

December 2017

HYDROLOGICAL REVIEW SUMMARY

The form is to be completed by the Professional that prepared the Hydrological Review.

Use of the form by the City of Toronto is not to be construed as verification of engineering/hydrological content.

Refer to the Terms of Reference, Hydrological Review:

http://www1.toronto.ca/static_files/CityPlanning/PDF/geotechnical.pdf

For City Staff Use Only:

Name of ECS Case Manager (Please print)

Date Review Summary provided to
to TW, EM&P

IF ANY OF THE REQUIREMENTS LISTED BELOW HAVE NOT BEEN INCLUDED IN THE HYDROLOGICAL REVIEW, THE REVIEW WILL BE CONSIDERED INCOMPLETE.

THE GREY SHADED BOXES WILL REQUIRE A CONSISTANCY CHECK BY THE ECS CASE MANAGER.

Summary of Key Information:

SITE INFORMATION		Page # & Section # of Review	Review Includes this Informati on City Staff (Check)
Site Address	5800 Yonge Street, Toronto, ON	Title Page, P.ii	
Postal Code	M2M 3T3		
Property Owner (on request for comments memo)	Life Construction Inc.	Title Page, P.ii	
Proposed description of the project (if applicable) (point towers, number of podiums)	The proposed development will consist of mixed residential and commercial developments with four (4) multi-storey buildings. It is understood that there will be two (2) phases of construction. Phase 1 will consist of the development located on the west side and Phase 2 will consist of the development on the east side of the Site.	P. ii & P.1., Sc.1	
Land Use (ex. commercial, residential, mixed, institutional,	Mixed residential and commercial	P. ii	

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industrial)			
Number of below grade levels for the proposed structure	Each phase of development will have five (5) levels of underground parking (P5).	P.ii P.1.,Sc.1 P.1., Sc.4.1	
HYDROLOGICAL REVIEW INFORMATION			
Date Hydrological Review was prepared:	March 27, 2019	Title Page, P. ii	
Who Performed the Hydrological Review (Consulting Firm)	DS Consultants Ltd.	Title Page	
Name of Author of Hydrological Review	Dorothy Garda, M.sc., Martin Gedeon, M.Sc., P.Geo, Pradeep Patel, M.Sc., P.Geo	P iv & P.10., Sc. 7.0	
Check the directories on the website for Professional Geoscientists and/or Professional Engineers of Ontario been checked to ensure that the Hydrological Report has been prepared by a qualified person who is a licensed Professional Geoscientist as set out in the Professional Geoscientist Act of Ontario or a Professional Engineer? PEO: http://peo.on.ca/index.php?ci_id=1798&la_id=1 APGO: https://www.apgo.net/search/registered-members	#0682 #2710		
Has the Hydrological Review been prepared in accordance with all the following: <ul style="list-style-type: none"> Ontario Water Resources Act Ontario Regulation 387/04 Toronto Municipal Code Chapter 681-Sewers 	This hydrogeological report has been prepared in accordance with the Ontario Resources Act, Ontario Regulation 387/04 and the Toronto Municipal Code Chapter 681-Sewers.	Not referenced in report	

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		Page # & Section # of every occurrence in the Review	Review Includes this Informati on City Staff (Check)
Total Volume (L/day) Short Term Discharge of groundwater (construction dewatering) with safety factor included	<p>The preliminary estimated dewatering rate for an unsealed excavation method for Phase 1 (west) and Phase 2 (east) is approximately 318,000 L/day (318 m³/day) and 265,000 L/day (265 m³/day), respectively. This value also accounts for storm water that may accumulate as result of a 10 mm precipitation event in 24 hrs.</p> <p>What safety factor was used? <u> x2 </u></p>	P.iii. & P.6., Sc. 3.2	
Total Volume (L/day) Short Term Discharge of groundwater (construction dewatering) without safety factor included	<p>Phase One: 114,000 L/day (114 m³/day)</p> <p>Phase Two: 100,000 (100 m³/day)</p>	P.5-6., Sc. 4.1	

