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February 21, 2024 Report: PH4398-1.REP.01.REV.01.

Southwell Homes LTD.

195 Julie Anne Crescent Carleton Place, Ontario K7C 4M5

Attention: John Southwell

Subject: Hydrogeological Assessment and Terrain Analysis Proposed Residential Development 122 Old Mill Lane Appleton, Ontario

Dear John Southwell,

Please find enclosed 3 copies of Report PH4398-1.REP.01.REV.01. regarding the Hydrogeological Assessment and Terrain Analysis conducted for the aforementioned location.

We trust that this information is to your satisfaction.

Sincerely,

Paterson Group Inc.

Michael Killam, P.Eng.

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Geotechnical Engineering

Environmental Engineering

Hydrogeology

Geological Engineering

Materials Testing

Building Science

Noise and Vibration Studies

Hydrogeological Assessment and Terrain Analysis

Proposed Residential Development 122 Old Mill Lane Appleton, Ontario

Prepared For

Southwell Homes Ltd.

Paterson Group Inc.

Consulting Engineers 154 Colonnade Road South Ottawa (Nepean), Ontario Canada K2E 7S8

Tel: (613) 226-7381 Fax: (613) 226-6344 www.patersongroup.ca February 21, 2024

Report: PH4398-REP.01.REV.01

Report History

Paterson Group (Paterson) was retained by Southwell Homes Ltd. to update the Hydrogeological Study and Terrain Analysis for the proposed rural subdivision situated on the south shore of the Mississippi River, in the Village of Appleton, Ontario (Refer to Figure-1: Site Location Plan (Appendix 5).

Since the initial release of the Hydrogeological Study and Terrain Analysis Report PH2723-REP.01 - Terrain Analysis and Hydrogeological Study dated November 13, 2015, the following regulatory authority comments and peer reviews have occurred:

- Mississippi Valley Conservation Authority (MVCA) review titled Terrain Analysis and Hydrogeological Study, project number 09-T-15005 dated May 18, 2015
- Mississippi Valley Conservation Authority Planning and Development Review Team comments titled Appleton Subdivision – Preliminary Comments, File number 09-T-15005 dated May 26, 2016
- Paterson Response to MVCA Review Comments dated May 18, 2016, Report number PH2723-LET.01. dated January 17, 2017
- Mississippi Valley Conservation Authority Memo titled Response to MVCA Review Comments dated May 18, 2016, Report number 09-T-15005 dated March 28, 2017
- Stantec Consulting Ltd. (Stantec) review titled Hydrogeological Review for a Redevelopment of a Brownfield, Appleton Subdivision, Part of Lot 4, concession 10, Geographic Township of Ramsay, Town of Mississippi Mills, Ontario, file number 160410034 dated September 11, 2017.
- Paterson Environmental Action Plan Former Appletex Mill Property 166-122 Old Mill Lane – Hamlet of Appleton, report number PE1114-MEMO.13 dated November 14, 2017
- Stantec Consulting Ltd. review titled Comments on Groundwater Sampling Program and Environmental Action Plan, Former Appletex Mill Property, Appleton, Ontario, file number 160410034 dated June 29, 2018
- Mississippi Mills review titled Appleton Subdivision 09-T-15005, dated August 14, 2018

- Lanark County Meeting notes titled Appleton Subdivision 09-T-15005 dated August 29, 2018
- JP2G Consultants Inc. (JP2G) peer review titled Peer Review of the Contaminated Site Related Documents – Proposed Residential Subdivision (Former Appletex Mill Property) – Appleton, Ontario, with file number 18-6061A dated September 28, 2018
- Mississippi Valley Conservation Authority Memo titled Status summary: Hydrogeological / private servicing review – Proposed subdivision at former Appletex Mill site, Project number 09-T-15005 dated October 9, 2018
- Mississippi Valley Conservation Authority Planning and Development Review Team review titled Appleton Subdivision, file number 09-T-15005 dated October 10, 2018
- Paterson Work Plan Supplementary Hydrogeological Study and Assessment Work, file number PH4398-MEMO.01. dated October 15, 2021
- Paterson completed a revised Hydrogeological Assessment titled PH4398-REP.01 -Hydrogeological Assessment and Terrain Analysis – Proposed Residential Development – 122 Old Mill Lane, Appleton, Ontario dated August 23, 2022. The report was submitted to the township in September of 2022.
- Paterson completed a report titled PE1114-LET.03. Environmental Action Plan Supplemental Groundwater Sampling Program - 116-122 Old Mill Lane, Appleton, Ontario dated March 1, 2022
- Paterson completed an Environmental Assessment Report titled PE1114-3 Phase II Environmental Site Assessment – 116-122 Old Mill Lane, Appleton, Ontario dated June 14, 2023
- Paterson received peer review comments from Stantec in their letter entitled: "Peer Review of Phase II – Environmental Site Assessment, 116-122 Old Mill Lane, Appleton, Ontario for Redevelopment Application" dated September 15, 2023
- Paterson prepared a comment response to Stantec peer-review comments titled PE1114-MEMO.14 Phase II Environmental Site Assessment – Response to Stantec Peer Review, Proposed Residential Development – Appleton Shores, 116 to 122 Old Mill Lane – Ottawa, Ontario dated September 27, 2023

- Stantec's provided hydrogeological peer review comments on December 4, 2023 with file number 122170312 Task 200 and titled Peer Review of a Hydrogeological Assessment and Terrain Analysis - Proposed Residential Development - 122 Old Mill Lane, Appleton, ON
- Paterson prepared a Remedial Action Plan titled PE1114-LET.04R- Remedial Action Plan 116-122 Old Mill Lane, Appleton, Ontario dated February 14, 2024

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Executive Summary

Paterson Group (Paterson) was retained by Southwell Homes Ltd. to update the Hydrogeological Study and Terrain Analysis for the proposed rural subdivision situated on the south shore of the Mississippi River, in the Village of Appleton, Ontario (Refer to Figure-1: Site Location Plan (Appendix 5).

The purpose of this study is to determine the suitability of the site for residential development on private services.

The subject property features a flat elevated area in the northeast and gently sloping land to the southwest. The remainder of the property is a floodplain of the Mississippi River and will remain undeveloped.

The subject property has a total area of 19.61 hectares (ha). The proposed subdivision occupies the southern portion of the property and covers an area of approximately 6.99 ha. The development involves 14 lots of variable size (0.40 ha to 0.57 ha with an average lot size of 0.43 ha) and a park. The lot layout, at the time of this submission is shown on Drawing No. PH4398-1-Lot Development Plan (see Appendix 5).

Fieldwork conducted by Paterson in 2008 and 2015 identified a variable thickness layer (0.5 to more than 1.55 metres) of sand and gravel fill over discontinuous native till, over bedrock. Available geological information (OGS, 2015) indicates that the site is underlain by horizontally bedded dolostone of the lower Ordovician Oxford Formation, which is part of the Beekmantown Group.

A topographic survey of the site was conducted by G.A. Smith Surveying Ltd. of Carleton Place Ontario in October 2014. Topographic contours are included on Drawing No. PH4398-2 – Test Hole Location Plan (Appendix 5).

Three (3) test wells (TW1, TW2 and TW3) were installed at the site in June, 2015. Test well locations are indicated on Drawing No. PH4398-2 - Test Hole Location Plan (Appendix 5). Pumping tests were conducted sequentially at each test well using the other test wells as observation wells. Each well was pumped at a constant rate of 91 L/min for six hours and was then allowed to recover. Drawdown observations during pumping and recovery were recorded manually and with electronic dataloggers. Pumping test data were analyzed using Aquifer Test Pro[™] (V 2015.1) software.

Groundwater samples were collected at each well during the pumping tests. Samples were collected at three (3) hours and six (6) hours after the start of each test. Additional water quality sampling was conducted at five (5) neighboring offsite water supply wells. All groundwater samples were submitted for comprehensive testing of bacteriological, chemical and physical water quality parameters.

Paterson returned to site on June 23 and 24 2016 to collect additional groundwater samples from the onsite wells and select neighboring potable supply wells.

The analytical results for groundwater samples that were obtained from the three onsite test wells show that water quality at the site is acceptable and that there are no exceedances of the applicable health related parameter limits of the Ontario Drinking Water Standards (ODWS, 2003). Minor exceedances of the non-health related operational guidelines and aesthetic objectives were noted including hardness (TW1, TW2 and TW3), and TDS (TW1, TW3). These results are very similar to those obtained from the neighboring water supply wells that were tested.

Water quantity was assessed in terms of anticipated peak demand, long term safe yield and potential well interference. Peak demand based on four bedroom single family homes is estimated to be 18.75 L/min. Each test well was pumped at 114 L/min for six hours, in order to demonstrate that well yields at the proposed subdivision will be sufficient to handle peak demand loadings. A long term safe yield analysis indicates that well yields should be capable of yielding at least 3.6 times more water than the test pumping rate. A well interference model indicates a maximum anticipated drawdown of 1.3 m after 20 years of pumping at 3,000 L/day, which is approx. 10% of the available drawdown in the test wells.

Paterson personnel returned to site on December 7 and 8, 2021 to collect groundwater samples from TW1, TW2, and TW3. All groundwater samples collected were submitted for analytical testing of total metals, polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), benzene, toluene, ethylbenzene and xylene (BTEX), Dioxins and Furans. None of the samples submitted exceeded O.Reg 153 standards.

Future wells at the site should be constructed according to Ontario Regulation 903 and should be similar to the test wells that were installed and used as part of this investigation (i.e. 6.7 m steel casing to bedrock and depths of 20-25 m).

Raw water is expected to be relatively hard. Residential grade water softeners are recommended. Additional treatment to address TDS may be desired.

A predictive impact assessment for nitrates was conducted. The cumulative nitrate impact was calculated to be approximately 4.18 mg/L, which is well below the provincially mandated value of 10 mg/L. As such the impact of private sewage treatment systems on the drinking water aquifer will be acceptable.

Onsite sewage disposal needs can be accommodated by standard Class 4 sewage systems. The proposed Lot Development Plan (Drawing No. PH4398-1 - Lot Development Plan - Appendix 5) provides details of the proposed layout at each lot. Each home is to be serviced by a sewage system with a treatment capacity of 3,000 L/day.

The subject site is suitable for development as a residential subdivision at the proposed lot density. The hydrogeological recommendations contained within this report, if followed, will ensure that the development takes place in an effective manner, with a minimal impact on the natural environment.

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1.0 INTRODUCTION

1.1 Terms of Reference

Paterson Group (Paterson) was retained by Southwell Homes Ltd. to update the Hydrogeological Study and Terrain Analysis for a proposed rural residential subdivision situated on Part of Lot 4, Concession 10 in the geographic Township of Ramsay, Town of Mississippi Mills, Ontario. The property is situated on the south shore of the Mississippi River, in the Village of Appleton (Refer to Figure-1: Site Location Plan, located in Appendix 5).

The purpose of this study has been to ascertain and assess the specific terrain and hydrogeological conditions which currently exist beneath the subject property as they relate to the suitability of the site for residential development on private services.

This study was conducted in general accordance with Ontario Ministry of the Environment, Conservation and Parks (MECP) guidance as follows:

- Guideline D-5: Planning for Sewage and Water Services (August 1996).
- Procedure D-5-4: Technical Guideline for Individual On-site Sewage Systems: Water Quality Impact Risk Assessment (August 1996).
- Procedure D-5-5: Technical Guideline for Private Wells: Water Supply Assessment (August 1996).

The investigation involved the following components:

- Review of available information regarding the subject site, the proposed subdivision, and surrounding lands.
- □ Terrain analysis including a topographic survey, test hole investigation, soil texture analyses and review of previous subsurface investigations.
- Hydrogeological water supply analysis including well record search, installation of test wells, pumping tests, groundwater sampling, geological information review, aquifer analysis and water quantity assessment.
- □ Hydrogeological wastewater analysis including review of subdivision specific conditions and nitrate impact assessment.

SITE DESCRIPTION 2.0

2.1 Site Location

The subject site is a proposed residential development that occupies the eastern third of the subject property as indicated on Figure-1: Site Location Plan. The subject property has a total area of approximately 19.61 hectares (ha), and is located on the west side of Old Mill Lane, north of Apple Street in the Village of Appleton, Ontario. The property is situated on the south shore of the Mississippi River and is immediately adjacent to the Appleton Swamp.

The topography of the subject site slopes down towards the wetlands to the west. A small escarpment runs in a north-south direction along the western portion of the site. The escarpment separates the low lying swampy area to the west from the slightly elevated area to the east. The western portion of the property is located on the floodplain of the Mississippi River and will remain undeveloped.

2.2 Proposed Subdivision

The portion of the subject property that comprises the proposed subdivision (herein referred to as the 'subject site' or 'Site') encompasses a total area of approximately 6.99 hectares out of the 19.61 ha site area.

The current proposal calls for 14 residential lots and a park of variable sizes covering an area of approximately 6.06 ha within a total subdivision area of approximately 6.99 ha. Individual lot sizes range from 0.40 ha (Lot 1) to 0.57 ha (Lot 11), with the average lot size being 0.43 ha.

The lot layout, at the time of this submission is shown on Paterson Drawing PH4398-1 Lot Development Plan (see Appendix 5).

The development is intended to be serviced by individual water supply wells and Class 4 sewage disposal systems.

2.3 Surrounding Land Uses

Surrounding land uses within approx. 500 m of the proposed subdivision are described below:

North

- Mississippi River (open water). 0
- Appleton Swamp (forest). 0

East

- Residential houses along Old Mill Lane.
- Old Mill Lane right of way.
- Mississippi River.
- o Residential houses on the east side of the river.
- Agricultural land on the far side of the Missisippi.
- West
 - Appleton Swamp (forest).
 - A golf course (Mississippi Golf Club).
- South
 - Partial forest or unused / grazing land.
 - Residential houses.

All existing developments in the area utilize private individual water supply and onsite sewage systems.

Based on the available information, there are no obvious indicators of potential groundwater contamination present on the surrounding lands within 500 m of the subject property, which may negatively impact the proposed development.

A textile mill was previously located on the southern portion of the site. The former buildings were demolished and removed. A thorough environmental cleanup was conducted. Contamination issues at the site have been addressed and fully remediated (Paterson, 2010 and Paterson, 2022).

2.4 Potential Sources of Contamination

A textile mill (Appletex Woolen Mill) was previously located on part of the southern portion of the site. The mill was operated from around the middle of the last century until the early 1990s.

Potential sources of contamination associated with woolen mills include heavy metals (from the use of colored dyes), and chlorinated solvents (used to clean up dyes). Other potential environmental concerns at the former mill include hydrocarbons (from use of liquid fuels for heating), and PCBs (from old electrical transformers).

The following is a brief coverage of the environmental assessment history of the site:

□ MOECC investigated a dam breach in 1990.

- A Phase I ESA by Dames and Moore in 1992 identified environmental concerns at the site including chemical discharge to lagoons, onsite storage of waste, liquid fuels handling, chemical storage and the presence of PCB containing equipment (limited sampling identified mercury at a concentration exceeding the provincial surface water limit in one of the ponds).
- MOECC investigated the site in 1993 and found the concentrations of some heavy metals (lead and strontium) in the ponds were above provincial limits.
- WESA conducted test pitting and installed three boreholes/monitoring wells in 1994. One test pit soil sample exceeded the remediation criteria for hexavalent chromium. PCB containing transformers were present. Analysis of bedrock groundwater samples did not identify any concerns. The report states that "no further action is recommended with regard to potential impacts on the groundwater regime arising from former industrial activities at the site".
- □ A fire occurred at the mill building in November 1994. All PCB containing oil and equipment was subsequently removed from the site.
- □ In 2007, an oil spill occurred in the vicinity of the former heating plant.
- □ In 2007, two lagoons were breached resulting in further MOECC involvement. MOECC identified high concentrations of manganese in one sediment sample.
- Paterson conducted test pitting and installed three boreholes/monitoring wells in 2008 (Paterson, 2009). Heavy metals (lead and vanadium) exceeded the soil remediation criteria at three test pit locations. Petroleum hydrocarbons exceeded the soil remediation criteria at one location. Petroleum hydrocarbons exceeded the groundwater remediation criteria at two monitoring well locations. PAHs exceeded the groundwater remediation criteria at one boreholes/monitoring well location. PAHs were detected in soil in the vicinity of the former mill building. Petroleum hydrocarbon free product was identified at two of the Paterson monitoring well locations. Various metals (cadmium, chromium, copper, nickel and zinc) from the three former ponds exceeded the sediment standards.
- Paterson conducted a remediation program at the site from 2007 to 2010 (Paterson, 2010). Metals impacted surface soils (136 metric tons) were removed from several large areas including the area where the former ponds had been located. Petroleum hydrocarbon impacted soils (1,740 metric tons) were removed from one excavation in the vicinity of the former heating plant. A further 33,828 L of impacted groundwater was removed during the remediation program.

- Two (2) records of site condition (RSCs) were subsequently filed in the Environmental Site Registry (ESR) in 2010: RSC #97711 covers the bulk of the subject site and RSC #102721 is for the 30 m buffer area along the banks of the Mississippi River. The environmental condition of the subject property at the time the RSCs were filed, was in accordance with the then applicable 2004 MOECC Table 1 and Table 2 standards. The RSC's were filed prior to July 1, 2011, which is when the current regulation (O.Reg. 153/04 Records of Site Condition) came into effect.
- On March 16, 2018, two boreholes (BH1-18 and BH2-18) were placed on the subject property, within the former remedial area along the bank of the Mississippi River. Monitor Wells (MW) were installed in BH1-18 and BH2-18.
- On March 1, 2021 Paterson released a report PE1114-LET.03 dated March 1, 2021 which states that based on the findings of the groundwater programs, the groundwater has not been impacted by past on-site activities.
- Paterson completed an Environmental Assessment Report titled PE1114-3 Phase II Environmental Site Assessment – 116-122 Old Mill Lane, Appleton, Ontario dated June 14, 2023 which concluded that All groundwater results comply with the selected MECP Table 6 Residential standards.
- Paterson prepared a Remedial Action Plan titled PE1114-LET.04R- Remedial Action Plan 116-122 Old Mill Lane, Appleton, Ontario dated February, 2024

Based on a thorough review of all of the available environmental information about the site, the following list of 'contaminants of concern' were identified:

- □ Heavy metals (primarily copper, lead, mercury and chromium)
- □ Volatile Organic Compounds (VOCs)
- D Petroleum Hydrocarbons (PHCs)
- Delycyclic Aromatic Hydrocarbons (PAHs)
- Polychlorinated Biphenyls (PCBs)

The risk to water quality in the bedrock aquifer from these contaminants is considered to be very small due to the massive nature of the upper bedrock.

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In order to demonstrate that there has been no impact to the bedrock aquifer from the listed contaminants, a comprehensive program of groundwater sampling and analysis was conducted in June of 2016. All three onsite wells (TW1, TW2 and TW3) were fully purged and sampled on June 23 and 24, 2016. The groundwater samples were submitted to Exova Laboratories of Ottawa Ontario for analysis of the following suite of parameters:

- □ Subdivision supply (no bacteria)
- □ VOCs
- D PHCs
- D PAHS
- D PCBs
- □ RVCA metals + hexavalent chromium

The 2016 analytical results were all non-detectible for VOCs, PHCs, PAHs and PCBs except for one low level detection of toluene on the sample from TW2 (and this is probably due to laboratory error). The toluene concentration is well below the maximum allowable concentration. The analytical results for general chemistry are consistent with previous findings from the same wells (i.e. elevated hardness and TDS). The analytical results from testing of metals were all either non-detectible or well below ODWS limits.

Due to Regulatory Authority Comments, the three onsite wells (TW1, TW2, and TW3) were fully purged until field parameters were noted to stabilize, and sampled on December 7 and 8, 2021. The groundwater samples were submitted to Eurofins Environment Testing Canada Inc. for analysis of the following suite of parameters:

- Benzene, Toluene, Ethylbenzene and Xylene (BTEX)
- Total Metals
- PAHS
- PCBs
- Dioxins and Furans

The results from the December 7 and 8, 2021 sampling program are all in compliance with the MECP O.Reg. 153 Table 1 and MECP Table 2 standards.

The comprehensive groundwater testing program did not identify any environmental concerns. The bedrock aquifer beneath the site has demonstrated that it can provide water that is safe and suitable for human consumption.

A review of the most recent Environmental Assessments were completed. Paterson recently released a report titled Remedial Action Plan (RAP) with report number PE1114-LET.04R dated February 14, 2024 which summarises the onsite environmental activities. Paterson's Hydrogeological Assessment report should be read in conjunction with the RAP. The RAP consists of excavation and disposal of impacted soils at an approved waste disposal facility to be undertaken in conjunction with the redevelopment of the subject site. The report further states that, "Based on the Phase II ESA, the groundwater beneath the subject site meets the selected MECP Table 6 and Table 8 standards". Should an environmental assessment identify potential contamination in the underlying groundwater aquifer, then this Hydrogeological Assessment report will need to be updated. As the Environmental Assessments have already concluded that environmental impacts are not present in the groundwater underlying the site, further action is not required.

3.0 METHOD OF STUDY

3.1 Terrain Analysis

Subsurface investigations (drilling and test pitting) were conducted at the site in 2008, 2015 and 2018. Refer to Paterson Drawing No. PH4398-2 – Test Hole Location Plan, located in Appendix 5.

Five (5) boreholes were drilled in August and October, 2008 by Paterson (Paterson, 2009). A series of 21 test pits were excavated by Paterson in 2008. Test pit and auger hole graphical logs are included in Appendix 1. Borehole graphical logs are provided in Appendix 2.

A series of eight (8) hand auger test holes were completed at the site by Paterson on August 28 and 31, 2015 to further delineate subsurface soil conditions.

Additional test pitting was conducted at the site on August 18, 2016 in order to obtain overburden thickness information at specific locations across the site. Test pitting was completed using a backhoe. A total of 24 test pits were excavated to a maximum depth of 3 m below ground surface (i.e. maximum reach of backhoe).

Two boreholes (BH1-18 and BH2-18) were placed on the subject property on March 16, 2018, within the former remedial area along the bank of the Mississippi River. Monitoring Wells (MW) were installed in BH1-18 and BH2-18.

Test pit locations were recorded and the subsurface conditions, including the soil morphology and depth to the groundwater table (where encountered), were carefully observed and recorded as the test pits were advanced. Representative samples of the soils were recovered from the test pits. All samples were classified texturally in the field and sealed in proper containers for reference purposes and laboratory analysis. Soil sample depths are indicated on the Soil Profile and Test Data sheets provided in Appendix 1.

Four (4) representative soil samples from the hand auger drilling program conducted in August 2015 were submitted to the Paterson materials testing laboratory in Ottawa for grain size analysis. Results of the soil testing are provided on the Grain Size Distribution curves included in Appendix 1.

Three test pits (TP18, TP21 and TP22) encountered significant amounts of fabric waste. All of the soil and debris was subsequently removed from this area.

3.2 Well Record Search

A review of available MOECC Water Well Records within a 500 m radius of the site was undertaken as part this study. Water well record information was obtained directly from the MOECC water well records interactive GIS system located at:

http://www.ontario.ca/environment-and-energy/map-well-records.

Overburden thickness, depth of casing, aquifer interception points and reported well yields were reviewed in detail in order to assist in establishing a hydrogeological conceptual model for the site.

3.3 Surrounding Permit to Take Water (PTTW)

A search of the MECP Permit to Take Water database provided one active PTTW within 500 m of the subject site. Permit Number 0507-9D5Q5X, located approximately 85 m east of the subject site, has been registered to Canadian Hydro Developers Inc. and contains one source. The permit is provided as power production, with a maximum taking of 3,500,000,000 L/day. The permit expired on January 15, 2024.

A search of the MECP Environmental Activity and Sector Registry (EASR) database did not provide any active EASR's within 500 m of the subject site.

This water taking will not be affected by the proposed residential development on the subject site.

3.4 Test Well Installation

Three (3) test wells (TW1, TW2 and TW3) were installed at the subject site on June 22 and 23, 2015. The test well locations were selected to provide adequate coverage of aquifer conditions across the site and are suitably constructed to ensure an adequate prediction of the quality and quantity of groundwater that will be provided by future wells at the site. Test well locations are indicated on Drawing No. PH4398-2 - Test Hole Locations (Appendix 5).

The test wells were drilled by Air Rock Drilling Co. Ltd. (Well Contractor License No.1119). A technical representative from Paterson was present during the installation of well casing and grouting of the annular space for each test well. The MOECC Water Well Records for each test well are included in Appendix 2.

It is intended that the test wells will be used as private water supply wells for individual lots in the proposed subdivision. If for any reason one or more of the test wells cannot be utilized for that purpose, the test well(s) should be abandoned according to the requirements of O.Reg. 903.

	TEST WELLS SUMMARY											
	Well ID	Year drilled	Depth to BR (m)	Casing depth (m)	Depth to water bearing fractures (m)	Total depth (m)	Recommended pumping rate (L/min)					
ſ	TW1	2015	1.22	6.10	20	21.64	91+					
	TW2	2015	0.91	6.10	20	21.34	91+					
	TW3	2015	3.66	6.40	11.89 / 18.29	20.42	91+					

Table 1 - Test Wells Summary

TW1

A 248 mm diameter casing hole was advanced using a rotary tri-cone bit through the sandy overburden material to the limestone/dolostone bedrock, which was encountered at a depth of approximately 1.2 m bgs. The casing hole was advanced into the bedrock an additional 4.9 m to ensure that the casing was seated into competent (i.e. unfractured) bedrock.

A new 6.7 m long section of 152 mm diameter steel casing was installed in the casing hole. Casing stickup is approximately 0.6 m above ground surface. The annular space was grouted using a bentonite grout slurry pumped to the bottom of the annular space using pressure grouting equipment. The return of the grout to ground surface was visually observed by the Paterson representative. The casing installation and grouting of the annular space is considered to be in compliance with Ontario Regulation (O.Reg.) 903.

After the completion of the casing installation the open borehole was advanced using a 152 mm diameter air percussion button bit to a total depth of 21.6 m bgs.

The well contractor reported a significant influx of groundwater at a depth of 19.8 m bgs.

Following completion of the well installation Air Rock Drilling Co. Ltd. developed the well and conducted shock chlorination (disinfection) in accordance with O.Reg. 903.

A one hour constant rate pumping test was then carried out. A pumping rate of 91 L/min was based on the preliminary findings of the well contractor at the time of installation. The well contractor measured a drawdown of 0.38 m at the end of the one hour test.

TW2

A 248 mm diameter casing hole was advanced using a rotary tri-cone bit through the sandy overburden material to the limestone/dolostone bedrock, which was encountered at a depth

of approximately 0.9 m bgs. The casing hole was advanced into the bedrock an additional 5.2 m to ensure that the casing was seated into competent bedrock.

A new 6.7 m long section of 152 mm diameter steel casing was installed in the casing hole. Casing stickup is approximately 0.6 m above ground surface. Grouting of the annular space was observed by the Paterson representative and is considered to be in compliance with O.Reg. 903. The borehole was advanced using a 150 mm diameter air percussion button bit to a total depth of 21.3 m bgs.

The well contractor reported a significant influx of groundwater at a depth of 19.5 m bgs.

Following completion of the well installation Air Rock Drilling Co. Ltd. developed the well and conducted shock chlorination (disinfection) in accordance with O.Reg. 903.

A one hour constant rate pumping test was then carried out. The chosen pumping rate 91 L/min resulted in a measured drawdown of 0.30 m at the end of the one hour test.

TW3

A 248 mm diameter casing hole was advanced using a rotary tri-cone bit through unconsolidated sand and fill material to the limestone/dolostone bedrock, which was encountered at a depth of approximately 3.7 m bgs. The casing hole was advanced into the bedrock an additional 2.1 m to ensure that the casing was seated into competent bedrock.

A new 6.7 m long section of 152 mm diameter steel casing was installed in the casing hole. Casing stickup is approximately 0.6 m above ground surface. Grouting of the annular space was observed by the Paterson representative and is considered to be in compliance with O.Reg. 903. The borehole was advanced using a 150 mm diameter air percussion button bit to a total depth of 20.42 m bgs.

The well contractor reported a significant influx of groundwater at a depth of 18.3 m bgs.

Following completion of the well installation Air Rock Drilling Co. Ltd. developed the well and conducted shock chlorination (disinfection) in accordance with O.Reg. 903.

A one hour constant rate pumping test was the carried out. The chosen pumping rate of 91 L/min resulted in a measured a drawdown of 0.81 m at the end of the one hour test.

3.5 Pumping Tests

Pumping tests were conducted sequentially at each test well using the other test wells as observation wells. The pumping tests were carried out following Air Rock's development of each well. All tests began with a static water level and involved pumping at a fixed rate

(+/- 5%) for six hours. Water levels were measured at the pumping well and observations wells at one minute intervals, and the pumped water was discharged far enough away from the test wells to ensure that artificial recharge did not occur.

Each of the test wells was pumped at a constant rate of 114 L/min for six hours and was then allowed to recover. The pumping discharge rates (114 L/min for each test) were selected to ensure a demonstrable reduction in potentiometric head (i.e. a lowering of the static water levels) within the water supply aquifer being tested. During the pumping test, the pumping rate was monitored at 60 minute intervals in order to ensure that the rate of discharge remained reasonable constant (i.e. < 5% variation).

Drawdown observations during pumping and recovery were recorded using manual measurements taken with an electronic water level tape. Electronic dataloggers (Schlumberger Micro-Diver[™]) were installed in each of the test wells prior to the test program. Full recovery was monitored using the dataloggers which were not removed from the wells until at least 24 hours after each pumping test.

Turbidity and free chlorine residual measurements were taken using a Hanna HI93414 Fast Tracker portable meter at the well head at regular intervals during each pumping test. No residual chlorine was detected at the time of water sample collection.

Field measurements of pH, temperature, conductivity and TDS were carried out during each test using an Extech[™] ExStik II portable multi-meter. Field parameter results are included on the field test sheets in Appendix 4.

3.6 Groundwater Sampling

Groundwater samples were collected at each well during the pumping tests. Samples were collected at 3 hours and 6 hours after the start of each test. Prior to collection of the pumping test water samples, the free chlorine residual was verified to be non-detectable using field test equipment.

Five (5) offsite water supply wells were also sampled as part of the investigation. The locations are indicated on Drawing No. PH4398-2 Test Hole Location (Appendix 5). A well and septic owner survey was conducted at offsite well locations in August, 2015.

All groundwater samples were submitted for comprehensive testing of bacteriological, chemical and physical water quality parameters consistent with standard 'Subdivision Assessment Package' suite of parameters. One sample from test well TW3 was submitted for analysis of metals and selected volatile organic compounds (VOCs).

No methane or other potentially explosive gases were encountered during the water supply assessment.

All samples were collected unfiltered and unchlorinated and were placed directly into clean bottles supplied by the analytical laboratory. Samples were placed immediately into a cooler with ice and were transported directly to the Exova laboratory in Ottawa. All samples were received by the laboratory within 24 hours of collection.

3.7 Topographic Survey

A topographic survey of the site was conducted by G.A. Smith Surveying Ltd. of Carleton Place Ontario in October 2014. The survey information was used to develop the Lot Development Plan (Paterson Drawing PH4398-1) included in Appendix 5.

4.0 GEOLOGY AND HYDROGEOLOGY

4.1 Surficial Geology

The subsurface investigations conducted by Paterson identified a variable thickness layer of sand and gravel fill over discontinuous native till, over bedrock. Available Ontario Geological Survey (OGS) mapping suggest that the site is in an area of exposed Paleozoic Bedrock and Organic Deposits. This information conflicts with onsite observations from the subsurface investigations. Surficial soil delineation mapping data from the OGS Earth website is included in Figure-2: Surficial Soil Delineation Mapping (Appendix 5).

Based on the test pit and borehole program, overburden thickness across the site is variable with thickness typically ranging from bedrock at surface to 4.6 m. Several small isolated areas of bedrock outcrop occur at the site. Most of the site (more than 95%) is covered with native soil and/or clean fill material. Refer to the Soil Profile and Test Data sheets in Appendix 1 for the details of the soil profile at each test hole location. Textural soil classifications are provided in Appendix 1. Test hole locations are summarized on the Test Hole Location Plan (Drawing No. PH4398-2 in Appendix 5).

4.2 Bedrock Geology

Geological mapping information provided by OGS reveals that the site and immediate surroundings are underlain by dolostone and sandstone of the lower Ordovician Oxford Formation, which is part of the Beekmantown Group, as indicated in Figure-3: Bedrock Geology (Appendix 5).

A review of the available MOECC Water Well Records shows that wells in the surrounding area have encountered limestone and sandstone (please note that dolostone is often interpreted as limestone by drilling contractors as it has a very similar appearance and is often associated with limestone). Dolostone typically occurs due to magnesium replacement of the calcium in limestone during lithification, and is very common in the Ottawa region.

4.3 Hydrogeology

From a hydrogeological perspective, 'aquifer zones' within horizontally bedded carbonate strata are typically associated with bedding plane fracture zones and associated interconnected vertical and sub-vertical fracturing. Relatively unfractured layers behave like aquitards.

The locations of MOECC Water Well Records located within a 500 m radius of the site are included on Figure 4 - MECP Water Well Location Plan (Please note: well location accuracy

is variable based on the MOECC database). A total of 27 well records were identified within 500 m of the site, on the west side of the Mississippi River. Table 1: MOECC Water Well Records Summary (below) provides a summary of hydrogeological information obtained from the available well records.

Well Record ID	Year Drilled	Depth to Bedrock (m)	Casing Depth (m)	Depth to Water Bearing Fractures (m)		Total Depth (m)	Recommended Pumping Rate (L/min)			
Well Records located to the west of the Mississippi River										
3502099	1958	0.0	4.3	13.1		14.3	not provided			
3502100	1952	0.6	1.8	18.6		20.4	not provided			
3502101	1958	1.2	7.0	14.0		15.2	not provided			
3502129	1949	1.2	1.8	18.6		20.4	not provided			
3502130	1951	2.4	3.2	18.9		19.5	not provided			
3502135	1959	1.8	3.0	15.2		19.5	11.4			
3502138	not provided	3.0	3.7	20.7		22.3	not provided			
3502139	1961	3.7	4.0	27.1	34.1	38.1	132.5			
3502152	1964	1.5	3.7	21.3		21.3	45.4			
3503276	1972	0.6	7.6	29.9		31.4	68.2			
3503339	1973	0.3	7.6	8.2	19.5	19.8	18.9			
3503366	1973	0.6	6.7	18.3		19.5	90.9			
3503546	1973	0.9	7.6	18.3		19.5	136.4			
3504685	1977	0.9	6.7	19.8		22.9	22.7			
3504686	1977	1.2	6.7	21.0		22.9	22.7			
3504687	1977	1.2	6.7	28.0		30.5	22.7			
3504689	1977	0.6	6.7	20.7		22.9	22.7			
3504691	1977	0.9	6.7	21.0		22.9	26.5			
3504813	1977	0.6	6.7	35.7		37.8	40.9			
3505232	1977	1.2	6.7	20.7		22.9	not provided			
3505550	1979	0.6	7.0	15.8		20.7	94.6			
3507000	1984	0.9	6.1	18.3		19.8	68.2			
3507253	1985	3.0	6.1	19.2		19.8	26.5			
7235377	2014		Aban	doning Red	ord - PVC	Well				
7244927	2015	1.2	6.1	19.5		21.6	91.0			
7244928	2015	0.9	6.1	19.5		21.3	90.9			
7244929	2015	3.7	6.4	11.9	18.3	20.4	91.0			

Table 2 - MECP Water Well Records Summary

Depth to bedrock varies from at ground surface to 3.7 m bgs in the available well records. The depth to significant water bearing fractures varies from 8.2 to 35.7 m bgs.

The pumping rates recommended by the drilling contractor at the time of well installation vary from 11 to 136 liters/minute (L/min). The average rate of pumping based on the available well records that included recommended pumping rates is 59 L/min.

The site is considered to be hydrogeologically sensitive due to bedrock occurring within 2 m of the ground surface. It should be noted that although the site is considered hydrogeologically sensitive, septic impacts were not observed in the groundwater analytical results from the pumping tests of the onsite wells. The presence of relatively shallow overburden and isolated bedrock outcrops will not promote higher than anticipated rates of infiltration due to the massive nature of the upper bedrock strata. No significant fracturing was identified in bedrock outcrops at the site. No karst related features were identified in outcrops at the site. The site is not located in an area of potential or inferred karst as determined by OGS.

4.4 Neighbouring Water Quality

Additional water quality sampling was conducted at five (5) offsite water supply wells. The wells that were sampled are all used for private domestic water supply at residences located along Old Mill Lane, Wilson Street and Apple Street, in close proximity to the subject site.

The locations of the offsite water wells that were sampled are included on Drawing No. PH4398-2 Test Hole Location (Appendix 5). Available Water Well Record information is included in Appendix 2.

A summary of the laboratory water quality results for the offsite sampling is presented in Table 2: Groundwater Geochemistry – Offsite Wells (below). Laboratory certificates of analysis are included for reference purposes in Appendix 3.

Analysis of the water quality data for the offsite water supply wells reveals that the aquifer has not been adversely impacted as a result of the existing development in the area. The development density of the existing lots that border the subject site along Old Mill Lane and Apple Street is approximately 7.2 lots/hectare. The proposed development density is approximately 0.7 lots/hectare, so the proposed development is unlikely to have a significant impact on groundwater quality.

Several exceedances of operational and aesthetic guideline limits are noted for Hardness, TDS, colour and DOC.

ODWS OFF-SITE WELL									
PARAMETER	UNITS			104 Old Mill 116 Old Mill 124 Wilson 119 Old Mill 110 Appl					
		LIMIT	TYPE	15-Dec-09	01-Feb-10	23-Dec-09			
				15-Dec-09	01-Feb-10	23-Dec-09	28-Aug-15	28-Aug-15	
MICROBIOLOGICAL									
Escherichia Coli (E.Coli)	ct/100mL	0	MAC	0	0		0	0	
Total Coliforms	ct/100mL	0	MAC	0	0		0	0	
Heterotrophic Plate Count	ct/1mL			0	0				
Faecal Coliforms	ct/100mL			0	0				
Faecal Streptococcus	ct/100mL			0	0				
GENERAL CHEMICAL - HE	ALTH RELA	TED				-			
Fluoride	mg/L	1.5(2.4)	MAC	0.26	0.31	0.32	0.32	0.43	
Nitrite	mg/L	1	MAC	<0.10	<0.10	<0.10	<0.10	<0.10	
Nitrate	mg/L	10	MAC	0.6	0.41	5.30	<0.10	1.23	
Turbidity	NTU	1.0(5.0)	MAC/AO	0.2	0.3	0.1	0.6	0.1	
Ammonia	mg/L			< 0.02	< 0.02		0.02	0.02	
TKN	mg/L			<0.10	<0.10		<0.1	<0.1	
GENERAL CHEMICAL - AE		LATED		•		•			
Hardness	mg/L	100	OG	322	376		370	430	
Ion Balance	unitless			1.04	1.01		1.04	0.98	
TDS	mg/L	500	AO	417	487	832	506	611	
Alkalinity	mg/L	500	OG	279	339	339	319	352	
Chloride	mg/L	250	AO	19	32	177	50	84	
Colour	τČU	5	AO	4	<2	3	18	16	
Conductivity	uS/cm			641	749	1280	779	940	
рН	unitless	6.5-8.5	AO	7.86	7.70	7 67	8 16	8.27	
Sulphide	mg/L	0.05	AO	< 0.01	< 0.01		< 0.02	< 0.02	
Sulphate	mg/L	500	AO	39	33	40	38	39	
Calcium	mg/L			86	98		92	98	
Iron	mg/L	0.3	AO	< 0.03	< 0.03		< 0.03	< 0.03	
Potassium	mg/L			3	5		4	9	
Magnesium	mg/L			26	32		34	35	
Manganese	mg/L	0.05	AO	<0.01	< 0.01		<0.01	< 0.01	
Sodium	mg/L	200	AO	17	20		33	30	
Phenols	mg/L	200		<0.001	<0.001		<0.001	< 0.001	
Tannin & Lignin	mg/L			<0.1	<0.1	<0.1	0.2	<0.1	
DOC	mg/L	5	AO	2.2	1.8	-0.1	63.9	65.1	
MAC=Maximum Allowable Concentra		, v	AO = Aesthetic C			OG= Operational Gui		00.1	

Table 3 – Potable Supply Well Geochemistry - Offsite Wells

4.5 Source Protection

The Mississippi-Rideau Source Protection Plan (MRSPP) provides guidance as to which policies apply to a given property, municipality or specific activity and if there are specific designations that apply to the area. The subject site and surrounding areas have been designated as a Highly Vulnerable Aquifer (HVA), and Intake Protection Zone (IPZ) Zone 3 within the MRSPP, and are identified as **two** of four groundwater related vulnerable areas identified within the Clean Water Act (2006). The four vulnerable areas consist of Significant Groundwater Recharge Area (SGRA), HVA, IPZ and wellhead protection area (WHPA).

Based upon the designation of an IPZ Zone 3 and HVA, the MRSPP provides a list of activities that are prohibited, managed or encouraged dependent upon the vulnerable area type. The subject site is mapped to be in IPZ zone 3 (Source Protection Atlas), however has

an IPZ score of less than 8 (MRSPP). There is no prohibition of land uses on the subject site based upon its proposed usage.

Therefore, there are no related requirements for an HVA or a IPZ with a score of less than 8 at this location.

5.0 AQUIFER ANALYSIS

The results of the groundwater review and pumping tests performed on the test wells are presented in the following sections.

5.1 Static Conditions

Subsurface conditions are indicated in a cross-section which is included as Figure-5: Generalized North - South Site Cross-Section (Appendix 5). The cross-section shows bedrock and overburden units as well as static groundwater levels in the test wells. Static water level data is summarized in Table 4: Water Level Elevations (below).

WATER LEVEL ELEVATIONS									
Test Well ID	Date	Elevation Ground Surface (m)	Elevation Top of Casing (m)	Water Level Below Top of Casing (m)	Water Elevation (m)				
	08-Jul-15			11.13	118.33				
TW1	15-Jul-15	129.00	129.46	11.22	118.24				
	07-Dec-21			11.12	118.34				
	08-Jul-15				9.06	118.33			
TW2	15-Jul-15	126.89	127.39	9.17	118.22				
	08-Dec-21			8.83	118.56				
	08-Jul-15			5.97	118.36				
TW3	15-Jul-15	123.93	124.33	6.06	118.27				
	08-Dec-21			5.94	118.39				

Note: Elevations are calculated relative to assumed local elevation from topographic survey, and are not specifically accurate relative to mean sea level.

Table 4 - Water Level Elevations

Prior to the initiation of the pumping tests, water levels were measured in the three (3) test wells. The static groundwater levels were between 118.33 and 118.36 m above sea level (ASL) on July 8, 2015 prior to the pumping tests. The groundwater elevations suggest that

groundwater flow in the bedrock is from south to north. The three wells were completed in the same geological unit (dolostone) and at relatively similar depths (Figure-5: Generalized North - South Site Cross-Section). This information is consistent with the expected direction of groundwater flow, which is towards the Mississippi River.

The horizontal hydraulic gradient in the shallow bedrock is estimated at be approximately 0.0003 based on an estimated head difference of 3 cm over 95 m.

5.2 Aquifer Characteristics

Table 5: Summary of Pumping Tests (below) provides a summary of the pumping test program including drawdown observed at each pumping well and at observation wells during pumping.

SUMMARY OF PUMPING TESTS									
Pumping Well ID	Pumping Rate (L/min)	Maximum Drawdown in Pumping Well (m)	Observation Well ID	Max Drawdown in Observation Well (m below top of casing)	Distance between Pumping Well and Observation Well (m)				
TW1	1 114	0.53	TW2	0.23	140				
1001			TW3	0.42	95				
TW2	114	0.47	TW1	0.42	140				
1002		0.47	0.47	TW3	0.4	206			
TW3	114	0.77	TW1	0.42	95				
1005	114	0.77	TW2	0.4	206				

Note: Drawdown values calculated from manual field measurements taken during pumping tests

Table 5 - Summary of Pumping Tests

Pumping test data were analyzed using Aquifer Test Pro[™] (V 2015.1) software. Drawdown data from dataloggers were analyzed using Theis (Theis, 1935), Theis with Jacob correction (Jacob, 1944) and Cooper-Jacob I (Cooper and Jacob, 1946) methods of analysis. Datalogger recovery data was analyzed using Theis (Theis, 1935).

