

August 2018

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:

[Link to Terms of Reference Hydrological Review](#)

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 Information City Staff (Check)
Site Address	Toronto, Ontario 11 to 21 Yorkville and 16 to 18 Cumberland Street	P.1, Sec.1.1	
Postal Code	M4W 1L1		
Property Owner (on request for comments memo)	11 Yorkville, Partners Inc.	P.1, Sec.1.1	
Proposed description of the project (if applicable) (point towers, number of podiums)	One 62 storey tower, and future commercial use	P.1, Sec.1.1	
Land Use (ex. commercial, residential, mixed, institutional, industrial)	mixed residential/commercial	P.1, Sec.1.1	
Number of below grade levels for the proposed structure	4 levels underground parking	P.1, Sec.1.1	
HYDROLOGICAL REVIEW INFORMATION			
Date Hydrological Review was prepared:	May 7, 2019	Title Page	
Who Performed the Hydrological Review (Consulting Firm)	EXP Services Inc.	Title Page	
Name of Author of Hydrological Review	Robert Ferris	P.22 Sec.9	

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<p>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?</p> <p>PEO: Professional Engineers of Ontario APGO: Association of Professional Geoscientists of Ontario</p>		N/A	
<p>Has the Hydrological Review been prepared in accordance with all the following:</p> <ul style="list-style-type: none"> • Ontario Water Resources Act • Ontario Regulation 387/04 • Toronto Municipal Code Chapter 681-Sewers 	Yes	P.2, Sec.1.3	
		Page # & Section # of every occurrence in the Review	Review Includes this Information City Staff (Check)


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<p>Total Volume (L/day) Short Term Discharge of groundwater (construction dewatering) with safety factor included</p>	<p>396,000 L/day - including 42000L/day allowed for precipitation</p> <p>What safety factor was used? Safety factor of 2 used</p>	<p>Pgs 15 and 16, Sec. 4.2 and 4.3</p>	
<p>Total Volume (L/day) Short Term Discharge of groundwater (construction dewatering) without safety factor included</p>	<p>calculated from Appendix E 219,000 L/day</p>	<p>Appendix E</p>	
<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>design allowance of 20L/day</p> <p>What safety factor was used? Safety Factor 0.</p> <p>No long-term dewatering anticipated since sub-drain system to be installed above the water table.</p>	<p>P.17, Sec. 5.1</p>	
<p>List the nearest surface water (river, creek, lake)</p>	<p>Don River</p>	<p>P.5, Sec. 2.2.2</p>	

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SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
Lowest basement elevation	P4 Underground parking Finished floor elevation 102.35 masl	P.14, Sec. 4.1	
Foundation elevation	100.85 masl	P.14, Sec. 4.1	
Ground elevation	Ground Floor Elevation 116.35 masl	P.14, Sec. 4.1	
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	Figures 1-6	N/A
Study area map(s) been prepared according to the Hydrological Review Terms of Reference.	✔ Yes	Figures 1-6	N/A
WATER LEVEL AND WELLS		Page # & Section # of every occurrence	Review Includes this Information (City Staff Initial)

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		in the Review	
The groundwater level has been monitored using all wells located on site (within property boundary).	Yes	P.8-10, Sec. 3.2	
The static water level measurements have been monitored at all monitoring wells for a minimum of 3 months with samples taken every 2 weeks for a minimum of 6 samples. The intent is for the qualified professional to use professional judgement to estimate the seasonally high groundwater level.	Yes - wells installed to the foundation depth and deep well	P.9, Sec. 3.2 Table 3-1	
All water levels in the wells have been measured with respect to masl.	Yes	P.9, Sec. 3.2 Table 3-1	
A table of geology/soil stratigraphy for the property has been included.	Included as a section in the report	Pgs. 5-7, Sec. 2.2.3	
GEOLOGY AND PHYSICAL HYDROLOGY		Page # & Section # of every occurrence in the Review	Review Includes this Information (City Staff Initial)
The review has made reference to the soil materials including thickness, composition and texture, and bedrock environments.	Refer to section 2.1 (Regional Setting) and Section 2.2 (Site Setting)	Pgs. 4-7, Sec. 2.1.2	
Key aquifers and the site's proximity to nearby surface water has been identified.	 Yes	P.5, Sec. 2.2.2	N/A

