399		< 0.09	< 0.09	NA	< 0.09	98%	60%	140%	102%	60%	140%	NA	60%	140%
Chlordane (Total)	908399		< 0.0007	< 0.0007	NA	< 0.0007	94%	60%	140%	93%	60%	140%	NA	60%	140%
Aldrin	908399		< 0.0002	< 0.0002	NA	< 0.0002	95%	60%	140%	90%	60%	140%	NA	60%	140%
alpha - chlordane	908399		< 0.0001	< 0.0001	NA	< 0.0001	95%	60%	140%	93%	60%	140%	NA	60%	140%
gamma-Chlordane	908399		< 0.0002	< 0.0002	NA	< 0.0002	94%	60%	140%	92%	60%	140%	NA	60%	140%
Oxychlordane	908399		< 0.0004	< 0.0004	NA	< 0.0004	104%	60%	140%	89%	60%	140%	NA	60%	140%
pp'-DDE	908399		< 0.0005	< 0.0005	NA	< 0.0005	100%	60%	140%	100%	60%	140%	NA	60%	140%
pp'-DDD	908399		< 0.0015	< 0.0015	NA	< 0.0015	86%	60%	140%	91%	60%	140%	NA	60%	140%
op'-DDT	908399		< 0.0015	< 0.0015	NA	< 0.0015	109%	60%	140%	100%	60%	140%	NA	60%	140%
pp'-DDT	908399		< 0.0005	< 0.0005	NA	< 0.0005	107%	60%	140%	105%	60%	140%	NA	60%	140%
Dieldrin	908399		< 0.0005	< 0.0005	NA	< 0.0005	96%	60%	140%	94%	60%	140%	NA	60%	140%
Heptachlor	908399		< 0.0001	< 0.0001	NA	< 0.0001	96%	60%	140%	87%	60%	140%	NA	60%	140%
Heptachlor Epoxide	908399		< 0.0002	< 0.0002	NA	< 0.0002	94%	60%	140%	93%	60%	140%	NA	60%	140%
Lindane	908399		< 0.0004	< 0.0004	NA	< 0.0004		60%	140%	83%	60%	140%	NA	60%	140%
Endrin	908399		< 0.0004	< 0.0004	NA	< 0.0004	92%	60%	140%	90%	60%	140%	NA	60%	140%
Toxaphene	908399		< 0.0005	< 0.0005	NA	< 0.0005		60%	140%	86%	60%	140%	NA	60%	140%
PCB's	908399		< 0.0002	< 0.0002	NA	< 0.0002	96%	60%	140%	92%	60%	140%	89%	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).



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T584983

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE:SP47

SAMPLED BY:Mohammod Safarpanah

	Trace Organics Analysis (Continued)														
RPT Date: Nov 13, 2020			С	UPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		otable nits	Recovery	Lin	ptable nits	Recovery	Lin	ptable nits
		la la					Value	Lower	Upper	,	Lower	Upper		Lower	Upper

Certified By:

NPoprikolof



# Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T584983

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE:SP47

SAMPLED BY:Mohammod Safarpanah

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis		•	
Arsenic Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	BICP-MS
Barium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	BICP-MS
Boron Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	3 ICP-MS
Cadmium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020	3 ICP-MS
Chromium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020	3 ICP-MS
Lead Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	3 ICP-MS
Mercury Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020	3 ICP-MS
Selenium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020	3 ICP-MS
Silver Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020	3 ICP-MS
Uranium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	3 ICP-MS
Fluoride Leachate	INOR-93-6018	EPA 1311 & modified from SM4500-F-C	ION SELECTIVE ELECTRODE
Cyanide Leachate	INOR-93-6052	EPA 1311 & modified from MOE 3015 & SM 4500 CN-I	TECHNICON AUTO ANALYZER
(Nitrate + Nitrite) as N Leachate	INOR-93-6053	EPA 1311 & modified from SM 4500-NO3-I	LACHAT FIA

# **Method Summary**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T584983

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE:SP47

SAMPLED BY:Mohammod Safarpanah

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Heptachlor + Heptachlor Epoxide	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
Aldrin + Dieldrin	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
DDT + Metabolites	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
Methoxychlor	ORG-91-5112	EPA SW-846 8081A & 8082	GC/ECD
Chlordane (Total)	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
Aldrin	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
alpha - chlordane	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
gamma-Chlordane	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
Oxychlordane	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
pp'-DDE	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
pp'-DDD	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
op'-DDT	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
pp'-DDT	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
Dieldrin	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
Heptachlor	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
Heptachlor Epoxide	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
Lindane	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
Endrin	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
Toxaphene	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
PCB's	ORG-91-5112	EPA SW-846 3550 & 8082	GC/ECD
Decachlorobiphenyl	ORG-91-5112	EPA SW-846 3550 & 8081	GC/ECD
OC/PCB Pest Extr			N/A
Vinyl Chloride	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
1,1 Dichloroethene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Dichloromethane	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Chloroform	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Benzene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Trichloroethene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Tetrachloroethene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Chlorobenzene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Toluene-d8	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS



r	ies		Ph: 90		issīssau <b>2.5100</b>	835 Coope ga, Ontari Fax: <b>905</b> bearth.aga	o L4 . <b>712</b>	Z 1Y . <b>512</b>	2 <b>2</b>	w	ork C	rder	#:	2		•	81	198	33		
e D	rinking Water Chain of	Custody Form (p	ootable v	vater o	consume	d by humans	5)			A	rrival	Temp	oerat	ures		7	2	1	1.7	16	7
R (Ple	egulatory Requ	irements:		lo R	egula	tory Red	uire	eme	ent		ustod lotes:		al Int	act:	K	□Yes		[	□No		□N/A
	Regulation 153/04  Table 2 Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate One   Indicate	Sewer	itary m	Re	 □ P O □ O	cegulation  CME  rov. Water bjectives ( ther  Indicate C	Qua PWQ	(O)		Tu	irna egula ish 1	rou ar T/ AT (f 3 Bu Days	AT Rush S Isine:	urchai SS	ges Ap	] 5 t (P) (P) (P) (D)	to 7 f Busin	equire Busines ness rcharge	ss Day:	Next i	Business :
R	Yes 🗹	ndition? No			Yes	e of Ana	٠.					TAT I	is ex	clusiv	e of	week ı, ple	ends	cation and st	tatutor	y holia	lays
B GV O P S SD SV	Oil Paint Soll Sediment	gend	Field Filtered - Metals, Hg, CrVI	Metals and Inorganics	☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	□B·HWS □Cr □CN □EC □FOC□Hg ]SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐TP ☐NH, ☐TKN ☐NO, ☐NO, ☐NO, ☐NO, ☐NO,	Volatiles: ☐ VOC ☐ BTEX ☐ THM	PHCs F1 - F4			PCBs: ■ Total □ Aroclors	Organochlorine Pesticides	TCLP: M&I VOCS ABNS B(a)P PCBS	Use	P OC pesticides			
e <	Commen Special Instr		Y/N	Metals	□ All Me	ORPS:	Full Me	Regula	Nutrier No.	Volatile	PHCs 6	ABNS	PAHs	PCBs:	Organo	TCLP: 🖪	Sewer Use	TCLP			
	HOLD																				

# **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:	WOOU					(1,1000	enter an applicable box	.3)						
Contact:	Alessandro Pellerito					□R	egulation 153/04	Sewe	rilea	1	[7] s	Regulation	550	
Address:	50 Vogell Road Units 3 ar	nd 4					able 2 Indicate One		i oac		- "	egulation	556	
	Richmond Hill, ON					"	Indicate One	□San	itary			CME		
Phone:	6479826220	Fax:				_	]Res/Park ]Agriculture	□Stoi	rm			rov. Water		
Reports to be sent to:  1. Email:	a.pellerito@woodplc.com				_		exture (Check One)  Coarse	Region	ite One	-		bjectives ther	(PWC	ĮU)
2. Email:	shami.malla@woodplc.co	m				_	]Fine	MISA			- 0	Indicate	One	
Project Inform	nation:						this submissi					Guldelin		
Project:	TP115086					Ke	cord of Site Co	ondition?		Cer	tificat	te of An	alys	ils
Site Location:	SP47						] Yes [ℤ	] No			Yes		l N	0
Sampled By:	Mohammod Safarpanah													
AGAT Quote #:	305848	PO:									O. Reg	153		
	Please note: If quotation number i	s not provided, client (	vill be billed full price	for analysis.			nple Matrix Le	gend	S		88			
nvoice Inform	nation:		Bill To Same:	Yes ☑ N	۰□	GW	Biota Ground Water		Ξ,		Metals (excl. Hydrides) 153 Metals (Incl. Hydrides)	-		
Company:						0	Oil		Metals,		ccl. H	등 문		v
Contact:	Shami Malla					P	Paint			93	Ils (e) Meta	ㅎㅁ		Meta
Address:						S	Soil		Filtered	Inorganics	Meta 153	in S		E
Email:	GTA EAST@woodplc.co	om				SD	Sediment		E E	, E			Scan	10
						SW	Surface Water		Field	and II	tals   153	□ B-HWS □ EC □ □SAR	Metals S	J/uoi
Sampl	e Identification	Date	Time	# of	Sam	ole	Comme	nts/	V/N	tals	II Meta ydride	-: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -: S =   -	₩ W	1 1

Invoice Infor Company: Contact: Address: Email:	Please note: If quotation number is mation:  Shami Malla  GTA EAST@woodplc.co		ill be billed full price	Ton Ton		Sample Matrix Legend B Biota GW Ground Water O Oil P Paint S Soil SD Sediment SW Surface Water	Field Filtered - Metals, Hg, CrVI	and Inorganics	ials   153 Metals (excl. Hydrides) e Metals   153 Metals (Incl. Hydrides)	ORPs: DB-HWS DC! DCN DCA* DEC DFOC DHg DPH DSAR	Full Metals Scan	om Met	NO ₂	s: □voc □BTEX □THM	1 - F4		1 Total □ Aroclors	Organochlorine Pesticides	M&I ☑ VOCs ☐ ABNs ☐ B(a)P 呕PC	5	L OC besticides	
Samp	le Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix		Y/N	Metals	☐ All Me	ORPs:	Full Me	Regula	NO.	Volatiles:	PHCS F1	PAHS	PCBs: Total	Organo	TCLP: M&I	Sewer Use	151	
Comp 1 TCLP D		24 Feb 2020		2	S														7	G	3	10
Comp 2 TCLP D		24 Feb 2020		2	S	HOLD																
Comp 1 TCLP B		20 Feb 202		2	S					4									<b>Ø</b>	G	2	1
	A					10																
Aressandro Peller amples Relinquished By (P.	ito X		Mar 13		1:20	Samples Received By (Print Name and Sign)	1	0		)		Data 3	16	20	Time	5:1	K					

amples Received By (Print Name and Sign):

of _

Page

Nº:



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4
RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Alessandro Pellerito

PROJECT: TP115086 AGAT WORK ORDER: 20T587352

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Lab Manager

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

DATE REPORTED: Nov 13, 2020

PAGES (INCLUDING COVER): 21 VERSION*: 1

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

*Notes	

#### Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
  incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other
  third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
  services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
  merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
  contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Page 1 of 21

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. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.



AGAT WORK ORDER: 20T587352

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE: SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammahd Safarpanah

				C	Corrosivity P	ackage		
DATE RECEIVED: 2020-03-23								DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH S10 SS5	BH C31 SS3	
					SAMPLE TYPE:	Soil	Soil	
				I	DATE SAMPLED:	2020-03-18	2020-03-19	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1046512	1046527	
Chloride (2:1)	μg/g	NA	2	2020-03-30	2020-03-30	363	69	
Sulphate (2:1)	μg/g		2	2020-03-30	2020-03-30	65	18	
pH (2:1)	pH Units		NA			8.12	8.54	
Electrical Conductivity (2:1)	mS/cm	1.4	0.005	2020-03-27	2020-03-27	0.798	0.224	
Resistivity (2:1) (Calculated)	ohm.cm		1	2020-03-27	2020-03-27	1250	4460	
Redox Potential 1	mV		NA	2020-03-25	2020-03-25	54	45	
Redox Potential 2	mV		NA	2020-03-25	2020-03-25	39	46	
Redox Potential 3	mV		NA	2020-03-25	2020-03-25	26	49	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

1046512-1046527 EC, pH, Chloride and Sulphate were determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water: 1 part soil). Resistivity is a calculated parameter.

Redox potential measured on as received sample. Due to the potential for rapid change in sample equilibrium chemistry with exposure to oxidative/reduction conditions laboratory results may differ from

field measured results.

Analysis performed at AGAT Toronto (unless marked by *)

mayot Bhells AMMINT BHELA 2



AGAT WORK ORDER: 20T587352

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE:SP47

NA

pH Units

12

5.0-9.0

NA

NA

2020-03-30

2020-03-28

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammahd Safarpanah

5: 2 5: · · · · · ·							J 222 .	51onaara Gararpanan
			C	). Reg. 153(	511) - Metals	& Inorgan	ics (Soil)	
DATE RECEIVED: 2020-03-23								DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH C37 SS1	BH C29 SS1	
					SAMPLE TYPE:	Soil	Soil	
					DATE SAMPLED:	2020-03-19	2020-03-19	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1046494	1046517	
Antimony	μg/g	40	0.8	2020-03-27	2020-03-27	<0.8	<0.8	
Arsenic	μg/g	18	1	2020-03-27	2020-03-27	5	3	
Barium	μg/g	670	2	2020-03-27	2020-03-27	79	119	
Beryllium	μg/g	8	0.5	2020-03-27	2020-03-27	0.6	0.6	
Boron	μg/g	120	5	2020-03-27	2020-03-27	9	8	
Boron (Hot Water Extractable)	μg/g	2	0.10	2020-03-27	2020-03-27	<0.10	0.50	
Cadmium	μg/g	1.9	0.5	2020-03-27	2020-03-27	<0.5	<0.5	
Chromium	μg/g	160	5	2020-03-27	2020-03-27	21	21	
Cobalt	μg/g	80	0.5	2020-03-27	2020-03-27	10.0	8.3	
Copper	μg/g	230	1	2020-03-27	2020-03-27	23	15	
Lead	μg/g	120	1	2020-03-27	2020-03-27	10	10	
Molybdenum	μg/g	40	0.5	2020-03-27	2020-03-27	<0.5	<0.5	
Nickel	μg/g	270	1	2020-03-27	2020-03-27	23	17	
Selenium	μg/g	5.5	0.4	2020-03-27	2020-03-27	<0.4	0.6	
Silver	μg/g	40	0.2	2020-03-27	2020-03-27	<0.2	<0.2	
Thallium	μg/g	3.3	0.4	2020-03-27	2020-03-27	<0.4	<0.4	
Uranium	μg/g	33	0.5	2020-03-27	2020-03-27	<0.5	1.0	
Vanadium	μg/g	86	1	2020-03-27	2020-03-27	28	31	
Zinc	μg/g	340	5	2020-03-27	2020-03-27	51	67	
Chromium, Hexavalent	μg/g	8	0.2	2020-03-26	2020-03-26	<0.2	<0.2	
Cyanide, Free	μg/g	0.051	0.040	2020-03-30	2020-03-30	< 0.040	<0.040	
Mercury	μg/g	3.9	0.10	2020-03-27	2020-03-27	<0.10	<0.10	
Electrical Conductivity (2:1)	mS/cm	1.4	0.005	2020-03-27	2020-03-27	1.33	2.06	

Certified By:

3.20

7.73

8.09

7.27



Sodium Adsorption Ratio

pH, 2:1 CaCl2 Extraction

2020-03-30

2020-03-28



AGAT WORK ORDER: 20T587352

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammahd Safarpanah

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

DATE RECEIVED: 2020-03-23 DATE REPORTED: 2020-11-13

Comments:

RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

1046494-1046517 EC was 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. SAR is a calculated parameter.

Analysis performed at AGAT Toronto (unless marked by *)

mayot Bhells AMMERTERED CHEMIST



AGAT WORK ORDER: 20T587352

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE:SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammahd Safarpanah

O/ ((())   E   (()   ()   ()							0, EED D .	morialmara Cara paran
				O. Re	g. 153(511)	- PAHs (So	oil)	
DATE RECEIVED: 2020-03-23								DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH C33 SS1	BH C29 SS1	
					SAMPLE TYPE:	Soil	Soil	
				1	DATE SAMPLED:	2020-03-19	2020-03-19	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1046509	1046517	
Naphthalene	μg/g	9.6	0.05	2020-03-27	2020-03-30	<0.05	<0.05	
Acenaphthylene	μg/g	0.15	0.05	2020-03-27	2020-03-30	< 0.05	<0.05	
Acenaphthene	μg/g	21	0.05	2020-03-27	2020-03-30	< 0.05	< 0.05	
Fluorene	μg/g	62	0.05	2020-03-27	2020-03-30	< 0.05	<0.05	
Phenanthrene	μg/g	12	0.05	2020-03-27	2020-03-30	< 0.05	<0.05	
Anthracene	μg/g	0.67	0.05	2020-03-27	2020-03-30	< 0.05	< 0.05	
Fluoranthene	μg/g	9.6	0.05	2020-03-27	2020-03-30	< 0.05	< 0.05	
Pyrene	μg/g	96	0.05	2020-03-27	2020-03-30	< 0.05	<0.05	
Benz(a)anthracene	μg/g	0.96	0.05	2020-03-27	2020-03-30	< 0.05	<0.05	
Chrysene	μg/g	9.6	0.05	2020-03-27	2020-03-30	< 0.05	<0.05	
Benzo(b)fluoranthene	μg/g	0.96	0.05	2020-03-27	2020-03-30	< 0.05	<0.05	
Benzo(k)fluoranthene	μg/g	0.96	0.05	2020-03-27	2020-03-30	< 0.05	<0.05	
Benzo(a)pyrene	μg/g	0.3	0.05	2020-03-27	2020-03-30	< 0.05	<0.05	
Indeno(1,2,3-cd)pyrene	μg/g	0.76	0.05	2020-03-27	2020-03-30	< 0.05	<0.05	
Dibenz(a,h)anthracene	μg/g	0.1	0.05	2020-03-27	2020-03-30	< 0.05	<0.05	
Benzo(g,h,i)perylene	μg/g	9.6	0.05	2020-03-27	2020-03-30	< 0.05	<0.05	
2-and 1-methyl Naphthalene	μg/g	30	0.05	2020-03-27	2020-03-30	<0.05	<0.05	
Moisture Content	%		0.1	2020-03-27	2020-03-30	14.5	20.6	
Surrogate	Unit	Acceptab	le Limits					
Naphthalene-d8	%	50-1	140	2020-03-27	2020-03-30	71	78	
Acenaphthene-d10	%	50-1	140	2020-03-27	2020-03-30	81	89	
Chrysene-d12	%	50-1	140	2020-03-27	2020-03-30	87	98	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

1046509-1046517 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.

2- and 1-Methyl Naphthalene is a calculated parameter. The calculated value is the sum of 2-Methyl Naphthalene and 1-Methyl Naphthalene.

Analysis performed at AGAT Toronto (unless marked by *)





AGAT WORK ORDER: 20T587352

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE: SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY: Mohammahd Safarpanah

		O. Reg.	153(511) - P	HCs F1 - F4	(with PAHs	and VOC) (	Soil)
DATE RECEIVED: 2020-03-23							DATE REPORTED: 2020-11-13
			SAMPL	E DESCRIPTION:	BH C33 SS1	BH C29 SS1	
				SAMPLE TYPE:	Soil	Soil	
				DATE SAMPLED:	2020-03-19	2020-03-19	
Parameter	Unit	G/S RDL	Date Prepared	Date Analyzed	1046509	1046517	
F1 (C6 to C10)	μg/g	55 5	2020-03-26	2020-03-27	<5	<5	
F1 (C6 to C10) minus BTEX	μg/g	55 5	2020-03-26	2020-03-27	<5	<5	
F2 (C10 to C16)	μg/g	230 10	2020-03-25	2020-03-25	<10	<10	
F2 (C10 to C16) minus Naphthalene	μg/g	10	2020-03-25	2020-03-25	<10	<10	
F3 (C16 to C34)	μg/g	1700 50	2020-03-25	2020-03-25	<50	<50	
F3 (C16 to C34) minus PAHs	μg/g	50	2020-03-25	2020-03-25	<50	<50	
F4 (C34 to C50)	μg/g	3300 50	2020-03-25	2020-03-25	<50	<50	
Gravimetric Heavy Hydrocarbons	μg/g	3300 50			NA	NA	
Moisture Content	%	0.1	2020-03-26	2020-03-26	14.5	20.6	
Surrogate	Unit	Acceptable Limits					
Terphenyl	%	60-140	2020-03-25	2020-03-25	73	75	

Comments:

RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

1046509-1046517 Results are based on sample dry weight.

The C6-C10 fraction is calculated using toluene response factor.

C6-C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX.

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.

C>10 - C16 (F2- Naphthalene) is a calculated parameter. The calculated value is F2 - Naphthalene.

C>16 - C34 (F3-PAH) is a calculated parameter. The calculated value is F3-PAH (PAH: sum of Phenanthrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene,

Fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-c,d)pyrene and Pyrene).

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

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.

Analysis performed at AGAT Toronto (unless marked by *)





AGAT WORK ORDER: 20T587352

PROJECT: TP115086

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

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE:SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY: Mohammahd Safarpanah

DATE RECEIVED: 2020-03-23				DATE REPORTED: 2020-11-13
	OAARDI E DEGODIDITION	D11 000 004	D11 000 004	

DATE RECEIVED: 2020-03-23								DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH C33 SS1	BH C29 SS1	
					SAMPLE TYPE:	Soil	Soil	
				I	DATE SAMPLED:	2020-03-19	2020-03-19	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1046509	1046517	
Dichlorodifluoromethane	μg/g	16	0.05	2020-03-26	2020-03-27	< 0.05	<0.05	
Vinyl Chloride	ug/g	0.032	0.02	2020-03-26	2020-03-27	<0.02	<0.02	
Bromomethane	ug/g	0.05	0.05	2020-03-26	2020-03-27	< 0.05	<0.05	
Trichlorofluoromethane	ug/g	4	0.05	2020-03-26	2020-03-27	< 0.05	<0.05	
Acetone	ug/g	16	0.50	2020-03-26	2020-03-27	< 0.50	<0.50	
1,1-Dichloroethylene	ug/g	0.064	0.05	2020-03-26	2020-03-27	< 0.05	<0.05	
Methylene Chloride	ug/g	1.6	0.05	2020-03-26	2020-03-27	< 0.05	<0.05	
Trans- 1,2-Dichloroethylene	ug/g	1.3	0.05	2020-03-26	2020-03-27	< 0.05	<0.05	
Methyl tert-butyl Ether	ug/g	1.6	0.05	2020-03-26	2020-03-27	< 0.05	<0.05	
1,1-Dichloroethane	ug/g	0.47	0.02	2020-03-26	2020-03-27	< 0.02	<0.02	
Methyl Ethyl Ketone	ug/g	70	0.50	2020-03-26	2020-03-27	< 0.50	<0.50	
Cis- 1,2-Dichloroethylene	ug/g	1.9	0.02	2020-03-26	2020-03-27	< 0.02	<0.02	
Chloroform	ug/g	0.47	0.04	2020-03-26	2020-03-27	<0.04	<0.04	
1,2-Dichloroethane	ug/g	0.05	0.03	2020-03-26	2020-03-27	< 0.03	<0.03	
1,1,1-Trichloroethane	ug/g	6.1	0.05	2020-03-26	2020-03-27	< 0.05	<0.05	
Carbon Tetrachloride	ug/g	0.21	0.05	2020-03-26	2020-03-27	< 0.05	<0.05	
Benzene	ug/g	0.32	0.02	2020-03-26	2020-03-27	< 0.02	<0.02	
1,2-Dichloropropane	ug/g	0.16	0.03	2020-03-26	2020-03-27	< 0.03	<0.03	
Trichloroethylene	ug/g	0.55	0.03	2020-03-26	2020-03-27	< 0.03	< 0.03	
Bromodichloromethane	ug/g	1.5	0.05	2020-03-26	2020-03-27	< 0.05	<0.05	
Methyl Isobutyl Ketone	ug/g	31	0.50	2020-03-26	2020-03-27	< 0.50	<0.50	
1,1,2-Trichloroethane	ug/g	0.05	0.04	2020-03-26	2020-03-27	< 0.04	<0.04	
Toluene	ug/g	6.4	0.05	2020-03-26	2020-03-27	< 0.05	< 0.05	
Dibromochloromethane	ug/g	2.3	0.05	2020-03-26	2020-03-27	< 0.05	<0.05	
Ethylene Dibromide	ug/g	0.05	0.04	2020-03-26	2020-03-27	<0.04	<0.04	
Tetrachloroethylene	ug/g	1.9	0.05	2020-03-26	2020-03-27	< 0.05	<0.05	
1,1,1,2-Tetrachloroethane	ug/g	0.087	0.04	2020-03-26	2020-03-27	<0.04	<0.04	
Chlorobenzene	ug/g	2.4	0.05	2020-03-26	2020-03-27	< 0.05	<0.05	
Ethylbenzene	ug/g	1.1	0.05	2020-03-26	2020-03-27	< 0.05	<0.05	
m & p-Xylene	ug/g		0.05	2020-03-26	2020-03-27	< 0.05	<0.05	





AGAT WORK ORDER: 20T587352

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE:SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammahd Safarpanah

				O. Re	g. 153(511) -	VOCs (So	il)	
DATE RECEIVED: 2020-03-23					9		/	DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH C33 SS1	BH C29 SS1	
					SAMPLE TYPE:	Soil	Soil	
				I	DATE SAMPLED:	2020-03-19	2020-03-19	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1046509	1046517	
Bromoform	ug/g	0.61	0.05	2020-03-26	2020-03-27	<0.05	<0.05	
Styrene	ug/g	34	0.05	2020-03-26	2020-03-27	< 0.05	<0.05	
1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05	2020-03-26	2020-03-27	< 0.05	< 0.05	
o-Xylene	ug/g		0.05	2020-03-26	2020-03-27	< 0.05	< 0.05	
,3-Dichlorobenzene	ug/g	9.6	0.05	2020-03-26	2020-03-27	< 0.05	< 0.05	
,4-Dichlorobenzene	ug/g	0.2	0.05	2020-03-26	2020-03-27	< 0.05	< 0.05	
,2-Dichlorobenzene	ug/g	1.2	0.05	2020-03-26	2020-03-27	< 0.05	< 0.05	
(ylenes (Total)	ug/g	26	0.05	2020-03-26	2020-03-27	< 0.05	< 0.05	
,3-Dichloropropene (Cis + Trans)	μg/g	0.059	0.04	2020-03-26	2020-03-27	< 0.04	<0.04	
n-Hexane	μg/g	46	0.05	2020-03-26	2020-03-27	< 0.05	<0.05	
Surrogate	Unit	Acceptab	le Limits					
Foluene-d8	% Recovery	50-1	140	2020-03-26	2020-03-27	97	96	
1-Bromofluorobenzene	% Recovery	50-1	140	2020-03-26	2020-03-27	82	82	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils
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.

1046509-1046517 The sample was analyzed 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.

Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene + o-Xylene.

1,3-Dichloropropene total is a calculated parameter. The calculated value is the sum of Cis-1,3-Dichloropropene and Trans-1,3-Dichloropropene.

Analysis performed at AGAT Toronto (unless marked by *)





#### **Exceedance Summary**

AGAT WORK ORDER: 20T587352

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

ATTENTION TO: Alessandro Pellerito

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
1046517	BH C29 SS1	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity (2:1)	mS/cm	1.4	2.06

AGAT WORK ORDER: 20T587352

## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito SAMPLING SITE:SP47 SAMPLED BY:Mohammahd Safarpanah

				Soi	l Ana	alysis	3								
RPT Date: Nov 13, 2020				UPLICATI	≣		REFERE	NCE MA	TERIAL	METHOD	BLANK	( SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		eptable mits	Recovery	Lie	eptable mits	Recovery	Lie	ptable nits
		ld		.			Value	Lower	Upper		Lower	Upper	]	Lower	Upper
O. Reg. 153(511) - Metals & Inor	ganics (Soil)	,													
Antimony	1049857		<0.8	<0.8	NA	< 0.8	141%	70%	130%	100%	80%	120%	77%	70%	130%
Arsenic	1049857		6	7	15.4%	< 1	111%	70%	130%	103%	80%	120%	104%	70%	130%
Barium	1049857		90	90	0.0%	< 2	110%	70%	130%	100%	80%	120%	101%	70%	130%
Beryllium	1049857		0.6	0.6	NA	< 0.5	87%	70%	130%	95%	80%	120%	91%	70%	130%
Boron	1049857		10	10	NA	< 5	85%	70%	130%	104%	80%	120%	90%	70%	130%
Boron (Hot Water Extractable)	1046396		0.12	0.11	NA	< 0.10	114%	60%	140%	104%	70%	130%	98%	60%	140%
Cadmium	1049857		<0.5	< 0.5	NA	< 0.5	110%	70%	130%	98%	80%	120%	100%	70%	130%
Chromium	1049857		20	20	NA	< 5	104%	70%	130%	94%	80%	120%	90%	70%	130%
Cobalt	1049857		10.0	10.2	2.0%	< 0.5	88%	70%	130%	90%	80%	120%	86%	70%	130%
Copper	1049857		26	26	0.0%	< 1	92%	70%	130%	97%	80%	120%	90%	70%	130%
Lead	1049857		16	17	6.1%	< 1	102%	70%	130%	89%	80%	120%	91%	70%	130%
Molybdenum	1049857		0.6	0.5	NA	< 0.5	100%	70%	130%	102%	80%	120%	101%	70%	130%
Nickel	1049857		22	22	0.0%	< 1	93%	70%	130%	100%	80%	120%	92%	70%	130%
Selenium	1049857		< 0.4	< 0.4	NA	< 0.4	79%	70%	130%	100%	80%	120%	99%	70%	130%
Silver	1049857		<0.2	<0.2	NA	< 0.2	105%	70%	130%	98%	80%	120%	93%	70%	130%
Thallium	1049857		<0.4	<0.4	NA	< 0.4	91%	70%	130%	98%	80%	120%	93%	70%	130%
Uranium	1049857		0.6	0.6	NA	< 0.5	95%	70%	130%	98%	80%	120%	101%	70%	130%
Vanadium	1049857		27	28	3.6%	< 1	91%	70%	130%	87%	80%	120%	85%	70%	130%
Zinc	1049857		66	66	0.0%	< 5	100%	70%	130%	102%	80%	120%	103%	70%	130%
Chromium, Hexavalent	1039746		<0.2	<0.2	NA	< 0.2	85%	70%	130%	82%	80%	120%	76%	70%	130%
Cyanide, Free	1051127		<0.040	<0.040	NA	< 0.040	86%	70%	130%	100%	80%	120%	108%	70%	130%
Mercury	1049857		<0.10	<0.10	NA	< 0.10	114%	70%	130%	99%	80%	120%	98%	70%	130%
Electrical Conductivity (2:1)	1046520		0.419	0.434	3.5%	< 0.005	109%	80%	120%						
Sodium Adsorption Ratio	1046520		5.06	5.67	11.4%	NA	NA			NA			NA		
pH, 2:1 CaCl2 Extraction	1048063		7.70	7.71	0.1%	NA	101%	80%	120%	NA			NA		

Comments: NA signifies Not Applicable.

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

QA Qualifier for metals - Antimony Reference recovery is outside method's acceptance limit by more than an absolute maximum of 10% however, all other QCs i.e. duplicate, blank, blank spike and matrix spike are within method's QC acceptance criteria.

#### Corrosivity Package

Chloride (2:1)	1048575	2040	2060	1.0%	< 2	93%	70%	130%	105%	80%	120%	112%	70%	130%
Sulphate (2:1)	1048575	87	83	4.7%	< 2	99%	70%	130%	105%	80%	120%	107%	70%	130%
pH (2:1)	1049859	8.30	8.39	1.1%	NA	101%	90%	110%	NA			NA		
Redox Potential 1	1					100%	90%	110%						

Comments: NA signifies Not Applicable.

AGAT QUALITY ASSURANCE REPORT (V1)

Page 10 of 21



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE AGAT WORK ORDER: 20T587352
PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SP47 SAMPLED BY: Mohammahd Safarpanah

Soil Analysis (Continued)															
RPT Date: Nov 13, 2020				DUPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPII	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		otable nits	Recovery	Lin	ptable nits	Recovery	Lin	ptable nits
		ld	·	'			Value	Lower	Upper		Lower	Upper		Lower	Upper





AGAT WORK ORDER: 20T587352

### **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito SAMPLING SITE:SP47 SAMPLED BY:Mohammahd Safarpanah

			Trac	ce Or	gani	cs Ar	nalys	is							
RPT Date: Nov 13, 2020			[	DUPLICAT	E		REFERE	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery		ptable nits	Recovery		ptable nits
FARAMETER	Batcii	ld	Dup #1	Dup #2	KFD		Value	Lower	Upper	Recovery	Lower	Upper	Recovery	Lower	Upper
O. Reg. 153(511) - PAHs (Soil)	•										•				
Naphthalene	1047067		< 0.05	< 0.05	NA	< 0.05	115%	50%	140%	107%	50%	140%	118%	50%	140%
Acenaphthylene	1047067		< 0.05	< 0.05	NA	< 0.05	119%	50%	140%	104%	50%	140%	116%	50%	140%
Acenaphthene	1047067		< 0.05	< 0.05	NA	< 0.05	111%	50%	140%	102%	50%	140%	115%	50%	140%
Fluorene	1047067		< 0.05	< 0.05	NA	< 0.05	106%	50%	140%	102%	50%	140%	114%	50%	140%
Phenanthrene	1047067		< 0.05	< 0.05	NA	< 0.05	117%	50%	140%	107%	50%	140%	108%	50%	140%
Anthracene	1047067		< 0.05	< 0.05	NA	< 0.05	107%	50%	140%	99%	50%	140%	94%	50%	140%
Fluoranthene	1047067		< 0.05	< 0.05	NA	< 0.05	112%	50%	140%	102%	50%	140%	113%	50%	140%
Pyrene	1047067		< 0.05	< 0.05	NA	< 0.05	108%	50%	140%	102%	50%	140%	112%	50%	140%
Benz(a)anthracene	1047067		< 0.05	< 0.05	NA	< 0.05	107%	50%	140%	94%	50%	140%	110%	50%	140%
Chrysene	1047067		< 0.05	< 0.05	NA	< 0.05	102%	50%	140%	103%	50%	140%	110%	50%	140%
Benzo(b)fluoranthene	1047067		< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	94%	50%	140%	79%	50%	140%
Benzo(k)fluoranthene	1047067		< 0.05	< 0.05	NA	< 0.05	80%	50%	140%	99%	50%	140%	105%	50%	140%
Benzo(a)pyrene	1047067		< 0.05	< 0.05	NA	< 0.05	113%	50%	140%	101%	50%	140%	113%	50%	140%
Indeno(1,2,3-cd)pyrene	1047067		< 0.05	< 0.05	NA	< 0.05	113%	50%	140%	75%	50%	140%	80%	50%	140%
Dibenz(a,h)anthracene	1047067		< 0.05	< 0.05	NA	< 0.05	118%	50%	140%	86%	50%	140%	84%	50%	140%
Benzo(g,h,i)perylene	1047067		< 0.05	< 0.05	NA	< 0.05	89%	50%	140%	77%	50%	140%	74%	50%	140%
O. Reg. 153(511) - VOCs (Soil)															
Dichlorodifluoromethane	1035936		< 0.05	< 0.05	NA	< 0.05	86%	50%	140%	84%	50%	140%	72%	50%	140%
Vinyl Chloride	1035936		< 0.02	< 0.02	NA	< 0.02	93%	50%	140%	100%	50%	140%	93%	50%	140%
Bromomethane	1035936		< 0.05	< 0.05	NA	< 0.05	74%	50%	140%	71%	50%	140%	86%	50%	140%
Trichlorofluoromethane	1035936		< 0.05	< 0.05	NA	< 0.05	83%	50%	140%	96%	50%	140%	83%	50%	140%
Acetone	1035936		< 0.50	< 0.50	NA	< 0.50	102%	50%	140%	97%	50%	140%	91%	50%	140%
1,1-Dichloroethylene	1035936		< 0.05	< 0.05	NA	< 0.05	115%	50%	140%	112%	60%	130%	73%	50%	140%
Methylene Chloride	1035936		< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	113%	60%	130%	111%	50%	140%
Trans- 1,2-Dichloroethylene	1035936		< 0.05	< 0.05	NA	< 0.05	106%	50%	140%	93%	60%	130%	110%	50%	140%
Methyl tert-butyl Ether	1035936		< 0.05	< 0.05	NA	< 0.05	87%	50%	140%	97%	60%	130%	106%	50%	140%
1,1-Dichloroethane	1035936		< 0.02	< 0.02	NA	< 0.02	113%	50%	140%	106%	60%	130%	111%	50%	140%
Mathyl Ethyl Katana	1035936		< 0.50	< 0.50	NA	< 0.50	82%	50%	140%	99%	50%	140%	89%	50%	140%
Methyl Ethyl Ketone			< 0.02	< 0.02		< 0.02	99%			106%		130%	115%	50%	140%
Cis- 1,2-Dichloroethylene Chloroform	1035936		< 0.02		NA			50%	140%		60%				140%
1,2-Dichloroethane	1035936 1035936		< 0.04	< 0.04 < 0.03	NA	< 0.04 < 0.03	88% 112%		140% 140%	93% 107%		130% 130%	118%		140%
1,1,1-Trichloroethane	1035936		< 0.05	< 0.05	NA NA	< 0.05	100%		140%	115%		130%	94% 90%		140%
Carbon Tetrachloride	1035936		< 0.05	< 0.05	NA	< 0.05	92%		140%	87%		130%	106%		140%
Benzene 4.2 Diahlarananan	1035936		< 0.02	< 0.02	NA	< 0.02	78%		140%	93%		130%	78%		140%
1,2-Dichloropropane	1035936		< 0.03	< 0.03	NA	< 0.03	85%		140%	78%		130%	72%		140%
Trichloroethylene	1035936		< 0.03	< 0.03	NA	< 0.03	103%		140%	99%	60%		100%		140%
Bromodichloromethane	1035936		< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	79%	60%	130%	97%	50%	140%
Methyl Isobutyl Ketone	1035936		< 0.50	< 0.50	NA	< 0.50	104%	50%	140%	87%	50%	140%	93%	50%	140%

AGAT QUALITY ASSURANCE REPORT (V1)

Page 12 of 21

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. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T587352

PROJECT: TP115086

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SP47 SAMPLED BY: Mohammahd Safarpanah

Trace Organics Analysis (Continued)															
RPT Date: Nov 13, 2020			С	UPLICAT	E		REFERE	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable	Recovery	Lin	ptable nits	Recovery		ptable
		ld					Value	Lower	Upper	,		Upper	,	Lower	Upper
1,1,2-Trichloroethane	1035936		< 0.04	< 0.04	NA	< 0.04	105%	50%	140%	105%	60%	130%	98%	50%	140%
Toluene	1035936		< 0.05	< 0.05	NA	< 0.05	111%	50%	140%	107%	60%	130%	100%	50%	140%
Dibromochloromethane	1035936		< 0.05	< 0.05	NA	< 0.05	83%	50%	140%	73%	60%	130%	95%	50%	140%
Ethylene Dibromide	1035936		< 0.04	< 0.04	NA	< 0.04	94%	50%	140%	98%	60%	130%	117%	50%	140%
Tetrachloroethylene	1035936		< 0.05	< 0.05	NA	< 0.05	117%	50%	140%	113%	60%	130%	87%	50%	140%
1,1,1,2-Tetrachloroethane	1035936		< 0.04	< 0.04	NA	< 0.04	104%	50%	140%	100%	60%	130%	112%	50%	140%
Chlorobenzene	1035936		< 0.05	< 0.05	NA	< 0.05	116%	50%	140%	119%	60%	130%	84%	50%	140%
Ethylbenzene	1035936		< 0.05	< 0.05	NA	< 0.05	107%	50%	140%	110%	60%	130%	106%	50%	140%
m & p-Xylene	1035936		< 0.05	< 0.05	NA	< 0.05	110%	50%	140%	107%	60%	130%	96%	50%	140%
Bromoform	1035936		< 0.05	< 0.05	NA	< 0.05	90%	50%	140%	81%	60%	130%	100%	50%	140%
Styrene	1035936		< 0.05	< 0.05	NA	< 0.05	96%	50%	140%	104%	60%	130%	70%	50%	140%
1,1,2,2-Tetrachloroethane	1035936		< 0.05	< 0.05	NA	< 0.05	94%	50%	140%	103%	60%	130%	86%	50%	140%
o-Xylene	1035936		< 0.05	< 0.05	NA	< 0.05	112%	50%	140%	113%	60%	130%	79%	50%	140%
1,3-Dichlorobenzene	1035936		< 0.05	< 0.05	NA	< 0.05	97%	50%	140%	109%	60%	130%	105%	50%	140%
1,4-Dichlorobenzene	1035936		< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	105%	60%	130%	94%	50%	140%
1,2-Dichlorobenzene	1035936		< 0.05	< 0.05	NA	< 0.05	82%	50%	140%	88%	60%	130%	89%	50%	140%
1,3-Dichloropropene (Cis + Trans)	1035936		< 0.04	< 0.04	NA	< 0.04	102%	50%	140%	108%	60%	130%	89%	50%	140%
n-Hexane	1035936		< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	94%	60%	130%	103%	50%	140%
O. Reg. 153(511) - PHCs F1 - F4 (w	ith PAHs a	and VOC)	(Soil)												
F1 (C6 to C10)	1037345		< 5	< 5	NA	< 5	96%	60%	140%	101%	60%	140%	104%	60%	140%
F2 (C10 to C16)	1037334		< 10	< 10	NA	< 10	104%	60%	140%	103%	60%	140%	87%	60%	140%
F3 (C16 to C34)	1037334		< 50	< 50	NA	< 50	109%	60%	140%	96%	60%	140%	87%	60%	140%
F4 (C34 to C50)	1037334		< 50	< 50	NA	< 50	100%	60%	140%	99%	60%	140%	111%	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:

Jung



#### **QA** Violation

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T587352
ATTENTION TO: Alessandro Pellerito

RPT Date: Nov 13, 2020			REFEREN	ICE MATE	ERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Sample Id	Sample Description	Measured	Accept Limit	te	Recovery	Lin	ptable nits	Recovery		eptable nits
	,		Value	Lower	Upper	,	Lower	Upper		Lower	Upper

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

Antimony BH C37 SS1 141% 70% 130% 100% 80% 120% 77% 70% 130%

Comments: NA signifies Not Applicable.