All pressure data from the dataloggers was corrected for atmospheric pressure variations (i.e. barometric compensation) using Schlumberger Diver-Office[™] software and a barometric pressure data logger that was deployed during the investigation.

The aquifer characteristics determined from the three pumping tests are summarized in Table 6: Summary of Aquifer Characteristics (below).

Analysis	Well	Transmissivity (m2/d)	Storativity					
Test 1								
Theis	TW2	2.05E+02	3.05E-06					
Theis	TW3	2.20E+02	4.39E-06					
Theis Jacob	TW2	2.08E+02	3.20E-06					
Theis Jacob	TW3	2.22E+02	4.64E-06					
Cooper Jacob I	TW2	2.05E+02	3.05E-06					
Cooper Jacob I	TW3	2.09E+02	5.87E-06					
Theis Recovery	TW2	1.77E+02						
Theis Recovery	TW3	1.70E+02						
	Test 1 Average	2.02E+02	4.03E-06					
Test 2								
Theis	TW1	3.58E+02	1.00E-07					
Theis	TW2	1.53E+02	1.00E-07					
Theis Jacob	TW1	3.65E+02	1.00E-07					
Theis Jacob	TW2	2.80E+02	1.37E-10					
Cooper Jacob I	TW1	4.56E+02	5.39E-09					
Cooper Jacob I	TW2	2.73E+02	1.17E-10					
Theis Recovery	TW1	TW1 5.45E+02						
Theis Recovery	TW2	4.52E+02						
	Test 2 Average	3.60E+02	5.09E-08					
Test 3								
Theis	TW1	4.12E+02	1.00E-07					
Theis	TW3	2.79E+02	1.00E-07					
Theis Jacob	TW1	3.65E+02	1.00E-07					
Theis Jacob	TW3	2.85E+02	1.00E-07					
Cooper Jacob I	TW1	4.12E+02	1.00E-07					
Cooper Jacob I	TW3	2.79E+02	1.00E-07					
Theis Recovery	TW1	2.78E+02						
Theis Recovery	TW3	1.98E+02						
	Test 3 Average	3.14E+02	1.00E-07					
	Average for all tests	2.92E+02	1.39E-06					
	Worst case values	1.53E+02	1.17E-10					

Table 6 - Summary of Aquifer Characteristics

5.3 Groundwater Geochemistry Assessment

Water quality analysis data from the test wells is summarized in Table 7: Onsite Groundwater, General Geochemistry, and Table 8: Onsite Groundwater Geochemistry, Metals and VOCs (below). The analytical results for the six (6) groundwater samples that were obtained from the three onsite test wells show that water quality at the subject site is acceptable and that there are no exceedances of the applicable health related parameter limits of the Ontario Drinking Water Standards (ODWS).

PARAMETER		ODWS		TEST WELL									
	UNITE		TYPE		TW 1			TW 2			TW 3		
	UNITS	LIMIT		11-Jul-15 2		23-Jun-16	13-J	ul-15	24-Jun-16	10-Jul-15		23-Jun-16	
				3hr	6hr		3hr	6hr		3hr	6hr		
MICROBIOLOGI	CAL												
Escherichia Coli	ct/100mL	0	MAC	0	0	-	0	0	-	0	0	-	
Total Coliforms	ct/100mL	0	MAC	0	0	-	0	0	-	0	1	-	
GENERAL CHE	NICAL - HEA	LTH RELA	TED			•							
Fluoride	mg/L	1.5(2.4)	MAC	0.39	0.32	0.41	0.33	0.31	0.33	0.43	0.43	0.4	
Nitrite	mg/L	1	MAC	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Nitrate	mg/L	10	MAC	0.72	0.73	1.36	0.16	0.23	0.7	0.93	1.16	0.48	
Turbidity - Lab	NTU	1.0(5.0)	MAC/AO	2.7	0.2	0.1	1.0	1.6	0.5	0.2	0.2	0.3	
Ammonia	mg/L			0.02	0.02	0.01	0.02	0.03	0.03	<0.05	<0.05	0.1	
TKN	mg/L			<0.10	<0.10	0.2	0.20	0.10	0.20	0.14	0.33	0.3	
GENERAL CHEN	ICAL - AES	THETIC RE	LATED			1							
Hardness	mg/L	100	OG	383	383	394	346	348	368	414	419	409	
TDS	mg/L	500	AO	520	520	544	449	460	526	565	578	621	
Alkalinity	mg/L	500	OG	329	343	358	322	316	327	358	369	439	
Chloride	mg/L	250	AO	53	56	60	30	34	60	62	68	57	
Colour	TCU	5	AO	<2	<2	<2	11	11	4	<2	<2	2	
Conductivity	uS/cm			800	815	837	691	707	810	869	869	955	
pН	unitless	6.5-8.5	AO	7.94	7.98	8.19	7.98	7.91	8.1	7.70	7.76	8.04	
Sulphide	mg/L	0.05	AO	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Sulphate	mg/L	500	AO	40	36	40	37	37	41	36	35	34	
Calcium	mg/L			94	96	95	89	90	93	100	102	98	
Iron	mg/L	0.3	AO	< 0.03	<0.03	< 0.03	0.18	0.16	0.1	< 0.03	< 0.03	<0.03	
Potassium	mg/L			7	7	7	3	3	3	7	7	7	
Magnesium	mg/L			36	37	38	30	30	33	40	40	40	
Manganese	mg/L	0.05	AO	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01	0.02	
Sodium	mg/L	200	AO	31	32	36	18	19	38	39	42	66	
Phenols	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.001	
Tannin & Lignin	mg/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	
DOC	mg/L	5	AO	75.4	71.2	1.6	70.3	73	2.4	2.3	2.1	3.5	

Table 7 – Test Well Geochemistry - Onsite Wells - General

The total coliform level in TW3 was 1 count/100 ml which exceeds the MAC of 0 counts/100 mL in the sample taken at the end of the six hour pumping test. Please note that the total coliform count was zero in the sample that was collected from TW3 after three hours of pumping. The result for the six hour sample is considered to be anomalous and is probably due to sample contamination at the time of sampling. MOE Guideline D-5-5 notes that total coliform counts of less than 6 counts/100 ml shall be considered as acceptable (MOE, 1996).

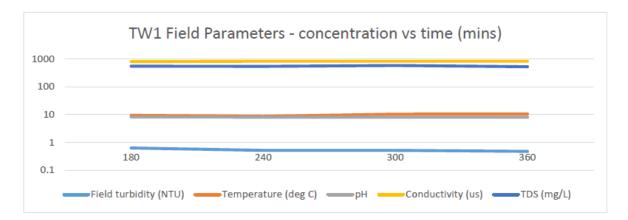
All test wells were purged and resampled on June 23, 24 2016, at which point Colour and DOC were below the Procedure D-5-5 Guideline limits.

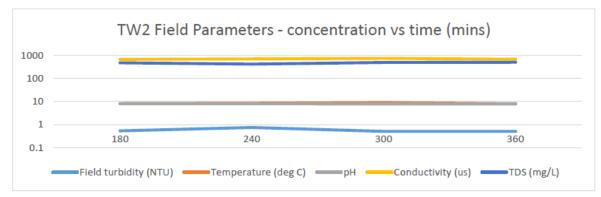
With respect to aesthetic objectives and operational guidelines, the analytical results indicate some minor exceedances of the non-health related guidelines and objectives as follows:

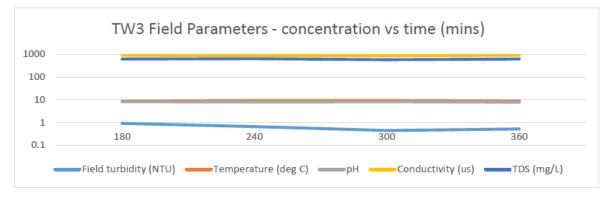
- Hardness (operation guideline) at TW1, TW2 and TW3.
- Total Dissolved Solids (aesthetic objective) at TW1 and TW3.

Laboratory determined turbidity levels were elevated at TW1 and TW2 after 3 hours of pumping at each location. The field turbidity measurement results were below Maximum Acceptable Concentration (MAC) limit, however, as were the 6 hour sample results (lab and field results). Turbidity results for the site are therefore considered to be acceptable.

Field parameter results for the final 3.5 hours of each test are shown graphically below:









Hardness, an operational guideline, does not appear in the ODWS. Rather it appears in the Technical Support Documents for Drinking Water Standards, Objectives and Guidelines (Technical Support Documents) as a parameter with an operational guideline of 100 mg/L. At the measured concentrations, the water is considered to be moderately hard, which is typical of wells drilled throughout eastern Ontario.

Total dissolved solids (TDS) refers to the concentration of inorganic substances dissolved in water. The main constituents are typically chloride, sulphates, calcium, magnesium and bicarbonates. There are various levels of the constituents at a low level and it is not anticipated that they will cause an issue with taste. A point of use reverse osmosis unit may be installed if a homeowner desires for drinking purposes. As such, no taste problems will occur when the system is used.

The Langelier Saturation Index (Langelier, 1936) is used to predict the calcium carbonate stability of water. It indicates whether the water will precipitate, dissolve, or be in equilibrium with calcium carbonate. The results of the Langelier calculation indicate the water is super saturated and tends to precipitate a scale layer of calcium carbonate (scale forming but non-corrosive). See Appendix 4 for calculation details.

The Ryznar Stability Index (Ryznar, 1944) uses a database of scale thickness measurements in municipal water systems to predict the effect of water chemistry. The RSI was developed from empirical observations of corrosion rates and film formation in steel water mains. The results of the RSI calculation indicates that scale will form. See Appendix 4 for calculation details.

		ODWS		TW1		TW2		TW 3			
		LIMIT	TYPE	23-Jun-16	07-Dec-21	24-Jun-16	08-Dec-21	10-Jul-15	23-Jun-16	08-Dec-21	
METALS			•	-	•						
Antimony	mg/L	0.006	IMAC	< 0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.0005	
Arsenic	mg/L	0.025	IMAC	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001	
Barium	mg/L	1	MAC	0.22	0.21	0.27	0.24	0.21	0.24	0.23	
Beryllium	mg/L			<0.0005	< 0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Boron	mg/L	5	IMAC	0.15	0.15	0.14	0.13	0.14	0.15	0.13	
Cadmuim	mg/L	0.005	MAC	< 0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.0001	
Chromium	mg/L	0.05	MAC	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	
Chromium VI	mg/L			<0.010	<0.010	<0.010	<0.010	-	<0.010	< 0.010	
Copper	mg/L	1	AO	<0.001	0.002	< 0.001	0.002	< 0.001	< 0.001	0.002	
lead	mg/L	0.01	MAC	<0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001	<0.001	
Mercury	mg/L	0.001	MAC	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.0001	< 0.0001	
Molybdenum	mg/L			<0.005	< 0.005	< 0.005	<0.005	< 0.005	< 0.005	<0.005	
Nickel	mg/L			<0.005	< 0.005	<0.005	< 0.005	<0.005	<0.005	<0.005	
Selemium	mg/L	0.01	MAC	<0.001	< 0.001	<0.001	< 0.001	< 0.001	<0.001	< 0.001	
Silver	mg/L			< 0.0001	< 0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.0001	
Strontium	mg/L			2.33	-	2.33	-	2.40	2.36	-	
Titanium	mg/L			< 0.0001	-	<0.0001	-	< 0.0001	<0.0001	-	
Uranium	mg/L	0.02	MAC	0.003	0.002	0.002	0.002	0.002	0.003	0.003	
Zinc	mg/L	5.0	AO	< 0.01	<0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.01	

Water quality analysis data for metals and VOC testing is summarized in Table 8 and Table 9 below.

 Table 8 – Test Well Geochemistry – Onsite Wells – Metals

TEST WELL GEOCHEMISTRY - ONSITE WELLS - VOCs PARAMETER UNITS TW1 TW2 TW3 ODWS / JMI													
PARAMETER	UNITS							ODWS LIMIT					
Volatile Organic Compounds		23-Jun-16	07-Dec-21	24-Jun-16	08-Dec-21	23-Jun-16	08-Dec-21						
1,1,1,2-tetrachloroethane	ug/L	<0.5	-	<0.5	-	<0.5	-	-					
1,1,1-trichloroethane	ug/L	<0.3	-	<0.3	-	<0.3	-						
1,1,2,2-tetrachloroethane	ug/L	<0.4	-	<0.4	-	< 0.4	-						
1,1,2-trichloroethane	-	<0.4	-	<0.4	-	<0.4	-						
1,1-dichloroethane	ug/L	<0.4	-	<0.4	-	<0.4	-						
1,1-dichloroethylene	ug/L ug/L	<0.4	-	<0.4	-	<0.4	-	14 ^{MAC}					
1,2-dichlorobenzene	ug/L	<0.4	-	<0.4	-	<0.4	-	200 MAC / 3AU					
1,2-dichloroethane	ug/L	<0.4	-	<0.4	-	<0.4	-	5 ^{IMAC}					
1,2-dichloropropane	ug/L	<0.2	-	<0.2	-	<0.2	-						
1,3-dichlorobenzene	ug/L	<0.4		<0.4	_	<0.4	_						
1,4-dichlorobenzene	ug/L	<0.4	_	< 0.4	-	<0.4	-	5 MAC / 1 AU					
Benzene	ug/L	<0.4	<0.5	<0.4	<0.5	<0.4	< 0.5	5 ^{MAC}					
Bromodichloromethane		<0.3	-0.0	<0.3	-0.0	<0.3	-0.0						
Bromoform	ug/L ug/L	<0.4		<0.4	_	<0.4		-					
Bromomethane	ug/L	<0.4		<0.4	_	<0.4							
c-1,2-Dichloroethylene	ug/L	<0.4		<0.4	_	<0.4							
c-1,3-Dichloropropylene	ug/L	<0.4		<0.4	_	<0.4		_					
Carbon Tetrachloride	ug/L	<0.2		<0.2	-	<0.2	-	5 ^{MAC}					
Chloroform	ug/L	<0.2	_	<0.5	_	<0.2	_	-					
Dibromochloromethane	ug/L	<0.3	-	<0.3	-	< 0.3	-	-					
Dichlorodifluoromethane	ug/L	<0.5	-	<0.5	-	<0.5	-	_					
Dichloromethane	ug/L	<4.0	_	<4.0	_	<4.0	-	50 ^{MAC}					
Ethylbenzene	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.4 "					
m/p-xylene	ug/L	<0.4	-	<0.4	-	<0.4	-	-					
Methyl Ethyl Ketone (MEK)	ug/L	<10	_	<10	-	<10	-						
Methyl Isobutyl Ketone (MIBK)	ug/L	<10	_	<10	_	<10	_						
Methyl Tert Butyl Ether (MTBE)	ug/L	<2	-	<2	-	<2	-						
Monochlorobenzene	ug/L	<0.2	_	<0.2	-	<0.2	_	80 MAC / 30 AU					
o-xylene	ug/L	<0.4	_	<0.4	_	<0.4	_	-					
Styrene	ug/L	<0.5	-	<0.5	-	<0.5	-	-					
t-1,2-Dichloroethylene	ug/L	<0.4	-	<0.4	-	<0.4	-	-					
t-1,3-Dichloropropylene	ug/L	<0.2	-	<0.2	-	<0.2	-	-					
Tetrachloroethylene	ug/L	<0.3	-	< 0.3	-	<0.3	-	30 ^{MAC}					
Toluene	ug/L	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	24 ^{,40}					
Trichloroethylene	ug/L	<0.3	_	< 0.3	_	<0.3	-	5 ^{MAC}					
Trichlorofluoromethane	ug/L	<0.5	-	<0.5	-	<0.5	-	-					
Vinyl Chloride	ug/L	<0.2	-	<0.2	-	<0.2	-	2 ^{MAC}					
Xylene; total	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	300 ^{AU}					

Table 9 - Test Well Geochemistry - Onsite Wells - VOCs

5.4 Water Quantity Assessment

An analysis of the suitability of the aquifer to supply the proposed development was carried out using the method summarized in Procedure D-5-5 Technical Guideline for Private Wells: Water Supply Assessment (MOE 1996).

5.4.1 Peak Demand Water Usage

Procedure D-5-5 indicates that a per-person water requirement of 450 L/day is to be used. The peak demand, which is determined as occurring over a 120 minute period each day, results in a peak demand rate of 3.75 L/min per person.

Procedure D-5-5 suggests the utilization of the number of bedrooms plus one, to determine the minimum number of people per house. It is anticipated that each lot will have one single family home with approximately four bedrooms per home. Using the Procedure D-5-5 methodology, the number of persons per home is determined to be five (5), so the total peak demand rate per home is 18.75 L/min. The pumping rates chosen for each of the pumping tests (114 L/min at each test well location) is well above the average peak demand value, so the current and future wells in the proposed subdivision will be sufficient to handle peak demand loadings.

5.4.2 Long Term Safe Yield

A determination of the long term safe yield (i.e. Q20 pumping rate) of each well was calculated using the method described by Maathius & van der Kamp (2006). For comparison purposes safe yield was also calculated using the Fervolden method (Fervolden, 1959) as described in Maathius & van der Kamp, 2006. The inputs and results of the calculation are presented in Table 10 (below).

20 Year Safe Yield			
Transmissivity Calculated Using	TW1	TW2	TW3
Theis	358	205	220
Theis	365	208	222
Theis Jacob	121	205	209
Theis Jacob	545	177	279
Cooper Jacob I	412	153	285
Cooper Jacob I	365	280	159
Theis Recovery	181	118	198
Theis Recovery	278	192	229
Average Transmissivity (m2/d)	328	192	225
Average Test Pumping Rate (L/min)	113.6	113.6	113.6
Average Test Pumping Rate (m³/day)	164	164	164
Available Drawdown (m)	11.12	15.97	11.97
Drawdown at 100 mins (m)	0.41	0.41	0.74
Maximum Test Drawdown (m)	0.57	0.44	0.77
Drawdown at 20 years (extrapolated)	2.1	1.59	1.83
% of available drawdown	18.9%	2.8%	6.4%
Specific Capacity (L/min/m)	199	258	148
Q20 safe well yield (m ³ /day) _{Farvolden}	1744	1468	1288
Q20 safe well yield (m ³ /day) _{Maarthius & van der Kamp}	606	1150	749
Q20 safe well yield (L/min) _{Maarthius & van der Kamp}	421	799	520

Farvolden, 1959

Maathius & van der Kamp, 2006

Table 10 – 20 Year Safe Yield

The results of the 20 year safe yield analysis indicate that the test wells could be pumped at much higher rates than what is required for normal domestic use. The lowest sustainable yield (Q20 = 421 L/min at TW1) is 3.6 times greater than the test pumping rate, and 22.5 times more than the peak demand rate of 18.75 L/min.

It is anticipated that the homes in the proposed subdivision will require a maximum water requirement of 2,250 L/day for all uses. As such, the installation of 14 more domestic water supply wells on the 6.99 ha subdivision will be sustainable.

5.4.3 Potential Well Interference

Results from the pumping test program show that drawdown was observed at the observation wells during each test. Measured drawdowns and distances from each pumping well are included in Table 5: Summary of Pumping Tests (above).

It is anticipated that a total of 14 individual water supply wells (including the three existing test wells) will be used at the proposed subdivision. The lot sizes vary from approx. 0.40 to 0.57 ha. The well spacing will vary according to lot size and the locations of wells on each lot. There will be no clustering of wells as there will be one well on each lot. Considering the inherent intermittent nature of pumping, potential well interference is anticipated to be negligible.

A potential well interference model was used to reflect a hypothetical stress test scenario for drawdown at the site. The model assumes a series of 28 wells arranged in a concentric circular array. Each well is pumping continuously at a rate of 3,000 L/day, over a period of 20 years.





Analytical model worksheets are presented in Appendix 4. Calculations were based on average and worst case values for Transmissivity and Storativity (as presented in Table 6).

When average values of Transmissivity and Storativity are used the maximum anticipated drawdown based on a total of 28 wells pumping continuously for 20 years at 3,000 L/day, is 0.50 m.

When worst case values of Transmissivity and Storativity are used the maximum anticipated drawdown for 28 wells pumping continuously for 20 years at 3,000 L/day, is 1.33 m.

Available drawdown at the test wells varies from 11.12 to 15.97 m (average = 13.02 m). The worst case maximum drawdown after 20 years of pumping represents a removal of approximately 10% of the available drawdown. The conclusions reached using this model are consistent with the 20 year safe yield values in Table 8: Aquifer Characteristics (above).

Based on this analysis, the proposed use of well water in the subdivision will not result in unacceptable water quantity interference conflicts between onsite and offsite well users.

6.0 DEVELOPMENT CONSIDERATIONS

6.1 Site Development

An adequate water supply aquifer of sufficient quality and quantity is located beneath the subject property and can be intercepted by private wells drilled in accordance with Ontario Regulation 903.

6.2 Future Water Well Construction

Drilled wells completed in the bedrock aquifer should be used for water supply in the proposed development. The wells should be drilled by a suitable experienced, MECP licensed well contractor. All wells must be completed in accordance with O.Reg. 903. Due to the hydrogeologically sensitive nature of the site, a separation distance of 30 m between any proposed well location and the septic bed components, possible stormwater management ponds, and any other sources of contamination is recommended.

Future well design recommendations are based on potential hydrogeological sensitivities, potential connections to the river and the water table depths.

Future wells should be drilled to depths of between 20 m and 25 m. This will ensure that the wells are completed in the same aquifer and will eliminate any potential for cross contamination between aquifers. The casing hole should extend into sound bedrock at least 0.3 m as per O.Reg. 903, and a minimum casing length of 6.7 meters below grade should be installed.

The minimum depth for future wells is 10 m. A minimum well depth is specified in order to ensure new wells that encounter water bearing fractures at shallow depths are drilled deep enough to accommodate long term potentiometric fluctuations in the 'shallow bedrock aquifer zone'.

The measured yields of future wells will probably be in excess of 100 L/min. If any future well at the proposed subdivision is found to have a yield of less than 22 L/min consideration should be given to extending the well a further 10 m in order to providing additional storage.

At each well location the casing should be installed and grouted in place utilizing either a neat cement grout or sodium bentonite grout slurry pumped from the bottom of the annular space to the ground surface in accordance with O.Reg. 903. The creation of the casing hole, the installation of the casing and the grouting of the annular space should be inspected by a qualified Professional Engineer or Professional Geoscientist.

Each well should be developed by surging or pumping until the water is developed to a sand free state at the time of construction in accordance with O.Reg. 903. If the water is observed to be cloudy at the completion of the prescribed well development, extended well development should be performed until all visible turbidity is removed.

Chlorine should be introduced at the completion of well development in sufficient quantity to produce a free chlorine residual of at least 50 mg/L (ppm). The chlorine should be mixed with the standing water in the casing using a procedure that will result in complete mixing of the chlorine over the entire depth of the well.

Each well should be completed with a submersible pump, pitless adaptor and vermin proof well cap. All such mechanical work connected to the well is to be completed by a qualified well contractor possessing a valid Class 4 pump installer's license. After completion of the mechanical work in the well, the well should be disinfected as described above.

The grading around each well casing should be slightly elevated within 3 m in all directions from the casing to direct surface runoff away from the well. Each well casing should project a minimum of 400 mm above the mounded soil.

Due to the hydrogeologically sensitive nature of the site, a separation distance of 30 m between any proposed well location and the septic bed components and any other potential sources of contamination is recommended. New wells should be accessible for future repair and replacement and as such have been located in front and side yards. This has been shown on Paterson drawing PH4398-1 – Lot Development Plan, attached in appendix 5.

There are currently no concerns regarding connectivity between wells and the river. Further groundwater sampling has demonstrated that DOC does not occur at elevated concentrations in the onsite wells, so there is no evidence to suggest connectivity with the river.

6.3 Water Treatment

The water within the bedrock aquifer displays elevated hardness which can be readily and suitably conditioned to reduce this aesthetic parameter. A standard residential grade water softener can be installed to remove the hardness in the raw water. Conventional water softeners will introduce sodium into the water supply, and it may be appropriate to bypass the water softener with a separate tap for drinking water.

The Langelier Saturation Index (LSI) and Ryznar Stability Index (RSI) were calculated for the three test wells (Appendix 4). The results indicate that scale formation should be minimal.

TDS is primarily comprised of the inorganic substances dissolved in water including chloride, sulphates, calcium, magnesium and bicarbonates. The palatability of drinking water with TDS above 500 mg/L may be unacceptable. Reverse osmosis treatment or Distillation Treatment can be used to remove TDS if raw water is considered to be unpalatable by the end user. Point of use systems (at kitchen sink) are recommended due to the relatively high cost of whole house reverse osmosis treatment, if desired by the user.

The elevated DOC noted at TW1 and TW2 (2015 results) is considered to be a laboratory error. Further development of the wells were completed and an additional sample in 2016 provided results below the aesthetic objective of 5 mg/L.

Elevated color analysis results from the pumping test at TW3 are slightly above the treatment limit indicated in MOE Guideline D-5-5. A resample was taken and was found to be below the treatment limits of D-5-5. Color in groundwater is usually associated with the mineral content of the bedrock aquifer material, but could also be associated with an organic source. Health Canada (2015) notes that color is primarily an aesthetic concern and indicates that a suitable aesthetic limit of 15 TCU should be used. Carbon filter treatment may be sufficient to reduce color to an acceptable level. Other effective methods for treating color include coagulation, distillation, and settling. Previous results indicating elevated color at TW2 are considered to be anomalous. Further development of the wells resulted in significant improvements in the color concentration.

6.4 **Predictive Impact Assessment for Nitrates**

The groundwater within the bedrock aquifer should be protected from sewage system effluent by the available overburden and the massive layer of Oxford Formation dolomite above the shallowest point of groundwater interception.

The general overburden groundwater flow direction will be controlled by the site topography, and will mostly flow to the north and northwest, towards the Appleton Swamp.

Procedure D-5-4: Three - Step Assessment Process

MECP procedure D-5-4 stipulates the use of a three-step assessment process which is outlined in the MECP document "D-5-4 Individual On-Site Sewage Systems: Water Quality Impact Risk Assessment". The three-step assessment process looks at Lot Size Considerations, System Isolation Characteristics, and Contaminant Attenuation Considerations.

Step 1 - Lot Size Considerations

As the proposed lot severance will create 14 lots of varying size (0.40 ha to 0.57 ha) with the average lot size of approximately 0.43 ha, which is less than the one hectare, the proposed lot severance does not meet this consideration.

Step 2 - System Isolation Characteristics

Where lot sizes are less than one hectare in size, the consultant is responsible for assessing the potential risk to the groundwater. The guideline asks that the consultant demonstrate system isolation using multiple lines of evidence.

As the overburden was determined to be less than 2 m during the subsurface investigations, it was determined that the residential development does not meet the requirements for system isolation.

Due to the general groundwater flow direction of north and northwest, the contaminant attenuation zone for the proposed residential development would extend off-site towards the Appleton Swamp. The effluent would be naturally attenuated within the adjacent properties without negative impacts on the present or potential reasonable use (residential buildings) of the area properties.

Step 3 – Contaminant Attenuation Considerations

In order to demonstrate that private services would adequately support the proposed residential development, a predictive nitrate impact assessment for the subject site was completed. The values shown in the Predictive Nitrate Impact Assessment attached to this report are summarized below.

Site area	19.61 ha
Impervious area %	7.0 %
Daily sewage flow	1.0 m ³
Concentration of nitrate in effluent (Value based on typical effluent concentration)	40 mg/L
Surplus Water (The surplus water value was estimated based on Environment values with a soil type comprised of clay loam (Urban Lawns) and a	
Combined infiltration factor based on:	0.70

• Topography infiltration factor 0.25



- Soil texture infiltration factor 0.30
- Cover infiltration factor 0.15

The topography infiltration factor of 0.25 is based upon an average of rolling land with average slope of 2.8 to 3.8 m/km for the proposed development and flat land with a average slope of less than 0.6 m/km.

The soil texture infiltration factor was based upon an average of "medium combinations of clay and loam" with a value of 0.2 and "Open Sandy Loam" with a value of 0.4, which is a reasonable generalization based upon the site investigations and available geological mapping.

The "vegetative cover infiltration factor" was calculated as 0.15 based upon an average of the value for cultivated land (0.1) and the value for Woodland (0.2).

The calculation for a standard septic system results in a predicted nitrate concentration of 4.2 mg/L nitrate concentration for the subject site, using a value of 40 mg/L nitrate concentration within the effluent. This value was based upon using a standard septic flow value of 1,000 L/day for the daily sewage flow.

Nitrate concentrations in the onsite wells are recorded to be below 1.4 mg/L. As such, additional loading will be well below the provincially mandated limit of 10 mg/L. It is Paterson's opinion that the proposed development will meet the regulatory requirements for nitrate dilution. The detailed analyses for these sections appears in Appendix 4.

Groundwater within the bedrock aquifer should be protected from sewage system effluent by the available overburden and the massive nature of the upper bedrock units.

The cumulative nitrate impact for this subdivision has been calculated to be 4.2 mg/L. Nitrate concentrations in onsite and offsite wells are typically non-detectible or below 1.2 mg/L, so the additional loading will be well below the provincially mandated limit of 10 mg/L. As such, it is Paterson's opinion that the proposed development will meet the regulatory requirements.

Groundwater samples were collected at three offsite well locations (see table below) in June 2016. Since the direction of groundwater flow in the bedrock aquifer is probably towards the north (based on the relative locations of the Mississippi and Ottawa Rivers) the concentration of nitrates in 139 Apple Street can be considered to be representative of the receiving aquifer (i.e. nitrates = 0 mg/L).

NI (1	5
North	вау

		ODWS	SITE WELL LOCA	OCATION		
PARAMETER	UNITS	LIMIT	128 Apple	139 Apple	140 Wilson	
		-	24-Jun-16	24-Jun-16 24-Jui		
General Chemistry Parameters						
DOC	mg/L	5 ^{AO}	1.7	2	1.9	
Nitrite	mg/L	1.0 ^{MAC}	<0.025	<0.025	< 0.025	
Nitrate	mg/L	10 ^{MAC}	<0.10	<0.10	<0.10	
Nitrite + Nitrate (as N)	mg/L	10 ^{MAC}	0.2	<0.10	2.52	
Nutrients						
Ammonia	mg/L	-	0.2	<0.10	2.52	
Organic Nitrogen	mg/L	0.15 ^{0G}	0.23	0.12	0.23	
ТКМ	mg/L	-	0.23	0.12	0.23	

Table 11 - Potable Supply Well Geochemistry - Offsite Wells - Nitrate Species

6.5 Wastewater Treatment and Disposal Options

Onsite sewage disposal needs can be accommodated with a combination of conventional absorption style and conventional filter media style Class 4 sewage systems. Standard class 4 systems consist of a septic tank and in-ground, partially or fully raised leaching beds, as per Part 8 of the Ontario Building Code. Class 4 systems with tertiary treatment are available for use, and often provide a reduced footprint, however, were not used in support of this study.

In order to minimize the impact of sewage systems on the environment the following design principals should be adhered to:

- □ Surface grades should promote drainage away from sewage systems such that surface water accumulation is prevented.
- □ Water supply wells should be properly constructed.
- Sewage systems should be properly constructed.
- □ The layout of each lot should maximize the separation between wells and sewage systems to ensure a minimum separation of 15 m for fully-raised sewage systems.

The proposed Lot Development Plan (Drawing No. PH4398-1 Lot Development Plan) in Appendix 5 shows details of the proposed layout at each lot. The purpose of this drawing is to show that a typical home and private services will fit onto the proposed lot, and can meet all pertinent regulations without causing environmental constraints. The houses shown on Drawing No. PH4398-1 cover a plan area of 300 m² (four bedroom single family home). Each home is serviced by a sewage system with the capacity of 3,000 L/day.

In all instances, site specific analysis of the soil morphology in the area of each proposed leaching bed is required during the design stages of the leaching bed in order to determine if sufficient soil exists to facilitate the use of native soil for subgrade preparation. Detailed soil morphology should only be determined by a qualified geotechnical specialist.

It is not the intent of the Lot Development Plan (Drawing No. PH4398-1) to restrict placement of a dwelling on each lot. While the actual configuration and position of the home may change, the relative position of the home, sewage system and well should be maintained. In all cases, the separation criteria for the immediate and neighbouring lots should be followed. Sewage systems must be designed according to Part 8 of the Ontario Building Code (OBC). The OBC sets out minimum design and construction standards for all approved classes of sewage systems.

OBC requirements state that there must be a minimum of 900 mm of suitable soil or leaching bed fill present between the base of the absorption trenches and the high groundwater table, bedrock or soil with a percolation rate greater than 50 min/cm. Although it is not expected that groundwater conditions will affect the design of the systems, there is a potential for shallow bedrock conditions to govern the siting of leaching beds on individual lots.

6.6 Phosphorous Impact Assessment

Individual onsite wastewater treatment systems are not usually a significant source of phosphorus impacts to surface water because the phosphorus rapidly binds to soil particles immediately below the leaching bed. The only concern is at locations where surface water is in close proximity to onsite wastewater treatment systems, and where soils are thin, sandy, and calcareous.

The science regarding phosphorus soil retention is complex and varies with different soil types. As effluent is dispersed to the unsaturated soil beneath the leaching bed, phosphorus is retained due to processes of precipitation and adsorption.

Precipitation occurs when negatively charged phosphate anions react with positively charged cations (e.g. iron, aluminum, and calcium). The amount of precipitation depends on pH, redox potential, and the availability of cations. Calcareous soils tend to be alkaline. Iron and aluminum cations are generally more available in acidic non-calcareous soils. Although

phosphate reacts with calcium in calcareous soils, it is more effectively immobilized by iron and aluminum in non-calcareous soils.

Adsorption occurs when phosphate anions are attracted to and bind to positively charged mineral particle surfaces. Binding by adsorption is not as strong as binding by precipitation and is reversible. Adsorption is also limited by the number of adsorption sites available.

All onsite wastewater treatment systems will be located more than 30 m away from the Mississippi River.

Soils conditions at the site are characterized by variable combinations of silt/sand/gravel. Existing soils are thin with the maximum thickness of approximately 4.6 m based on the available borehole and test pit logs.

The Mississippi River is 200 km long and drains an area of 4,450 km². Canadian Hydro Developers Inc. operates an electrical power generation plant in Appleton, and routinely reports information about water depth and flow to the Mississippi Valley Conservation Authority (MVCA). The average flow measured at Appleton Hydro Dam is approximately 9 m³/second. This is equivalent to approximately 778 million L/day.

Ontario Ministry of the Environment, Conservation and Parks (MECP) Procedure D-5-4 indicates that the concentration of phosphate used in assessing the potential impact of sewage effluent should be 15 mg/L, at an effluent flow rate of 1,000 L/day per lot.

The MECP Ontario Provincial Water Quality Objectives (PWQO) indicate that phosphorus in lakes should not exceed 20 ug/L, and that "excessive plant growth in rivers and streams should be eliminated at a total phosphorus concentration below 30 ug/L". The United States Environmental Protection Authority (USEPA) limit is 50 ug/L if streams discharge into lakes or reservoirs. The 'Canadian Water Quality Guidelines for the Protection of Aquatic Life' (CCME, 2004), indicates that most uncontaminated freshwaters contain between 10 and 50 ug/L of total phosphorus.

Although the soils at the site are relatively coarse grained and calcareous (due to the underlying limestone bedrock), there will still be a lot of precipitation and adsorption of phosphorus immediately below each wastewater treatment system bed. Depending on the soil thickness and the relative elevation of the overburden water table, each location will have a variable amount of soil material available for binding of phosphorus beneath the wastewater treatment system, and between the wastewater treatment system and the Mississippi River. Breakout to the river will not occur for many years but can be expected to occur eventually as all of the available soil becomes saturated with phosphorus. Preferential

pathways for groundwater flow (sandy lenses, soil fractures) could also result in the transportation of some phosphorus impacted shallow groundwater to the river.

The following calculation assumes a worst case scenario where ALL of the phosphorus from 14 lots reaches the river on any given day:

- □ 14 lots x 1000 litres effluent /day x 15 mg/L phosphorus = 210 g phosphorus/day
- □ Flow rate in the Mississippi River = 778 million litres/day
- □ 210 grams phosphorus dissolved into 778 million litres water = 0.00000027 grams/L

The resultant phosphorus concentration is equal to 0.27 micrograms/litre (ug/L). This value is two orders of magnitude less than the interim PWQO limit of 30 ug/L. If all of the phosphorus from the proposed subdivision flowed straight into the Mississippi River, there would be no significant impact. Most of the phosphorus will be retained onsite however due to precipitation and adsorption of phosphorus within the overburden soil unit, so there will be no adverse effects to the river. There are no significant concerns regarding potential phosphorus impacts to the Mississippi River that could be associated with the proposed subdivision.

7.0 CONCLUSIONS

The following statements and conclusions are based on the investigation and analysis contained within this report:

- □ The test wells in the proposed subdivision have demonstrated that the underlying aquifer is capable of providing water that is safe and suitable for human consumption.
- □ The test wells in the proposed subdivision have demonstrated that the underlying aquifer is capable of providing a sufficient quantity of water for normal domestic purposes.
- Adverse effects on well water in the proposed subdivision from potential onsite and offsite sources are considered to be minimal/insignificant. Previous contamination issues at the site have been addressed and are fully remediated (Paterson, 2010). No potential offsite sources of contamination were identified.
- In Paterson's professional opinion the probable well yields determined on the basis of this investigation are representative of the yields which residents of the proposed subdivision are likely to obtain from their wells in the long term.
- □ Groundwater withdrawals in the proposed subdivision and at neighbouring properties should not exceed the long term safe yield of the aquifer, or significantly decrease base flow to sensitive water courses. Long term safe yield calculations indicate that the groundwater use in the area will be well below the long term safe yield of the aquifer.
- Potential well interference with neighboring offsite wells is considered to be minimal and based on the aquifer parameters determined by this study, the anticipated water demand from this subdivision should have minimal impact on the safe yield of the main water supply aquifer in the area.
- □ The subject property is suitable for development as a residential subdivision at the proposed density. Impacts to the neighbouring low density residential development area is expected to be negligible.

8.0 RECOMMENDATIONS

8.1 Water Supply

- □ All new wells should be constructed such that the casing hole extends into sound bedrock at least 0.3 m as per O.Reg. 903, with a minimum casing length of 6.7 meters below grade and extend to a minimum depth of at least 10 m below grade.
- □ Existing wells at the site which are not to be utilized for water supply wells, should be decommissioned according to the requirements of O.Reg. 903.
- Due to the hydrogeologically sensitive nature of the site, a separation distance of 30 m between any proposed well location and the septic bed components, possible stormwater management ponds, and any other sources of contamination is recommended.
- New wells should be accessible for future repair and replacement and as such have been located in front and side yards.
- The creation of the casing hole, installation of the casing, and grouting of the annular space, should be inspected by a qualified Professional Engineer or Professional Geoscientist. All well construction must be carried out by a licensed and experienced well technician.
- Wells should be developed to a sand free state in order to ensure that the residual turbidity created by the well drilling activities is completely purged from the well. Additional well development, prior to placing the well into use, is strongly recommended in order to provide adequate development of the formation and remove extraneous rock debris from the aquifer pathways. It is likely that future wells at this site will require additional well development. The additional well development should take place during well construction, or alternatively, take place during the mandatory pumping test set forth by O.Reg. 903.
- All future water wells be completed such that the top of well casing is a minimum of 400 mm above the finished grade within a 3 m radius of the wellhead. The grade should slope away from the wellhead in all directions for a distance of at least 3 m.
- Any remaining monitoring wells at the site should be abandoned in accordance with O.Reg. 903 requirements.
- □ Individual future well owners should carry out semi-annual verification of potability of the raw water supply, specifically bacteriological analyses (E.coli, and total

coliforms). The well owner should ensure that the wellhead and surrounding area are maintained in accordance with the requirements of O.Reg. 903. Future well owners should refer to the MOECC Water Supply Wells Requirements and Best Management Practices, (Revised April 2015) website at:

https://dr6j45jk9xcmk.cloudfront.net/documents/4410/a-wwbmp-title-master-tableof-contents-chapter-1.pdf

- A warning clause addressed to people on low sodium diets should be registered on title regarding the elevated concentration of sodium (> 20 mg/L) identified at TW1 and potentially at other future wells at the site. The warning should also address the potential use of water softeners to reduce hardness, which was elevated at all of the test wells.
- □ The raw water found in the water supply aquifer system is considered to be hard. Residential grade water softeners are recommended where water hardness is deemed unsuitable to the future homeowner.
- Additional treatment to address TDS and color may be required at each location depending on the specific findings of analytical testing. Additional treatments methods may include reverse osmosis, coagulation/flocculation processes, biological filtration, and/or granulated activated charcoal filtration.

8.2 Wastewater Treatment

- In the proposed areas for septic systems, the water table and bedrock surface may be less than 0.9 m below the ground surface and therefore imported material may be required.
- A site specific investigation should be carried out for the detailed sewage system design at each lot, as part of the building permit application process.
- The septic systems should be constructed with all appropriate setbacks as per Ontario Building Code requirements.
- Some native material is relatively permeable for septic systems; the native soils should be assessed at the proposed septic location and imported fill be used, if necessary.
- Proposed well, septic, and building locations are noted on Drawing No. PH4398-1 Lot Development Plan (Appendix 5).

 Future owners of individual onsite wastewater treatment systems should familiarize themselves with basic safety and maintenance information which is available at: <u>http://www.omafra.gov.on.ca/english/environment/facts/sep_smart.htm</u>

In summary, it is Paterson's professional opinion that this site is suitable for development as a residential subdivision at the proposed lot density. The hydrogeological recommendations contained within this report, if followed, should ensure that the development takes place in an effective manner, with a minimal impact on the natural environment.

We trust that this information satisfies your immediate requirements.

Best Regards,

patersongroup

North Bay

Ottawa

Paterson Group Inc.

Ill they

Erik Ardley, P.Geo



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Michael S. Killam, P.Eng.

9.0 STATEMENT OF LIMITATIONS

This Hydrogeology and Terrain Analysis report has been prepared in general accordance with the agreed scope-of-work and the requirements of MECP Guideline D-5: Planning for Sewage and Water Services (August 1996), Procedure D-5-4: Technical Guideline for Individual Onsite Sewage Systems: Water Quality Impact Risk Assessment (August 1996), and Procedure D-5-5: Technical Guideline for Private Wells: Water Supply Assessment (August 1996).

The conclusions presented herein are based on information gathered from a limited historical review along with limited field inspection and testing programs. The findings of this investigation are based on a review of readily available geological, historical, and regulatory information and a cursory review made at the time of the field assessment. The historical research relies on information supplied by provincial agencies and was limited within the scope-of-work, time, and budget of the project herein.

The client should be aware that any information pertaining to soils and all test hole logs are furnished as a matter of general information only and test hole descriptions or logs are not to be interpreted as descriptive of conditions at locations other than those described by the test holes themselves.

This report was prepared for the sole use of Southwell Homes LTD. Permission from the above noted party and our firm will be required to release this report to any other party.