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<p>Total Volume (L/day) Long Term drainage of groundwater (from foundation drainage, weeping tiles, sub slab drainage) with safety factor included</p> <p>If the development is part of a multiple tower complex, include total volume for each separate tower</p>	<p>Based on current design, depth to water and flow rates, the estimated permanent theoretical flow is approximately 5,000 L/day (5 m³/day) for the development during Phase 1 and Phase 2 Construction.</p> <p>What safety factor was used? <u>No safety factor reported</u></p>	P.iii, P7-8.,Sc.4.4	
List the nearest surface water (river, creek, lake)	There are no surface water features at the Site. The Newtonbrook creek and Westminster creek are located approximately 2.5 km southeast and 3 km southwest of the Site	P.2., Sc. 3.1	
Lowest basement elevation	An excavation depth of approximately 17 mbgs (Elev. 173.4 masl) is anticipated.	P.5, Sc. 4.1	
Foundation elevation	Not discussed- Foundation is Discussed in the geotechnical report under a separate cover by DS Consultants.		
Ground elevation	The current surface elevation ranges between 190.4 to 191.1 masl	P.4. Sc. 3.3.2	
STUDY AREA MAP		Page # & Section # of every occurrence in the Review	Review Includes this Information City Staff (Check)
Study area map(s) have been included in the report.	Yes	Figure 1 to Figure 4	

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Study area map(s) been prepared according to the Hydrological Review Terms of Reference.	<input checked="" type="radio"/> Yes		N/A
	<input type="radio"/> Yes		N/A
WATER LEVEL AND WELLS		Page # & Section # of every occurrence in the Review	Review Includes this Information (City Staff Initial)
The groundwater level has been monitored using all wells located on site (within property boundary).	Yes	P.4., Sc.3.3.2	
The static water level measurements have been monitored at all monitoring wells for a minimum of 3 months with The intent is for the qualified professional to use professional judgement to estimate the seasonally high groundwater level.	Yes- Six monitoring events completed between February 2019- June 2019	Please refer to additional table at the end.	
All water levels in the wells have been measured with respect to masl.	Yes	P. 4., Sc.3.3.2	
A table of geology/soil stratigraphy for the property has been included.	Yes	Borehole logs shown in Appendix A	
GEOLOGY AND PHYSICAL HYDROLOGY		Page # & Section # of every occurrence in the Review	Review Includes this Information (City

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			Staff Initial)
The review has made reference to the soil materials including thickness, composition and texture, and bedrock environments.	Yes	P.3., Sc.3.2.3 & Borehole logs in Appendix A	
Key aquifers and the site's proximity to nearby surface water has been identified.	<input checked="" type="radio"/> Yes	P.2., Sc.3.1	N/A
PUMP TEST/SLUG TEST/DRAWDOWN ANALYSIS		Page # & Section # of every occurrence in the Review	Review Includes this Information City Staff (Check)
A summary of the pumping test data and analysis is included in the review.	Pumping tests were not conducted as part of the preliminary hydrogeological investigation. Rising head tests (slug tests) were completed.		
The pump test been carried out for at least 24 hours if possible. If not, has a slug test been conducted?	Yes- slug tests were conducted at all monitoring wells on site	P.4-5., Sc. 3.3.3	
Have the monitoring well(s) have been monitored using digital devices? If yes how frequently?	Yes; data loggers were placed at the bottom of the aquifer set to every 30s for 24 hrs.	P.4-5., Sc.3.3.3	
If a slug or pump test has been conducted has the static groundwater level been monitored at all monitoring well(s) multiple times to measure recovery? -prior to the slug or pumping test(s)? -post slug or pumping test(s)?	<input checked="" type="radio"/> Yes Slug tests were completed at eight (8) monitoring wells	P4-5., Sc.3.3.2 Appendix B	N/A
The above noted slug or pump tests have been	<input checked="" type="radio"/> Yes	P5., Sc.3.3.2	