PROJECT: TP115086

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

QA Qualifier for metals - Antimony Reference recovery is outside method's acceptance limit by more than an absolute maximum of 10% however, all other QCs i.e. duplicate, blank, blank spike and matrix spike are within method's QC acceptance criteria.

# Method Summary

SAMPLING SITE.SP47		O/ (WII EED D1.INO	nammanu Sararpanan
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Chloride (2:1)	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate (2:1)	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
pH (2:1)	INOR 93-6031	MSA part 3 & SM 4500-H+ B	PH METER
	114011 30 0001	modified from MSA PART 3, CH 14	
Electrical Conductivity (2:1)	INOR-93-6036	and SM 2510 B	EC METER
Resistivity (2:1) (Calculated)	INOR-93-6036	McKeague 4.12, SM 2510 B,SSA #5 Part 3	CALCULATION
Redox Potential 1	INOR-93-6066	modified G200-09, SM 2580 B	REDOX POTENTIAL ELECTRODE
Redox Potential 2	INOR-93-6066	modified G200-09, SM 2580 B	REDOX POTENTIAL ELECTRODE
Redox Potential 3	INOR-93-6066	modified G200-09. SM 2580 B	REDOX POTENTIAL ELECTRODE
Antimony	MET-93-6103	modified from EPA 3050B and EPA	ICP-MS
		6020B and ON MOECC	
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron (Hot Water Extractable)	MET-93-6104	modified from EPA 6010D and MSA PART 3, CH 21	ICP/OES
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Zinc	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium, Hexavalent	INOR-93-6068	modified from EPA 3060 and EPA 7196	SPECTROPHOTOMETER
Cyanide, Free	INOR-93-6052	modified from ON MOECC E3015 and SM 4500-CN- I	TECHNICON AUTO ANALYZER
Mercury	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS



# Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086

SAMPLING SITE:SP47

AGAT WORK ORDER: 20T587352
ATTENTION TO: Alessandro Pellerito
SAMPLED BY:Mohammahd Safarpanah

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
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	modified from EPA 9045D and MCKEAGUE 3.11	PH METER

# Method Summary

SAMPLING SITE:SP47		OAIMI LLD D1.IMO	Nohammahd Safarpanah								
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE								
Trace Organics Analysis											
Naphthalene	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
Acenaphthylene	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
Acenaphthene	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
Fluorene	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
Phenanthrene	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
Anthracene	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
Fluoranthene	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
Pyrene	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
Benz(a)anthracene	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
Chrysene	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
Benzo(b)fluoranthene	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
Benzo(k)fluoranthene	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
Benzo(a)pyrene	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
Indeno(1,2,3-cd)pyrene	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
Dibenz(a,h)anthracene	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
Benzo(g,h,i)perylene	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
2-and 1-methyl Naphthalene	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
Moisture Content	ORG-91-5106	Tier 1 Method	BALANCE								
Naphthalene-d8	ORG-91-5106	modified from EPA SW-846 3541 & 8270E50	GC/MS								
Acenaphthene-d10	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
Chrysene-d12	ORG-91-5106	modified from EPA SW-846 3541 & 8270E	GC/MS								
F1 (C6 to C10)	VOL-91-5009	modified from CCME Tier 1 Method	P&T GC/FID								
F1 (C6 to C10) minus BTEX	VOL-91-5009	modified from CCME Tier 1 Method	P&T GC/FID								
F2 (C10 to C16)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID								
F2 (C10 to C16) minus Naphthalene	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID								
F3 (C16 to C34)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID								
F3 (C16 to C34) minus PAHs	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID								
F4 (C34 to C50)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID								
Gravimetric Heavy Hydrocarbons	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE								
Moisture Content	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE								
Terphenyl	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID								
Dichlorodifluoromethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS								

# **Method Summary**

OAIMI EINO OITE.OI 47		OAIMI EED DT.IM	ionammana Gararpanan							
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE							
Vinyl Chloride	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Bromomethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Trichlorofluoromethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Acetone	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
1,1-Dichloroethylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Methylene Chloride	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Trans- 1,2-Dichloroethylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Methyl tert-butyl Ether	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
1,1-Dichloroethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Methyl Ethyl Ketone	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Cis- 1,2-Dichloroethylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Chloroform	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
1,2-Dichloroethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
1,1,1-Trichloroethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Carbon Tetrachloride	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Benzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
1,2-Dichloropropane	VOL-91-5002 modified from EPA 5035C and EPA 8260D		(P&T)GC/MS							
Trichloroethylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Bromodichloromethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Methyl Isobutyl Ketone	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
1,1,2-Trichloroethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Toluene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Dibromochloromethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Ethylene Dibromide	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Tetrachloroethylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
1,1,1,2-Tetrachloroethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Chlorobenzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							
Ethylbenzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS							

# Method Summary

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE					
m & p-Xylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS					
Bromoform	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS					
Styrene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS					
1,1,2,2-Tetrachloroethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS					
o-Xylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS					
1,3-Dichlorobenzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS					
1,4-Dichlorobenzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS					
1,2-Dichlorobenzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS					
Xylenes (Total)	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS					
1,3-Dichloropropene (Cis + Trans)	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS					
n-Hexane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS					
Toluene-d8	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS					
4-Bromofluorobenzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS					



5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2 Ph: 905.712.5100 Fax: 905.712.5122 webearth.agatlabs.com

Laboratory	Use Only	
Work Order #:	201587	3.52

	Wo	ork O	rder i	#: _	X	C		>	8		3.	5	2	-
		oler		eratu	ures:	1	100 P	3	0	3	3	0	3	1
t		stody	y Sea	al Inta			Yes	0	10	□No	1	06		A
	Re	gula sh T	r TA	<b>\T</b> lush Su	rcharg	<b>7</b>	5 to	o 7 E	quir		ays	4 D		
		*	Days OR D PI TAT i	ease s exc	Requ prov	ide p	Da: Rush Prior I	n Sur notifi ends	charg catlor and s	n for statu	ay Ar	ay oply): <b>TAT</b> nolida	ays	ess
Nutrients: □TP □NH ₃ □TKN □NO ₃ □NO ₂ □NO ₃ +NO ₂	Volatiles: ₩voc □ BTEX □THM	PHCs F1 - F4	ABNS	PAHS	PCBs: <b>©</b> Total □ Aroclors	Organochlorine Pesticides	TCLP: NM&I NVOCs CABNS NB(a)P NPCBs	Sewer Use	CORPOSIONTY					
	X	X		X					×					
	X	X		X										
- 7	4	_	Time	_	1	-	-			-	_	_		1

						Beginstery Peguirements: No Peguirement									Ouet	todu	Cool	C	ف	7	8.		24	26	
<b>Report Inforn</b> Company:	nation: Wood					Regulatory Requirements:   No Regulatory Requirement (Please check all applicable boxes)									Note		seal I	Intact	t:	□Y	es	ļ	□No		
Contact:						Regulation 153/04 Sewer Use Regulation 558																			
ddress: 50 Vogell Road Units 3 and 4					Table 2	_			CCME				- 10	Turnaround Time (TAT) Required:											
Richmond Hill, ON				Indicate One  ✓Ind/Com	∏Sani	itary	LICCIVIE				Reg	ular	TAT	Ī	1	<b></b>	5 to 7	Busines	ss Day	i					
Phone:	6479826220 Fax:			☐Res/Park ☐Agriculture	□Stori	m		Prov. Water Quality					Rusi	ush TAT (Rush Surcharges				Apply)							
Reports to be sent to:	a.pellerito@woodplc.com					Soil Texture (Check One)	Region			Objectives (PWQO) Other			0)	- []		3 Business Days				,	a Busi	2220		Nama Dunia	
1. Email:	-				- 1	✓ Coarse		te One												Days Next Busines					
2. Email:	shami.malla@woodplc.c	om				Fine	MISA		Indicate One				М		0	R Da	R Date Required (Rush Surcharges					s May	s May Apply):		
Project Information:				Is this submissio	Report Guldeline on					П			Die			/-		Section	Say me	ob TAT					
Project:	TP115086				Record of Site Co	ndition?		Cert	tificat	e of An	alys	S	Ш		*T/						fication s and s		y holidays		
Site Location:	SP47					☐ Yes ☑ No			☐ Yes			Yes □ No				For 'Same Day' analysis, please contact your AGAT CPM									
Sampled By:	Mohammahd Safarpana	h			_	Sample Matrix Legend			EI				/												
AGAT Quote #:	305848	PO:							0. Reg 153										APCBs	3	1				
	Please note: If quotation number	er is not provided, client wi	lli be billed full price	for unalysis.		B Biota	,0	g, CrVI		rides) Hydrides)										O'C	T E			1 1 1	
Invoice Infor	mation:		Bill To Same:	Yes 🗹 No		GW Ground Water		als, H		Hydrid ncl. Hy	Z			O O TKN	THM					Z d(a)B				111	
Company:					_	O Oil P Paint		Meta		(excl.	고 됐		stals	ا يورث	<u>م</u>				OLS CALL	SES SES	CNIG	7		1 + 1	
Contact:	Shami Malla					S Soil		- d	Si	atals 3 Me			ž į	E to					☐ Aroclors	Silc	٥	15			
Address:	CTA PARTO 1.1.				- 1	SD Sediment		ilter	Inorganics	53 M	\& \B	Scan	stor		00	1				e 1	3	3		111	
Email:	GTA EAST@woodplc.	.com				SW Surface Water		Field Filtered - Metals, Hg,	and In	als 🗆 1 Metals	JEC SAR	als Sc	ion/Cu	No O	<b>a</b>	1 - F4			☐ Total	Nochiorine Pesticides	M&i is	50			
Samp	Comple Identification		Samp			Y/N	Metals	☐ All Met	ORPs: DB-HWS DCI DCN DCP* DEC DFOC DHg	Full Metals	Regulation/Custom Metals	Nutrients: DTP DNH, D'	Volatiles:	PHCs F1 - F4	ABNS	PAHs	PCBs:	Organochiorine Pesticides	Sewer Use	CORPOSINTY					
BH C37 SS1		19 Mar 202	NA	4	S				X	ha										1					
BH C35 SS1		19 Mar 202	1:50	4	S	HOUS														1					
3H C33 SS1		19 Mar 202	1:15	4	S										X		-	X		1					
3H C32 SS2		19 Mar 202	12:00	4	S	has																			
3H S10 SS2		18 Mar 202	10:05	4	S	HOUS															_		-		
3H S10 SS5		18 Mar 202	10:30	4	S									7		1			_	1		X			
BH S9 SS1		18 Mar 202	1:30	4	S	HOUS			1						- 20		-								
3H S9 SS5		18 Mar 202	1:45	4	S	MOCS															1				
3H C29 SS1		19 Mar 202	9:45	4	S			1	IX	4					X	X		X							
3H C29 SS3		19 Mar 202	10:00	4	S	HOLD							1										-		
3H C30 SS2		19 Mar 202	10:55	4	S	MOGA		0															- 1	7/24/24	
amples Relinquished By (I	Print Name and Sign)	/	Date	100	me.	Samples Received By (	Print Name and Signit	W	Š				Da	10	3/2	Ti	10	1-3	5				1		
Alessandro Pelle	rito Signi:		Date	Tim	11:20	Sammen Received By	Print Name and Sidal	M				-	Da	of oc-	70	Ti	HETH	1.0	/	1	Pi	age	1 0	12	
Toey			3/2	STRU	11:0		That stead have blead						Do	10	1	Ti	me	_	-	-			1	-	
applies Rollnauished DV N	trint Name and Stent:		Dave	Tir	Life #	Samples Received By (	CHIL NOTING BING SIGN):						1	4-7-						Nº:					



**Chain of Custody Record** 

Wood

**Report Information:** 

Company:

5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2 Ph: 905.712.5100 Fax: 905.712.5122 webearth.agatlabs.com

Laboratory	Use	On	ly	
	63		-	

Work Order #:	207587352
Cooler Quantity:	lang-

Cooler Quantity:	low	1	-
Arrival Temperatures:	35	33	31
	1.8	24	20
Custody Seal Intact:	□Yes	□No	FINA
Notes:		7	nida.

e Dillikilij	E Marci Cilaili Di	Custouy Form (	potable	water	consume	u oy numan	15)									1	2	-	45	X 8	37
Regul (Please che	latory Requ	irements:		No F	Regula	tory Red	quir	em	ent		Custo Votes		eal In	tact:		□Ye	s	(		70	DNA
Table   Zind   Res   Zind   Res   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zind   Zin	GW Ground Water O Oil P Paint S Soil Sediment Surface Water		itary	CCME Prov. Water Quality Objectives (PWQO)						Turnaround Time (TAT) Required:  Regular TAT										r days	
					O. Reg	153							1		l y dia		asc (	Jones	ct you	T AGAI	T
B Bi GW G O Oi P Pe S Sc SD Se	iota round Water il aint oil ediment	gend	Field Filtered - Metals, Hg, CrVI	Metals and Inorganics	☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydrides ☐ 153 Metals (excl. Hydrides) ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	VS CC CN	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐TP ☐NH, ☐TKN ☐No, ☐NO, ☐NO, ☐NO, ☐NO,	Volatiles: □ VOC □ BTEX □ THM	1-F4			Total 🗆 Aroclors	Organochlorine Pesticides	M&I STVOCS TABNS STB(a)P SPCBS	es	いっちょう			
e K	Special Instr	•	Y/N	Metals	☐ All Met	ORPs: □B-HV □ Cr ⁶⁺ □ EC □ pH □ SAR	Ful! Mer	Regulat	Nutrient I NO.	Volatile	PHCs F1 - F4	ABNs	PAHs	PCBs: Total	Organo	TCLP: T M&I	Sewer Use	B			
			7															X			
Sa Sa	moves Received By I Pr	Int Name and Sign):	K					Da	te 2	g	0	lime /	0-	36	5		Pag	e	2_0	of 2	

Contact:	Alessandro Pellerito					Regulation 153/04 Sewe		1	П.				- 1	-								-			_		
Address:	50 Vogell Road Units 3 a	and 4				<u> </u>	ruse		الــا	Regulatio	1 558			Turnaround Time (TAT) Required:													
	Richmond Hill, ON					Table	itary			CCME						ar T/											
Phone:	6479826220	Fax:				☐Res/Park ☐Sto	m			Prov. Wate	r Oue	lity	- 1								7 Busin	ess Da	iys				
Reports to be sent to:  1. Email:	a.pellerito@woodplc.con					□ Agriculture  Soil Texture (Check One)  Region	ite One			bjectives ther	(PW	(O)		Ru		3 Bu:			ges Apply		siness		Almor	A Door!			
2. Email:	shami.malla@woodplc.co	om				☑Coarse ☐MISA	ite One		-	indicat	One	_				Days		ate Required (Rush Surcharges May Apply):						ess			
Project Inform	nation:					Is this submission for a	1	Re	port	Guldeli	ne o	n							·			,	J	,,,			
Project:	TP115086					Record of Site Condition?	1			te of A						Pl	ease	prov	ide pri	lor not	tificatio	n for r	ush TA	T			
Site Location:	SP47					☐ Yes ☑ No		П	Yes		N	0	- 1		k	*TAT is exclusive		lusive	e of weekends and statutory holidays								
Sampled By:	Mohammahd Safarpanah	ĭ										•		1	For 'S	Same	Day'	' anal	lysis, r	please	e conta	ct you	r AGAT	CPM			
AGAT Quote #:	305848	PO:							O. Reg	153								T		8			$\top$	TT			
Littura aprazzon k	Please note: If quotation number		will be billed full price	for analysis.		Sample Matrix Legend	\ <u>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</u>		<u>88</u>											<b>☑</b> PCBs							
Invoice Inform	nation:		Bill To Same:	Yes 🗹 No		GW Ground Water		GW Ground Water ボ				□ CN		S	OTKN	MHT					č	☑ B(a)P					
Contact:	Shami Malla				-	P Paint	Me	10	☐ 153 Metals (excl. Hydrides) etals ☐ 153 Metals (Incl. Hydrides)	그		etal	ONH, ONI	គ្ន		1		lors	ides	□ ABNs	9						
Address:						<b>S</b> Soil	red G	Ji Si	letals 53 M	70 CG		E N	No.	Пвтех				☐ Aroclors			F			1 1			
Email:	GTA EAST@woodplc.c	com				SD Sediment	E E	org.	53 1	δ <u>□</u>	Scan	otsr		0 VOC					e Pe	ő	3			1 1			
						SW Surface Water	ield	P P	als   153   Metals   1	DB-HWS	ls Sc	ı/C	□ g [~]		F4			otal	lorin [	<b>21</b> a				1 1			
Sampl	e Identification	Date Sampled	Time Sampled	# of Containers	Sampl Matrix		Y/N	Metals and Inorganics	دە خد ا	ORPs: DB+	Full Metals 9	Regulation/Custom Metals	Nutrients:    TP	Volatiles:	PHCs F1 -	ABNs	PAHs	PCBs: Total	Organochlorine Pesticides	TCLP: I M&I I VOCS	940						
BH C31 SS2		19 Mar 202	11:20	4	S	MOCA								ŕ						- 07	7						
BH C31 SS3		19 Mar 202	11:25	4	S																X			11			
																					12.1			T			
																					1 - 1						
																						1		-			
																				1	$\perp$						
							7												-			1	_				
	X	/												,						- 1	5						
Alessandro Pellerit		1	Date Mar 20	), 2020 Tin	1:20	Samples Received By (Princhann and Silve);	K					Dat	2/2	0/3	n	ime /	7:	36	1		-3						
emples Reliaquished By (Prin	nt Navrie and Sign)	to a	3129	Tirr	11:5	Samples Received By (Print Name and Sign):						Dat	1	P	7	ime	1		4	Pa	age	2 0	12	_			
amples Relinquished by (Prin	ni Namu und Shini:		50103	Tim	10	Samples Received By (Print Name and Sign):						Dat	0	_	T	ime	_		1.00	_							
			1	1															Nº:								

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



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4
RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Alessandro Pellerito

PROJECT: TP115086 AGAT WORK ORDER: 20T588871

SOIL ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

DATE REPORTED: Nov 13, 2020

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	

#### Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
  incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other
  third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
  services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
  merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
  contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Page 1 of 14

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. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.



AGAT WORK ORDER: 20T588871

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammad Safarpanah

#### Corrosivity Package

						a.c.i.a.g.c	
DATE RECEIVED: 2020-03-30							DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH S12 SS5	
					SAMPLE TYPE:	Soil	
					DATE SAMPLED:	2020-03-25	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1055914	
Chloride (2:1)	μg/g	NA	2	2020-04-03	2020-04-03	546	
Sulphate (2:1)	μg/g		2	2020-04-03	2020-04-03	35	
pH (2:1)	pH Units		NA	2020-03-06	2020-03-06	8.09	
Electrical Conductivity (2:1)	mS/cm	1.4	0.005	2020-04-03	2020-04-03	1.08	
Resistivity (2:1) (Calculated)	ohm.cm		1	2020-04-03	2020-04-03	926	
Redox Potential 1	mV		NA	2020-04-02	2020-04-02	89	
Redox Potential 2	mV		NA	2020-04-02	2020-04-02	92	
Redox Potential 3	mV		NA	2020-04-02	2020-04-02	98	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

1055914 EC, pH, Chloride and Sulphate were determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water: 1 part soil). Resistivity is a calculated parameter.

Redox potential measured on as received sample. Due to the potential for rapid change in sample equilibrium chemistry with exposure to oxidative/reduction conditions laboratory results may differ from

field measured results.

Analysis performed at AGAT Toronto (unless marked by *)

SAMPLING SITE: SP47

CHEMIST OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTE



AGAT WORK ORDER: 20T588871

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE: SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammad Safarpanah

O. Reg. 153	3(511) - Metals	& Inorganics	(Soil)	

DATE RECEIVED: 2020-03-30									DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH C1 SS4	BH C12 SS2	BH C6 SS2	
					SAMPLE TYPE:	Soil	Soil	Soil	
				1	DATE SAMPLED:	2020-03-25	2020-03-25	2020-03-25	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1055899	1055904	1055906	
Antimony	μg/g	40	0.8	2020-04-01	2020-04-01	<0.8	<0.8	<0.8	
Arsenic	μg/g	18	1	2020-04-01	2020-04-01	3	3	3	
Barium	μg/g	670	2	2020-04-01	2020-04-01	96	78	44	
Beryllium	μg/g	8	0.5	2020-04-01	2020-04-01	0.6	<0.5	<0.5	
Boron	μg/g	120	5	2020-04-01	2020-04-01	9	7	6	
Boron (Hot Water Extractable)	μg/g	2	0.10	2020-04-01	2020-04-01	<0.10	0.20	<0.10	
Cadmium	μg/g	1.9	0.5	2020-04-01	2020-04-01	<0.5	<0.5	<0.5	
Chromium	μg/g	160	5	2020-04-01	2020-04-01	21	18	11	
Cobalt	μg/g	80	0.5	2020-04-01	2020-04-01	12.4	9.3	5.8	
Copper	μg/g	230	1	2020-04-01	2020-04-01	19	16	16	
Lead	μg/g	120	1	2020-04-01	2020-04-01	9	11	5	
Molybdenum	μg/g	40	0.5	2020-04-01	2020-04-01	<0.5	<0.5	<0.5	
Nickel	μg/g	270	1	2020-04-01	2020-04-01	24	17	10	
Selenium	μg/g	5.5	0.4	2020-04-01	2020-04-01	<0.4	0.4	<0.4	
Silver	μg/g	40	0.2	2020-04-01	2020-04-01	<0.2	<0.2	<0.2	
Thallium	μg/g	3.3	0.4	2020-04-01	2020-04-01	<0.4	<0.4	<0.4	
Uranium	μg/g	33	0.5	2020-04-01	2020-04-01	0.5	<0.5	<0.5	
Vanadium	μg/g	86	1	2020-04-01	2020-04-01	33	32	22	
Zinc	μg/g	340	5	2020-04-01	2020-04-01	52	47	29	
Chromium, Hexavalent	μg/g	8	0.2	2020-04-01	2020-04-01	<0.2	<0.2	<0.2	
Cyanide, Free	μg/g	0.051	0.040	2020-04-03	2020-04-03	<0.040	<0.040	< 0.040	
Mercury	μg/g	3.9	0.10	2020-04-01	2020-04-01	<0.10	<0.10	<0.10	
Electrical Conductivity (2:1)	mS/cm	1.4	0.005	2020-04-03	2020-04-03	0.312	1.94	1.19	
Sodium Adsorption Ratio	NA	12	NA	2020-04-03	2020-04-03	0.811	23.1	14.3	
pH, 2:1 CaCl2 Extraction	pH Units	5.0-9.0	NA	2020-04-03	2020-04-03	7.81	7.79	8.05	





AGAT WORK ORDER: 20T588871

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammad Safarpanah

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

DATE RECEIVED: 2020-03-30 DATE REPORTED: 2020-11-13

Comments:

RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

1055899-1055906 EC was 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. SAR is a calculated

parameter.

Analysis performed at AGAT Toronto (unless marked by *)

SCHMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE CHEMIST DE



AGAT WORK ORDER: 20T588871

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE: SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY: Mohammad Safarpanah

							· •
				O. Reg. 1	53(511) - PH	Cs F1 - F4	(Soil)
DATE RECEIVED: 2020-03-30							DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH S11 SS5	
					SAMPLE TYPE:	Soil	
					DATE SAMPLED:	2020-03-25	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1055912	
Benzene	μg/g	0.32	0.02	2020-03-31	2020-04-01	<0.02	
Toluene	μg/g	6.4	0.05	2020-03-31	2020-04-01	< 0.05	
Ethylbenzene	μg/g	1.1	0.05	2020-03-31	2020-04-01	< 0.05	
Xylenes (Total)	μg/g	26	0.05	2020-03-31	2020-04-01	< 0.05	
F1 (C6 to C10)	μg/g	55	5	2020-03-31	2020-04-01	<5	
F1 (C6 to C10) minus BTEX	μg/g	55	5	2020-03-31	2020-04-01	<5	
F2 (C10 to C16)	μg/g	230	10	2020-04-01	2020-04-02	<10	
F3 (C16 to C34)	μg/g	1700	50	2020-04-01	2020-04-02	<50	
F4 (C34 to C50)	μg/g	3300	50	2020-04-01	2020-04-02	<50	
Gravimetric Heavy Hydrocarbons	μg/g	3300	50			NA	
Moisture Content	%		0.1	2020-04-01	2020-04-01	17.0	
Surrogate	Unit	Acceptable	Limits				
Terphenyl	%	60-140	)	2020-04-01	2020-04-02	113	

RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -Comments:

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

1055912 Results are based on sample dry weight.

The C6-C10 fraction is calculated using Toluene response factor.

Xylenes is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.

C6-C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX.

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 contribution.

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.

Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Quality Control Data is available upon request.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

NPoprukoloj



### **Exceedance Summary**

AGAT WORK ORDER: 20T588871

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

ATTENTION TO: Alessandro Pellerito

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
1055904	BH C12 SS2	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity (2:1)	mS/cm	1.4	1.94
1055904	BH C12 SS2	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Sodium Adsorption Ratio	NA	12	23.1
1055906	BH C6 SS2	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Sodium Adsorption Ratio	NA	12	14.3



AGAT WORK ORDER: 20T588871

## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito SAMPLING SITE:SP47 SAMPLED BY:Mohammad Safarpanah

			Soi	l Ana	alysis	3								
RPT Date: Nov 13, 2020		DUPLICATE				REFERE	NCE MA	TERIAL	METHOD	BLAN	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Value		eptable mits	Recovery	l 1 is	eptable mits	Recovery	Lie	ptable nits
	l ld					value	Lower Uppe			Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inor	ganics (Soil)				,									
Antimony	1057467	<0.8	<0.8	NA	< 0.8	136%	70%	130%	99%	80%	120%	85%	70%	130%
Arsenic	1057467	2	3	NA	< 1	100%	70%	130%	96%	80%	120%	98%	70%	130%
Barium	1057467	7	7	NA	< 2	106%	70%	130%	100%	80%	120%	100%	70%	130%
Beryllium	1057467	<0.5	< 0.5	NA	< 0.5	81%	70%	130%	106%	80%	120%	95%	70%	130%
Boron	1057467	<5	<5	NA	< 5	77%	70%	130%	105%	80%	120%	91%	70%	130%
Boron (Hot Water Extractable)	1056220	0.13	0.13	NA	< 0.10	99%	60%	140%	91%	70%	130%	89%	60%	140%
Cadmium	1057467	<0.5	< 0.5	NA	< 0.5	110%	70%	130%	97%	80%	120%	99%	70%	130%
Chromium	1057467	12	12	NA	< 5	101%	70%	130%	87%	80%	120%	82%	70%	130%
Cobalt	1057467	2.7	2.8	2.5%	< 0.5	92%	70%	130%	96%	80%	120%	95%	70%	130%
Copper	1057467	4	4	NA	< 1	92%	70%	130%	95%	80%	120%	86%	70%	130%
Lead	1057467	3	3	NA	< 1	105%	70%	130%	87%	80%	120%	83%	70%	130%
Molybdenum	1057467	<0.5	<0.5	NA	< 0.5	93%	70%	130%	92%	80%	120%	94%	70%	130%
Nickel	1057467	4	4	NA	< 1	90%	70%	130%	96%	80%	120%	93%	70%	130%
Selenium	1057467	<0.4	<0.4	NA	< 0.4	98%	70%	130%	94%	80%	120%	97%	70%	130%
Silver	1057467	<0.2	<0.2	NA	< 0.2	98%	70%	130%	96%	80%	120%	95%	70%	130%
Thallium	1057467	<0.4	<0.4	NA	< 0.4	86%	70%	130%	97%	80%	120%	92%	70%	130%
Uranium	1057467	<0.5	<0.5	NA	< 0.5	91%	70%	130%	98%	80%	120%	97%	70%	130%
Vanadium	1057467	31	32	1.7%	< 1	101%	70%	130%	95%	80%	120%	90%	70%	130%
Zinc	1057467	9	9	NA	< 5	99%	70%	130%	98%	80%	120%	109%	70%	130%
Chromium, Hexavalent	1057102	<0.2	<0.2	NA	< 0.2	89%	70%	130%	86%	80%	120%	86%	70%	130%
Cyanide, Free	1063190	<0.040	<0.040	NA	< 0.040	91%	70%	130%	98%	80%	120%	107%	70%	130%
Mercury	1057467	<0.10	<0.10	NA	< 0.10	107%	70%	130%	103%	80%	120%	103%	70%	130%
Electrical Conductivity (2:1)	1055899 1055899	0.312	0.321	2.6%	< 0.005	112%	80%	120%						
Sodium Adsorption Ratio	1055899 1055899	0.811	0.803	1.0%	NA									
pH, 2:1 CaCl2 Extraction	1056610	7.43	7.44	0.1%	NA	101%	80%	120%						

Comments: NA signifies Not Applicable.

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Antimony: For a multi-element scan for lab control standards and matrix spikes, up to 10% of analytes may exceed the quoted limits by up to 10% absolute and it is considered acceptable.

#### Corrosivity Package

Chloride (2:1)	1063243	8	8	NA	< 2	91%	70%	130%	101%	80%	120%	104%	70%	130%
Sulphate (2:1)	1063243	202	203	0.5%	< 2	101%	70%	130%	104%	80%	120%	108%	70%	130%
pH (2:1)	1055914 1055914	8.09	8.09	0.0%	NA	101%	90%	110%						
Electrical Conductivity (2:1)	1055899 1055899	0.312	0.321	2.8%	< 0.005	112%	80%	120%						
Redox Potential 1	1				NA	101%	90%	110%						

Comments: NA signifies Not Applicable.

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

#### AGAT QUALITY ASSURANCE REPORT (V1)

Page 7 of 14



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T588871

PROJECT: TP115086

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE:SP47 SAMPLED BY:Mohammad Safarpanah

													·		
			Soil	Analy	ysis	(Con	tinue	d)							
RPT Date: Nov 13, 2020				UPLICAT	Έ		REFEREN	NCE MAT	ΓERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured	Accep Lim		Recovery	Lin	ptable nits	Recovery		ptable nits
		ld	·	·			Value	Lower	Upper	,	Lower	Upper	,	Lower	Upper





## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T588871

PROJECT: TP115086

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE:SP47 SAMPLED BY:Mohammad Safarpanah

O/ (IIII EII (O O I I E. O I I I							•	,		a		- Ca.a.	pariari		
			Trac	e Or	gani	cs Ar	nalys	is							
RPT Date: Nov 13, 2020				UPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery	Lie	ptable nits	Recovery	Lin	eptable mits
		la	·	·			Value	Lower	Upper	,	Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4	(Soil)														
Benzene	1053371		< 0.02	< 0.02	NA	< 0.02	103%	50%	140%	105%	60%	130%	98%	50%	140%
Toluene	1053371		< 0.05	< 0.05	NA	< 0.05	100%	50%	140%	103%	60%	130%	107%	50%	140%
Ethylbenzene	1053371		< 0.05	< 0.05	NA	< 0.05	102%	50%	140%	96%	60%	130%	110%	50%	140%
Xylenes (Total)	1053371		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	99%	60%	130%	104%	50%	140%
F1 (C6 to C10)	1053371		< 5	< 5	NA	< 5	112%	60%	140%	104%	60%	140%	89%	60%	140%
F2 (C10 to C16)	1057461		< 10	< 10	NA	< 10	109%	60%	140%	89%	60%	140%	79%	60%	140%
F3 (C16 to C34)	1057461		< 50	< 50	NA	< 50	104%	60%	140%	86%	60%	140%	79%	60%	140%
F4 (C34 to C50)	1057461		< 50	< 50	NA	< 50	92%	60%	140%	120%	60%	140%	99%	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).





#### **QA** Violation

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T588871
ATTENTION TO: Alessandro Pellerito

RPT Date: Nov 13, 2020			REFEREN	ICE MAT	ERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPII	KE
PARAMETER	Sample Id	Sample Description	Measured	Accep Limi	ite	Recovery	Lin	ptable nits	Recovery	Lin	ptable nits
			Value	Lower	Upper	, ,		Upper	,	Lower	Upper

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

Antimony BH C1 SS4 136% 70% 130% 99% 80% 120% 85% 70% 130%

Comments: NA signifies Not Applicable.

PROJECT: TP115086

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Antimony: For a multi-element scan for lab control standards and matrix spikes, up to 10% of analytes may exceed the quoted limits by up to 10% absolute and it is considered acceptable.