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Appendix 1

- Soil Profile and Test Data Sheets
- Symbols and Terms
- Grain Size Distribution Curves

patersongro	In	Con	sulting		SOI	l pro	FILE A	ND TEST	DATA				
154 Colonnade Road South, Ottawa, Or		-		ineers	Fc	nase II-En ormer App opleton, (pletex M		Assessment	t			
DATUM Ground surface elevations p	provid	ed by	G. A. S	Smith S		-	Ontario		FILE NO.				
REMARKS									HOLE NO.	PE1114	•		
BORINGS BY Backhoe	1	1		DA	TE	August 26	, 2008			TP 1			
	PLOT		SAN	IPLE		DEPTH	ELEV.			nization Detector			
SOIL DESCRIPTION			R	IRY	N VALUE or RQD	(m)	(m)	Volatile Organic Rdg. (ppm)			Monitoring Well Construction		
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GROUND SURFACE			Z	RE	z ⁰	0-	124.90	20	40 60	80	Σĭ		
25mm Topsoil over brown SILTY													
SAND with some clay and gravel													
0.48		G	1										
End of Test Pit TP terminated on bedrock surface @													
0.48m depth													
								100 RKI	200 300 Eagle Rdg. (400 50 (ppm)	00		
									as Resp. △ M				

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BORINGS BY Backhoe	1	1		DA	TE /	August 26	, 2008			TP 2	
SOIL DESCRIPTION	PLOT		SAN			DEPTH (m)	ELEV. (m)		DIZATION D		g Well ction
	STRATA	ТҮРЕ	UMBER	NUMBER % RECOVERY N VALUE		()	(11)	 Lower Explosive Limit % 			Monitoring Well Construction
GROUND SURFACE	ũ	_	ž	RE	z ö	0-	-127.28	20	40 60	80	ž
TOPSOIL 0.10 FILL: Brown silty sand with cinder blocks 0.53 Brown SILTY SAND 0.81 End of Test Pit 0.81 TP terminated on bedrock surface @ 0.81m depth 0.81m depth		G	1								
									200 300 Eagle Rdg. (s Resp. △ Me	ppm)	00

patersongro		In	Con	sulting		SOI	l pro	FILE AI	ND TEST	DATA		
154 Colonnade Road South, Ottawa, Or		-		ineers	Fo	ase II-En rmer Apj pleton, (pletex M		ssessment			
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REMARKS									HOLE NO.		•	
BORINGS BY Backhoe	1			DA	TE A	August 26	, 2008			TP 3		
SOIL DESCRIPTION	PLOT		TYPE NUMBER ® RECOVERY N VALUE			DEPTH (m)	ELEV. (m)			nization Detector e Organic Rdg. (ppm)		
	STRATA	ТҮРЕ				(,	(,	○ Lowe	er Explosive	Monitoring Well Construction		
GROUND SURFACE	N N	_				0-	127.94	20	40 60	80	ž	
FILL: Dark brown silty clay with gravel and brick pieces							- 126.94					
Grey-brown SILTY CLAY with sand		G - - - - -	2			2-	- 125.94				Ÿ	
TP terminated on bedrock surface @												
2.34m depth (GWL @ 1.6m depth)									200 300 Eagle Rdg. (as Resp. △ M	ppm)	00	

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SOIL DESCRIPTION	PLOT		SAM			DEPTH (m)	ELEV. (m)		onization D tile Organic Rd		g Well ction
	STRATA	ТҮРЕ	TYPE NUMBER * RECOVERY N VALUE			(,	()	○ Lowe	er Explosive	e Limit %	Monitoring Well Construction
GROUND SURFACE	ία Ι	-	ž	REC	zö	0-	-128.92	20	40 60	80	ž
FILL: Brown sand and gravel with rubble						0-	120.92				
GLACIAL TILL: Brown silty sand with clay, gravel and cobbles		G	2			1-	- 127.92				
2.67						2-	-126.92				
End of Test Pit TP terminated on bedrock surface @ 2.67m depth								1	200 300 Eagle Rdg. (as Resp. △ M	(ppm)	00

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154 Colonnade Road South, Ottawa, Or		-		ineers	Fo	nase II-En ormer App opleton, (pletex M		Assessment		
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REMARKS									HOLE NO.		•
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SOIL DESCRIPTION	PLOT		TYPE NUMBER RECOVERY N VALUE			DEPTH (m)	ELEV. (m)		onization D Itile Organic Rd		g Well ction
	STRATA	гурб					(11)	○ Lowe	er Explosive	Limit %	Monitoring Well Construction
GROUND SURFACE	เงิ					0-	-128.72	20	40 60	80	ž
FILL: Brown silty sand with gravel and clay		G	1				-127.72	·····			
GLACIAL TILL: Brown silty clay with sand and gravel		G	2					À			
End of Test Pit											
TP terminated on bedrock surface @ 1.83m depth								1	200 300 Eagle Rdg. (as Resp. △ Me	ppm)	00

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-		-		ineers		nase II-En ormer Apj			ssessment		
154 Colonnade Road South, Ottawa, On				Crocith Cr	Ap	pleton,					
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BORINGS BY Backhoe				ПА	TF	August 26	2008		HOLE NO.	TP 6	
	ы		SAN	IPLE			, 2000	Photo I	onization D	=_	
SOIL DESCRIPTION	PLOT					DEPTH (m)	ELEV. (m)		tile Organic Rd		Monitoring Well Construction
	STRATA				N VALUE or RQD			○ Lowe	r Explosive	l imit %	nitorir
GROUND SURFACE	ST	Ĥ	IÓN I	REC	N N N N			20	40 60	80	δŎ
FILL: Dark brown silty sand with topsoil Brown SILTY SAND, some clay GLACIAL TILL: Grey-brown silty		G	1 2 3				- 127.70				
									200 300 Eagle Rdg. (as Resp. △ Me	ppm)	00

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BORINGS BY Backhoe				DA	TE	August 26	, 2008			TP 7	
SOIL DESCRIPTION	PLOT		SAN			DEPTH (m)	ELEV. (m)		onization D tile Organic Rd		ig Well iction
	STRATA	ТҮРЕ	TYPE NUMBER * * RECOVERY N VALUE		N VALUE or RQD			• Lowe	er Explosive	Limit %	Monitoring Well Construction
GROUND SURFACE	ν ν		Z	RE	z ^o	- 0-	128.63	20	40 60	80	Σĭ
FILL: Brown silty sand with gravel		G	1					Δ			
FILL: Dark brown silty sand with clay and concrete pieces		G	2					···· &····			
FILL: Brown silty sand with gravel						1-	-127.63				
1.22		G	3					<u></u>			
GLACIAL TILL : Light brown silty		G	4					Δ			
GLACIAL TILL: Light brown silty sand with clay, gravel and cobbles										· · · · · · · · · · · · · · · · · · ·	
						2-	-126.63				
2.34											
TP terminated on bedrock surface @ 2.34m depth											
									200 300 Eagle Rdg. (as Resp. △ M	(ppm)	1 DO

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154 Colonnade Road South, Ottawa, Ot		-		ineers	Phase II-Environmental Site Assessment Former Appletex Mill Appleton, Ontario								
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REMARKS									HOLE NO.		•		
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SOIL DESCRIPTION	PLOT		TYPE NUMBER ************************************			DEPTH (m)	ELEV. (m)		onization E atile Organic Ro		g Well ction		
	STRATA	ТҮРЕ			N VALUE or RQD	(,	(,	• Lower Explosive Limit %			Monitoring Well Construction		
GROUND SURFACE	N N		Z	RE	z ⁰	0-128.92			40 60	80	ΣŬ		
FILL: Brown silty sand with clay, cobbles, steel and topsoil		G	1				-127.92	A					
1.78	3	G	2										
End of Test Pit													
TP terminated on bedrock surface @ 1.78m depth									200 300 Eagle Rdg. as Resp. △ M	(ppm)	00		

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REMARKS	HOLE NO.	PE 1114	•									
BORINGS BY Backhoe	DA					August 26	, 2008	1		TP 9		
SOIL DESCRIPTION	PLOT		SAMPLE			DEPTH (m)	ELEV. (m)		 Photo Ionization Detector Volatile Organic Rdg. (ppm) 			
	STRATA	STKATA TYPE NUMBER		* RECOVERY	N VALUE or RQD	(,	()	• Lower Explosive Limit %			Monitoring Well Construction	
GROUND SURFACE	N N		Z	RE	z ^o	0-	-128.84	20	40 60	80	Σĭ	
FILL: Sand and gravel with concrete and steel pieces		G	1				-127.84	Δ				
1.47 End of Test Pit	7	< -										
TP terminated on bedrock surface @ 1.47m depth									200 300 Eagle Rdg. (as Resp. △ M	ppm)	00	

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patersongro 154 Colonnade Road South, Ottawa, Or		-		ineers								
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REMARKS									HOLE NO.	PE1114	•	
BORINGS BY Backhoe	1	1		DA	TE /	August 26	, 2008			TP10		
SOIL DESCRIPTION	PLOT		SAN			DEPTH (m)	ELEV. (m)		Dization De		Monitoring Well Construction	
	STRATA	TYPE		[%] RECOVERY	N VALUE or RQD	(11)	(11)	○ Lower Explosive Limit %				
GROUND SURFACE	ß		NUMBER	RE	zö	0-	-127.73	20	40 60	80	ΣĞ	
TOPSOIL		G	1			, in the second s						
Brown SILTY SAND, trace clay		G	2					Δ				
GLACIAL TILL: Grey-brown silty clay with sand, gravel and cobbles		G	3									
0.99 End of Test Pit		-										
TP terminated on bedrock surface @ 0.99m depth												
									200 300 20 0 300 Eagle Rdg. (∣ s Resp. △ Me		00	

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154 Colonnade Road South, Ottawa, Or		-		ineers	Phase II-Environmental Site Assessment Former Appletex Mill Appleton, Ontario							
DATUM Ground surface elevations p	orovide	ed by	G. A. S	Smith S		-	Ontario		FILE NO.			
REMARKS									HOLE NO.	PE1114	ŀ	
BORINGS BY Backhoe	DAT					August 26	, 2008			TP11	1	
SOIL DESCRIPTION	PLOT		SAMPLE			DEPTH (m)	ELEV. (m)		onization D tile Organic Ro		g Well ction	
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	N VALUE or RQD	(11)	(11)	 Lowe 	er Explosive	e Limit %	Monitoring Well Construction	
GROUND SURFACE	LS.		NC	REC	N O	0-	100 24	20	40 60	40 60 80		
FILL: Silty sand with gravel, concrete, metal and slag pieces		G	1			0-	- 128.34	·				
Brown SILTY CLAY with sand		G	2			1-	- 127.34					
End of Test Pit												
									200 300 Eagle Rdg. (as Resp. △ M	(ppm)	1 00	

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154 Colonnade Road South, Ottawa, Or		-		jineers	Phase II-Environmental Site Assessment Former Appletex Mill Appleton, Ontario									
DATUM Ground surface elevations p	orovido	ed by	G. A. :	Smith S			Jillano		FILE NO.	PE1114				
REMARKS BORINGS BY Backhoe DATE August 26 2008											•			
BORINGS BY Backhoe				DA	TE AI	ugust 26	, 2008	I	HOLE NO.					
	PLOT		SAN	IPLE		DEPTH	ELEV.		onization De		Vell			
SOIL DESCRIPTION	1		R X E			(m)	(m)	Vola	tile Organic Rdg	Monitoring Well Construction				
	STRATA	TYPE NUMBER * RECOVERY N VALUE			N VALUE or RQD			O Lowe	er Explosive	Limit %	onst			
GROUND SURFACE	SI		N	REC	z Ö	0	100.10	20	40 60	80	ΣO			
FILL: Brown sand with gravel 0.15		-				0-	-128.16							
TOPSOIL 0.33		G	2					Δ						
Brown SILTY CLAY with sand		– G	1											
<u>0.53</u>		Ğ	3											
GLACIAL TILL: Light brown silty sand with clay, gravel and cobbles		G	4											
sand with clay, gravel and cobbles		Ľ	4			1-	-127.16							
1.37														
End of Test Pit														
TP terminated on bedrock surface @ 1.37m depth														
•														
									200 300 Eagle Rdg. (as Resp. △ Me		00			

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154 Colonnade Road South, Ottawa, Ot		-		ineers	Phase II-Environmental Site Assessment Former Appletex Mill Appleton, Ontario									
DATUM Ground surface elevations p	orovide	ed by	G. A. S	Smith S			ontario		FILE NO.	PE1114				
REMARKS									HOLE NO.	•				
BORINGS BY Backhoe				DA	TE /	August 26	, 2008			TP13				
SOIL DESCRIPTION	PLOT	SAMPLE				DEPTH (m)	ELEV. (m)		onization D atile Organic Ro		Monitoring Well Construction			
	STRATA	ТҮРЕ	TYPE NUMBER * RECOVERY N VALUE			()	(,	○ Lowe	Lower Explosive Limit %					
GROUND SURFACE	ŭ		ž	REC	N O U	0-	- 128.85	20 40 60 80			ž			
FILL: Sand and gravel with topsoil		G	1			U	120.03	·····						
1.12 Brown SILTY SAND , some clay 1.73		G	2			1-	- 127.85	Δ						
GLACIAL TILL: Light brown silty sand with clay, gravel and cobbles						2-	- 126.85							
End of Test Pit TP terminated on bedrock surface @ 3.05m depth		G	3			3-	- 125.85							
									200 300 Eagle Rdg. (as Resp. △ M	(ppm)	0 0			

patersongro						SOIL PROFILE AND TEST DATA						
•		-		ineers	Former Appletex Mill							
154 Colonnade Road South, Ottawa, On DATUM Ground surface elevations p				Smith Si	Ар	pleton,			FILE NO.			
REMARKS	IUVIU	Suby	а. л. (Smith S	uivey	ing Liu.				PE1114	•	
BORINGS BY Backhoe	ORINGS BY Backhoe DA								HOLE NO.	TP14		
	Ę		SAN	IPLE				Photo I	onization De	etector	n ll	
SOIL DESCRIPTION	PLOT			2	E o	DEPTH (m)	ELEV. (m)	Vola	• Volatile Organic Rdg. (ppm)			
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	N VALUE or RQD			O Lowe	Lower Explosive Limit %			
GROUND SURFACE	ES .	F	NN	REC	N O U	0	100.00	20	40 60 80		Monitoring Well Construction	
FILL: Brown silty sand with clay, concrete and steel GLACIAL TILL: Light brown silty 1.42 End of Test Pit TP terminated on bedrock surface @ 1.42m depth	· · · · · ·	G	1				- 128.82	۵. 	200 300		00	
								RKI	200 300 Eagle Rdg. (as Resp. △ Me	ppm)	00	

natoreonard		in	Con	sulting	ng SOIL PROFILE AND TEST DATA								
patersongro 154 Colonnade Road South, Ottawa, Or		-		ineers	 Phase II-Environmental Site Assessment Former Appletex Mill Appleton, Ontario 								
DATUM Ground surface elevations p	provid	ed by	G. A. S	Smith S		•			FILE NO.	PE1114	L		
REMARKS									HOLE NO.		r		
BORINGS BY Backhoe				DA	TE A	August 26	, 2008			TP15			
SOIL DESCRIPTION	PLOT		SAN	IPLE		DEPTH (m)	ELEV. (m)		onization E tile Organic Re		ng Well Lction		
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	N VALUE or RQD			• Lowe	er Explosiv	e Limit %	Monitoring Well Construction		
GROUND SURFACE				8	z	0-	-128.04	20	40 60	80	2		
FILL: Mixture of topsoil, sand, silty clay, gravel and wood		G	1					·					
TP terminated on bedrock surface @ 0.51m depth									200 300 Eagle Rdg. as Resp. △ M	(ppm)	00		

patersongro		in	Con	sulting	1	SOI	l pro	FILE AN	ND TEST	DATA	
154 Colonnade Road South, Ottawa, On		-		ineers	F	hase II-En ormer App ppleton, (pletex Mi	ssessmen	t		
DATUM Ground surface elevations p	orovide	ed by	G. A. S	Smith S					FILE NO.	PE1114	
REMARKS									HOLE NO.		•
BORINGS BY Backhoe	1			DA	ATE	August 26	6, 2008			TP16	
SOIL DESCRIPTION	PLOT		SAM			DEPTH (m)	ELEV. (m)		onization [tile Organic Re		g Well iction
	STRATA	ТҮРЕ	NUMBER	* RECOVERY	N VALUE or RQD			 Lowe 	er Explosiv	e Limit %	Monitoring Well Construction
GROUND SURFACE			4	RE	zv		127.95	20	40 60	80	2
FILL: Sand and gravel with clay, wood and slag		G	1 2					Δ			
0.91 End of Test Pit	×××										
TP terminated on bedrock surface @ 0.91m depth									200 300 Eagle Rdg. as Resp. △ M	(ppm)	00

natoreonard		In	Con	sulting		SOI	l pro	FILE AN	ND TES	T DATA	
patersongro 154 Colonnade Road South, Ottawa, Or		_		ineers	Fc	hase II-En ormer Appopleton,	pletex M	ental Site A ill	ssessme	nt	
DATUM Ground surface elevations p	orovide	ed by	G. A. S	Smith S		-			FILE NO.	PE111 4	1
REMARKS									HOLE NO.		T
BORINGS BY Backhoe				DA	TE	August 26	6, 2008			TP17	
SOIL DESCRIPTION	PLOT			IPLE 거		DEPTH (m)	ELEV. (m)		onization tile Organic F		Monitoring Well Construction
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	N VALUE or RQD			• Lowe	r Explosiv	ve Limit %	onitorii Constri
GROUND SURFACE	s N		Z	RE	z ⁰	- 0-	127.85	20	40 60	80	ΣŬ
FILL: Sand, gravel, wood and slag		G	1					Δ			
End of Test Pit											
TP terminated on bedrock surface @ 0.66m depth									200 300 Eagle Rdg as Resp. △	0 400 5 . (ppm) Methane Elim.	00

patersongro		In	Con	sulting	ng SOIL PROFILE AND TEST DATA						
154 Colonnade Road South, Ottawa, On		—		ineers	Pł Fc Ap	nt					
DATUM Ground surface elevations p	orovide	ed by (G. A. S	Smith S	-	-			FILE NO.	PE1114	L
REMARKS						A			HOLE NO.	TP18	
BORINGS BY Backhoe			SAM			August 26	, 2008	Photo	onization I		
SOIL DESCRIPTION	PLOT					DEPTH (m)	ELEV. (m)		itile Organic R		ng W€ uction
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	VALUE r ROD			O Lowe	er Explosiv	e Limit %	Monitoring Well Construction
GROUND SURFACE	5		N	REC	N O L O	- 0-	- 125.97	20	40 60	80	₹O
FILL: Silty sand with clay, topsoil, wood and slag		G	1					Δ			
End of Test Pit TP terminated on bedrock surface @											
0.63m depth									200 300 Eagle Rdg. as Resp. △ N	(ppm)	00

patersongro						SOI	L PRO		ND TEST	DATA	
154 Colonnade Road South, Ottawa, Or		-		ineers	F	hase II-En ormer App ppleton, (oletex Mi		ssessmen	t	
DATUM Ground surface elevations p	rovide	ed by (G. A. S	Smith S					FILE NO.	PE 1114	
REMARKS									HOLE NO.		•
BORINGS BY Backhoe	1	1		DA	TE	August 26	, 2008			TP19	1
SOIL DESCRIPTION	PLOT		SAM			DEPTH (m)	ELEV. (m)		onization D tile Organic Ro		ig Well Iction
	STRATA	ТҮРЕ	NUMBER	» RECOVERY	N VALUE or RQD			 Lowe 	r Explosive	e Limit %	Monitoring Well Construction
		L.	-	R	z °	- o-	-	20	40 60	80	2
TP terminated on bedrock surface @ 0.03m depth									200 300 Eagle Rdg. ∩	(ppm)	00

patersongro		in	Con	sulting		SOI	l pro	FILE A	ND TEST	DATA	
154 Colonnade Road South, Ottawa, O		-		ineers	Fo	nase II-En ormer App opleton, (pletex M		ssessmen	ıt	
DATUM Ground surface elevations	provide	ed by	G. A. S	Smith S		-	ontario		FILE NO.	DE111/	
REMARKS									HOLE NO.	PE1114	•
BORINGS BY Backhoe	1	1		DA	TE /	August 26	, 2008	1		TP20	I
SOIL DESCRIPTION	РГОТ		SAM	IPLE		DEPTH	ELEV.		onization I tile Organic R		y Well
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	N VALUE or RQD	(m)	(m)	○ Lowe	er Explosiv	e Limit %	Monitoring Well Construction
GROUND SURFACE	-S		ŭ –	REC	z ⁶			20	40 60	80	ΣO
FILL: Brown silty sand with clay, rubber, steel, plastic and fabric 0.25		G	1			0-	-	Δ			
End of Test Pit		-									
TP terminated on bedrock surface @ 0.25m depth											
									200 300 Eagle Rdg.	(ppm)	00
								L ▲ Full Ga	as Resp. \triangle N	/lethane Elim.	

patersongro		In	Con	sulting	,	SOI	l pro	FILE AN	ND TEST	DATA				
154 Colonnade Road South, Ottawa, Or				ineers	S Phase II-Environmental Site Assessment Former Appletex Mill Appleton, Ontario									
DATUM Ground surface elevations p	orovid	ed by	G. A. :	Smith S			ontario		FILE NO.					
REMARKS									HOLE NO.	PE1114	•			
BORINGS BY Backhoe	1	1		DA	TE	August 26	, 2008	1		TP21				
SOIL DESCRIPTION	PLOT		SAN			DEPTH (m)	ELEV. (m)		onization De tile Organic Rd		g Well ction			
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	N VALUE of ROD		(11)	 Lowe 	r Explosive	Limit %	Monitoring Well Construction			
GROUND SURFACE	Ω Ω	_	z	RE	z ö		-128.19	20	40 60	80	ž			
FILL: Brown silty sand with clay and gravel		G	1				120.19	Δ						
0.20														
TOPSOIL		_ G	2											
		- -												
GLACIAL TILL: Brown silty clay with sand, gravel and cobbles		G	3					Δ						
1.12						1-	-127.19							
End of Test Pit		1												
TP terminated on bedrock surface @ 1.12m depth														
									200 300 Eagle Rdg. (as Resp. △ Me	ppm)	00			

Consulting Engineers

SOIL PROFILE AND TEST DATA

Monitoring Well Construction

500

Phase II-Environmental Site Assessment Former Appletex Mill

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7 Appleton, Ontario Ground surface elevations provided by G. A. Smith Surveying Ltd. DATUM FILE NO. **PE1114** REMARKS HOLE NO. MW 1-08 DATE 26 Aug 08 BORINGS BY CME 55 Power Auger SAMPLE Pen. Resist. Blows/0.3m STRATA PLOT DEPTH ELEV. SOIL DESCRIPTION • 50 mm Dia. Cone (m) (m) RECOVERY N VALUE or RQD NUMBER TYPE 0\0 Lower Explosive Limit % 40 80 20 60 **GROUND SURFACE** 0+127.46..... FILL: Silty sand with gravel AU 1 0.86 RC 1 91 0 1+126.46RC 2 90 60 2+125.463+124.46RC 3 88 82 4+123.46 RC 4 100 44 5+122.46 6+121.46 **BEDROCK:** Limestone 5 RC 90 73 7+120.46 RC 6 95 92 8+119.46 9+118.46 RC 7 78 100 10+117.46 11+116.46 RC 8 97 80 RC 9 <u>12.1</u>9 100 100 12+115.46 End of Monitoring Well (GWL @ 9.86m-Sept. 2/08) 300 200 400 100 Gastech 1314 Rdg. (ppm) ▲ Full Gas Resp. △ Methane Elim.

patersongroup	Consulting Engineers	SOIL PROFI	LE AND TEST [)ATA
28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7	Engineers	Phase II-Environmenta Former Appletex Mill Appleton, Ontario	I Site Assessment	
DATUM Ground surface elevations provided by	G. A. Smith Su	urveying Ltd.	FILE NO.	PE1114
BORINGS BY CME 55 Power Auger	DA	re 26 Aug 08	HOLE NO.	/W 2-(

									HOLE NO.	MW 2-	-08
BORINGS BY CME 55 Power Auger			SVI	IPLE		26 Aug 08		Don Pr	esist. Blow		
SOIL DESCRIPTION	PLOT		JAN			DEPTH (m)	ELEV. (m)) mm Dia. C		Jg We
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	VALUE r ROD			• Lower	Explosive	Limit %	Monitoring Well Construction
GROUND SURFACE	ß	_	Ā	RE	N V		100.00	20	40 60	80	ž
FILL: Silty sand with gravel and concrete pieces							128.08 127.08				
<u>1.9</u> 0		RC	1	85	73	2-	126.08				
		RC	2	93	60		125.08 124.08				1944년 14년 14년 14년 14년 14년 14년 14년 14년 14년
		RC	3	100	100	5-	123.08				
BEDROCK: LImestone		RC	4	97	87		122.08 121.08				
	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	RC	5	92	82		120.08 119.08				
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	RC	6	100	93		118.08				
		RC	7	93	88	11-	117.08				
12.19	$ \frac{1}{1} 1$	RC	8	100	100	12-	116.08			·····	
End of Monitoring Well											
(GWL @ 7.30m-Sept. 2/08)								100	200 300	400 5	00
								Gastec	h 1314 Rdg s Resp. △ M	. (ppm)	

patersongroup Consulting Engineers

SOIL PROFILE AND TEST DATA

Full Gas Resp. \triangle Methane Elim.

Phase II-Environmental Site Assessment Former Appletex Mill

28 Concourse Gate, Unit 1, Ottawa, ON	NZC .				Ap	pleton, C	Ontario		
DATUM Ground surface elevations p	rovide	d by (G. A. S	Smith S	Survey	ving Ltd.		FILE NO. PE1114	
REMARKS									_
BORINGS BY CME 55 Power Auger				D	ATE 2	26 Aug 08		MW 3-08	8
SOIL DESCRIPTION	РГОТ		SAN	IPLE		DEPTH	ELEV.	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone	ction
GROUND SURFACE	STRATA	ЭДХТ	NUMBER	°8 RECOVERY	N VALUE or RQD	(m)	(m)	C Lower Explosive Limit %	Construction
TOPSOIL	XXX	ss	4	00	0	0-	-121.79	E	E
FILL: Brown silty sand with clay and gravel		ss ss	1 2	33 17	2 12	1-	-120.79		1111 Դեմերինինինինինինինինինինինին
<u>2.2</u> 1		SS AU	3 5	4	4	2-	-119.79		11111111111111
FILL: Grey to black silty clay		ss	4	17	2	3-	-118.79		
with gravel		ss	6	17	3	4	117 70		
GLACIAL TILL 4.62		∬ ss √ ss	7 8	29 55	74 33	4-	-117.79		
		RC	o 1	55 96	33 83	5-	-116.79		
BEDROCK: Limestone		-	-			6-	-115.79		
		RC	2	95	90	7-	-114.79		
<u>7.62</u> End of Monitoring Well		RC	3	90	70				
(GWL @ 2.70m-Sept. 2/08)									
								100 200 300 400 500 Gastech 1314 Rdg. (ppm)	

patersongr		In	Con	sulting	SOIL PROFILE AND TEST DAT								
154 Colonnade Road South, Ottawa, C		_		ineers	Proposed Old Mill La Appleton,	ne	tial Subdivision						
DATUM Ground surface elevations Surveying Limited and, as	interpo such, a	lated re app	from to proxim	opo plar ate only	prepared by		th FILE NO. PH2723						
REMARKS BORINGS BY Hand Auger				DA	TE August 28	3, 2015	HOLE NO. TH 1						
	E		SAN	IPLE			Pen. Resist. Blows/0.3m						
SOIL DESCRIPTION	A PLOT		R	RY	DEPTH (m) 북요	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %						
	STRATA	ТҮРЕ	NUMBER	RECOVERY	OF ROD		• Water Content %						
GROUND SURFACE				RI		-126.0	20 40 60 80						
FILL: Dark brown silty sand with gravel		G	1		1	-125.0							
							20 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded						

patersongr		In	Con	sulting	SO	FILE AND TEST DATA	
154 Colonnade Road South, Ottawa, G		—		ineers	Proposed Old Mill La Appleton,	tial Subdivision	
DATUM Ground surface elevations Surveying Limited and, as	s interpo such, a	lated re app	from to proxim	opo plar ate only	prepared by		th FILE NO. PH2723
REMARKS BORINGS BY Hand Auger				DA	TE August 2	0 0015	HOLE NO. TH 2
BORINGS BY Hand Auger	E		SAN				
SOIL DESCRIPTION	A PLOT		~	۲.	DEPTH 및 (m)	I ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %
	STRATA	ТҮРЕ	NUMBER	RECOVERY	VALUE Pr RQD		• Water Content %
GROUND SURFACE			N	RE	z °	- 128.3	20 40 60 80
FILL: Dark brown silty sand with gravel	55	G	1			-127.3	20 40 60 80 100 Shear Strength (kPa)
							20 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

patersongr		In	Con	sulting		SOI	l pro	FILE AI	ND TES	ST DATA	
154 Colonnade Road South, Ottawa,		-		ineers	Olo	oposed F d Mill Lar pleton, (ne	ial Subdiv	vision		
DATUM Ground surface elevation Surveying Limited and, as	s interpo	lated	from to proxim	opo plar ate only	n prep	-		th	FILE NO.	PH2723	
REMARKS							0015		HOLE NO		
BORINGS BY Hand Auger			SVN			August 28	,2015	Pon B	Rociet Bl	ows/0.3m	
SOIL DESCRIPTION	A PLOT					DEPTH (m)	ELEV. (m)		50 mm Di		Piezometer Construction
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	N VALUE of RQD				Water Co		Piezol Const
GROUND SURFACE				<u></u>	4	0-	-126.0	20	40	60 80	-
FILL: Dark brown silty sand with gravel	55	G	1			1-	- 125.0				
								20 Shea ▲ Undis	ar Streng		00

patersongr		in	Con	sulting	S	OIL PRO	OFILE AND TEST DATA
154 Colonnade Road South, Ottawa, C		-		sulting ineers	Old Mill		tial Subdivision
DATUM Ground surface elevations Surveying Limited and, as	interpo such, a	lated	from to proxim	opo plar ate only	n prepared l		
REMARKS						00.0015	HOLE NO. TH 4
BORINGS BY Hand Auger			SVN	IPLE	TE August	20, 2015	
SOIL DESCRIPTION	PLOT				DEPT		● 50 mm Dia. Cone
	STRATA	ТҮРЕ	NUMBER	∾ RECOVERY	VALUE		Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %
GROUND SURFACE			E	RE	N O F O F O	0+127.9	20 40 60 80
0.0	5						
FILL: Dark brown silty sand with some gravel and cobbles to sand-gravel, trace silt and clay		G	1				
End of Test Pit Practical refusal to augering on inferred bedrock surface at 1.13m depth	3					1 - 126.9	
							20 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

patersongro		n	Con	sulting	SO	IL PRO	FILE AND TEST DATA
154 Colonnade Road South, Ottawa, Or				jineers	Proposed Old Mill La Appleton,	ne	ial Subdivision
DATUM Ground surface elevations in Surveying Limited and, as su	nterpo uch, a	lated re app	from to proxim	opo plar ate only	prepared by		th FILE NO. PH2723
REMARKS BORINGS BY Hand Auger				DA	TE August 2	8. 2015	HOLE NO. TH 5
	ц		SAN	IPLE			Pen. Resist. Blows/0.3m
SOIL DESCRIPTION	A PLOT		щ	RY	DEPTH 문이 (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	N VALUE OF RQD		• Water Content %
GROUND SURFACE	xxx v		2	RE	z º	-127.9	20 40 60 80
FILL: Light brown silty sand		G	1				
Very stiff, brown SILTY CLAY, trace gravel		G	2		1	- 126.9	
<u>1.05</u> End of Test Hole							
Practical refusal to augering on inferred bedrock surface at 1.05m depth							20 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

patersongro		in	Con	sulting	SO	L PRO	FILE AND TEST DATA
154 Colonnade Road South, Ottawa, Or		—		sulting ineers	Proposed Old Mill La Appleton,	ne	ial Subdivision
DATUM Ground surface elevations in Surveying Limited and, as su	nterpo uch, a	lated t re app	from to proxima	opo plar ate only.	prepared by		th FILE NO. PH2723
REMARKS BORINGS BY Hand Auger				DA.	TE August 28	2 2015	HOLE NO. TH 6
	ы		SAM			5,2015	
SOIL DESCRIPTION	A PLOT				DEPTH 꾀이(m)	ELEV. (m)	• 50 mm Dia. Cone
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	OF ROD		Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %
GROUND SURFACE						128.6	
FILL: Brown silty sand with clay							
End of Test Hole		•					
Practical refusal to augering on inferred bedrock surface at 0.35m depth							20 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

patersongro		In	Con	sulting ineers		SOI	l pro	FIL	E.	AN	ID	TES	ST D	ΑΤΑ	
154 Colonnade Road South, Ottawa, O		-		ineers	Old	Mill Lar	Resident ne Ontario	ial S	Sub	divi	sio	n			
DATUM Ground surface elevations i Surveying Limited and, as s	interpo	lated	from to	opo plar	n prepa			th			FIL	e no.	DL	12723	
REMARKS	ouch, a	ie app			•						но)		
BORINGS BY Hand Auger		1		DA	TE Au	igust 28	, 2015						^{[°] TH}	7	1
SOIL DESCRIPTION	PLOT		SAM	IPLE	C	DEPTH (m)	ELEV. (m)		Pen •				ows/0 a. Cor		eter ction
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	VALUE Dr RQD	(11)	(11)		С	> W	ate	r Cor	ntent	%	Piezometer Construction
GROUND SURFACE	ζ.		IJ	REC	N OL (0	100.0		2	0	40	e	60	80	
TOPSOIL0.04	4					0-	-123.9								
FILL: Brown silty sand with clay															
0.65	5	4													
Practical refusal to augering on inferred bedrock surface at 0.65m depth															
												· · · · · · · · · · · · · · · · · · ·			
										0 hea ndistu		reng	0 th (kF Remo	Pa)	00

patersongr		In	Con	sulting ineers	;	SOI	l pro	FILE AND TEST DATA	
154 Colonnade Road South, Ottawa,		-		ineers	Old Mi	ill Lar		ial Subdivision	
DATUM Ground surface elevations Surveying Limited and, as	s interpo	lated	from to	opo plar ate only	prepare			h FILE NO. PH2723	
REMARKS	ouori, u								
BORINGS BY Hand Auger					TE Augu	ust 28	, 2015	TH 8	
SOIL DESCRIPTION	PLOT		SAM			PTH m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone	eter iction
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	N VALUE or RQD	,		○ Water Content %	Plezometer Construction
GROUND SURFACE TOPSOIL 0.0	04			<u> </u>	4	0-	-124.7		
FILL: Brown silty sand with clay FILL: Brown silty sand with clay O.S End of Test Hole Practical refusal to augering on inferred bedrock surface at 0.91m depth								20 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded	

patersongro		in	Con	sulting		SOI	L PRO	FILE AND TEST DATA	
154 Colonnade Road South, Ottawa, On		-		ineers	Old	posed I Mill Lar pleton, 0	ne	al Subdivision	
DATUM Ground surface elevations in Surveying Limited and, as su	nterpo	lated	from to	opo plar	n prep			h FILE NO. PH2723	
REMARKS	uon, a	ie app			•				
BORINGS BY Hand Auger				DA	TE S	eptembe	er 9, 2015	TH 9	
SOIL DESCRIPTION	PLOT		SAM	IPLE		DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone	ction
	STRATA	TYPE	NUMBER	% RECOVERY	N VALUE or RQD	()	(,	• Water Content %	Construction
GROUND SURFACE			4	RE	z ^o	0-	-124.5	20 40 60 80	
TOPSOIL 0.03 SILTY SAND with clay		G	1						
0.34 End of Test Hole	<u>i i l l</u>	-							
Practical refusal to augering on inferred bedrock surface at 0.34m depth								20 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded	

patersongro		in	Cons	ulting	SOI	L PRO	FILE AND TEST DATA
154 Colonnade Road South, Ottawa, Or		—		neers	Proposed Old Mill La Appleton,	ne	tial Subdivision
DATUM Ground surface elevations in Surveying Limited and, as su	nterp	olated	from top	po plan te only			th FILE NO. PH2723
REMARKS				-			HOLE NO. THIO
BORINGS BY Hand Auger			CAM		re Septembe	er 9, 2015 	
SOIL DESCRIPTION	A PLOT		SAMF		DEPTH	ELEV. (m)	Pen. Resist. Blows/0.3m • 50 mm Dia. Cone • Water Content %
GROUND SURFACE	STRATA	ТҮРЕ	NUMBER	RECOVERY	OF ROD		○ Water Content %
	·					123.7	
SILTY SAND		G	1				
0.22 End of Test Hole		<u>.</u>					
Practical refusal to augering on inferred bedrock surface at 0.22m depth							
							20 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

patersongro		In	Con	sulting		SOI	L PRO	FILE AND TEST DATA
154 Colonnade Road South, Ottawa, On		-		sulting ineers	OI	roposed F d Mill Lar opleton, (ne	ial Subdivision
DATUM Ground surface elevations in Surveying Limited and, as su	iterpo	lated	from to	opo plar	n pre	-		th FILE NO. PH2723
REMARKS	icn, a	ie app			•			
BORINGS BY Hand Auger		1		DA	TE	Septembe	er 9, 2015	TU11
SOIL DESCRIPTION	РЬОТ		SAM	IPLE		DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	N VALUE or RQD		(11)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %
GROUND SURFACE	ŗ.	_ .	N	REC	z ö	0	124.6	20 40 60 80
TOPSOIL0.02		-					124.0	
SILTY SAND, some clay								
End of Test Hole	<u>I. Î. İ</u> .	+						
Practical refusal to augering on inferred bedrock surface at 0.18m depth								
								20 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane Appleton Ontario

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Old Mill L Appleton

		-	-			pleton,	Ontario				
DATUM Geodetic									FILE NO.	PH2723	
REMARKS									HOLE NO		
BORINGS BY Backhoe	,			D	DATE	August 18	3, 2016	I		[°] TP1	
SOIL DESCRIPTION	РГОТ	SAMPLE				DEPTH (m)	ELEV. (m)		esist. Blo 0 mm Dia	ows/0.3m . Cone	er on
	STRATA	ТҮРЕ	NUMBER	°% RECOVERY	N VALUE or RQD		(11)	• v	later Cor	itent %	Piezometer Construction
GROUND SURFACE	S.	Ε	ЮN	REC	N OF		100.05	20		0 80	Piez
	\bigotimes					0-	-126.25				
FILL: Brown sand, silt, clay, rock and burnt wood debris. Slightly moist. 0.70		G	1								
FILL: Brown sand, silt and broken stone. Dry.		G	2								
FILL: Gravel, old wires, black plastic pieces. Drainage tile (pea stone) at 1.30 1.3m depth. FILL: Brown sand, silt and fabric debris		- G	3			1-	-125.25				
1.60 End of Test Pit	\boxtimes										-
Refusal on bedrock at 1.60 m depth											
								20 Shea ▲ Undist	r Streng	0 80 10 t h (kPa) Remoulded	¹ 00

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane Appleton, Ontario

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

DATUM Geodetic									FILE NO.	PH2723	
REMARKS				_		August 10	0.0016		HOLE NO		
BORINGS BY Backhoe			SVI	/IPLE		August 18	5, 2010	Don B	eiet Bl	ows/0.3m	
SOIL DESCRIPTION	PLOT					DEPTH (m)	ELEV. (m)		0 mm Dia		er ion
	STRATA	ТҮРЕ	NUMBER	* RECOVERY	N VALUE or RQD			• v	later Cor	ntent %	Piezometer Construction
GROUND SURFACE	STI	T	NUN	RECO	N OF U			20		60 80	Piez
FILL: Brown silt, sand and clay with gravel. Slightly moist.		– G	4			- 0-	-128.17				
FILL: Light brown silt, sand, some gravel. Slightly moist. 0.40		G	5								
FILL: Black sand and silt, trace clay and charcoal. Slightly moist.		G	6								
0.70											
FILL : Light brown oppropriate and cilt		G	8			1-	-127.17				-
FILL: Light brown coarse sand, silt, gravel. Moist.		G	7								
<u>1.70</u> End of Test Pit		-									-
Refusal on bedrock at 1.70 m depth		_									
									ar Streng	th (kPa)	00
								▲ Undist	urbed 🛆	Remoulded	

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane

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154 Colonnade Road South, Ottawa, Or	itario r	(2E / J	15		A	opleton,	Ontario				
DATUM Geodetic									FILE	NO. PH2723	
REMARKS						•			HOLI	^{E NO.} TP3	
BORINGS BY Backhoe				D	ATE	August 18	<u>3, 2016</u>			IFJ	1
SOIL DESCRIPTION	PLOT			/IPLE 거	51	DEPTH (m)	ELEV. (m)			Blows/0.3m Dia. Cone	tion
	STRATA	ТҮРЕ	NUMBER	* RECOVERY	ALUE ROD			• v	later (Content %	omet
GROUND SURFACE	STI	Υ.	NUN	RECO	N VALUE or RQD	0-	-128.60	20	40	60 80	Piezometer Construction
FILL: Dark brown sand, silt, clay 0.10	אאי	_					120.00				
· ·											
FILL: Light brown sand, silt, clay and gravel. Slightly moist.											
and gravel. Slightly moist.		G	8			-	107.00				
							-127.60				
											-
1.83	3										
End of Test Pit											
Refusal on bedrock at 1.83 m depth											
								20 Shor	40 ar Stro	60 80 1 ength (kPa)	00
								Undist		△ Remoulded	
								1			

SOIL PROFILE AND TEST DATA

FILE NO.

Proposed Residential Subdivision Old Mill Lane Appleton, Ontario

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Geodetic

DATUM

										PH	2723	
REMARKS									HOL	E NO. TP4		
BORINGS BY Backhoe				D	ATE /	August 18	8, 2016 					
SOIL DESCRIPTION	РГОТ		SAN			DEPTH (m)	ELEV. (m)			Blows/0.3 Dia. Cone		er ion
	STRATA	ТҮРЕ	NUMBER	° ≈ © ©	N VALUE or RQD	(,	()	0 V	Vater	Content %	/ 0	Piezometer Construction
GROUND SURFACE	ν.		N	REC	z ö		107.05	20	40	60 8	0	o E E E O
FILL: Brown sandy silt, trace clay 0.09 topsoil. Slightly moist.		_				0-	127.95					
FILL: Light brown sand, silt, clay, gravel with debris (wood and plastic). Slightly moist.		G	9			1-	-126.95					
1.92	\bigotimes	_										
End of Test Pit												
Refusal on bedrock at 1.92 m depth								20 Shea ▲ Undis		60 8 ength (kPa △ Remou)	00

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane Appleton Ontario

DATUM Geodetic					_ * Y		ontario		FILE NO.	PH2723	
REMARKS									HOLE NO		
BORINGS BY Backhoe SOIL DESCRIPTION	PLOT		SAN	D IPLE	DATE	August 18	8, 2016 ELEV.		esist. Blo 0 mm Dia	ows/0.3m	
SUL DESCRIPTION	STRATA P	ТҮРЕ	NUMBER	[∞] RECOVERY	N VALUE or RQD	(m)	(m)		later Cor		Piezometer Construction
GROUND SURFACE	STF	Ţ	NUN	RECO	N OF			20		0 80	Piezo
FILL: Brown sandy silt with roots 0.11						0-	-128.78				
FILL: Light brown fine sand, silt,											
FILL: Light brown fine sand, silt, some clay and gravel. Slight moist.		G	10								
1.17						1-	-127.78				-
End of Test Pit											
Refusal on bedrock at 1.17 m depth											
								20 Shea ▲ Undist	40 6 ar Strengt urbed △	0 80 1 t h (kPa) Remoulded	00

SOIL PROFILE AND TEST DATA

FILE NO.