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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.	Single Well Response Test (SWRT) conducted in place of pumping test.	P.11, Sec. 3.3 Appendix D	
The pump test been carried out for at least 24 hours if possible. If not, has a slug test been conducted?	SWRT conducted in place of pumping test.	P.11, Sec. 3.3 Appendix D	
Have the monitoring well(s) have been monitored using digital devices? If yes how frequently?	6 times over 3 mnths using Solinst graduated Water level tapes.	P.9, Sec. 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)?	☑ Yes	P.11, Sec. 3.3 Appendix D	N/A
The above noted slug or pump tests have been included in the report.	☑ Yes	P.11, Sec. 3.3 Appendix D	
WATER QUALITY		Page # & Section # of every occurrence in the Review	Review Includes this Information City Staff (Check)

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SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
<p>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.</p>	<p>Refer to Section 3.4 Groundwater Quality</p>	<p>P.12 Sec. 3.4 Appendix D</p>	
<p>The water quality data templates in Appendix A have been completed for each sample taken for both sanitary/combined and storm sewer limits.</p>	<p>For sanitary discharge- See the sanitary/combined sewer parameter limit template</p> <p>For storm discharge- See the storm sewer parameter limit template</p>	<p>See completed Appendix A templates in HG Review Summary</p>	
<p>Qualified professional to list all sample parameters that have violated the Bylaw limits for each sample taken for the sanitary/combined Bylaw limits</p> <p>If there are any sample parameter Exceedances the groundwater can't be discharged as is.</p>	<p>Total Suspended Solids (SAMPLE 15-3)</p>	<p>P.12 Sec. 3.4 Table 3-4</p>	
<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>Total Suspended Solids Total Manganese Total Phosphorous Samples 15-3 AND TH109D</p>	<p>P.12 Sec. 3.4 Table 3-4 Appendix D</p>	
<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>✓ Yes</p> <p>Maxxam Analytics Inc. of Mississauga, Ontario</p>	<p>Appendix D</p>	<p>N/A</p>

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SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
List of Canadian accredited laboratories: Standards Council of Canada	Maxxam Analytics Inc. of Mississauga, Ontario	P.12, Sec. 3.4	
A chain of custody record for the samples is included with the report.	Refer to Appendix D	Appendix D	
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.	Non-filtered samples were submitted.	Appendix D	
List any of the sample parameters that exceed the Bylaw limits with the reporting detection limit (RDL) included.	Total Suspended Solids Total Manganese Total Phosphorous Samples 15-3 AND TH109D	P.12 Sec. 3.4 Table 3-4 Appendix D	
A true copy of the Certificate of Analysis report, is included with the report.	Refer to Appendix D	Appendix D	
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)?	<input type="radio"/> Yes <input checked="" type="radio"/> No	P.17, Sec. 5.1	
Does the associated Geotechnical report recommend a back-up system or relief safety valve(s)?	<input type="radio"/> Yes <input checked="" type="radio"/> No	P.18, Sec. 6.3	
The taking and discharging of groundwater on site has been analyzed to ensure that no negative	<input checked="" type="radio"/> Yes	P.18-19, Sec. 6.0	N/A

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SITE INFORMATION	Page # & Section # of Review	Review Includes this Information City Staff (Check)
impacts will occur to: the City sewage works in terms of quality and quantity (including existing infrastructure), the natural environment, and settlement issues.		
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 type="radio"/> Yes If yes, identify impact: <input checked="" type="radio"/> No	P.18-19 Sec. 6.0 N/A

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

HYDROLOGICAL REVIEW SUMMARY

Appendix A:

SANITARY/COMBINED

Sample Location: 15-3 and TH109D

Inorganics		Sample Result	Sample Result with upper RDL included	
<u>Parameter</u>	<u>mg/L</u>	<u>-</u>		<u>ug/L</u>
BOD	300	8/<2	10/2	300,000
Fluoride	10	0.16/0.15	0.26/0.25	10,000
TKN	100	2.1/1.6	2.2/1.7	100,000
pH	6.0 - 11.5	7.93/7.96	7.93/7.96	6.0 - 11.5
Phenolics 4AAP	1	<0.0010/<0.0010	0.0010/0.0010	1,000
TSS	350	12000/37	12050/87	350,000
Total Cyanide	2	<0.0050/<0.0050	0.0050/0.0050	2,000
Metals				
Chromium Hexavalent	2	<0.50/<0.50	0.50/0.50	2,000
Mercury	0.01	<0.0001/<0.0001	0.0001/0.0001	40
Total Aluminum	50	19000/380	19005/385	50,000
Total Antimony	5	1.3/<0.50	1.8/0.50	5,000
Total Arsenic	1	5.5/1.4	6.5/2.4	1,000
Total Cadmium	0.7	0.29/<0.10	0.39/0.10	700
Total Chromium	4	44/<5.0	49/5.0	4,000
Total Cobalt	5	16/<0.50	16.5/0.50	5,000
Total Copper	2	36/2.1	37/3.1	2,000
Total Lead	1	14/1.3	14.5/1.8	1,000
Total Manganese	5	940/86	942/88	5,000
Total Molybdenum	5	2.1/1.7	2.6/2.1	5,000
Total Nickel	2	37/4.0	38/5.0	2,000
Total Phosphorus	10	1700/490	1800/590	10,000
Total Selenium	1	<2.0/<2.0	2.0/2.0	1,000
Total Silver	5	<0.10/<0.10	0.10/0.10	5,000
Total Tin	5	1.4/<1.0	2.4/1.0	5,000
Total Titanium	5	880/15	885/20	5,000
Total Zinc	2	76/5.9	81/10.9	2,000
Petroleum Hydrocarbons				
Animal/Vegetable Oil & Grease	150	3.8/<0.50	4.2/0.50	150,000
Mineral/Synthetic Oil & Grease	15	1.9/<0.50	2.4/0.50	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>
Benzene	0.04	<0.10/<0.50	0.10/0.50	10
Chloroform	0.04	<0.10/<0.50	0.10/0.50	40
1,2-Dichlorobenzene	0.05	<0.20/<1.3	0.20/1.3	50
1,4-Dichlorobenzene	0.08	<0.20/<1.3	0.20/1.3	80
Cis-1,2-Dichloroethylene	4	<0.10/<1.3	0.20/1.3	4,000
Trans-1,3-Dichloropropylene	0.14	<0.20/<1.3	0.20/1.3	140
Ethyl Benzene	0.16	<0.10/<0.50	0.10/0.50	160
Methylene Chloride	2	<0.50/<5.0	0.50/5.0	2,000
1,1,2,2-Tetrachloroethane	1.4	<0.20/<1.3	0.20/1.3	1,400
Tetrachloroethylene	1	<0.10/<0.50	0.10/0.50	1,000
Toluene	0.016	<0.20/<0.50	0.20/0.50	16
Trichloroethylene	0.4	<0.10/<0.50	0.10/0.50	400
Total Xylenes	1.4	<0.10/<0.50	0.10/0.50	1,400
Semi-Volatile Organics				
Di-n-butyl Phthalate	0.08	<2/<2	2/2	80
Bis (2-ethylhexyl) Phthalate	0.012	<2/4	2/6	12
3,3'-Dichlorobenzidine	0.002	<0.8/<0.8	0.8/0.8	2
Pentachlorophenol	0.005	<1/<1	1/1	5
Total PAHs	0.005	<1/<1	1/1	5
Misc Parameters				
Nonylphenols	0.02	<0.001/<0.001	0.001/0.001	20
Nonylphenol Ethoxylates	0.2	<0.005/<0.005	0.005/0.005	200