## **Method Summary**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086

SAMPLING SITE:SP47

AGAT WORK ORDER: 20T588871

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:Mohammad Safarpanah

SAMPLING SITE:SP47		SAMI LED DT.MO	hammad Safarpanah
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Chloride (2:1)	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate (2:1)	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
pH (2:1)	INOR 93-6031	MSA part 3 & SM 4500-H+ B	PH METER
Electrical Conductivity (2:1)	INOR-93-6036	modified from MSA PART 3, CH 14 and SM 2510 B	EC METER
Resistivity (2:1) (Calculated)	INOR-93-6036	McKeague 4.12, SM 2510 B,SSA #5 Part 3	CALCULATION
Redox Potential 1	INOR-93-6066	modified G200-09, SM 2580 B	REDOX POTENTIAL ELECTRODE
Redox Potential 2	INOR-93-6066	modified G200-09, SM 2580 B	REDOX POTENTIAL ELECTRODE
Redox Potential 3	INOR-93-6066	modified G200-09, SM 2580 B	REDOX POTENTIAL ELECTRODE
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron (Hot Water Extractable)	MET-93-6104	modified from EPA 6010D and MSA PART 3, CH 21	ICP/OES
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Zinc	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium, Hexavalent	INOR-93-6068	modified from EPA 3060 and EPA 7196	SPECTROPHOTOMETER
Cyanide, Free	INOR-93-6052	modified from ON MOECC E3015 and SM 4500-CN- I	TECHNICON AUTO ANALYZER
Mercury	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS



## Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086

SAMPLING SITE:SP47

AGAT WORK ORDER: 20T588871

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:Mohammad Safarpanah

		*******	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Sodium Adsorption Ratio	INOR-93-6007	McKeague 4.12 & 3.26 & EPA SW-84 6010C	⁶ ICP/OES
pH, 2:1 CaCl2 Extraction	INOR-93-6031	modified from EPA 9045D and MCKEAGUE 3.11	PH METER
Trace Organics Analysis			
Benzene	VOL-91-5009	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Toluene	VOL-91-5009	modified from EPA SW-846 5035C & 8260D	P&T GC/MS
Ethylbenzene	VOL-91-5009	modified from EPA SW-846 5035C & 8260D	P&T GC/MS
Xylenes (Total)	VOL-91-5009	modified from EPA SW-846 5035C & 8260D	P&T GC/MS
F1 (C6 to C10)	VOL-91-5009	modified from CCME Tier 1 Method	P&T GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	modified from CCME Tier 1 Method	P&T GC/FID
F2 (C10 to C16)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F3 (C16 to C34)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F4 (C34 to C50)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE
Moisture Content	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID





**Laboratory Use Only** 

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

Chain of C	ustody Reco	rd If this is	a Drinking Wa	ter sample, p	lease use D	Drinking Water Chain of Custody Form	potable	vater c	onsume	d by huma	ns)		- 1		l Temp			_		me	
Report Inform	nation: Wood				R	Regulatory Requirements:		No R	egula	tory Re	quire	ment	11		dy Sea	al Inta	et:		Yes	□N	lo 🗆 N/
Company.	Alessandro Pellerito				-			V					L	Notes							
Address:	50 Vogell Road Units 3 a	and 4			-    🗹	Regulation 153/04 Sew	er Use			Regulation	558		T	urna	arou	nd T	ľim	e (TA	AT) R	equired	
	Richmond Hill, ON					Table	nitary			CME			11		ar T						
Phone:	6479826220	Fax:				Res/Park Sto	rm			rov. Wate	r Oual	ity	11	_			rebaro	لاً ges Apply		Business D	ays
Reports to be sent to:  1. Email:	a.pellerito@woodplc.com				So	☐ Agriculture  ioil Texture (Check One) Region				)bjectives )ther			11.			sines		Com Adhii	" 2 Bus	iness	Next Busine
2. Email:	shami.malla@woodplc.c	om				✓Coarse MISA	ate One			Indicate	One	_		Ш	Days	i		ired (R	Days	ا urcharges N	□ Day
Project Inform						Is this submission for a  Record of Site Condition?			•	Guideli	ne oi									ification for	
Project:	TP115086				-11					te of Ar	. Ī.,										utory holidays
Site Location:	SP47 Mohammad Safarpanah				-4	☐ Yes   ☑ No			Yes		N	0	Ш	For	'Same	Day'	апа	lysis, į	please	contact yo	our AGAT CPM
Sampled By: AGAT Quote #:	305848	DO:			-1=			I	O. Re	(153			1	T	T		1		88		
AGAI Quote #:	Please note: If quotation number	PO:PO:	vill be billed full price	e for analysis.	S	Sample Matrix Legend Biota	Ş		_			. 1							IPCBs		
Invoice Information Company: Contact: Address:	Shami Malla		Bill To Same:	Yes 🗹 No	G G G P S	Paint	Field Filtered - Metals, Hg.	nics	☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals ☐ 153 Metals (incl. Hydrides)	ORPs: CIB-HWS CICT CINC CICT CICT CICT CICT CICT CICT		m Metals □ NH, □TKN	NO3+NO2				☐ Aroclors	sticides	S ☐ ABNS ☑ B(a)P		
Email:	GTA EAST@woodplc.o	com				Sediment Surface Water	ield Filter	and Inorganics	s   153 M Vetals   19	: CIB-HWS	ls Scan	Regulation/Custom Metals Nutrlents: □TP □NH, □	ع ا ت	4			☐ Total □/	lorine Pe	Maki M vocs		
Sampl	e Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y/N	Metals a	☐ All Metal	ORPs:	Full Metals Scan	Regulation/Cu Nutrients: □1	Nolatiles:	PHCs F1	ABNS	PAHs	PCBs: 🖪	Organochlorine	TCLP: ID M&		
BH C1 SS2		25 Mar 202	10:45	4	s	HOLD															
BH C1 SS4		25 Mar 200	11:00	4	S			Ø													
BH C5 SS2		25 Mar 202	12:00	4	S	HOLD															
BH C5 SS4		25 Mar 202	12:20	4	S	HOLD						-	11%	e T		F				1=	
BH C7 SS2		25 Mar 202	9:45	4	S	HOLD									TE						
BH C7 SS3		25 Mar 202	10:00	4	S	HOLD															
BH C12 SS2		25 Mar 202	2:45	4	S										H						
BH C9 SS1		25 Mar 202	1:00	4	S	HOLD															
BH C6 SS2		25 Mar 202	1:20	4	S							F									
BH C8 SS2		25 Mar 202	9:20	4	S	HOLD 0	1														
BH C2 SS2		25 Mar 202	11.15	14	S	HOLD	1														

Page 13 of 14

Date to a Marco 16 1118



5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2 Ph: 905.712 5100 Fax: 905 712.5122 webearth agatlabs.com

<b>Laboratory Use</b>	Only		
Work Order #:			
Cooler Quantity:	3-10	un-	
Arrival Temperatures:	_	1	
		1	
Custody Seal Intact: Notes:	□Yes	□No	□N/A

Report Information Company:	mation: Wood					Regulatory Require	ements:	□ N	o Re	egulat	ory Red	quire	mer	nt		stody tes:_	Seal	Intact:		□Yes		□No		□N/A
Contact:	Alessandro Pellerito				🗹	Regulation 153/04	Sewe	r Use	1	R	egulation	558		1	_			4 200			_			
Address:	50 Vogell Road Units	3 and 4				Table 2 Indicate One	∏San	itanı		По	CME			- 14					ne (	IAI)	Req	uired:		
	Richmond Hill, ON				_	☑Ind/Com		-							Reg	(ula	TA	Т	7	7 5 to	7 Bu	siness Da	ys	
Phone:	6479826220	Fax:			-	☐ Res/Park ☐ Agriculture	□Sto	m			ov. Water bjectives			- 11	Rus	h TA	<b>T</b> (Ru	sh Surch	erges A	pply)				
Reports to be sent to:  1. Email:	a.pellerito@woodplc.	com			So	oil Texture (Check One)	egion	te One	-		-	(FVVQ	0)			_, 3	Busi	iness	_	_ 2E	usine	ss _	¬ Nex	t Business
2. Email:	shami.malla@woodpl	c.com				☑Coarse ☐Fine	MISA	ile Orie		_	Indicate	One	-		L		ays O <b>R</b> Da	ate Red	L uired	∟ _{Dag} (Rush		L narges Ma	Duj	
Project Inform	mation:					Is this submission					uldelir					_	51							
Project:	TP115086					Record of Site Cond			Cert	ificat	e of An	_				*7						ation for r nd statut		
Site Location:	SP47				_	☐ Yes ☑ N	10			Yes		N	0		F	or 'Sa	ame	Dav' aı	naivsi	s. plea	se co	ntact you	r AGA	г срм
Sampled By:	Mohammad Safarpan	ah								O. Reg	153			_		-			1		T			
AGAT Quote #:	305848 Please note: If quotation nu	PO:PO:	ill be billed full price	o for analysis.	_   s	ample Matrix Lege	nd	CrV			103		-1							<b>™</b> PCBs				
Invoice Information Company: Contact: Address:	Shami Malla		Bill To Same:	Yes 🗹 No	G G P S S	Ground Water Oil Paint Soil		Filtered - Metals, Hg	rganics	☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals ☐ 153 Metals (Incl. Hydrides)	S CICH CONT	<u>_</u>	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH, ☐ TKN ☐ NO, ☐ NO, +NO,	ос Ввтех □тнм			☐ Aroclors	Pesticides	■ VOCs □ ABNs 国 B(a)P				
Email:	GTA EAST@woodp	olc.com			s	Surface Water		Field Fi	and Inorganics	tals □ 15 e Metals [	∷ □B-HWS □CI □ □EC □ FOC I □SAR	Full Metals Scan	tion/Cus	ts: 0 T	s: 🗆 voc	1 - F4				M&I 🗖	Use			
Samp	e Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments, Special Instruc		Y/N	Metals	☐ All Mel	ORPs:	Full Me	Regular	Nutrien	Volatiles:	PHCs F1 - F4	ABNS	PAHs PCBs: Total	Organo	TCLP: M&I	Sewer			
BH C3 SS1		25 Mar 20	10:20	4	S	HOLD																		
BH S11 SS2		25 Mar 20	10:00	4	S	HOLD																		
BH S11 SS4		25 Mar 202	10:15	4	S	HOLD												- (					R	
BH S11 SS5		25 Mar 202	10:30	3	S										7	V							100	
BH S12 SS2		25 Mar 202	12:15	4	S	HOLD																		
BH S12 SS5		25 Mar 202	12:20	4	S	HOLD																		
																								1-1
								Later Control																
				35	20	00/		121	7															
amples Relinquished By (Pr	int (Mine and Sign):	m - 0	Date	HA Clipton	ne L	Samples Received By (Print	Namo and S(a)	W				40	Date	1	1	√Tir	7	01	/					-1/
Alessandro Peller samples Relinquished By (Pr	int Number a ptil Septin)	Anten?	Date 1	5, 2020 -6	:05pm	Samhlad Received By (Print I	Name and Sign)	<i>u</i> \	V			-	Date	ع الم	142	Tir	na	Cy			Page	20	of /	7
		The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s	- 1	A J I ZA V		/						1		1		- 1		_/	- 1		-0-		-	



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4
RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Alessandro Pellerito

PROJECT: TP115086 AGAT WORK ORDER: 20T588920

SOIL ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

DATE REPORTED: Nov 13, 2020

PAGES (INCLUDING COVER): 11 VERSION*: 1

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

<u>*Notes</u>

#### Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
  incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other
  third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
  services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
  merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
  contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Page 1 of 11

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA)



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

Certificate of Analysis

AGAT WORK ORDER: 20T588920

PROJECT: TP115086

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

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:

## SAMPLING SITE: Corrosivity Package

NA

NA

DATE RECEIVED: 2020-03-30							DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH C17 SS3	
					SAMPLE TYPE:	Soil	
				I	DATE SAMPLED:	2020-03-27	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1056578	
Chloride (2:1)	μg/g	NA	2	2020-04-02	2020-04-02	141	
Sulphate (2:1)	μg/g		2	2020-04-02	2020-04-02	21	
pH (2:1)	pH Units		NA	2020-04-06	2020-04-06	8.17	
Electrical Conductivity (2:1)	mS/cm	1.4	0.005	2020-03-27	2020-03-27	0.392	
Resistivity (2:1) (Calculated)	ohm.cm		1	2020-03-27	2020-03-27	2550	
Redox Potential 1	mV		NA	2020-03-30	2020-03-30	124	

2020-03-30

2020-03-30

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

2020-03-30

2020-03-30

Industrial/Commercial/Community Property Use - Coarse Textured Soils

m۷

mV

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.

1056578 EC, pH, Chloride and Sulphate were determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water: 1 part soil). Resistivity is a calculated parameter.

Redox potential measured on as received sample. Due to the potential for rapid change in sample equilibrium chemistry with exposure to oxidative/reduction conditions laboratory results may differ from

117

99

field measured results.

Analysis performed at AGAT Toronto (unless marked by *)

Redox Potential 2

Redox Potential 3

OHANTERS) S WHONE BASLY O CHEMIST O



AGAT WORK ORDER: 20T588920

PROJECT: TP115086

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:

http://www.agatlabs.com

5835 COOPERS AVENUE

MISSISSAUGA, ONTARIO CANADA L4Z 1Y2

TEL (905)712-5100 FAX (905)712-5122

SAMPLING SITE:

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

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

DATE RECEIVED: 2020-03-30								[	DATE REPORTED	: 2020-11-13
				SAMPL	E DESCRIPTION:	BH C13 SS3	BH C17 SS1	BH C25 SS3	DUP	
					SAMPLE TYPE:	Soil	Soil	Soil	Soil	
					DATE SAMPLED:	2020-03-27	2020-03-27	2020-03-27	2020-03-27	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1056574	1056577	1056587	1056591	
Antimony	μg/g	40	0.8	2020-04-02	2020-04-02	<0.8	<0.8	<0.8	<0.8	
Arsenic	μg/g	18	1	2020-04-02	2020-04-02	5	4	4	4	
Barium	μg/g	670	2	2020-04-02	2020-04-02	96	65	77	78	
Beryllium	μg/g	8	0.5	2020-04-02	2020-04-02	0.6	<0.5	<0.5	<0.5	
Boron	μg/g	120	5	2020-04-02	2020-04-02	12	7	9	9	
Boron (Hot Water Extractable)	μg/g	2	0.10	2020-04-01	2020-04-01	0.43	0.21	0.25	0.25	
Cadmium	μg/g	1.9	0.5	2020-04-02	2020-04-02	<0.5	<0.5	<0.5	<0.5	
Chromium	μg/g	160	5	2020-04-02	2020-04-02	23	17	19	19	
Cobalt	μg/g	80	0.5	2020-04-02	2020-04-02	11.3	7.3	8.6	8.9	
Copper	μg/g	230	1	2020-04-02	2020-04-02	19	18	17	18	
Lead	μg/g	120	1	2020-04-02	2020-04-02	9	8	7	8	
Molybdenum	μg/g	40	0.5	2020-04-02	2020-04-02	<0.5	<0.5	<0.5	<0.5	
Nickel	μg/g	270	1	2020-04-02	2020-04-02	25	16	19	19	
Selenium	μg/g	5.5	0.4	2020-04-02	2020-04-02	<0.4	<0.4	<0.4	<0.4	
Silver	μg/g	40	0.2	2020-04-02	2020-04-02	<0.2	<0.2	<0.2	<0.2	
Thallium	μg/g	3.3	0.4	2020-04-02	2020-04-02	<0.4	<0.4	<0.4	<0.4	
Uranium	μg/g	33	0.5	2020-04-02	2020-04-02	0.6	<0.5	0.6	0.6	
Vanadium	μg/g	86	1	2020-04-02	2020-04-02	35	28	29	29	
Zinc	μg/g	340	5	2020-04-02	2020-04-02	52	44	44	45	
Chromium, Hexavalent	μg/g	8	0.2	2020-03-31	2020-03-31	<0.2	<0.2	<0.2	<0.2	
Cyanide, Free	μg/g	0.051	0.040	2020-04-03	2020-04-03	<0.040	<0.040	<0.040	<0.040	
Mercury	μg/g	3.9	0.10	2020-04-02	2020-04-02	<0.10	<0.10	<0.10	<0.10	
Electrical Conductivity (2:1)	mS/cm	1.4	0.005	2020-03-27	2020-03-27	1.45	0.552	1.57	1.42	
Sodium Adsorption Ratio	NA	12	NA	2020-04-02	2020-04-02	3.85	1.60	4.76	3.98	
pH, 2:1 CaCl2 Extraction	pH Units	5.0-9.0	NA	2020-04-03	2020-04-03	7.75	7.71	7.88	7.93	





AGAT WORK ORDER: 20T588920

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:

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

DATE RECEIVED: 2020-03-30 DATE REPORTED: 2020-11-13

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

1056574-1056591 EC was 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. SAR is a calculated

parameter.

Analysis performed at AGAT Toronto (unless marked by *)

ORANGE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODUCTION OF THE PRODU



### **Exceedance Summary**

AGAT WORK ORDER: 20T588920

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

ATTENTION TO: Alessandro Pellerito

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
1056574	BH C13 SS3	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity (2:1)	mS/cm	1.4	1.45
1056587	BH C25 SS3	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity (2:1)	mS/cm	1.4	1.57
1056591	DUP	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity (2:1)	mS/cm	1.4	1.42

## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE AGAT WORK ORDER: 20T588920
PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

SAMPLING SITE.								DAIVIE L	LDB	1.					
				Soi	l Ana	alysis	6								
RPT Date: Nov 13, 2020				DUPLICATE			REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	IKE
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acce Lin	ptable nits	Recovery		ptable nits	Recovery		ptable nits
		la	·	·			value	Lower	Upper		Lower	Upper		Lower	Uppe
O. Reg. 153(511) - Metals & Inor	rganics (Soil)														
Antimony	1059297		<0.8	<0.8	NA	< 0.8	123%	70%	130%	101%	80%	120%	70%	70%	1309
Arsenic	1059297		4	4	NA	< 1	103%	70%	130%	105%	80%	120%	109%	70%	1309
Barium	1059297		91	83	9.1%	< 2	99%	70%	130%	99%	80%	120%	106%	70%	1309
Beryllium	1059297		0.6	<0.5	NA	< 0.5	80%	70%	130%	103%	80%	120%	86%	70%	1309
Boron	1059297		9	9	NA	< 5	75%	70%	130%	109%	80%	120%	79%	70%	1309
Boron (Hot Water Extractable)	1057235		0.13	0.13	NA	< 0.10	94%	60%	140%	91%	70%	130%	86%	60%	1409
Cadmium	1059297		< 0.5	< 0.5	NA	< 0.5	103%	70%	130%	98%	80%	120%	99%	70%	1309
Chromium	1059297		20	18	NA	< 5	95%	70%	130%	93%	80%	120%	103%	70%	1309
Cobalt	1059297		9.5	8.3	12.8%	< 0.5	80%	70%	130%	92%	80%	120%	92%	70%	1309
Copper	1059297		19	17	9.8%	< 1	84%	70%	130%	96%	80%	120%	92%	70%	1309
Lead	1059297		9	8	4.8%	< 1	95%	70%	130%	90%	80%	120%	87%	70%	1309
Molybdenum	1059297		<0.5	<0.5	NA	< 0.5	96%	70%	130%	101%	80%	120%	103%	70%	1309
Nickel	1059297		21	19	11.2%	< 1	85%	70%	130%	99%	80%	120%	98%	70%	1309
Selenium	1059297		<0.4	<0.4	NA	< 0.4	107%	70%	130%	100%	80%	120%	101%	70%	1309
Silver	1059297		<0.2	<0.2	NA	< 0.2	108%	70%	130%	97%	80%	120%	90%	70%	1309
Thallium	1059297		<0.4	<0.4	NA	< 0.4	86%	70%	130%	100%	80%	120%	98%	70%	1309
Uranium	1059297		0.5	<0.5	NA	< 0.5	88%	70%	130%	102%	80%	120%	106%	70%	1309
Vanadium	1059297		32	28	12.8%	< 1	96%	70%	130%	99%	80%	120%	107%	70%	1309
Zinc	1059297		56	49	13.2%	< 5	104%	70%	130%	102%	80%	120%	106%	70%	1309
Chromium, Hexavalent	1048424		<0.2	<0.2	NA	< 0.2	87%	70%	130%	85%	80%	120%	81%	70%	1309
Cyanide, Free	1063190		<0.040	<0.040	NA	< 0.040	91%	70%	130%	98%	80%	120%	107%	70%	1309
Mercury	1059297		<0.10	<0.10	NA	< 0.10	101%	70%	130%	106%	80%	120%	107%	70%	1309
Electrical Conductivity (2:1)	1057235		0.179	0.178	0.6%	< 0.005	112%	80%	120%						
Sodium Adsorption Ratio	1057235		0.358	0.367	2.6%	NA									
pH, 2:1 CaCl2 Extraction	1056610		7.43	7.44	0.1%	NA	101%	80%	120%						
Comments: NA signifies Not Applic pH duplicates QA acceptance crite If the RPD value is NA, the results	ria was met re														
Corrosivity Package															
Chloride (2:1)	1052899		34	36	6.0%	< 2	90%	70%	130%	99%	80%	120%	100%	70%	1309
Sulphate (2:1)	1052899		37	35	4.9%	< 2	98%		130%	98%		120%	102%		1309
pH (2:1)	1057228		8.21	8.20	0.1%	NA	101%	90%	110%						
Electrical Conductivity (2:1)	1057235		0.179	0.178	0.6%	< 0.005	NA		120%						
· · · · · · · · · · · · · · · · · · ·	1					NA	101%		110%						

Comments: NA signifies Not Applicable.

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE AGAT WORK ORDER: 20T588920
PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

Soil Analysis (Continued)															
RPT Date: Nov 13, 2020				DUPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPII	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		otable nits	Recovery	Lin	ptable nits	Recovery	Lin	ptable nits
		ld		'			Value	Lower	Upper		Lower	Upper		Lower	Upper



## **Method Summary**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T588920

PROJECT: TP115086

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

SAMPLING SITE.		SAMPLED BY.							
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE						
Soil Analysis									
Chloride (2:1)	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH						
Sulphate (2:1)	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH						
pH (2:1)	INOR 93-6031	MSA part 3 & SM 4500-H+ B	PH METER						
Electrical Conductivity (2:1)	INOR-93-6036	modified from MSA PART 3, CH 14 and SM 2510 B	EC METER						
Resistivity (2:1) (Calculated)	INOR-93-6036	McKeague 4.12, SM 2510 B,SSA #5 Part 3	CALCULATION						
Redox Potential 1	INOR-93-6066	modified G200-09, SM 2580 B	REDOX POTENTIAL ELECTRODE						
Redox Potential 2	INOR-93-6066	modified G200-09, SM 2580 B	REDOX POTENTIAL ELECTRODE						
Redox Potential 3	INOR-93-6066	modified G200-09, SM 2580 B	REDOX POTENTIAL ELECTRODE						
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Boron (Hot Water Extractable)	MET-93-6104	modified from EPA 6010D and MSA PART 3, CH 21	ICP/OES						
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Zinc	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Chromium, Hexavalent	INOR-93-6068	modified from EPA 3060 and EPA 7196	SPECTROPHOTOMETER						
Cyanide, Free	INOR-93-6052	modified from ON MOECC E3015 and SM 4500-CN- I	TECHNICON AUTO ANALYZER						
Mercury	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						



## **Method Summary**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE AGAT WORK ORDER: 20T588920

PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
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	modified from EPA 9045D and MCKEAGUE 3.11	PH METER



5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2

	207588920
Work Order #:	20   588   20

Chain of C						Ph: 905.712.5100 Fax: 905.712.5122 webearth agallabs, come use Drinking Water Chain of Custody Form (potable water consumed by humans)									ooler rrival		10.0			1	5	L-	vg e	
Report Inform	nation: Wood					Regulatory Requirement	s: 🗌	No F	Regul	atory Re	quir	eme	nt	C	ustod	y Sea	al Int	act:		Yes		□Ne	0	□N/A
Company: Contact:	Alessandro Pellerito				-									N	otes:									
Address:	50 Vogell Road Units	s 3 and 4			-	Regulation 153/04	ewer Use			Regulatio	า 558			Tu	rna	rou.	nd	Tim	o (T/	T) E	Requ	irod		
, ladi coo.	Richmond Hill, ON	o o ana i				Table	Sanitary			CCME				1						-	-			
	6479826220				-	= .	Storm								gula						7 Busir	ness D	ays	
Phone: Reports to be sent to: 1. Email:	a.pellerito@woodplc.	Fax: .com				☐Agriculture  Soil Texture (Check One) Region				Prov. Wate Objectives Other				Ru			Rush S		ges Apph		siness	_	_ Nex	t Business
2. Email:	shami.malla@woodp	lc.com				☑Coarse ☐ M	ndicate One			Indicat	e One	4				Days OR [		Requ	ired (R	Days	i	L	Day Day	
Project Inform	mation:					Is this submission for a				Guidell					12									
Project:	TP115086					Record of Site Condition?		Ce	rtifica	ate of A	naly	sls			*								rush TA	
Site Location:	SP47					☐ Yes ☑ No			] Yes	s [	] [	lo									ekends and statutory holidays			
Sampled By:	Mohammad Safarpar	nah					1		0.0	1450	_				rur a	Same	e Day	ana			e conta	act yo	Ir AGAI	CPM
AGAT Quoto #:	205848	PO:PO:	dil be billion feel meion	the replied	-	Sample Matrix Legend	CrV	-		eg 153	-					11.0			70	INPCBs	100			
Invoice Information Company: Contact: Address: Email:	Shami Malla  GTA EAST@woodr		Bill To Same:	Yes 🗹 No		B         Biota           GW         Ground Water           0         Oil           P         Paint           S         Soil           SD         Sediment           SW         Surface Water	Field Filtered - Metals, Hg,	norganics	153 Metals (excl. Hydrides)		Scan	Regulation/Custom Metals	TP □NH, □TKN □NO,+NO,	□ voc □втех □тнм				I □ Aroclors	Organochlorine Pesticides	ICLP: EMIKI ELVOCS LIABNS ELB(a)P	CORROSIVITY			
Samo	le Identification	Date	Time	# of	Sample	e Comments/	Y/N	Metals and Inorganics	□ All Metals □ 153 N □ Hvdride Metals □ 1	ORPs: □B-HWS	Full Metals S	gulation/0	Nutrients: ☐ TP ☐ ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO, ☐ NO	Volatiles:	PHCs F1 - F4	Ns	ş	PCBs: 🖪 Total	ganochlori	ICLP: IN M&I	ORR(			
		Sampled	Sampled	Containers	Matrix	Special Instructions		ž	òċ	5 6 i	j 2	Re	ŽĎ	9	표	ABNs	PAHS	2	Org	<u> </u>	3 0			
BH C13 SS1		27 Mar 202	9:20	4	S	HOLD		-								11/								
BH C13 SS3		27 Mar 202	9:30	4	S			V									0							
BH C11 SS2		27 Mar 202		4	S	HOLD																		
BH C11 SS4			1:15	4	S	HOLD														_				
BH C17 SS1			9:50	4	S			V									_							
BH C17 SS3		27 Mar 202	10:00	4	S						-										Ø		4	
BH S8 SS2		26 Mar 202	10:15	4	S	HOLD		-	-		-													
BH S8 SS4		26 Mar 202	10:30	4	S	HOLD		┡																
BH S7/C27 SS2	-		1:00	4	S	HOLD														4				
BH S7/C27 SS3		26 Mar 202	1:10	4	S	HOLD						2.3												
BH C15 SS1		27 Mar 202	12:30	4	S	HOLD			1										08					
Samples Relinquished By (Pri Alessandro Pelleri Samples Relinquished By (Pri Samples Relinquished By (Pri	to nt Name and Sign);		Mar 29	), 2020 Tim		Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Signation Samples Received By (Print Name and Samples Received By (Print Name and Samples Received By (Print Name and Samples Received By (Print Name and Samples Received By (Print Name and Samples Received By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Name and Samples By (Print Nam	Olar )	1				3 Date	13	01		me	126	14	No.	Pa	age	(	of	

Date benner March 25, 2018

# 1. 3.5 3.3 3 2.3.4 3-6 3-1 3. 3.53.5 3.3 1.8 2.2 3.5 2.3 2 1.8 25. 2-3 2aboratory Use Only

	AGAT	Laboratorie
--	------	-------------

	A G		Γr.	ahor	ator	rios		Ph- Pr			Fax 90				Wo	rk O	rder #	t: _							_
Chain of C	sustody Rec									We	bearthing	atlob					Quan Temp		res:		3	L	aly	e	
Jilaili Ui C	ustouy Rec	Oru If this is	a Drinking Wa	ter sample, p	olease use I	Orlnking Water Chain of	Custody Form (	potable	water c	onsume	d by huma	ns)		-					, , ,			TI			
Report Inform Company:	Wood				F (P	Regulatory Requires to the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of the character of	irements:		No R	egula	tory Re	quire	mei	nt		stody	/ Sea	I Inta	ct:		Yes		□No		]N/A
Contact:	Alessandro Pellerito				[	Regulation 153/04	Sewe	er Use	1	F	Regulation	n 558				_									
Address:	50 Vogell Road Units	3 and 4			_	Table					CME				Tu	rnaı	our	nd T	ime	) (TA	T) R	equi	red:		
	Richmond Hill, ON					✓Ind/Com	□San	itary			CIVIE				Re	gula	r TA	T		7	5 to 7	Busine	ess Days	3	
Phone:	6479826220	Fax:				□Res/Park □Agriculture	□Stor	rm			rov. Wate				Rus	sh T	AT (R	ısh Su	rcharge	a Apply			-		
Reports to be sent to:  1. Email:	a.pellerito@woodplc.	com			S	oil Texture (Check One)	Region	ate One	-		bjectives ther	(PWQ	O)				3 Bus	iness	5		2 Busi	iness		Next Bu	siness
2. Email:	shami.malla@woodpl	lc.com				☑ Coarse ☐ Fine	MISA			-	Indicate	One	_				Days <b>OR</b> D	ate R	Requir		Days ush Su	ırcharş	ges May	Day Apply):	
Project Inform						Is this submissio					Guideli					-	DI.	2000	nrev.	do ==:	or 2.1	dinati-	n for rus	h TAT	3.
Project:	TP115086										te of A					*								sn IAI y holiday	'S
Site Location:	SP47	,				☐ Yes ☑	No			Yes		] N	O		F	or 'S	ame	Dav'	anal	vsls. r	olease	conta	ct vour	AGAT CP	м
Sampled By:	Mohammad Safarpan	nah					-	-	II	O. Reg	150						T		T			1 1	Je your .	T T	
AGAT Quote #:	205848 Please note: If quotation nu	PO: umber is not provided, client w	will be billed full prior	o for analysis.	S	iample Matrix Leg	gend	CrVI		(S)	103									[ C	ZPCBs			l l	
Invoice Information Company: Contact:	Shami Malla		Bill To Same:	Yes 🗹 No		W Ground Water Oil Paint		Field Filtered - Metals, Hg,	lics	tals (excl. Hydrides) 3 Metals (Incl. Hydric	JCi □CN C □ Hg		Metals	□NH, □TKN 1NO,+NO,	Пвтех □тнм				Aroclors		□ ABNS № B(a)P	SIVITY			
Address: Email:	GTA EAST@woodp	ole com			s			Field Filtere	Metals and Inorganics	als □ 153 Me Metzls □ 15	ORPs: DB-HWS DCI C	aris Scan	Regulation/Custom	Nutrients:   TP	□ voc	F1 - F4			Total   A	Organochlorine Pee	ICLP: IN M&I IN VOCS LIABINS Sewer Use				
Sample	e Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Commer Special instr		Y/N	Metals	☐ All Meb	ORPs: [	Full Metals	Regulat	Nutrient O NO, [	Volatiles:	PHCs F	ABNS	PAHS	PCBs: 🖸	Organo Organo	ICLP: IN M&	CORR		П	
BH C25 SS1		27 Mar 202	11:00	4	S	HOLD																			
BH C25 SS3		27 Mar 202	11:15	4	S				7													$\Box$			
BH C23 SS1		27 Mar 202	11:40	4	S	HOLD																			1
BH C23 SS3		27 Mar 202	11:50	4	S	HOLD											1		1		+	+			1
BH C21 SS1		27 Mar 202		4	S	HOLD													1	+	1				+
DUP		27 Mar 202	10.15	4	S	NOLD						-				-	-	7	+	-	+	+			+
									۳			+					-	+	+	+	-		_		+
				-								-	-		-		-	+	+	+	+	++	-		+
				-									-		$\vdash$	-	-	+	-	+	+	$\vdash$		-	+
				-				-										-	-	-	+		-		-
																	_			-	-				_
										11															
Eamples Relinquished By (Prii Alessandro Pellerit Samples Relinquished By (Prii	to		Mar 29	9, 2020 Tin	10:15AM	Samples Received By (Pr	rint Name and Bign).	dgi	1 4	lle			3 Date	130	7/2	O TH	) ).	1	4						
Samples Relinquished By (Prin			Date	Tin		Samples Received By (Pr	The House of Landson												_ '		Pag	ge	of _		
Complete Companioned by IPIII	is reactio atto Signif.		Distant.	Lun	110	Learnthins Nacembed GA (I.)	NW NAMED WAS SIGN.						Date			1.100	rie			1					

Decument ID DIV 78 1511 015

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

Boto 1 1 - March 10 1019



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4
RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Alessandro Pellerito

PROJECT: TP115086 AGAT WORK ORDER: 20T590525

SOIL ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

DATE REPORTED: Nov 13, 2020

PAGES (INCLUDING COVER): 23 VERSION*: 1

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

*Notes	

#### Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
  incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other
  third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
  services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
  merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
  contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Page 1 of 23

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. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.



AGAT WORK ORDER: 20T590525

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE:SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammad Safarpanah

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

DATE RECEIVED: 2020-04-03									DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH D18 SS3	BH D17 SS2	BH C24 SS2	
					SAMPLE TYPE:	Soil	Soil	Soil	
				1	DATE SAMPLED:	2020-04-01	2020-04-01	2020-04-01	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1066581	1066582	1066586	
Antimony	μg/g	40	0.8	2020-04-13	2020-04-13	<0.8	<0.8	<0.8	
Arsenic	μg/g	18	1	2020-04-08	2020-04-08	5	12	4	
Barium	μg/g	670	2	2020-04-08	2020-04-08	70	14	74	
Beryllium	μg/g	8	0.5	2020-04-08	2020-04-08	0.5	<0.5	0.6	
Boron	μg/g	120	5	2020-04-08	2020-04-08	11	14	8	
Boron (Hot Water Extractable)	μg/g	2	0.10	2020-04-08	2020-04-08	0.32	0.30	<0.10	
Cadmium	μg/g	1.9	0.5	2020-04-08	2020-04-08	<0.5	<0.5	<0.5	
Chromium	μg/g	160	5	2020-04-08	2020-04-08	19	6	20	
Cobalt	μg/g	80	0.5	2020-04-08	2020-04-08	8.1	5.1	9.4	
Copper	μg/g	230	1	2020-04-08	2020-04-08	17	11	19	
Lead	μg/g	120	1	2020-04-08	2020-04-08	10	18	9	
Molybdenum	μg/g	40	0.5	2020-04-08	2020-04-08	<0.5	0.9	<0.5	
Nickel	μg/g	270	1	2020-04-08	2020-04-08	17	8	19	
Selenium	μg/g	5.5	0.4	2020-04-08	2020-04-08	<0.4	<0.4	< 0.4	
Silver	μg/g	40	0.2	2020-04-08	2020-04-08	<0.2	<0.2	<0.2	
Thallium	μg/g	3.3	0.4	2020-04-08	2020-04-08	<0.4	<0.4	<0.4	
Uranium	μg/g	33	0.5	2020-04-08	2020-04-08	0.6	<0.5	0.5	
Vanadium	μg/g	86	1	2020-04-08	2020-04-08	29	9	29	
Zinc	μg/g	340	5	2020-04-08	2020-04-08	48	79	46	
Chromium, Hexavalent	μg/g	8	0.2	2020-04-08	2020-04-08	<0.2	<0.2	<0.2	
Cyanide, Free	μg/g	0.051	0.040	2020-04-13	2020-04-13	<0.040	<0.040	<0.040	
Mercury	μg/g	3.9	0.10	2020-04-08	2020-04-08	<0.10	<0.10	<0.10	
Electrical Conductivity (2:1)	mS/cm	1.4	0.005	2020-04-08	2020-04-08	1.25	1.68	0.830	
Sodium Adsorption Ratio	NA	12	NA	2020-04-08	2020-04-08	4.37	12.4	4.19	
pH, 2:1 CaCl2 Extraction	pH Units	5.0-9.0	NA	2020-04-13	2020-04-13	7.83	8.12	7.88	





AGAT WORK ORDER: 20T590525

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY: Mohammad Safarpanah

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

DATE RECEIVED: 2020-04-03 DATE REPORTED: 2020-11-13

Comments:

RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

1066581-1066586 EC was 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. SAR is a calculated

parameter.

Analysis performed at AGAT Toronto (unless marked by *)

CHARTERED S NYME BASHY O CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST



AGAT WORK ORDER: 20T590525

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE:SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY: Mohammad Safarpanah

O. Reg. 558 Metals and Inorganics	
-----------------------------------	--

DATE RECEIVED: 2020-04-03							DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	Comp. TCLP C	
					SAMPLE TYPE:	Soil	
				1	DATE SAMPLED:	2020-04-01	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1066587	
Arsenic Leachate	mg/L	2.5	0.010	2020-04-08	2020-04-08	<0.010	
Barium Leachate	mg/L	100	0.100	2020-04-08	2020-04-08	0.510	
Boron Leachate	mg/L	500	0.050	2020-04-08	2020-04-08	0.084	
Cadmium Leachate	mg/L	0.5	0.010	2020-04-08	2020-04-08	<0.010	
Chromium Leachate	mg/L	5	0.010	2020-04-08	2020-04-08	<0.010	
Lead Leachate	mg/L	5	0.010	2020-04-08	2020-04-08	<0.010	
Mercury Leachate	mg/L	0.1	0.01	2020-04-08	2020-04-08	<0.01	
Selenium Leachate	mg/L	1	0.010	2020-04-08	2020-04-08	<0.010	
Silver Leachate	mg/L	5	0.010	2020-04-08	2020-04-08	<0.010	
Uranium Leachate	mg/L	10	0.050	2020-04-08	2020-04-08	< 0.050	
Fluoride Leachate	mg/L	150	0.05	2020-04-08	2020-04-08	0.16	
Cyanide Leachate	mg/L	20	0.05	2020-04-08	2020-04-08	< 0.05	
(Nitrate + Nitrite) as N Leachate	mg/L	1000	0.70	2020-04-08	2020-04-08	< 0.70	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria 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.

Analysis performed at AGAT Toronto (unless marked by *)

CHEMIST OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTERS OF MINISTE



AGAT WORK ORDER: 20T590525

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE: SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammad Safarpanah

							•				
O. Reg. 153(511) - OC Pesticides (Soil)											
DATE RECEIVED: 2020-04-03							DATE REPORTED: 2020-11-13				
				SAMPL	E DESCRIPTION:	BH D17 SS2					
					SAMPLE TYPE:	Soil					
					DATE SAMPLED:	2020-04-01					
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1066582					
Hexachloroethane	μg/g	0.21	0.01	2020-04-09	2020-04-13	<0.01					
Gamma-Hexachlorocyclohexane	μg/g	0.056	0.005	2020-04-09	2020-04-13	<0.005					
Heptachlor	μg/g	0.19	0.005	2020-04-09	2020-04-13	< 0.005					
Aldrin	μg/g	0.088	0.005	2020-04-09	2020-04-13	<0.005					
Heptachlor Epoxide	μg/g	0.05	0.005	2020-04-09	2020-04-13	<0.005					
Endosulfan	μg/g	0.3	0.005	2020-04-09	2020-04-13	< 0.005					
Chlordane	μg/g	0.05	0.007	2020-04-09	2020-04-13	< 0.007					
DDE	μg/g	0.52	0.007	2020-04-09	2020-04-13	< 0.007					
DDD	μg/g	4.6	0.007	2020-04-09	2020-04-13	< 0.007					
DDT	μg/g	1.4	0.007	2020-04-09	2020-04-13	< 0.007					
Dieldrin	μg/g	0.088	0.005	2020-04-09	2020-04-13	< 0.005					
Endrin	μg/g	0.04	0.005	2020-04-09	2020-04-13	< 0.005					
Methoxychlor	μg/g	1.6	0.005	2020-04-09	2020-04-13	<0.005					
Hexachlorobenzene	μg/g	0.66	0.005	2020-04-09	2020-04-13	< 0.005					
Hexachlorobutadiene	μg/g	0.031	0.01	2020-04-09	2020-04-13	<0.01					
Moisture Content	%		0.1	2020-04-07	2020-04-07	8.0					
Surrogate	Unit	Acceptab	le Limits								
TCMX	%	50-	140	2020-04-09	2020-04-13	79					
Decachlorobiphenyl	%	50-	140	2020-04-09	2020-04-13	80					
(											

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

1066582 Results are based on the dry weight of the soil.

DDT total is a calculated parameter. The calculated value is the sum of op'DDT and pp'DDT. DDD total is a calculated parameter. The calculated value is the sum of op'DDD and pp'DDD. DDE total is a calculated parameter. The calculated value is the sum of op'DDE and pp'DDE.

Endosulfan total is a calculated parameter. The calculated value is the sum of Endosulfan I and Endosulfan II.

Chlordane total is a calculated parameter. The calculated value is the sum of Alpha-Chlordane and Gamma-Chlordane.

Analysis performed at AGAT Toronto (unless marked by *)





AGAT WORK ORDER: 20T590525

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammad Safarpanah

O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Soil)										
DATE RECEIVED: 2020-04-03							DATE REPORTED: 2020-11-13			
				SAMPL	E DESCRIPTION:	BH D17 SS2				
					SAMPLE TYPE:	Soil				
			2020-04-01							
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1066582				
F1 (C6 to C10)	μg/g	55	5	2020-04-07	2020-04-07	<5				
F1 (C6 to C10) minus BTEX	μg/g	55	5	2020-04-07	2020-04-07	<5				
F2 (C10 to C16)	μg/g	230	10	2020-04-08	2020-04-09	<10				
F3 (C16 to C34)	μg/g	1700	50	2020-04-08	2020-04-09	72				
F4 (C34 to C50)	μg/g	3300	50	2020-04-08	2020-04-09	62				
Gravimetric Heavy Hydrocarbons	μg/g	3300	50			NA				
Moisture Content	%		0.1	2020-04-07	2020-04-07	8.0				
Surrogate	Unit	Acceptable	Limits							
Terphenyl	%	60-14	10	2020-04-08	2020-04-09	120				

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

1066582 Results are based on sample dry weight.

The C6-C10 fraction is calculated using toluene response factor.

C6-C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX.

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 contribution.

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.

Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

NPoprukolef



AGAT WORK ORDER: 20T590525

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE:SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammad Safarpanah

				O. Re	g. 153(511) -	VOCs (Soil)	
DATE RECEIVED: 2020-04-03							DATE REPORTED: 2020-11-13
				SAMPL	E DESCRIPTION:	BH D17 SS2	
					SAMPLE TYPE:	Soil	
					DATE SAMPLED:	2020-04-01	
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1066582	
Dichlorodifluoromethane	μg/g	16	0.05	2020-04-07	2020-04-08	<0.05	
Vinyl Chloride	ug/g	0.032	0.02	2020-04-07	2020-04-08	<0.02	
Bromomethane	ug/g	0.05	0.05	2020-04-07	2020-04-08	<0.05	
Trichlorofluoromethane	ug/g	4	0.05	2020-04-07	2020-04-08	<0.05	
Acetone	ug/g	16	0.50	2020-04-07	2020-04-08	<0.50	
1,1-Dichloroethylene	ug/g	0.064	0.05	2020-04-07	2020-04-08	<0.05	
Methylene Chloride	ug/g	1.6	0.05	2020-04-07	2020-04-08	< 0.05	
Trans- 1,2-Dichloroethylene	ug/g	1.3	0.05	2020-04-07	2020-04-08	<0.05	
Methyl tert-butyl Ether	ug/g	1.6	0.05	2020-04-07	2020-04-08	< 0.05	
1,1-Dichloroethane	ug/g	0.47	0.02	2020-04-07	2020-04-08	<0.02	
Methyl Ethyl Ketone	ug/g	70	0.50	2020-04-07	2020-04-08	<0.50	
Cis- 1,2-Dichloroethylene	ug/g	1.9	0.02	2020-04-07	2020-04-08	<0.02	
Chloroform	ug/g	0.47	0.04	2020-04-07	2020-04-08	<0.04	
1,2-Dichloroethane	ug/g	0.05	0.03	2020-04-07	2020-04-08	< 0.03	
1,1,1-Trichloroethane	ug/g	6.1	0.05	2020-04-07	2020-04-08	<0.05	
Carbon Tetrachloride	ug/g	0.21	0.05	2020-04-07	2020-04-08	<0.05	
Benzene	ug/g	0.32	0.02	2020-04-07	2020-04-08	<0.02	
1,2-Dichloropropane	ug/g	0.16	0.03	2020-04-07	2020-04-08	<0.03	
Trichloroethylene	ug/g	0.55	0.03	2020-04-07	2020-04-08	<0.03	
Bromodichloromethane	ug/g	1.5	0.05	2020-04-07	2020-04-08	<0.05	
Methyl Isobutyl Ketone	ug/g	31	0.50	2020-04-07	2020-04-08	<0.50	
1,1,2-Trichloroethane	ug/g	0.05	0.04	2020-04-07	2020-04-08	<0.04	
Toluene	ug/g	6.4	0.05	2020-04-07	2020-04-08	<0.05	
Dibromochloromethane	ug/g	2.3	0.05	2020-04-07	2020-04-08	<0.05	
Ethylene Dibromide	ug/g	0.05	0.04	2020-04-07	2020-04-08	<0.04	
Tetrachloroethylene	ug/g	1.9	0.05	2020-04-07	2020-04-08	<0.05	
1,1,1,2-Tetrachloroethane	ug/g	0.087	0.04	2020-04-07	2020-04-08	<0.04	
Chlorobenzene	ug/g	2.4	0.05	2020-04-07	2020-04-08	<0.05	
Ethylbenzene	ug/g	1.1	0.05	2020-04-07	2020-04-08	<0.05	
m & p-Xylene	ug/g		0.05	2020-04-07	2020-04-08	<0.05	





AGAT WORK ORDER: 20T590525

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE: SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammad Safarpanah

O. Reg. 153(511) - VOCs (Soil)											
DATE RECEIVED: 2020-04-03							DATE REPORTED: 2020-11-13				
				SAMPL	E DESCRIPTION:	BH D17 SS2					
					SAMPLE TYPE:	Soil					
					DATE SAMPLED:	2020-04-01					
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1066582					
Bromoform	ug/g	0.61	0.05	2020-04-07	2020-04-08	< 0.05					
Styrene	ug/g	34	0.05	2020-04-07	2020-04-08	< 0.05					
1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05	2020-04-07	2020-04-08	< 0.05					
o-Xylene	ug/g		0.05	2020-04-07	2020-04-08	< 0.05					
1,3-Dichlorobenzene	ug/g	9.6	0.05	2020-04-07	2020-04-08	< 0.05					
1,4-Dichlorobenzene	ug/g	0.2	0.05	2020-04-07	2020-04-08	< 0.05					
1,2-Dichlorobenzene	ug/g	1.2	0.05	2020-04-07	2020-04-08	< 0.05					
Xylenes (Total)	ug/g	26	0.05	2020-04-07	2020-04-08	< 0.05					
1,3-Dichloropropene (Cis + Trans)	μg/g	0.059	0.04	2020-04-07	2020-04-08	< 0.04					
n-Hexane	μg/g	46	0.05	2020-04-07	2020-04-08	< 0.05					
Surrogate	Unit	Acceptab	le Limits								
Toluene-d8	% Recovery	50-1	140	2020-04-07	2020-04-08	102					
4-Bromofluorobenzene	% Recovery	50-1	140	2020-04-07	2020-04-08	84					

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil -

Industrial/Commercial/Community Property Use - Coarse Textured Soils

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.

The sample was analyzed 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.

Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene + o-Xylene.

1,3-Dichloropropene total is a calculated parameter. The calculated value is the sum of Cis-1,3-Dichloropropene and Trans-1,3-Dichloropropene.

Analysis performed at AGAT Toronto (unless marked by *)





AGAT WORK ORDER: 20T590525

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:SP47

ATTENTION TO: Alessandro Pellerito SAMPLED BY: Mohammad Safarpanah

O. Reg. 558 - Benzo(a) pyrene											
DATE RECEIVED: 2020-04-03							DATE REPORTED: 2020-11-13				
SAMPLE DESCRIPTION: Comp. TCLP C											
	SAMPLE TYPE: Soil										
					DATE SAMPLED:	2020-04-01					
Parameter	Unit	G/S	RDL	Date Prepared	Date Analyzed	1066587					
Benzo(a)pyrene	mg/L	0.001	0.001	2020-04-09	2020-04-14	<0.001					
Surrogate	Unit	Acceptab	le Limits								
Naphthalene-d8	%	50-1	140		2020-04-14	97					
Acenaphthene-d10	%	50-1	50-140		2020-04-14	117					
Chrysene-d12	%	50-1	140		2020-04-14	73					

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria

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.

1066587 The sample was leached according to Regulation 558 protocol. Analysis was performed on the leachate.

Analysis performed at AGAT Toronto (unless marked by *)





CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

Certificate of Analysis

AGAT WORK ORDER: 20T590525

PROJECT: TP115086

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

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammad Safarpanah

O. Reg. 558 - PCBs

DATE RECEIVED: 2020-04-03

SAMPLE DESCRIPTION: Comp. TCLP C
SAMPLE TYPE: Soil
DATE SAMPLED: 2020-04-01
Parameter Unit G/S RDL Date Prepared Date Analyzed 1066587

Polychlorinated Biphenyls	mg/L	0.3 0.005	2020-04-08	2020-04-09	< 0.005
PCB Extr	NA		2020-04-08		Υ
Surrogate	Unit	Acceptable Limits			
Decachlorobiphenyl	%	60-130	2020-04-08	2020-04-09	85

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria

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.

1066587 The soil sample was leached using the Regulation 558 procedure. Analysis was performed on the leachate.

PCB total is a calculated parameter. The calculated value is the sum of Aroclor 1242, Aroclor 1248, Aroclor 1254 and Aroclor 1260.

Analysis performed at AGAT Toronto (unless marked by *)

SAMPLING SITE: SP47





CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

Certificate of Analysis

AGAT WORK ORDER: 20T590525

PROJECT: TP115086

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

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammad Safarpanah

SAMPLING SITE:SP47

O. Reg. 558 - VOCs

DATE RECEIVED: 2020-04-03						DATE REPORTED: 2020-11-13
			SAMP	LE DESCRIPTION:	Comp. TCLP C	
				SAMPLE TYPE:	Soil	
				DATE SAMPLED:	2020-04-01	
Parameter	Unit	G/S RD	L Date Prepared	d Date Analyzed	1066587	
Vinyl Chloride	mg/L	0.2 0.03	30 2020-04-08	2020-04-09	<0.030	
1,1 Dichloroethene	mg/L	1.4 0.02	20 2020-04-08	2020-04-09	<0.020	
Dichloromethane	mg/L	5.0 0.03	30 2020-04-08	2020-04-09	< 0.030	
Methyl Ethyl Ketone	mg/L	200 0.09	2020-04-08	2020-04-09	< 0.090	
Chloroform	mg/L	10.0 0.02	20 2020-04-08	2020-04-09	<0.020	
1,2-Dichloroethane	mg/L	0.5 0.02	20 2020-04-08	2020-04-09	<0.020	
Carbon Tetrachloride	mg/L	0.5 0.02	2020-04-08	2020-04-09	<0.020	
Benzene	mg/L	0.5 0.02	20 2020-04-08	2020-04-09	<0.020	
Trichloroethene	mg/L	5.0 0.02	20 2020-04-08	2020-04-09	<0.020	
Tetrachloroethene	mg/L	3.0 0.08	50 2020-04-08	2020-04-09	< 0.050	
Chlorobenzene	mg/L	8.0 0.0	10 2020-04-08	2020-04-09	<0.010	
1,2-Dichlorobenzene	mg/L	20.0 0.0	10 2020-04-08	2020-04-09	<0.010	
1,4-Dichlorobenzene	mg/L	0.5 0.0	10 2020-04-08	2020-04-09	<0.010	
Surrogate	Unit	Acceptable Lim	its			

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria

2020-04-08

60-130

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.

120

2020-04-09

1066587 Sample was prepared using Regulation 558 protocol and a zero headspace extractor.

% Recovery

Analysis performed at AGAT Toronto (unless marked by *)

Toluene-d8





#### **Exceedance Summary**

AGAT WORK ORDER: 20T590525

PROJECT: TP115086

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

ATTENTION TO: Alessandro Pellerito

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
1066582	BH D17 SS2	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity (2:1)	mS/cm	1.4	1.68
1066582	BH D17 SS2	ON T2 S ICC CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Sodium Adsorption Ratio	NA	12	12.4



AGAT WORK ORDER: 20T590525

## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito SAMPLING SITE:SP47 SAMPLED BY:Mohammad Safarpanah

Soil Analysis															
RPT Date: Nov 13, 2020				UPLICATI	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value		ptable nits	Recovery		ptable nits	Recovery	Lin	ptable nits
		lu					value	Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inor	ganics (Soil)														
Antimony	1067008		2.8	4.6	NA	< 0.8	115%	70%	130%	102%	80%	120%	95%	70%	130%
Arsenic	1067008		4	4	NA	< 1	111%	70%	130%	104%	80%	120%	108%	70%	130%
Barium	1067008		147	177	18.8%	< 2	112%	70%	130%	97%	80%	120%	98%	70%	130%
Beryllium	1067008		< 0.5	< 0.5	NA	< 0.5	83%	70%	130%	114%	80%	120%	94%	70%	130%
Boron	1067008		10	10	NA	< 5	98%	70%	130%	101%	80%	120%	77%	70%	130%
Boron (Hot Water Extractable)	1067008		0.43	0.46	NA	< 0.10	101%	60%	140%	96%	70%	130%	97%	60%	140%
Cadmium	1067008		1.2	1.1	NA	< 0.5	109%	70%	130%	102%	80%	120%	97%	70%	130%
Chromium	1067008		21	22	NA	< 5	95%	70%	130%	96%	80%	120%	112%	70%	130%
Cobalt	1067008		5.4	5.5	1.2%	< 0.5	87%	70%	130%	96%	80%	120%	92%	70%	130%
Copper	1067008		24	24	2.0%	< 1	89%	70%	130%	100%	80%	120%	78%	70%	130%
Lead	1067008		45	49	9.5%	< 1	101%	70%	130%	94%	80%	120%	94%	70%	130%
Molybdenum	1067008		<0.5	0.5	NA	< 0.5	89%	70%	130%	92%	80%	120%	94%	70%	130%
Nickel	1067008		12	12	2.6%	< 1	92%	70%	130%	96%	80%	120%	90%	70%	130%
Selenium	1067008		<0.4	0.4	NA	< 0.4	123%	70%	130%	97%	80%	120%	97%	70%	130%
Silver	1067008		<0.2	<0.2	NA	< 0.2	102%	70%	130%	103%	80%	120%	89%	70%	130%
Thallium	1067008		<0.4	<0.4	NA	< 0.4	91%	70%	130%	100%	80%	120%	93%	70%	130%
Uranium	1067008		<0.5	< 0.5	NA	< 0.5	94%	70%	130%	103%	80%	120%	100%	70%	130%
Vanadium	1067008		23	23	1.1%	< 1	96%	70%	130%	95%	80%	120%	94%	70%	130%
Zinc	1067008		289	291	0.6%	< 5	101%	70%	130%	97%	80%	120%	105%	70%	130%
Chromium, Hexavalent	1064470		<0.2	<0.2	NA	< 0.2	92%	70%	130%	84%	80%	120%	74%	70%	130%
Cyanide, Free	1064433		<0.040	<0.040	NA	< 0.040	93%	70%	130%	113%	80%	120%	111%	70%	130%
Mercury	1067008		0.11	0.12	NA	< 0.10	110%	70%	130%	108%	80%	120%	103%	70%	130%
Electrical Conductivity (2:1)	1069840		0.228	0.219	4.2%	< 0.005	109%	80%	120%						
Sodium Adsorption Ratio	1069840		0.749	0.726	3.1%	NA									
pH, 2:1 CaCl2 Extraction	1068460		7.82	7.81	0.1%	NA	101%	80%	120%						

Comments: NA signifies Not Applicable.

Silver Leachate

Uranium Leachate

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

< 0.010

< 0.050

< 0.010

< 0.050

If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

1066150

1066150

#### O. Reg. 558 Metals and Inorganics Arsenic Leachate 1066150 < 0.010 < 0.010 NA < 0.010 101% 70% 130% 98% 80% 120% 102% 70% 130% Barium Leachate 1066150 0.104 < 0.100 NA < 0.100 97% 70% 130% 97% 80% 120% 98% 70% 130% **Boron Leachate** 1066150 0.063 0.056 NA < 0.050 95% 70% 130% 103% 80% 120% 99% 70% 130% 130% 1066150 < 0.010 <0.010 < 0.010 97% 70% 80% 120% 70% 130% Cadmium Leachate NA 91% 92% Chromium Leachate 1066150 < 0.010 < 0.010 NA < 0.010 101% 70% 130% 97% 80% 120% 110% 70% 130% Lead Leachate 1066150 < 0.010 < 0.010 NA < 0.010 96% 70% 130% 88% 80% 120% 82% 70% 130% Mercury Leachate 1066150 < 0.01 < 0.01 NA < 0.01100% 70% 130% 93% 80% 120% 96% 70% 130% Selenium Leachate 1066150 94% 70% 130% < 0.010 < 0.010 NA < 0.010 70% 130% 89% 80% 120% 96%

#### AGAT QUALITY ASSURANCE REPORT (V1)

Page 13 of 23

70% 130%

70% 130%

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. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.

NA

NA

< 0.010

< 0.050

70%

70%

130%

130%

92%

96%

80%

80%

120%

120%

89%

93%

93%

98%



#### **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T590525

PROJECT: TP115086

PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito SAMPLING SITE:SP47 SAMPLED BY:Mohammad Safarpanah

							7						F		
	Soil Analysis (Continued)														
RPT Date: Nov 13, 2020				UPLICAT	E		REFERE	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery	Lin	ptable nits	Recovery	Lin	ptable nits
		ld	'	'			Value	Lower	Upper	ĺ	Lower	Upper		Lower	Upper
Fluoride Leachate	1066150		0.05	0.05	NA	< 0.05	101%	90%	110%	106%	90%	110%	104%	70%	130%
Cyanide Leachate	1066150		< 0.05	< 0.05	NA	< 0.05	99%	70%	130%	110%	80%	120%	104%	70%	130%
(Nitrate + Nitrite) as N Leachate	1066150		< 0.70	< 0.70	NA	< 0.70	92%	80%	120%	95%	80%	120%	93%	70%	130%

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

CHARTERED OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF T



AGAT WORK ORDER: 20T590525

## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito SAMPLING SITE:SP47 SAMPLED BY:Mohammad Safarpanah

Trace Organics Analysis															
RPT Date: Nov 13, 2020	RPT Date: Nov 13, 2020 DUPLICATE								TERIAL	METHOD	BLANK	SPIKE	MATRIX S		KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured			Recovery		ptable	Recovery		ptable nits
TANAMETER	Buton	ld	Dup " 1	Bup #2	111 5		Value	Lower	Upper	110001019	Lower	Upper	ricocvery	Lower	Upper
O. Reg. 153(511) - VOCs (Soil)	•					•						•		•	
Dichlorodifluoromethane	1068718		< 0.05	< 0.05	NA	< 0.05	105%	50%	140%	95%	50%	140%	86%	50%	140%
Vinyl Chloride	1068718		< 0.02	< 0.02	NA	< 0.02	91%	50%	140%	97%	50%	140%	84%	50%	140%
Bromomethane	1068718		< 0.05	< 0.05	NA	< 0.05	101%	50%	140%	106%	50%	140%	98%	50%	140%
Trichlorofluoromethane	1068718		< 0.05	< 0.05	NA	< 0.05	104%	50%	140%	94%	50%	140%	107%	50%	140%
Acetone	1068718		< 0.50	< 0.50	NA	< 0.50	103%	50%	140%	104%	50%	140%	90%	50%	140%
1,1-Dichloroethylene	1068718		< 0.05	< 0.05	NA	< 0.05	83%	50%	140%	83%	60%	130%	91%	50%	140%
Methylene Chloride	1068718		< 0.05	< 0.05	NA	< 0.05	90%	50%	140%	105%	60%	130%	83%	50%	140%
Trans- 1,2-Dichloroethylene	1068718		< 0.05	< 0.05	NA	< 0.05	98%	50%	140%	99%	60%	130%	102%	50%	140%
Methyl tert-butyl Ether	1068718		< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	92%	60%	130%	98%	50%	140%
1,1-Dichloroethane	1068718		< 0.02	< 0.02	NA	< 0.02	98%	50%	140%	101%	60%	130%	83%	50%	140%
Methyl Ethyl Ketone	1068718		< 0.50	< 0.50	NA	< 0.50	104%	50%	140%	99%	50%	140%	112%	50%	140%
Cis- 1,2-Dichloroethylene	1068718		< 0.02	< 0.02	NA	< 0.02	90%	50%	140%	116%	60%	130%	108%	50%	140%
Chloroform	1068718		< 0.04	< 0.04	NA	< 0.04	102%	50%	140%	107%	60%	130%	82%	50%	140%
1,2-Dichloroethane	1068718		< 0.03	< 0.03	NA	< 0.03	103%	50%	140%	83%	60%	130%	110%	50%	140%
1,1,1-Trichloroethane	1068718		< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	89%	60%	130%	82%	50%	140%
Carbon Tetrachloride	1068718		< 0.05	< 0.05	NA	< 0.05	106%	50%	140%	112%	60%	130%	83%	50%	140%
Benzene	1068718		< 0.02	< 0.02	NA	< 0.02	83%	50%	140%	82%	60%	130%	102%	50%	140%
1,2-Dichloropropane	1068718		< 0.03	< 0.03	NA	< 0.03	90%	50%	140%	84%	60%	130%	83%	50%	140%
Trichloroethylene	1068718		< 0.03	< 0.03	NA	< 0.03	106%	50%	140%	82%	60%	130%	92%	50%	140%
Bromodichloromethane	1068718		< 0.05	< 0.05	NA	< 0.05	100%	50%	140%	95%	60%	130%	102%	50%	140%
Methyl Isobutyl Ketone	1068718		< 0.50	< 0.50	NA	< 0.50	110%	50%	140%	116%	50%	140%	87%	50%	140%
1,1,2-Trichloroethane	1068718		< 0.04	< 0.04	NA	< 0.04	112%	50%	140%	104%	60%	130%	110%	50%	140%
Toluene	1068718		< 0.05	< 0.05	NA	< 0.05	89%	50%	140%	80%	60%	130%	90%	50%	140%
Dibromochloromethane	1068718		< 0.05	< 0.05	NA	< 0.05	101%	50%	140%	89%	60%	130%	85%	50%	140%
Ethylene Dibromide	1068718		< 0.04	< 0.04	NA	< 0.04	104%		140%	104%		130%	103%	50%	140%
Tetrachloroethylene	1068718		< 0.05	< 0.05	NA	< 0.05	92%	50%	140%	83%	60%	130%	83%	50%	140%
1,1,1,2-Tetrachloroethane	1068718		< 0.04	< 0.04	NA	< 0.04	99%	50%	140%	88%	60%	130%	95%	50%	140%
Chlorobenzene	1068718		< 0.05	< 0.05	NA	< 0.05	98%	50%	140%	86%	60%	130%	94%	50%	140%
Ethylbenzene	1068718		< 0.05	< 0.05	NA	< 0.05	86%	50%	140%	73%	60%	130%	81%	50%	140%
m & p-Xylene	1068718		< 0.05	< 0.05	NA	< 0.05	88%		140%	104%	60%	130%	102%	50%	140%
Promoform	1060710		- 0.05	- 0.05	NΙΛ	- 0.05	1029/	E00/	1.400/	1009/	609/	1200/	1020/	E09/	1.400/
Bromoform Styrene	1068718 1068718		< 0.05 < 0.05	< 0.05 < 0.05	NA NA	< 0.05 < 0.05	102% 91%		140% 140%	109% 82%		130% 130%	103% 82%	50%	140% 140%
1,1,2,2-Tetrachloroethane	1068718		< 0.05	< 0.05	NA	< 0.05	102%		140%	109%		130%	106%		140%
o-Xylene	1068718		< 0.05	< 0.05	NA	< 0.05	94%	50%	140%	83%		130%	93%		140%
1,3-Dichlorobenzene	1068718		< 0.05	< 0.05	NA	< 0.05	95%	50%	140%	82%		130%	88%		140%
4.4 Diablambana	4000740		. 0. 05		N 1 A	. 0.05	070/	F00/		040/	000/	40007	000/	F00/	4.4007
1,4-Dichlorobenzene	1068718		< 0.05	< 0.05	NA NA	< 0.05	97%		140%	81%		130%	82%		140%
1,2-Dichloropropene (Cis + Trans)	1068718		< 0.05	< 0.05	NA NA	< 0.05	99%	50%	140%	84%	60%	130%	83%		140%
1,3-Dichloropropene (Cis + Trans) n-Hexane	1068718 1068718		< 0.04 < 0.05	< 0.04 < 0.05	NA NA	< 0.04 < 0.05	110% 106%	50%	140% 140%	93% 83%		130% 130%	94% 106%		140% 140%
II I IOAAIIC	1000710		< 0.00	< 0.03	INA	< 0.05	100%	JU 70	14070	0370	00%	130%	100%	JU 70	170 /0

AGAT QUALITY ASSURANCE REPORT (V1)

Page 15 of 23

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. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.

## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T590525 PROJECT: TP115086 ATTENTION TO: Alessandro Pellerito SAMPLING SITE:SP47 SAMPLED BY: Mohammad Safarpanah

	-	Ггасе	Org	anics	Ana	alysis	(Co	ntin	ued	l)					
RPT Date: Nov 13, 2020			Г	UPLICAT	E		REFERE	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MATRIX SPI		IKE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery	Acceptable Limits		Recovery	Liv	eptable mits
		ld	·				Value	Lower	Upper	,	Lower	Upper		Lower	Uppe
O. Reg. 153(511) - PHCs F1 - F4 (	(-BTEX) (Sc	oil)													
F1 (C6 to C10)	1066669	,	< 5	< 5	NA	< 5	97%	60%	140%	98%	60%	140%	98%	60%	140%
F2 (C10 to C16)	1066189		< 10	< 10	NA	< 10	113%	60%	140%	89%	60%	140%	85%	60%	140%
F3 (C16 to C34)	1066189		< 50	< 50	NA	< 50	109%	60%	140%	86%	60%	140%	98%	60%	140%
F4 (C34 to C50)	1066189		< 50	< 50	NA	< 50	96%	60%	140%	89%	60%	140%	111%	60%	140%
O. Reg. 153(511) - OC Pesticides	(Soil)														
Hexachloroethane	1065709		< 0.01	< 0.01	NA	< 0.01	95%	50%	140%	103%	50%	140%	103%	50%	140%
Gamma-Hexachlorocyclohexane	1065709		< 0.005	< 0.005	NA	< 0.005	93%	50%	140%	108%	50%	140%	90%	50%	140%
Heptachlor	1065709		< 0.005	< 0.005	NA	< 0.005	102%	50%	140%	93%	50%	140%	99%	50%	140%
Aldrin	1065709		< 0.005	< 0.005	NA	< 0.005	106%	50%	140%	100%	50%	140%	97%	50%	140%
Heptachlor Epoxide	1065709		< 0.005	< 0.005	NA	< 0.005	90%	50%	140%	104%	50%	140%	108%	50%	140%
Endosulfan	1065709		< 0.005	< 0.005	NA	< 0.005	101%	50%	140%	106%	50%	140%	103%	50%	140%
Chlordane	1065709		< 0.007	< 0.007	NA	< 0.007	99%	50%	140%	107%	50%	140%	106%	50%	140%
DDE	1065709		< 0.007	< 0.007	NA	< 0.007	98%	50%	140%	104%	50%	140%	108%	50%	140%
DDD	1065709		< 0.007	< 0.007	NA	< 0.007	101%	50%	140%	105%	50%	140%	105%	50%	140%
DDT	1065709		< 0.007	< 0.007	NA	< 0.007	106%	50%	140%	104%	50%	140%	90%	50%	140%
Dieldrin	1065709		< 0.005	< 0.005	NA	< 0.005	104%	50%	140%	106%	50%	140%	106%	50%	140%
Endrin	1065709		< 0.005	< 0.005	NA	< 0.005	104%	50%	140%	100%	50%	140%	100%	50%	140%
Methoxychlor	1065709		< 0.005	< 0.005	NA	< 0.005	103%	50%	140%	99%	50%	140%	104%	50%	140%
Hexachlorobenzene	1065709		< 0.005	< 0.005	NA	< 0.005	108%	50%	140%	106%	50%	140%	104%	50%	140%
Hexachlorobutadiene	1065709		< 0.01	< 0.01	NA	< 0.01	100%	50%	140%	108%	50%	140%	107%	50%	140%
O. Reg. 558 - VOCs															
Vinyl Chloride	1062440		< 0.030	< 0.030	NA	< 0.030	91%	60%	140%	97%	60%	140%	84%	60%	
1,1 Dichloroethene	1062440		< 0.020	< 0.020	NA	< 0.020	83%	70%	130%	83%	70%	130%	91%	60%	140%
Dichloromethane	1062440		< 0.030	< 0.030	NA	< 0.030	99%	70%	130%	85%	70%	130%	96%	60%	140%
Methyl Ethyl Ketone	1062440		< 0.090	< 0.090	NA	< 0.090	104%	70%	130%	99%	70%	130%	112%	60%	140%
Chloroform	1062440		< 0.020	< 0.020	NA	< 0.020	105%	70%	130%	110%	70%	130%	99%	60%	140%
1,2-Dichloroethane	1062440		< 0.020	< 0.020	NA	< 0.020	95%	70%	130%	109%	70%	130%	98%	60%	140%
Carbon Tetrachloride	1062440		< 0.020	< 0.020	NA	< 0.020	98%	70%	130%	102%	70%	130%	92%	60%	140%
Benzene	1062440		< 0.020	< 0.020	NA	< 0.020	83%	70%	130%	82%	70%	130%	102%	60%	140%
Trichloroethene	1062440		< 0.020	< 0.020	NA	< 0.020	112%	70%	130%	102%	70%	130%	105%	60%	140%
Tetrachloroethene	1062440		< 0.050	< 0.050	NA	< 0.050	92%	70%	130%	83%	70%	130%	83%	60%	140%
Chlorobenzene	1062440		< 0.010	< 0.010	NA	< 0.010	98%	70%	130%	86%	70%	130%	94%	60%	140%
1,2-Dichlorobenzene	1062440		< 0.010	< 0.010	NA	< 0.010	99%	70%	130%	84%	70%	130%	83%	60%	140%
1,4-Dichlorobenzene	1062440		< 0.010	< 0.010	NA	< 0.010	97%	70%	130%	81%	70%	130%	82%	60%	140%
O. Reg. 558 - Benzo(a) pyrene															
Benzo(a)pyrene	1066225		< 0.001	< 0.001	NA	< 0.001	115%	70%	130%	100%	70%	130%	NA	70%	130%

O. Reg. 558 - PCBs

**AGAT** QUALITY ASSURANCE REPORT (V1)

Page 16 of 23



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086

SAMPLING SITE:SP47

AGAT WORK ORDER: 20T590525

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:Mohammad Safarpanah

Trace Organics Analysis (Continued)															
RPT Date: Nov 13, 2020				DUPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLAN	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery	Lir	ptable nits	Recovery	Lin	ptable nits
		ld					Value	Lower	Upper	,	Lower	Upper	,	Lower	Upper
Polychlorinated Biphenyls	1066136		< 0.005	< 0.005	NA	< 0.005	99%	60%	130%	96%	60%	130%	104%	60%	130%

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).



## **Method Summary**

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis		1	
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron (Hot Water Extractable)	MET-93-6104	modified from EPA 6010D and MSA PART 3, CH 21	ICP/OES
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Zinc	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium, Hexavalent	INOR-93-6068	modified from EPA 3060 and EPA 7196	SPECTROPHOTOMETER
Cyanide, Free	INOR-93-6052	modified from ON MOECC E3015 and SM 4500-CN- I	TECHNICON AUTO ANALYZER
Mercury	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Electrical Conductivity (2:1)	INOR-93-6036	modified from MSA PART 3, CH 14 and 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	modified from EPA 9045D and MCKEAGUE 3.11	PH METER
Arsenic Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Barium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Boron Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Cadmium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Chromium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS



## **Method Summary**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 20T590525

PROJECT: TP115086

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:Mohammad Safarpanah

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Lead Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Mercury Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Selenium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Silver Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Uranium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Fluoride Leachate	INOR-93-6018	EPA 1311 & modified from SM4500-F-C	ION SELECTIVE ELECTRODE
Cyanide Leachate	INOR-93-6052	EPA 1311 & modified from MOE 3015 & SM 4500 CN-I	TECHNICON AUTO ANALYZER
(Nitrate + Nitrite) as N Leachate	INOR-93-6053	EPA 1311 & modified from SM 4500-NO3-I	LACHAT FIA

## Method Summary

Trace Organics Analysis	OANI EINO OTTE.OT 47			
Hexachloroethane	PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Gamma-Hexachlorocyclohexane	Trace Organics Analysis			
Heptachlor	Hexachloroethane	ORG-91-5113	α 000 I	
Addrin ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD 8 8081  Heptachlor Epoxide ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD 8 8081  Endosulfan ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD 8 8081  DDE ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD 8 8081  DDD ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD 8 8081  DDD ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD 8 8081  DDD ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD 8 8081  DDT ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD 8 8081  Endrin ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD 8 8081  Endrin ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD 8 8081  Endrin ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD 8 8081  Endrin ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD 8 8081  Endrin ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD 8 8081  Endrin ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD 8 8081  Endrin ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846 3541,3620 GC/ECD 8 8081  ENDRING META SW-846	Gamma-Hexachlorocyclohexane	ORG-91-5113	& 0U0 I	
Heptachlor Epoxide	Heptachlor	ORG-91-5113	& 8081	
Endosulfan	Aldrin	ORG-91-5113	& 0U0 I	
Chlordane	Heptachlor Epoxide	ORG-91-5113	& 8081	
DDE ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD & 8081  DDD ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD & 8081  DDT ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD & 8081  DDT ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD & 8081  Endrin ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD & 8081  Endrin ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD & 8081  Endrin ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD & 8081  Methoxychlor ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD & 8081  Hexachlorobenzene ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD & 8081  TCMX ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD & 8081  TCMX ORG-91-5112 modified from EPA SW-846 3541,3620 GC/ECD & 8081  Decachlorobiphenyl ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD & 8081  Moisture Content MOE 3139 BALANCE modified from EPA SW-846 3541,3620 GC/ECD & 8081  MOE E3139 BALANCE PAT GC/FID SW-846 3541,3620 GC/ECD modified from CCME Tier 1 Method, SW-846 5035 modified from CCME Tier 1 Method, SW-846 5035 modified from CCME Tier 1 Method, SW-846 5035 modified from CCME Tier 1 Method, SW-846 5035 modified from CCME Tier 1 Method, SC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/FID GC/	Endosulfan	ORG-91-5113	& 0U0 I	
DDD ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD & 8 8081  DT ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD & 8 8081  Endrin ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD & 8 8081  Endrin ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD & 8 8081  Methoxychlor ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD & 8 8081  Methoxychlor ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD & 8 8081  Hexachlorobenzene ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD & 8 8081  TCMX ORG-91-5112 modified from EPA SW-846 3541,3620 GC/ECD & 8 8081  TCMX ORG-91-5112 modified from EPA SW-846 3541,3620 GC/ECD & 8 8081  Moisture Content modified from EPA SW-846 3541,3620 GC/ECD & 8 8081  MOE E3139 modified from EPA SW-846 3541,3620 GC/ECD & 8 8081  MOE E3139 modified from CCME Tier 1 Method, SW-846 5035 modified from CCME Tier 1 Method, SW-846 5035 modified from CCME Tier 1 Method, SW-846 5035 modified from CCME Tier 1 Method, SW-846 5035 modified from CCME Tier 1 Method, GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Method GC/FID modified from CCME Tier 1 Met	Chlordane	ORG-91-5113	& 0U0 I	
DDT ORG-91-5113 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from EPA SW-846 3541,3620 GC/ECD 88081 modified from CCME Tier 1 Method 9808 SW846 5035 modified from CCME Tier 1 Method 9808 SW846 5035 modified from CCME Tier 1 Method 9808 SW846 5035 modified from CCME Tier 1 Method 9808 SW846 5035 modified from CCME Tier 1 Method 9808 SW846 5035 modified from CCME Tier 1 Method 9808 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 SW846 S	DDE	ORG-91-5113	& 8081	
Dieldrin ORG-91-5113	DDD	ORG-91-5113	& 8081	
Endrin	DDT	ORG-91-5113	& 8081	
Methoxychlor         ORG-91-5113         modified from EPA SW-846 3541,3620 gC/ECD         GC/ECD           Hexachlorobenzene         ORG-91-5113         modified from EPA SW-846 3541,3620 gC/ECD         GC/ECD           Hexachlorobutadiene         ORG-91-5113         modified from EPA SW-846 3541,3620 gC/ECD         GC/ECD           TCMX         ORG-91-5112         modified from EPA SW-846 3541,3620 gC/ECD         GC/ECD           Decachlorobiphenyl         ORG-91-5113         modified from EPA SW-846 3541,3620 gC/ECD         GC/ECD           Moisture Content         MOE E3139         BALANCE           F1 (C6 to C10)         VOL-91-5009         modified from CCME Tier 1 Method, SW846 5035         P&T GC/FID           F1 (C6 to C10) minus BTEX         VOL-91-5009         modified from CCME Tier 1 Method, SW846 5035         P&T GC/FID           F2 (C10 to C16)         VOL-91-5009         modified from CCME Tier 1 Method, GC/FID         F           F3 (C16 to C34)         VOL-91-5009         modified from CCME Tier 1 Method, GC/FID         G           F4 (C34 to C50)         VOL-91-5009         modified from CCME Tier 1 Method, GC/FID         G           Gravimetric Heavy Hydrocarbons         VOL-91-5009         modified from CCME Tier 1 Method, GC/FID         G           Moisture Content         VOL-91-5009         modified from CCME Tier 1 Method, GC/FID </td <td>Dieldrin</td> <td>ORG-91-5113</td> <td>&amp; 0U0 I</td> <td></td>	Dieldrin	ORG-91-5113	& 0U0 I	
Hexachlorobenzene   ORG-91-5113   modified from EPA SW-846 3541,3620   GC/ECD	Endrin	ORG-91-5113	& 0U0 I	
Hexachlorobutadiene	Methoxychlor	ORG-91-5113	& 8081	
TCMX  ORG-91-5112  Decachlorobiphenyl  Moisture Content  F1 (C6 to C10)  F1 (C6 to C10)  F2 (C10 to C16)  F3 (C16 to C34)  F4 (C34 to C50)  Gravimetric Heavy Hydrocarbons  MOL-91-5009  Moisture Content  VOL-91-5009  F2 (C10 to C16)  F3 (C16 to C34)  F4 (C34 to C50)  Gravimetric Heavy Hydrocarbons  MOL-91-5009  Moisture Content  VOL-91-5009  Moified from CME Tier 1 Method, SW846 5035  Modified from CME Tier 1 Method, SW846 5035  Modified from CME Tier 1 Method, P&T GC/FID  Modified from CME Tier 1 Method GC/FID  Modified from CME Tier 1 Method GC/FID  Modified from CME Tier 1 Method GC/FID  Modified from CME Tier 1 Method GC/FID  Modified from CME Tier 1 Method GC/FID  Modified from CME Tier 1 Method GC/FID  Modified from CME Tier 1 Method GC/FID  Modified from CME Tier 1 Method GC/FID  Modified from CME Tier 1 Method BALANCE  Moisture Content  MOE E3139  MOE E3139  MOE E3139  MOE GT IN Method, P&T GC/FID  Modified from CME Tier 1 Method GC/FID  Modified from CME Tier 1 Method GC/FID  Modified from CME Tier 1 Method BALANCE  Moisture Content  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  Modified from CME Tier 1 Method, P&T GC/FID  Modified from CME Tier 1 Method GC/FID  Modified from CME Tier 1 Method BALANCE  Modified from CME Tier 1 Method GC/FID  Modified from CME Tier 1 Method GC/FID  Modified from CME Tier 1 Method GC/FID  Modified from CME Tier 1 Method GC/FID  Modified from EPA 5035C and EPA  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE E3139  MOE AS MOE MOE MEDA SOLOTA  MOE AS MOE MOE MEDA SOLOTA  MOE SOLOTA  MOE SOLOTA  MOE SOLOTA  MOE SOLOTA  MOE	Hexachlorobenzene	ORG-91-5113	& 0U0 I	
Decachlorobiphenyl  Decachlorobiphenyl  Decachlorobiphenyl  Moisture Content  F1 (C6 to C10)  VOL-91-5009  F1 (C6 to C10)  F1 (C6 to C10)  F2 (C10 to C16)  F3 (C16 to C34)  F4 (C34 to C50)  Gravimetric Heavy Hydrocarbons  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5009  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5002  MOL-91-5003  MOL-91-5004  MOL-91-5004  MOL-91-5005  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-91-5006  MOL-	Hexachlorobutadiene	ORG-91-5113	& 0U0 I	
Moisture Content F1 (C6 to C10) VOL-91-5009 MOE E3139 MOE E3139 BALANCE F3 (C6 to C10) MOE E3139 F4 (C6 to C10) minus BTEX VOL-91-5009 F5 (C10 to C16) F6 (C34) F7 (C34 to C50) F7 (C34 to C50) Moisture Content MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE E3139 MOE METHAN MOE E3139 MOE MOE TIER 1 Method MOE CAFE THE 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method BALANCE MOE TIER 1 Method	тсмх	ORG-91-5112	& 0U0 I	
F1 (C6 to C10)  VOL-91-5009  Modified from CCME Tier 1 Method, SW846 5035  F1 (C6 to C10) minus BTEX  VOL-91-5009  F2 (C10 to C16)  F3 (C16 to C34)  F4 (C34 to C50)  Gravimetric Heavy Hydrocarbons  Moisture Content  Terphenyl  VOL-91-5009  VOL-91-5009  VOL-91-5009  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  Modified from CCME Tier 1 Method  Modified from CCME Tier 1 Method  Modified from CCME Tier 1 Method  Modified from CCME Tier 1 Method  Modified from CCME Tier 1 Method  Modified from CCME Tier 1 Method  Modified from CCME Tier 1 Method  Modified from CCME Tier 1 Method  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA	Decachlorobiphenyl	ORG-91-5113	modified from EPA SW-846 3541,3620 & 8081	GC/ECD
F1 (C6 to C10) minus BTEX  VOL-91-5009  F2 (C10 to C16)  F3 (C16 to C34)  F4 (C34 to C50)  Gravimetric Heavy Hydrocarbons  WOL-91-5009  WOL-91-5009  WOL-91-5009  Modified from CCME Tier 1 Method  GC/FID  Gravimetric Heavy Hydrocarbons  WOL-91-5009  Modified from CCME Tier 1 Method  GC/FID  Gravimetric Heavy Hydrocarbons  WOL-91-5009  Modified from CCME Tier 1 Method  GC/FID  Gravimetric Heavy Hydrocarbons  WOL-91-5009  Modified from CCME Tier 1 Method  BALANCE  Modified from CCME Tier 1 Method  BALANCE  Modified from CCME Tier 1 Method  BALANCE  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified	Moisture Content		MOE E3139	BALANCE
SW846 5035 F2 (C10 to C16) F3 (C16 to C34) F4 (C34 to C50) VOL-91-5009 VOL-91-5009 Modified from CCME Tier 1 Method GC/FID F4 (C34 to C50) VOL-91-5009 Modified from CCME Tier 1 Method GC/FID F4 (C34 to C50) Gravimetric Heavy Hydrocarbons VOL-91-5009 Moisture Content VOL-91-5009 Moisture Content VOL-91-5009 Modified from CCME Tier 1 Method BALANCE Terphenyl VOL-91-5009 Modified from CCME Tier 1 Method GC/FID Modified from CCME Tier 1 Method GC/FID Modified from CCME Tier 1 Method GC/FID Modified from CME Tier 1 Method GC/FID Modified from CME Tier 1 Method GC/FID Modified from EPA 5035C and EPA WOL-91-5002 Modified from EPA 5035C and EPA WOL-91-5002 Modified from EPA 5035C and EPA WOL-91-5002 Modified from EPA 5035C and EPA WOL-91-5002 Modified from EPA 5035C and EPA WOL-91-5002 Modified from EPA 5035C and EPA WOL-91-5002 Modified from EPA 5035C and EPA WOL-91-5002 Modified from EPA 5035C and EPA WOL-91-5002 Modified from EPA 5035C and EPA WOL-91-5002 Modified from EPA 5035C and EPA WOL-91-5002 Modified from EPA 5035C and EPA WOL-91-5002 Modified from EPA 5035C and EPA WOL-91-5002 Modified from EPA 5035C and EPA WOL-91-5002 Modified from EPA 5035C and EPA WOL-91-5002 Modified from EPA 5035C and EPA WOL-91-5002 Modified from EPA 5035C and EPA WOL-91-5002 Modified from EPA 5035C and EPA WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91-5002 MODIFIED WOL-91	F1 (C6 to C10)	VOL-91-5009	·	P&T GC/FID
F3 (C16 to C34)  F4 (C34 to C50)  F4 (C34 to C50)  Gravimetric Heavy Hydrocarbons  VOL-91-5009  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  Modified from CCME Tier 1 Method  Modified from CCME Tier 1 Method  Modified from CCME Tier 1 Method  Modified from CCME Tier 1 Method  Modified from CCME Tier 1 Method  Modified from CCME Tier 1 Method  Modified from CCME Tier 1 Method  Modified from CCME Tier 1 Method  Modified from CCME Tier 1 Method  Modified from CCME Tier 1 Method  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modifie	F1 (C6 to C10) minus BTEX	VOL-91-5009		P&T GC/FID
F4 (C34 to C50)  Gravimetric Heavy Hydrocarbons  VOL-91-5009  Moisture Content  Terphenyl  Dichlorodifluoromethane  VOL-91-5002  Wol-91-5002  Modified from CCME Tier 1 Method  BALANCE  Modified from CCME Tier 1 Method  BALANCE  Modified from CCME Tier 1 Method  BALANCE  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  GC/FID  Modified from CCME Tier 1 Method  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA  Modified from EPA 5035C and EPA	F2 (C10 to C16)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
Gravimetric Heavy Hydrocarbons VOL-91-5009 modified from CCME Tier 1 Method BALANCE Moisture Content VOL-91-5009 modified from CCME Tier 1 Method BALANCE Terphenyl VOL-91-5009 modified from CCME Tier 1 Method GC/FID Dichlorodifluoromethane VOL-91-5002 modified from EPA 5035C and EPA 8260D Vinyl Chloride VOL-91-5002 modified from EPA 5035C and EPA 8260D Bromomethane VOL-91-5002 modified from EPA 5035C and EPA 8260D modified from EPA 5035C and EPA 8260D modified from EPA 5035C and EPA 8260D modified from EPA 5035C and EPA 8260D modified from EPA 5035C and EPA 8260D	F3 (C16 to C34)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
Moisture Content  VOL-91-5009  modified from CCME Tier 1 Method  GC/FID  modified from EPA 5035C and EPA 8260D  Wol-91-5002  Bromomethane  VOL-91-5002  Modified from EPA 5035C and EPA 8260D  modified from EPA 5035C and EPA 8260D  modified from EPA 5035C and EPA 8260D  modified from EPA 5035C and EPA 8260D  modified from EPA 5035C and EPA 8260D  modified from EPA 5035C and EPA 8260D  modified from EPA 5035C and EPA 8260D  modified from EPA 5035C and EPA 8260D  modified from EPA 5035C and EPA 8260D  modified from EPA 5035C and EPA 8260D	F4 (C34 to C50)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
Terphenyl VOL-91-5009 modified from CCME Tier 1 Method GC/FID  Dichlorodifluoromethane VOL-91-5002 modified from EPA 5035C and EPA 8260D (P&T)GC/MS  Vinyl Chloride VOL-91-5002 modified from EPA 5035C and EPA 8260D (P&T)GC/MS  Bromomethane VOL-91-5002 modified from EPA 5035C and EPA 8260D modified from EPA 5035C and EPA 8260D modified from EPA 5035C and EPA 8260D	Gravimetric Heavy Hydrocarbons	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE
Dichlorodifluoromethane  VOL-91-5002  modified from EPA 5035C and EPA 8260D  Vinyl Chloride  VOL-91-5002  modified from EPA 5035C and EPA 8260D  modified from EPA 5035C and EPA 8260D  modified from EPA 5035C and EPA 8260D  modified from EPA 5035C and EPA 8260D  modified from EPA 5035C and EPA 8260D  modified from EPA 5035C and EPA 8260D	Moisture Content	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE
Vinyl Chloride         VOL-91-5002         8260D         (P&T)GC/MS           Vinyl Chloride         VOL-91-5002         modified from EPA 5035C and EPA 8260D         (P&T)GC/MS           Bromomethane         VOL-91-5002         modified from EPA 5035C and EPA 8260D         (P&T)GC/MS	Terphenyl	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
Bromomethane  VOL-91-5002  8260D  modified from EPA 5035C and EPA 8260D  (P&T)GC/MS  (P&T)GC/MS	Dichlorodifluoromethane	VOL-91-5002		(P&T)GC/MS
Bromometnane VOL-91-5002 8260D (P&T)GC/MS	Vinyl Chloride	VOL-91-5002		(P&T)GC/MS
modified from EPA 5035C and EPA	Bromomethane	VOL-91-5002		(P&T)GC/MS
Trichlorofluoromethane VOL-91-5002 8260D (P&T)GC/MS	Trichlorofluoromethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS

#### **Method Summary**

OAWI LING OITE.OI 47		O/ (IVII EED D1:IVI	onaminad Gararpanan
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Acetone	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Methylene Chloride	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Trans- 1,2-Dichloroethylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Methyl tert-butyl Ether	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Cis- 1,2-Dichloroethylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Chloroform	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Benzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Trichloroethylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Bromodichloromethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Toluene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Dibromochloromethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Chlorobenzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Ethylbenzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
m & p-Xylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Bromoform	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Styrene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS

# Method Summary

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
1,1,2,2-Tetrachloroethane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
o-Xylene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Xylenes (Total)	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
1,3-Dichloropropene (Cis + Trans)	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
n-Hexane	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Toluene-d8	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5002	modified from EPA 5035C and EPA 8260D	(P&T)GC/MS
Benzo(a)pyrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Naphthalene-d8	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Acenaphthene-d10	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Chrysene-d12	ORG-91-5105	modified from EPA 3541 and EPA 8270E	GC/MS
Polychlorinated Biphenyls	ORG-91-5112	Regulation 558, EPA SW846 3510C/8082	GC/ECD
Decachlorobiphenyl	ORG-91-5112	EPA SW846 3510C/8082	GC/ECD
PCB Extr	ORG-91-5112	EPA SW846 3510C/8082	N/A
Vinyl Chloride	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
1,1 Dichloroethene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Dichloromethane	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Chloroform	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Benzene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Trichloroethene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Tetrachloroethene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Chlorobenzene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Toluene-d8	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS





5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2 Ph: 905 712 5100 Fax 905 712 5122 webenith agallabs com

O. Reg 153

53 Metals (excl. Hydrides)

Laboratory Use Only								
Work Order #: 20	DT590	1525						
Cooler Quantity:								
Arrival Temperatures:	4.9	5.11	5.0					
Custody Seal Intact: Notes:	□Yes	□No	□N/A					

#### **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: Wood Company: Alessandro Pellerito Contact: 50 Vogell Road Units 3 and 4 Address: Richmond Hill, ON 6479826220 Phone: Reports to be sent to:

2. Email:	shami.malla@woodplc.com
Project Info	rmation:
Project:	TP115086
Site Location:	SP47
Sampled By:	Mohammad Safarpanah
AGAT Quote #:	305848 PO:
	Please note: If quotation number is not provided, client will be billed full price for analysis

a.pellerito@woodplc.com

1. Email:

Invoice Inf	ormation:	Bill To Same:	Yes 🗹	No 🗆
Company:				
Contact:	Shami Malla			
Address:				
Email:	GTA EAST@woodplc.com			

Regulatory Requirements of the Regulatory Requirements (Please check all applicable boxes)		Regulatory Requirement
Regulation 153/04	Sewer Use	Regulation 558
Table <u>L</u> Indicate One ☑Ind/Com	□Sanitary	ССМЕ
□Res/Park □Agriculture	□Storm	Prov. Water Quality Objectives (PWOO)
Soil Texture (Check One)  Coarse	Region	Other
Fine	MISA	Indicate One
Is this suhmission	on for a	Penort Guideline on

	mission for a ite Condition?	Report Guideline on Certificate of Analysis						
☐ Yes	☑ No	☐ Yes	□ No					

iltered - Metals, Hg, CrVI

Arrival Temperatures:	11.0	3./	7.1
Custody Seal Intact: Notes:	□Yes	□No	□N/A
Turnaround Time	(TAT) Red	quired:	
Regular TAT	√ 5 to 7 B	usiness Days	
Rush TAT (Rush Surcharge	es Apply)		
3 Business Days	2 Busine		ext Business ay
<b>OR</b> Date Requir	red (Rush Surc	harges May Ap	pply):
Please provi		ation for rush and statutory f	
		ontact your AG	

□ B(a)P

Company: Contact: Address: Email:	Shami Malla GTA EAST@wood		Bill 10 Saille.	ies 🖭 No		P Paint S Soil SD Sediment SW Surface Water	Field Filtered - Metals,	and Inorganics	als   153 Metals (excl. Hydi e Metals   153 Metals (Incl.	: B+ws Cor Cor Cec Coc Chg	Full Metals Scan	om Met	Nutrients: ☐ TP ☐ NH, ☐ TKN ☐ NO, ☐ NO, ☐ NO, +NO,	S: B VOC DBTEX DTH	1-F4				chlorine Pesticides	IM&I INVOCS □ ABNS IN IN	250			
Sam	ple Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix		Y/N	Metals	☐ All Metals ☐ Hydride Mo	ORPs:	Full Me	Regular	Nutrlen No	Volatiles:	PHCs F	ABNs	PAHs	PCBs:	Organo	Sewer	מפוגרו			
BH D18 SS3		1 Apr 2020	10:00	4	S										6.1									
BH D17 SS2		1 Apr 2020	10:20	4	S			V						<b>V</b>	Ø				V					
BH D17 SS4		1 Apr 2020	10:35	4	S	HOLD																		
BH C18 SS2		1 Apr 2020	11:00	4	S	HOLD			1-5-				-											
BH C20 SS2		1 Apr 2020	11:30	4	S	HOLD													1					
BH C24 SS2		1 Apr 2020	12:30	4	S			V																
Comp. TCLP C		1 Apr 2020		4	S													1	E	7	T	$\Box$		
																	_		1					_
												1												
																	1		1				1	
Dampios Halms, whed by	Plint Name and Sign)		Debs	1700	4	Mains are Tryping of Dy (Plys Name and Digo)			,	1		Date			10	1		1	1		1		1	ľ

Samples Received By (Print Name and Sign)

Sample Matrix Legend

Ground Water

Biota

GW

1 Apr 2020

Alessandro Pellerito

□втех □тнм

rP □ NH, □ TKN □ NO, +NO,

Page

Nº:



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4
RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Alessandro Pellerito

PROJECT: TP115086.1.6000.5800.573000

AGAT WORK ORDER: 22T858487

SOIL ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

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

DATE REPORTED: Feb 07, 2022

PAGES (INCLUDING COVER): 25 VERSION*: 1

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

<u>*Notes</u>

#### Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
  incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other
  third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
  services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
  merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
  contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Page 1 of 25

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. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE: SP47/Boreholes B

Certificate of Analysis

AGAT WORK ORDER: 22T858487

PROJECT: TP115086.1.6000.5800.573000

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

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Ramin Zanganeh

Corrosivity	Package
-------------	---------

DATE RECEIVED: 2022-01-28	}			
	SA	AMPLE DESC	RIPTION:	BH B24 SS1
		SAMP	LE TYPE:	Soil
		DATE S	AMPLED:	2022-01-26 10:40
Parameter	Unit	G/S	RDL	3464485
Chloride (2:1)	μg/g		2	54
Sulphate (2:1)	μg/g		2	68
oH (2:1)	pH Units		NA	8.15
Electrical Conductivity (2:1)	mS/cm		0.005	0.335
Registivity (2:1) (Calculated)	ohm cm		1	2000

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

EC, pH, Chloride and Sulphate were determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water: 1 part soil). Resistivity is a calculated parameter.

Redox potential measured on as received sample. Due to the potential for rapid change in sample equilibrium chemistry with exposure to oxidative/reduction conditions laboratory results may differ from

field measured results.

Redox potential measurement in soil is quite variable and non reproducible due in part, to the general heterogeneity of a given soil. It is also related to the introduction of increased oxygen into the sample after extraction. The interpretation of soil redox potential should be considered in terms of its general range rather than as an absolute measurement.

Analysis performed at AGAT Toronto (unless marked by *)

3464485

CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF CHEMIST OF



AGAT WORK ORDER: 22T858487

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE:SP47/Boreholes B

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Ramin Zanganeh

O/ (WII EII VO OI I E.OI + I/DOI O	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			O/tim EED D1tainin Zanganen
		0	. Reg. 153(511)	- Metals & Inorganics (Soil)
DATE RECEIVED: 2022-01-28				DATE REPORTED: 2022-02-07
	SA	AMPLE DESCRIPTION:	BH B23 SS1	
		SAMPLE TYPE:	Soil	
		DATE SAMPLED:	2022-01-26 09:10	
Parameter	Unit	G/S RDL	3464483	
Antimony	μg/g	0.8	<0.8	
Arsenic	μg/g	1	3	
Barium	μg/g	2.0	72.3	
Beryllium	μg/g	0.4	0.5	
Boron	μg/g	5	7	
Boron (Hot Water Soluble)	μg/g	0.10	0.44	
Cadmium	μg/g	0.5	<0.5	
Chromium	μg/g	5	22	
Cobalt	μg/g	0.5	9.0	
Copper	μg/g	1.0	19.8	
Lead	μg/g	1	12	
Molybdenum	μg/g	0.5	<0.5	
Nickel	μg/g	1	17	
Selenium	μg/g	0.8	<0.8	
Silver	μg/g	0.5	<0.5	
Thallium	μg/g	0.5	<0.5	
Uranium	μg/g	0.50	0.52	
Vanadium	μg/g	0.4	32.6	
Zinc	μg/g	5	56	
Chromium, Hexavalent	μg/g	0.2	<0.2	
Cyanide, Free	μg/g	0.040	<0.040	
Mercury	μg/g	0.10	<0.10	
Electrical Conductivity (2:1)	mS/cm	0.005	0.359	
Sodium Adsorption Ratio (2:1) (Calc.)	N/A	N/A	0.644	
pH, 2:1 CaCl2 Extraction	pH Units	NA	7.23	





AGAT WORK ORDER: 22T858487

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:SP47/Boreholes B

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Ramin Zanganeh

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

DATE RECEIVED: 2022-01-28 DATE REPORTED: 2022-02-07

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

3464483 EC was 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. SAR is a calculated

parameter.

Analysis performed at AGAT Toronto (unless marked by *)

CHARTERED S NYME BASILY O CHEMIST OF



AGAT WORK ORDER: 22T858487

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE: SP47/Boreholes B

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Ramin Zanganeh

O. Reg. 558 Metals and Inorganics							
DATE RECEIVED: 2022-01-28					DATE REPORTED: 2022-02-07		
		SAMPLE DESC	CRIPTION:	BH B26 SS1			
		SAME	PLE TYPE:	Soil			
		DATE S	SAMPLED:	2022-01-26 13:00			
Parameter	Unit	G/S	RDL	3464488			
Arsenic Leachate	mg/L	2.5	0.010	<0.010			
Barium Leachate	mg/L	100	0.010	0.466			
Boron Leachate	mg/L	500	0.050	< 0.050			
Cadmium Leachate	mg/L	0.5	0.010	< 0.010			
Chromium Leachate	mg/L	5	0.050	< 0.050			
Lead Leachate	mg/L	5	0.010	< 0.010			
Mercury Leachate	mg/L	0.1	0.01	<0.01			
Selenium Leachate	mg/L	1	0.010	<0.010			
Silver Leachate	mg/L	5	0.010	<0.010			
Uranium Leachate	mg/L	10	0.050	< 0.050			
Fluoride Leachate	mg/L	150	0.10	0.18			
Cyanide Leachate	mg/L	20	0.05	<0.05			
(Nitrate + Nitrite) as N Leachate	mg/L	1000	0.70	<0.70			

Comments:

RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria

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.

Analysis performed at AGAT Toronto (unless marked by *)

CHARTERED BY MYNNE BASILY OF CHEMIST OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PR



AGAT WORK ORDER: 22T858487

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE:SP47/Boreholes B

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Ramin Zanganeh

			O. Reg. 153(511) - OC	Pesticides (Soil)
DATE RECEIVED: 2022-01-28				DATE REPORTED: 2022-02-07
	5	SAMPLE DESCRIPTION:	BH B25 SS1	
		SAMPLE TYPE:	Soil	
		DATE SAMPLED:	2022-01-26 11:20	
Parameter	Unit	G/S RDL	3464486	
Hexachloroethane	μg/g	0.01	<0.01	
Gamma-Hexachlorocyclohexane	μg/g	0.005	<0.005	
Heptachlor	μg/g	0.005	<0.005	
Aldrin	µg/g	0.005	<0.005	
Heptachlor Epoxide	μg/g	0.005	<0.005	
Endosulfan I	µg/g	0.005	<0.005	
Endosulfan II	μg/g	0.005	<0.005	
Endosulfan	μg/g	0.005	<0.005	
Alpha-Chlordane	μg/g	0.005	<0.005	
gamma-Chlordane	μg/g	0.005	<0.005	
Chlordane	μg/g	0.007	<0.007	
op'-DDE	ug/g	0.005	<0.005	
pp'-DDE	μg/g	0.005	<0.005	
DDE	μg/g	0.007	<0.007	
op'-DDD	μg/g	0.005	<0.005	
pp'-DDD	μg/g	0.005	<0.005	
DDD	μg/g	0.007	<0.007	
op'-DDT	μg/g	0.005	<0.005	
pp'-DDT	μg/g	0.005	<0.005	
DDT (Total)	μg/g	0.007	<0.007	
Dieldrin	μg/g	0.005	<0.005	
Endrin	μg/g	0.005	<0.005	
Methoxychlor	μg/g	0.005	<0.005	
Hexachlorobenzene	μg/g	0.005	<0.005	
Hexachlorobutadiene	μg/g	0.01	<0.01	
Moisture Content	%	0.1	17.2	
wet weight OC	g	0.01	10.88	





AGAT WORK ORDER: 22T858487

O. Reg. 153(511) - OC Pesticides (Soil)

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE: SP47/Boreholes B

DATE RECEIVED: 2022-01-28

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Ramin Zanganeh

	`	,	`	,	
					DATE REPORTED: 2022-02-07

		SAMPLE DESCRIPTION:	BH B25 SS1	
		SAMPLE TYPE:	Soil	
		DATE SAMPLED:	2022-01-26 11:20	
Surrogate	Unit	Acceptable Limits	3464486	
TCMX	%	50-140	72	
Decachlorobiphenyl	%	50-140	91	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

3464486 Results are based on the dry weight of the soil.

DDT total is a calculated parameter. The calculated value is the sum of op'DDT and pp'DDT. DDD total is a calculated parameter. The calculated value is the sum of op'DDD and pp'DDD. DDE total is a calculated parameter. The calculated value is the sum of op'DDE and pp'DDE.

Endosulfan total is a calculated parameter. The calculated value is the sum of Endosulfan I and Endosulfan II. Chlordane total is a calculated parameter. The calculated value is the sum of Alpha-Chlordane and Gamma-Chlordane.

The calculated parameters are non-accredited. The parameters that are components of the calculation are accredited.

Analysis performed at AGAT Toronto (unless marked by *)





AGAT WORK ORDER: 22T858487

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE: SP47/Boreholes B

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Ramin Zanganeh

		О.	Reg. 153(5	11) - PHCs F1 - F4 (-BTEX) (Soil)
DATE RECEIVED: 2022-01-28				DATE REPORTED: 2022-02-07
	Si	AMPLE DESCRIPTION:	BH B28 SS2	
		SAMPLE TYPE:	Soil	
		DATE SAMPLED:	2022-01-26 14:50	
Parameter	Unit	G/S RDL	3464492	
F1 (C6 - C10)	μg/g	5	<5	
F1 (C6 to C10) minus BTEX	μg/g	5	<5	
F2 (C10 to C16)	μg/g	10	<10	
F3 (C16 to C34)	μg/g	50	<50	
F4 (C34 to C50)	μg/g	50	<50	
Gravimetric Heavy Hydrocarbons	μg/g	50	NA	
Moisture Content	%	0.1	16.9	
Surrogate	Unit	Acceptable Limits		
Toluene-d8	% Recovery	50-140	86	
Terphenyl	%	60-140	99	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

3464492 Results are based on sample dry weight.

The C6-C10 fraction is calculated using toluene response factor.

C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX. The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.

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 contribution.

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.

Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Analysis performed at AGAT Toronto (unless marked by *)



AGAT WORK ORDER: 22T858487

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE:SP47/Boreholes B

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Ramin Zanganeh

			O. Reg. 1	53(511) - VOCs (Soil)
DATE RECEIVED: 2022-01-28				DATE REPORTED: 2022-02-07
	S	SAMPLE DESCRIPTION:	BH B28 SS2	
		SAMPLE TYPE:	Soil	
		DATE SAMPLED:	2022-01-26	
Dana waten	11.20	0.40	14:50	
Parameter	Unit	G/S RDL	3464492	
Dichlorodifluoromethane	μg/g	0.05 0.02	<0.05 <0.02	
Vinyl Chloride	ug/g	0.02	<0.02	
Bromomethane	ug/g			
Trichlorofluoromethane	ug/g	0.05	<0.05	
Acetone	ug/g	0.50	<0.50	
1,1-Dichloroethylene	ug/g	0.05	<0.05	
Methylene Chloride	ug/g	0.05	<0.05	
Trans- 1,2-Dichloroethylene	ug/g	0.05	<0.05	
Methyl tert-butyl Ether	ug/g	0.05	<0.05	
1,1-Dichloroethane	ug/g	0.02	<0.02	
Methyl Ethyl Ketone	ug/g	0.50	<0.50	
Cis- 1,2-Dichloroethylene	ug/g	0.02	<0.02	
Chloroform	ug/g	0.04	<0.04	
1,2-Dichloroethane	ug/g	0.03	<0.03	
1,1,1-Trichloroethane	ug/g	0.05	<0.05	
Carbon Tetrachloride	ug/g	0.05	<0.05	
Benzene	ug/g	0.02	<0.02	
1,2-Dichloropropane	ug/g	0.03	<0.03	
Trichloroethylene	ug/g	0.03	<0.03	
Bromodichloromethane	ug/g	0.05	<0.05	
Methyl Isobutyl Ketone	ug/g	0.50	<0.50	
1,1,2-Trichloroethane	ug/g	0.04	<0.04	
Toluene	ug/g	0.05	<0.05	
Dibromochloromethane	ug/g	0.05	<0.05	
Ethylene Dibromide	ug/g	0.04	<0.04	
Tetrachloroethylene	ug/g	0.05	<0.05	
1,1,1,2-Tetrachloroethane	ug/g	0.04	<0.04	
Chlorobenzene	ug/g	0.05	<0.05	
Ethylbenzene	ug/g	0.05	<0.05	





AGAT WORK ORDER: 22T858487

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE: SP47/Boreholes B

SAMPLED BY: Ramin Zanganeh

ATTENTION TO: Alessandro Pellerito

			O. Reg	g. 153(511) - VOCs (Soil)
DATE RECEIVED: 2022-01-28				DATE REPORTED: 2022-02-07
	Si	AMPLE DESCRIPTION:	BH B28 SS2	
		SAMPLE TYPE:	Soil	
		DATE SAMPLED:	2022-01-26 14:50	
Parameter	Unit	G/S RDL	3464492	
m & p-Xylene	ug/g	0.05	<0.05	
Bromoform	ug/g	0.05	< 0.05	
Styrene	ug/g	0.05	< 0.05	
1,1,2,2-Tetrachloroethane	ug/g	0.05	< 0.05	
o-Xylene	ug/g	0.05	< 0.05	
1,3-Dichlorobenzene	ug/g	0.05	< 0.05	
1,4-Dichlorobenzene	ug/g	0.05	< 0.05	
1,2-Dichlorobenzene	ug/g	0.05	< 0.05	
Xylenes (Total)	ug/g	0.05	< 0.05	
1,3-Dichloropropene (Cis + Trans)	μg/g	0.04	< 0.04	
n-Hexane	μg/g	0.05	< 0.05	
Moisture Content	%	0.1	16.9	
Surrogate	Unit	Acceptable Limits		
Toluene-d8	% Recovery	50-140	90	
4-Bromofluorobenzene	% Recovery	50-140	88	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

3464492

The sample was analyzed 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.

Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene + o-Xylene.

1,3-Dichloropropene total is a calculated parameter. The calculated value is the sum of Cis-1,3-Dichloropropene and Trans-1,3-Dichloropropene.

The calculated parameters are non-accredited. The parameters that are components of the calculation are accredited.

Analysis performed at AGAT Toronto (unless marked by *)





AGAT WORK ORDER: 22T858487

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE: SP47/Boreholes B

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Ramin Zanganeh

				O. Re	g. 558 - Benzo(a) pyrene
DATE RECEIVED: 2022-01-28					DATE REPORTED: 2022-02-07
	S	SAMPLE DES	CRIPTION:	BH B26 SS1	
		SAM	PLE TYPE:	Soil	
		DATE	SAMPLED:	2022-01-26 13:00	
Parameter	Unit	G/S	RDL	3464488	
Benzo(a)pyrene Leachate	mg/L	0.001	0.001	<0.001	
Surrogate	Unit	Acceptab	le Limits		
Acridine-d9	%	50-	140	74	
Naphthalene-d8	%	50-	140	86	
Terphenyl-d14	%	50-	140	115	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria

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.

3464488 The sample was leached according to Regulation 558 protocol. Analysis was performed on the leachate.

Analysis performed at AGAT Toronto (unless marked by *)





CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

Certificate of Analysis

AGAT WORK ORDER: 22T858487

PROJECT: TP115086.1.6000.5800.573000

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

ATTENTION TO: Alessandro Pellerito

SAMPLED BY: Ramin Zanganeh

0.0.550.000

					O. Reg. 558 - PCBs
DATE RECEIVED: 2022-01-28					DATE REPORTED: 2022-02-07
		SAMPLE DES	CRIPTION:	BH B26 SS1	
		SAMI	PLE TYPE:	Soil	
		DATES	SAMPLED:	2022-01-26 13:00	
Parameter	Unit	G/S	RDL	3464488	
PCB's Leachate	mg/L	0.3	0.005	< 0.005	
Surrogate	Unit	Acceptab	le Limits		
Decachlorobiphenyl	%	50-1	140	108	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria

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.

3464488 The soil sample was leached using the Regulation 558 procedure. Analysis was performed on the leachate.

PCB total is a calculated parameter. The calculated value is the sum of Aroclor 1242, Aroclor 1248, Aroclor 1254 and Aroclor 1260.

Analysis performed at AGAT Toronto (unless marked by *)

SAMPLING SITE: SP47/Boreholes B





CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE: SP47/Boreholes B

Certificate of Analysis

AGAT WORK ORDER: 22T858487

PROJECT: TP115086.1.6000.5800.573000

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

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Ramin Zanganeh

O. Reg. 558 - VOCs

				Ο.	veg. 556 - VOCs
DATE RECEIVED: 2022-01-28					DATE REPORTED: 2022-02-07
	SA	AMPLE DES	CRIPTION:	BH B26 SS1	
		SAM	PLE TYPE:	Soil	
		DATE SAMPLED:		2022-01-26 13:00	
Parameter	Unit	G/S	RDL	3464488	
Vinyl Chloride Leachate	mg/L	0.2	0.030	< 0.030	
1,1 Dichloroethene Leachate	mg/L	1.4	0.020	<0.020	
Dichloromethane Leachate	mg/L	5.0	0.030	< 0.030	
Methyl Ethyl Ketone Leachate	mg/L	200	0.090	< 0.090	
Chloroform Leachate	mg/L	10.0	0.020	<0.020	
1,2-Dichloroethane Leachate	mg/L	0.5	0.020	<0.020	
Carbon Tetrachloride Leachate	mg/L	0.5	0.020	<0.020	
Benzene Leachate	mg/L	0.5	0.020	<0.020	
Trichloroethene Leachate	mg/L	5.0	0.020	<0.020	
Tetrachloroethene Leachate	mg/L	3.0	0.050	< 0.050	
Chlorobenzene Leachate	mg/L	8.0	0.010	<0.010	
1,2-Dichlorobenzene Leachate	mg/L	20.0	0.010	<0.010	
1,4-Dichlorobenzene Leachate	mg/L	0.5	0.010	<0.010	
Surrogate	Unit	Acceptab	le Limits		
Toluene-d8	% Recovery	50-	140	97	
4-Bromofluorobenzene	% Recovery	50-	140	88	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria

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.

3464488 Sample was prepared using Regulation 558 protocol and a zero headspace extractor.

Analysis performed at AGAT Toronto (unless marked by *)



116%

70% 130%

Page 14 of 25

80% 120%

## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE:SP47/Boreholes B

Boron Leachate

3460977

AGAT QUALITY ASSURANCE REPORT (V1)

< 0.050

< 0.050

AGAT WORK ORDER: 22T858487
ATTENTION TO: Alessandro Pellerito
SAMPLED BY:Ramin Zanganeh

				Soi	i Ana	alysis	3								
RPT Date: Feb 07, 2022			Г	DUPLICATI	<u> </u>		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPIKE	
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value		ptable	Recovery	1 1 1 1 1	ptable	Recovery		ptable
		lu lu					value	Lower	Upper		Lower	Upper		Lower	Uppe
O. Reg. 153(511) - Metals & Inoi	rganics (Soil)														
Antimony	3464318		<0.8	<0.8	NA	< 0.8	127%	70%	130%	100%	80%	120%	94%	70%	1309
Arsenic	3464318		3	4	NA	< 1	119%	70%	130%	100%	80%	120%	113%	70%	1309
Barium	3464318		40.1	42.3	5.3%	< 2.0	113%	70%	130%	102%	80%	120%	114%	70%	1309
Beryllium	3464318		< 0.4	< 0.4	NA	< 0.4	92%	70%	130%	83%	80%	120%	93%	70%	130
Boron	3464318		7	8	NA	< 5	83%	70%	130%	93%	80%	120%	102%	70%	1309
Boron (Hot Water Soluble)	3457204		0.10	0.11	NA	< 0.10	107%	60%	140%	103%	70%	130%	110%	60%	140
Cadmium	3464318		<0.5	<0.5	NA	< 0.5	110%	70%	130%	100%	80%	120%	109%	70%	130
Chromium	3464318		15	15	NA	< 5	102%	70%	130%	102%	80%	120%	112%	70%	1309
Cobalt	3464318		4.9	4.2	15.4%	< 0.5	105%	70%	130%	102%	80%	120%	118%	70%	130
Copper	3464318		8.5	8.4	1.2%	< 1.0	100%	70%	130%	109%	80%	120%	111%	70%	130
_ead	3464318		4	4	NA	< 1	107%	70%	130%	109%	80%	120%	106%	70%	130
Molybdenum	3464318		1.2	1.2	NA	< 0.5	114%	70%	130%	108%	80%	120%	126%	70%	130
Nickel	3464318		6	6	0.0%	< 1	103%	70%	130%	103%	80%	120%	113%	70%	
Selenium	3464318		<0.8	<0.8	NA	< 0.8	120%	70%	130%	96%	80%	120%	114%	70%	
Silver	3464318		<0.5	<0.5	NA	< 0.5	106%	70%	130%	108%	80%	120%	100%		
Fhallium	3464318		<0.5	<0.5	NA	< 0.5	107%	70%	130%	103%	80%	120%	98%	70%	130
Jranium	3464318		<0.50	<0.50	NA	< 0.50	112%	70%	130%	106%	80%	120%	109%	70%	
Vanadium	3464318		27.4	28.1	2.5%	< 0.50	113%	70%	130%	102%	80%	120%	113%	70%	130
Zinc	3464318		30	33	9.5%	< 0.4 < 5	108%	70%	130%	105%	80%	120%	123%	70%	130
Chromium, Hexavalent	3463940		<0.2	<0.2	NA	< 0.2	104%	70%	130%	90%	80%	120%	107%	70%	
Cyanide, Free	2464000		-0.040	-0.040	NΙΔ	- 0 040	1050/	70%	1200/	102%	900/	1200/	101%	70%	130
•	3464980		<0.040	<0.040	NA	< 0.040	105%		130%		80%	120%			
Mercury	3464318		0.17	0.16	NA 5.20/	< 0.10	109%	70%	130%	100%	80%	120%	103%	70%	130
Electrical Conductivity (2:1) Sodium Adsorption Ratio (2:1)	3471930 3457204		0.146 0.115	0.154 0.116	5.3% 0.9%	< 0.005 NA	105%	80%	120%						
(Calc.)	3464999		6.23	6.27	0.6%	NA	99%	80%	120%						
oH, 2:1 CaCl2 Extraction	3464999		0.23	0.27	0.6%	INA	99%	60%	120%						
Comments: NA signifies Not Applic pH duplicates QA acceptance crite Duplicate NA: results are under 5X	eria was met re				Analytica	al Protocol	document	-							
Corrosivity Package															
Chloride (2:1)	3459198		15	15	0.0%	< 2	92%	70%	130%	107%	80%	120%	100%	70%	130
Sulphate (2:1)	3459198		112	107	4.6%	< 2	99%	70%	130%	102%	80%	120%	101%	70%	130
oH (2:1)	3459198		8.16	8.17	0.1%	NA	100%	80%	120%						
Electrical Conductivity (2:1)	3471930		0.146	0.154	5.3%	< 0.005	105%	80%	120%						
Comments: NA signifies Not Applic oH duplicates QA acceptance crite		lative as s	tated in Ta	able 5-15 of	Analytica	al Protocol	document	=							
D. Reg. 558 Metals and Inorgan	nics														
Arsenic Leachate	3460977		<0.010	<0.010	NA	< 0.010	94%	70%	130%	120%	80%	120%	128%	70%	130
Barium Leachate	3460977		0.243	0.245	0.9%	< 0.010			130%	107%		120%	116%	70%	

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. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.

NA

< 0.050

106% 70% 130%

99%



#### **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE:SP47/Boreholes B AGAT WORK ORDER: 22T858487
ATTENTION TO: Alessandro Pellerito
SAMPLED BY:Ramin Zanganeh

OF THE CITE OF THE DOTOR	10100 B				Ortin 225 5 Titaliii 2anganon											
	Soil Analysis (Continued)															
RPT Date: Feb 07, 2022			UPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MATRIX SPIKE		KE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	منا أ	ptable nits	Recovery	منا ا	ptable nits	
		lu lu					value	Lower	Upper		Lower	Upper		Lower	Upper	
Cadmium Leachate	3460977		<0.010	<0.010	NA	< 0.010	101%	70%	130%	106%	80%	120%	109%	70%	130%	
Chromium Leachate	3460977		<0.050	<0.050	NA	< 0.050	101%	70%	130%	120%	80%	120%	121%	70%	130%	
Lead Leachate	3460977		0.015	0.015	NA	< 0.010	104%	70%	130%	104%	80%	120%	102%	70%	130%	
Mercury Leachate	3460977		<0.01	<0.01	NA	< 0.01	96%	70%	130%	90%	80%	120%	99%	70%	130%	
Selenium Leachate	3460977		<0.010	<0.010	NA	< 0.010	102%	70%	130%	119%	80%	120%	117%	70%	130%	
Silver Leachate	3460977		<0.010	<0.010	NA	< 0.010	100%	70%	130%	101%	80%	120%	104%	70%	130%	
Uranium Leachate	3460977		<0.050	<0.050	NA	< 0.050	100%	70%	130%	108%	80%	120%	108%	70%	130%	
Fluoride Leachate	3460977		0.24	0.24	NA	< 0.10	100%	90%	110%	102%	90%	110%	97%	70%	130%	
Cyanide Leachate	3460977		< 0.05	< 0.05	NA	< 0.05	100%	70%	130%	94%	80%	120%	114%	70%	130%	
(Nitrate + Nitrite) as N Leachate	3460977		<0.70	<0.70	NA	< 0.70	98%	80%	120%	94%	80%	120%	92%	70%	130%	

Comments: NA signifies Not Applicable.

Duplicate NA: results are under 5X the RDL and will not be calculated.