Proposed Residential Subdivision Old Mill Lane

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Appleton, Ontario

DATUM	Geodetic

		P.	• !	Resist 50 mr	n Dia r Cor	IPt lows/0. a. Cone ntent %	3m e
DEPTI (m)	H ELEV. (m)	P.	• :	50 mr Natei	n Dia r Cor	ows/0. a. Cone	3m e %
Covery (m) N VALUE N VALUE N VALUE	(m) 0-127.88		• :	50 mr Natei	n Dia r Cor	a. Cone	e %
		· · · · · · · · · · · · · · · · · · ·	20	40	6	60 8	30
	1-126.88						
				: :		1 : : :	
				20 She	20 40 Shear St	Shear Streng	20 40 60 € Shear Strength (kPa ▲ Undisturbed △ Remot

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Appleton, Ontario

GEO

DATUM Geodetic									FILE N	ю. PH2723	
REMARKS						• • • • •			HOLE	^{NO.} TP7	
BORINGS BY Backhoe					ATE	August 18	3, 2016				
SOIL DESCRIPTION	А РІОТ			MPLE 값	Що	DEPTH (m)	ELEV. (m)			Blows/0.3m Dia. Cone	eter ction
	STRATA	ТУРЕ	NUMBER	% RECOVERY	N VALUE or RQD					ontent %	Piezometer Construction
GROUND SURFACE	XXX			<u></u>	~	0-	128.42	20	40	60 80	шO
FILL: Brown sandy silt topsoil. Dry.											
0.38										· · · · · · · · · · · · · · · · · · ·	-
FILL: Light brown sandy silt, trace clay, debris. Dry.		0	10								
clay, debris. Dry.		G	12			1_	-127.42				
1.17	\bigotimes						127.42				
End of Test Pit											
Refusal on bedrock at 1.17 m depth											
								20 Shea ▲ Undistr		60 80 10 ngth (kPa) △ Remoulded	00

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane Appleton, Ontario

DATUM Geodetic					·				FILE NO. PH2723	
REMARKS BORINGS BY Backhoe					ATE	August 10	2 2016		HOLE NO. TP8	
BURINGS BY DACKING	H		SAN	IPLE		August 18		Pen. R	esist. Blows/0.3m	
SOIL DESCRIPTION	LOT			1	ы	DEPTH (m)	ELEV. (m)			tion
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	N VALUE or RQD			• v	Vater Content %	Construction
GROUND SURFACE			N	REC	z Ö	- 0-	_	20	40 60 80 0	2 S S
FILL: Brown to light brown sandy silt. Dry. 		G	13			1-	_			
								20 Shea ▲ Undist	40 60 80 100 ar Strength (kPa) turbed △ Remoulded	

SOIL PROFILE AND TEST DATA

FILE NO.

HOLE NO.

PH2723

TP9

Proposed Residential Subdivision Old Mill Lane

ton, Ontario

154 Colonnade Road South, Ottawa, Ont	ario k	(2E 7J	5		A	ppleton,	Ontario
DATUM Geodetic							
REMARKS							
BORINGS BY Backhoe				D	ATE	August 18	8, 2016
	РІОТ		SAN	IPLE		DEPTH	ELEV
SOIL DESCRIPTION	STRATA PI	ТҮРЕ	NUMBER	% RECOVERY	VALUE r RQD	(m)	(m)
GROUND SURFACE	Ω.	•	N	RE(z ö		100.0
FILL: Brown sandy silt topsoil. Slightly moist. 0.56							-128.3
FILL: Light brown to grey sandy silt, gravel and wood debris. Slightly moist. End of Test Pit		G	14			1-	-127.3 ⁻
Refusal on bedrock at 1.18 m depth							

SOIL DESCRIPTION	PLOT		SAN	IPLE		DEPTH	ELEV.	1		. Blows/ n Dia. Co		<u> </u>
	STRATA I	ТҮРЕ	NUMBER	% RECOVERY	N VALUE or RQD	(m)	(m)	С		Content		Piezometer Construction
ROUND SURFACE	N N		z	RE	z ^o	0-	-128.31	2	0 40	60	80	in C
L: Brown sandy silt topsoil. ghtly moist.							120.01					-
0.56		_								·····		
L: Light brown to grey sandy silt, avel and wood debris. Slightly		G	14									
vist.						1-	-127.31					-
1.18 d of Test Pit	XXX	_										
fusal on bedrock at 1.18 m depth												
								2		60 congth (k		⊣ 00
									near Sti ndisturbed	rength (k ∆ Rem	(Pa) noulded	

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane Appleton, Ontario

DATUM Geodetic									FILE NO. PH2723	
REMARKS										_
BORINGS BY Backhoe				D	ATE	August 18	3, 2016	1	TP10	
SOIL DESCRIPTION	PLOT		SAN			DEPTH (m)	ELEV. (m)		esist. Blows/0.3m 0 mm Dia. Cone	on
	STRATA	ТҮРЕ	NUMBER	∾ RECOVERY	VALUE F ROD	(11)	(11)	• N	0 mm Dia. Cone Jater Content % 40 60 80	structi
GROUND SURFACE	STI	Ĥ	NUN	RECO	N OF		107.05	20	40 60 80 Z	Con
FILL: Brown topsoil. Slightly moist.							-127.85			
FILL: Brown sandy silt, some clay. Slightly moist. 0.55		G	15							
End of Test Pit										
Refusal on bedrock at 0.55 m depth										
								20 Shea ▲ Undist	40 60 80 100 ar Strength (kPa) urbed △ Remoulded	

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Appleton, Ontario

DATUM Geodetic									FILE NO	D. PH2723	
REMARKS BORINGS BY Backhoe				п	ΔΤΕ	August 18	3 2016		HOLEN	^{ю.} TP 11	
	Ę		SAN	IPLE				Pen. R	esist. B	lows/0.3m	
SOIL DESCRIPTION	A PLOT		~	Х	Но	DEPTH (m)	ELEV. (m)	• 5	60 mm D	ia. Cone	ter
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	N VALUE or RQD			0 \	Vater Co	ontent %	Piezometer
GROUND SURFACE	50 50	-	N	REC	N O	0-	-127.55	20	40	60 80	Ъ.
FILL: Dark brown sandy topsoil. Dry.							127100				
FILL: Brown sandy silt, clay and		G	16								
End of Test Pit		-									
Refusal on bedrock at 0.49 m depth											
								20	40	60 80 1	00
									ar Stren	gth (kPa) △ Remoulded	

SOIL PROFILE AND TEST DATA

FILE NO.

PH2723

Proposed Residential Subdivision Old Mill Lane Appleton, Ontario

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Geodetic

DATUM

REMARKS BORINGS BY Backhoe				D	ATE /	August 18	3. 2016		HOLE NO	^{).} TP12		
SOIL DESCRIPTION		SAMPLE			DEPTH	ELEV.		esist. Blo 0 mm Dia	. =			
	STRATA PLOT	ЭДХТ	NUMBER	% RECOVERY	N VALUE of RQD	(m)	(m)		/ater Cor		Piezometer Construction	
GROUND SURFACE	IS	H	NN	REC	N OL	0	107.05	20	40 6	60 80	Pie: Cor	
FILL: Dark brown sandy silt topsoil. Slightly moist.		_				0-	-127.85					
FILL: Light brown fine sand, silt, trace clay. Dry.		G	17									
0.88 End of Test Pit	XXX	-										
Refusal on bedrock at 0.88 m depth												
								20 Shea ▲ Undist	r Streng		00	

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane Appleton, Ontario

DATUM Geodetic									FILE NC	PH2723	
REMARKS									HOLE N		
BORINGS BY Backhoe		DATE August 18, 2016									
SOIL DESCRIPTION	A PLOT	SAMPLE			DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m • 50 mm Dia. Cone			eter ction	
GROUND SURFACE	STRATA	TYPE NUMBER « RECOVERY N VALUE or RQD					0 W 20	/ater Co 40	Piezometer Construction		
FILL: Brown mixture of sand, silt, clay and gravel. Dry.		G	18				- 128.03			60 80	
End of Test Pit Refusal on bedrock at 1.27 m depth								20	40	60 80 10	00
								20 Shea ▲ Undist	r Streng	60 80 10 gth (kPa) ∆ Remoulded	00

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane Appleton Ontario

						spieton,	Unitario						
DATUM Geodetic									FILE	NO. PH2723			
REMARKS				_			0010		HOLE	^{NO.} TP14			
BORINGS BY Backhoe							DATE August 18, 2016						
SOIL DESCRIPTION	РГОТ		SAN	IPLE	1	DEPTH		Pen. Resist. Blows/0.3m • 50 mm Dia. Cone			<u>ب</u> ۲		
		ы	ER	ERY	E G	(m)	(m)				Piezometer Construction		
	STRATA	ТҮРЕ	NUMBER	∾ RECOVERY	N VALUE or RQD			0	Water C	Vater Content %			
GROUND SURFACE	~~~		4	RE	z	- 0-	126.89	20	40	60 80	ъŏ		
FILL: Brown sandy silt, gravel. Slightly moist.		G	19										
0.28 End of Test Pit		-											
Refusal on bedrock at 0.28 m depth													
								20 She	40 ear Stre	ngth (kPa)	00		
								🔺 Undi	sturbed	△ Remoulded			

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane Appleton Ontario

DATUM Geodetic REMARKS									FILE NO. PH2723			
BORINGS BY Backhoe				D	ATE	August 18	8, 2016		HOLE NO. TP15			
SOIL DESCRIPTION		SAMPLE			DEPTH	ELEV.		esist. Blows/0.3m 50 mm Dia. Cone	- uo			
	STRATA PLOT	ТҮРЕ	NUMBER	[%] RECOVERY	VALUE r RQD	(m)	(m)		Vater Content %	Piezometer Construction		
GROUND SURFACE	E S	Ĥ	ЮN	REC	N OF			20	40 60 80	Con		
FILL: Brown sandy silt, clay, boulders, concrete, asphalt, plastic and stell debris. Slightly moist.		G	20				-121.62					
FILL: Grey/black clay, sand, gravel and organics. Very moist.		= G	21			2-	-119.62					
End of Test Pit Test pit terminated due to maximum reach of backhoe.	⊃ <u>×</u> ××	_				3-	-118.62	20 Shea ▲ Undist	40 60 80 100 ar Strength (kPa) turbed △ Remoulded			

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane

154 Colonnade Road South, Ottawa, On		∠⊏ /J	5		A	opleton,	Ontario					
DATUM Geodetic									FIL	ENO. Ph	12723	
REMARKS									но	LE NO. TP		
BORINGS BY Backhoe				DA	ATE .	August 18	8, 2016			IP	10	
SOIL DESCRIPTION	PLOT		SAN	MPLE		DEPTH (m)	ELEV. (m)	Pen.	.3m Ie	er tion		
	STRATA	ТҮРЕ	NUMBER	* RECOVERY	N VALUE or RQD			0	Water	Content	%	Piezometer Construction
GROUND SURFACE	ST	H	ИŬ	REC	N OF	0	-121.06	20			80	Piez Con
FILL: Brown sandy silt, clay and cobbles/boulders. Moist.		G	24									
<u>1.4</u> 8		_				1-	-120.06					
FILL: Grey clay, sand		G	22			2-	-119.06					
Black organics, cat tails. Very wet.	<u> </u>	G	23			3-	-118.06					
End of Test Pit Test pit terminated due to maximum reach of backhoe.												
(GWL @ 1.57 m depth)									40 near Str disturbed	rength (kF	a)	00

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane Appleton, Ontario

DATUM Geodetic						•			FIL	E NO.	PH272	23		
REMARKS BORINGS BY Backhoe					ATE	August 18	2016		нс	DLE NO	^{D.} TP17			
SOIL DESCRIPTION	PLOT			IPLE		DEPTH (m)	ELEV. (m)				ows/0.3m a. Cone	Piezometer Construction		
	STRATA	ТҮРЕ	NUMBER	° ≈	N VALUE of ROD			0	Wate	Vater Content %				
GROUND SURFACE			~	RI	z ^o	0-	-120.63	20	40		50 80	ŭ <u>ה</u>		
FILL: Brown sandy silt topsoil. Slightly moist.							120.00							
FILL: Brown to dark brown sandy silt, clay, gravel, brick, plastic and concrete debris. Moist.		G	27			1-	-119.63							
1.92 FILL: Grey clay, sand. Very wet2.34 End of Test Pit		- - - -	26			2-	-118.63							
Test pit terminated due to inflow of groundwater.														
(GWL @ 1.78 m depth)								20 She	40 par Si		50 80 th (kPa)	100		

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane Appleton, Ontario

DATUM Geodetic									FILE NO. PH2723
REMARKS BORINGS BY Backhoe				п		August 18	3 2016		HOLE NO. TP18
SOIL DESCRIPTION	PLOT		SAN	IPLE		DEPTH	ELEV.		esist. Blows/0.3m 0 mm Dia. Cone
	STRATA	ЭДУТ	NUMBER	% RECOVERY	N VALUE or RQD	(m)	(m)	• N	0 mm Dia. Cone and a cone Vater Content % and a cone 40 60 80
GROUND SURFACE			4	RE	z	0-	121.74	20	40 60 80 🗖 🤆
FILL: Brown silty sand, some clay, gravel. Dry									
		G	29			1-	-120.74		
FILL: Black to grey clay, sand, fabric, garbage bag. Slightly wet.		G	28			2-	-119.74		
<u>3.00</u> End of Test Pit Test pit terminated due to maximum reach of backhoe.		-				3-	-118.74	20	40 60 80 100
									ar Strength (kPa)

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane Appleton, Ontario

DATUM Geodetic									FILE NO. PH2723
REMARKS				_		A	0.0010		HOLE NO. TP19
BORINGS BY Backhoe	ы		SAN	IPLE		August 18	5, 2016	Pen Re	esist. Blows/0.3m
SOIL DESCRIPTION	PLOT					DEPTH (m)	ELEV. (m)		
	STRATA	ТҮРЕ	NUMBER	° ≈	N VALUE or RQD			0 N	0 mm Dia. Cone Jater Content % 40 60 80 80
GROUND SURFACE	L S	H	ЮN	REC	N O N		100.00	20	40 60 80 ^N ^N ^N ^N
FILL: Brown sandy silt topsoil. 0.13		-				0-	-120.63		
FILL: Brown to dark brown sandy silt, clay, gravel, brick, plastic and concrete debris. Moist.		_					-119.63		
FILL: Grey clay, sand. Very wet.		_				2-	-118.63		
End of Test Pit									
Test pit terminated due to inflow of groundwater.									
(GWL @ 1.78 m depth)								20 Shea ▲ Undistr	40 60 80 100 ar Strength (kPa) urbed △ Remoulded

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane Appleton, Ontario

DATUM Geodetic									FILE I	NO. PH2723	3	
REMARKS				_		A	0.0010		HOLE	^{E NO.} TP20		
BORINGS BY Backhoe	ы		SAN	IPLE		August 18	5, 2016	Pen R	esist. Blows/0.3m			
SOIL DESCRIPTION	PLOT				ы	DEPTH (m)	ELEV. (m)			Dia. Cone	ter	
	STRATA	ТҮРЕ	NUMBER	∾ RECOVERY	/ater C	Piezometer						
GROUND SURFACE	LS LS		NN	REC	N VALUE or RQD	0-	127.07	20	40	60 80	Pie:	
FILL: Dark brown sandy silt. Slightly moist.		× × × ×					127.07					
FILL: Light brown sand, silt, clay, gravel, wood debris. Slightly moist.		G	30									
End of Test Pit												
Refusal on bedrock at 0.68 m depth								20	40	60 80	100	
								20 Shea ▲ Undistr		60 80 •ngth (kPa) △ Remoulded	100	

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Appleton, Ontario

								FILE	NO. PH2	2723	
				ATE		2016		HOL	^{E NO.} TP2 ⁻	1	
н		SAN				5, 2010	Pen Besist Blows/0.3m				
						ELEV. (m)					er tion
RATA	(PE	IBER	°° VER!	ALUE ROD		()		/ator	Content %		omet struct
STI	Ĥ	ION	RECO	N O H			20	40			Piezometer Construction
8	G	31			- 0-		20 Shea	40 ar Str	ength (kPa))	00
	STRATA PLOT	STRATA STRATA	OTA ETARTE ATATA ALTA ALTA ALTA ALTA ALTA ALTA A	G 31	G 311	G 31 I I I I I I I I I I I I I I I I I I	OTA DEPTH ELEV. BALL MUNBER MUNBER (m) (m) G 31 I I I	Ling SAMPLE DEPTH (m) ELEV. (m) Pen. R • 5 Image: state sta	DATE August 18, 2016 PEPTH (m) PEN. Resist. 1 1 1 1 1 0 1 0 1 0 <td< td=""><td>DATE August 18, 2016 PH2 HOLE NO. TP2' DEPTH (m) Clear the sist. Blows/0.3 Image: signed si</td><td>PH2723 HOLE NO. TP21 SAMPLE DEPTH ELEV. Image: Image</td></td<>	DATE August 18, 2016 PH2 HOLE NO. TP2' DEPTH (m) Clear the sist. Blows/0.3 Image: signed si	PH2723 HOLE NO. TP21 SAMPLE DEPTH ELEV. Image: Image

SOIL PROFILE AND TEST DATA

FILE NO.

Proposed Residential Subdivision Old Mill Lane Appleton, Ontario

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Geodetic

DATUM

2E 7J5 A

										NO.	PH	12723	
REMARKS							/ _		HOL	E NO.	TP	22	
BORINGS BY Backhoe					ATE	August 18	8, 2016 		<u> </u>				
SOIL DESCRIPTION	PLOT		SAN	IPLE		DEPTH (m)	ELEV. (m)		esist. 0 mm				er on
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	N VALUE or RQD		(11)	0 V	/ater	Con	tent '	%	Piezometer Construction
GROUND SURFACE	LS	н	N N	REC	N O		100.00	20	40	60) (80	Cor
FILL: Dark brown sand, silt, gravel, wood, fabrick, concrete, glass, metal and plastic debris. Dry.		G	33				-123.68 -122.68		· · · · · · · · · · · · · · · · · · ·	·····			-
FILL: Brown sand, silt, metal, glass, wood and plastic debris. gravel. Dry. 1.82 End of Test Pit		G	34										
Refusal on bedrock at 1.82 m depth								20 Shea Jndist	40 ar Stro urbed	60 engti ∆) h (kP Remo	a)	00

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane

154 Cold ada Road South Ottawa Ontario K2E 7.15

154 Colonnade Road South, Ottawa, Oh		ZE / J	5		Ap	pleton,	Ontario				
DATUM Geodetic									FILE NO.	PH2723	
REMARKS									HOLE NO)	
BORINGS BY Backhoe				DA	ATE /	August 18	3, 2016	1		^{^^} TP23	1
SOIL DESCRIPTION	РІОТ		SAN			DEPTH (m)	ELEV. (m)		esist. Bl	ows/0.3m a. Cone	er ion
	STRATA	ы С	BER	VERY	ZOD	(,	(,				mete
	STR	ТҮРЕ	NUMBER	% RECOVERY	N VALUE or RQD				later Cor		Piezometer Construction
GROUND SURFACE	XXX			<u></u>	4	0-	123.42	20	40 6	60 80	
FILL: Dark brown sandy silt. Dry.											-
0.53											
	\bigotimes										
	\bigotimes					1-	-122.42				
FILL: Light brown sandy silt, some clay, gravel. Dry.		G	35								
1.74											
FILL: Brown clay, some sand, silt and gravel		G	36			2-	-121.42				
2.17											
End of Test Pit											
Refusal on bedrock at 2.17 m depth											
								20 Shea ▲ Undist	r Streng	50 80 1 th (kPa) Remoulded	oo

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision Old Mill Lane Appleton, Ontario

DATUM Geodetic									FILE NO. PH2723
REMARKS				_		A	0.001.0		HOLE NO. TP24
BORINGS BY Backhoe					ATE	August 18	3, 2016		
SOIL DESCRIPTION	PLOT			IPLE 거	M -	DEPTH (m)	ELEV. (m)		esist. Blows/0.3m 0 mm Dia. Cone
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	N VALUE or RQD			• v	0 mm Dia. Cone Jater Content % 40 60 80
GROUND SURFACE			4	RE	z ⁰	0-	123.16	20	40 60 80 ⁱ ĒŬ
FILL: Dark brown sandy silt, some clay. Slightly moist. 0.25		G	39				120.10		
FILL: Light brown sandy silt, some clay and gravel. Dry.		G	38			1-	-122.16		
FILL: Dark grey clay with sand and boulders. Wet.		– G	37			2-	-121.16		
End of Test Pit									
Refusal on large boulders at 2.23 m depth.								20	40 60 80 100
									r Strength (kPa)

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

FILE NO.

PE1114

Groundwater Sampling Program Former Appletex Mill Appleton, Ontario

DATUM

REMARKS

REMARKS BORINGS BY CME 55 Power Auger				D	ATE	March 16	. 2018		HOLE NO	D. BH 1-	18	
SOIL DESCRIPTION	РГОТ		SAN	IPLE		DEPTH	ELEV.	 Photo Ionization Detector Volatile Organic Rdg. (ppn) 			r Well	
	STRATA P	ТҮРЕ	NUMBER	° © © © © © ©	N VALUE or RQD	(m)	(m)	• Lowe	r Explos	ive Limit %	Monitoring Well Construction	
GROUND SURFACE TOPSOIL 0.10		-7		Ř	4	0-	-	20	40 (50 80 		
TOPSOIL0.10		X ss	1	42	15							
		ss	2	50	13	4						
		RC	-	86		1-	-					
			I	00							ន៍សំណើលហំណើលសំណើលសំណើលសំណើលសំណើលសំណើលសំណើលសំណើលស	
						2-	-					
		RC	2	10					· · · · · · · · · · · · · · · · · · ·			
						3-	-					
FILL: Brown silty sand, some gravel, cobbles and boulders, trace												
gravel, cobbles and boulders, trace concrete		RC	3	10								
			•			4-	-					
		_										
						5-	_					
						6-	_					
						0						
7.01												
7.01		_				7-	-					
		RC	4	100	48							
						8-	-					
		RC	5	100	52							
BEDROCK: Grey limestone												
		_				9-	-					
		RC	6	100	72	10-	-				- 1	
<u>10.6</u> 4												
End of Borehole		_										
(GWL @ 8.46m - June 7, 2018)												
								100			 500	
										g. (ppm) Methane Elim		

SOIL PROFILE AND TEST DATA

Groundwater Sampling Program Former Appletex Mill Appleton, Ontario

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

DATUM

REMARKS

BORINGS BY	CME 55 Power Aug	jer

FILE NO.	PE1114
HOLE NO.	BH 2-18

BORINGS BY CME 55 Power Auger				D	ATE	March 16	2018		BH 2-18	
SOIL DESCRIPTION	TOT	FO SAMPLE			DEPTH	ELEV.	Photo Ionization Detector Volatile Organic Rdg. (ppm)			
GROUND SURFACE	STRATA F	ТҮРЕ	NUMBER	% RECOVERY	N VALUE or RQD	(m)	(m)		Image: Second state of the se	
FILL: Topsoil with organics, trace gravel, cobbles and boulders		RC	1	100	52	- 0-	-		. _	
<u>1.83</u>		- RC	2	100	94	2- 3-	-			
BEDROCK: Grey limestone		RC	3	100	68	4-	-			
		RC -	4	100	93	5-	-			
End of Borehole		RC	5	100	92	7-	-			
(GWL @ 3.35m - June 7, 2018)										
									200 300 400 500 agle Rdg. (ppm) s Resp. △ Methane Elim.	

SYMBOLS AND TERMS

SOIL DESCRIPTION

Behavioural properties, such as structure and strength, take precedence over particle gradation in describing soils. Terminology describing soil structure are as follows:

Desiccated	-	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure.
Varved	-	composed of regular alternating layers of silt and clay.
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or silt and clay.
Well-Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes (see Grain Size Distribution).
Uniformly-Graded	-	Predominantly of one grain size (see Grain Size Distribution).

The standard terminology to describe the strength of cohesionless soils is the relative density, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm.

Relative Density	'N' Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

Consistency	Undrained Shear Strength (kPa)	'N' Value
Very Soft	<12	<2
Soft	12-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their "sensitivity". The sensitivity is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil.

Terminology used for describing soil strata based upon texture, or the proportion of individual particle sizes present is provided on the Textural Soil Classification Chart at the end of this information package.

ROCK DESCRIPTION

The structural description of the bedrock mass is based on the Rock Quality Designation (RQD).

The RQD classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be a result of closely-spaced discontinuities (resulting from shearing, jointing, faulting, or weathering) in the rock mass and are not counted. RQD is ideally determined from NXL size core. However, it can be used on smaller core sizes, such as BX, if the bulk of the fractures caused by drilling stresses (called "mechanical breaks") are easily distinguishable from the normal in situ fractures.

RQD % ROCK QUALITY

90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard
		Penetration Test (SPT))

- TW Thin wall tube or Shelby tube
- PS Piston sample
- AU Auger sample or bulk sample
- WS Wash sample
- RC Rock core sample (Core bit size AXT, BXL, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

GRAIN SIZE DISTRIBUTION

MC% LL PL PI	- - -	Natural moisture content or water content of sample, % Liquid Limit, % (water content above which soil behaves as a liquid) Plastic limit, % (water content above which soil behaves plastically) Plasticity index, % (difference between LL and PL)
Dxx	-	Grain size which xx% of the soil, by weight, is of finer grain sizes These grain size descriptions are not used below 0.075 mm grain size
D10	-	Grain size at which 10% of the soil is finer (effective grain size)
D60	-	Grain size at which 60% of the soil is finer
Сс	-	Concavity coefficient = $(D30)^2 / (D10 \times D60)$
Cu	-	Uniformity coefficient = D60 / D10
Cc and	Cu are	used to assess the grading of sands and gravels:

Well-graded gravels have: 1 < Cc < 3 and Cu > 4Well-graded sands have: 1 < Cc < 3 and Cu > 4Well-graded sands have: 1 < Cc < 3 and Cu > 6Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded. Cc and Cu are not applicable for the description of soils with more than 10% silt and clay (more than 10% finer than 0.075 mm or the #200 sieve)

CONSOLIDATION TEST

p'o	-	Present effective overburden pressure at sample depth
p'c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'c)
Сс	-	Compression index (in effect at pressures above p'c)
OC Ratio)	Overconsolidaton ratio = p'_c / p'_o
Void Rat	io	Initial sample void ratio = volume of voids / volume of solids
Wo	-	Initial water content (at start of consolidation test)

PERMEABILITY TEST

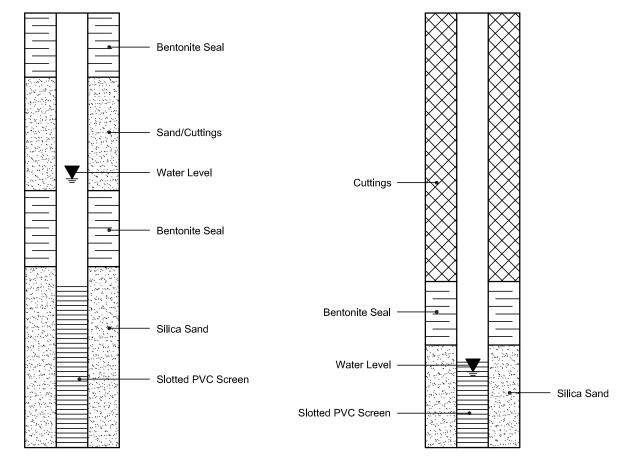
k - Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the test.

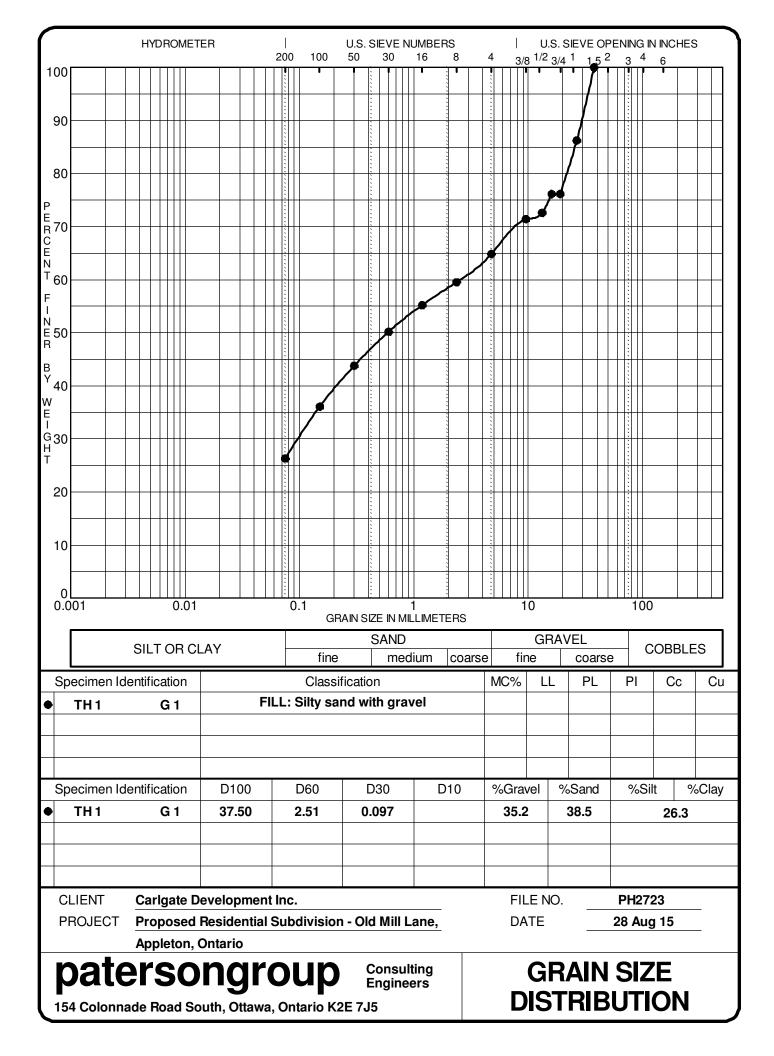
SYMBOLS AND TERMS (continued) STRATA PLOT Topsoil Asphalt Peat Sand Silty Sand Fill Δ Sandy Silt Clay Silty Clay Clayey Silty Sand Glacial Till Shale Bedrock

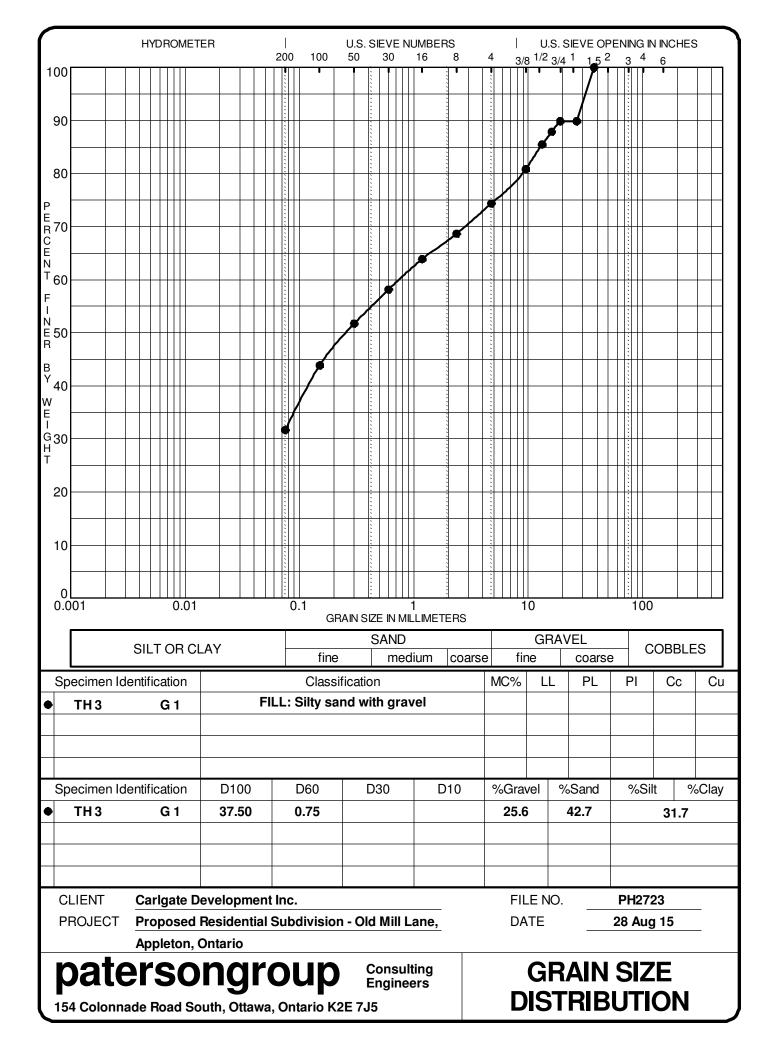
MONITORING WELL AND PIEZOMETER CONSTRUCTION

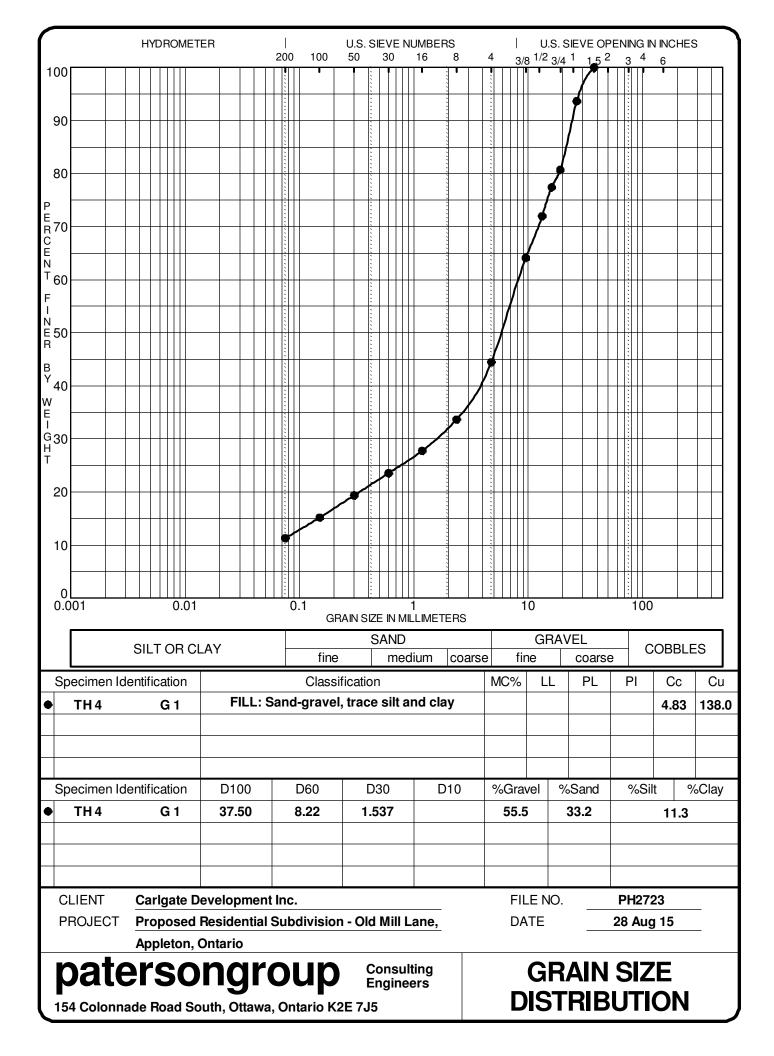
MONITORING WELL CONSTRUCTION

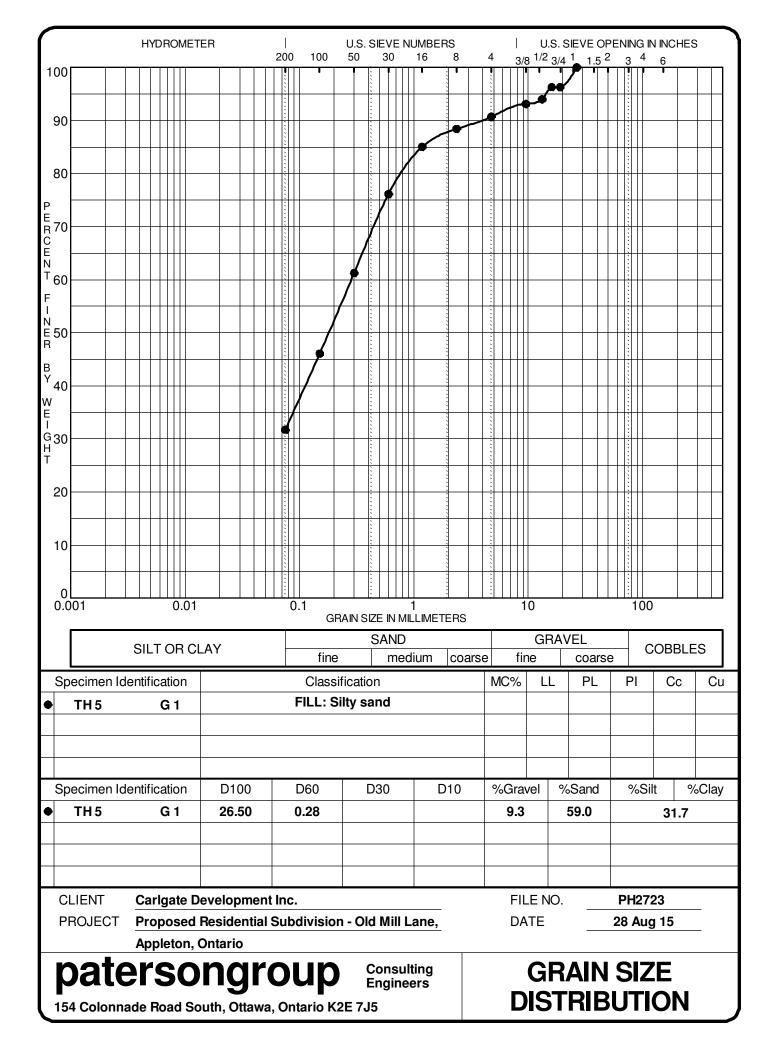
PIEZOMETER CONSTRUCTION











Appendix 2

- MECP Water Well Records for Test Wells TW 1 to TW 3
- MECP Water Well Records for Existing Neighbouring Wells

TW I

() Ontario	the Environment	w Tag#: A18703 A187038	Below)	Regulation	903 Ontario V	Vater Res	-	
	in: 🔲 Metric 🕅 Imperial	ter and the second s	u. c. yest and the set of the		Pag		of	
Well Owner's Informa	1 oet Name / Omanization	And Andrewski Inc	E-mail Address		<u>yela estra (x</u>	🔲 Weil 🤇	Constructed	
Mallion Address (Cheat Bir	1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	evelopment Inc.	Province	Postal Code	Telephon	by We le No. (Inc.	area coda)	···· · · · · · · · · · · · · ·
Mailing Address (Street Nu BOX 44		Caneton Pla			3 P 3			
Well Location		Township		Lot	Concess			
Address of Well Location (#1-10-#1-22-0)	d Mill Lane	Township Ramsay/Mis	sissippi Mills					
County/District/Municipality	/	City/Town/Village		-	Province Ontario	Postal		
UTM Coordinates Zone E	esting Northing	Municipal Plan and Suble	x Number	F F	Other			
	411380 50036	62 Plan 288	back of this form)		and specific sectors.		a da ka ji	
	ost Common Material	Other Materials		eral Description		From	th (<i>mono</i>	
	SSanda . ** ***		1.1. 40 34 1.4 1.4 1.4 	en e	al Constant al constant a	0/	4/	
	2 Limestone			· · · · .	• 1	4	85	
Grey & Brown	······································	Leads an east	· ·	· · ·		65 '	71/	
·						<u></u>		
		1 100000	(== 0) , .		20.1	
* RP27 R98	84 Karts (to	4/RP26R5	6 18 101	ms 4,7	1,17,18	140	<u> 18 18 </u>	
							 	
		1 2 2					+	
[]	BT WELL #	1 07 3		DEALINE AFANIS	II Matarasett	a contraction of the second		
Depth Set at (np.)	Annular Space	Volume Placed	After test of well yield	, water was:	Draw Dowr	1 R	ecovery	
From To	(Material and Type) Neat/cements////////////////////////////////////		Clear and sand	nee Not teste	Time Water Li (min) (min)	r (min)	Water Level . (mill)	
			If pumping discontinu		Static Section 1	38.8."	:: 37.5	
			X		1 8-36	3:5i - y	36.8	
			Pump intake set at		·2·	7. 2		
		and the second	Pumping rate (Vinin	. But and the second	i≤3/ ⊅: 3€	1 9 3		
Method: of Constr		Well Use	- 10 - 20 ke nimi	Kaning and a grant	4 31	4	36,2	
Rotary (Coriventional)		Municipal: Dewatoring	Duration of pumping	nin saran sa	-5° × 37		36.2	
Rotary (Reverse)	Digging 🖓 🗌 Inigation 👘	Test Hole Monitoring Cooling & Alr Conditioning	Final water level end	of aumping (m/t)	×10 × 37	2 10	-36:2	
Air percussion	☐ Industrial ☐ Other, specify _		If flowing give rate (Vitin / GPM)	-15 37	5 15	36.2	
	uction Record - Casing		X		20 37	-5-20	36.2	
Inside Open Holo OR Diameter (Galvenized, Fr	breglass, Thickness	To Reptacement Well	Recommended pur	There are the	25 37	7.5 ₂₅	38.2	
(om/a) Concrete Plas	1884 + 2 ¹	20 Test Hole	Recommended pur (/min/Sere	np rate. a start	* 30 ⁻ *****37	5 . 30		
O14Open H6	and the second second second second second	Dewatering Well	and the second se		40 37	5 40	36.2	
6	an the second states and second states and second states and second states and second states are second states	Monitoring Hole	Well production (//		<u>≈50</u> m 3	≪ 5 1~50°	36.2	
		(Construction)	Disinfected?		60 53	60	A	+
	ruction Record - Screen	insufficient Supply	1000 C	Map of W	ell Location	e	ethan	
Outside Materia	Shi Nham Dept	(m/t) Water Quality	Please provide a πa	p below following	instructions on th	he back.		
(cm/in) (Plastic Galvani	zed, Sleel) From	To Abandoned, other spocify		Æ	WHAN Y	Qiu		
		Diher, specify	TW			NZ		
	Vater Details	Depth (m/t) Diameter]	Tw#!	adter	(J)		
San Gas 🖸	Other, specify	From To (cm/in)	4			Ľ.		
Water found at Depth Kin	d of Water: Fresh Unlested	0' 20 93/4"		- Jac	"Kan	F9		
(m/ft) Gas Water found at Depth Kin	d of Water: Fresh Untested	20 71 6"		V.		/ଁ ତି		
(m/ft) 🗌 Gas 📋					ET 1	1		
Business Name of Well Co	Contractor and Well Technicia	Well Contractor's Licence No.	MALL MALL	E STRE	[1		
Air Rock Drilling	Co. Ltdie en	4119	Commercia			\		
Bue 8899/ Prank Street	******	Muntershond		GPM SET	8.69 ET	2		
Province Posta	L Code Business E-mail Add	k@sympatico.ca		WELL-4		- 3	e Onlo	
11	godal Namo of Woll Technician (information	2015 Move		°Z19	1501	
5188882;170 .jj.e	erem؛ مودد، (apanna) مودد.	¥ 4.		Work Completed				
Well Technician's Licence No.	Signature of Technician and/or Co	ntractor Date Still fored 08 30		2015 6 Y Y M M		d ·		
	Hinter for Ontario. 2007	Minietorie Com	المشاليب معيال	<u> </u>	أشتريتكما ليستسب			-

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CERTIFICATE OF WELL COMPLIANCE

AIR ROCK DRILL ING COLTD. DO HEREBY CERTIFIY that I am

licensed to drill wells in the Province of Ontario, and that I have supervised the drilling of

a well on the property of (Name of Landowner)

DEVELAMENT ***11/ - #122 OLD MILL LANE, APP ETON (Legal Description, Lot, Conc, Plan No.) in the Geographical Township of MISIESI in the County of LANAR P11#4 KLAN 288 CON IN CERTIFY FURTHER that, I am aware of the well drilling requirements, the guidelines, recommendations and regulations of the Ministry of the Environment governing well installations in the Province of Ontario, and the standards specified in any subdivision agreement and hydrogeological report applicable to this site and City Standards. *RP27R988 4 Parts 1-104/RP26R2678 Parts 4, 9, 17, 18 4 28 * AND DO HEREBY CERTIFIY THAT the said well has been drilled, cased, grouted (cement or bentonite) as applicable and constructed in strict conformity with the standards required. 22ND day of JUNE Signed this

(Well Driller/Company) Kenny Desaul niers The Engineer on behalf of the landowner set out above Certifies that he/she has inspected

the well and it was constructed in accordance with the specifications in O.Reg 903, this report and the Hydrogeological Report with regards to casing length and grouting requirements.