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included in the report.		Appendix B	
WATER QUALITY		Page # & Section # of every occurrence in the Review	Review Includes this Information City Staff (Check)
The report includes baseline water quality samples from a laboratory. The water quality must be analyzed for all parameters listed in Tables 1 and 2 of Chapter 681 Sewers of the Toronto Municipal Code (found in Appendix A) and the samples must have to be taken unfiltered within 9 months of the date of submission.	Yes	P5., Sc.3.3.4	
The water quality data templates in Appendix A have been completed for each sample taken for both sanitary/combined and storm sewer limits.	For sanitary discharge- See the sanitary/combined sewer parameter limit template For storm discharge- See the storm sewer parameter limit template	yes	
Qualified professional to list all sample parameters that have violated the Bylaw limits for each sample taken for the sanitary/combined Bylaw limits If there are any sample parameter Exceedances the groundwater can't be discharged as is.	No Exceedances	P.5., Sc.3.3.4	

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<p>Qualified professional to list all sample parameters that have violated the Bylaw limits for each sample taken for the storm Bylaw limits.</p> <p>If there are any sample parameter exceedances the groundwater can't be discharged as is.</p>	<p>PAHs- Total</p> <p>Manganese-Total</p>	P.5., Sc.3.3.4	
<p>The water quality samples have been analyzed by a Canadian laboratory accredited and licensed by Standards Council of Canada and/or Canadian Association for Laboratory Accreditation.</p> <p>List of Canadian accredited laboratories: https://www.scc.ca/en/search/palcan </p>	<p><input checked="" type="radio"/> Yes</p> <p>ALS Laboratory- accredited</p>	P.5., Sc.3.3.4	N/A
<p>A chain of custody record for the samples is included with the report.</p>	Yes	Appendix C	
<p>Has the chain of custody reference any filtered sample? If yes, the report has to be amended and re-submitted to include only non-filtered samples.</p>	Unfiltered sample submitted	Appendix C	
<p>List any of the sample parameters that exceed the Bylaw limits with the reporting detection limit (RDL) included.</p>	<p>PAHs- Total (3.5 mg/L)</p> <p>Manganese- Total (0.050 mg/L)</p>	P.5., Sc.3.3.4 Appendix C	

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A true copy of the Certificate of Analysis report, is included with the report.	Yes	Appendix C	
EVALUATION OF IMPACT		Page # & Section # of every occurrence in the Review	Review Includes this Information City Staff (Check)
Does the report recommend a back-up system or relief safety valve(s)? Does the associated Geotechnical report recommend a back-up system or relief safety valve(s)?	<input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Yes <input checked="" type="radio"/> No	Not referenced in report	
The taking and discharging of groundwater on site has been analyzed to ensure that no negative impacts will occur to: the City sewage works in terms of quality and quantity (including existing infrastructure), the natural environment, and settlement issues.	<input checked="" type="radio"/> Yes	P.8-9., Sc.5.0	N/A
Has it been determined that there will be a negative impact to the natural environment, City sewage works, or surrounding properties has the study identified the following: the extent of the negative impact, the detail of the precondition state of all the infrastructure, City sewage works, and natural environment within the effected zone and the proposed remediation and monitoring plan?	<input checked="" type="radio"/> Yes If yes, identify impact: Groundwater not suitable for discharge into the City's storm sewers without treatment <input type="radio"/> No	P.8-9., Sc.5.2	N/A

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Summary of Additional Information and Key Items (if applicable):

Appendix A:

SANITARY/COMBINED

Sample Location:
BH18-10

Inorganics		Sample Result	Sample Result with upper RDL included	
Parameter	mg/L	mg/L	mg/L	ug/L
BOD	300	<2.0	<2.0	300,000
Fluoride	10	<0.20	<0.20	10,000
TKN	100	0.60	<0.15	100,000
pH	6.0 - 11.5	6.95	<0.10	6.0 - 11.5
Phenolics 4AAP	1	0.0011	<0.0010	1,000
TSS	350	6.7	<2.0	350,000
Total Cyanide	2	<0.020	<0.020	2,000
Metals				
Chromium Hexavalent	2	<0.00050	<0.00050	2,000
Mercury	0.01	<0.000010	<0.000010	10
Total Aluminum	50	<0.050	<0.050	50,000
Total Antimony	5	<0.0010	<0.0010	5,000
Total Arsenic	1	<0.0010	<0.0010	1,000
Total Cadmium	0.7	<0.000050	<0.000050	700
Total Chromium	4	<0.0050	<0.0050	4,000
Total Cobalt	5	0.0028	<0.0010	5,000
Total Copper	2	<0.010	<0.010	2,000
Total Lead	1	<0.00050	<0.00050	1,000
Total Manganese	5	0.928	<0.0050	5,000
Total Molybdenum	5	<0.00050	<0.00050	5,000
Total Nickel	2	<0.0054	<0.0050	2,000
Total Phosphorus	10	0.0123	<0.0030	10,000
Total Selenium	1	<0.00050	<0.00050	1,000
Total Silver	5	<0.00050	<0.00050	5,000
Total Tin	5	<0.0010	<0.0010	5,000
Total Titanium	5	<0.0030	<0.0030	5,000
Total Zinc	2	<0.030	<0.030	2,000
Petroleum Hydrocarbons				
Animal/Vegetable Oil & Grease	150	<2.0	<2.0	150,000
Mineral/Synthetic Oil & Grease	15	<1.0	<1.0	15,000

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Volatile Organics		Sample Result	Sample Result with upper RDL included	
<u>Parameter</u>	<u>mg/L</u>	<u>ug/L</u>	<u>ug/L</u>	<u>ug/L</u>
Benzene	0.01	<0.50	<0.50	10
Chloroform	0.04	<1.0	<1.0	40
1,2-Dichlorobenzene	0.05	<0.50	<0.50	50
1,4-Dichlorobenzene	0.08	<0.50	<0.50	80
Cis-1,2-Dichloroethylene	4	<0.50	<0.50	4,000
Trans-1,3-Dichloropropylene	0.14	<0.50	<0.50	140
Ethyl Benzene	0.16	<0.50	<0.50	160
Methylene Chloride	2	<2.0	<2.0	2,000
1,1,2,2-Tetrachloroethane	1.4	<0.50	<0.50	1,400
Tetrachloroethylene	1	<0.50	<0.50	1,000
Toluene	0.016	<0.50	<0.50	16
Trichloroethylene	0.4	<0.50	<0.50	400
Total Xylenes	1.4	<1.1	<1.1	1,400
Semi-Volatile Organics				
Di-n-butyl Phthalate	0.08	<1.0	<1.0	80
Bis (2-ethylhexyl) Phthalate	0.012	<2.0	<2.0	12
3,3'-Dichlorobenzidine	0.002	<0.40	<0.40	2
Pentachlorophenol	0.005	<0.50	<0.50	5
Total PAHs	0.005	<3.5	<3.5	5
Misc Parameters				
Nonylphenols	0.02	<1.0	<1.0	20
Nonylphenol Ethoxylates	0.2	<2.0	<2.0	200