OMARIERED S OMARIERED S ONNINE BASILY O ONNINE BASILY O ONNINE BASILY ON THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE:SP47/Boreholes B AGAT WORK ORDER: 22T858487
ATTENTION TO: Alessandro Pellerito
SAMPLED BY:Ramin Zanganeh

			Trac	e Or	gani	cs Ar	alys	is							
RPT Date: Feb 07, 2022				DUPLICATI	E		REFERENCE MATERIAL			METHOD BLANK SPIKE			MAT	RIX SPI	IKE
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value		ptable	Recovery		ptable	Recovery		eptable mits
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - OC Pesticides	(Soil)														
Hexachloroethane	3451885		< 0.01	< 0.01	NA	< 0.01	88%	50%	140%	81%	50%	140%	79%	50%	140%
Gamma-Hexachlorocyclohexane	3451885		< 0.005	< 0.005	NA	< 0.005	92%	50%	140%	80%	50%	140%	86%	50%	140%
Heptachlor	3451885		< 0.005	< 0.005	NA	< 0.005	80%	50%	140%	81%	50%	140%	74%	50%	140%
Aldrin	3451885		< 0.005	< 0.005	NA	< 0.005	97%	50%	140%	83%	50%	140%	79%	50%	140%
Heptachlor Epoxide	3451885		< 0.005	< 0.005	NA	< 0.005	96%	50%	140%	86%	50%	140%	74%	50%	140%
Endosulfan I	3451885		< 0.005	< 0.005	NA	< 0.005	94%	50%	140%	74%	50%	140%	72%	50%	140%
Endosulfan II	3451885		< 0.005	< 0.005	NA	< 0.005	96%	50%	140%	78%	50%	140%	76%	50%	140%
Alpha-Chlordane	3451885		< 0.005	< 0.005	NA	< 0.005	95%	50%	140%	88%	50%	140%	76%	50%	140%
gamma-Chlordane	3451885		< 0.005	< 0.005	NA	< 0.005	95%	50%	140%	80%	50%	140%	74%	50%	140%
op'-DDE	3451885		< 0.005	< 0.005	NA	< 0.005	85%	50%	140%	90%	50%	140%	75%	50%	140%
pp'-DDE	3451885		< 0.005	< 0.005	NA	< 0.005	86%	50%	140%	81%	50%	140%	70%	50%	140%
op'-DDD	3451885		< 0.005	< 0.005	NA	< 0.005	84%	50%	140%	91%	50%	140%	86%	50%	140%
pp'-DDD	3451885		< 0.005	< 0.005	NA	< 0.005	80%	50%	140%	82%	50%	140%	82%	50%	
op'-DDT	3451885		< 0.005	< 0.005	NA	< 0.005	91%	50%	140%	83%	50%	140%	75%	50%	
pp'-DDT	3451885		< 0.005	< 0.005	NA	< 0.005	90%		140%	79%	50%	140%	70%	50%	
Dieldrin	3451885		< 0.005	< 0.005	NA	< 0.005	93%	50%	140%	84%	50%	140%	72%	50%	140%
Endrin	3451885		< 0.005	< 0.005	NA	< 0.005	85%	50%	140%	80%	50%	140%	78%	50%	140%
Methoxychlor	3451885		< 0.005	< 0.005	NA	< 0.005	96%	50%	140%	73%	50%	140%	82%	50%	140%
Hexachlorobenzene	3451885		< 0.005	< 0.005	NA	< 0.005	94%	50%	140%	83%	50%	140%	87%	50%	140%
Hexachlorobutadiene	3451885		< 0.01	< 0.01	NA	< 0.01	100%	50%	140%	80%	50%	140%	79%	50%	140%
O Dec 550 DODe															
O. Reg. 558 - PCBs PCB's Leachate	3464488 34	64488	< 0.005	< 0.005	NA	< 0.005	109%	50%	140%	86%	50%	140%	101%	50%	140%
1 OD 3 Leachate	3404400 34	04400	< 0.003	< 0.003	INA	< 0.003	10376	JU /6	140 /6	00 /6	30 /6	140 /6	10176	30 /6	140 /0
O. Reg. 558 - VOCs															
Vinyl Chloride Leachate	3462584		<0.030	<0.030	NA	< 0.030	90%	50%	140%	106%	50%	140%	106%	50%	
1,1 Dichloroethene Leachate	3462584		<0.020	<0.020	NA	< 0.020	111%	50%	140%	99%	60%	130%	96%	50%	140%
Dichloromethane Leachate	3462584		<0.030	<0.030	NA	< 0.030	93%	50%	140%	113%	60%	130%	107%	50%	140%
Methyl Ethyl Ketone Leachate	3462584		<0.090	<0.090	NA	< 0.090	93%	50%	140%	115%	50%	140%	102%	50%	140%
Chloroform Leachate	3462584		<0.020	<0.020	NA	< 0.020	105%	50%	140%	108%	60%	130%	91%	50%	140%
1,2-Dichloroethane Leachate	3462584		<0.020	<0.020	NA	< 0.020	86%	50%	140%	92%	60%	130%	86%	50%	140%
Carbon Tetrachloride Leachate	3462584		< 0.020	<0.020	NA	< 0.020	80%	50%	140%	81%	60%	130%	85%	50%	140%
Benzene Leachate	3462584		< 0.020	<0.020	NA	< 0.020	95%	50%	140%	94%	60%	130%	86%	50%	140%
Trichloroethene Leachate	3462584		< 0.020	<0.020	NA	< 0.020	93%	50%	140%	92%	60%	130%	88%	50%	140%
Tetrachloroethene Leachate	3462584		< 0.050	<0.050	NA	< 0.050	87%	50%	140%	87%	60%	130%	93%	50%	140%
Chlorobenzene Leachate	3462584		<0.010	<0.010	NA	< 0.010	89%	50%	140%	91%	60%	130%	96%	50%	140%
1,2-Dichlorobenzene Leachate	3462584		<0.010	<0.010	NA	< 0.010	88%		140%	90%		130%	93%		140%
1,4-Dichlorobenzene Leachate	3462584		<0.010	<0.010	NA	< 0.010	92%		140%	98%		130%	101%		140%
O. Reg. 558 - Benzo(a) pyrene	2452707		-0.004	-0.004	N I A	. 0.001	700/	E00/	1.400/	000/	E00/	1.400/	1110	E00/	1.4007
Benzo(a)pyrene Leachate	3453767		<0.001	<0.001	NA	< 0.001	78%	50%	140%	89%	50%	140%	114%	50%	140%

AGAT QUALITY ASSURANCE REPORT (V1)

Page 16 of 25

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. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000

SAMPLING SITE: SP47/Boreholes B

AGAT WORK ORDER: 22T858487 ATTENTION TO: Alessandro Pellerito SAMPLED BY:Ramin Zanganeh

SAMPLING STIE.SP47/Borefloles B SAMPLED BY:Railiii Zangarien															
Trace Organics Analysis (Continued)															
RPT Date: Feb 07, 2022		DUPLICATE			REFERENCE MATERIAL		METHOD BLANK SPIKE		( SPIKE	MATRIX SPIK		KE			
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		eptable mits	Recovery	1 1 1 1 1 1	eptable mits	Recovery	1 1 1 1	ptable nits
TANAMETER	Daton	ld	Dup #1	Dup #2	KFD		Value	Lower	Upper	1.000 V GI Y		Upper	. ROOUVEI y	Lower	Upper
0 D 450/54 () 5110 51 5															
O. Reg. 153(511) - PHCs F1 - F	, , ,	11)	NIA	N 1 A	N I A		000/	600/	1.400/	NIA	600/	1.400/	NI A	600/	1.400/
F1 (C6 - C10)	3464492		NA 110	NA 110	NA NA	< 5	99%	60%	140%	NA 1150/	60%		NA cent	60%	140%
F2 (C10 to C16)	3451889		< 10	< 10	NA NA	< 10	96%	60%	140%	115%	60%		65%	60%	140%
F3 (C16 to C34) F4 (C34 to C50)	3451889 3451889		< 50 < 50	< 50 < 50	NA NA	< 50 < 50	89% 89%	60% 60%	140% 140%	117% 122%	60% 60%	140% 140%	68% 72%	60% 60%	140% 140%
1 7 (007 10 000)	0 <del>-1</del> 01008		<b>\</b> 30	<b>\</b> 30	INA	<b>\</b> 30	03/0	00 /6	170/0	122/0	00 /6	170/0	1 4 /0	00 /0	170/0
O. Reg. 153(511) - VOCs (Soil)															
Dichlorodifluoromethane	3464980		<0.05	<0.05	NA	< 0.05	60%	50%	140%	81%	50%	140%	85%	50%	140%
Vinyl Chloride	3464980		<0.02	< 0.02	NA	< 0.02	104%	50%	140%	109%	50%	140%	109%	50%	140%
Bromomethane	3464980		<0.05	<0.05	NA	< 0.05	80%	50%	140%	82%	50%	140%	80%	50%	140%
Trichlorofluoromethane	3464980		<0.05	<0.05	NA	< 0.05	74%	50%	140%	77%	50%	140%	92%	50%	140%
Acetone	3464980		<0.50	<0.50	NA	< 0.50	114%	50%	140%	104%	50%	140%	106%	50%	140%
1,1-Dichloroethylene	3464980		<0.05	<0.05	NA	< 0.05	77%	50%	140%	80%	60%	130%	83%	50%	140%
Methylene Chloride	3464980		<0.05	< 0.05	NA	< 0.05	71%	50%	140%	74%	60%	130%	74%	50%	140%
Trans- 1,2-Dichloroethylene	3464980		<0.05	< 0.05	NA	< 0.05	76%	50%	140%	84%	60%	130%	79%	50%	140%
Methyl tert-butyl Ether	3464980		<0.05	<0.05	NA	< 0.05	74%	50%	140%	77%	60%	130%	83%	50%	140%
1,1-Dichloroethane	3464980		<0.02	<0.02	NA	< 0.02	74%	50%	140%	86%	60%	130%	83%	50%	140%
Methyl Ethyl Ketone	3464980		<0.50	<0.50	NA	< 0.50	90%	50%	140%	93%	50%	140%	96%	50%	140%
Cis- 1,2-Dichloroethylene	3464980		<0.02	< 0.02	NA	< 0.02	71%	50%	140%	84%	60%		80%	50%	140%
Chloroform	3464980		<0.04	<0.04	NA	< 0.04	80%	50%	140%	94%	60%	130%	91%	50%	140%
1,2-Dichloroethane	3464980		<0.03	<0.03	NA	< 0.03	74%	50%	140%	85%	60%	130%	92%	50%	140%
1,1,1-Trichloroethane	3464980		<0.05	<0.05	NA	< 0.05	75%	50%	140%	85%	60%	130%	91%	50%	140%
Carbon Tetrachloride	3464980		<0.05	<0.05	NA	< 0.05	79%	50%	140%	79%	60%	130%	76%	50%	140%
Benzene	3464980		<0.02	< 0.02	NA	< 0.02	73%	50%	140%	74%	60%	130%	86%	50%	140%
1,2-Dichloropropane	3464980		< 0.03	<0.03	NA	< 0.03	80%	50%	140%	78%	60%	130%	81%	50%	140%
Trichloroethylene	3464980		< 0.03	<0.03	NA	< 0.03	91%	50%	140%	75%	60%	130%	81%	50%	140%
Bromodichloromethane	3464980		<0.05	<0.05	NA	< 0.05	74%	50%	140%	78%	60%	130%	77%	50%	140%
Methyl Isobutyl Ketone	3464980		<0.50	<0.50	NA	< 0.50	87%	50%	140%	93%	50%	140%	102%	50%	140%
1,1,2-Trichloroethane	3464980		<0.04	< 0.04	NA	< 0.04	110%	50%	140%	94%	60%	130%	100%	50%	140%
Toluene	3464980		<0.05	<0.05	NA	< 0.05	116%	50%	140%	90%	60%	130%	86%	50%	140%
Dibromochloromethane	3464980		< 0.05	< 0.05	NA	< 0.05	101%	50%	140%	83%	60%	130%	84%	50%	140%
Ethylene Dibromide	3464980		<0.04	<0.04	NA	< 0.04	95%	50%	140%	86%	60%	130%	92%	50%	140%
Tetrachloroethylene	3464980		<0.05	<0.05	NA	< 0.05	105%	50%	140%	80%	60%	130%	87%	50%	140%
1,1,1,2-Tetrachloroethane	3464980		<0.04	< 0.04	NA	< 0.04	97%	50%	140%	88%	60%	130%	83%	50%	140%
Chlorobenzene	3464980		< 0.05	< 0.05	NA	< 0.05	106%	50%	140%	89%	60%	130%	84%	50%	140%
Ethylbenzene	3464980		<0.05	< 0.05	NA	< 0.05	102%	50%	140%	77%	60%	130%	71%	50%	140%
m & p-Xylene	3464980		<0.05	<0.05	NA	< 0.05	106%	50%	140%	99%	60%	130%	91%	50%	140%
Bromoform	3464980		<0.05	<0.05	NA	< 0.05	104%	50%	140%	93%	60%	130%	95%	50%	140%
Styrene	3464980		<0.05	<0.05	NA	< 0.05	84%		140%	71%		130%	74%	50%	140%
1,1,2,2-Tetrachloroethane	3464980		<0.05	< 0.05	NA	< 0.05	107%		140%	102%		130%	101%		140%

AGAT QUALITY ASSURANCE REPORT (V1)

Page 17 of 25

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. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE:SP47/Boreholes B AGAT WORK ORDER: 22T858487
ATTENTION TO: Alessandro Pellerito
SAMPLED BY:Ramin Zanganeh

O TIVIL EITO OTTE. GT 47/BOTOTIOTO B						Critin LED D F. Kamim Zanganen									
Trace Organics Analysis (Continued)															
RPT Date: Feb 07, 2022				UPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	МАТ	RIX SPI	KE
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Blank Measured L		otable nits	Recovery	Acceptable Limits		Recovery	Acceptable Limits	
		Iu		·			Value	Lower	Upper		Lower	Upper		Lower	Upper
o-Xylene	3464980		<0.05	<0.05	NA	< 0.05	117%	50%	140%	90%	60%	130%	84%	50%	140%
1,3-Dichlorobenzene	3464980		<0.05	<0.05	NA	< 0.05	96%	50%	140%	99%	60%	130%	93%	50%	140%
1,4-Dichlorobenzene	3464980		<0.05	<0.05	NA	< 0.05	105%	50%	140%	99%	60%	130%	92%	50%	140%
1,2-Dichlorobenzene	3464980		< 0.05	< 0.05	NA	< 0.05	104%	50%	140%	89%	60%	130%	89%	50%	140%
n-Hexane	3464980		< 0.05	< 0.05	NA	< 0.05	108%	50%	140%	98%	60%	130%	99%	50%	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:

Jung

## Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE:SP47/Boreholes B

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE ANALYTICAL TE		
Soil Analysis				
Chloride (2:1)	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH	
Sulphate (2:1)	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH	
pH (2:1)	INOR 93-6031	modified from EPA 9045D and MCKEAGUE 3.11	PH METER	
Electrical Conductivity (2:1)	INOR-93-6036	modified from MSA PART 3, CH 14 and SM 2510 B	EC METER	
Resistivity (2:1) (Calculated)	INOR-93-6036	McKeague 4.12, SM 2510 B,SSA #5 Part 3	CALCULATION	
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS	
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS	
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS	
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS	
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS	
Boron (Hot Water Soluble)	MET-93-6104	modified from EPA 6010D and MSA PART 3, CH 21	ICP/OES	
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS	
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS	
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS	
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS	
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS	
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS	
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS	
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS	
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS	
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS	
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS	
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS	
Zinc	MET 93 -6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS	
Chromium, Hexavalent	INOR-93-6068	modified from EPA 3060 and EPA 7196	SPECTROPHOTOMETER	
Cyanide, Free	INOR-93-6052	modified from ON MOECC E3015, SM 4500-CN- I, G-387	TECHNICON AUTO ANALYZER	
Mercury	MET-93-6103	modified from EPA 7471B and SM 3112 B	ICP-MS	
Sodium Adsorption Ratio (2:1) (Calc.)	INOR-93-6007	modified from EPA 6010D & Analytical Protocol	ICP/OES	



# Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000

AGAT WORK ORDER: 22T858487 ATTENTION TO: Alessandro Pellerito

SAMPLING SITE:SP47/Boreholes B		SAMPLED BY: Ramin Zanganeh				
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE			
pH, 2:1 CaCl2 Extraction	INOR-93-6031	modified from EPA 9045D and MCKEAGUE 3.11	PH METER			
Arsenic Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020E	BICP-MS			
Barium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020E	BICP-MS			
Boron Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020E	BICP-MS			
Cadmium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020E	BICP-MS			
Chromium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020E	BICP-MS			
Lead Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020E	BICP-MS			
Mercury Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020E	BICP-MS			
Selenium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020E	BICP-MS			
Silver Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020E	BICP-MS			
Uranium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020E	BICP-MS			
Fluoride Leachate	INOR-93-6018	EPA 1311 & modified from SM4500-F-C	ION SELECTIVE ELECTRODE			
Cyanide Leachate	INOR-93-6052	EPA 1311 modified from MOE 3015 SM 4500 CN-I,G387	TECHNICON AUTO ANALYZER			
(Nitrate + Nitrite) as N Leachate	INOR-93-6053	EPA SW 846-1311 & modified from SM 4500 - NO3- I	LACHAT FIA			

## Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE:SP47/Boreholes B

		OAIMI EED D1:IV	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis		"" I	
Hexachloroethane	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Gamma-Hexachlorocyclohexane	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Heptachlor	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Aldrin	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Heptachlor Epoxide	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Endosulfan I	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Endosulfan II	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Endosulfan	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	CALCULATION
Alpha-Chlordane	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
gamma-Chlordane	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Chlordane	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	CALCULATION
op'-DDE	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
pp'-DDE	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
DDE	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
op'-DDD	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
pp'-DDD	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
DDD	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	CALCULATION
op'-DDT	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
pp'-DDT	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
DDT (Total)	ORG-91-5113	modified from EPA 3570, 3620C & 8081B	CALCULATION
Dieldrin	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Endrin	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Methoxychlor	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Hexachlorobenzene	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Hexachlorobutadiene	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
TCMX	ORG-91-5112	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Decachlorobiphenyl	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Moisture Content	VOL-91-5009	CCME Tier 1 Method	BALANCE

## Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE:SP47/Boreholes B

			•
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
wet weight OC	ORG-91-5113		BALANCE
F1 (C6 - C10)	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/FID
Toluene-d8	VOL-91-5009	modified from EPA SW-846 5030C & 8260D	(P&T)GC/MS
F2 (C10 to C16)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F3 (C16 to C34)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F4 (C34 to C50)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
Dichlorodifluoromethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Vinyl Chloride	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Bromomethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Acetone	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Methylene Chloride	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Trans- 1,2-Dichloroethylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Methyl tert-butyl Ether	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Cis- 1,2-Dichloroethylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Chloroform	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Benzene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Trichloroethylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Bromodichloromethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS

## **Method Summary**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE:SP47/Boreholes B

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Toluene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Dibromochloromethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Chlorobenzene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Ethylbenzene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
m & p-Xylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Bromoform	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Styrene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
o-Xylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Xylenes (Total)	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,3-Dichloropropene (Cis + Trans)	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
n-Hexane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Toluene-d8	VOL-91-5002	modified from EPA 5035A & EPA 8260D	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5002	modified from EPA 5035A & EPA 8260D	(P&T)GC/MS
Moisture Content	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE
Benzo(a)pyrene Leachate	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Acridine-d9	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Naphthalene-d8	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Terphenyl-d14	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
PCB's Leachate	ORG-91-5112	Regulation 558, EPA SW846 3510C/8082	GC/ECD
Decachlorobiphenyl	ORG-91-5112	EPA SW846 3510C/8082	GC/ECD
Vinyl Chloride Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
1,1 Dichloroethene Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS

# Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000

SAMPLING SITE: SP47/Boreholes B

AGAT WORK ORDER: 22T858487 ATTENTION TO: Alessandro Pellerito

SAMPLED BY: Ramin Zanganeh

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Dichloromethane Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
Methyl Ethyl Ketone Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
Chloroform Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
1,2-Dichloroethane Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
Carbon Tetrachloride Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
Benzene Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
Trichloroethene Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
Tetrachloroethene Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
Chlorobenzene Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
1,2-Dichlorobenzene Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
1,4-Dichlorobenzene Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
Toluene-d8	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91- 5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS



5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2 Ph: 905,712,5100 Fax: 905,712,5122 webearth_agatlabs.com

Only	
2785	8487.
	2 7
3.71	3.513-8
	2T85)

#### Chain of Custody Record If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (

	detody Record		Drinking water sample, pie	1	onuin o	. Justouj i orini (potabli			oj				7				2	8 1	2	. 5	- 2	2, 3
Report Inform Company:	nation: Wood			Reg	gulatory Requ	uirements:							11	ustody Seal otes:	Intact	t:	Yes			]No	[	]N/A
Contact:	Alessandro Pellerito				egulation 153/04	I Excess Soils R40	ne I	Sev	ver U	se												
Address:	50 Vogell Road, Richmon	d Hill, ON, L4I	B 3K6		ble		.			y 🗆 s	itorm		Tu	rnaroun	d Ti	me (	TAT)	Req	uire	d:		
				_	ind/Com	Table			Reg	lon	-		Re	gular TA1	Г		<b>7</b> 5 t	o 7 Bu	siness	s Days		
Phone:	647-982-6220	Fax:			]Res/Park ]Agriculture	Regulation 558				iter Qua			Ru	sh TAT (Ru	uh Surci	harges A	pply)					
Reports to be sent to:  1. Email:	a.pellerito@woodplc.com				exture (Check One)	ССМЕ		Oth		(	/			3 Busi	ness		] 2 E	Busine vs	ss		Next Bu Day	siness
2. Email:	shami.malla@woodplc.com				]Fine			_	Indica	ate One		_		OR Da	ite Re	quired			narges		•	
Project Inform					this submissio					deline				Ple	ase n	rovide	prior	notifica	ation f	or rush	TAT	
Project:	TP115086.1.6000.5800.573	000		- 11							_		11	*TAT is								'S
Site Location:	SP47/Boreholes B			_    [	] Yes ☑	l No		Yes	5	<b>V</b>	No			For 'Same I	Day' a	analysi	s, ple	ase co	ntact	your #	GAT CF	M
Sampled By:	Ramin Zanganeh 305848	715.		- =			0	0.	. Reg	153			0. Re 558	9 O. Reg 4	06							7
AGAT Quote #:	Please note: If quotation number is	not provided, client will	be billed full price for analysis	—   Ѕап	nple Matrix Le	gend	00,			0				8 9	5			(				1/V) II
1				В	Biota		S.			- 8 □			ration TCLP:	Rainwater Leach rocs Svocs				VOC				tratio
Involce Inforn	Mood PLC	В	ill To Same: Yes 🗌 No	□    GW	Ground Water Oil		S, Tg		WSB	□ Yes			ation	water Le	F1-F4	- 10						oncer
Company: Contact:	WOODPLC			-   P	Paint		letal		H				teriza	Rainwa Vocs 🗆 s	X.	- 1/		기종			11	igh C
Address:				_   s	Soil	V	2 - ₽	SS	五	HCs required l			larac	Rair VOCs	, втех,		de	7 0				P .0
Email:	APInvoice.Canada <apinvo< td=""><td>oice.canada@wo</td><td>oodplc.com&gt;</td><td>SD</td><td>Sediment</td><td></td><td>lltere</td><td>gani</td><td>  <u> </u>  </td><td>PHC:</td><td></td><td></td><td>osal Chi</td><td>SPLF Is D</td><td>etals</td><td>~  </td><td></td><td></td><td>B(a)P</td><td></td><td></td><td>rdou</td></apinvo<>	oice.canada@wo	oodplc.com>	SD	Sediment		lltere	gani	<u> </u>	PHC:			osal Chi	SPLF Is D	etals	~			B(a)P			rdou
Linaii.				sw	Surface Water		Field Filtered - Metals, Hg. CrVI, DOC	& Inorganics	- Crvi, CHg, CHWSB	-F4			fill Dispos	Soils Soils Soils Soils	MS M	S/SAF	est	P	l d			ly Haza
Samp	le Identification	Date Sampled	Time # of Containers	Sample Matrix		ments/ Instructions	Y/N	Metals	Metals -	BTEX, F1 Analyze I	PAHS	PCBs	Landfill Disposal Characterization TCLP:	Excess Soils Characterization	pH, ICPMS Metals,	Salt - EC/SAR	OC pesticides	TCLP M/I. PCB.	TCLP			Potentially Hazardous or High Concentration (Y/N)
BH B23 SS1		26 Jan 22	9:10 AM 1	S																		
BH B23 SS2		26 Jan 22	9:15 AM 1	S	HOLD																	
BH B24 SS1		26 Jan 22	10:40 AM 1	S													G					
BH B25 SS1		26 Jan 22	11:20 AM PM 1	S							-(						7					
BH B25 SS2		26 Jan 22	11:25 AM 1	S	HOLD																	
BH B26 SS1		26 Jan 22	13:00 AM 1	S														7	1			
BH B27 SS1		26 Jan 22	14:15 AM 1	S	HOLD																	
BH B27 SS2		26 Jan 22	14:20 AM 3	S	HOLD																	
BH B28 SS1		26 Jan 22	14:45 AM 1	S	HOLD																	
BH B28 SS2		26 Jan 22	14:50 AM 2	S						Ø			7							. ,		
			AM PM			1																
Samples Relinquished By (Prii Ramin Zanganeh	nt Name and Sign)		Date Time 27 January 2‡i	PM	Samples Received By (F	1 orle	1	t e	11	ne.		Date //	:1/0	Time								
Samples Relinquished By (Pri	nt Name and Sign)		Date		Samples Received By	Print Name and Sired			1			Date		Timh				Page	1	_ of _1		
Samples Relinquished By (Prin	nt Name and Sign)		D-*- Time		Samples Received By (F	Print Name and Sign)		1				Date		Time		1	V-					
							_									_						



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4 RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Alessandro Pellerito PROJECT: TP115086.1.6000.5139.57

AGAT WORK ORDER: 22T853859

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Lab Manager TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

DATE REPORTED: Jan 24, 2022

PAGES (INCLUDING COVER): 20 VERSION*: 1

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

otes Otes	

#### Disclaimer

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
  incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may
  be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other
  third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
  services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
  merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
  contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Page 1 of 20

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. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.



AGAT WORK ORDER: 22T853859 PROJECT: TP115086.1.6000.5139.57 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE: SP47 Boreholes/E-W

ATTENTION TO: Alessandro Pellerito SAMPLED BY:MS

					• · · · · · · · · · · · · · · · · · · ·
				Inor	ganic Chemistry (Soil)
DATE RECEIVED: 2022-01-14					DATE REPORTED: 2022-01-24
	S/	AMPLE DES	CRIPTION:	E31 SS1	
		SAM	PLE TYPE:	Soil	
		DATES	SAMPLED:	2022-01-13 11:00	
Parameter	Unit	G/S	RDL	3428929	
Chloride (2:1)	µg/g		2	20	
Sulphate (2:1)	μg/g		2	40	
pH (2:1)	pH Units		NA	7.58	
Electrical Conductivity (2:1)	mS/cm		0.005	0.235	
Resistivity (2:1) (Calculated)	ohm.cm		1	4260	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

3428929 EC, pH, Chloride and Sulphate were determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water: 1 part soil). Resistivity is a calculated parameter.

Analysis performed at AGAT Toronto (unless marked by *)

Amanyot Bheld AMMET BELD S



AGAT WORK ORDER: 22T853859 PROJECT: TP115086.1.6000.5139.57 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE: SP47 Boreholes/E-W

ATTENTION TO: Alessandro Pellerito SAMPLED BY:MS

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

DATE RECEIVED: 2022-01-14								DATE REPORTE	ED: 2022-01-24	
	SA	AMPLE DESCRIPTION:	E23 SS1	E25 SS1	E27 SS1	E29 SS1	E30 SS1	E32 SS1	DUP1	
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
		DATE SAMPLED:	2022-01-13 14:50	2022-01-13 13:50	2022-01-13 12:30	2022-01-13 09:10	2022-01-13 09:35	2022-01-13 11:20	2022-01-13	
Parameter	Unit	G/S RDL	3428908	3428911	3428915	3428919	3428927	3428933	3428935	
Antimony	μg/g	0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	
Arsenic	μg/g	1	4	5	5	4	4	3	3	
Barium	μg/g	2.0	105	90.6	166	151	137	78.5	79.4	
Beryllium	μg/g	0.4	0.7	0.7	1.0	0.7	0.7	0.5	0.6	
Boron	μg/g	5	7	10	9	11	10	7	7	
Boron (Hot Water Soluble)	μg/g	0.10	<0.10	0.28	0.12	<0.10	<0.10	<0.10	<0.10	
Cadmium	μg/g	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Chromium	μg/g	5	26	29	38	34	36	23	25	
Cobalt	μg/g	0.5	9.0	14.0	14.3	12.2	14.3	7.5	8.0	
Copper	μg/g	1.0	15.8	23.7	25.4	20.5	23.8	14.4	16.5	
_ead	μg/g	1	11	13	15	11	13	8	9	
Molybdenum	μg/g	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Nickel	μg/g	1	18	31	30	25	28	17	19	
Selenium	μg/g	0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	
Silver	μg/g	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Γhallium	μg/g	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Jranium	μg/g	0.50	0.76	0.58	1.62	0.67	0.70	0.59	0.59	
/anadium	μg/g	0.4	40.2	40.3	54.0	45.4	51.0	34.9	35.8	
Zinc	μg/g	5	46	62	104	58	67	43	46	
Chromium, Hexavalent	μg/g	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Cyanide, Free	μg/g	0.040	<0.040	<0.040	< 0.040	< 0.040	<0.040	<0.040	<0.040	
Mercury	μg/g	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Electrical Conductivity (2:1)	mS/cm	0.005	0.206	0.221	0.245	0.218	0.250	0.244	0.263	
Sodium Adsorption Ratio (2:1) (Calc.)	N/A	N/A	0.368	0.767	0.304	0.237	0.266	0.809	0.815	
pH, 2:1 CaCl2 Extraction	pH Units	NA	7.58	7.35	7.28	6.72	7.06	7.09	7.11	





AGAT WORK ORDER: 22T853859 PROJECT: TP115086.1.6000.5139.57 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE: SP47 Boreholes/E-W

ATTENTION TO: Alessandro Pellerito

SAMPLED BY:MS

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

DATE RECEIVED: 2022-01-14 DATE REPORTED: 2022-01-24

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

3428908-3428935 EC was 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. SAR is a calculated parameter.

Analysis performed at AGAT Toronto (unless marked by *)

mayot Bhells AMMIST BHELD S CHEMIST O



AGAT WORK ORDER: 22T853859 PROJECT: TP115086.1.6000.5139.57 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SP47 Boreh	oles/E-W					SAMPL	LED BY:MS	
			O. R	eg. 153(511)	- OC Pesticio	des (Soil)		
DATE RECEIVED: 2022-01-14								DATE REPORTED: 2022-01-24
		SAMPLE DESCRIPT					DUP2	
		SAMPLE T				Soil	Soil	
		DATE SAMPI	.ED: 2022- 14			13 2022-01-13 11:25	3 2022-01-13	
Parameter	Unit	G/S RD					3428936	
Hexachloroethane	μg/g	0.0	1 <0	01 <0.0	)1 <0.01	<0.01	<0.01	
Gamma-Hexachlorocyclohexane	μg/g	0.0	05 <0.	005 <0.0	05 <0.005	<0.005	< 0.005	
Heptachlor	μg/g	0.0	05 <0.	0.05 <0.0	05 <0.005	< 0.005	< 0.005	
Aldrin	μg/g	0.0	05 <0.	0.05 <0.0	05 <0.005	< 0.005	< 0.005	
Heptachlor Epoxide	μg/g	0.0	05 <0.	0.05 <0.0	05 <0.005	< 0.005	< 0.005	
Endosulfan I	μg/g	0.0	05 <0.	0.05 <0.0	05 <0.005	< 0.005	< 0.005	
Endosulfan II	μg/g	0.0	05 <0.	0.05	05 <0.005	< 0.005	< 0.005	
Endosulfan	μg/g	0.0	05 <0.	0.05 <0.0	05 <0.005	< 0.005	< 0.005	
Alpha-Chlordane	μg/g	0.0	05 <0.	0.05 <0.0	05 <0.005	< 0.005	< 0.005	
gamma-Chlordane	μg/g	0.0	05 <0.	0.05 <0.0	05 <0.005	< 0.005	< 0.005	
Chlordane	μg/g	0.0	07 <0.	0.07	07 <0.007	< 0.007	< 0.007	
op'-DDE	ug/g	0.0	05 <0.	0.05	05 <0.005	< 0.005	< 0.005	
pp'-DDE	μg/g	0.0	05 <0.	0.05	05 <0.005	< 0.005	< 0.005	
DDE	μg/g	0.0	07 <0.	0.0	07 <0.007	< 0.007	< 0.007	
op'-DDD	μg/g	0.0	05 <0.	0.05	05 <0.005	< 0.005	< 0.005	
pp'-DDD	μg/g	0.0	05 <0.	0.05	05 <0.005	< 0.005	< 0.005	
DDD	μg/g	0.0	07 <0.	0.0	07 <0.007	< 0.007	< 0.007	
op'-DDT	μg/g	0.0	05 <0.	0.05 <0.0	05 <0.005	< 0.005	< 0.005	
pp'-DDT	μg/g	0.0	05 <0.	0.05	05 <0.005	< 0.005	< 0.005	
DDT (Total)	μg/g	0.0	07 <0.	0.0	07 <0.007	< 0.007	< 0.007	
Dieldrin	μg/g	0.0	05 <0.	0.05	05 <0.005	< 0.005	< 0.005	
Endrin	μg/g	0.0	05 <0.	005 <0.0	05 <0.005	<0.005	< 0.005	
Methoxychlor	μg/g	0.0	05 <0.	005 <0.0	05 <0.005	< 0.005	< 0.005	
Hexachlorobenzene	μg/g	0.0	05 <0.	005 <0.0	05 <0.005	< 0.005	< 0.005	
Hexachlorobutadiene	μg/g	0.0	1 <0	01 <0.0	)1 <0.01	<0.01	<0.01	
Moisture Content	%	0.	1 20	.7 13.	6 12.9	10.6	12.1	
wet weight OC	g	0.0	1 10	41 10.0	05 10.75	10.51	10.67	

Certified By:

MPopukolej



AGAT WORK ORDER: 22T853859 PROJECT: TP115086.1.6000.5139.57 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:SP47 Boreholes/E-W

ATTENTION TO: Alessandro Pellerito SAMPLED BY:MS

			O. Reg. 15	53(511) - OC	Pesticides	(Soil)		
DATE RECEIVED: 2022-01-14								DATE REPORTED: 2022-01-24
		SAMPLE DESCRIPTION:	E24 SS1	E26 SS1	E28 SS2	E32 SS2	DUP2	
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	
		DATE SAMPLED:	2022-01-13 14:25	2022-01-13 12:50	2022-01-13 12:05	2022-01-13 11:25	2022-01-13	
Surrogate	Unit	Acceptable Limits	3428909	3428912	3428918	3428934	3428936	
TCMX	%	50-140	91	103	82	95	104	
Decachlorobiphenyl	%	50-140	100	104	87	107	108	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

3428909-3428936 Results are based on the dry weight of the soil.

DDT total is a calculated parameter. The calculated value is the sum of op'DDT and pp'DDT. DDD total is a calculated parameter. The calculated value is the sum of op'DDD and pp'DDD. DDE total is a calculated parameter. The calculated value is the sum of op'DDE and pp'DDE.

Endosulfan total is a calculated parameter. The calculated value is the sum of Endosulfan I and Endosulfan II.

Chlordane total is a calculated parameter. The calculated value is the sum of Alpha-Chlordane and Gamma-Chlordane.

The calculated parameters are non-accredited. The parameters that are components of the calculation are accredited.

Analysis performed at AGAT Toronto (unless marked by *)





AGAT WORK ORDER: 22T853859 PROJECT: TP115086.1.6000.5139.57 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE: SP47 Boreholes/E-W

ATTENTION TO: Alessandro Pellerito SAMPLED BY:MS

O/ ((())) E (() O () () E (O) ()	10100/2 11				67 tim 225 5 1 time
		О.	Reg. 153(5	11) - PHCs F	F1 - F4 (-BTEX) (Soil)
DATE RECEIVED: 2022-01-14					DATE REPORTED: 2022-01-24
	Si	AMPLE DESCRIPTION:	E27 SS2	DUP3	
		SAMPLE TYPE:	Soil	Soil	
		DATE SAMPLED:	2022-01-13 12:35	2022-01-13	
Parameter	Unit	G/S RDL	3428916	3428937	
F1 (C6 - C10)	μg/g	5	<5	<5	
F1 (C6 to C10) minus BTEX	μg/g	5	<5	<5	
F2 (C10 to C16)	μg/g	10	<10	<10	
F3 (C16 to C34)	μg/g	50	<50	<50	
F4 (C34 to C50)	μg/g	50	<50	<50	
Gravimetric Heavy Hydrocarbons	μg/g	50	NA	NA	
Moisture Content	%	0.1	12.2	12.4	
Surrogate	Unit	Acceptable Limits			
Toluene-d8	% Recovery	50-140	86	91	
Terphenyl	%	60-140	98	89	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

3428916-3428937 Results are based on sample dry weight.

The C6-C10 fraction is calculated using toluene response factor.

C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX. The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.

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 contribution.

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.

Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Analysis performed at AGAT Toronto (unless marked by *)





AGAT WORK ORDER: 22T853859 PROJECT: TP115086.1.6000.5139.57 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE: SP47 Boreholes/E-W

ATTENTION TO: Alessandro Pellerito SAMPLED BY:MS

#### O. Reg. 153(511) - VOCs (Soil) DATE RECEIVED: 2022-01-14 DATE REPORTED: 2022-01-24 SAMPLE DESCRIPTION: E27 SS2 DUP3 SAMPLE TYPE: Soil Soil DATE SAMPLED: 2022-01-13 2022-01-13 12:35 Parameter Unit G/S RDL 3428916 3428937 Dichlorodifluoromethane µg/g 0.05 < 0.05 < 0.05 Vinyl Chloride ug/g 0.02 < 0.02 < 0.02 0.05 < 0.05 < 0.05 Bromomethane ug/g Trichlorofluoromethane 0.05 < 0.05 < 0.05 ug/g Acetone 0.50 < 0.50 < 0.50 ug/g 1,1-Dichloroethylene 0.05 < 0.05 < 0.05 ug/g Methylene Chloride ug/g 0.05 < 0.05 < 0.05 Trans- 1,2-Dichloroethylene 0.05 < 0.05 < 0.05 ug/g 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 0.02 < 0.02 ug/g < 0.02 Chloroform 0.04 < 0.04 < 0.04 ug/g 1,2-Dichloroethane 0.03 < 0.03 < 0.03 ug/g 1.1.1-Trichloroethane 0.05 < 0.05 < 0.05 ug/g Carbon Tetrachloride 0.05 < 0.05 < 0.05 ug/g Benzene 0.02 < 0.02 < 0.02 ug/g 0.03 < 0.03 1,2-Dichloropropane ug/g < 0.03 Trichloroethylene ug/g 0.03 < 0.03 < 0.03 0.05 Bromodichloromethane ug/g < 0.05 < 0.05 Methyl Isobutyl Ketone 0.50 < 0.50 ug/g < 0.50 1.1.2-Trichloroethane 0.04 < 0.04 ug/g < 0.04 0.05 Toluene ug/g < 0.05 < 0.05 Dibromochloromethane 0.05 < 0.05 < 0.05 ug/g Ethylene Dibromide ug/g 0.04 < 0.04 < 0.04 Tetrachloroethylene ug/g 0.05 < 0.05 < 0.05 1,1,1,2-Tetrachloroethane 0.04 < 0.04 < 0.04 ug/g

Certified By:

NPopukolof

ug/g

ug/g

0.05

0.05

< 0.05

< 0.05

Chlorobenzene

Ethylbenzene

< 0.05

< 0.05



AGAT WORK ORDER: 22T853859 PROJECT: TP115086.1.6000.5139.57 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE: SP47 Boreholes/E-W

ATTENTION TO: Alessandro Pellerito SAMPLED BY:MS

O/ (WII EII VO OITE. OI +/ DOIC	1101C3/L VV				0/1	WII EED DT.WO		
			O. Re	g. 153(511) -	VOCs (Soil)			
DATE RECEIVED: 2022-01-14							DATE REPORTED: 2	022-01-24
	S	AMPLE DESCRIPTION:	E27 SS2	DUP3				
		SAMPLE TYPE:	Soil	Soil				
		DATE SAMPLED:	2022-01-13 12:35	2022-01-13				
Parameter	Unit	G/S RDL	3428916	3428937				
m & p-Xylene	ug/g	0.05	<0.05	<0.05				
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				
Xylenes (Total)	ug/g	0.05	< 0.05	< 0.05				
1,3-Dichloropropene (Cis + Trans)	μg/g	0.04	< 0.04	< 0.04				
n-Hexane	μg/g	0.05	< 0.05	< 0.05				
Moisture Content	%	0.1	12.2	12.4				
Surrogate	Unit	Acceptable Limits						
Toluene-d8	% Recovery	50-140	103	102	·	·		·
4-Bromofluorobenzene	% Recovery	50-140	98	97				

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

3428916-3428937 The sample was analyzed 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.

Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene + o-Xylene.

1,3-Dichloropropene total is a calculated parameter. The calculated value is the sum of Cis-1,3-Dichloropropene and Trans-1,3-Dichloropropene.

The calculated parameters are non-accredited. The parameters that are components of the calculation are accredited.