Signed this _____ day of

(Engineer)

Please fax - 613-838-3277

TEST WELL# 1 043 TAS# A187038 2015232

T٧	12
	-

	IW 2
, f 1 1	Winistry of the Environment Winistry of the Environment Winistry of A187039 Well Record Measurements recorded in: Image: Angle State
	Well:Owner's information First Name Lest Name / Organization
	Carkgate Development Inc. by Well Owner
	Mailing Address (Street Number/Name). Municipality Carleton Place Province N Province N Posta Code Telephone No. (inc. aree code)
	Well Location 经济学家 网络小学学会 医小学学会 医小学学会 医小学学会 医中心的 医外外的 计算法分子 网络拉拉拉拉拉拉拉拉拉拉拉拉拉拉拉拉拉拉拉
	Address (Well as in the second
	County/District/Munkcipality City/Town/Village Province Postal Code Ontario Postal Code
	UTH Contributes Zone , Easting Northing Northing Municipal Plan and Subiol Number Other Lot 7.
	Overbuilden and Hedrock Materials/Abaildonment Sealing:Record (see instructions on the back of this form)
	General Colour Most Common Material Other Materials General Description Depth (Mp)
	Grey & Brewn as a second
	Grey & Brown Limestone 60 64 /
	Grey & Brown Access Chimestone
	* R12789884 borts 1th 4 / R126 R2678 Brts 49, 17, 18 + 28 *
	TEST WELL & d OF 3
	Annula: Space Results of Well Yield Testing Depth Set at (mg) Type of Sealant Used Volume Placed From To (Meterial and Type) Depth Set at (mg) Clear and sand free Time Water Level Mater Level
	An analysis on several and the free contraction was as a set of a low as the contraction of the contraction
	If pumping discontinued, give reason. Static 30.57
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	Construction of the second sec
	Inside Open Hole OR Material Weat Depth (mg) Water Supply Recommended pump depth (mg)
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	Monitoring Hole 201 50 50
	Construction) ☐ Abandoned, ↓ Konstruction ↓ Solution ↓ Solution ↓ 60 ↓ 60 ↓ 60 ↓ 60 ↓ 60 ↓ 60 ↓ 60 ↓ 6
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	Outside Material Depth (m/t) Water Quality Diamiser (Plassic, Calvestid, Steel Stoc No. Prom To Abandoned, other, specify
	Other, specity
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	64 (mm) Ges Uniter, specify 20. 10 60
	Weter found at Depth Kind of Water:
	Buildness Name of Wall Contractor and Well Technician Information
	Air Rock Drilling Co. Ttd: 1719
	1/2 HF - 10 GFM SEL (200 F).
	Well owners Date Package Delivered Ministry Use Only
	Bus Telephone Ng. (nc. snacoce) Name of Well Technician (Last Name, First Name)
	Wel Technician's Licence No. Signature of Technician and/or Contractor Date Statistica 6 30 Deter Work Somoletes 2015 6 23
	35055 7007733 € Classon Printer Complex 2007

CERTIFICATE OF WELL COMPLIANCE

AIR KOCK DRILL D.DO HEREBY CERTIFIY that I am

licensed to drill wells in the Province of Ontario, and that I have supervised the drilling of

a well on the property of (Name of Landowner)

REGATE DEVELOPMENT INC -#= OLD MILL LANE, APPLE TON - #122 (Legal Description, Lot, Conc. Plan No.) in the Geographical Township of MISTISS in the County of LANA

PIL#A CON 10 PLAN 288 CERTIFY FURTHER that, I am aware of the well drilling requirements, the guidelines, recommendations and regulations of the Ministry of the Environment governing well installations in the Province of Ontario, and the standards specified in any subdivision

agreement and hydrogeological report applicable to this site and City Standards.

*RP27R988 4 Parts 1-104/RP26R2678 Parts 4, 9, 17, 18 4 28 * AND DO HEREBY CERTIFIY THAT the said well has been drilled, cased, grouted (cement or bentonite) as applicable and constructed in strict conformity with the

RD day of JUNE Signed this **DIS** Air Rock Drilling Co. Ltd. (ompany) Kenny Desaulniers

The Engineer on behalf of the landowner set out above Certifies that he/she has inspected the well and it was constructed in accordance with the specifications in O.Reg 903, this report and the Hydrogeological Report with regards to casing length and grouting

day of ____ Signed this

(Engineer)

Please fax - 613-838-3277

TEST WELL # 2 0F3 TAS# A 187039 2015233



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Ontario Ministry of the Environment	Tag#:A18704	0t Belaw)	Regulation	903 Ontario V		urces Act	
Measurements recorded in: Metric Almperial Well Owner's information			i.	Pag		of	
First Name / Organization	Nunicipality	E-mall Address Province	Postal Code	Telephon	Well C — by Well a No. (inc. a)	Owner	
Box 44 Well Location	Carleton Plac		K7C				
Addross of Well Location (Street Number/Name) #116-#122 Old Mill Lane	Township Ramsay/Miss	issippi Mills	Lot	Concess		<u>, , , , , , , , , , , , , , , , , , , </u>	
County/District/Municipality				Province Ontario	Postal	Code	
UTM Coordinates Zone Eesting Northing NAD 8 3				Other			
Overburden and Bedrock Materials/Abandonment Sea General Colour Most Common Material	Other Materials		al Description		Dept From		
Greys&Brownson Sauth Science Limestone		· · ·			<u>- 0- /</u> 12./	12. ⁴ 38 ⁴	
Grey&Brown					39 /	80	
Grey & Browney Content States States	•••			• • • • • • • • • • •	60 /	67.	
		<u> </u>					
* K12789884 Korts 1-10-4	-/RP26R2678	4-n54	9,17,	180-9	8 🗶		
TEST WELL # 3	of 3		·····				
Annular Space		After test of well yield, w	ater was:	Draw Down Time Water Le	Re	covery Nater Level	
-215 - Otto serverients	Sectores established and	SOthers specify	Nottester		(min)	(m/i)	
		X		1 21	2 1	20.1	•
		Pump intake set et (m 500		2 21			
Method of Construction	Well/Use	Pumping rate (Vmin / 4		*3****21 **4****21	V 1000	194	
Rotary (Conventional) Diviting Rotary (Reverse) Diving Livestock	Municipel Dewatering	Duration of pumping				19:4	
Bonng Digging Dirigation Difference Differenc	Cooling & Air Conditioning	Final water level and of 22/22/22/22/22/22/22/22/22/22/22/22/22/	19. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	40 21 15 22	8 210	19:4 19:4	
Construction Record -Casing	Status of Wells	Recommended pump			ie (1200 ±		
Concrete, Galvanized; Fibreglass, Thickness (cmap); Concrete, Plastic, Steel) - (cmap); From	To Replacement Well	50.000		<u> </u>	25		
6/4/ Steel - 198	211- Devatoring Well 67	Recommented pump. Name 2011	100 300	301 22 20 22		19.4 19.4	
6.	Monitoring Hole	Well production (<i>Umin</i>) 2015 States Disinfected?		250	彩 #505 7	3418:4	
	(Construction)	XOres DNo	Man of Ma	60 22		** 48 44	
Outside Diameter (Pleetic, Savanged, Steel) Sot No. From		Please provide a map b				~ 1	
(cm/n) Prom	specify		(TWA) / (noz noz	
	Cther, specify	TW3	6	0-74	N_	Ĩ₹	
Water found at Depth King of Water Cleash Kintested	Depth (m/ft) Diameter From To (cm/in)	A	-	ı	7.	ι	
	<u>.</u>	gen	T	- III		Ϋ́́ε.	
Water found at Depth Kind of Water: Fresh Untested	24 67 6"	*				TA .	
(m/fi) Gas Other, specify (m/fi) Gas Well: Contractor and Well: Technician Business Name of Well Contractor	Well Contractor's Licence No.	<u> </u>		0.05	.	10	
Air Rock Drilling Goe Ltdcs of Section 200	anger sam at at 190 gg	Comments:		REE		1	
		TEST WE	PM SET @ LL+#3		3		
Bus, Telephone No., (nc. area.code). Name of Well-Technician (La	ast Name, First Name)	information package and the State	ickage Delivered		istry Use Z 1 Q 1		
Well Technician's Licence No. Signature of Technician and yor Con	e: : -	A Yos Date W	rk Completed	23	LU:L		
(5065 (2007/12) • Queen's Privier for Ontario. 2007	Y Y Y M M D D	10 No Y Y	Y Y M M I	DReceived		· . 	

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CERTIFICATE OF WELL COMPLIANCE

HIR KOCK-D.DO HEREBY CERTIFIY that I am

licensed to drill wells in the Province of Ontario, and that I have supervised the drilling of

a well on the property of (Name of Landowner)

DEVELOPMENT ATER #= - #122 LANE, APP OLD MILL TON (Legal Description, Lot, Conc. Plan No.) in the Geographical Township of MISSISS in the County of PIL#A CON PLAN 288

CERTIFY FURTHER that, I am aware of the well drilling requirements, the guidelines, recommendations and regulations of the Ministry of the Environment governing well installations in the Province of Ontario, and the standards specified in any subdivision agreement and hydrogeological report applicable to this site and City Standards.

RP37R9884 Parts 1-184/RP36R3678 Parts 4, 9, 17, 184 28 * AND DO HEREBY CERTIFIY THAT the said well has been drilled, cased, grouted

5

(cement or bentonite) as applicable and constructed in strict conformity with the standards required.

day of JUNE Signed this ____ Air Rock Drilling Co. Ltd. Driller/Company) Desaulniers Kenn

The Engineer on behalf of the landowner set out above Certifies that he/she has inspected the well and it was constructed in accordance with the specifications in O.Reg 903, this report and the Hydrogeological Report with regards to casing length and grouting

Signed this _____ day of

(Engineer)

Please fax - 613-838-3277

TEST WELL#3 043 TAS#A187040 2015234

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Department of N	Aines, Provin	ce of Ontar	io	,	
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		appe	ton	m	
Date Completed 9 April 5 Cost of (day) (month) (year)	f Well (excludi	ing pump)			
Pipe and Casing Record		Р	umping Test		
Casing diameter (s) 6	Date	aril 9		- 	
Length(s) of casing(s)	Static level.	over	flowing	around	Kel
Type of screen	Pumping lev	el . /	o ydl	n hr	(20gm)
Length of screen Distance from top of screen to ground level	Duration of	test 3	0 min	••••••	\dots
Is well a gravel-wall type?			bowls to ground	level	• • • • • • • • • • • •
	ater Record				
		· · · · · · · · · · · · · · · · · · ·	Depth(s)	Kind of	No. of Feet
Kind (fresh or mineral)	5. 6.	£	to Water Horizon(s)	Water	Water Rises
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How far is well from possible source of contamination?. What is the source of contamination?	• • • • • • • • • • • • • •	•••••			· ·
Enclose a copy of any mineral analysis that has been ma					
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Overburden and Bedrock Record	From	То	NI	ation of Wel	
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Drilling Firm P. A. S. A. S. M. C. S.	no	• • • • • • • • • • • •			
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For what purpose(s) is the water to be used?	el.				
How far is well from possible source of contamination?		• • • • • • • • • • • • •	•		-
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Enclose a copy of any mineral analysis that has been mad	e of water	· · · · · · · · · · ·	. Juin		
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Date 7		Licence N	umber		1
FORM 5 Carliton	place.		Signature of	Licensee	<u>~</u>

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Pipe and Casing			7	Pumping Test	
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Is well on upland, in valley, or on hi Drilling firm	(1.1g. Q. L. 7.),	<u> </u>		201	Pridge
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How far is well from possible source of conta					
What is source of contamination? Enclose a copy of any mineral analysis that					
Well Log				Location of V	Vell
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Pipe and Casing Record			Pumping Test		
Casing diameter (s)	. Date				
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Type of screen				•••••	
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Is well a gravel-wall type?	. Distance from	n cylinde	er or bowls to ground	l level	• • • • • • • • •
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How far is well from possible source of contamination?.		••••			· ^
What is the source of contamination? And the source of contamination?					
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Casing and Screen Record		1	·····	nping Test	
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Type of screennil Length of screen				g 10 Minutes	
Depth to top of screen		Water cl	ear or cloudy at	end of test clo iled hand pump	oudy
Diameter of finished hole		Recomm	insta. ended pumping	rate	3
Well Log			Wa	iter Record	
Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, sulphur)
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Limestone	6"		50 *	28 •	fresh
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For what purpose(s) is the water to be used?				ition of Well	· 11 . f
demestic				v show distances o e. Indicate nort	
Is well on upland, in valley, or on hillside?				s. maleate more	
upland		· - {			
Drilling Firm BLAIR FHILLIPS DRILLIN	IG.C.C. LTD,	. ζ	H T		- ve
Address 1119 Falaise Road, Ottawa	5, Ont.	. `\	12 3	,	TV//
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Licence Number 190	,	. 🔰 🌊	2 roba		0
Name of Driller M . Sztepa			e l'a		\mathcal{Q}
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(Signature of Licensed Drilling Contracto			يج ا	~~~	
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Form	
15M-5	8-4149

around WATER BRANCI 317/1 east UTM 118 4111500 E ONTARIO WATER 5 R 5003400 The Ontario Water Resources Commission Act RESOURCES COMMISSION Elev. 5 R 0405 Township, Village, Town or City RAMSER Basin y & District LAA 2.41 Lot # 3 Date completed Con. X (day month lress. **Pumping Test Casing and Screen Record** 22 Static level Inside diameter of casing..... Ι.Ο. Test-pumping rate G.P.M. Total length of casing 2 2 Pumping level. Type of screen Duration of test pumping A. . Length of screen Water clear or cloudy at end of test and the Depth to top of screen. Recommended pumping rateG.P.M. Diameter of finished hole 251 feet below ground surface with pump setting of. Water Record Well Log ÷ Depth(s) at Kind of water From То (fresh, salty, sulphur) which water(s) Overburden and Bedrock Record ft. ft. found < -O7 n Location of Well For what purpose(s) is the water to be used? In diagram below show distances of well from road and lot line. Indicate north by arrow. Is well on upland, in valley, or on hillside?..... Drilling or Boring Firm, LOT Address. Licence Number. Name of Driller or Borer..... Address 🥥 👌 Date 2 (Signature of Licensed Drilling or Boring Contractor) 155 1851 PP1 R Form 7 15M-60-4138 $i \ge 1.56$ OWRC COPY

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MINISTRY OF THE ENVIRONMENT The Ontario Water Resources Act 31F/, E L RECORD ONTARIO 3503366 1. PRINT ONLY IN SPACES PROVIDED 35012 CÓN 2. CHECK 🖾 CORRECT BOX WHERE APPLICABLE CON. BLOCK TRACT SURVEY ETC OUNTY OR DIST TOWNSHIP, BOROUGH, CITY, TOWN Romsey L 003 Lanark COMPLETED _ MC 05 YB 23 2 0395 5 25 0.0.3.4.6 LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS) DEPTH - FEET MOST COMMON MATERIAL GENERAL COLOUR OTHER MATERIALS GENERAL DESCRIPTION FROM Fill 0 2 Lime stone 2 64 Start RE Ţ r . 31 32 SIZE(S) OF OPENING (SLOT NO.) 34-38 LENGTH (51) CASING & OPEN HOLE RECORD WATER RECORD SCREEN 41) TER FOUND DEPTH KIND OF WATER INCHES WALL THICKNESS INSIDE DIAM. MATERIAL 41-44 FROM DEPTH TO TO OF SCREEN то 10-17 ¹ FRESH ³ SULPHUR ² SALTY ⁴ MINERAL ٠. STEEL X60 2 GALVANIZED 0 022 185 1 _____ FRESH 3 ____ SULPHUR 2 _____ SALTY 4 ____ MINERAL 15-18 CONCRETE 61 **PLUGGING & SEALING RECORD** 4 OPEN HOLE 20-2 DEPTH SET AT - FEET (CEMENT GROUT. LEAD PACKER. ETC.) 1 🗌 STEEL 20-23 MATERIAL AND TYPE 1 FRESH 3 🗍 SULPHUR 2 GALVANIZED 3 CONCRETE FROM то ² SALTY ⁴ MINERAL 10-1 25-28 1 FRESH 3 SULPHUR 2 SALTY 4 MINERAL 4 🗌 OPEN HOLE 27 20 18-2 22-25 1 C STEEL 2 GALVANIZED 1 [] FRESH 3 [] SULPHUR 2 [] SALTY 4 [] MINERAL 30-33 30-33 26-25 3 🗌 CONCRETE OPEN HOL LOCATION OF WELL 71 00 15-16 HOURS 30 0020 S X PUMP 2 🛄 BAILER IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW. WATER LEVEL END OF PUMPING PUMPING STATIC WATER LEVELS DURING 15 MINUTES 19-21 22-24 30 MINUTES PUMPING TEST MINUTES 60 MINUTES 030 26-28 29-31 32-34 020 0.30 FEET 30 FEET FEET FEE 🗶 CLEAR CLOUDY RECOMMENDED PUMP TYPE RECOMMENDED PUMP SETTING 0 4/5 43-45 RECOMMENDED PUMPING FEET RATE 0020 🗆 SHALLOW 💆 DEEP 00 2 . O GPM. / FT. SPECIFIC CAPACITY Migsissipp Rivel WATER SUPPLY 5 🔲 ABANDONED, INSUFFICIENT SUPPLY FINAL OBSERVATION WELL 6 🗌 ABANDONED. POOR QUALITY STATUS TEST HOLE RECHARGE WELL 3 🗆 7 🗍 UNFINISHED OF WELL 4 🗆 1 🜌 DOMESTIC 5 COMMERCIAL GR 11403 2 🗆 3 🗍 STOCK 6 🗌 MUNICIPAL WATER PUBLIC SUPPLY USE OI 4 🗆 INDUSTRIAL 8 COOLING OR AIR CONDITIONING 9 D NOT USED OTHER 6 D BORING 7 DIAMOND CABLE TOOL ٦ ۱ METHOD 2 **b** ROTARY (CONVENTIONAL) OF ROTARY (REVERSE) JETTING DRILLING ROTARY (AIR) 9 DRIVING 5 AIR PERCUSSION ILLERS REMARK CONTRACTOR OFFICE USE ONLY Air-Rock Drilling Co 150873 111 9 P 1119 CONTRACTOR ADDRESS DATE OF INSPECTION R.R. #2 Jasper OnT R.W. Doyle 13 Nov 74 NUMBER Р Desaulniers 1119 ,23 8 WI FORM 7 07-091 MINISTRY OF THE ENVIRONMENT COPY

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41 WATER RECORD WATER FOUND AT - FEET KIND OF WATER 10-13 KIND OF WATER 10-14 Stell WATER FOUND INCHES MATERIAL DEPTH - FEET THICKNESS TO 10-13 1 FRESH 3 SULPHUR 12 GALVANIZED 0 20 20 20 20 20 20 20-23 10 FRESH 3 SULPHUR 12 GALVANIZED 20 20-23 10 FRESH 3 SULPHUR 20 20-23 20-23 11-16 12-16 20-22 11-16 12-16 20-23 12-16 20-23 12-16 12-16 20-22 13-16 20-23 13-16 20-27-30 10-13 14-17 10-13 14-17 10-13 14-17 10-13 14-17 10-13 14-17 10-13 14-17 10-13 14-17 10-13 14-17 10-13 10-13
WATER FOUND AT - FEET KIND OF WATER 01/17 1 FRESH 3 SULPHUR MATERIAL THICANESS FRUM TO 01/17 2 SALTY 4 INNERAL 12 STEEL 12 STEEL 13-16 00222 1 1 FRESH 3 SULPHUR 13 GALVANIZED 00222 13-16 00222 13-16 14-17 FEET FEET FEET FEET FEET FEET 10-11 STEEL 12 GALVANIZED 00222 13-16
1 FRESH 3 I SULPHUR 2 SALTY 4 ININERAL 3 CONCRETE 28 4 OPEN HOLE 28 2 SALTY 4 ININERAL 3 CONCRETE 27:30 18-21 22-25 18-21 22-25 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 2 GALVANIZED <t< td=""></t<>
Ans-18 1 FRESH 3 SULPHUR 19 3 CONCRETE A
20-23 1 FRESH 3 I SULPHUR 24 2 GALVANIZED 3 CONCRETE 2 SALTY 4 INNERAL 2 GALVANIZED 10-13 14-17 2 SALTY 4 INNERAL 26-29 30-33 80 24-25 2 GALVANIZED 27-30 18-21 22-25 22-25 26-29 30-33 80
1 FRESH 30-33 1 FRESH 3 STEEL 26-29 30-33 80
1 FRESH 3 SULPHUR 3 CONCRETE
2 SALTY 4 MINERAL 4 OPEN HOLE
The second second pumping rate 10 pumping rate 11-14 duration of pumping LOCATION OF WELL 1 2 pump 2 I bailer 000 gpm 00 15-16 3017-18 Hours 17-18 Hours
STATIC WATER LEVEL 25 1 PUMPING STATIC END OF WATER LEVELS DURING 2 IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LEVEL PUMPING 2 RECOVERY 19-21 22-24 15 MINUTES 45 MINUTES 60 MINUTES
$\sum_{rest}^{20} 025_{rest} 070_{rest} 070_{rest} 070_{rest} rest rest$
IF FLET FLET FEET GIVE RATE GIVE RATE GIVE RATE 1 RECOMMENDED PUMP TYPE RECOMMENDED 43-45 RECOMMENDED PUMP TYPE RECOMMENDED 46-49
ECOMMENDED PUMP TYPE RECOMMENDED 43-45 RECOMMENDED 46-49 PUMP O O O O GPM
If FLOWING. 38-41 PUMP INTAKE SET AT WATER AT END OF TEST 42 GIVE RATE CPM FEET 1 X LEAR 2 CLOUDY RECOMMENDED PUMP TYPE RECOMMENDED 48-49 PUMP Stallow X DEEP SETTING 0 80 FEET RECOMMENDED 46-49 Stallow X DEEP SETTING 0 80 FEET RECOMMENDED 600 69 Status
FINAL 1 DC WAIER SUPPLY 5 □ ABANDONED, INSUFFICIENT SUPPLY 2 □ OBSERVATION WELL 6 □ ABANDONED, POOR QUALITY 3 □ TEST HOLE 7 □ UNFINISHED
OF WELL ' 4 CRECHARGE WELL ³ 55-56 ' D DOMESTIC ' 5 COMMERCIAL 2 STOCK 6 MUNICIPAL
WATER 3 IRRIGATION 7 PUBLIC SUPPLY USE 0/ 4 INDUSTRIAL • COOLING OR AIR CONDITIONING
METHOD 2 PC ROTARY (CONVENTIONAL) 7 D IAMOND OF 2 CONVENTIONAL) 7 D IAMOND 0 F 3 D ROTARY (REVERSE) 6 0 JETTING
DRILLING S AIR PERCUSSION DRILLERS REMARKS
a Air- Rach Drilling C. ITD. 1119
RR# 2 Jasper OnT. B JUNE 13/28 DN MM
To Wallace Desaudriers 1119 5 OLDLOG HOUSE WITH
SIGNATURE OF CONTRACTOR WEINSION DATE WEWEXTERISION ALL AN NO VR22

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	20-23		ESH 3 []	SULPHUR ²⁴ Mineral	17-18	I 🗍 STEEL I GALVANIZ I CONCRETE	:		20-23	FROM		TO 14-17	MATERIAL AND TY	PE ^{A®} (CEI	PACKER, ETC.)	_
	25-28	2 🗌 SA	LTY 4		24-25	4 OPEN HOL 1 STEEL 2 GALVANIZ	26 E D		27-30		6-29	22-25				_
]	2 🗌 SA	LTY 4 []	SULPHUR MINERAL		CONCRETE OPEN HOL IN-14 DURATION C	.E	<u> </u>						· · · · · · · · · · · · · · · · · · ·		
				006	10	<u>срм</u> <u>2/</u>	15-16 00 HOURS DO	17-18 _ MINS		GRAM BEI	LOW SHO	W DISTANC	DF WELL	OM ROAD	AND	
TEST	STATIO	-	END OF PUMPING	4 15 MINUTE	1 30 MINU		RECOVERY	JTES 5-37	LOT L	ine in ge y	DICATE I	NORTH BY A	RROW.			
ING T	OTO IF FLOWING GIVE RATE	FEET	66, _{FEE} 31-		EET AT	FEET WATER AT	FEET ST	FEET 42	appl	itor	0	میر آنه د ۱۹۰۹ میر در ۱۹۰۰ م	ang dipanan Ang di			
PUMPING	1	ED PUMP TY		RECOMMEND PUMP		13-45 RECOMMEN PUMPING	EAR 2 CL	46-49					+ \$ 100.			
	50-53			SETTING		FEET RATE		GPM			-		·//			
	FINA STATU	JS、/	2 🗆 01	ATER SUPPLY SERVATION W	ELL] ABANDONED, F] ABANDONED, P] UNFINISHED		PPLY	51	LEDD	EN			L X I	10	
·	OF WE	55-56		CHARGE WELL	5 🗌 cc	OMMERCIAL UNICIPAL								R	12	
	WATE USE		3. □ : F 4 □ 'N	RIGATION	7 🗂 PL	IBLIC SUPPLY	ONDITIONING NOT USED									ļ
	METH	57	۱ 🗆 د	BLE TOOL		6 🗋 BORII 7 🗍 DIAM										
	OF	4	3 .	DTABY (CONVE TARY (REVER: DTARY (AIR) R PERCUSSION	5E)	9 🗌 DIAM B 💭 JETTI 9 🗌 DRIVI	NG		DRILLERS REMAR	KS					- L	
	5	WELL CON		vill D			LICENCE NUMBE		DATA		CONTRACT	OR 59-6	2 DATE 2 EIV 2)77	63-68	80
TRAGTOR		ende tt 7	io U	Br.	Al.		10/		DATE OF INSPI	ECTION	78	INSPECTOR	h Dr			1
NTRA	NAME OF			ter?	Jeno		LICENCE NUMB	R ,		. 70	50	469	38		o. ATER	
CON	SIGNATU	E OF CON	are	neles	2	SUBMISSION DAT		(R. <u>77</u>		دد ه		,	C	8.58 -	100"	
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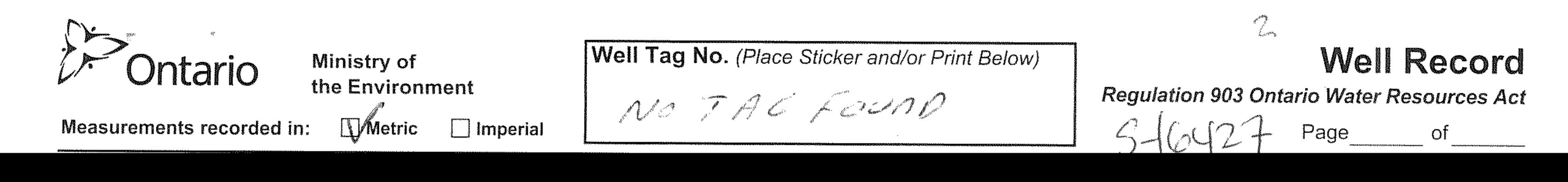
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Ministry of the	WAT	The Ontario V	Vater Resources	ECORD
Ontario Environment		3505550	350/2	CON 11/0
COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON. 1	BLOCK, TRACT, SURVEY, ETC.	00 3 ²⁵⁻²⁷
	7. R. 3	ALMOUTE	DAT DA	E COMPLETED 48-53
			BASIN CODE	
	OG OF OVERBURDEN AND BEDRO			DEPTH - FEET
GENERAL COLOUR COMMON MATERIAL	OTHER MATERIALS	GENERA Fine	L DESCRIPTION	FROM TO
Brown Sand Brown Shail		Iyard		7 68
	and a construction of the			
(3) 990,2608 1 006	 	<u> </u>		
41 WATER RECORD				DIAMETER 34-38 LENGTH 39-40 INCHES FEET
AT - FEET AILD OF WALK 0052 10-13 ' FRESH 3 SULPHUR 14 2 SALTY 4 MINERAL	10-11 1 5TEEL 12	RUM TO MATER	HAL AND TYPE	DEPTH TO TOP 41-44 30 OF SCREEN . FEET
15-16 1 FRESH 3 [] SULPHUR ¹⁹ 2 [] SALTY ⁴ [] MINERAL	06 2 GALVANIZED 3 CONCRETE 4 OPEN HOLE 188 C			SEALING RECORD
20-23 1 _ FRESH 3 _ SULPHUR 24 2 _ SALTY 4 _ MINERAL	17-18 I _ STEEL 19 2 _ GALVANIZED 3 _ CONCRETE	20-23 DEPTH 5 FROM	TO	IAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC)
25-28 1 _ FRESH 3 _ SULPHUR 29 2 _ SALTY 4 _ MINERAL	4 _ OPEN HOLE 24-25 1 _ STEEL 26 2 _ GALVANIZED	27-30 18-	21 22-25	
30-33 I _ FRESH 3 _ SULPHUR 34 40 2 _ SALTY 4 _ MINERAL	3 CONCRETE 4 OPEN HOLE	26-1	30-33 80	
71 PUMPING TEST METHOD 10 PUMPING RATE	е 11-14 DURATION OF PUMPING 15-16 50 17-18 GPM 02 HOURS 6 17-18 HINS		OCATION OF V	
STATIC LEVEL WATER LEVEL PUMPING 19-21 22-24 IS MINUTES 26-2	Image: 1 PUMPING Image: 2 Image: 2 Image: 30 minutes 45 minutes	LOT LINE IND	W SHOW DISTANCES OF ICATE NORTH BY ARROW	WELL FROM ROAD AND
$rac{1}{2}$ $rac{$	18 29-31 32-34 35-37 Et feet feet feet	K NOLZIAN	Э.	MONTE North
GIVE RATE	FEET 1 H CLEAR 2 CLOUDY	NOL 3TO		19 S
RECOMMENDED PUMP TYPE RECOMMENDED PUMP TYPE PUMP SETTING	PUMPING	R	3	7
FINAL * WATER SUPPLY	5 🗌 ABANDONED, INSUFFICIENT SUPPLY		Xex	<u> </u>
STATUS OF WELL / 4 C RECHARGE WELL	LL 6 🗋 ABANDONED POOR QUALITY 7 🗍 UNFINISHED	H	M IM	ie /
SS-S6 I Ø DOMESTIC 2 □ STOCK 3 □ IRRIGATION	5 COMMERCIAL 6 MUNICIPAL 7 D PUBLIC SUPPLY			
	COOLING OR AIR CONDITIONING			
57 1 CABLE TOOL 2 ROTARY (CONVENT				
DRILLING	E) 4 D JETTING 9 DRIVING	DRILLERS REMARKS		
NAME OF WELL CONTRACTOR	ERON LICENCE NUMBER		DNTRACTOR 59-62 DATE	""."
ADDRESS ADDRESS R. R. 2 C. L. A.	TTON TSGT	DATE OF INSPECTION	INSPECTOR	<u> </u>
A AME OF DRILLER OR BORER		B REMARKS W 70		C.b-
SIGNATURE OF CONTRACTOR	SUBMISSION DATE			CER1484 (
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COUNTY OF DISTRICT		SHIP, BOROUGH CITY, TOWN VILLAGE		CON . BLOC	K TRACT, SURVE	τ <u>τ</u> 7 <u>Χ</u>		22 23 74 OT 25-27
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		103299	6/2/					<u> </u>
	LOG OF (OVERBURDEN AND BEDRO	OCK MATERIA	LS ISEE INSTRI	UCTIONS)			
GENERAL COLOUR	MOST COMMON NATERIAL	OTHER MATERIALS		GENERAL DE	SCRIPTION		DEPTH -	FEET TO
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10-13	D OF WATER DIAM SH 3 D SULPHUR 18 10-11	MATERIAL THICKNESS FR	DEPTH - FEET ROM TO 13-16		ND TYPE		INCHES DEPTH TO TOP DF SCREEN	FEET 41-44 30
15-18 1 _ FRES	14 4 MINERAL	2 GALVANIZED		[[61]	PLUGGING	& SEALL		
20-23 1 G FRES	SH 3 _ SULPHUR 24	4 I OPEN HOLE 1 I STEEL 1 GALVANIZED	0/00/20	DEPTH SET AT	FEET	ATERIAL AND 1		r grout
25-28 1 🗍 FRES	IY 4 WINERAL SH 3 JULPHUR 29	3 CONCRETE 4 OPEN HOLE 1 STEEL 26	27-30	10-13	14-17			
30-33 I 🗍 FRES	Y 4 MINERAL 24-25 SH 3 3 34 80 Y 4 MINERAL 24 24	2 GALVANIZED 3 CONCRETE		26-29	30-33 80			
PUMPING TEST METHOD	10 PUMPING RATE	4 OPEN HOLE			ATION O	FWFIL	••••••••••••••••••••••••••••••••••••••	·
	BAILER 00 15 IR LEVEL 25 WATER LEVELS DURI			GRAM BELOW SH	OW DISTANCES	OF WELL F	ROM ROAD AN	D
	MPING 22-24 15 MINUTES 30 MINUT	Z 🗌 RECOVERY	LOT LI		NORTH BY ARI	1	j	
U DOG FEET D	15 FEET 04 SFEET 04 5 30-41 PUMP INTAKE SET AT	FEET. ET.	Plan	288	t Lov	8.	/	
U IF FLOWING, GIVE RATE RECOMMENDED PUMP TYPE		FEET 1 DECLEAR 2 CLOUDY 3-45 RECOMMENDED 46-49				11		1
SI SHALLOW C	DEEP SETTING 0.50	FEET RATE 0015 GPM)			
		ABANDONED, INSUFFICIENT SUPPLY ABANDONED POOR QUALITY		1.1.11:	St.	Ap	atten	
OF WELL		UNFINISHED			Ca' >	il-		
2	с⊡́ sтоск ≰⊡ м∪			60'	- 08-			
		BLIC SUPPLY DLING OR AIR CONDITIONING 9 🔲 NOT: USED		Ý				
	CABLE TOOL CABLE TOOL CABLE TOOL	BORING DIAMOND Total		_			I	
OF 2, DRILLING	📋 ROTARY (REVERSE) 🔲 ROTARY (AIR)	DIAMOND DALE				I		
NAME OF WELL CONTRA		LICENCE NUMBER	DRILLERS REMARKS	S CONTRAC	TOR 59-62 D	ALE RECEIVED	· · · · · · · · · · · · · · · · · · ·	\$3-68 80
HIC-RO RRH 1	cl Drilling (o Ltd 1119	DATE OF INSPEC			<u>U6 (</u>	38	5
	JORER Jasper C	Licence NUMBER			3	· · · ·	•	
NAME OF DUILLER OF B	e Desaul	NIERS 1119	OFFICE			C	ss P	s
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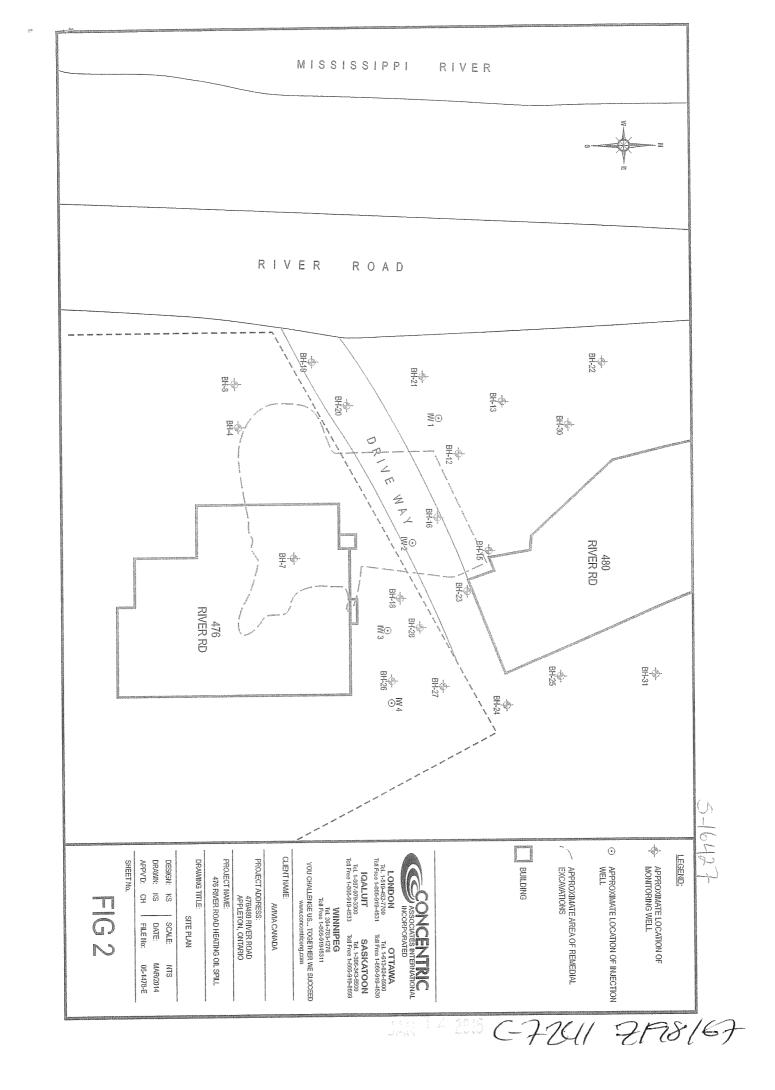
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Ontario Env	ironment 1. print only in s		35072	53	135012	ir.»N	, 1,0
COUNTY OR DISTRICT	2. CHECK 🛛 CORRE	TOWNSHIP, BOROUGH. CITY. TOWN. VILLAGE	/ 00-00- <u></u>	CON., BI	OCK, TRACT. SURVEY. E	ITC.	22 23 74 LOT 25-27
LAN OWNER (SURNAME FIR	<u>AKK</u>	RAMSAY ADDRESS		10		DATE COMPLETED	3 A
HALLI	DAY HOME	ES V.O. BOX 340		ETON	PLACE ASIN CODE	дау мо	VR. 8
21		1 10 24 25	26	30	31		
	LO	G OF OVERBURDEN AND BEDRO	CK MATERIA		DESCRIPTION	· · · · · · · · · · · · · · · · · · ·	TH - FEET
GENERAL COLOUR		GRAVEL STON	k 'd			FROM	10
BROWN GREY	SAND LIMESTONE	UNIVER STOP	<u>vc</u>			10'	65'
					<u>.</u> ,		
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31 444		$\frac{1}{1} \cdot 1 \cdot$					
1 2 10		51 CASING & OPEN HOLE F	RECORD		OF OPENING 31- 0 ;	65 33 DIAMETER 34-38	75 80
WATER FOUND AT - FEET	KIND OF WATER	DIAM MATERIAL THICKNESS	DEPTH - FEET OM TO		AL AND TYPE	INCHES DEPTH TO TO OF SCREEN	
	FRESH 3 🗌 SULPHUR ¹⁴ 3 SALTY 4 🗌 MINERAL	614 2 GALVANIZED 1.88 C)' 20 ^{13.16}	Š			FEET
] FRESH ³ □ SULPHUR ¹⁹] SALTY ⁴ □ MINERAL	I CONCRETE	*' <u>65'</u>	61	TAT - FEET		
] FRESH ³ 🗌 SULPHUR ²⁴] SALTY ⁴ 🗋 MINERAL	Image: Street Image: Street Image: Street Image: Street Image: Street Image: Street Image: Street Image: Street		FROM 10-13	TO		PACKER, ETC.)
25-28 † [2 [] FRESH 3 🗌 SULPHUR ²⁹] SALTY 4 🗋 MINERAL	4 OPEN HOLE 24-25 1 STEEL 26 2 GALVANIZED	27-30	18-21	22-25		
] FRESH 3] SULPHUR ³⁴ ¹⁰] SALTY 4] MINERAL	3 CONCRETE 4 OPEN HOLE		26-29	30-35 80		
71 PUMPING TEST ME		11-14 DURATION OF PUMPING		LO	CATION OF	WELL	
STATIC	2 BAILER WATER LEVEL 25 END OF WATER LE	C GPNHOURSMINS PUMPING EVELS DURING 2 □ RECOVERY	IN DIA LOT L		SHOW DISTANCES (DF WELL FROM ROAD	AND
Г С Ш	26-28	30 MINUTES 45 MINUTES 60 MINUTES 29-31 32-34 33-37)
IF FLOWING. GIVE RATE	Т <u>40 FEET</u> 40 FEE 38-41 PUMP INTAKE S						
U F FLOWING. GIVE RATE		FEET 1 CLEAR 2 CLOUDY 43-45 RECOMMENDED 46-49 46-49				1.4 K	HEY
G. SHALLOV	DEEP SETTING	50 FEET RATE 7 GPM				<	
FINAL	54 1 WATER SUPPLY	\$ 🗍 ABANDONED, INSUFFICIENT SUPPLY			1.216'		
STATUS OF WELL	2 OBSERVATION WEL 3 TEST HOLE 4 RECHARGE WELL	L 6 ABANDONED, POOR QUALITY 7 UNFINISHED			∇		5
	3-56 I DOMESTIC	S COMMERCIAL			~		-
WATER USE	3 IRRIGATION 4 INDUSTRIAL	HUNICIPAL DUBLIC SUPPLY COOLING OR AIR CONDITIONING					No
		9 🔲 NOT USED	APPLETO	n		¥.	R
METHOD OF	CABLE TOOL CABLE TOOL CONVENT					1X)	T
DRILLING	4 C ROTARY (AIR) 5 AIR PERCUSSION	9 🗆 DRIVING	DRILLERS REMAR	KS		_	\
NAME OF WELL		LICENCE NUMBER		58 CON		3112	Q K *** "
		WELL DRULLING 3142	SOURCE	CTION	INSPECTOR	- - -	
NAME OF DRILL		LICENCE NUMBER					
NOO SIGNATUBE OF		UANAGH 3142 SUBMISSION DATE	OFFICE		WDE	CSS.	ES
MINISTRY O	magh	DAY 3 NO. 10 YR.83	0			h.	506-4-77 FORM 7
	F THE ENVIRONME						



Address of Well Loc	cation (Street Number/Name)	Township	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Lot	Concess	sion
480 2	iver Rd					
County/District/Mur	nicipality	City/Town/Villa	age į	F	rovince	Postal Code
		APPI	eton	(Ontario	
UTM Coordinates Z	one Easting Northi	ng Municipal Plar	ר and Sublot Number	C)ther	
NAD 8 3	1341164160	03300				
Overburden and E	Bedrock Materials/Abandonm	ent Sealing Record (see instruc	ctions on the back of this form)			
General Colour	Most Common Material	Other Materials	Gene	eral Description		Depth (<i>m/ft</i>) From To
·						

Annular Space	Results of We	II Yield Testing
Depth Set at (<i>m/ft</i>) From To Type of Sealant Used (<i>Material and Type</i>) (<i>m³/ft³</i>)	After test of well yield, water was:	Draw Down Recovery
(m³/ft³)	Clear and sand free	TimeWater LevelTimeWater Level(min)(m/ft)(min)(m/ft)
	If pumping discontinued, give reason:	Static
<u>. 11 1.22 1504641</u>		
1,22 AREA Grout Slurg		
	Pump intake set at (m/ft)	2
Method of Construction	Pumping rate (I/min / GPM)	3
Method of Construction Well Use Cable Tool Diamond Public Ommercial Not used		4
Rotary (Conventional)	Duration of pumping	~ T.
Rotary (Reverse) Driving Livestock Test Hole Monitoring Boring Digging Irrigation Cooling & Air Conditioning	hrs + min	5
□ Air percussion	Final water level end of pumping (m/ft)	10
Other, specify	If flowing give rate (I/min / GPM)	15
Construction Record - Casing Status of Well		20 20
Containcou, i inicyidoo, j inichieso	Recommended pump depth (m/ft)	
(cm/in) Concrete, Plastic, Steel) (cm/in) From To Explacement Well		25
3.45 1^{2} 356 \Box Recharge Well	Recommended pump rate (I/min / GPM)	30
Dewatering Well Deservation and/or	Moll production ///	40
Monitoring Hole	Well production (I/min / GPM)	50 50
Construction	Disinfected?	
Construction Descrit Construct	Yes	60
Outside	Map of Wel	
Diameter (<i>Cm/in</i>) (Plastic, Galvanized, Steel) Slot No. Depth (<i>m/ft</i>) (Water Quality <i>(cm/in</i>) To To Abandoned, other,	Please provide a map below following in	structions on the back.
specify i		
$\frac{4.21}{100} \frac{100}{100} 1$		
		map
Water Details Hole Diameter		
Water found at Depth Kind of Water: Fresh Untested Depth (<i>m/ft</i>) Diameter	Kon the	29
$(m/ft) \ Gas \ Other, specify \ Water found at Depth Kind of Water: Fresh Untested O I, S \ Y, QI$		
(m/ft) Gas Other, specify		· · ·
Water found at Depth Kind of Water: Fresh Untested	$Q \downarrow f = 1 P$	
(m/ft) Gas Other, specify		
Well Contractor and Well Technician Information		
Business Name of Well Contractor's Licence No.		
Business Address (Street Number/Name), OCOUP Municipality	\sim	
165 shields crit Manchan	Comments:	
Province Postal Code Business E-mail Address		
	Well owner's Date Package Delivered	Ministry Use Only
Construction of the second frame of the second control (Last Name, First Name)	information package	Audit No.Z 198167
YOE Yoe <td>Date Work Completed</td> <td></td>	Date Work Completed	
5616646	INO ADI 4120	?
0506E (2007/12) © Queen's Printer for Ontario, 2007 Ministry's Copy		