Sample Collected: sample 15-3 date - 2018/02/07 sample TH109D date - 2019/03/04

Temperature: sample 15-3 temperature - 2.3 C sample TH109D temperature - 3.7 C

HYDROLOGICAL REVIEW SUMMARY

STORM

Sample Location: 15-3 and TH109D

Inorganics		Sample Result	Sample Result with upper RDL included	
<u>Parameter</u>	<u>mg/L</u>			<u>ug/L</u>
pH	6.0 - 9.5	7.93/7.96	7.93/7.96	
BOD	15	8/<2	10/2	15,000
Phenolics 4AAP	0.008	<0.0010/<0.0010	0.0010/0.0010	8
TSS	15	12000/37	12050/87	15,000
Total Cyanide	0.02	<0.0050/<0.0050	0.0050/0.0050	20
Metals				
Total Arsenic	0.02	5.5/1.4	6.5/2.4	20
Total Cadmium	0.008	0.29/<0.10	0.39/0.10	8
Total Chromium	0.08	44/<5.0	49/5.0	80
Chromium Hexavalent	0.04	<0.50/<0.50	0.50/0.50	40
Total Copper	0.04	36/2.1	37/3.1	40
Total Lead	0.12	14/1.3	14.5/1.8	120
Total Manganese	0.05	940/86	942/88	50
Total Mercury	0.0004	<0.0001/<0.0001	0.0001/0.0001	0.4
Total Nickel	0.08	37/4.0	38/5.0	80
Total Phosphorus	0.4	1700/490	1800/590	400
Total Selenium	0.02	<2.0/<2.0	2.0/2.0	20
Total Silver	0.12	<0.10/<0.10	0.10/0.10	120
Total Zinc	0.04	76/5.9	81/10.9	40
Microbiology				
E.coli	200	<10/<10	10/10	200,000
Volatile Organics				
<u>Parameter</u>	<u>mg/L</u>			<u>ug/L</u>
Benzene	0.002	<0.10/<0.50	0.10/0.50	2
Chloroform	0.002	<0.10/<0.50	0.10/0.50	2
1,2-Dichlorobenzene	0.0056	<0.20/<1.3	0.20/1.3	6
1,4-Dichlorobenzene	0.0068	<0.20/<1.3	0.20/1.3	7
Cis-1,2-Dichloroethylene	0.0056	<0.10/<1.3	0.20/1.3	6
Trans-1,3-Dichloropropylene	0.0056	<0.20/<1.3	0.20/1.3	6
Ethyl Benzene	0.002	<0.10/<0.50	0.10/0.50	2
Methylene Chloride	0.0052	<0.50/<5.0	0.50/5.0	5
1,1,2,2-Tetrachloroethane	0.017	<0.20/<1.3	0.20/1.3	17
Tetrachloroethylene	0.0044	<0.10/<0.50	0.10/0.50	4
Toluene	0.002	<0.20/<0.50	0.20/0.50	2
Trichloroethylene	0.0076	<0.10/<0.50	0.10/0.50	8
Total Xylenes	0.0044	<0.10/<0.50	0.10/0.50	4

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Semi-Volatile Organics		Sample Result	Sample Result with upper RDL included	
Di-n-butyl Phthalate	0.015	<2/<2	2/2	5
Bis (2-ethylhexyl) Phthalate	0.0088	<2/4	2/6	8.8
3,3'-Dichlorobenzidine	0.0008	<0.8/<0.8	0.8/0.8	0.8
Pentachlorophenol	0.002	<1/<1	1/1	2
Total PAHs	0.002	<1/<1	1/1	2
PCBs	0.0004	<0.05/<0.05	0.05/0.05	0.4
Misc Parameters				
Nonylphenols	0.001	<0.001/<0.001	0.001/0.001	1
Nonylphenol Ethoxylates	0.01	<0.005/<0.005	0.005/0.005	10

Sample Collected: sample 15-3 date - 2018/02/07 sample TH109D date - 2019/03/04

Temperature: sample 15-3 temperature - 2.3 C sample TH109D temperature - 3.7 C

Consulting Firm that prepared Hydrological Report: EXP Services Inc.

Qualified Professional who completed the report summary: Robert Ferris
 Print Name

Qualified Professional who completed the report summary: 
 Signature