Sample Collected: 11/03/19

Temperature: 8.7

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STORM

Sample Location:
BH18-10

Inorganics		Sample Result	Sample Result with upper RDL included	
<u>Parameter</u>	<u>mg/L</u>	<u>mg/L</u>	<u>mg/L</u>	<u>ug/L</u>
pH	6.0 - 9.5	6.95	<0.10	
BOD	15	<2.0	<2.0	15,000
Phenolics 4AAP	0.008	0.0011	<0.0010	8
TSS	15	6.7	<2.0	15,000
Total Cyanide	0.02	<0.020	<0.020	20
Metals				
Total Arsenic	0.02	<0.0010	<0.0010	20
Total Cadmium	0.008	<0.000050	<0.000050	8
Total Chromium	0.08	<0.0050	<0.0050	80
Chromium Hexavalent	0.04	<0.00050	<0.00050	40
Total Copper	0.04	<0.010	<0.010	40
Total Lead	0.12	<0.00050	<0.00050	120
Total Manganese	0.05	0.928	<0.0050	50
Total Mercury	0.0004	<0.000010	<0.000010	0.4
Total Nickel	0.08	<0.0054	<0.0054	80
Total Phosphorus	0.4	0.0123	<0.0030	400
Total Selenium	0.02	<0.00050	<0.00050	20
Total Silver	0.12	<0.00050	<0.00050	120
Total Zinc	0.04	<0.030	<0.030	40
Microbiology				
E.coli	200	0	CFU/100mL	200,000
Volatile Organics				
<u>Parameter</u>	<u>mg/L</u>	<u>ug/L</u>	<u>ug/L</u>	<u>ug/L</u>
Benzene	0.002	<0.50	<0.50	2
Chloroform	0.002	<1.0	<1.0	2
1,2-Dichlorobenzene	0.0056	<0.50	<0.50	6
1,4-Dichlorobenzene	0.0068	<0.50	<0.50	7
Cis-1,2-Dichloroethylene	0.0056	<0.50	<0.50	6
Trans-1,3-Dichloropropylene	0.0056	<0.50	<0.50	6
Ethyl Benzene	0.002	<0.50	<0.50	2
Methylene Chloride	0.0052	<2.0	<2.0	5
1,1,2,2-Tetrachloroethane	0.017	<0.50	<0.50	17
Tetrachloroethylene	0.0044	<0.50	<0.50	4
Toluene	0.002	<0.50	<0.50	2
Trichloroethylene	0.0076	<0.50	<0.50	8
Total Xylenes	0.0044	<1.1	<1.1	4

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Semi-Volatile Organics		Sample Result	Sample Result with upper RDL included	
Di-n-butyl Phthalate	0.08	<1.0	<1.0	80
Bis (2-ethylhexyl) Phthalate	0.012	<2.0	<2.0	12
3,3'-Dichlorobenzidine	0.002	<0.40	<0.40	2
Pentachlorophenol	0.005	<0.50	<0.50	5
Total PAHs	0.005	<3.5	<3.5	5
Hexachlorocyclohexane	0.1	N/A (See note 1)	N/A	100
Misc Parameters				
Nonylphenols	0.001	<1.0	<1.0	1
Nonylphenol Ethoxylates	0.01	<2.0	<2.0	10

Sample Collected: 11/03/19

Temperature: 8.7

Note 1- Hexachlorocyclohexane is no longer analyzed in the Toronto Sanitary and Storm Package.

Consulting Firm that prepared Hydrological Report: DS Consultants

Qualified Professional who completed the report summary: Pradeep Patel
Print Name



Qualified Professional who completed the report summary: P. A. Patel Feb 5/2020
Signature Date & Stamp

18-733-100, 5800 Yonge St.

Water Levels

Date			04-Feb-19		07-Feb-19		22-Feb-19		11-Mar-19		26-Mar-19		28-May-19	
Well ID	Elevation	Stick Up	Water level	Water level	Water level	Water level	Water level	Water level	Water level	Water level	Water level	Water level	Water level	Water level
		m	(mbgs)	(BGL) m	(mbgs)	(BGL) m	(mbgs)	(BGL) m	(mbgs)	(BGL) m	(mbgs)	(BGL) m	(mbgs)	(BGL) m
BH19-1	190.46	0	2.22	188.24	2.40	188.06	1.85	188.61	inaccessible		1.57	188.89	1.65	188.81
BH19-2	190.41	0	DRY		dry		dry		inaccessible		dry		dry	
BH19-3	190.82	0	1.75	189.07	1.80	189.02	inaccessible		inaccessible		0.97	189.85	1.07	189.75
BH19-4	190.85	0	1.39	189.46	1.10	189.75	inaccessible		inaccessible		1.02	189.83	0.86	189.99
BH19-5	191.11	0.93	1.42	189.69	1.10	190.01	2.3	187.88	1.43	189.68	1.16	189.95	0.84	190.27
BH19-6	190.86	0	inaccessible		dry		dry		dry		dry		dry	
BH19-7	191.12	0	3.49	187.63	1.50	189.62	3.57	187.55	inaccessible		2.94	188.18	2.48	188.64
BH19-10	190.46	0.6	1.37	189.09	0.55	189.91	1.42	188.44	0.85	189.61	0.41	190.05	0.37	190.09