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U UILAND the	istry of Environment	w Ta	g#:A1870 A187038	38t Below)	Regulation	n 903 Ontario	o Water Res	
	Metric V Imperial					P	°age	
Well Owner's Information First Name	Last Name / Organizati	on ,		E-mail Address			- Well	Constructed
Mailing Address (Street Number/		1	Municipality Carleton Place	Province ON	Postal Code	7P7	by W one No. (inc.	(ell Owner . area code)
Well Location				<u> </u>				
Address of Well Location (Street #116-#122 Old M	Number/Name)		Ramsay/Mis	eiseinni Mille	Lot P/L	A Conce	ession 10	
County/District/Municipality			City/Town/Village			Province	• • • • • • • • • • • • • • • • • • •	I Code
Lanark		anterana. Contector anterana	Appleton			Ontario		
UTM Coordinates Zone Easting	1380	1	Municipal Plan and Sublo Plan 288	ot Number	a e a Chailteannaiste	Other Lot 7		
NAD 8 3 14 41 Overburden and Bedrock Mat	the second from the second finites second range	e dales and a deal of		back of this form)		LOLI		
	ommon Material		ner Materials	1	eral Description		Der From	pth (<i>n</i>
	Sand	ees op op terte V	na politica de la construcción de l	gan da ann an thairte de teach de the se	an a	an an Anna an Air-	· · · · · 0 · ′	4.1
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Grey & Brown	Limestone	an an an an Anna an An An Anna an Anna	1997 - S.		en e	an a	65 '	711
· · · · · · · · · · · · · · · · · · ·								
* RP27R9884 TEST	Parts 1-1		RP26R5					78 X
Depth Set at (mft)	Annular Space Type of Sealant Used		Volume Placed	After test of well vield	Results of We water was:	ell Yield Tes		Recovery
From To	(Material and Type) t cement		(m³/@)	Clear and sand	free		r Level Time 1/ft) (min)	Water Level (m/ft)
			10.8	If pumping discontinu		Static	36:2"	37.5 %
				V I		Level	36.5 1	36.8
				Pump intake set at (mæ		36.7 2	36.5
				60		2	38.9 3	36.2
Method of Construction	n	Well Us	5e	Pumping rate (I/min / 20	(CEM)		17	36.2
Cable Tool Diam		Comme		Duration of pumping		4	~	36.2
Rotary (Reverse)	ng Livestock	Test Ho	le 🗌 Monitoring	1 hrs + 0				36.2
Boring Diggi	ing Irrigation		& Air Conditioning	Final water level end	or pumping (<i>ma</i>)	10	37.2 <u>10</u>	
Other, specify	Other, specify	,		If flowing give rate (h	/min / GPM)		37.5 ₁₅	36.2
Construction	n Record - Casing al Wall Dep	oth (<i>m/ft</i>)	Status of Well Water Supply	Recommended pum	ip depth (m@)		37.5 ₂₀	36.2
Diameter (Galvanized, Fibreglas (cm/in) Concrete, Plastic, Stee	s, Thickness el) <i>(cm/in)</i> From	То	Replacement Well	60 ′		20	37.5 25	36.2
61/4" Steel	.188″ +2′	201	Recharge Well	Recommended pum (I/min / SPM)	ip rate		37.5 ₃₀	36.2
6" Open Hole	201	71/	Dewatering Well Observation and/or	Well production (I/mi		40	37.5 ₄₀	36.2
			Monitoring Hole	20 +		50	37.5 ₅₀	36.2
			 (Construction) Abandoned, 	Disinfected?		60	37.5° 60	36.24
Constructio	n Record - Screen		Insufficient Supply		Map of W	ell Location		
Outside Material	. Slot No-	oth (<i>m/ft</i>)	Water Quality	Please provide a map	o below following	instructions or	i the back.	
(Plastic, Galvanized, Ste	From From	То	specify		A	witta) ~	QU	
			Other, specify	(TW#3)			20Z	
				F		Ť	#	
Water Water found at Depth Kind of W	Details		tole Diameter	1	Tw#1	Qa44	EIN	
65 (m Gas Other,		From	To (cm/in)				> JOE	
Water found at Depth Kind of W		ed	0' 20' 93'4"		Tec	31.00	TO	
(<i>m/ft</i>) Gas Other, Water found at Depth Kind of W		2	0 71 6"		10,0	KM	$\int \tilde{\Theta}$	
(m/ft) Gas Other,					¥.		-/ -	
Well Contra Business Name of Well Contracto	ictor and Well Technic	No. of Concession, Name	tion ell Contractor's Licence No.	APPL	E STRE	ET	(
Air Rock Drilling Co. L			1119				$\langle \rangle$	
Busi 0635 Aptrask Stort Hubba	·/仲积 异 1	Mi	meienthond	Comments: 1/2 HP - 10				
Province Postal Code ON KUA 2	Business E-mail A	ddress ock@symp	patico.ca	TEST	WEU-4	<u>E 0</u>	F <u>3</u> Winistry Us	e Only
Bus.Telephone No. (inc. area code)	Name of Well Technician Hanna, Jeren		First Name)	information	2015 0 6	Audit		1501
Well Technician's Licence No. Signa		e Trinne a la com	ite SUBMBEred OB 30	Date	Work Completed	22		
T 3632 K	myD) _Y	YYYMMDD	No ∨ ∨	V V MM		<u># 2 ;</u>	2015
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Measurements reco	the En	vironment	mperial	Ta	9#: A18704 A187040	10 t Below)	Regulation	903 O			ecord
Well Owner's In First Name		.ast Name / (Organization			E-mail Address					Constructed
		Ca	rigate C)evelop	ment Inc.		ar 1 1 1 g 1 11 1			by We	II Owner
Mailing Address (Sti Box 44	reet Number/Nar	ne)		neregos de televisión actividades de la composición de la composición de la composición de la composición de la actividades de la composición de la comp	^{1unicipality} Carleton Pla		Postal Code		elephone N	0. (inc.)	area code)
Well Location	ation (Otroot Nur	mbor/Nomo)			ownship		Lot		Concession		
Address of Well Loc #116-#12	2 Old Mill	Lane		entre sousce de la	Ramsay/Mis	sissippi Mills	PJL 4		10		
County/District/Mun	icipality			C	ity/Town/Village			Provinc Onta		Postal	Code
Lanark UTM Coordinates Z	one Easting	I NO	orthing	N	Appleton Iunicipal Plan and Suble	ot Number		Other			
NAD 8 3	18 4112	the second second second	50036		Plan 288			Lot	7		
Overburden and E General Colour		als/Abando non Material	nment Sea		rd (see instructions on the er Materials	1	eral Description			Depl From	th (<i>m</i>
		Sand		Back	GIL	and the second second		n en staar en e	an an the state of	0 1	12 1
Grey & Brow	" Magalaria	Lime	stone	des sole		L. Dr. Without	e estas april francisca da	National and the state	in en en e	12 /	39 (
Grey & Brow	'n	Lime	stone						and the second	39 /	60
Grey & Brow	n	Lime	stone	detromente de	· · ·		an an Spining an Annais	diana ang	a a construction and the second	60 ′	67'
*Rf27R TES	9884 T WE	lorts	1-10-	<i>8</i> *	126 R267 = 3	8 Brts 2	1,9,17,	18	9-38	¥	
		Annular			-	After test of well yield	Results of We		I Testing		ecovery
Depth Set at (neff From To	2	Type of Sea (Material an			Volume Placed	Clear and sand	free	Time	Water Level	Time	Water Level
21' 0'	Neat o	ement			10.9	Other, specify		Static	(m/ft) 19'	(min) 4 (1	(m/ft)
							ou, gire reacon.	Level	21.2	1	20.1
						Pump intake set at (mÆR)	2	21.4	2	19.8
						50	_	3	21.4	3	19.5
Method of (Construction			Well Us		Pumping rate (I/min / 20	(CELA)	4	21.5	4	19.4
Cable Tool	Diamono	I Pu		Comme		Duration of pumping			21.6	5	19.4
Rotary (Reverse)	Driving	automation in the second se	estock	Test Ho	le Monitoring & Air Conditioning	1 hrs + 0 Final water level end		5	21.0		19.4
Air percussion		🗌 🗌 Ind		C Coomig	ay in conditioning	221	1 1 01 1	10	21.0	10	19.4
Other, specify	Construction R				Status of Well	I If flowing give rate (//	/min / GPM)	15	22	15	19.4
Inside Open I	Hole OR Material	Wall		(n æ	Water Supply	Recommended pum	p depth (nD)	20	22	20	19.4
(cm Concre	nized, Fibreglass, ete, Plastic, Steel)	Thickness (cm/w)	From	То	Replacement Well Test Hole	50 Recommended pum	n rate	25		25	
61/4" Stee	2 1	.188″		21/	Recharge Well	Recommended pum (//min / CEAH) 20	F	30	22	30	19.4
6" Ope	n Hole		21/	67 /	Observation and/or Monitoring Hole	Well production (I/mi	n / 0RM)	40	22	40	19.4
					Alteration (Construction)	20+ Disinfected?		50	22	50	19.4
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0.00	Construction R	ecord - Scre	T	((r)	Abandoned, Poor	Please provide a mar	Map of W			ack	
Outside Diameter (cm/in) (Plastic,	Material Galvanized, Steel)	Slot No.	Depth From	(<i>m/ft</i>) To	Water Quality Abandoned, other, specify		Delow Ionowing				Q/1
			<u> </u>		Other, specify	-		\Box	way		102
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Mater found at Day	Water Del		N Marta at a d		th (<i>m/ft)</i> Diameter				1	\rightarrow	プレ
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(m(t)) G Water found at Dep	as Other, spe oth Kind of Wate		Untested	2	67 6"			M)		₩ _A
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Business Name of V	Well Contractor	or and Well	Technicia		tion Il Contractor's Licence No.	Λορ	LEST	-DE	785		70
Air Rock Dril	lling Co. Ltd.	deterbeter e ere			1119		LE D'		(1
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(day)	(month)	(year)			<u>v</u>
Pipe and Casing	Record		<u> </u>	Pumping Test	
Garing diameter (2) 5"	· · · · · · · · · · · · · · · · · · ·	I		751	
Length (s)		1	Static level	000 call	per hr.
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Well Log		[Water Record	·····
Overburden and Bedrock Record			at which water (s)		Kind of water (fresh, salty, or sulphur)
Sandy loam	D	10	60'	35'	fresh
	o be used?		 Lo	ocation of Well	 D
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ta		317	li east	GROUND W	ATER BRANCH
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Overburden and Bedrock Record			at which water (s)		Kind of water (fresh, salty, or sulphur)
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Is well on upland, in valley, or on hil	lside ?		road and lot line.	Indicate north	by arrow.
Drilling firm	-7 - 2: T			1	
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V	Vater-V	We	ll Record	d	
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County or Territorial District	<u></u>	Town	nship, Village, Town or	City	
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Pipe and Casing	Record		. <u>12 </u>	Pumping Test	
· · · · · · · · · · · · · · · · · · ·			1		
Casing diameter(s)			Static level		
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Land correction		51	95'	351	Jacob
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Marta S. C.				ation of Well	
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Is well on upland, in valley, or on hi			roud und tot mit.	indicate north	by allow.
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Drilling firm			/		
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	County or Territorial DistrictX	۲he Wa ت Nater	ater-well D Department	in Village, Town or Address	ontario v resources coi d c City. Ranz	MMISSION
	Pipe and Casing	Record			Pumping Test	<u> </u>
	Type of screen	> 		Static level	e ij gale p	24. X
	Well Log			Water Record		
	Overburden and Bedrock Record	From ft.	To ft.	Depth (s) at which water (s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
	sayd lozon	0	2'	581	281	break
-	shally blue	2	12-	,		<i>P</i>
	Raid brown		<u>~~~</u>			
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Fre		hillside?		In diagram belov	beation of Well v show distances of e. Indicate north Itor err(R) 60'=	by arrow.
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						189.98 199

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25 R 500131550 N								
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County or District Sanah		Township.	Village, Town or (City Rams	er			
		Dete com	pleted 4	Show	year)			
		dress	appleton	month	year)			
Casing and Screen Record			Pum	ping Test				
Inside diameter of casing 5 4		. Static lev	vel 29					
Total length of casing 9		. Test-pun	nping rate					
Type of screenX		Pumping level 45						
Length of screen			n of test pumping.	1hr.				
Depth to top of screen			lear or cloudy at en					
Diameter of finished hole.		Recomm	ended pumping ra pumping level of.	4 5	G.P.M.			
		with	pumping level of.					
Well Log			Wate	er Record				
	From	То	Depth(s) at which	No. of feet	Kind of water (fresh, salty,			
Overburden and Bedrock Record	ft.	ft.	water(s) found	water rises	sulphur)			
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For what purpose(s) is the water to be used?	÷ .		Locati	on of Well	D.C.			
House.		I	n diagram below	show distances o	of well from			
Is well on upland, in valley, or on hillside?		r	oad and lot line.	Indicate north	by arrow.			
Hillseli			6lon. CTY	RD2				
Drilling Firm W.U. Ma					$\searrow N$			
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Name of Driller Stewart W	oodo							
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W. V. Mugen	£	101						
(Signature of Licensed Drilling Contracto	r)		4	520 br	• •			
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Form 5 15M-58-4149		1	0	ł / · · ·				

317/1 east 182 41/16010 E NG 2° 35 501013171510 N The Ontario Water Resources Commission Act RECORD 0400 /illage, Town or City Mansa ANARK Township. or District 1966 Date completed 264 Con. VETO ress **Pumping Test Casing and Screen Record** Static levei 25' 64 Inside diameter of casing..... 65 G.P.M. J Test-pumping rate Total length of casing Pumping level Type of screen 30 min Duration of test pumping Length of screen Water clear or cloudy at end of test Depth to top of screen 5 G.P.M. Recommended pumping rate Ð Diameter of finished hole 65 feet below ground surface with pump setting of..... Water Record Well Log Kind of water Depth(s) at To ft. From (fresh, salty, sulphur) which water(s) Overburden and Bedrock Record ft. found loomed 7*0* mas Location of Well For what purpose(s) is the water to by used?... In diagram below show distances of well from Kouse road and lot line. Indicate north by arrow. Is well on upland, in valley, or on hillside? uplend Drilling or Boring Firm Wel M "Laughle. lton but Address 1637. Licence Number Name of Driller or Borer Mahulle M Langs tton Ont Address 1966 Date (Signature of Licensed Drifting or Boring Contractor) Form 7 15M-60-4138 CS2.58 OWRC COPY

w	The Ontario Water Reso	L RECORD	31Flik
Water management in Ontario FRINT ONLY IN SF 2. CHECK CORRECT Sounty DR DISTRICT	TOWNSHIP BOROUGH, CITY, TOWN, CILLAGE	3502471 3 9 MUNICIP. 3 5 0/2 Con. 3 5 0/2 Con. 10 10 11 15 CON., BLOCK, TRACT, SURVEY, ETC. 10 10 15 10 10 10 15 10 10 10 15 10 10 10 10 10 10 10	N1 1 22 23 2 LOT 25-27 X 800 MPLETED 48-53 69
LO	G OF OVERBURDEN AND BEDRO	DAY 2 ELEVATION ELEVATION 26 213 COL 315 26 COL 315 27 COL 315 COL 315	
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31) 600 3205 1 008	<u>a</u> 1.5 <u>1</u>		
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ADDRESS ADDRES	LICENCE NUMBER 3 33 9. LICENCE NUMBER 3 3 3 9.	DATE OF INSPECTION INSPECTOR IIIIISPECTOR REMARKS:	60969 - nA
SIGNATURE OF CONTRACTOR	ugle: DAY 30 MO Cing YR.69	OFFICE	

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Water management in Ont	^{tario} 1. Print only in Sf	PACES PROVIDED	11	135032			but 1	110
COUNTY OR DISTRICT		TOWNSHIP, BOROUGH, CIT		<u>h</u>	9	TACT, SURVEY, ETC.	· · · · · · · · · · · · · · · · · · ·	22 23 24 LOT 25-27
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71 PUMPING TEST METHOD		<u>,</u>] [,	LOCAT	ION OF W	ELL	<u> </u>
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a SHALLOW 5 0-53	DEEP SETTING		GPM.		+	<u>↓</u>]	*	
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Z NAME OF DIVILLER OF Z J ALL CC O SIGNATURE TE CONTR	r borer c Desage		ence NUMBER				-	P K.
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		s 10]	Dorland Cresc	ent. Ott	awa 6, Ont	1		YR. 7
		HING	3.2.9.3 4		RC. BASIN COL			vv ا
2	<u> </u>	.OG OF OVERBURD	EN AND BEDRO	CK MATERIAL	S (SEE INSTRUCT	ONS)		
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30-33 1	FRESH 3 [] SULPHUR 34 SALTY 4 [] MINERAL	2 🗌 GALVANI	re		26-29	30-33 80		
PUMPING TEST ME	ETHOD 10 PUMPING RA	TE 11-14 DURATION	OF PUMPING	l	LOCAT	ION OF W	ELL	
STATIC	2 DAILER 00		15-16 00 17-18 HOURS 00 MINS. 1 X PUMPING	IN DIA	GRAM BELOW SHOW NE. INDICATE NO	DISTANCES OF	ELL FROM COAD AI	ND
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50-53	54	· • • • • • • • • • • • • • • • • • • •	INCHEELCICHT CURTU					
FINAL STATUS	54 1 ₩ WATER SUPPLY, 2 □ OBSERVATION ₩ 3 □ TEST HOLE ↓		INSUFFICIENT SUPPLY POOR QUALITY		1	7	1,011	
FINAL STATUS OF WELL	54 1 ₩ WATER SUPPLY, 2 □ OBSERVATION ₩ 3 □ TEST HOLE ↓	ELL 6 ABANDONED		GR 119	9033	(min	J.1011	
FINAL STATUS OF WELL WATER	54 1 WATER SUPPLY, 2 OBSERVATION W 3 TEST HOLE / 4 RECHARGE WELL 55-56 1 DOMESTIC 2 STOCK *** 3 3 IRRIGATION IRRIGATION	ELL 6 C AEMONYED 7 UNFINISHED 5 C COMMERCIAL 6 MUNICIPAL 7 PUBLIC SUPPLY	POOR QUALITY	GR 115	9033	Spin	1,01	
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Anne of Well CONTRACTOR	Dulle 4767	J DATA 58 SOURCE	CONTRACTOR 59-62 DATE 4767	1711	8 7
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Ē	UMPING TEST METHOD 10 PUMPING RAT	5 GPM 0/ 15-10 17-18 HOURS 0 MINS		LOCATION OF W	
TECT	LEVEL PUMPING	LEVELS DURING 2 PUMPING. 2 RECOVERY 30 MINUTES 45 MINUTES 60 MINUTES 2 0 0 0 29-31 0 0 32-34	LOT LINE	INDICATE NORTH BY ARROW.	X
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	Henry Mains W	el Drilling 3644	DATE OF INSPECTION	SO CONTRACTOR 59 62 ATE	060583
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31 32) <u>[</u>]] <u>[</u>]				⊥┘└ ⊥┘└						
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COUNTY OR DISTRICT		TOWNSHIP, BOROUGH, CITY, TOWN, V	ILLAGE		CON. BLC	DCK. TRACT. SURVEY 10	ETC	L	от 25-27 З
				urt,Kanata	Ontario	K2T 381		_етер 4	•-53 у <u>к88</u>
		z rener							
		OG OF OVERBURDEN AND I	BEDRO	CK MATERIAI	30 3 LS (SEE INST	RUCTIONS)			47
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS			GENERAL	DESCRIPTION		DEPTH FROM	FEET TO
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Gray	Limestone				Soft			3	18
Gray	Limestone				Medium	Hard		18	99
31									
						DF OPENING	11-33 DIAME	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	75 80 ENGTH 39-40
WATER FOUND		51 CASING & OPEN		RECORD				INCHES	FEET
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30-33 1	□ SALIT 6 □ GAS □ FRESH 3 □ SULPHUR 34 8 4 □ MINERALS	1 - STEEL 2 - GALVANIZED 3 - CONCRETE 4 - OPEN HOLE			26-29	30-33 80	-		
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71 1 CPUMP STATIC	WATER LEVEL 25	30 GPM 15-16 	17-18 MINS		AGRAM BELOW	SHOW DISTANCES	OF WELL		N D
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	GPM	65 FEET 1 XCLEAR 1	CLOUDY				1.11		مستنا ۱
SHALLO	PUMP	80 FEET RATE	46-49 GPM		Chu	cch St			
50-53	\$4					Š			\searrow
FINAL STATUS	1 Gr WATER SUPPLY 2 OBSERVATION WE 3 TEST HOLE	B ABANDONED, INSUFFICIENT B ABANDONED POOR QUALITY T UNFINISHED				- Internet			,
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	ION 4 C ROTARY (REVERS 4 ROTARY (AIR) 4 AIR PERCUSSION	E) ▲ □ JETTING ♦ □ DRIVING □ DIGGING □ OTH	HER	DRILLERS REMAR		Dead	End	38:	391
NAME OF WEL	L CONTRACTOR	WELL CONTR		DATA			DATE RECEIVE		63-64 60
Capita ADDRESS P.O. I	al Water Supply			DATE OF INSI	PECTION	INSPECTOR	DEC	2 1 198	50
	BOX 490 Stitts	ville, Ontario KOA	NICIAN'S						
	11er DF TECHINICIAN/CONTRACTOR	SUBMISSION DATE		OFFICE			٢	CSS.	ES
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Ministry of the Environment	WAT		Water Resour	
Ontario		3509661	350,12	
2. CHECK (2) C	TOWNSHIP, BOROUGH, CITY TOWN, VILLAGE	COM	N. BLOCK. TRACT. SURVE	Y ETC LOT 25-27
	STI	Heville C	Brit	DATE COMPLETED 44-53 DAY 25 NO 4 YR 20
	G RC.	ELEVATION RC.	BASIN CODE	
MOST			ERAL DESCRIPTION	DEPTH - FEET
GENERAL COLOUR COMMON MATERIAL 9501/ /imes on	OTHER MATERIALS			FROM TO 138
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31 1 32 1			╎ <mark>└╷╷╷</mark> ╎╷╷╷	
41 WATER RECORD	51 CASING & OPEN HOLE I		54 ZE(S) OF OPENING SLOT NO)	65 75 80 31-33 DIAMETER 54-38 LENGTH 35-40 INCHES FEET
WATER FOUND AT - FEET 10-13 1 2 FRESH 3 SULPHUR 10-13 2 FRESH 3 USULPHUR 10-13 4 MINERALS	14 INSIDE MATERIAL THICKNESS FR		ATERIAL AND TYPE	DEPTH TO TOP 41-44 30 OF SCREEN FEET
15-10 1 CA FRESH 3 USULPHUR	19 / GALVANIZED 19 / GALVANIZED 19 / GALVANIZED 19 / GALVANIZED 10 CONCRETE 10 CONCRETE 10 CONCRETE	22 61		IG & SEALING RECORD
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30-33 1 FRESH 3 CSULPHUR 4 CMINERALS 2 SALTY 6 CGAS	S 4 OPPEN HOLE 5 OPLASTIC		26-29 30-33 80	
71 PUMPING TEST METHOD 10 PUMPIN 1 2 PUMP 2 BAILER 25	10 GPMHOURSMINS	IN DIAGRAM E	LOCATION	CES OF WELL FROM ROAD AND
STATIC WATER LEVEL WA LEVEL PUMPING WA	Image: Ater Levels During Image: Ater Levels During 2 □ Recovery Nutes 30 minutes 45 minutes 60 minutes 24-28 29-31 32-34 35-37	LOT LINE	INDICATE NORTH BY	ARROW.
19-21 22-24 15 MI B FEET 20 FEET 20 1F FLOWING. 38-41 FUNP 1	24-28 20-31 20 32-34 20 55-37 D FEET 20 FEET 20 FEET 11 FEET 12 FEET 42			0 11
	FEET 1 SCLEAR 2 CLOUDY			Snedden
C SHALLOW CLEEP				ur.
FINAL 2 DOBSENTATIO	ON WELL ABANDONED POOR QUALITY		*	ak.
STATUS , TEST HÖLE OF WELL 4 RECHARGE 55-56 1 & ODMESTIC			190	2Ki
WATER 2 STOCK 3 IRRIGATION USE 4 INDUSTRIAL	6 🗆 MUNICIPAL 7 🗇 PUBLIC SUPPLY			
	R 9 🗌 NOT USED			~~**
METHOD 2 CABLE TOO 2 ROTARY (C OF 3 ROTARY (R CONSTRUCTION 4 ROTARY (A	ONVENTIONAL) 7 DIAMOND EVERSE) 8 🗂 JETTING			48216
NAME OF WELL CONTRACTOR	SSION DIGGING OTHER	DRILLERS REMARKS	SE CONTRACTOR SA	2 DATE RECEIVED 63-66 80
	Drilling Galla 1119	DATE OF INSPECTION	1119	JAN 1 8 1991
ADDRESS ADDRES	asper On well rechnician's			
SIGNATURE OF MAINICIAN /CONTRA	CTOR SUBMISSION DATE	OFFICE		CSS.ES
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COUNTY		2. CHECK 🖾 CORRE	TOWNSHIP. BOROUGH						rt of		3
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	wil		G OF OVERBURD	EN AND BEDRO	DCK M	ATERIALS	30 3	RUCTIONS			*1
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50-		$\begin{array}{c c} 14 \\ \hline \\ RESH & 3 \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	10-11 1 STEEL 2 GALVANIZI	12 ED		13-16	<u>, </u>			OF SCREEN	FEET
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71	PUMPING TEST METHOD	BAILER	25- GPN _1	15-16 17-18 HOURS MIN				SHOW DISTAN			AND 1
_ ۲	STATIC W LEVEL 19-21	ATER LEVEL 25 END OF WATER I PUMPING 22-24 15 MINUTES	EVELS DURING	T PUMPING PUMPING RECOVERY		LOT LINE		ALE NORTH BY	ARROW.	25	AND AUVI ea
G TEST	7 FEET	2.4 FEET 7 FE	28 29-31 ET FEET	32-34 35-3 FEET FEE T END OF TEST 4	т						e° T
PUMPING	IF FLOWING. GIVE RATE	38-41 PUMP INTAKE GPM	FEET 1 🗙	CLEAR 2 CLOUDY					* /	/	high.
		TYPE RECONMENDE PUMP SETTING	D 43-45 RECOMMI PUMPING RATE						2. ve		vay
	50-53 FINAL	WATER SUPPLY		INSUFFICIENT SUPPLY					7		È.
	STATUS OF WELL	2 OBSERVATION WE 3 TEST HOLE 4 RECHARGE WELL	LL 6 ABANDONED 7 UNFINISHED Dewatering					Frank	PJI ICA	of oon	
	55-54		S COMMERCIAL				fer		M.	le	1217
	WATER USE	3 IRRIGATION 4 INDUSTRIAL 0 OTHER	7 🔲 PUBLIC SUPPLY 8 🗌 COOLING OR AIR 9 🗍								027
	METHOD	I CABLE TOOL	• 🗌 BOF				1 2				6
со	OF NSTRUCTION	2 C ROTARY (CONVEL 3 ROTARY (REVERS 4 ROTARY (AIR)	E) 8 🗍 JET 9 🗍 DRI	TING VING		,		'// `	men	09	98961
	NAME OF WELL CO	S AIR PERCUSSION		WELL CONTRACTOR		DATA	58 CG	ANTRACTOR 59-	62 DATE RECEIVE	D	63-64 80
стов	BOYD	CAME		LICENCE NUMBER	ONLY	SOURCE	ION		API	221	992
	RIP 2 NAME OF WELL		TON O	N7 WELL TECHNICIAN LICENCE NUMBER		REMARKS					
CONTRA	BOY I		ERON	70089. DATE	OFFICE				10	S F	S
	Boyd	OF THE ENVIR	ONMENT COPY	_ ho _3_ YR/C	<u>⊀</u> } [°				F	ORM NO. 050	06 (11/86) FORM 9

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County or District		Missis Address	Borough/City/Tov Ssippi Mi	-	nsay	Con block tract 10 Date comple	
21		136 W	Northing	R-R- RC	Elevation RC	Basin Code	B day 6 month 0
	LOG			24 25 DCK MATERIA	ALS (see instruct	31 tions)	
General colour	Most common material	·······	er materials		Genera	description	Depth – From
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oruy							6 7
		•					
31							
32 10 14 41 WAT	ER RECORD 51			5COPD	Sizes of a	65 nepring 31-33 Diam	
Water found at - feet	Kind of water	Material	Wall thickness	Depth - feet	Z (Slot No.)	pening ^{31–33} Diam	inches
59 ²	Fresh ³ Sulphur ¹⁴ Salty ⁴ Minerals ⁶ Gas 6 1 7	2 Concrete	•188	0 2	Z ⁶ O S Material a	nd type	Depth at top of scree
15-18 1	Tresh BSUISOphur 19 A □ Minerals Salty 6 □ Gas			20		PLUGGING & SE	ALING RECORD
2 🗌	Fresh ³ □ Sulphur ²⁴ 4 □ Minerals 1 <td>2 Galvanized 3 Concrete 8 F Open hole</td> <td></td> <td>22 75</td> <td>Depth set at -</td> <td></td> <td> Abandonment e (Cement grout, bentonite </td>	2 Galvanized 3 Concrete 8 F Open hole		22 75	Depth set at -		 Abandonment e (Cement grout, bentonite
2 🗋	Fresh 3 □ Sulphur 29 ✓ ▲/ Salty 4 □ Minerals 24-25 24-25				10-13	14-17	- Hole Plug
30–33 1 [] 2 []	Fresh ³ Sulphur ³⁴ ⁶⁰ ⁴ Minerals ⁵ Gas	 Galvanized Concrete Open hole Plastic 			26-29	30-33 80	
71 Pumping test me	thod ¹⁰ Pumping rate ¹¹⁻¹					ATION OF WELL	
Statia Javal Wa	Bailer 25 GPI ater level d of pumping 25 Water levels during 1		Recovery	In diag		distances of well from	n road and lot line.
	22-24 15 minutes 30 minutes 29-28 29-28	31 32-34	D minutes 35-37				
If flowing give rat Recommended p	e 38-41 Pump intake set at GPM feet	Water at end of test	3'10 ^{eet} 2 Cloudy	1.1	illiam S	treat	/ .
	ump type Recommended 43-4 pump setting	¹⁵ Recommended pump rate	46~49		16' dl	t	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
50-53	<u>× 55</u> ^{tee}	et	5 GPM	1	No	15'4	
FINAL STATUS Water supp Observation Test hole	ly 5 🗋 Abandoned, insufficien	t supply ^s □ Un1inishe ty ¹⁰ □ Replacen	d nent well]	ł	2
³ ∐ Test hole 4 ⊡ Recharge w	reli 8 🖸 Dewatering			I		· · ·	
VATER USE ¹ Domestic ² Stock	55-56 5 □ Commercial 6 □ Municipal	 9 Not used 10 Other 		I	House #13	5 '	
3 🔲 Irrigation 4 🗌 Industrial	 Public supply Cooling & air conditioni 						
METHOD OF CO	STRUCTION 57 5 🙀 Air percussion	9 🗋 Driving					
	eventional) 6 🗍 Boring erse) 7 ∏ Diamond	¹⁰ Digging ¹¹ Other					194862
Name of Well Contrac		Well Contractor's	Licence No.	Data	58 Contracctor	59-62 Date	received 63-66
	ater Supply Ltd.	1558		source	155	• A .	1111 0 9 1999
P.O. Box Name of Well Technic	490 Stittsville, O	Ntario K2S Well Technician's				•	
S. Miller Signature of Technicia		TOO97 Submission date					CSS.ES0
Signature of Technicia	in/Centractor	Submission date					

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Print only in spaces provided. Mark correct box with a checkmark, where applica	ble.	π 3513014	he Ontario Water Resources Ad WATER WELL RECORD
County or District	Township/Borough/City/	Town/Village	Con block tract survey, etc. Lot 3
	Address A >	plata Dut	Date completed day
	Northing []	RC Elevation RC	Basin Code ii iii iv
	F OVERBURDEN AND BEDF	ROCK MATERIALS (see instruct	
General colour Most common material	Other materials	Genera	al description Depth - feet From To
Ricy Jinestone			O 42
Ju Salsin			
		<u> </u>	
31	L		
41 WATER RECORD	CASING & OPEN HOLE	43 RECORD Depth - feet	65 75 40 of opening 31-33 Diameter 34-38 Length 39-40 o.)
Water found Kind of water Inside diam inches	Wall Material thickness inches	From To Materia	inches feet al and type Depth at top of screen 30
10-13 1 BP Fresh 3 Sulphur 14 2 Salty 6 Gas	1 P Steel 12 2 Galvanized	13-16	feet
15-18 1 D Flesh 3 D Sulphur 19	3 □ Concrete 4 □ Open hole 5 □ Plastic	0 22 <u>61</u>	PLUGGING & SEALING RECORD
20-23 1 Fresh 3 Sulphur 24	1 Steel 1 Galvanized	00.00	Annular space Abandonment at - feet
2 U Saity 6 Gas	3 □ Concrete 4 ⊉ Open hole 5 □ Plastic	0 Zo From	To Material and type (Cement grout, bentonite, etc.)
2 Salty 6 Gas	1 🖸 Steel 26 2 🗋 Galvanized	27-30 2 18-21	222 Conentscont
30-33 1 Fresh 3 Sulphur 34 60 2 Salty 6 Gas	 3 Concrete 4 Den hole 5 Plastic 	Zo 82 26-29	30-33 80
Pumping test method ¹⁰ Pumping rate () ¹¹⁻¹	4 Duration of pumping		
71 1 1 PP Pump 2 D Bailer 7 GPI	M Hours Mins	In diagram below sho	DCATION OF WELL ow distances of well from road and lot line.
	Pumping 2 Precovery 31 45 minutes 60 minutes 32-34 60 minutes	Indicate north by arro	ow.
19:21 22:24 15 minutes 30 minutes 19:21 22:24 15 minutes 30 minutes 18 feet 70 feet 18 16 feet 70 feet 18 17 feet 98:41 Pump intake set at 18 GPM feet 18			
If flowing give rate GPM GPM ft	Water at end of test 42 eet Clear SCloudy		76
Recommended pump type Recommended	45 Recommended 46.49 pump rate		
	GPM		
FINAL STATUS OF WELL. 54	t cumplu 9 🗆 Unfinished	io T	
2 ☐ Observation well 6 ☐ Abandoned, poor qualit 3 ☐ Test hole 7 ☐ Abandoned (Other)		EX	
4 Recharge well 8 Dewatering			N N
WATER USE 55-56 1 Domestic 5 Commercial 2 Stock 6 Municipal	9 🔲 Not use	.Utr	
3 □ Irrigation 7 □ Public supply 4 □ Industrial 8 □ Cooling & air condition			1 JH
1 □ Cable tool 5 ■ Air percussion 2 □ Rotary (conventional) 6 □ Boring	 ⁹ Driving ¹⁰ Digging 		
 3 □ Rotary (reverse) 4 □ Rotary (air) 7 □ Diamond 8 □ Jetting 	¹¹ Other		217011
Name of Well Contractor	Well Contractor's Licence No.	Data 58 Contractor	59-62 Date received 63-68 80
Air-Rock Drillinglat	F-1 3 1119	Source J	119 JUL 21 2000
Address RAHZ JASDED OF		L S	Inspector
Name of Well Technician	Well Technician's Licence No.	Remarks NHLSINIW	
Signature of Tachnician/Contractor	TZIZZ Submission date 00		CSS.ES0
Les a production	day mo yr		0506 (11/98) Front Form

2 - MINISTRY OF THE ENVIRONMENT COPY

-1-1

Print only in spac Mark correct box	Environment	able.	3513234	Municipality _ C	
County or District		Township/Borough/City/	/Town/Village	Con block tract sur	vey, etc. Lot
LANDO	F	Address	(7	10 //au Date	63 3
		R.R. 3 Northing	ALNIN T	Basin Code ii	day month
21			24 25 26 30	31	
·····		1	ROCK MATERIALS (see instruct		Depth - feet
General colour	Most common material	Other materials	\square	I description	From To
Diown	Jand J	(Jay	1911	ke d	<u> </u>
Diek PII	bines line		Layened	Hoose	6 17
Plack	Limes Time			lard	
35-80 2 15-18 1 2 20-23 1 2 20-23 2	Kind of water Inside diam inches I Fresh 3 Sulphur 14 1 Salty 6 Gas 1 Fresh 3 Sulphur 19 4 Minerals 6 9 Salty 6 9 Fresh 3 1 Salty 6 6 Gas 1 Fresh 3 Sulphur 14 Minerals 15 Salty 6 Gas 1 Fresh 3 Sulphur 24 Minerals 15 Gas 16 Gas	Material thickness	13-16 9 9 1 1 1 1 1 1 1 1	PLUGGING & SEALII	Inches Depth at top of screes 41-4 feet NG RECORD Abandonment (Cement grout, bentonite,
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1 Salty Gas Gas Fresh Sulphur Minerals Sulphur Pumping rate If Sulphur Sulphur Minerals Sulphur Sulphur Minerals Sulphur Minerals Sulphur Sulphur Minerals Sulphur Minerals Minerals Sulphur Minerals /ul>	3 1 Steel 26 2 Galvanized 3 Concrete 4 Open hole 5 Plastic 14 Duration of pumping 17.18 PM 2 Recovery 3-31 45 minutes 60 minutes 3-45 feet feet P Clear Cloudy 4-5 Recommended 46.49 pump rate GPM	In diagram below sho Indicate north by arro		n road and lot line.
2 30-33 1 2 30-33 1 2 2 2 2 2 30 2 2 30	1 Salty • ■ Minterans 24-25 1 Fresh 3 Sulphur 34 1 Fresh 3 Sulphur 34 1 Salty 6 Gas 60 ethod 10 Pumping rate 11 Bailer	3 1 Steel 26 2 Galvanized 3 Concrete 4 Open hole 5 Plastic 2M Juration of pumping 17.18 32.34 60 minutes 35.37 feet feet feet Water at end of test 42 GPM GPM 46.49 pump rate GPM feet GPM ity 10 Replacement well 9 Not use 10 10 Other 0	27-30	CATION OF WELL w distances of well from	22 4 7 n road and lot line No ^r 21777
2 2 30-33 1 2 2 30-33 1 2 2 71 Pumping test m 1 2 Static level W ISEL Y ff flowing give re Precommended pr Shallow FINAL STATUS Water sup Observatic Test hole Recharge WATER USE Domestic Stock Industrial METHOD OF C Cable tool Rotary (co	1 Salty • □ minorans 24-25 1 Fresh 3 Sulphur 34 1 Fresh 3 Sulphur 34 1 Salty 6 Gas 60 ethod 10 Pumping rate 11 Bailer // GF Gas 30 minutes // Ater level 25 Water levels during 30 minutes 22:24 15 minutes 30 minutes 26:23 30 minutes // Deep Pump intake set at GPM 10 90 // Deep Perpendent 6 Abandoned, insufficier 40 // Deep 5 Abandoned, poor qual 7 Abandoned (Other) // Deep 56:56 5 Commercial 6 // Abandoned (strippal) 7 Public supply 8 Cooling & air condition // Deenseitional) 6 Boring 6 Boring // Diamond 8 Jetting 4 Jetting	3 1 Steel 26 2 Galvanized 3 Concrete 4 Open hole 5 Plastic 5M Duration of pumping 17.18 2M John hole 77.18 2M Plastic Mins 1 Pumping 2 Ø Recovery 331 45 minutes 32.34 60 minutes 35.37 feet feet Ø feet Ø Clear Clear Cloudy 345 Recommended pump rate GPM ity 1° Replacement well 9 9 Not use 10 Other ning 9	27:30 18:21 26:29 LO In diagram below sho Indicate north by arro Indicate north by arro Indicate north by arro Data source Date of inspection	CATION OF WELL w distances of well from w.	22 4, 7 m road and lot line, No ^r , W W W W W W W W W W W W W W W W W W W
2 2 30-33 1 2 2 30-33 1 2 2 71 Pumping test m 1 2 Static level w 1521 9 1521 9 1521 1 1521 1 1521 1 1521 1 1521 1 1521 1 1521 1 1521 1 1521 1 1521 1 1521 1 1521 1 1521 1 1521 1 1521 1 1521 1 1533 1 FINAL STATUS 10 0 10 0 10 0 11 1 12 1 13 1 14 1 15 1 15	1 Salty • □ minorans 24-25 1 Fresh 3 □ Sulphur 34 1 Fresh 3 □ Sulphur 34 1 Salty 6 Gas 60 ethod 10 Pumping rate 11 □ Bailer // GF Gas 30 minutes rater level 22-24 15 minutes 30 minutes 22-24 15 minutes 30 minutes 25 ite 38-41 Pump intake set at 30 minutes gPM 9 Recommended 40 ump type Recommended 90 5 ite 38-41 Pump intake set at 30 gPM 5 Abandoned, insufficier 40 pump setting 5 5 6 Commercial in well 6 Abandoned, poor qual 7 Abandoned (Other) well 8 Deewatering 55-56 5 Cooling & air condition constructional 6 Boring 10 10 10 scooling & air condititor 5 Air pe	3 1 Steel 26 2 Galvanized 3 Concrete 4 Open hole 5 Plastic 14 Duration of pumping 12-18 2 Galvanized 12-16 2 Open hole 5 5 Plastic 12-16 2 Mins 12-18 2 Y Recovery 3-1 45 minutes 32-34 60 minutes 32-34 feet feet feet Water at end of test 42 feet Clear Cloudy 3-45 Recommended 46-49 pump rate GPM ity 10 Replacement well 9 Not use 10 10 Other	27:30 15:21 26:29 LO In diagram below sho Indicate north by arro Indicate north by arro Indicate north by arro Indicate north by arro Data source Date of inspection	CATION OF WELL w distances of well from w.	n road and lot line, No ^r , W No ^r , W

2 - MINISTRY OF THE ENVIRONMENT COPY

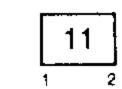


Ministry of the Environment

The Ontario Water Resources Act WATER WELL RECORD

Print only in spaces provided.