Analysis performed at AGAT Toronto (unless marked by *)





## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE AGAT WORK ORDER: 22T853859

PROJECT: TP115086.1.6000.5139.57 ATTENTION TO: Alessandro Pellerito

SAMPLING SITE:SP47 Boreholes/E-W SAMPLED BY:MS

				Soi	l Ana	alysis	3								
RPT Date: Jan 24, 2022				UPLICATE			REFEREN	ICE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	IKE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery		ptable	Recovery		eptable mits
TANAMETER	24.0	ld	Jup	Sup	2		Value	Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inorg	ganics (Soil)	)				•					•				•
Antimony	3428908	3428908	<0.8	<0.8	NA	< 0.8	99%	70%	130%	97%	80%	120%	99%	70%	130%
Arsenic	3428908	3428908	4	4	NA	< 1	103%	70%	130%	103%	80%	120%	105%	70%	130%
Barium	3428908	3428908	105	108	2.8%	< 2.0	102%	70%	130%	111%	80%	120%	106%	70%	130%
Beryllium	3428908	3428908	0.7	0.7	NA	< 0.4	98%	70%	130%	91%	80%	120%	83%	70%	130%
Boron	3428908	3428908	7	6	NA	< 5	101%	70%	130%	93%	80%	120%	80%	70%	130%
Boron (Hot Water Soluble)	3428778		0.10	0.10	NA	< 0.10	101%	60%	140%	91%	70%	130%	104%	60%	140%
Cadmium	3428908 3	3428908	<0.5	<0.5	NA	< 0.5	97%	70%	130%	104%	80%	120%	103%	70%	
Chromium	3428908 3		26	28	7.4%	< 5	93%		130%	108%	80%	120%	113%	70%	130%
Cobalt	3428908 3		9.0	9.3	3.3%	< 0.5	100%	70%	130%	110%	80%	120%	110%	70%	
Copper	3428908 3		15.8	16.6	4.9%	< 1.0	100%	70%	130%	110%	80%	120%	110%	70%	
l and	0.400000		4.4	40	0.70/		1050/	700/	1000/	4400/	2221	1000/	1000/	700/	4000/
Lead	3428908 3		11	12	8.7%	< 1	105%	70%	130%	110%	80%	120%	103%	70%	130%
Molybdenum	3428908 3		<0.5	<0.5	NA	< 0.5	103%	70%	130%	110%	80%	120%	109%	70%	
Nickel	3428908 3		18	19	5.4%	< 1	96%	70%	130%	105%	80%	120%	106%		130%
Selenium	3428908 3		<0.8	<0.8	NA	< 0.8	103%	70%	130%	106%	80%	120%	109%	70%	
Silver	3428908 3	3428908	<0.5	<0.5	NA	< 0.5	102%	70%	130%	107%	80%	120%	105%	70%	130%
Thallium	3428908	3428908	<0.5	<0.5	NA	< 0.5	103%	70%	130%	104%	80%	120%	97%	70%	130%
Uranium	3428908	3428908	0.76	0.79	NA	< 0.50	102%	70%	130%	108%	80%	120%	104%	70%	130%
Vanadium	3428908	3428908	40.2	42.7	6.0%	< 0.4	93%	70%	130%	106%	80%	120%	112%	70%	130%
Zinc	3428908	3428908	46	48	4.3%	< 5	98%	70%	130%	112%	80%	120%	114%	70%	130%
Chromium, Hexavalent	3428908	3428908	<0.2	<0.2	NA	< 0.2	111%	70%	130%	96%	80%	120%	107%	70%	130%
Cyanide, Free	3433697		<0.040	<0.040	NA	< 0.040	92%	70%	130%	104%	80%	120%	106%	70%	130%
Mercury	3428908 3	3428908	<0.10	<0.10	NA	< 0.10	105%	70%	130%	97%	80%	120%	93%	70%	130%
Electrical Conductivity (2:1)	3428908 3		0.206	0.206	0.0%	< 0.005	109%	80%	120%	NA			NA		
Sodium Adsorption Ratio (2:1)	3428908		0.368	0.358	2.8%	N/A	NA			NA			NA		
(Calc.)	2426064		6 50	6 67	1 /10/	NΙΛ	00%	900/	1200/	NΙΛ			NΙΛ		
pH, 2:1 CaCl2 Extraction	3436064		6.58	6.67	1.4%	NA	99%	80%	120%	NA			NA		
Comments: NA signifies Not Applica pH duplicates QA acceptance criter Duplicate NA: results are under 5X	ia was met re				Analytica	al Protocol	document	-							
O. Reg. 153(511) - Metals & Inorg	ganics (Soil)	)													
pH, 2:1 CaCl2 Extraction	3428919		6.72	6.93	3.1%	NA	99%	80%	120%	NA			NA		
Comments: NA signifies Not Applica pH duplicates QA acceptance criter Duplicate NA: results are under 5X	ia was met re				Analytica	al Protocol	document								
Inorganic Chemistry (Soil)															
Chloride (2:1)	3427749		2	2	NA	< 2	95%	70%	130%	106%	80%	120%	107%	70%	130%
Sulphate (2:1)	3427749		108	109	0.9%	< 2	100%	70%	130%	105%	80%	120%	108%	70%	130%
pH (2:1)	3427749		7.35	7.36	0.1%	NA	101%	80%	120%	NA			NA		

#### AGAT QUALITY ASSURANCE REPORT (V1)

Page 10 of 20

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. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

AGAT WORK ORDER: 22T853859 PROJECT: TP115086.1.6000.5139.57 ATTENTION TO: Alessandro Pellerito

SAMPLING SITE: SP47 Boreholes/E-W SAMPLED BY:MS

Soil Analysis (Continued)															
RPT Date: Jan 24, 2022			С	UPLICAT	Έ		REFEREN	ICE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch Sar		Dup #1	Dup #2	RPD	Method Blank	Measured	Accep Lim	nite	Recovery	Lin	ptable nits	Recovery	Lin	ptable nits
		Id	.,	.,			Value	Lower	Upper	,	Lower	Upper		Lower	Upper

Comments: NA signifies Not Applicable.

pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

Duplicate NA: results are under 5X the RDL and will not be calculated.



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE AGAT WORK ORDER: 22T853859
PROJECT: TP115086.1.6000.5139.57 ATTENTION TO: Alessandro Pellerito

SAMPLING SITE:SP47 Boreholes/E-W SAMPLED BY:MS

			Trac	e Org	gani	cs Ar	alys	is							
RPT Date: Jan 24, 2022				UPLICATE	<u> </u>		REFERE	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch Sa	ample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value		eptable mits	Recovery	Lin	ptable	Recovery		ptable
							Value	Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - OC Pesticides	(Soil)														
Hexachloroethane	3417516		< 0.01	< 0.01	0.0%	< 0.01	79%	50%	140%	82%	50%	140%	70%	50%	140%
Gamma-Hexachlorocyclohexane	3417516		< 0.005	< 0.005	0.0%	< 0.005	93%	50%	140%	108%	50%	140%	97%	50%	140%
Heptachlor	3417516		< 0.005	< 0.005	0.0%	< 0.005	80%	50%	140%	87%	50%	140%	82%	50%	140%
Aldrin	3417516		< 0.005	< 0.005	0.0%	< 0.005	102%	50%	140%	96%	50%	140%	75%	50%	140%
Heptachlor Epoxide	3417516		< 0.005	< 0.005	0.0%	< 0.005	97%	50%	140%	96%	50%	140%	76%	50%	140%
Endosulfan I	3417516		< 0.005	< 0.005	0.0%	< 0.005	98%	50%	140%	85%	50%	140%	82%	50%	140%
Endosulfan II	3417516		< 0.005	< 0.005	0.0%	< 0.005	98%	50%	140%	82%	50%	140%	77%	50%	140%
Alpha-Chlordane	3417516		< 0.005	< 0.005	0.0%	< 0.005	101%	50%	140%	78%	50%	140%	72%	50%	140%
gamma-Chlordane	3417516		< 0.005	< 0.005	0.0%	< 0.005	100%	50%	140%	82%	50%	140%	70%	50%	140%
op'-DDE	3417516		< 0.005	< 0.005	0.0%	< 0.005	88%	50%	140%	78%	50%	140%	94%	50%	140%
pp'-DDE	3417516		< 0.005	< 0.005	0.0%	< 0.005	84%	50%	140%	86%	50%	140%	90%	50%	140%
op'-DDD	3417516		< 0.005	< 0.005	0.0%	< 0.005	91%	50%	140%	92%	50%	140%	86%	50%	140%
pp'-DDD	3417516		< 0.005	< 0.005	0.0%	< 0.005	90%	50%	140%	84%	50%	140%	81%	50%	140%
op'-DDT	3417516		< 0.005	< 0.005	0.0%	< 0.005	91%	50%	140%	80%	50%	140%	74%	50%	140%
pp'-DDT	3417516		< 0.005	< 0.005	0.0%	< 0.005	90%	50%	140%	86%	50%	140%	72%	50%	140%
Dieldrin	3417516		< 0.005	< 0.005	0.0%	< 0.005	93%	50%	140%	86%	50%	140%	70%	50%	140%
Endrin	3417516		< 0.005	< 0.005	0.0%	< 0.005	101%	50%	140%	82%	50%	140%	84%	50%	140%
Methoxychlor	3417516		< 0.005	< 0.005	0.0%	< 0.005	86%	50%	140%	76%	50%	140%	70%	50%	140%
Hexachlorobenzene	3417516		< 0.005	< 0.005	0.0%	< 0.005	103%	50%	140%	96%	50%	140%	102%	50%	140%
Hexachlorobutadiene	3417516		< 0.01	< 0.01	0.0%	< 0.01	103%	50%	140%	92%	50%	140%	74%	50%	140%
O. Reg. 153(511) - PHCs F1 - F4	(-BTEX) (Soil)														
F1 (C6 - C10)	3428937 3428	3937	<5	<5	NA	< 5	102%	60%	140%	110%	60%	140%	103%	60%	140%
F2 (C10 to C16)	3433707	5001	< 10	< 10	NA	< 10	101%	60%	140%	80%	60%	140%	83%	60%	140%
F3 (C16 to C34)	3433707		< 50	< 50	NA	< 50	108%	60%	140%	75%	60%	140%	65%	60%	140%
F4 (C34 to C50)	3433707		< 50	< 50	NA	< 50	86%	60%	140%	77%	60%	140%	79%	60%	140%
O. Reg. 153(511) - VOCs (Soil)															
Dichlorodifluoromethane	3425928		<0.05	<0.05	NA	< 0.05	83%	50%	140%	78%	50%	140%	102%	50%	140%
Vinyl Chloride	3425928		<0.03	<0.03	NA	< 0.03	84%	50%	140%	101%	50%	140%	89%	50%	140%
Bromomethane	3425928		<0.05	<0.02	NA	< 0.02	84%	50%	140%	99%	50%	140%	91%	50%	140%
Trichlorofluoromethane	3425928		<0.05	<0.05	NA	< 0.05	74%	50%	140%	83%	50%	140%	64%	50%	140%
Acetone	3425928		<0.50	<0.50	NA	< 0.50	93%		140%	102%		140%	108%		140%
1.1 Diobloroothylese	2425020		-0.05	-0.05	NIA	. 0.05	1040/	E00/	1.400/	4400/	600/	1200/	069/	E00/	1.400
1,1-Dichloroethylene	3425928		<0.05	< 0.05	NA NA	< 0.05	101% 103%	50% 50%		118%		130%	96%		140% 140%
Methylene Chloride Trans- 1,2-Dichloroethylene	3425928		<0.05	< 0.05	NA NA	< 0.05		50%		85% 107%	60%	130%	115%		
,	3425928		<0.05	<0.05	NA NA	< 0.05	101%	50%		107%		130%	82%	50%	
Methyl tert-butyl Ether 1,1-Dichloroethane	3425928		<0.05	<0.05	NA NA	< 0.05	106%			96% 85%		130%	98% 101%		140%
i, i-Dichiologularie	3425928		<0.02	<0.02	NA	< 0.02	118%	50%	140%	85%	60%	130%	101%	50%	140%
Methyl Ethyl Ketone	3425928		<0.50	<0.50	NA	< 0.50	86%	50%	140%	93%	50%	140%	101%	50%	140%
Cis- 1,2-Dichloroethylene	3425928		< 0.02	<0.02	NA	< 0.02	115%	50%		94%		130%	99%	50%	140%
Chloroform	3425928		< 0.04	< 0.04	NA	< 0.04	106%	50%	140%	91%	60%	130%	92%	50%	140%

AGAT QUALITY ASSURANCE REPORT (V1)

Page 12 of 20

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. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE AGAT WORK ORDER: 22T853859

PROJECT: TP115086.1.6000.5139.57 ATTENTION TO: Alessandro Pellerito

SAMPLING SITE:SP47 Boreholes/E-W SAMPLED BY:MS

SAMPLENG STE.SP47 BOTETIOLES/E-W SAMPLED BT.MS															
	7	Trace	Org	anics	Ana	alysis	(Cor	ntin	ued	)					
RPT Date: Jan 24, 2022				DUPLICAT	E		REFERE	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable	Recovery	Lie	ptable nits	Recovery		ptable
		ld	·	·			Value	Lower	Upper	,	Lower	Upper	,	Lower	Upper
1,2-Dichloroethane	3425928		<0.03	<0.03	NA	< 0.03	119%	50%	140%	106%	60%	130%	89%	50%	140%
1,1,1-Trichloroethane	3425928		<0.05	<0.05	NA	< 0.05	83%	50%	140%	102%	60%	130%	108%	50%	140%
Carbon Tetrachloride	3425928		<0.05	<0.05	NA	< 0.05	81%	50%	140%	101%	60%	130%	85%	50%	140%
Benzene	3425928		< 0.02	< 0.02	NA	< 0.02	92%	50%	140%	111%	60%	130%	108%	50%	140%
1,2-Dichloropropane	3425928		< 0.03	< 0.03	NA	< 0.03	99%	50%	140%	92%	60%	130%	87%	50%	140%
Trichloroethylene	3425928		< 0.03	< 0.03	NA	< 0.03	76%	50%	140%	88%	60%	130%	107%	50%	140%
Bromodichloromethane	3425928		<0.05	<0.05	NA	< 0.05	98%	50%	140%	107%	60%	130%	98%	50%	140%
Methyl Isobutyl Ketone	3425928		<0.50	<0.50	NA	< 0.50	107%	50%	140%	98%	50%	140%	109%	50%	140%
1,1,2-Trichloroethane	3425928		< 0.04	< 0.04	NA	< 0.04	114%	50%	140%	116%	60%	130%	104%	50%	140%
Toluene	3425928		< 0.05	< 0.05	NA	< 0.05	86%	50%	140%	88%	60%	130%	78%	50%	140%
Dibromochloromethane	3425928		< 0.05	< 0.05	NA	< 0.05	98%	50%	140%	117%	60%	130%	107%	50%	140%
Ethylene Dibromide	3425928		<0.04	<0.04	NA	< 0.04	116%	50%	140%	83%	60%	130%	100%	50%	140%
Tetrachloroethylene	3425928		<0.05	<0.05	NA	< 0.05	72%	50%	140%	111%	60%	130%	93%	50%	140%
1,1,1,2-Tetrachloroethane	3425928		< 0.04	< 0.04	NA	< 0.04	84%	50%	140%	70%	60%	130%	101%	50%	140%
Chlorobenzene	3425928		< 0.05	< 0.05	NA	< 0.05	86%	50%	140%	86%	60%	130%	109%	50%	140%
Ethylbenzene	3425928		< 0.05	< 0.05	NA	< 0.05	75%	50%	140%	102%	60%	130%	97%	50%	140%
m & p-Xylene	3425928		<0.05	<0.05	NA	< 0.05	86%	50%	140%	106%	60%	130%	103%	50%	140%
Bromoform	3425928		<0.05	<0.05	NA	< 0.05	109%	50%	140%	101%	60%	130%	102%	50%	140%
Styrene	3425928		< 0.05	< 0.05	NA	< 0.05	82%	50%	140%	107%	60%	130%	86%	50%	140%
1,1,2,2-Tetrachloroethane	3425928		< 0.05	< 0.05	NA	< 0.05	109%	50%	140%	85%	60%	130%	82%	50%	140%
o-Xylene	3425928		< 0.05	< 0.05	NA	< 0.05	84%	50%	140%	119%	60%	130%	91%	50%	140%
1,3-Dichlorobenzene	3425928		<0.05	<0.05	NA	< 0.05	92%	50%	140%	80%	60%	130%	93%	50%	140%
1,4-Dichlorobenzene	3425928		<0.05	<0.05	NA	< 0.05	92%	50%	140%	84%	60%	130%	101%	50%	140%
1,2-Dichlorobenzene	3425928		< 0.05	< 0.05	NA	< 0.05	95%	50%	140%	113%	60%	130%	92%	50%	140%
n-Hexane	3425928		<0.05	<0.05	NA	< 0.05	76%	50%	140%	108%	60%	130%	103%	50%	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).



## Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5139.57

SAMPLING SITE: SP47 Boreholes/E-W

AGAT WORK ORDER: 22T853859
ATTENTION TO: Alessandro Pellerito

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE ANALYTICAL							
Soil Analysis									
Chloride (2:1) Sulphate (2:1)	INOR-93-6004 INOR-93-6004	modified from SM 4110 B modified from SM 4110 B	ION CHROMATOGRAPH ION CHROMATOGRAPH						
pH (2:1)	INOR 93-6031	modified from EPA 9045D and MCKEAGUE 3.11	PH METER						
Electrical Conductivity (2:1)	INOR-93-6036	modified from MSA PART 3, CH 14 and SM 2510 B	EC METER						
Resistivity (2:1) (Calculated)	INOR-93-6036	McKeague 4.12, SM 2510 B,SSA #5 Part 3	CALCULATION						
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Boron (Hot Water Soluble)	MET-93-6104	modified from EPA 6010D and MSA PART 3, CH 21	ICP/OES						
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Zinc	MET 93 -6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS						
Chromium, Hexavalent	7196		SPECTROPHOTOMETER						
Cyanide, Free	4500-CN- 1, G-387		TECHNICON AUTO ANALYZER						
Mercury	MET-93-6103	modified from EPA 7471B and SM 3112 B	ICP-MS						
Sodium Adsorption Ratio (2:1) (Calc.)	INOR-93-6007	modified from EPA 6010D & Analytical Protocol	ICP/OES						



## Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5139.57 SAMPLING SITE:SP47 Boreholes/E-W AGAT WORK ORDER: 22T853859

ATTENTION TO: Alessandro Pellerito

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
pH, 2:1 CaCl2 Extraction	INDR-03-6031	modified from EPA 9045D and MCKEAGUE 3.11	PH METER

## **Method Summary**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5139.57

SAMPLING SITE: SP47 Boreholes/E-W

AGAT WORK ORDER: 22T853859 ATTENTION TO: Alessandro Pellerito

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE					
Trace Organics Analysis								
Hexachloroethane	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
Gamma-Hexachlorocyclohexane	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
Heptachlor	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
Aldrin	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
Heptachlor Epoxide	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
Endosulfan I	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
Endosulfan II	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
Endosulfan	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	CALCULATION					
Alpha-Chlordane	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
gamma-Chlordane	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
Chlordane	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	CALCULATION					
op'-DDE	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
pp'-DDE	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
DDE	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
op'-DDD	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
pp'-DDD	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
DDD	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	CALCULATION					
op'-DDT	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
pp'-DDT	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
DDT (Total)	ORG-91-5113	modified from EPA 3570, 3620C & 8081B	CALCULATION					
Dieldrin	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
Endrin	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
Methoxychlor	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
Hexachlorobenzene	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
Hexachlorobutadiene	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
тсмх	ORG-91-5112	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
Decachlorobiphenyl	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD					
Moisture Content	VOL-91-5009	CCME Tier 1 Method	BALANCE					

## **Method Summary**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE AGAT WORK ORDER: 22T853859
PROJECT: TP115086.1.6000.5139.57 ATTENTION TO: Alessandro Pellerito

SAMPLING SITE:SP47 Boreholes/E-W SAMPLED BY:MS

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
wet weight OC	ORG-91-5113		BALANCE
F1 (C6 - C10)	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/FID
Toluene-d8	VOL-91-5009	modified from EPA SW-846 5030C & 8260D	(P&T)GC/MS
F2 (C10 to C16)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F3 (C16 to C34)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F4 (C34 to C50)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
Dichlorodifluoromethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Vinyl Chloride	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Bromomethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Acetone	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Methylene Chloride	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Trans- 1,2-Dichloroethylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Methyl tert-butyl Ether	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Cis- 1,2-Dichloroethylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Chloroform	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Benzene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Trichloroethylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Bromodichloromethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS

# Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5139.57 SAMPLING SITE:SP47 Boreholes/E-W AGAT WORK ORDER: 22T853859
ATTENTION TO: Alessandro Pellerito

SAMPLING SITE.SP47 BUTCHOICE/E-W		SAMPLED BY.MS	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Toluene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Dibromochloromethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Chlorobenzene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Ethylbenzene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
m & p-Xylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Bromoform	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Styrene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
o-Xylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Xylenes (Total)	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,3-Dichloropropene (Cis + Trans)	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
n-Hexane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Toluene-d8	VOL-91-5002	modified from EPA 5035A & EPA 8260D	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5002	modified from EPA 5035A & EPA 8260D	(P&T)GC/MS
Moisture Content	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE



5835 Coopers Avenue Mississauga, Ontairo L47/1Y2 Ph: 905.712.5100 Fax: 905.712.5122 webearth.agatlabs.com

Laboratory Use	Only		
Work Order #: 2	278	538	59
Cooler Quantity:			
Arrival Temperatures:	2.4	3.3	2.2
Custody Seal Intact:	□Yes •	₽Mo	□N/A
Notes:	$\sim$ 104	2	

Chain of C				ase use Drini	se use Drinking Water Chain of Custody Form (potable water consumed by humans)								Arri	val Tem	perature	es:	31	513	7.3	2 2.	2
Report Inform	mation: Wood				gulatory Requ								Cus	tody Se	al Intaci		□Yes.		H100	12	□N/A
Contact:	Alessandro Pellerito				egulation 153/04	Excess Soils R	406	Sev	ver Us	ie		1	IVO	.05		-					
Address:	50 Vogell Road, Richm	ond Hill, ON, L41	B 3K6		,			□s	anitary	St	orm		Turi	narou	nd Ti	me (	TAT)	Requi	ired:		
					lnd/Com	Table	0	-	Regi	on			Reg	ular T	ΔT	r	71 5 to	7 Busir	ness Day	√S.	
Phone:	647-982-6220	Fax:			Res/Park  Agriculture	Regulation 55	8	Pro	v. Wat	er Quali	ty		Rus	h TAT	Rush Surci	Line	_				
Reports to be sent to:	a pellerito@woodplc.com				exture (Check One;		Ι,	Obj	ective	s (PWQ	))	- 1									
1_ Email:					Coarse	CCME	1	Olh	er			1		Days	isiness s		☐ Day	usiness s		Day	Business
2. Email:	shami.malla@woodplc.co	ın			]Fine	1	-	_	Indica	e One		-		OR	Date Re	equired	l (Rush	Surcha	rges Ma	y Apply):	:
Project Inform	mation:				this submissi					leline											_6
Project:	TP115086.1,6000.5139.53	73000		Re	cord of Site Co	ondition?	Cei	rtifica	ite o	f Anal		70							on for ru d statuto	ush IAI ory holidi	ays
Site Location:	SP47/Boreholes E-W				] Yes ☑	] No		Yes	3	<b>V</b>	No		F	or 'Sam	e Day' a	analys	ls, plea:	se cont	act you	r AGAT C	CPM
Sampled By:	Mohammad Safarpanah 305848			-  -			1	0.	Reg 1	53			0, Reg 558		_						
AGAT Quote #:	Please note: If grantation mumber	PO:	be billed full price for analysis.	San	nple Matrix Le	gend	, DOC			o _N			SBS		Package =4						n IY/h
Contact: Address: Email:	APInvoice.Canada <apin< th=""><th>voice,canada@we</th><th>podplc.com&gt;</th><th>Sample</th><th>Paint Soil Sediment Surface Water</th><th>nments/</th><th>Field Filtered - Metals, Hg, CrVI,</th><th>Metals &amp; Inorganics</th><th>Metals - □ CrVI, □ Hg, □ HWSB</th><th>BTEX, F1-F4 PHCs Analyze F4G if required □ Yes</th><th>s</th><th></th><th>Landfil Disposal Characterization TCLP: TCLP: ☐ M&amp; ☐ Voos ☐ ABNs ☐ B(a)P ☐ P</th><th>Excess Soils SPLP Rainwater SPLP: ☐ Metals ☐ Vocs ☐ Svo</th><th>Excess Soils Characterization pH, ICPMS Metals, BTEX, F1-F</th><th></th><th>C pesticides</th><th></th><th></th><th></th><th>Potentially Hazardous or High</th></apin<>	voice,canada@we	podplc.com>	Sample	Paint Soil Sediment Surface Water	nments/	Field Filtered - Metals, Hg, CrVI,	Metals & Inorganics	Metals - □ CrVI, □ Hg, □ HWSB	BTEX, F1-F4 PHCs Analyze F4G if required □ Yes	s		Landfil Disposal Characterization TCLP: TCLP: ☐ M& ☐ Voos ☐ ABNs ☐ B(a)P ☐ P	Excess Soils SPLP Rainwater SPLP: ☐ Metals ☐ Vocs ☐ Svo	Excess Soils Characterization pH, ICPMS Metals, BTEX, F1-F		C pesticides				Potentially Hazardous or High
Samp	ole Identification	Sampled	Sampled Container		Special	Instructions	Y/N	ĭ Şe	Me	Ana	PAHS	VOC	교 교	Excess SPLP:	및 된	Salt -	2				Pote
E23 SS1		13 Jan 22	14:50 AM 1	S				Ø											111		
E24 SS1		13 Jan 22	14:25 AM 1	S														17			
E24 SS2		13 Jan 22	14:30 AM 1	S	HOLD																
E25 SS1		13 Jan 22	13:50 AM 1	S															1		
E26 SS1		13 Jan 22	12:50 AM 1	S													<b>7</b>				
E26 SS2		13 Jan 22	12:55 AM PM 1	S	HOLD																
E27 SS1		13 Jan 22	12:30 AM 1	S	1			<b>V</b>													
E27 SS2		13 Jan 22	12:35 AM 3	S						7		<b>V</b>									
E28 SS1		13 Jan 22	12:00 AM 1	S	HOLD																
E28 SS2		13 Jan 22	12:05 AM 1	S													7		V		
E29 SS1		13 Jan 22	9:10 AM I	S				V													
Samples Relinguished Dv (Pr Mohammad Safar	panah			3:00	Sampled Retinived by 6	aks ha	ry	a		TH	- 0	Jan	114	Tinie	4:5	0					
Saroples Relinion theri By (Pr	no Name and Signt		Itsatu 3000		Samples Geneved for	Print Name and Corn	1				Da	le		Tima			F	Page 1	of	f 2	- 1
Samiles Belling asped By (Pe	unt Name and Sier i		Time Time		Samples Received By I	Print Name and Sign):	V				-Ua	le		Tiere		1	V				

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



Mississauga Ontario 142 1Y2 Ph: 905-712-5100 Fax: 905.712-5122 webcarth agatlabs.com

Work Order #:			
Cooler Quantity:			
Arrival Temperatures:	_		
Custody Seal Intact:	□Yes	ПNо	□N/A

Chain of Custody Record If this is a Drinking Water sample, please						_				-			er Quantit al Temper		:		1	- 1	-	
Snain of C	sustoay Reco	Ord If this is a	Drinking Water sample	, please use Drii	nking Water Chain of	Custody Form (pola	able water o	onsumo	d by h	umans)								1	1	
Report Inform Company:	Wood				egulatory Requise check at applicable boxes								Custo	ody Seal I s:	ntact:		]Yes		No	□N/A
Contact: Address:	Alessandro Pellerito 50 Vogell Road, Rich	mond Hill, ON, L4	B 3K6		Regulation 153/04  Table Industrial Industrial	Table Indicate Or		Sew Sew	er Us anitary Regio	☐ St	orm			around			-	equire		
Phone: Reports to be sent to:	647-982-6220	Fax:			□ Res/Park □ Agriculture	Regulation 55	58 [		. Wat	er Quali s (PWQ0				TAT (Rust	n Surcha		ly)			
1. Email:	a.pellerito@woodplc.co shami.malla@woodplc.			- (	Texture (Check One) □Coarse □Fine	ССМЕ	[	Othe	er	e Our				3 Busir Days OR Dat		uired (	2 Busi Days Rush Su	iness urcharges	□ D;	,
Project Information: Project: Site Location: Sampled By:	mation: TP115086.1.6000.5139 SP47/Boreholes E-W Mohammad Safarpana			Re	Is this submission for a Report Guideline o Certificate of Analys  ☐ Yes ☑ No ☐ Yes ☑ N					/sis	Please provide prior notification for rush TAT *TAT is exclusive of weekends and statutory hol.  For 'Same Day' analysis, please contact your AGAT							olidays		
AGAT Quote #:	305848	P0:	Il be tilled full price for analysis	Sal B	mple Matrix Leg	gend	CrVI, DOC	0.	Reg 1	o _N			O. Reg 558	O. Reg 40	16					ion (Y/N)
Invoice Inform Company: Contact: Address: Email:	mation: Wood PLC  APInvoice.Canada <ap< td=""><td>oinvoice.canada@w</td><td></td><td>O P S SD SW</td><td>Oil Paint Soil Sediment Surface Water</td><td></td><td>Fleid Filtered - Metals, Hg, C</td><td>PO  </td><td></td><td>, F1-F4 PHCs ze F4G if required □ Yes □</td><td></td><td></td><td>Disposal Characterizatio M&amp;I □VOCs □ ABNs □ B(</td><td>Solls SPLP Kainwater Le I Metals □ VOCs □ SVOCs Solls Characterization Pa</td><td>pH, ICPMS Metals, BTEX, F1-F4</td><td>pesticides</td><td></td><td></td><td></td><td>tially Hazardous or Hign Concentr</td></ap<>	oinvoice.canada@w		O P S SD SW	Oil Paint Soil Sediment Surface Water		Fleid Filtered - Metals, Hg, C	PO		, F1-F4 PHCs ze F4G if required □ Yes □			Disposal Characterizatio M&I □VOCs □ ABNs □ B(	Solls SPLP Kainwater Le I Metals □ VOCs □ SVOCs Solls Characterization Pa	pH, ICPMS Metals, BTEX, F1-F4	pesticides				tially Hazardous or Hign Concentr
Samp	ole Identification	Date Sampled	Time # Conta			ments/ nstructions	Y/N	Metals	Metals - [	BTEX, F1 Analyze	PCBs	VOC	Landf TCLP:	SPLP:	pH, IC	00	3			Poten
E29 SS2 E30 SS1		13 Jan 22 13 Jan 22	9:15 AM 3 9:35 AM 1	S	HOLD			Ø												
E30 SS2 E31 SS1		13 Jan 22 13 Jan 22	9:40 AM 1 11:00 AM 1	S	HOLD									-	-					
E31 SS2		13 Jan 22	11:05 AM 3	S	HOLD										3					
E32 SS1		13 Jan 22	11:20 AM I	S																
E32 SS2		13 Jan 22	11:25 AM PM 1	S																
DUP 1		13 Jan 22	AM 1	S				Ø					4	- 1						
DUP 2 DUP 3		13 Jan 22 13 Jan 22	AM 1 AM 3	S						7										
			AM PM			10				31										
Samples Relinquished By (Pr Mohammad Safar) Saniples Relinquished By (Pr	panah		13 January 202	18:00	Samples Received By (Pr	ner Name and Son	y	~		秋	Date			Time			Pag	ge <u>2</u>	of 2	

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



CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE 50 VOGELL ROAD, UNIT 3&4
RICHMOND HILL, ON L4B 3K6

ATTENTION TO: Alessandro Pellerito

PROJECT: TP115086.1.6000.5800.573000

AGAT WORK ORDER: 22T853869

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Lab Manager TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

DATE REPORTED: Jan 25, 2022

PAGES (INCLUDING COVER): 24 VERSION*: 1

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

*Notes	

#### Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
  incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other
  third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the
  services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
  merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
  contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Page 1 of 24

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. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.



AGAT WORK ORDER: 22T853869

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE: SP47/Boreholes F-W

ATTENTION TO: Alessandro Pellerito SAMPLED BY: Mohammad Safarpanah

SAMPLING SITE: SP47/Boren	oles E-W						SAMPLE	D BY:Mohan	nmad Safarpanah
			0.	Reg. 153(	511) - Metal:	s & Inorgan	ics (Soil)		
DATE RECEIVED: 2022-01-14									DATE REPORTED: 2022-01-25
		SAMPLE DESC	RIPTION:	E1 SS1	E2 SS1	E3 SS1	E5 SS2	E7 SS1	
		SAMPL	_E TYPE:	Soil	Soil	Soil	Soil	Soil	
		DATE SA	AMPLED:	2022-01-11	2022-01-11	2022-01-11	2022-01-11	2022-01-11	
				12:00	12:25	13:10	14:00	14:15	
Parameter	Unit	G/S	RDL	3429023	3429025	3429028	3429040	3429041	
Antimony	μg/g		8.0	<0.8	<0.8	<0.8	<0.8	<0.8	
Arsenic	μg/g		1	5	5	5	4	5	
Barium	μg/g		2.0	99.0	96.0	125	40.2	94.0	
Beryllium	μg/g		0.4	0.8	0.8	0.8	0.5	0.8	
Boron	μg/g		5	10	10	10	<5	8	
Boron (Hot Water Soluble)	μg/g		0.10	0.24	<0.10	<0.10	<0.10	<0.10	
Cadmium	μg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Chromium	μg/g		5	30	30	33	16	28	
Cobalt	μg/g		0.5	10.8	13.2	14.8	5.3	11.5	
Copper	μg/g		1.0	24.1	26.4	27.8	14.9	23.1	
Lead	μg/g		1	16	11	13	6	10	
Molybdenum	μg/g		0.5	0.5	<0.5	<0.5	<0.5	<0.5	
Nickel	μg/g		1	23	26	29	12	24	
Selenium	μg/g		0.8	<0.8	<0.8	<0.8	<0.8	<0.8	
Silver	μg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Thallium	μg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Uranium	μg/g		0.50	0.90	0.64	0.77	0.55	0.63	
Vanadium	μg/g		0.4	39.1	40.0	46.9	27.5	37.9	
Zinc	μg/g		5	94	67	72	35	59	
Chromium, Hexavalent	μg/g		0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Cyanide, Free	μg/g		0.040	< 0.040	< 0.040	< 0.040	<0.040	<0.040	
Mercury	μg/g		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Electrical Conductivity (2:1)	mS/cm		0.005	0.304	0.227	0.260	0.167	0.211	
Sodium Adsorption Ratio (2:1) (Calc.)	N/A		N/A	0.508	0.343	0.423	0.127	0.235	
	1111 %			7.40	7.04		7.04	7.00	

Certified By:

7.24

7.33

7.37



pH Units

pH, 2:1 CaCl2 Extraction

7.24

7.10



AGAT WORK ORDER: 22T853869

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:SP47/Boreholes E-W

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammad Safarpanah

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

DATE RECEIVED: 2022-01-14 DATE REPORTED: 2022-01-25

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

3429023-3429041 EC was 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. SAR is a calculated parameter.

Analysis performed at AGAT Toronto (unless marked by *)

mayot Bhells AMMERTERED CHEMIST



AGAT WORK ORDER: 22T853869

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE: SP47/Boreholes E-W

ATTENTION TO: Alessandro Pellerito SAMPLED BY: Mohammad Safarpanah

			O. Reg.	558 Metals and Inorganics
DATE RECEIVED: 2022-01-14				DATE REPORTED: 2022-01-25
	S	AMPLE DESCRIPTION:	E5 SS1	
		SAMPLE TYPE:	Soil	
		DATE SAMPLED:	2022-01-11 13:55	
Parameter	Unit	G/S RDL	3429039	
Arsenic Leachate	mg/L	0.010	<0.010	
Barium Leachate	mg/L	0.010	0.250	
Boron Leachate	mg/L	0.050	< 0.050	
Cadmium Leachate	mg/L	0.010	<0.010	
Chromium Leachate	mg/L	0.050	< 0.050	
Lead Leachate	mg/L	0.010	<0.010	
Mercury Leachate	mg/L	0.01	<0.01	
Selenium Leachate	mg/L	0.010	<0.010	
Silver Leachate	mg/L	0.010	<0.010	
Uranium Leachate	mg/L	0.050	< 0.050	
Fluoride Leachate	mg/L	0.10	<0.10	
Cyanide Leachate	mg/L	0.05	< 0.05	
(Nitrate + Nitrite) as N Leachate	mg/L	0.70	<0.70	

RDL - Reported Detection Limit; G / S - Guideline / Standard Comments:

Analysis performed at AGAT Toronto (unless marked by *)



AGAT WORK ORDER: 22T853869

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE: SP47/Boreholes E-W

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammad Safarpanah

			O. Reg. 1	53(511) - OC F	esticides (Soil)	
DATE RECEIVED: 2022-01-14						DATE REPORTED: 2022-01-25
	5	SAMPLE DESCRIPTION:	E2 SS1	E3 SS2		
		SAMPLE TYPE:	Soil	Soil		
		DATE SAMPLED:	2022-01-11 12:25	2022-01-11 13:15		
Parameter	Unit	G/S RDL	3429025	3429029		
Hexachloroethane	μg/g	0.01	<0.01	<0.01		
Gamma-Hexachlorocyclohexane	μg/g	0.005	< 0.005	< 0.005		
Heptachlor	μg/g	0.005	< 0.005	<0.005		
Aldrin	μg/g	0.005	< 0.005	< 0.005		
Heptachlor Epoxide	μg/g	0.005	< 0.005	<0.005		
Endosulfan I	μg/g	0.005	< 0.005	< 0.005		
Endosulfan II	μg/g	0.005	< 0.005	< 0.005		
Endosulfan	μg/g	0.005	< 0.005	< 0.005		
Alpha-Chlordane	μg/g	0.005	< 0.005	< 0.005		
gamma-Chlordane	μg/g	0.005	< 0.005	< 0.005		
Chlordane	μg/g	0.007	< 0.007	< 0.007		
op'-DDE	ug/g	0.005	< 0.005	< 0.005		
pp'-DDE	μg/g	0.005	< 0.005	<0.005		
DDE	μg/g	0.007	< 0.007	< 0.007		
op'-DDD	μg/g	0.005	< 0.005	< 0.005		
op'-DDD	μg/g	0.005	< 0.005	< 0.005		
DDD	μg/g	0.007	< 0.007	< 0.007		
pp'-DDT	μg/g	0.005	< 0.005	<0.005		
pp'-DDT	μg/g	0.005	<0.005	< 0.005		
DDT (Total)	μg/g	0.007	<0.007	<0.007		
Dieldrin	μg/g	0.005	<0.005	<0.005		
Endrin	μg/g	0.005	< 0.005	< 0.005		
Methoxychlor	μg/g	0.005	<0.005	<0.005		
Hexachlorobenzene	μg/g	0.005	< 0.005	< 0.005		
Hexachlorobutadiene	μg/g	0.01	<0.01	<0.01		
Moisture Content	%	0.1	13.4	21.7		
wet weight OC	g	0.01	10.18	10.25		





AGAT WORK ORDER: 22T853869

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE: SP47/Boreholes E-W

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammad Safarpanah

O. Reg. 153(511) - OC Pesticides (Soil)										
DATE RECEIVED: 2022-01-14	2022-01-14 DATE REPORTED: 2022-01-25									
	SAMPLE DESCRIPTION: E2 SS1 E3 SS2									
		SAMPLE TYPE:	Soil	Soil						
		DATE SAMPLED:	2022-01-11 12:25	2022-01-11 13:15						
Surrogate	Unit	Acceptable Limits	3429025	3429029						
TCMX	%	50-140	81	104						
Decachlorobiphenyl	%	50-140	88	108						

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

3429025-3429029 Results are based on the dry weight of the soil.

DDT total is a calculated parameter. The calculated value is the sum of op'DDT and pp'DDT. DDD total is a calculated parameter. The calculated value is the sum of op'DDD and pp'DDD.

DDE total is a calculated parameter. The calculated value is the sum of op'DDE and pp'DDE.

Endosulfan total is a calculated parameter. The calculated value is the sum of Endosulfan I and Endosulfan II.

Chlordane total is a calculated parameter. The calculated value is the sum of Alpha-Chlordane and Gamma-Chlordane.

The calculated parameters are non-accredited. The parameters that are components of the calculation are accredited.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

NPoprikolof



AGAT WORK ORDER: 22T853869

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE: SP47/Boreholes E-W

ATTENTION TO: Alessandro Pellerito SAMPLED BY: Mohammad Safarpanah

O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Soil)									
DATE RECEIVED: 2022-01-14				DATE REPORTED: 2022-01-25					
	SA	AMPLE DESCRIPTION:	E2 SS2						
		SAMPLE TYPE:	Soil						
		DATE SAMPLED:							
Parameter	Unit	G/S RDL	3429027						
F1 (C6 - C10)	μg/g	5	<5						
F1 (C6 to C10) minus BTEX	μg/g	5	<5						
F2 (C10 to C16)	μg/g	10	<10						
F3 (C16 to C34)	μg/g	50	<50						
F4 (C34 to C50)	μg/g	50	<50						
Gravimetric Heavy Hydrocarbons	μg/g	50	NA						
Moisture Content	%	0.1	19.3						
Surrogate	Unit	Acceptable Limits							
Toluene-d8	% Recovery	50-140	102						
Terphenyl	%	60-140	95						

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

3429027 Results are based on sample dry weight.

The C6-C10 fraction is calculated using toluene response factor.

C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX. The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.

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 contribution.

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.

Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

NPoprukolof



AGAT WORK ORDER: 22T853869

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE:SP47/Boreholes E-W

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammad Safarpanah

			O. Reg	. 153(511) - VOCs (Soil)
DATE RECEIVED: 2022-01-14				DATE REPORTED: 2022-01-25
	5	SAMPLE DESCRIPTION:	E2 SS2	
		SAMPLE TYPE:	Soil	
		DATE SAMPLED:	2022-01-11	
_			12:30	
Parameter	Unit	G/S RDL	3429027	
Dichlorodifluoromethane	μg/g	0.05	<0.05	
Vinyl Chloride	ug/g	0.02	<0.02	
Bromomethane	ug/g	0.05	<0.05	
Trichlorofluoromethane	ug/g	0.05	<0.05	
Acetone	ug/g	0.50	<0.50	
1,1-Dichloroethylene	ug/g	0.05	<0.05	
Methylene Chloride	ug/g	0.05	<0.05	
Trans- 1,2-Dichloroethylene	ug/g	0.05	<0.05	
Methyl tert-butyl Ether	ug/g	0.05	<0.05	
1,1-Dichloroethane	ug/g	0.02	<0.02	
Methyl Ethyl Ketone	ug/g	0.50	<0.50	
Cis- 1,2-Dichloroethylene	ug/g	0.02	<0.02	
Chloroform	ug/g	0.04	<0.04	
1,2-Dichloroethane	ug/g	0.03	< 0.03	
1,1,1-Trichloroethane	ug/g	0.05	< 0.05	
Carbon Tetrachloride	ug/g	0.05	<0.05	
Benzene	ug/g	0.02	< 0.02	
1,2-Dichloropropane	ug/g	0.03	< 0.03	
Trichloroethylene	ug/g	0.03	< 0.03	
Bromodichloromethane	ug/g	0.05	<0.05	
Methyl Isobutyl Ketone	ug/g	0.50	<0.50	
1,1,2-Trichloroethane	ug/g	0.04	<0.04	
Toluene	ug/g	0.05	< 0.05	
Dibromochloromethane	ug/g	0.05	< 0.05	
Ethylene Dibromide	ug/g	0.04	<0.04	
Tetrachloroethylene	ug/g	0.05	<0.05	
1,1,1,2-Tetrachloroethane	ug/g	0.04	<0.04	
Chlorobenzene	ug/g	0.05	<0.05	
Ethylbenzene	ug/g	0.05	<0.05	





AGAT WORK ORDER: 22T853869

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SAMPLING SITE: SP47/Boreholes E-W

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammad Safarpanah

			O. Re	g. 153(511) - VOCs (Soil)
DATE RECEIVED: 2022-01-14				DATE REPORTED: 2022-01-25
		AMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED:	E2 SS2 Soil 2022-01-11 12:30	
Parameter	Unit	G/S RDL	3429027	
m & p-Xylene	ug/g	0.05	<0.05	
Bromoform	ug/g	0.05	<0.05	
Styrene	ug/g	0.05	<0.05	
1,1,2,2-Tetrachloroethane	ug/g	0.05	< 0.05	
o-Xylene	ug/g	0.05	< 0.05	
1,3-Dichlorobenzene	ug/g	0.05	<0.05	
1,4-Dichlorobenzene	ug/g	0.05	< 0.05	
1,2-Dichlorobenzene	ug/g	0.05	<0.05	
Xylenes (Total)	ug/g	0.05	< 0.05	
1,3-Dichloropropene (Cis + Trans)	μg/g	0.04	<0.04	
n-Hexane	μg/g	0.05	< 0.05	
Moisture Content	%	0.1	19.3	
Surrogate	Unit	Acceptable Limits		
Toluene-d8	% Recovery	50-140	101	
4-Bromofluorobenzene	% Recovery	50-140	96	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

3429027

The sample was analyzed 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.

Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene + o-Xylene.

1,3-Dichloropropene total is a calculated parameter. The calculated value is the sum of Cis-1,3-Dichloropropene and Trans-1,3-Dichloropropene.

The calculated parameters are non-accredited. The parameters that are components of the calculation are accredited.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

NPoprukolef



AGAT WORK ORDER: 22T853869

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

SAMPLING SITE:SP47/Boreholes E-W

ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammad Safarpanah

O. Reg. 558 - Benzo(a) pyrene									
DATE RECEIVED: 2022-01-14				DATE REPORTED: 2022-01-25					
SAMPLE DESCRIPTION:			ON: E5 SS1						
	SAMPLE TYPE:		PE: Soil						
		DATE SAMPL	ED: 2022-01-11 13:55						
Parameter	Unit	G/S RD	3429039						
Benzo(a)pyrene Leachate	mg/L	0.00	1 <0.001						
Surrogate	Unit	Acceptable Limi	ts						
Acridine-d9	%	50-140	78						
Naphthalene-d8	%	50-140	85						
Terphenyl-d14	%	50-140	99						

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

3429039 The sample was leached according to Regulation 558 protocol. Analysis was performed on the leachate.

Analysis performed at AGAT Toronto (unless marked by *)





CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

Certificate of Analysis

AGAT WORK ORDER: 22T853869

PROJECT: TP115086.1.6000.5800.573000

ATTENTION TO: Alessandro Pellerito

SAMPLED BY: Mohammad Safarpanah

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

O Pog 559 PCPc

					O. Reg. 558 - PCBs
DATE RECEIVED: 2022-01-14					DATE REPORTED: 2022-01-25
	S	AMPLE DESCRI	IPTION:	E5 SS1	
		SAMPLE	TYPE:	Soil	
		DATE SAN	MPLED: 2	2022-01-11 13:55	
Parameter	Unit	G/S	RDL	3429039	
PCB's Leachate	mg/L	(	0.005	<0.005	
Surrogate	Unit	Acceptable L	Limits		
Decachlorobiphenyl	%	50-140		117	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

3429039 The soil sample was leached using the Regulation 558 procedure. Analysis was performed on the leachate.

PCB total is a calculated parameter. The calculated value is the sum of Aroclor 1242, Aroclor 1248, Aroclor 1254 and Aroclor 1260.

Analysis performed at AGAT Toronto (unless marked by *)

SAMPLING SITE: SP47/Boreholes E-W





SAMPLING SITE: SP47/Boreholes E-W

Certificate of Analysis

AGAT WORK ORDER: 22T853869

PROJECT: TP115086.1.6000.5800.573000

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

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

ATTENTION TO: Alessandro Pellerito SAMPLED BY: Mohammad Safarpanah

O. Reg. 558 - VOCs

			`	2. Neg. 330 - VOC3
DATE RECEIVED: 2022-01-14				DATE REPORTED: 2022-01-25
	S	AMPLE DESCRIPTION:	E5 SS1	
		SAMPLE TYPE:	Soil	
		DATE SAMPLED:	2022-01-11 13:55	
Parameter	Unit	G/S RDL	3429039	
Vinyl Chloride Leachate	mg/L	0.030	<0.030	
1,1 Dichloroethene Leachate	mg/L	0.020	<0.020	
Dichloromethane Leachate	mg/L	0.030	<0.030	
Methyl Ethyl Ketone Leachate	mg/L	0.090	<0.090	
Chloroform Leachate	mg/L	0.020	<0.020	
1,2-Dichloroethane Leachate	mg/L	0.020	<0.020	
Carbon Tetrachloride Leachate	mg/L	0.020	<0.020	
Benzene Leachate	mg/L	0.020	<0.020	
Trichloroethene Leachate	mg/L	0.020	<0.020	
Tetrachloroethene Leachate	mg/L	0.050	<0.050	
Chlorobenzene Leachate	mg/L	0.010	<0.010	
1,2-Dichlorobenzene Leachate	mg/L	0.010	<0.010	
1,4-Dichlorobenzene Leachate	mg/L	0.010	<0.010	
Surrogate	Unit	Acceptable Limits		
Toluene-d8	% Recovery	50-140	100	
4-Bromofluorobenzene	% Recovery	50-140	83	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

3429039 Sample was prepared using Regulation 558 protocol and a zero headspace extractor.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

NPoprukolof



#### **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE:SP47/Boreholes E-W AGAT WORK ORDER: 22T853869
ATTENTION TO: Alessandro Pellerito
SAMPLED BY:Mohammad Safarpanah

				Soi	l Ana	alysis	3								
RPT Date: Jan 25, 2022				DUPLICATI	 E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery	Lir	ptable nits	Recovery		ptable nits
T/HVHVETER		ld	500	2492	5		Value	Lower	Upper	. 1.000 7 0. )	Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inor	rganics (Soil)	)						•						•	•
Antimony	3429023	3429023	<0.8	<0.8	NA	< 0.8	110%	70%	130%	100%	80%	120%	101%	70%	130%
Arsenic	3429023	3429023	5	5	0.0%	< 1	123%	70%	130%	106%	80%	120%	96%	70%	130%
Barium	3429023	3429023	99.0	103	4.0%	< 2.0	112%	70%	130%	99%	80%	120%	94%	70%	130%
Beryllium	3429023	3429023	0.8	0.8	NA	< 0.4	91%	70%	130%	103%	80%	120%	90%	70%	130%
Boron	3429023	3429023	10	11	NA	< 5	88%	70%	130%	107%	80%	120%	85%	70%	130%
Boron (Hot Water Soluble)	3431742		<0.10	<0.10	NA	< 0.10	98%	60%	140%	92%	70%	130%	100%	60%	140%
Cadmium	3429023	3429023	<0.5	<0.5	NA	< 0.5	103%	70%	130%	106%	80%	120%	97%	70%	130%
Chromium	3429023		30	31	3.3%	< 5	109%	70%	130%	101%	80%	120%	116%	70%	130%
Cobalt	3429023		10.8	11.5	6.3%	< 0.5	111%		130%	103%	80%	120%	99%		130%
Copper	3429023		24.1	24.2	0.4%	< 1.0	101%		130%	104%	80%		92%		130%
Lead	3429023 3	3420023	16	17	6.1%	< 1	110%	70%	130%	100%	80%	120%	94%	70%	130%
Molybdenum	3429023		0.5	0.5	0.176 NA	< 0.5	112%		130%	106%	80%	120%	101%		130%
Nickel	3429023		23	24	4.3%	< 1	106%		130%	98%	80%	120%	91%		130%
Selenium	3429023		<0.8	<0.8	4.3% NA	< 0.8	119%	70%	130%	96% 109%	80%	120%	100%		130%
Silver	3429023	3429023	<0.5	<0.5	NA	< 0.5	101%	70%	130%	105%	80%	120%	88%	70%	130%
Thallium	3429023	3429023	<0.5	<0.5	NA	< 0.5	125%	70%	130%	100%	80%	120%	95%	70%	130%
Uranium	3429023	3429023	0.90	0.93	NA	< 0.50	115%	70%	130%	96%	80%	120%	97%	70%	130%
Vanadium	3429023	3429023	39.1	41.2	5.2%	< 0.4	116%	70%	130%	95%	80%	120%	99%	70%	130%
Zinc	3429023	3429023	94	95	1.1%	< 5	114%	70%	130%	113%	80%	120%	106%	70%	130%
Chromium, Hexavalent	3428908		<0.2	<0.2	NA	< 0.2	111%	70%	130%	96%	80%	120%	107%	70%	130%
Cyanide, Free	3429041	3429041	<0.040	<0.040	NA	< 0.040	92%	70%	130%	104%	80%	120%	107%	70%	130%
Mercury	3429023	3429023	<0.10	< 0.10	NA	< 0.10	109%	70%	130%	101%	80%	120%	97%	70%	130%
Electrical Conductivity (2:1)	3429023	3429023	0.304	0.300	1.3%	< 0.005	109%	80%	120%	NA			NA		
Sodium Adsorption Ratio (2:1) (Calc.)	3429023	3429023	0.508	0.508	0.0%	NA	NA			NA			NA		
pH, 2:1 CaCl2 Extraction	3428919		6.72	6.93	3.1%	NA	99%	80%	120%	NA			NA		
Comments: NA signifies Not Applic pH duplicates QA acceptance crite Duplicate NA: results are under 5X	ria was met re				f Analytica	al Protocol	document								
O. Reg. 558 Metals and Inorgan	ics														
Arsenic Leachate	3432229		<0.010	<0.010	NA	< 0.010	102%	70%	130%	109%	80%	120%	120%	70%	130%
Barium Leachate	3432229		0.431	0.448	3.8%	< 0.010			130%	109%	80%	120%	124%		130%
Boron Leachate	3432229		0.136	0.141	NA	< 0.050	100%	70%	130%	100%	80%	120%	91%	70%	130%
Cadmium Leachate	3432229		<0.010	<0.010	NA	< 0.010	99%	70%	130%	100%	80%	120%	98%	70%	130%
Chromium Leachate	3432229		<0.050	<0.050	NA	< 0.050	106%	70%	130%	112%	80%	120%	118%	70%	130%
Lead Leachate	3432229		<0.010	<0.010	NA	< 0.010	104%	70%	130%	106%	80%	120%	98%	70%	130%
Mercury Leachate	3432229		<0.01	<0.01	NA	< 0.010	103%		130%	91%		120%	90%		130%
Selenium Leachate	3432229		<0.010	<0.010	NA	< 0.010			130%	111%		120%	114%		130%
Silver Leachate	3432229		<0.010	<0.010	NA NA	< 0.010			130%	108%		120%	102%		130%
Silver Leadriale	3432229		<0.010	<0.010	INA	< 0.010	102%	10%	130%	100%	00%	120%	10270	10%	130%

#### AGAT QUALITY ASSURANCE REPORT (V1)

Page 13 of 24



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE:SP47/Boreholes E-W AGAT WORK ORDER: 22T853869
ATTENTION TO: Alessandro Pellerito
SAMPLED BY:Mohammad Safarpanah

Critin Enterent Inflorence E 11							•			a.		. • • • • • • • • • • • • • • • • • • •	p aa		
	Soil Analysis (Continued)														
RPT Date: Jan 25, 2022				UPLICAT	E		REFEREN	ICE MA	ΓERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Value		otable iits	Recovery	Lie	ptable nits	Recovery	Lie	ptable nits
	Id bup#1 bup#2 Nrb		value	Lower	Upper	ĺ	Lower	Upper	Í	Lower	Upper				
Uranium Leachate	3432229		<0.050	<0.050	NA	< 0.050	101%	70%	130%	106%	80%	120%	103%	70%	130%
Fluoride Leachate	3428848		0.24	0.24	NA	< 0.10	96%	90%	110%	97%	90%	110%	98%	70%	130%
Cyanide Leachate	3432229		< 0.05	< 0.05	NA	< 0.05	92%	70%	130%	104%	80%	120%	108%	70%	130%
(Nitrate + Nitrite) as N Leachate	3432229		<0.70	< 0.70	NA	< 0.70	102%	80%	120%	104%	80%	120%	94%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate NA: results are under 5X the RDL and will not be calculated.

Amanyot Bhells Amanor Heren



## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE:SP47/Boreholes E-W AGAT WORK ORDER: 22T853869
ATTENTION TO: Alessandro Pellerito
SAMPLED BY:Mohammad Safarpanah

SAMPLING SITE. SP47/BOTEI	0169 F-44								LLDD	T.IVIONA	шиас	Jaiai	Pariari		
			Trac	ce Or	gani	cs Ar	alys	IS							
RPT Date: Jan 25, 2022			С	UPLICATI	E		REFERE	NCE MA	TERIAL	METHOD	BLAN	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Lir	eptable mits	Recovery	Lir	eptable mits	Recovery	Lir	ptable nits
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - OC Pesticides	(Soil)														
Hexachloroethane	3426717		< 0.01	< 0.01	NA	< 0.01	102%	50%	140%	96%	50%	140%	98%	50%	140%
Gamma-Hexachlorocyclohexane	3426717		< 0.005	< 0.005	NA	< 0.005	104%	50%	140%	92%	50%	140%	82%	50%	140%
Heptachlor	3426717		< 0.005	< 0.005	NA	< 0.005	107%	50%	140%	88%	50%	140%	88%	50%	140%
Aldrin	3426717		< 0.005	< 0.005	NA	< 0.005	106%	50%	140%	92%	50%	140%	80%	50%	140%
Heptachlor Epoxide	3426717		< 0.005	< 0.005	NA	< 0.005	103%	50%	140%	102%	50%	140%	92%	50%	140%
Endosulfan I	3426717		< 0.005	< 0.005	NA	< 0.005	107%	50%	140%	90%	50%	140%	91%	50%	140%
Endosulfan II	3426717		< 0.005	< 0.005	NA	< 0.005	102%	50%	140%	91%	50%	140%	84%	50%	140%
Alpha-Chlordane	3426717		< 0.005	< 0.005	NA	< 0.005	108%	50%	140%	88%	50%	140%	84%	50%	140%
gamma-Chlordane	3426717		< 0.005	< 0.005	NA	< 0.005	104%	50%	140%	85%	50%	140%	82%	50%	140%
op'-DDE	3426717		< 0.005	< 0.005	NA	< 0.005	103%	50%	140%	80%	50%	140%	79%	50%	140%
pp'-DDE	3426717		< 0.005	< 0.005	NA	< 0.005	108%	50%	140%	82%	50%	140%	82%	50%	140%
op'-DDD	3426717		< 0.005	< 0.005	NA	< 0.005	107%	50%	140%	107%	50%	140%	85%	50%	140%
pp'-DDD	3426717		< 0.005	< 0.005	NA	< 0.005	102%	50%	140%	102%	50%	140%	80%	50%	140%
op'-DDT	3426717		< 0.005	< 0.005	NA	< 0.005	98%	50%	140%	89%	50%	140%	84%	50%	140%
pp'-DDT	3426717		< 0.005	< 0.005	NA	< 0.005	99%	50%	140%	82%	50%	140%	82%	50%	140%
Dieldrin	3426717		< 0.005	< 0.005	NA	< 0.005	97%	50%	140%	88%	50%	140%	102%	50%	140%
Endrin	3426717		< 0.005	< 0.005	NA	< 0.005	103%	50%	140%	102%	50%	140%	92%	50%	140%
Methoxychlor	3426717		< 0.005	< 0.005	NA	< 0.005	96%	50%	140%	102%	50%	140%	104%	50%	140%
Hexachlorobenzene	3426717		< 0.005	< 0.005	NA	< 0.005	108%	50%	140%	103%	50%	140%	89%	50%	140%
Hexachlorobutadiene	3426717		< 0.01	< 0.01	NA	< 0.01	106%	50%	140%	102%	50%	140%	79%	50%	140%
O. Reg. 153(511) - PHCs F1 - F4 (	-BTEX) (So	il)													
F1 (C6 - C10)	3429006	,	<5	<5	NA	< 5	90%	60%	140%	90%	60%	140%	95%	60%	140%
F2 (C10 to C16)	3433707		< 10	< 10	NA	< 10	101%	60%		80%	60%	140%	83%	60%	140%
F3 (C16 to C34)	3433707		< 50	< 50	NA	< 50	108%	60%	140%	75%	60%	140%	65%	60%	140%
F4 (C34 to C50)	3433707		< 50	< 50	NA	< 50	86%	60%	140%	77%	60%	140%	79%	60%	140%
O. Reg. 153(511) - VOCs (Soil)															
Dichlorodifluoromethane	3427631		<0.05	<0.05	NA	< 0.05	83%	50%	140%	78%	50%	140%	66%	50%	140%
Vinyl Chloride	3427631		<0.03	<0.03	NA	< 0.03	84%	50%	140%	101%	50%	140%	97%	50%	140%
Bromomethane	3427631		<0.05	< 0.05	NA	< 0.02	84%	50%	140%	99%	50%	140%	83%	50%	140%
Trichlorofluoromethane	3427631		<0.05	<0.05	NA	< 0.05	74%	50%	140%	83%	50%	140%	93%	50%	
Acetone	3427631		<0.50	<0.50	NA	< 0.50	93%		140%	102%		140%	105%		140%
1 1-Dichloroethylono	2/127624		-0.0E	-0.0E	NΙΛ	- 0.0F	1010/	50%	1/00/	1100/	609/	1200/	1000/	500/	140%
1,1-Dichloroethylene Methylene Chloride	3427631 3427631		<0.05 <0.05	<0.05 <0.05	NA NA	< 0.05 < 0.05	101% 103%		140% 140%	118% 85%		130% 130%	100% 112%	50%	140%
Trans- 1,2-Dichloroethylene	3427631		<0.05	<0.05	NA	< 0.05	103%		140%	107%		130%	84%		140%
Methyl tert-butyl Ether	3427631		<0.05	<0.05	NA	< 0.05	101%		140%	96%		130%	80%		140%
1,1-Dichloroethane	3427631		<0.03	<0.02	NA	< 0.02	118%		140%	85%	60%	130%	100%	50%	140%
M (1 1 5 (1 1 1 )															
Methyl Ethyl Ketone	3427631		<0.50	<0.50	NA	< 0.50	86%		140%	93%		140%	102%	50%	
Cis- 1,2-Dichloroethylene	3427631		<0.02	<0.02	NA	< 0.02	115%		140%	94%	60%	130%	96%		140%
Chloroform	3427631		<0.04	<0.04	NA	< 0.04	106%	50%	140%	91%	60%	130%	87%	50%	140%

AGAT QUALITY ASSURANCE REPORT (V1)

Page 15 of 24

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. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.

## **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE:SP47/Boreholes E-W ATTENTION TO: Alessandro Pellerito SAMPLED BY:Mohammad Safarpanah

AGAT WORK ORDER: 22T853869

Trace Organics Analysis (Continued)													-		
RPT Date: Jan 25, 2022			С	UPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
		Comple				Method			ptable			ptable			ptable
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Blank	Measured Value	Lower	upper	Recovery	Lower	Upper	Recovery	Lower	upper
1,2-Dichloroethane	3427631	l	<0.03	<0.03	NA	< 0.03	119%	50%	140%	106%	60%	130%	94%	50%	140%
1,1,1-Trichloroethane	3427631		<0.05	<0.05	NA	< 0.05	83%	50%	140%	102%	60%	130%	88%	50%	140%
Carbon Tetrachloride	3427631		<0.05	<0.05	NA	< 0.05	81%	50%	140%	101%	60%	130%	100%	50%	140%
Benzene	3427631		<0.02	<0.02	NA	< 0.02	92%	50%	140%	111%	60%	130%	101%	50%	140%
1,2-Dichloropropane	3427631		<0.03	<0.03	NA	< 0.03	99%	50%	140%	92%	60%	130%	91%	50%	140%
Trichloroethylene	3427631		<0.03	<0.03	NA	< 0.03	76%	50%	140%	88%	60%	130%	86%	50%	140%
Bromodichloromethane	3427631		<0.05	<0.05	NA	< 0.05	98%	50%	140%	107%	60%	130%	86%	50%	140%
Methyl Isobutyl Ketone	3427631		<0.50	<0.50	NA	< 0.50	107%	50%	140%	98%	50%	140%	104%	50%	140%
1,1,2-Trichloroethane	3427631		<0.04	< 0.04	NA	< 0.04	114%	50%	140%	116%	60%	130%	107%	50%	140%
Toluene	3427631		< 0.05	< 0.05	NA	< 0.05	86%	50%	140%	88%	60%	130%	90%	50%	140%
Dibromochloromethane	3427631		< 0.05	< 0.05	NA	< 0.05	98%	50%	140%	117%	60%	130%	109%	50%	140%
Ethylene Dibromide	3427631		<0.04	<0.04	NA	< 0.04	116%	50%	140%	83%	60%	130%	112%	50%	140%
Tetrachloroethylene	3427631		<0.05	<0.05	NA	< 0.05	72%	50%	140%	111%	60%	130%	90%	50%	140%
1,1,1,2-Tetrachloroethane	3427631		< 0.04	< 0.04	NA	< 0.04	84%	50%	140%	70%	60%	130%	96%	50%	140%
Chlorobenzene	3427631		< 0.05	< 0.05	NA	< 0.05	86%	50%	140%	86%	60%	130%	113%	50%	140%
Ethylbenzene	3427631		< 0.05	< 0.05	NA	< 0.05	75%	50%	140%	102%	60%	130%	107%	50%	140%
m & p-Xylene	3427631		<0.05	<0.05	NA	< 0.05	86%	50%	140%	106%	60%	130%	106%	50%	140%
Bromoform	3427631		<0.05	< 0.05	NA	< 0.05	109%	50%	140%	101%	60%	130%	116%	50%	140%
Styrene	3427631		< 0.05	< 0.05	NA	< 0.05	82%	50%	140%	107%	60%	130%	101%	50%	140%
1,1,2,2-Tetrachloroethane	3427631		< 0.05	< 0.05	NA	< 0.05	109%	50%	140%	85%	60%	130%	104%	50%	140%
o-Xylene	3427631		< 0.05	< 0.05	NA	< 0.05	84%	50%	140%	119%	60%	130%	90%	50%	140%
1,3-Dichlorobenzene	3427631		<0.05	<0.05	NA	< 0.05	92%	50%	140%	80%	60%	130%	89%	50%	140%
1,4-Dichlorobenzene	3427631		<0.05	< 0.05	NA	< 0.05	92%	50%	140%	84%	60%	130%	112%	50%	140%
1,2-Dichlorobenzene	3427631		< 0.05	< 0.05	NA	< 0.05	95%	50%	140%	113%	60%	130%	101%	50%	140%
n-Hexane	3427631		<0.05	<0.05	NA	< 0.05	76%	50%	140%	108%	60%	130%	109%	50%	140%
Comments: When the average of the	e sample and	l duplicate	results is	less than 5	x the RDL	, the Rela	tive Perce	nt Diffe	rence (F	RPD) will b	e indic	ated as	Not Appli	cable (N	IA).
O. Reg. 558 - VOCs															
Vinyl Chloride Leachate	3432229		<0.030	< 0.030	NA	< 0.030	99%	50%	140%	96%	50%	140%	95%	50%	140%
1,1 Dichloroethene Leachate	3432229		<0.020	< 0.020	NA	< 0.020	86%	50%	140%	90%	60%	130%	70%	50%	140%
Dichloromethane Leachate	3432229		< 0.030	< 0.030	NA	< 0.030	103%	50%	140%	113%	60%	130%	74%	50%	140%
Methyl Ethyl Ketone Leachate	3432229		< 0.090	< 0.090	NA	< 0.090	102%	50%	140%	98%	50%	140%	97%	50%	140%
Chloroform Leachate	3432229		<0.020	<0.020	NA	< 0.020	101%	50%	140%	111%	60%	130%	102%	50%	140%
1,2-Dichloroethane Leachate	3432229		<0.020	<0.020	NA	< 0.020	103%	50%	140%	102%	60%	130%	101%	50%	140%
Carbon Tetrachloride Leachate	3432229		<0.020	<0.020	NA	< 0.020	116%	50%	140%	99%	60%	130%	71%	50%	140%
Benzene Leachate	3432229		<0.020	<0.020	NA	< 0.020	107%	50%	140%	92%	60%	130%	113%	50%	140%
Trichloroethene Leachate	3432229		<0.020	<0.020	NA	< 0.020	100%	50%	140%	98%	60%	130%	93%	50%	140%
Tetrachloroethene Leachate	3432229		<0.050	<0.050	NA	< 0.050	102%	50%	140%	84%	60%	130%	84%	50%	140%
Chlorobenzene Leachate	3432229		<0.010	<0.010	NA	< 0.010	90%	50%	140%	86%	60%	130%	112%	50%	140%
1,2-Dichlorobenzene Leachate	3432229		<0.010	<0.010	NA	< 0.010	104%	50%	140%	107%		130%	106%	50%	140%

AGAT QUALITY ASSURANCE REPORT (V1)

Page 16 of 24

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. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.



#### **Quality Assurance**

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE:SP47/Boreholes E-W AGAT WORK ORDER: 22T853869
ATTENTION TO: Alessandro Pellerito
SAMPLED BY:Mohammad Safarpanah

, <u>-</u>															
Trace Organics Analysis (Continued)															
RPT Date: Jan 25, 2022				UPLICATI	E		REFERE	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPII	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery	Lin	ptable nits	Recovery	1:00	otable nits
		ld	,	""   Bup "2   Tu b   V	Value	Lower	Upper		Lower	Upper		Lower	Upper		
1,4-Dichlorobenzene Leachate	3432229		<0.010	<0.010	NA	< 0.010	78%	50%	140%	118%	60%	130%	101%	50%	140%
O. Reg. 558 - PCBs PCB's Leachate	3429039 3	3429039	< 0.005	< 0.005	NA	< 0.005	104%	50%	140%	91%	50%	140%	98%	50%	140%
O. Reg. 558 - Benzo(a) pyrene Benzo(a)pyrene Leachate	3432229		< 0.001	< 0.001	NA	< 0.001	78%	50%	140%	105%	50%	140%	99%	50%	140%



## Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE: SP47/Boreholes E-W

GAINI EING GITE. GI 47/BOTCHOICS E W		O/ (IVII EED D1: IVIO)	Tammaa Gararpanan
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Arsenic	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Barium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Beryllium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Boron (Hot Water Soluble)	MET-93-6104	modified from EPA 6010D and MSA PART 3, CH 21	ICP/OES
Cadmium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Cobalt	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Copper	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Lead	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Molybdenum	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Nickel	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Selenium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Silver	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Thallium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Uranium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Vanadium	MET-93-6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Zinc	MET 93 -6103	modified from EPA 3050B and EPA 6020B and ON MOECC	ICP-MS
Chromium, Hexavalent	INOR-93-6068	modified from EPA 3060 and EPA 7196	SPECTROPHOTOMETER
Cyanide, Free	INOR-93-6052	modified from ON MOECC E3015, SM 4500-CN- I, G-387	TECHNICON AUTO ANALYZER
Mercury	MET-93-6103	modified from EPA 7471B and SM 3112 B	ICP-MS
Electrical Conductivity (2:1)	INOR-93-6036	modified from MSA PART 3, CH 14 and SM 2510 B	EC METER
Sodium Adsorption Ratio (2:1) (Calc.)	INOR-93-6007	modified from EPA 6010D & Analytical Protocol	ICP/OES
pH, 2:1 CaCl2 Extraction	INOR-93-6031	modified from EPA 9045D and MCKEAGUE 3.11	PH METER
Arsenic Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Barium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Boron Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Cadmium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS
Chromium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020B	ICP-MS



# Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE: SP47/Boreholes E-W

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Lead Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020l	B ICP-MS
Mercury Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020	B ICP-MS
Selenium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020	B ICP-MS
Silver Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020	B ICP-MS
Uranium Leachate	MET-93-6103	EPA 1311 & modified from EPA 6020	B ICP-MS
Fluoride Leachate	INOR-93-6018	EPA 1311 & modified from SM4500-F-C	ION SELECTIVE ELECTRODE
Cyanide Leachate	INOR-93-6052	EPA 1311 modified from MOE 3015 SM 4500 CN-I,G387	TECHNICON AUTO ANALYZER
(Nitrate + Nitrite) as N Leachate	INOR-93-6053	EPA SW 846-1311 & modified from SM 4500 - NO3- I	LACHAT FIA

## Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE: SP47/Boreholes E-W

	T		
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis		modified from EPA 3570 & 3620C &	
Hexachloroethane	ORG-91-5113	8081B	GC/ECD
Gamma-Hexachlorocyclohexane	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Heptachlor	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Aldrin	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Heptachlor Epoxide	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Endosulfan I	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Endosulfan II	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Endosulfan	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	CALCULATION
Alpha-Chlordane	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
gamma-Chlordane	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Chlordane	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	CALCULATION
op'-DDE	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
pp'-DDE	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
DDE	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
op'-DDD	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
pp'-DDD	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
DDD	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	CALCULATION
op'-DDT	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
pp'-DDT	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
DDT (Total)	ORG-91-5113	modified from EPA 3570, 3620C & 8081B	CALCULATION
Dieldrin	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Endrin	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Methoxychlor	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Hexachlorobenzene	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Hexachlorobutadiene	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
тсмх	ORG-91-5112	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Decachlorobiphenyl	ORG-91-5113	modified from EPA 3570 & 3620C & 8081B	GC/ECD
Moisture Content	VOL-91-5009	CCME Tier 1 Method	BALANCE

## Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE: SP47/Boreholes E-W

DADAMETED	ACATEOD	LITEDATURE DECEDENCE	ANALYTICAL TECHNIQUE
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
wet weight OC	ORG-91-5113		BALANCE
F1 (C6 - C10)	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	modified from CCME Tier 1 Method	(P&T)GC/FID
Toluene-d8	VOL-91-5009	modified from EPA SW-846 5030C & 8260D	(P&T)GC/MS
F2 (C10 to C16)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F3 (C16 to C34)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
F4 (C34 to C50)	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009	modified from CCME Tier 1 Method	GC/FID
Dichlorodifluoromethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Vinyl Chloride	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Bromomethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Acetone	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Methylene Chloride	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Trans- 1,2-Dichloroethylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Methyl tert-butyl Ether	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Cis- 1,2-Dichloroethylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Chloroform	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Benzene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Trichloroethylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Bromodichloromethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS

## Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE: SP47/Boreholes E-W

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Toluene	VOL-91-5002	modified from EPA 5035A and EPA	(P&T)GC/MS
Tolderie	VOL-91-3002	8260D	(1 & 1)OO/WO
Dibromochloromethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Chlorobenzene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Ethylbenzene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
m & p-Xylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Bromoform	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Styrene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
o-Xylene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Xylenes (Total)	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
1,3-Dichloropropene (Cis + Trans)	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
n-Hexane	VOL-91-5002	modified from EPA 5035A and EPA 8260D	(P&T)GC/MS
Toluene-d8	VOL-91-5002	modified from EPA 5035A & EPA 8260D	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5002	modified from EPA 5035A & EPA 8260D	(P&T)GC/MS
Moisture Content	VOL-91-5009	modified from CCME Tier 1 Method	BALANCE
Benzo(a)pyrene Leachate	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Acridine-d9	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Naphthalene-d8	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Terphenyl-d14	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
PCB's Leachate	ORG-91-5112	Regulation 558, EPA SW846 3510C/8082	GC/ECD
Decachlorobiphenyl	ORG-91-5112	EPA SW846 3510C/8082	GC/ECD
Vinyl Chloride Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS
1,1 Dichloroethene Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS



# Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE

PROJECT: TP115086.1.6000.5800.573000 SAMPLING SITE: SP47/Boreholes E-W

O, 2 0 2		o, iiii 223 5 i iiionaninaa bararpanan					
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE				
Dichloromethane Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS				
Methyl Ethyl Ketone Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS				
Chloroform Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS				
1,2-Dichloroethane Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS				
Carbon Tetrachloride Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS				
Benzene Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS				
Trichloroethene Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS				
Tetrachloroethene Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS				
Chlorobenzene Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS				
1,2-Dichlorobenzene Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS				
1,4-Dichlorobenzene Leachate	VOL-91-5001	EPA 1311, modified from EPA 5030C & EPA 8260D	(P&T)GC/MS				
Toluene-d8	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS				
4-Bromofluorobenzene	VOL-91- 5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS				



5835 Coopers Avenue Mississauga, Ontario LAZ 1Y2 Ph; 905.712.5100 Fax: 905.712.5122 webearth.agatlabs.com

Laboratory	Use Only
Work Order #:	22T853869.

Cooler Quantity:			
Arrival Temperatures:	40	BIS	Cut
·	2.4	12.2	2.2

<b>Turnaround Tin</b>	ne (TAT) Requir	red:
Regular TAT	☑ 5 to 7 Busine	ess Days
Rush TAT (Rush Surcha	rges Apply)	
3 Business Days	2 Business Days	Next Business Day
OR Date Req	uired (Rush Surcharg	(es May Apply):

0	Date	Time	Page 1 of 1								
	Date 14	14:49									
				7	HALL						
						_					

Chain of Custody Record If this is a Drinking Water sample, please				se use Drink	use Drinking Water Chain of Custody Form (potable water consumed by humans)							_	Arriv	/al lem	peratui	es:	2	4	2	2	2.2		
Report Inform	mation: Wood					gulatory Requ									-	eal Intad		OY.	es d	10.	DKO _	□N/A	
Company:	Alessandro Pellerito				=					- I 🗆 CII			Notes: on ice (free ice)										
Contact:	50 Vogell Road, Richmond Hill, ON, L4B 3K6			_   ✓ Re	egulation 153/04	Excess Soils R406		06 Sewer Use □Sanitary □Storm			Turnaround Time (TAT) Required:												
Address:	Address: 50 Vogeli Road, Richmond Hill, Olv, L48 3K6		- Ta	Table Indicate One Table Indicate One Region																			
Phone: 647-982-6220 Fax:				-		Res/Park Agriculture	Regulation 558		Prov. Water Quality Objectives (PWQO) Other			Regular TAT  5 to 7 Business Days  Rush TAT (Rush Surcharges Apply)											
Reports to be sent to:	epoits to be sent to:  a.pellerito@woodplc.com  shami malla@woodplc.com		- 11	exture (Check One)		3 Business							2 Business Next Busin				t Rusiness						
2. Email:				Coarse  Fine	_	Days						Days Day Apply):											
Project Infor	ject Information:				111				Report Guideline on Certificate of Analysis					Please provide prior notification for rush TAT *TAT is exclusive of weekends and statutory holidays									
Project:	TP115086.1,6000,5139.573000			-																			
Site Location:	SP47/Boreholes E-W	,			_     -	☐ Yes ☑ No				☐ Yes ☑ No					For 'Same Day' analysis, please contact your AGAT CPM								
Sampled By:	000010		-			1	0.	Reg 1	153	1		0, Reg 558		eg 406					-	-			
AGAT Quote #:			Sam	Sample Matrix Legend B Biota		CrVI, DOC		N ON			CBs		ckage			CB			/// Iton (Y//				
Invoice Infor	mation:	E	Bill To Same: Ye	es 🗆 No 🗆		Ground Water		Hg. C		BS B				acterization TCLP: JABNs □B(a)P□P	Rainwater Leach	g 4			P.			centra	
Company:	Wood PLC				0	Oil		ials,		□ HWSB	□ Yes			15 C	water	Ization Pa X, F1-F4			VOC,	837		Con	
Contact:					P	Paint		Filtered - Metals,		ρ □	red			aracteriz	tainy Cs [	cteriza BTEX,		SS	181	133		i i	
Address:						SD Sediment			nics	VI. □ Hg, ℂ PHCs if required				Char				T id	Į.į	8			
Email:	APInvoice.Canada <ap< td=""><td>oinvoice.canada@w</td><td>oodplc.com&gt;</td><td></td><td>- sw</td><td>Surface Water</td><td></td><td>Field Filte</td><td>&amp; Inorganics</td><td>- CrVI.</td><td>L-F4 PI F4G if</td><td></td><td></td><td>Disposal  </td><td>Soils SP</td><td>Excess Soils Chara pH, ICPMS Metals.</td><td>S/SAR</td><td>pesticides</td><td>TCLP M/I,</td><td>P PC</td><td></td><td>y Hazard</td></ap<>	oinvoice.canada@w	oodplc.com>		- sw	Surface Water		Field Filte	& Inorganics	- CrVI.	L-F4 PI F4G if			Disposal	Soils SP	Excess Soils Chara pH, ICPMS Metals.	S/SAR	pesticides	TCLP M/I,	P PC		y Hazard	
Sam	ple Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix		nments/ Instructions	Y/N	Metals	Metals - [	BTEX, F3 Analyze	PCBs	00V	Landfill (	Excess:	Excess pH, ICPI	Salt - EC/SAR	100 r	TCL	TCLP		Potential	
E1 SS1		11 Jan 22	12:00 AN	4 1	S																		
E1 SS2		11 Jan 22	12:10 AN	1	S	HOLD			3														
E2 SS1		11 Jan 22	12:25 AN	1	S				V									<b>7</b>		1-11			
E2 SS2		11 Jan 22		3	S								<b>V</b>										
E3 SS1		11 Jan 22	13:10 At	4 1	S				7											4			
E3 SS2		11 Jan 22	13:15 A	1	S													<b>V</b>					
E4 SS1		11 Jan 22	13:30 A		S	HOLD										T					hiel)		
E5 SS1		11 Jan 22	13:55 A		S											4			Ø				
E5 SS2		11 Jan 22		4	S				<b>V</b>														
E7 SS1		11 Jan 22	14:15 A	1	S				7														
		- P	Al			4	1							M									
Samples Relinquished By (1) Mohammad Safal			Date 13 Januar	y 20; Time 18;	00	Samples Received by I	Print Name and Sign):	4	k		J	an	14	1	Time	149	)						
Samples Relinguished By (*			Dafe	Virne		Samules Regions Ry	Print Name and Ruger	/	/		0	Da	te	•	Time				Pa	age 1	of 1		

Samples Received By (Print Name and Sign Samples Palmonished By Front Name and Stank

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

District Visit 123