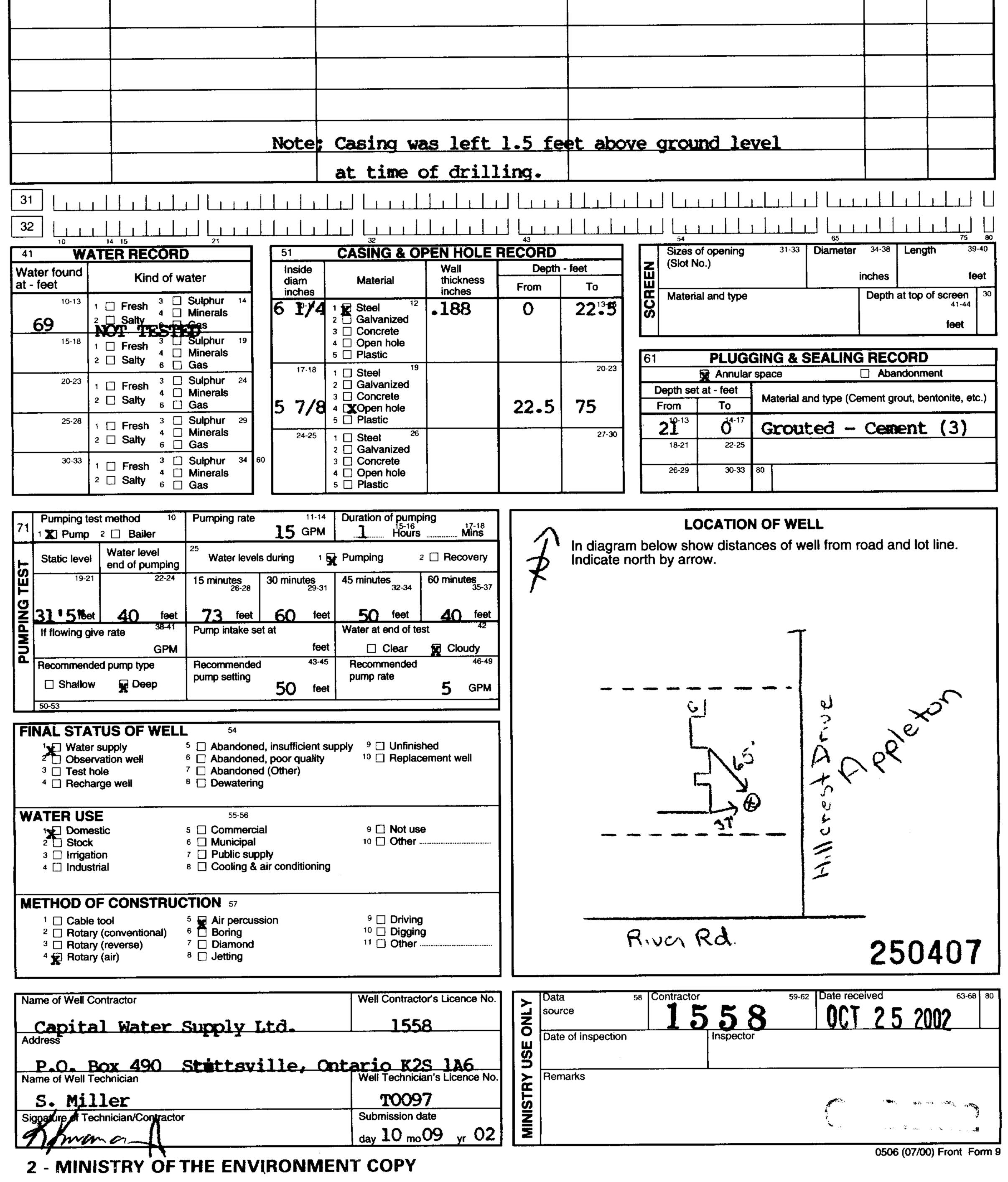
Mark correct box with a checkmark, where applicable.



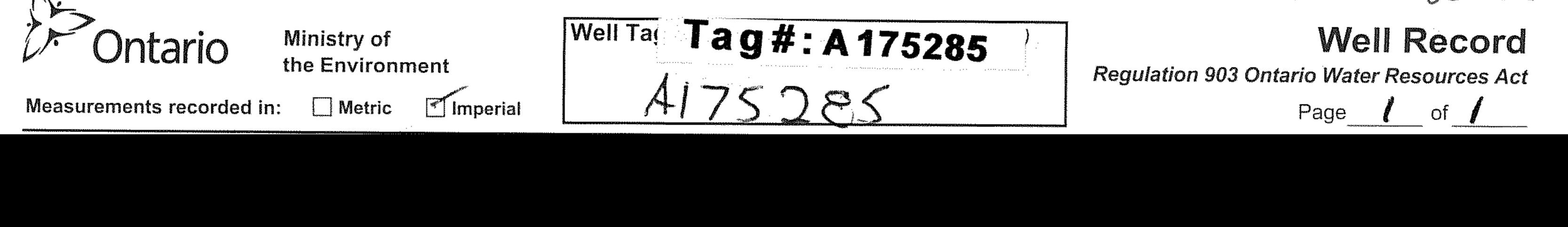
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County or District		Township/Borough/City/Town/Village)	Con block	tract survey, etc.	Lot 25-27
Lanark		Mississippi MIlls	- Ramsay	10		4
	·····	Address	ntario KOA 1AO		Date completed 10day	9 month Opear
21		Easting Northing	RC Elevation RC	Basin Code		iv 47
		OF OVERBURDEN AND BEDROCK MAT	ERIALS (see instructio	ns)		
General colour	Most common material	Other materials	General	description		Depth - feet
					Fro	
brown	Clay	Stones			() 16
Green	Shale				16	5 70
Gray	Limestone				7(75
 						
			· · · · · · · · · · · · · · · · · · ·			



(5 - 0700 - 0)



Address of Well Loc	ation (Street Number/Name)	Township	Lot	Concession
480 R	Rer Rd.	Ramsau		
County/District/Mun	icipality	City/Town/Village	Provinc	e Postal Code
Lana	irk	Appleton	Onta	rio
UTM Coordinates Zo		Appeton Municipal Plan and Suble	ot Number Other	
NAD 8 3	8411646500	3794		
Overburden and E	3edrock Materials/Abandonment	Sealing Record (see instructions on the	back of this form)	
General Colour	Most Common Material	Other Materials	General Description	Depth (<i>m/ft</i>) From To
Brn	C:1+	CCAL	10050	01 5

Grey		limeston	Sh	<u>ale</u>	Bedrock		5	22
Depth So From	et at (<i>m/ft</i>) To	Annular Space Type of Sealant I (Material and Type)	Jsed	Volume Placed	Results of Well yield, water was:	Draw Down		Recovery
0	20		-cv/	(m³/ft³)] 113	Pump intake set at (<i>m/ft</i>)	Time Water Le (min) (MA) Static Level 209 1 10.1	vel 1 ime (<i>min</i>) Y 1	
Metl	nod of Con	struction	Well Use] Pumping rate (<i>I/min_JGPM</i>)	3 12.45	3	12.5

1 ~ 13.55 Public Cable Tool Y, A Diamond Not used 4 Commercial 4 Duration of pumping Rotary (Conventional) **Z** Domestic Municipal Dewatering 15.52 9.01 5 5 min hrs + Rotary (Reverse) Driving Livestock Test Hole Monitoring Digging Boring Final water level end of pumping (m/ft) Irrigation Cooling & Air Conditioning 8.23 15.96 10 10 Air percussion Industrial 6 1 16.18 Other, specify Other, specify 8. 15 15 If flowing give rate (I/min / GPM) **Construction Record - Casing Status of Well** 8.17 16.19 20 20 Water Supply Inside Open Hole OR Material Depth (m/ft) Recommended pump depth (m/ft) Wall (Galvanized, Fibreglass, Diameter Thickness Replacement Well 16.23 25 25 φ_{1}, φ_{2} From То (cm/in) Concrete, Plastic, Steel) (cm/in) 60 Test Hole Recomprended pump rate er: ((14' 4) q20 30 Recharge Well 30 Steel 6.2 (I/min GPM) 0 10 Dewatering Well 8. 16.41 40 40 Observation and/or Well production (I/min //GPM) Monitoring Hole 8.09 16.53 50 50 Alteration Disinfected? (Construction) 60 60 there No Yes Abandoned, Insufficient Supply Map of Well Location **Construction Record - Screen** Abandoned, Poor Outside Please provide a map below following instructions on the back. Depth (*m/ft*) Water Quality Material Diameter Slot No. (Plastic, Galvanized, Steel) Abandoned, other, ODM From То (cm/in) specify Screen Ŋ 0 Other, *specify* 9

Water Details ,	Hole Diameter			
Nater found at Depth Kind of Water: Fresh Untested		iameter		IN TOME
(m)(ft) Gas Other, specify	From To	(cm/in)		
Vater found at Depth Kind of Water: Fresh Untested	01201	10" ·s		
(m/ft) Gas Other, specify	7M 77 /	~// ····		$\Phi / $
Vater found at Depth Kind of Water: Fresh Untested		N e		30 River RZ
(m/ft) Gas Other, specify		L Z		
Well Contractor and Well Technician	n Information			
usiness Name of Well Contractor Aardvark Drilling Inc.	Well Contractor's Lice	nce No.		
usiness Address (Street Number/Name) 25-C Lewis Road	Municipality Guelph	Comments:	·	
rovince Postal Code Business E-mail Add	ress			
on www.aarc	lvarkdrillinginc.con	Well owner's	Date Package Delivered	Ministry Use Only
us.Telephone No. (inc. area code) Name of Well Technician (L	ast Name, First Name)	package		Audit No.Z 199779
5198269340 Smith, K	-/~	delivered		LYYY((Y
/ell Technician's Licence No. Signature of Technician and/or Cor	ntractor Date Submitted	Yes	Date Work Completed	
3591 240.429	201511	$051 \square NO$	20151022	1 DEC 24 2015
506E (2007/12) © Queen's Printer for Ontario, 2007	Ministry's	Conv		
		and the second sec		

Appendix 3

- Certificates of Analysis for Water Samples (TW1 to TW3)
- Certificates of Analysis for Water Samples (Offsite Wells)

Certificate of Analysis



Client: Attention: PO#:	Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Jamie Blakely 15962		Report Number: Date Submitted: Date Reported: Project: COC #:	1513000 2015-07-09 2015-07-17 PH2723 52218
Invoice to:	Paterson Group	Page 1 of 5		

Dear Jamie Blakely:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL:

Shyla Monette Team Leader, Inorganics

All analysis is completed in Ottawa, Ontario (unless otherwise indicated).

Exova Ottawa is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on our CALA scope of accreditation. It can be found at http://www.cala.ca/scopes/2602.pdf.

Exova (Ottawa) is certified and accredited for specific parameters by OMAFRA, Ontario Ministry of Agriculture, Food and Rural Affairs (for farm soils). Licensed by Ontario MOE for specific tests in drinking water.

Exova (Mississauga) is accredited for specific parameters by SCC, Standards Council of Canada (to ISO 17025)

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Exova recommends consulting the official provincial or federal guideline as required.



Client:	Paterson Group 154 Colonnade Rd South Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	15962
Invoice to:	Paterson Group

Report Number:	1513000
Date Submitted:	2015-07-09
Date Reported:	2015-07-17
Project:	PH2723
COC #:	52218

Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1187383 Water 2015-07-09 TW1 WS1	1187384 Water 2015-07-09 TW1 WS2
Calculations	Hardness as CaCO3	1	mg/L	OG-100	383*	392*
	Ion Balance	0.01			1.02	1.02
	TDS (COND - CALC)	1	mg/L	AO-500	520*	530*
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500	329	343
	Cl	1	mg/L	AO-250	53	56
	Colour	2	TCU	AO-5	<2	<2
	Conductivity	5	uS/cm		800	815
	F	0.10	mg/L	MAC-1.5	0.39	0.32
	N-NO2	0.10	mg/L	MAC-1.0	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC-10.0	0.72	0.73
	рН	1.00		6.5-8.5	7.94	7.98
	SO4	1	mg/L	AO-500	40	36
	Turbidity	0.1	NTU	AO-5.0	2.7	0.2
Metals	Са	1	mg/L		94	96
	Fe	0.03	mg/L	AO-0.3	<0.03	<0.03
	K	1	mg/L		7	7
	Mg	1	mg/L		36	37
	Mn	0.01	mg/L	AO-0.05	<0.01	<0.01
	Na	2	mg/L	AO-200	31	32
Nutrients	Total Kjeldahl Nitrogen	0.1	mg/L		<0.1	<0.1
Phenols	Phenols	0.001	mg/L		<0.001	<0.001
Subcontract	DOC	0.5	mg/L	AO-5	75.4*	71.2*
	N-NH3	0.01	mg/L		0.02	0.02
	S2-	0.02	mg/L	AO-0.05	<0.02	<0.02
	Tannin & Lignin	0.1	mg/L		<0.1	<0.1

Guideline = ODWSOG

* = Guideline Exceedence

All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario). Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	15962
Invoice to:	Paterson Group

Report Number:	1513000
Date Submitted:	2015-07-09
Date Reported:	2015-07-17
Project:	PH2723
COC #:	52218

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 290173 Analysis/Extraction Date 20	015-07-10 Analyst K	_A	
Method EPA 200.8			
Iron	<0.03 mg/L	95	92-107
Manganese	<0.01 mg/L	100	94-106
Run No 290241 Analysis/Extraction Date 20	015-07-11 Analyst C	_F	
Method C SM2130B			
Turbidity	<0.1 NTU	99	73-127
Run No 290251 Analysis/Extraction Date 2015-07-11 Analyst SKH			
Method M SM3120B-3500C			
Calcium	<1 mg/L	102	90-110
Potassium	<1 mg/L	100	87-113
Magnesium	<1 mg/L	98	76-124
Sodium	<2 mg/L	109	82-118
Run No 290304 Analysis/Extraction Date 2015-07-13 Analyst NP			
Method C SM4500-NO3-F			
N-NO2	<0.10 mg/L	107	80-120
N-NO3	<0.10 mg/L	92	80-120
Run No 290342 Analysis/Extraction Date 2015-07-13 Analyst AET			

Guideline = ODWSOG

* = Guideline Exceedence

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Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	15962
Invoice to:	Paterson Group

Report Number:	1513000
Date Submitted:	2015-07-09
Date Reported:	2015-07-17
Project:	PH2723
COC #:	52218

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Method C SM4500-H+B			
Alkalinity (CaCO3)	<5 mg/L	104	90-110
Conductivity	<5 uS/cm	100	90-110
F	<0.10 mg/L	101	90-110
рН	6.03	100	90-110
Run No 290540 Analysis/Extraction Date 2015-07-16 Analyst AET			
Method C SM2120C			
Colour	<2 TCU	95	90-110
Run No 290567 Analysis/Extraction Date 20)15-07-15 Analyst N	Р	
Method SM 4110			
Chloride	<1 mg/L	100	90-110
SO4	<1 mg/L	103	90-110
Run No 290603 Analysis/Extraction Date 2015-07-14 Analyst AET			
Method SUBCONTRACT P-INORG			
DOC	<0.5 mg/L	99	
N-NH3	<0.01 mg/L	100	
Phenols	<0.001 mg/L	92	69-132
S2-	<0.02 mg/L	104	
Tannin & Lignin	<0.1 mg/L	90	

Guideline = ODWSOG

* = Guideline Exceedence

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

Certificate of Analysis



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	15962
Invoice to:	Paterson Group

Report Number:	1513000
Date Submitted:	2015-07-09
Date Reported:	2015-07-17
Project:	PH2723
COC #:	52218

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Total Kjeldahl Nitrogen	<0.1 mg/L	101	81-126

Guideline = ODWSOG

* = Guideline Exceedence

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

Certificate of Analysis



Client: Attention: PO#:	Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Jamie Blakely		Report Number: Date Submitted: Date Reported: Project: COC #:	1513010 2015-07-09 2015-07-11 PH2723 52218
Invoice to:	Paterson Group	Page 1 of 2		

Dear Jamie Blakely:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL:

Krista Quantrill Laboratory Supervisor, Microbiology

All analysis is completed in Ottawa, Ontario (unless otherwise indicated).

Exova Ottawa is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on our CALA scope of accreditation. It can be found at http://www.cala.ca/scopes/2602.pdf.

Exova (Ottawa) is certified and accredited for specific parameters by OMAFRA, Ontario Ministry of Agriculture, Food and Rural Affairs (for farm soils). Licensed by Ontario MOE for specific tests in drinking water.

Exova (Mississauga) is accredited for specific parameters by SCC, Standards Council of Canada (to ISO 17025)

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Certificate of Analysis



Paterson Group
154 Colonnade Rd South
Nepean, ON
K2E 7T7
Mr. Jamie Blakely
Paterson Group

Report Number:	1513010
Date Submitted:	2015-07-09
Date Reported:	2015-07-11
Project:	PH2723
COC #:	52218

Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1187401 Water 2015-07-09 TW1 WS1	1187402 Water 2015-07-09 TW1 WS2
Group	Analyte	WIRL	Units	Guideline		
Microbiology	Escherichia Coli	0	ct/100mL	MAC-0	0	0
	Total Coliforms	0	ct/100mL	MAC-0	0	0

Guideline = ODWSOG

* = Guideline Exceedence

All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario). Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

Certificate of Analysis



Client: Attention: PO#:	Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Jamie Blakely 15963		Report Number: Date Submitted: Date Reported: Project: COC #:	1513209 2015-07-13 2015-07-21 PH2723 52220
Invoice to:	Paterson Group	Page 1 of 5		

Dear Jamie Blakely:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL:

Shyla Monette Team Leader, Inorganics

All analysis is completed in Ottawa, Ontario (unless otherwise indicated).

Exova Ottawa is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on our CALA scope of accreditation. It can be found at http://www.cala.ca/scopes/2602.pdf.

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Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Exova recommends consulting the official provincial or federal guideline as required.



Client:	Paterson Group 154 Colonnade Rd South Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	15963
Invoice to:	Paterson Group

Report Number:	1513209
Date Submitted:	2015-07-13
Date Reported:	2015-07-21
Project:	PH2723
COC #:	52220

Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1187964 Water 2015-07-13 TW2 WS1	1187965 Water 2015-07-13 TW2 WS2
Calculations	Hardness as CaCO3	1	mg/L	OG-100	346*	348*
	Ion Balance	0.01			0.96	0.97
	TDS (COND - CALC)	1	mg/L	AO-500	449	460
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500	322	316
	Cl	1	mg/L	AO-250	30	34
	Colour	2	TCU	AO-5	11*	11*
	Conductivity	5	uS/cm		691	707
	F	0.10	mg/L	MAC-1.5	0.33	0.31
	N-NO2	0.10	mg/L	MAC-1.0	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC-10.0	0.16	0.23
	pH	1.00		6.5-8.5	7.98	7.91
	SO4	1	mg/L	AO-500	37	37
	Turbidity	0.1	NTU	AO-5.0	1.0	1.6
Metals	Са	1	mg/L		89	90
	Fe	0.03	mg/L	AO-0.3	0.18	0.16
	К	1	mg/L		3	3
	Mg	1	mg/L		30	30
	Mn	0.01	mg/L	AO-0.05	<0.01	<0.01
	Na	2	mg/L	AO-200	18	19
Nutrients	Total Kjeldahl Nitrogen	0.1	mg/L		0.2	0.1
Phenols	Phenols	0.001	mg/L		<0.001	<0.001
Subcontract	DOC	0.5	mg/L	AO-5	70.3*	73.0*
	N-NH3	0.01	mg/L		0.02	0.03
	S2-	0.02	mg/L	AO-0.05	<0.02	<0.02
	Tannin & Lignin	0.1	mg/L		<0.1	<0.1

Guideline = ODWSOG

* = Guideline Exceedence

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Certificate of Analysis



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	15963
Invoice to:	Paterson Group

1513209
2015-07-13
2015-07-21
PH2723
52220

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 290480 Analysis/Extraction Date 20	015-07-15 Analyst K	_A	
Method EPA 200.8			
Iron	<0.03 mg/L	99	92-107
Manganese	<0.01 mg/L	99	94-106
Run No 290496 Analysis/Extraction Date 20	015-07-15 Analyst A	ET	
Method C SM2130B			
Turbidity	<0.1 NTU	93	73-127
Run No 290517 Analysis/Extraction Date 2015-07-15 Analyst AET			
Method C SM4500-H+B			
Alkalinity (CaCO3)	<5 mg/L	102	90-110
Conductivity	<5 uS/cm	101	90-110
F	<0.10 mg/L	101	90-110
рН	6.11	100	90-110
Run No 290540 Analysis/Extraction Date 20	015-07-16 Analyst A	ET	
Method C SM2120C			
Colour	<2 TCU	95	90-110
Run No 290561 Analysis/Extraction Date 2015-07-16 Analyst SKH			
Method M SM3120B-3500C			

Guideline = ODWSOG

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Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	15963
Invoice to:	Paterson Group

Report Number:	1513209
Date Submitted:	2015-07-13
Date Reported:	2015-07-21
Project:	PH2723
COC #:	52220

QC Summary

Analyte	Blank	QC % Rec	QC Limits	
Calcium	<1 mg/L	102	90-110	
Potassium	<1 mg/L	104	87-113	
Magnesium	<1 mg/L	99	76-124	
Sodium	<2 mg/L	103	82-118	
Run No 290572 Analysis/Extraction Date 2015-07-16 Analyst K_A				
Method EPA 200.8				
Iron	<0.03 mg/L	94	92-107	
Manganese	<0.01 mg/L	97	94-106	
Run No 290653 Analysis/Extraction Date 2015-07-17 Analyst NP				
Method C SM4500-NO3-F				
N-NO2	<0.10 mg/L	93	80-120	
N-NO3	<0.10 mg/L	93	80-120	
Run No 290719 Analysis/Extraction Date 20	Run No 290719 Analysis/Extraction Date 2015-07-16 Analyst SCM			
Method SUBCONTRACT P-INORG				
N-NH3	<0.01 mg/L	100		
Run No 290720 Analysis/Extraction Date 2015-07-16 Analyst SCM				
Method SUBCONTRACT P-INORG				
DOC	<0.5 mg/L	105		
Run No 290721 Analysis/Extraction Date 20) 15-07-16 Analyst S	СМ		

Guideline = ODWSOG

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Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	15963
Invoice to:	Paterson Group

Report Number:	1513209
Date Submitted:	2015-07-13
Date Reported:	2015-07-21
Project:	PH2723
COC #:	52220

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Method SUBCONTRACT P-INORG			
Phenols	<0.001 mg/L	100	69-132
Run No 290723 Analysis/Extraction Date 20	015-07-20 Analyst S	СМ	
Method SUBCONTRACT P-INORG			
Tannin & Lignin	<0.1 mg/L	100	
Run No 290724 Analysis/Extraction Date 2015-07-17 Analyst SCM			
Method SUBCONTRACT P-INORG			
Total Kjeldahl Nitrogen	<0.1 mg/L	105	81-126
Run No 290758 Analysis/Extraction Date 2015-07-15 Analyst AET			
Method SUBCONTRACT P-INORG			
S2-	<0.02 mg/L	104	
Run No 290781 Analysis/Extraction Date 2015-07-20 Analyst NP			
Method SM 4110			
Chloride	<1 mg/L	103	90-110
SO4	<1 mg/L	106	90-110

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Certificate of Analysis



Client: Attention:	Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Jamie Blakely		Report Number: Date Submitted: Date Reported: Project: COC #:	1513208 2015-07-13 2015-07-14 PH2723 52220
PO#:	15963		000 #.	52220
Invoice to:	Paterson Group	Page 1 of 2		

Dear Jamie Blakely:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL:

Krista Quantrill Laboratory Supervisor, Microbiology

All analysis is completed in Ottawa, Ontario (unless otherwise indicated).

Exova Ottawa is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on our CALA scope of accreditation. It can be found at http://www.cala.ca/scopes/2602.pdf.

Exova (Ottawa) is certified and accredited for specific parameters by OMAFRA, Ontario Ministry of Agriculture, Food and Rural Affairs (for farm soils). Licensed by Ontario MOE for specific tests in drinking water.

Exova (Mississauga) is accredited for specific parameters by SCC, Standards Council of Canada (to ISO 17025)

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Exova recommends consulting the official provincial or federal guideline as required.

Certificate of Analysis



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	15963
Invoice to:	Paterson Group

Report Number:	1513208
Date Submitted:	2015-07-13
Date Reported:	2015-07-14
Project:	PH2723
COC #:	52220

Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1187962 Water 2015-07-13 TW2 WS1	1187963 Water 2015-07-13 TW2 WS2
Group	Analyte	WIKL	Units	Guideinie		
Microbiology	Escherichia Coli	0	ct/100mL	MAC-0	0	0
	Total Coliforms	0	ct/100mL	MAC-0	0	0

Guideline = ODWSOG

All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario). Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

Certificate of Analysis



Client: Attention: PO#:	Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Jamie Blakely 15964		Report Number: Date Submitted: Date Reported: Project: COC #:	1513146 2015-07-10 2015-07-20 PH2723 52219
Invoice to:	Paterson Group	Page 1 of 9		

Dear Jamie Blakely:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL:

Shyla Monette Team Leader, Inorganics

All analysis is completed in Ottawa, Ontario (unless otherwise indicated).

Exova Ottawa is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on our CALA scope of accreditation. It can be found at http://www.cala.ca/scopes/2602.pdf.

Exova (Ottawa) is certified and accredited for specific parameters by OMAFRA, Ontario Ministry of Agriculture, Food and Rural Affairs (for farm soils). Licensed by Ontario MOE for specific tests in drinking water.

Exova (Mississauga) is accredited for specific parameters by SCC, Standards Council of Canada (to ISO 17025)

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Exova recommends consulting the official provincial or federal guideline as required.

APPROVAL:

Tanya Baillargeon Team Lead, Organics



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	15964
Invoice to:	Paterson Group

Report Number:	1513146
Date Submitted:	2015-07-10
Date Reported:	2015-07-20
Project:	PH2723
COC #:	52219

Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1187819 Water 2015-07-10 TW3 WS1	1187820 Water 2015-07-10 TW3 WS2	1187821 Water 2015-07-10 TW3 WS2 - Paterson Package
Calculations	Hardness as CaCO3			OG-100	414*	419*	
	lon Balance	0.01	mg/L	06-100	1.04	1.02	
	TDS (COND - CALC)	1	mg/l	AO-500	565*	578*	
Cyanide	Cyanide (free)	0.005	mg/L mg/L	MAC-0.2	505	570	<0.005
General Chemistry	Alkalinity as CaCO3	0.005	mg/L	OG-500	358	369	-0.000
	Cl	1	•	AO-250	62	68	
	Colour	2	mg/L TCU	AO-250 AO-5	<2	<2	
		5		AU-5	869	889	
	Conductivity		uS/cm	105	2.3	2.1	
	DOC	0.5	mg/L	AO-5	0.43	0.43	
	F	0.10	mg/L	MAC-1.5			
	N-NO2	0.10	mg/L	MAC-1.0	<0.10	<0.10	
	N-NO3	0.10	mg/L	MAC-10.0	0.93	1.16	
	рН	1.00		6.5-8.5	7.70	7.76	
	SO4	1	mg/L	AO-500	36	35	
	Tannin & Lignin	0.1	mg/L		<0.1	<0.1	
	Turbidity	0.1	NTU	AO-5.0	0.2	0.2	
Mercury	Hg	0.0001	mg/L	MAC-0.001			<0.0001
Metals	Ag	0.0001	mg/L				<0.0001
	As	0.001	mg/L	IMAC-0.025			<0.001
	В	0.01	mg/L	IMAC-5.0			0.14
	Ва	0.01	mg/L	MAC-1.0			0.21
	Be	0.0005	mg/L				< 0.0005
	Са	1	mg/L		100	102	
	Cd	0.0001	mg/L	MAC-0.005			<0.0001
	Со	0.0002	mg/L				<0.0002
	Cr	0.001	mg/L	MAC-0.05			<0.001

Guideline = ODWSOG

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Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	15964
Invoice to:	Paterson Group

Report Number:	1513146
Date Submitted:	2015-07-10
Date Reported:	2015-07-20
Project:	PH2723
COC #:	52219

Crown	Angluás	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1187819 Water 2015-07-10 TW3 WS1	1187820 Water 2015-07-10 TW3 WS2	1187821 Water 2015-07-10 TW3 WS2 - Paterson Package
Group	Analyte						<0.001
Metals	Cu	0.001	mg/L	AO-1.0	< 0.03	<0.03	<0.001
	Fe	0.03	mg/L	AO-0.3			
	K	1	mg/L		7	7	
	Mg	1	mg/L	4.0.0.05	40	40	
	Mn	0.01	mg/L	AO-0.05	0.01	0.01	
	Мо	0.005	mg/L				<0.005
	Na	2	mg/L	AO-200	39	42	
	Ni	0.005	mg/L				<0.005
	Pb	0.001	mg/L	MAC-0.010			<0.001
	Sb	0.0005	mg/L	IMAC-0.006			<0.0005
	Se	0.001	mg/L	MAC-0.01			<0.001
	Sr	0.001	mg/L				2.40
	TI	0.0001	mg/L				<0.0001
	U	0.001	mg/L	MAC-0.02			0.002
	V	0.001	mg/L				<0.001
	Zn	0.01	mg/L	AO-5.0			<0.01
Nutrients	N-NH3	0.05	mg/L		<0.05	<0.05	
	Total Kjeldahl Nitrogen	0.07	mg/L		0.14	0.33	
Phenols-4AAP	Phenols	0.002	mg/L		<0.002	<0.002	
Sulphide	S2-	0.002	mg/L	AO-0.05	<0.002	<0.002	
VOCs	1,4-dichlorobenzene	0.4	ug/L	MAC-5			<0.4
	Benzene	0.5	ug/L	MAC-5			<0.5
	Dichloromethane	4.0	ug/L	MAC-50			<4.0
	Toluene	0.5	ug/L	AO-24			1.3
	Vinyl Chloride	0.2	ug/L	MAC-2			<0.2
OCs Surrogates (%	1,2-dichloroethane-d4	0	%				103

Guideline = ODWSOG

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Certificate of Analysis



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	15964
Invoice to:	Paterson Group

Report Number:	1513146
Date Submitted:	2015-07-10
Date Reported:	2015-07-20
Project:	PH2723
COC #:	52219

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1187819 Water 2015-07-10 TW3 WS1	1187820 Water 2015-07-10 TW3 WS2	1187821 Water 2015-07-10 TW3 WS2 - Paterson Package
Group	Analyte	MRL	Units	Guideline			
VOCs Surrogates	4-bromofluorobenzene	0	%				106
(%REC)	Toluene-d8	0	%				100

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Page 4 of 9



Paterson Group
154 Colonnade Rd South
Nepean, ON
K2E 7T7
Mr. Jamie Blakely
15964
Paterson Group

Report Number:	1513146
Date Submitted:	2015-07-10
Date Reported:	2015-07-20
Project:	PH2723
COC #:	52219

QC Summary

Analyte	Blank	QC % Rec	QC Limits	
Run No 290245 Analysis/Extraction Date 20)15-07-11 Analyst C	_F		
Method C SM2130B				
Turbidity	<0.1 NTU	99	73-127	
Run No 290251 Analysis/Extraction Date 20)15-07-11 Analyst S	КН		
Method M SM3120B-3500C				
Calcium	<1 mg/L	102	90-110	
Potassium	<1 mg/L	100	87-113	
Magnesium	<1 mg/L	98	76-124	
Sodium	<2 mg/L	109	82-118	
Run No 290315 Analysis/Extraction Date 2015-07-13 Analyst SCM				
Method M SM3112B-3500B				
Mercury	<0.0001 mg/L	100	76-123	
Run No 290318 Analysis/Extraction Date 2015-07-13 Analyst K_A				
Method EPA 200.8				
Iron	<0.03 mg/L	94	92-107	
Manganese	<0.01 mg/L	96	94-106	
Run No 290480 Analysis/Extraction Date 2015-07-15 Analyst K_A				
Method EPA 200.8				

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Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	15964
Invoice to:	Paterson Group

1513146
2015-07-10
2015-07-20
PH2723
52219

QC Summary

Analyte	Blank	QC % Rec	QC Limits	
Silver	<0.0001 mg/L	95	94-106	
Arsenic	<0.001 mg/L	96	93-106	
Barium	<0.01 mg/L	100	91-109	
Beryllium	<0.0005 mg/L	99	93-107	
Cadmium	<0.0001 mg/L	101	93-107	
Cobalt	<0.0002 mg/L	97	94-106	
Chromium Total	<0.001 mg/L	97	94-106	
Copper	<0.001 mg/L	96	93-106	
Molybdenum	<0.005 mg/L	98	94-106	
Nickel	<0.005 mg/L	97	94-106	
Lead	<0.001 mg/L	101	70-130	
Antimony	<0.0005 mg/L	96	80-120	
Selenium	<0.001 mg/L	101	91-108	
Strontium	<0.001 mg/L	101	89-110	
Thallium	<0.0001 mg/L	98	95-105	
Uranium	<0.001 mg/L	98	94-106	
Vanadium	<0.001 mg/L	96	93-107	
Run No 290503 Analysis/Extraction Date 2015-07-15 Analyst SCM				

Guideline = ODWSOG

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Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	15964
Invoice to:	Paterson Group

1513146
2015-07-10
2015-07-20
PH2723
52219

QC Summary

Analyte	Blank	QC % Rec	QC Limits	
Method C SM4500-CNC				
Cyanide (CN-)	<0.005 mg/L	103	75-125	
Run No 290517 Analysis/Extraction Date 20	15-07-15 Analyst A	ET		
Method C SM4500-H+B				
Alkalinity (CaCO3)	<5 mg/L	102	90-110	
Conductivity	<5 uS/cm	101	90-110	
F	<0.10 mg/L	101	90-110	
рН	6.11	100	90-110	
Run No 290540 Analysis/Extraction Date 20	15-07-16 Analyst A	ET		
Method C SM2120C				
Colour	<2 TCU	95	90-110	
Run No 290563 Analysis/Extraction Date 20	15-07-13 Analyst T.	JB		
Method V 8260B				
Dichlorobenzene, 1,4-	<0.4 ug/L	113	60-130	
Benzene	<0.5 ug/L	102	60-130	
Methylene Chloride	<4.0 ug/L	89	60-130	
Toluene	<0.5 ug/L	110	60-130	
Vinyl Chloride	<0.2 ug/L	83	60-130	
Run No 290567 Analysis/Extraction Date 2015-07-16 Analyst NP				

Guideline = ODWSOG

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	15964
Invoice to:	Paterson Group

Report Number:	1513146
Date Submitted:	2015-07-10
Date Reported:	2015-07-20
Project:	PH2723
COC #:	52219

QC Summary

Analyte	Blank	QC % Rec	QC Limits		
Method SM 4110					
Chloride	<1 mg/L	100	90-110		
SO4	<1 mg/L	103	90-110		
Run No 290572 Analysis/Extraction Date 20	15-07-16 Analyst K	A			
Method EPA 200.8					
Boron (total)	<0.01 mg/L	101	88-112		
Zinc	<0.01 mg/L	98	94-106		
Run No 290579 Analysis/Extraction Date 20	15-07-15 Analyst A	ET			
Method Exova Edmonton-SM4500-NH3-G					
N-NH3	<0.05 mg/L	102			
Run No 290582 Analysis/Extraction Date 2015-07-15 Analyst AET					
Method Exova Edmonton-ISO/TR 11905-2					
Total Kjeldahl Nitrogen	<0.07 mg/L	102			
Run No 290583 Analysis/Extraction Date 20	15-07-15 Analyst A	ET			
Method Exova Edmonton-SM5310B					
DOC	<0.5 mg/L	100			
Run No 290588 Analysis/Extraction Date 2015-07-15 Analyst AET					
Method Exova Edmonton-SM4500-S2 E					
S2-	<0.002 mg/L	99			

Guideline = ODWSOG

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Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	15964
Invoice to:	Paterson Group

Report Number:	1513146
Date Submitted:	2015-07-10
Date Reported:	2015-07-20
Project:	PH2723
COC #:	52219

QC Summary

Analyte	Blank	Blank QC % Rec			
Run No 290589 Analysis/Extraction Date 20)15-07-15 Analyst A	ET			
Method Exova Surrey-SM5550B					
Tannin & Lignin	<0.1 mg/L	106			
Run No 290591 Analysis/Extraction Date 2015-07-15 Analyst AET					
Method Exova Edmonton-SM5530D					
Phenols	<0.002 mg/L	100			
Run No 290653 Analysis/Extraction Date 2015-07-17 Analyst NP					
Method C SM4500-NO3-F					
N-NO2	<0.10 mg/L	93	80-120		
N-NO3	<0.10 mg/L	97	80-120		

Guideline = ODWSOG

* = Guideline Exceedence

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Certificate of Analysis



Client: Attention:	Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Jamie Blakely		Report Number: Date Submitted: Date Reported: Project: COC #:	1513145 2015-07-10 2015-07-13 PH2723 52219
PO#:	15964			02210
Invoice to:	Paterson Group	Page 1 of 2		

Dear Jamie Blakely:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL:

Krista Quantrill Laboratory Supervisor, Microbiology

All analysis is completed in Ottawa, Ontario (unless otherwise indicated).

Exova Ottawa is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on our CALA scope of accreditation. It can be found at http://www.cala.ca/scopes/2602.pdf.

Exova (Ottawa) is certified and accredited for specific parameters by OMAFRA, Ontario Ministry of Agriculture, Food and Rural Affairs (for farm soils). Licensed by Ontario MOE for specific tests in drinking water.

Exova (Mississauga) is accredited for specific parameters by SCC, Standards Council of Canada (to ISO 17025)

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Exova recommends consulting the official provincial or federal guideline as required.

Certificate of Analysis



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	15964
Invoice to:	Paterson Group

Report Number:	1513145
Date Submitted:	2015-07-10
Date Reported:	2015-07-13
Project:	PH2723
COC #:	52219

Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1187817 Water - 2015-07-10 TW3 WS1	1187818 Water - 2015-07-10 TW3 WS2
Microbiology	Escherichia Coli	0	ct/100mL	MAC-0	0	0
	Total Coliforms	0	ct/100mL	MAC-0	0	1*

Guideline = ODWSOG

All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario). Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

Certificate of Analysis



Client: Attention: PO#:	Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Jamie Blakely 18622		Report Number: Date Submitted: Date Reported: Project: COC #:	1517097 2015-08-28 2015-09-08 PH2723 58211
Invoice to:	Paterson Group	Page 1 of 6		

Dear Jamie Blakely:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL:

Shyla Monette Team Leader, Inorganics

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Client:	Paterson Group 154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	18622
Invoice to:	Paterson Group

Report Number:	1517097
Date Submitted:	2015-08-28
Date Reported:	2015-09-08
Project:	PH2723
COC #:	58211

Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1198478 Water 2015-08-28 RW WS1 119 Old Mill Lane	1198479 Water 2015-08-28 RW WS2 110 Apple Street
Calculations	Hardness as CaCO3	1	mg/L	OG-100	370*	430*
	Ion Balance	0.01			1.04	0.98
	TDS (COND - CALC)	1	mg/L	AO-500	506*	611*
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500	319	352
	Cl	1	mg/L	AO-250	50	84
	Colour	2	TCU	AO-5	18*	16*
	Conductivity	5	uS/cm		779	940
	F	0.10	mg/L	MAC-1.5	0.32	0.43
	N-NO2	0.10	mg/L	MAC-1.0	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC-10.0	<0.10	1.23
	рН	1.00		6.5-8.5	8.16	8.27
	SO4	1	mg/L	AO-500	38	39
	Turbidity	0.1	NTU	AO-5.0	0.6	0.1
Metals	Са	1	mg/L		92	98
	Fe	0.03	mg/L	AO-0.3	<0.03	<0.03
	K	1	mg/L		4	9
	Mg	1	mg/L		34	45
	Mn	0.01	mg/L	AO-0.05	<0.01	<0.01
	Na	2	mg/L	AO-200	33	30
Nutrients	Total Kjeldahl Nitrogen	0.1	mg/L		<0.1	<0.1
Phenols	Phenols	0.001	mg/L		<0.001	<0.001
Subcontract	DOC	0.5	mg/L	AO-5	63.9*	65.1*
	N-NH3	0.01	mg/L		0.02	0.02
	S2-	0.02	mg/L	AO-0.05	<0.02	<0.02
	Tannin & Lignin	0.1	mg/L		0.2	<0.1

Guideline = ODWSOG

* = Guideline Exceedence

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	18622
Invoice to:	Paterson Group

Report Number:	1517097
Date Submitted:	2015-08-28
Date Reported:	2015-09-08
Project:	PH2723
COC #:	58211

QC Summary

Analyte	Blank	QC % Rec	QC Limits	
Run No 293561 Analysis/Extraction Date 2	2015-08-31 Analyst A	ET		
Method C SM2130B				
Turbidity	<0.1 NTU	93	73-127	
Run No 293760 Analysis/Extraction Date 2015-09-01 Analyst K_A				
Method EPA 200.8				
Iron	<0.03 mg/L	97	92-107	
Manganese	<0.01 mg/L	98	94-106	
Run No 293762 Analysis/Extraction Date 2	2015-09-01 Analyst K	A		
Method M SM3120B-3500C				
Calcium	<1 mg/L	105	90-110	
Potassium	<1 mg/L	100	87-113	
Magnesium	<1 mg/L	100	76-124	
Sodium	<2 mg/L	85	82-118	
Run No 293798 Analysis/Extraction Date 2015-09-01 Analyst AET				
Method C SM4500-H+B				
Conductivity	<5 uS/cm	101	90-110	
Run No 293840 Analysis/Extraction Date 2015-09-02 Analyst AET				
Method C SM2120C				

Guideline = ODWSOG

* = Guideline Exceedence

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Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	18622
Invoice to:	Paterson Group

Report Number:	1517097
Date Submitted:	2015-08-28
Date Reported:	2015-09-08
Project:	PH2723
COC #:	58211

QC Summary

Analyte	Blank	QC % Rec	QC Limits	
Colour	<2 TCU	95	90-110	
Run No 293894 Analysis/Extraction Date 20	015-09-02 Analyst N	IP		
Method C SM4500-NO3-F				
N-NO2	<0.10 mg/L	110	80-120	
N-NO3	<0.10 mg/L	83	80-120	
Run No 293919 Analysis/Extraction Date 2015-09-02 Analyst AET				
Method C SM4500-H+B				
Alkalinity (CaCO3)	<5 mg/L	100	90-110	
F	<0.10 mg/L	98	90-110	
рН	5.89	100	90-110	
Run No 294103 Analysis/Extraction Date 20	015-09-01 Analyst S	CM		
Method SUBCONTRACT P-INORG				
N-NH3	<0.01 mg/L	102		
Run No 294105 Analysis/Extraction Date 2015-09-02 Analyst SCM				
Method SUBCONTRACT P-INORG				
DOC	<0.5 mg/L	107		
Run No 294108 Analysis/Extraction Date 2015-09-02 Analyst SCM				
Method SUBCONTRACT P-INORG				
Total Kjeldahl Nitrogen	<0.1 mg/L	102	81-126	

Guideline = ODWSOG

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Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	18622
Invoice to:	Paterson Group

Report Number:	1517097
Date Submitted:	2015-08-28
Date Reported:	2015-09-08
Project:	PH2723
COC #:	58211

QC Summary

Analyte	Blank	QC % Rec	QC Limits			
Run No 294110 Analysis/Extraction Date 20	15-09-01 Analyst S	СМ				
Method SUBCONTRACT P-INORG						
Phenols	<0.001 mg/L	89	69-132			
Run No 294111 Analysis/Extraction Date 20	15-09-02 Analyst S	СМ				
Method SUBCONTRACT P-INORG						
Tannin & Lignin	<0.1 mg/L	94				
Run No 294112 Analysis/Extraction Date 20	15-09-01 Analyst S	СМ				
Method SUBCONTRACT P-INORG						
S2-	<0.02 mg/L	105				
Run No 294146 Analysis/Extraction Date 2015-09-03 Analyst NP						
Method SM 4110						
Chloride	<1 mg/L	101	90-110			
SO4	<1 mg/L	106	90-110			
Run No 294166 Analysis/Extraction Date 20	15-09-08 Analyst S	СМ				
Method C SM2340B						
Hardness as CaCO3						
Run No 294167 Analysis/Extraction Date 20	15-09-08 Analyst S	СМ				
Method C lon Balance						
Ion Balance						

Guideline = ODWSOG

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Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	18622
Invoice to:	Paterson Group

Report Number:	1517097
Date Submitted:	2015-08-28
Date Reported:	2015-09-08
Project:	PH2723
COC #:	58211

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Method C SM2540		•	
TDS (COND - CALC)			
Run No 294168 Analysis/Extraction Date 20	015-09-08 Analyst S	SCM	
Method C SM2340B			
Hardness as CaCO3			
Run No 294169 Analysis/Extraction Date 20	015-09-08 Analyst S	SCM	
Method C Ion Balance			
Ion Balance			
Method C SM2540	-	-	
TDS (COND - CALC)			

Guideline = ODWSOG

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Certificate of Analysis



Client: Attention: PO#:	Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Jamie Blakely		Report Number: Date Submitted: Date Reported: Project: COC #:	1517089 2015-08-28 2015-08-31 PH2723 58211
Invoice to:	Paterson Group	Page 1 of 2		

Dear Jamie Blakely:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL:

Krista Quantrill Laboratory Supervisor, Microbiology

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Certificate of Analysis



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	
Invoice to:	Paterson Group

Report Number:	1517089
Date Submitted:	2015-08-28
Date Reported:	2015-08-31
Project:	PH2723
COC #:	58211

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1198465 Water 2015-08-28 RW WS1	1198466 Water 2015-08-28 RW WS2
Group	Analyte	MRL	Units	Guideline	119 Old Mill Lane	110 Apple Street
Microbiology	Escherichia Coli	0	ct/100mL	MAC-0	0	0
	Total Coliforms	0	ct/100mL	MAC-0	0	0

Guideline = ODWSOG

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Client: Paterson Group						Report Numbe	er:	2930580	
28 Concourse Gate, Unit 1						Date: Date Submitte	4.	2009-12-17 2009-12-15	
Nepean, ON						Date Submitte	u.	2003-12-13	
K2E 7T7 Attention: Ms. Stephanie Marriott						Project:		PE1114	
INVOICE: Paterson Group Inc.						P.O. Number:		Mator	
Chain of Custody Number: 108559	LABID	767000	1		1	Matrix:		Water GUIDELINE	·
	LAB IL Sample Date							GUIDELINE	
		·	·····						
	Sample ID	Lane WS1						ODWSOG	
PARAMETER	UNITS MRL					1	TYPE	LIMIT	
Total Coliforms	CFU/100mL	0					MAC	0	CFU/100mL
Escherichia Coli	CFU/100mL	0					MAC	0	CFU/100mL
Heterotrophic Plate Count	CFU/1mL	0							
Faecal Coliforms	CFU/100mL	0							
Faecal Streptococcus	CFU/100mL	0				1			
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MRL = Method Reporting Limit INC = Incomplete AO = Aesthetic Ob	lective OG = Operational Guideli	ne MAC = Maximur	n Allowable Conce	entration IMAC =	Interim Maximum	Allowable Concert	tration		

MRL = Method Reporting Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:

Dragana Dzeletovic Microbiology Analyst



Client: Paterson Group 28 Concourse Gate, Unit 1							Report Number Date:	r:	2930624 2009-12-23	
Nepean, ON							Date Submittee	d:	2009-12-15	
K2E 7T7							Project:			
Attention: Ms. Stephanle Marriott	ttention: Ms. Stephanie Marriott								PE1114	
NVOICE: Paterson Group Inc.							P.O. Number:		8478	
Chain of Custody Number: 108559			707111		r	1	Matrix:		Water	
	0	LAB ID:	767111						GUIDELINE	
		ple Date:	2009-12-15 104 Old Mill							
	5	ample ID:	Lane-WS1						ODWSOG	
PARAMETER	UNITS	MRL	070					TYPE OG	LIMIT 500	UNITS mg/L
Alkalinity as CaCO3	mg/L	5	279 19					AO	250	÷
Chloride	mg/L TCU	1 2	19					AO AO	250	mg/L TCU
Colour	uS/cm	2 5	4 641					AU	5	100
Conductivity		о 0.5	2.2					AO	5	mg/L
Dissolved Organic Carbon	mg/L	0.5	0.26					MAC	1.5	mg/L
	mg/L	0.01	<0.01					AO	0.05	mg/L
lydrogen Sulphide	mg/L mg/L	0.01	<0.01					AU	0.05	шуль
I-NH3 (Ammonia)	mg/L	0.02	<0.02					MAC	1.0	mg/L
I-NO2 (Nitrite)	mg/L	0.1	0.60					MAC	10.0	mg/L
J-NO3 (Nitrate) 9H	ing/c	0.1	7,86					MAO	6.5-8.5	тцус
Phenols	mg/L	0.001	<0.001						0.5-0.5	
	mg/L	1	39					AO	500	mg/L
	mg/L	0.1	<0.1					70	500	тığı
annin & Lignin	mg/L	5	417					AO	500	mg/L
otal Dissolved Solids (COND - CALC)	mg/L	0.1	<0.10					70	300	ing/c
otal Kjeldahl Nitrogen	NTU	0.1	0.2					MAC	1.0	NTU
urbidity Iardness as CaCO3	mg/L	1	322					OG	100	mg/L
naroness as CaCO3	mg/L	0.01	1.04							11191.7
Dalcium	mg/L	1	86							
Aagnesium	mg/L	1	26							
Potassium	mg/L	1	3							
odium	mg/L	2	17					AO	200	mg/L
on	mg/L	0.03	<0.03					AO	0.3	mg/L
Aanganese	mg/L	0.00	<0.00					AO	0.05	mg/L
										-

MRL = Method Reporting Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:

Ewan McRobbie Inorganic Lab Supervisor à



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Client: Paterson Group 28 Concourse Gate, Unit 1 Nepean, ON K2E 7T7 Attention: Ms. Stephanie Marriott					Report Numbe Date: Date Submitte Project:		1001900 2010-02-03 2010-02-01 PE1114	
INVOICE: Paterson Group Inc.					P.O. Number:		8489	
Chain of Custody Number: 108560					Matrix:		Water	
		LAB ID:	774157				GUIDELINE	
	Sam	ple Date:	2010-01-30					
		ample ID:	116 Old Mill Lane WS 1				ODWSOG	
PARAMETER	UNITS	MRL		 		TYPE	LIMIT	UNITS
Total Coliforms	CFU/100mL		0	 		MAC	0	CFU/100mL
Escherichia Coli	CFU/100mL		0			MAC	0	CFU/100mL
Heterotrophic Plate Count	CFU/1mL		0					
Faecal Coliforms	CFU/100mL		o					
Faecal Streptococcus	CFU/100mL		0					

MRL = Method Reporting Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:

Krista Quantrill Drinking Water Coordinator



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Client: Paterson Group 28 Concourse Gate, Unit 1 Nepean, ON K2E 7T7					Report Numbe Date: Date Submittee		1001909 2010-02-09 2010-02-01	
Attention: Ms. Stephanie Marriott					Project:		PE1114	
NVOICE: Paterson Group Inc.					P.O. Number:			
Chain of Custody Number: 108560				 	 Matrix:		Water	
		LAB ID:	774170		 		GUIDELINE	
		ple Date:	2010-01-30		 			
	S	ample ID:	116 Old Mill				ODWSOG	
			Lane WS 1					
PARAMETER	UNITS	MRL				TYPE	LIMIT	UNITS
Ikalinity as CaCO3	mg/L	5	339	 		OG	500	mg/L
hloride	mg/L	1	32			AO	250	mg/L
Colour	TCU	2	<2			AO	5	TCU
onductivity	uS/cm	5	749					
issolved Organic Carbon	mg/L	0.5	1.8			AO	5	mg/L
luoride	mg/L	0.1	0.31			MAC	1.5	mg/L
ydrogen Sulphide	mg/L	0.01	<0.01			AO	0.05	mg/L
-NH3 (Ammonia)	mg/L	0.02	<0.02					
-NO2 (Nitrite)	mg/L	0.1	<0.10			MAC	1.0	mg/L
I-NO3 (Nitrate)	mg/L	0.1	0.41			MAC	10.0	mg/L
н			7.70				6.5-8.5	
henols	mg/L	0.001	<0.001					
ulphate	mg/L	1	33			AO	500	mg/L
annin & Lignin	mg/L	0.1	<0.1					
otal Dissolved Solids (COND - CALC)	mg/L	5	487			AO	500	mg/L
otal Kjeldahl Nitrogen	mg/L	0.1	<0.10					
urbidity	NTU	0.1	0.3			MAC	1.0	NTU
lardness as CaCO3	mg/L	1	376			OG	100	mg/L
on Balance		0.01	1.01					
alcium	mg/L	1	98					ļ
lagnesium	mg/L	1	32					
otassium	mg/L	1	5				_	
odium	mg/L	2	20			AO	200	mg/L
on	mg/L	0.03	<0.03			AO	0.3	mg/L
langanese	mg/L	0.01	<0.01			AO	0.05	mg/L

MRL = Method Reporting Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:

Ewan McRobbie Inorganic Lab Supervisor



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Client: Paterson Group 28 Concourse Gate, Unit 1 Nepean, ON K2E 7T7					Report Number: Date: Date Submitted:		2931218 2009-12-30 2009-12-23	
Attention: Ms. Stephanie Marriott					Project:		PE1114	
INVOICE: Paterson Group Inc. Chain of Custody Number: 108988					P.O. Number: Matrix:		Water	•
		LAB ID:	768646				GUIDELINE	
		ole Date:	2009-12-23					
	Sa	mple ID:	124 Wilson St W				ODWSOG	
PARAMETER		MRL		 		ТҮРЕ	LIMIT	UNITS
Alkalinity as CaCO3	mg/L	5	339	 	 <u> </u>	OG	500	mg/L
Chloride	mg/L	1	177			AO	250	mg/L
Colour	TCU	2	3			AO	5	TCU
Conductivity	uS/cm	5	1280				-	
Fluoride	mg/L	0.1	0.32			MAC	1.5	mg/L
N-NO2 (Nitrite)	mg/L	0.1	<0.10			MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.1	5.30			MAC	10.0	mg/L
DH			7.67				6.5-8.5	÷
Sulphate	mg/L	1	40			AO	500	mg/L
Tannin & Lignin	mg/L	0.1	<0.1					-
Total Dissolved Solids (COND - CALC)	mg/L.	5	832			AO	500	mg/L
furbidity	NTU	0.1	0.1			MAC	1.0	NTU

MRL = Method Reporting Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:

Ewan McRobbie Inorganic Lab Supervisor



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Client: Attention: PO#:	Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Jamie Blakely	Date Submitted: 201	
Invoice to:	Paterson Group		

				Lab I.D. Sample Matrix Sample Type	1198465 Water	1198466 Water
				Sampling Date Sample I.D.	2015-08-28 RW WS1	2015-08-28 RW WS2
Group	Analyte	MRL	Units	Guideline	119 OLD MILLANE	110 APPLE ST.T.
Microbiology	Escherichia Coli	0	ct/100mL	MAC-0	0	0
	Total Coliforms	0	ct/100mL	MAC-0	0	0

 Guideline = ODWSOG
 * = Guideline Exceedence

 All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario).

 Results relate only to the parameters tested on the samples submitted.

 Methods references and/or additional QA/QC information available on request.



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Jamie Blakely
PO#:	18622
Invoice to:	Paterson Group

Report Number:	1517097
Date Submitted:	2015-08-28
Date Reported:	2015-09-08
Project:	PH2723
COC #:	58211

0	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1198478 Water 2015-08-28 RW WS1 119 OLD MILL CANE	1198479 Water 2015-08-28 RW WS2 No APPLE ST.
Group	Hardness as CaCO3			OG-100	370*	430*
Calculations	Ion Balance	0.01	mg/L	00-100	1.04	0.98
		1	mg/L	AO-500	506*	611*
	TDS (COND - CALC)	5	-	OG-500	319	352
eneral Chemistry	Alkalinity as CaCO3	_	mg/L	AO-250	50	84
	Cl	1	mg/L		18*	16*
	Colour	2	TCU	AO-5	779	940
	Conductivity	5	uS/cm	110.15		0.43
	F	0.10	mg/L	MAC-1.5	0.32	
	N-NO2	0.10	mg/L	MAC-1.0	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC-10.0	<0.10	1.23
	pH	1.00		6.5-8.5	8.16	8.27
	SO4	1	mg/L	AO-500	38	39
	Turbidity	0.1	NTU	AO-5.0	0.6	0.1
Metals	Ca	1	mg/L		92	98
	Fe	0.03	mg/L	AO-0.3	<0.03	<0.03
	K	1	mg/L		4	9
	Mg	1	mg/L		34	45
	Mn	0.01	mg/L	AO-0.05	<0.01	<0.01
	Na	2	mg/L	AO-200	33	30
Nutrients	Total Kjeldahl Nitrogen	0.1	mg/L		<0.1	<0.1
Phenols	Phenols	0.001	mg/L	· · · · · ·	<0.001	<0.001
Subcontract	DOC	0.5	mg/L	AO-5	63.9*	65.1*
	N-NH3	0.01	mg/L		0.02	0.02
		0.02	mg/L	AO-0.05	<0.02	<0.02
	Tannin & Lignin	0.1	mg/L		0.2	<0.1

Guideline = ODWSOG

* = Guideline Exceedence

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Certificate of Analysis



Client: Attention: PO#:	Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Russell Chown		Report Number: Date Submitted: Date Reported: Project: COC #:	1610507 2016-06-24 2016-07-04 PH2723 56555	
Invoice to:	Paterson Group	Page 1 of 14			

Dear Russell Chown:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL:

Nadine Pinsonneault Team Leader, Inorganics

All analysis is completed in Ottawa, Ontario (unless otherwise indicated).

Exova Ottawa is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on our CALA scope of accreditation. It can be found at http://www.cala.ca/scopes/2602.pdf.

Exova (Ottawa) is certified and accredited for specific parameters by OMAFRA, Ontario Ministry of Agriculture, Food and Rural Affairs (for farm soils). Licensed by Ontario MOE for specific tests in drinking water.

Exova (Mississauga) is accredited for specific parameters by SCC, Standards Council of Canada (to ISO 17025)

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Exova recommends consulting the official provincial or federal guideline as required.

APPROVAL:

Charlie (Long) Qu Laboratory Supervisor, Organics



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Russell Chown
PO#:	
Invoice to:	Paterson Group

Report Number:	1610507
Date Submitted:	2016-06-24
Date Reported:	2016-07-04
Project:	PH2723
COC #:	56555

Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1247167 Water 2016-06-23 TW1	1247168 Water 2016-06-23 TW3
Calculations	Hardness as CaCO3	1	mg/L	OG-100	394*	409*
	Ion Balance	0.01	-		0.98	1.01
	TDS (COND - CALC)	1	mg/L	AO-500	544*	621*
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500	358	439
	CI	1	mg/L	AO-250	60	57
	Colour	2	TCU	AO-5	<2	2
	Conductivity	5	uS/cm		837	955
	DOC	0.5	mg/L	AO-5	1.6	3.5
	F	0.10	mg/L	MAC-1.5	0.41	0.40
	N-NO2	0.10	mg/L	MAC-1.0	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC-10.0	1.36	0.48
	рН	1.00		6.5-8.5	8.19	8.04
	SO4	1	mg/L	AO-500	40	34
	Turbidity	0.1	NTU	AO-5.0	0.1	0.3
Mercury	Hg	0.0001	mg/L	MAC-0.001	<0.0001	<0.0001
Metals	Ag	0.0001	mg/L		<0.0001	<0.0001
	Al	0.01	mg/L	OG-0.1	<0.01	<0.01
	As	0.001	mg/L	IMAC-0.025	<0.001	<0.001
	В	0.01	mg/L	IMAC-5.0	0.15	0.15
	Ва	0.01	mg/L	MAC-1.0	0.22	0.24
	Be	0.0005	mg/L		<0.0005	<0.0005
	Са	1	mg/L		95	98
	Cd	0.0001	mg/L	MAC-0.005	<0.0001	<0.0001
	Cr	0.001	mg/L	MAC-0.05	<0.001	<0.001
	Cr(VI)	0.010	mg/L		<0.010	<0.010
	Cu	0.001	mg/L	AO-1.0	<0.001	<0.001

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Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Russell Chown
PO#:	
Invoice to:	Paterson Group

Report Number:	1610507
Date Submitted:	2016-06-24
Date Reported:	2016-07-04
Project:	PH2723
COC #:	56555

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1247167 Water 2016-06-23 TW1	1247168 Water 2016-06-23 TW3
Group	Analyte	MRL	Units	Guideline		
Metals	Fe	0.03	mg/L	AO-0.3	<0.03	<0.03
	К	1	mg/L		7	7
	Mg	1	mg/L		38	40
	Mn	0.01	mg/L	AO-0.05	<0.01	0.02
	Мо	0.005	mg/L		<0.005	< 0.005
	Na	2	mg/L	AO-200	36	66
	Ni	0.005	mg/L		<0.005	< 0.005
	Pb	0.001	mg/L	MAC-0.010	<0.001	<0.001
	Sb	0.0005	mg/L	IMAC-0.006	<0.0005	< 0.0005
	Se	0.001	mg/L	MAC-0.01	<0.001	<0.001
	Sr	0.001	mg/L		2.33	2.36
	TI	0.0001	mg/L		<0.0001	<0.0001
	U	0.001	mg/L	MAC-0.02	0.003	0.003
	Zn	0.01	mg/L	AO-5.0	<0.01	<0.01
Nutrients	Total Kjeldahl Nitrogen	0.1	mg/L		0.2	0.3
Others	Alpha-androstrane	0	%		108	120
	F1 (C6-C10)	20	ug/L		<20	<20
	F2 (C10-C16)	20	ug/L		<20	<20
	F3 (C16-C34)	50	ug/L		<50	<50
	F4 (C34-C50)	50	ug/L		<50	<50
Phenols	Phenols	0.001	mg/L		<0.001	<0.001
Semi-Volatiles	1-methylnaphthalene	0.1	ug/L		<0.1	<0.1
	2-methylnaphthalene	0.1	ug/L		<0.1	<0.1
	Acenaphthene	0.1	ug/L		<0.1	<0.1
	Acenaphthylene	0.1	ug/L		<0.1	<0.1
	Anthracene	0.1	ug/L		<0.1	<0.1

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Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Russell Chown
PO#:	
Invoice to:	Paterson Group

Report Number:	1610507
Date Submitted:	2016-06-24
Date Reported:	2016-07-04
Project:	PH2723
COC #:	56555

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1247167 Water 2016-06-23 TW1	1247168 Water 2016-06-23 TW3
Group	Analyte	MRL	Units	Guideline		
Semi-Volatiles	Benzo(a)anthracene	0.1	ug/L		<0.1	<0.1
	Benzo(a)pyrene	0.01	ug/L	MAC-0.01	<0.01	<0.01
	Benzo(b)fluoranthene	0.05	ug/L		<0.05	<0.05
	Benzo(g,h,i)perylene	0.1	ug/L		<0.1	<0.1
	Benzo(k)fluoranthene	0.05	ug/L		<0.05	<0.05
	Chrysene	0.05	ug/L		<0.05	<0.05
	Dibenzo(a,h)anthracene	0.1	ug/L		<0.1	<0.1
	Fluoranthene	0.1	ug/L		<0.1	<0.1
	Fluorene	0.1	ug/L		<0.1	<0.1
	Indeno(1,2,3-c,d)pyrene	0.1	ug/L		<0.1	<0.1
	Naphthalene	0.1	ug/L		<0.1	<0.1
	Phenanthrene	0.1	ug/L		<0.1	<0.1
	Pyrene	0.1	ug/L		<0.1	<0.1
Subcontract	N-NH3	0.01	mg/L		0.01	0.10
	S2-	0.02	mg/L	AO-0.05	<0.02	<0.02
	Tannin & Lignin	0.1	mg/L		<0.1	0.2
VOCs	1,1,1,2-tetrachloroethane	0.5	ug/L		<0.5	<0.5
	1,1,1-trichloroethane	0.4	ug/L		<0.4	<0.4
	1,1,2,2-tetrachloroethane	0.5	ug/L		<0.5	<0.5
	1,1,2-trichloroethane	0.4	ug/L		<0.4	<0.4
	1,1-dichloroethane	0.4	ug/L		<0.4	<0.4
	1,1-dichloroethylene	0.5	ug/L	MAC-14	<0.5	<0.5
	1,2-dichlorobenzene	0.4	ug/L	MAC-200	<0.4	<0.4
	1,2-dichloroethane	0.2	ug/L	IMAC-5	<0.2	<0.2
	1,2-dichloropropane	0.5	ug/L		<0.5	<0.5
	1,3-dichlorobenzene	0.4	ug/L		<0.4	<0.4

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Client:	Paterson Group 154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Russell Chown
PO#:	
Invoice to:	Paterson Group

Report Number:	1610507
Date Submitted:	2016-06-24
Date Reported:	2016-07-04
Project:	PH2723
COC #:	56555

				_		
Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1247167 Water 2016-06-23 TW1	1247168 Water 2016-06-23 TW3
VOCs	1,3-Dichloropropylene (cis+trans)	0.2		Guideinie	<0.2	<0.2
VUUS	1,4-dichlorobenzene	0.2	ug/L	MAC-5	<0.2	<0.2
	Acetone	30	ug/L	IVIAC-5	<30	<30
			ug/L		<0.5	<0.5
	Benzene	0.5	ug/L	MAC-5	<0.5	<0.5
	Bromodichloromethane	0.3	ug/L			
	Bromoform	0.4	ug/L		<0.4	<0.4
	Bromomethane	0.5	ug/L		<0.5	<0.5
	c-1,2-Dichloroethylene	0.4	ug/L		<0.4	<0.4
	c-1,3-Dichloropropylene	0.2	ug/L		<0.2	<0.2
	Carbon Tetrachloride	0.2	ug/L	MAC-5	<0.2	<0.2
	Chloroform	0.5	ug/L		<0.5	<0.5
	Dibromochloromethane	0.3	ug/L		<0.3	<0.3
	Dichlorodifluoromethane	0.5	ug/L		<0.5	<0.5
	Dichloromethane	4.0	ug/L	MAC-50	<4.0	<4.0
	Ethylbenzene	0.5	ug/L	AO-2.4	<0.5	<0.5
	Ethylene Dibromide	0.2	ug/L		<0.2	<0.2
	Hexane	5	ug/L		<5	<5
	m/p-xylene	0.4	ug/L		<0.4	<0.4
	Methyl Ethyl Ketone (MEK)	10	ug/L		<10	<10
	Methyl Isobutyl Ketone (MIBK)	10	ug/L		<10	<10
	Methyl Tert Butyl Ether (MTBE)	2	ug/L		<2	<2
	Monochlorobenzene	0.2	ug/L	MAC-80	<0.2	<0.2
	o-xylene	0.4	ug/L		<0.4	<0.4
	Styrene	0.5	ug/L		<0.5	<0.5
	t-1,2-Dichloroethylene	0.4	ug/L		<0.4	<0.4
	t-1,3-Dichloropropylene	0.2	ug/L		<0.2	<0.2

Guideline = ODWSOG

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Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Russell Chown
PO#:	
Invoice to:	Paterson Group

Report Number:	1610507
Date Submitted:	2016-06-24
Date Reported:	2016-07-04
Project:	PH2723
COC #:	56555

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1247167 Water 2016-06-23 TW1	1247168 Water 2016-06-23 TW3
Group	Analyte	MRL	Units	Guideline		
VOCs	Tetrachloroethylene	0.3	ug/L	MAC-30	<0.3	<0.3
	Toluene	0.5	ug/L	AO-24	<0.5	<0.5
	Trichloroethylene	0.3	ug/L	MAC-5	<0.3	<0.3
	Trichlorofluoromethane	0.5	ug/L		<0.5	<0.5
	Vinyl Chloride	0.2	ug/L	MAC-2	<0.2	<0.2
	Xylene; total	0.5	ug/L	AO-300	<0.5	<0.5
VOCs Surrogates	1,2-dichloroethane-d4	0	%		102	102
(%REC)	4-bromofluorobenzene	0	%		120	125
	Toluene-d8	0	%		95	95

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Russell Chown
PO#:	
Invoice to:	Paterson Group

Report Number:	1610507
Date Submitted:	2016-06-24
Date Reported:	2016-07-04
Project:	PH2723
COC #:	56555

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 290004 Analysis/Extraction Date 20	16-06-30 Analyst T	JB	
Method CCME O.Reg 153/04			
Petroleum Hydrocarbons F1	<20 ug/L	98	60-140
Method V 8260B			
Dichloropropene,1,3-			
Acetone	<30 ug/L	94	60-130
Methyl Ethyl Ketone	<10 ug/L	87	60-130
Methyl Isobutyl Ketone	<10 ug/L	83	60-130
Methyl tert-Butyl Ether (MTBE)	<2 ug/L	80	60-130
Run No 310325 Analysis/Extraction Date 2016-06-24 Analyst K A			
Method C SM2130B			
Turbidity	<0.1 NTU	101	70-130
Run No 310384 Analysis/Extraction Date 2016-06-27 Analyst C_N			
Method M SM3112B-3500B			
Mercury	<0.0001 mg/L	98	76-123
Run No 310385 Analysis/Extraction Date 2016-06-27 Analyst AET			
Method C SM4500-H+B			
Alkalinity (CaCO3)	<5 mg/L	99	90-110
Conductivity	<5 uS/cm	99	90-110

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

Page 7 of 14



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Russell Chown
PO#:	
Invoice to:	Paterson Group

Report Number:	1610507
Date Submitted:	2016-06-24
Date Reported:	2016-07-04
Project:	PH2723
COC #:	56555

QC Summary

Analyte	Blank	QC % Rec	QC Limits
F	<0.10 mg/L	101	90-110
рН	5.86	99	90-110
Run No 310387 Analysis/Extraction Date 20	016-06-28 Analyst J	LD	
Method CCME O.Reg 153/04			
Petroleum Hydrocarbons F2	<20 ug/L	110	60-140
Petroleum Hydrocarbons F3	<50 ug/L	110	60-140
Petroleum Hydrocarbons F4	<50 ug/L	110	60-140
Run No 310389 Analysis/Extraction Date 20	016-06-27 Analyst N	IP	
Method C SM4500-NO3-F			
N-NO2	<0.10 mg/L	103	80-120
N-NO3	<0.10 mg/L	95	80-120
Run No 310391 Analysis/Extraction Date 20	016-06-28 Analyst A	ET	
Method C SM2120C			
Colour	<2 TCU	100	90-110
Run No 310396 Analysis/Extraction Date 2016-06-27 Analyst NP			
Method SM 4110			
Chloride	<1 mg/L	102	90-110
SO4	<1 mg/L	104	90-110
Run No 310410 Analysis/Extraction Date 2016-06-28 Analyst SKH			

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Client: Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Attention: Mr. Russell Chown PO#: Invoice to: Paterson Group

 Report Number:
 1610507

 Date Submitted:
 2016-06-24

 Date Reported:
 2016-07-04

 Project:
 PH2723

 COC #:
 56555

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Method M SM3120B-3500C		•	
Calcium	<1 mg/L	98	90-110
Potassium	<1 mg/L	102	87-113
Magnesium	<1 mg/L	98	76-124
Sodium	<2 mg/L	101	82-118
Run No 310438 Analysis/Extraction Date 20	16-06-28 Analyst Jl	LD	
Method P 8270			
Methlynaphthalene, 1-	<0.1 ug/L	60	50-140
Methlynaphthalene, 2-	<0.1 ug/L	54	50-140
Acenaphthene	<0.1 ug/L	68	50-140
Acenaphthylene	<0.1 ug/L	68	50-140
Anthracene	<0.1 ug/L	80	50-140
Benz[a]anthracene	<0.1 ug/L	80	50-140
Benzo[a]pyrene	<0.01 ug/L	90	50-140
Benzo[b]fluoranthene	<0.05 ug/L	80	50-140
Benzo[ghi]perylene	<0.1 ug/L	88	50-140
Benzo[k]fluoranthene	<0.05 ug/L	119	50-140
Chrysene	<0.05 ug/L	84	50-140

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

Objective, TDR - Ty



Client: Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Attention: Mr. Russell Chown PO#: Invoice to: Paterson Group

Report Number:	1610507
Date Submitted:	2016-06-24
Date Reported:	2016-07-04
Project:	PH2723
COC #:	56555

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Dibenz[a h]anthracene	<0.1 ug/L	88	50-140
Fluoranthene	<0.1 ug/L	84	50-140
Fluorene	<0.1 ug/L	76	50-140
Indeno[1 2 3-cd]pyrene	<0.1 ug/L	82	50-140
Naphthalene	<0.1 ug/L	58	50-140
Phenanthrene	<0.1 ug/L	78	50-140
Pyrene	<0.1 ug/L	86	50-140
Run No 310442 Analysis/Extraction Date 2016-06-28 Analyst K_A			
Method EPA 200.8			
Silver	<0.0001 mg/L	105	94-106
Aluminum	<0.01 mg/L	104	89-111
Arsenic	<0.001 mg/L	103	93-106
Boron (total)	<0.01 mg/L	102	88-112
Barium	<0.01 mg/L	106	91-109
Beryllium	<0.0005 mg/L	100	93-107
Cadmium	<0.0001 mg/L	104	93-107
Chromium Total	<0.001 mg/L	100	94-106
Copper	<0.001 mg/L	99	93-106

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Russell Chown
PO#:	
Invoice to:	Paterson Group

Report Number:	1610507
Date Submitted:	2016-06-24
Date Reported:	2016-07-04
Project:	PH2723
COC #:	56555

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Iron	<0.03 mg/L	104	92-107
Manganese	<0.01 mg/L	100	94-106
Molybdenum	<0.005 mg/L	104	94-106
Nickel	<0.005 mg/L	99	94-106
Lead	<0.001 mg/L	103	70-130
Antimony	<0.0005 mg/L	100	80-120
Selenium	<0.001 mg/L	101	91-108
Strontium	<0.001 mg/L	101	89-110
Thallium	<0.0001 mg/L	101	95-105
Uranium	<0.001 mg/L	101	94-106
Zinc	<0.01 mg/L	105	94-106
Run No 310601 Analysis/Extraction Date 20	016-06-27 Analyst R	L_K	
Method SUBCONTRACT P	-		
Chromium VI	<0.01 mg/L	104	
N-NH3	<0.01 mg/L	106	
Phenols	<0.001 mg/L	92	
S2-	<0.02 mg/L	104	
Tannin & Lignin	<0.1 mg/L	100	

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1



Client: Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Russell Chown Attention: PO#: Invoice to: Paterson Group

Report Number: 1610507 Date Submitted: Date Reported: Project: PH2723 COC #: 56555

2016-06-24 2016-07-04

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Total Kjeldahl Nitrogen	<0.1 mg/L	99	
Run No 310640 Analysis/Extraction Date 20	016-07-04 Analyst N	Р	
Method C Ion Balance	1		
Ion Balance			
Method C SM2340B			
Hardness as CaCO3			
Method C SM2540			
TDS (COND - CALC)			
Run No 310645 Analysis/Extraction Date 20	016-06-30 Analyst T	JB	
Method V 8260B			
Tetrachloroethane, 1,1,1,2-	<0.5 ug/L	117	60-130
Trichloroethane, 1,1,1-	<0.4 ug/L	100	60-130
Tetrachloroethane, 1,1,2,2-	<0.5 ug/L	111	60-130
Trichloroethane, 1,1,2-	<0.4 ug/L	107	60-130
Dichloroethane, 1,1-	<0.4 ug/L	106	60-130
Dichloroethylene, 1,1-	<0.5 ug/L	92	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	110	60-130
Dichloroethane, 1,2-	<0.2 ug/L	100	60-130
Dichloropropane, 1,2-	<0.5 ug/L	104	60-130

Guideline = ODWSOG

* = Guideline Exceedence

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1



Client: Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Russell Chown Attention: PO#: Invoice to: Paterson Group

Report Number: 1610507 Date Submitted: Date Reported: Project: PH2723 COC #: 56555

2016-06-24 2016-07-04

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Dichlorobenzene, 1,3-	<0.4 ug/L	107	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	98	60-130
Benzene	<0.5 ug/L	98	60-130
Bromodichloromethane	<0.3 ug/L	101	60-130
Bromoform	<0.4 ug/L	111	60-130
Bromomethane	<0.5 ug/L	87	60-130
Dichloroethylene, 1,2-cis-	<0.4 ug/L	103	60-130
Dichloropropene,1,3-cis-	<0.2 ug/L	104	60-130
Carbon Tetrachloride	<0.2 ug/L	95	60-130
Chloroform	<0.5 ug/L	100	60-130
Dibromochloromethane	<0.3 ug/L	102	60-130
Dichlorodifluoromethane	<0.5 ug/L	103	60-130
Methylene Chloride	<4.0 ug/L	82	60-130
Ethylbenzene	<0.5 ug/L	98	60-130
Ethylene dibromide	<0.2 ug/L	107	60-130
Hexane (n)	<5 ug/L	80	60-130
m/p-xylene	<0.4 ug/L	97	60-130
Chlorobenzene	<0.2 ug/L	93	60-130

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

Page 13 of 14



Client: Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Attention: Mr. Russell Chown PO#: Invoice to: Paterson Group

 Report Number:
 1610507

 Date Submitted:
 2016-06-24

 Date Reported:
 2016-07-04

 Project:
 PH2723

 COC #:
 56555

QC Summary

Analyte	Blank	QC % Rec	QC Limits
o-xylene	<0.4 ug/L	101	60-130
Styrene	<0.5 ug/L	98	60-130
Dichloroethylene, 1,2-trans-	<0.4 ug/L	95	60-130
Dichloropropene, 1, 3-trans-	<0.2 ug/L	108	60-130
Tetrachloroethylene	<0.3 ug/L	98	60-130
Toluene	<0.5 ug/L	101	60-130
Trichloroethylene	<0.3 ug/L	95	60-130
Trichlorofluoromethane	<0.5 ug/L	99	60-130
Vinyl Chloride	<0.2 ug/L	93	60-130
Run No 310647 Analysis/Extraction Date 20	16-07-04 Analyst T	JB	
Method V 8260B			
Xylene Mixture			
Run No 310666 Analysis/Extraction Date 20	16-07-04 Analyst A	ET	
Method C SM5310C			
DOC	<0.5 mg/L	104	84-116

Guideline = ODWSOG

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Certificate of Analysis



Client: Attention: PO#:	Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Russell Chown		Report Number: Date Submitted: Date Reported: Project: COC #:	1611394 2016-07-06 2016-07-13 PH 2723 183211
Invoice to:	Paterson Group	Page 1 of 3		

Dear Russell Chown:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL:

Tanya Baillargeon Team Lead, Organics

All analysis is completed in Ottawa, Ontario (unless otherwise indicated).

Exova Ottawa is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on our CALA scope of accreditation. It can be found at http://www.cala.ca/scopes/2602.pdf.

Exova (Ottawa) is certified and accredited for specific parameters by OMAFRA, Ontario Ministry of Agriculture, Food and Rural Affairs (for farm soils). Licensed by Ontario MOE for specific tests in drinking water.

Exova (Mississauga) is accredited for specific parameters by SCC, Standards Council of Canada (to ISO 17025)

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Exova recommends consulting the official provincial or federal guideline as required.

Certificate of Analysis



Client:	Paterson Group	Report Number:	1611394
	154 Colonnade Rd South	Date Submitted:	2016-07-06
	Nepean, ON	Date Reported:	2016-07-13
	K2E 7T7	Project:	PH 2723
Attention: PO#: Invoice to:	Mr. Russell Chown Paterson Group	COC #:	183211

Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1249217 Water 2016-06-23 TW1	1249218 Water 2016-06-23 TW3
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L		<0.1	<0.1

 Guideline =
 * = Guideline Exceedence

 All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario).

 Results relate only to the parameters tested on the samples submitted.

 Methods references and/or additional QA/QC information available on request.

Certificate of Analysis



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Russell Chown
PO#:	
Invoice to:	Paterson Group

Report Number:	1611394
Date Submitted:	2016-07-06
Date Reported:	2016-07-13
Project:	PH 2723
COC #:	183211

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 208523 Analysis/Extraction Date 2016-07-08 Analyst C_M			
Method P 8081A			
Polychlorinated Biphenyls	<0.1 ug/L	103	60-140

Guideline = * = Guideline Exceedence All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario). Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

Certificate of Analysis



Client: Attention: PO#:	Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Russell Chown		Report Number: Date Submitted: Date Reported: Project: COC #:	1610511 2016-06-24 2016-07-04 PH 2723 56556	
Invoice to:	Paterson Group	Page 1 of 14			

Dear Russell Chown:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL:

Nadine Pinsonneault Team Leader, Inorganics

All analysis is completed in Ottawa, Ontario (unless otherwise indicated).

Exova Ottawa is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on our CALA scope of accreditation. It can be found at http://www.cala.ca/scopes/2602.pdf.

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APPROVAL:

Charlie (Long) Qu Laboratory Supervisor, Organics



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Russell Chown
PO#:	
Invoice to:	Paterson Group

Report Number:	1610511
Date Submitted:	2016-06-24
Date Reported:	2016-07-04
Project:	PH 2723
COC #:	56556

Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1247172 Water 2016-06-24 TW2
Calculations	Hardness as CaCO3	1	mg/L	OG-100	368*
-	Ion Balance	0.01			0.99
-	TDS (COND - CALC)	1	mg/L	AO-500	526*
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500	327
	CI	1	mg/L	AO-250	60
	Colour	2	TCU	AO-5	4
	Conductivity	5	uS/cm		810
	DOC	0.5	mg/L	AO-5	2.4
	F	0.10	mg/L	MAC-1.5	0.33
	N-NO2	0.10	mg/L	MAC-1.0	<0.10
	N-NO3	0.10	mg/L	MAC-10.0	0.70
	рН	1.00		6.5-8.5	8.10
	SO4	1	mg/L	AO-500	41
	Turbidity	0.1	NTU	AO-5.0	0.5
Mercury	Hg	0.0001	mg/L	MAC-0.001	<0.0001
Metals	Ag	0.0001	mg/L		<0.0001
	Al	0.01	mg/L	OG-0.1	<0.01
	As	0.001	mg/L	IMAC-0.025	<0.001
	В	0.01	mg/L	IMAC-5.0	0.14
	Ва	0.01	mg/L	MAC-1.0	0.27
	Ве	0.0005	mg/L		<0.0005
	Са	1	mg/L		93
	Cd	0.0001	mg/L	MAC-0.005	<0.0001
	Cr	0.001	mg/L	MAC-0.05	<0.001
	Cr(VI)	0.010	mg/L		<0.010
	Cu	0.001	mg/L	AO-1.0	<0.001

Guideline = ODWSOG

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Russell Chown
PO#:	
Invoice to:	Paterson Group

Report Number:	1610511
Date Submitted:	2016-06-24
Date Reported:	2016-07-04
Project:	PH 2723
COC #:	56556

Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1247172 Water 2016-06-24 TW2
Metals	Fe	0.03	mg/L	AO-0.3	0.10
	ĸ	1	mg/L	710 0.0	3
	Mg	1	mg/L		33
	Mn	0.01	mg/L	AO-0.05	0.01
	Мо	0.005	mg/L		<0.005
	Na	2	mg/L	AO-200	38
	Ni	0.005	mg/L		<0.005
	Pb	0.001	mg/L	MAC-0.010	<0.001
	Sb	0.0005	mg/L	IMAC-0.006	<0.0005
	Se	0.001	mg/L	MAC-0.01	<0.001
	Sr	0.001	mg/L		2.33
	TI	0.0001	mg/L		<0.0001
	U	0.001	mg/L	MAC-0.02	0.002
	Zn	0.01	mg/L	AO-5.0	<0.01
Nutrients	Total Kjeldahl Nitrogen	0.1	mg/L		0.2
Others	Alpha-androstrane	0	%		110
	F1 (C6-C10)	20	ug/L		<20
	F2 (C10-C16)	20	ug/L		<20
	F3 (C16-C34)	50	ug/L		<50
	F4 (C34-C50)	50	ug/L		<50
Phenols	Phenols	0.001	mg/L		<0.001
Semi-Volatiles	1-methylnaphthalene	0.1	ug/L		<0.1
	2-methylnaphthalene	0.1	ug/L		<0.1
	Acenaphthene	0.1	ug/L		<0.1
	Acenaphthylene	0.1	ug/L		<0.1
	Anthracene	0.1	ug/L		<0.1

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Russell Chown
PO#:	
Invoice to:	Paterson Group

Report Number:	1610511
Date Submitted:	2016-06-24
Date Reported:	2016-07-04
Project:	PH 2723
COC #:	56556

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1247172 Water 2016-06-24 TW2
Group	Analyte	MRL	Units	Guideline	
Semi-Volatiles	Benzo(a)anthracene	0.1	ug/L		<0.1
	Benzo(a)pyrene	0.01	ug/L	MAC-0.01	<0.01
	Benzo(b)fluoranthene	0.05	ug/L		<0.05
	Benzo(g,h,i)perylene	0.1	ug/L		<0.1
	Benzo(k)fluoranthene	0.05	ug/L		<0.05
	Chrysene	0.05	ug/L		<0.05
	Dibenzo(a,h)anthracene	0.1	ug/L		<0.1
	Fluoranthene	0.1	ug/L		<0.1
	Fluorene	0.1	ug/L		<0.1
	Indeno(1,2,3-c,d)pyrene	0.1	ug/L		<0.1
	Naphthalene	0.1	ug/L		<0.1
	Phenanthrene	0.1	ug/L		<0.1
	Pyrene	0.1	ug/L		<0.1
Subcontract	N-NH3	0.01	mg/L		0.03
	S2-	0.02	mg/L	AO-0.05	<0.02
	Tannin & Lignin	0.1	mg/L		<0.1
VOCs	1,1,1,2-tetrachloroethane	0.5	ug/L		<0.5
	1,1,1-trichloroethane	0.4	ug/L		<0.4
	1,1,2,2-tetrachloroethane	0.5	ug/L		<0.5
	1,1,2-trichloroethane	0.4	ug/L		<0.4
	1,1-dichloroethane	0.4	ug/L		<0.4
	1,1-dichloroethylene	0.5	ug/L	MAC-14	<0.5
	1,2-dichlorobenzene	0.4	ug/L	MAC-200	<0.4
	1,2-dichloroethane	0.2	ug/L	IMAC-5	<0.2
	1,2-dichloropropane	0.5	ug/L		<0.5
	1,3-dichlorobenzene	0.4	ug/L		<0.4

Guideline = ODWSOG

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Paterson Group
154 Colonnade Rd South
Nepean, ON
K2E 7T7
Mr. Russell Chown
Paterson Group

Report Number:	1610511
Date Submitted:	2016-06-24
Date Reported:	2016-07-04
Project:	PH 2723
COC #:	56556

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1247172 Water 2016-06-24 TW2
Group	Analyte	MRL	Units	Guideline	
VOCs	1,3-Dichloropropylene (cis+trans)	0.2	ug/L		<0.2
	1,4-dichlorobenzene	0.4	ug/L	MAC-5	<0.4
	Acetone	30	ug/L		<30
	Benzene	0.5	ug/L	MAC-5	<0.5
	Bromodichloromethane	0.3	ug/L		<0.3
	Bromoform	0.4	ug/L		<0.4
	Bromomethane	0.5	ug/L		<0.5
	c-1,2-Dichloroethylene	0.4	ug/L		<0.4
	c-1,3-Dichloropropylene	0.2	ug/L		<0.2
	Carbon Tetrachloride	0.2	ug/L	MAC-5	<0.2
	Chloroform	0.5	ug/L		<0.5
	Dibromochloromethane	0.3	ug/L		<0.3
	Dichlorodifluoromethane	0.5	ug/L		<0.5
	Dichloromethane	4.0	ug/L	MAC-50	<4.0
	Ethylbenzene	0.5	ug/L	AO-2.4	<0.5
	Ethylene Dibromide	0.2	ug/L		<0.2
	Hexane	5	ug/L		<5
	m/p-xylene	0.4	ug/L		<0.4
	Methyl Ethyl Ketone (MEK)	10	ug/L		<10
	Methyl Isobutyl Ketone (MIBK)	10	ug/L		<10
	Methyl Tert Butyl Ether (MTBE)	2	ug/L		<2
	Monochlorobenzene	0.2	ug/L	MAC-80	<0.2
	o-xylene	0.4	ug/L		<0.4
	Styrene	0.5	ug/L		<0.5
	t-1,2-Dichloroethylene	0.4	ug/L		<0.4
	t-1,3-Dichloropropylene	0.2	ug/L		<0.2

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Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Russell Chown
PO#:	
Invoice to:	Paterson Group

Report Number:	1610511
Date Submitted:	2016-06-24
Date Reported:	2016-07-04
Project:	PH 2723
COC #:	56556

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1247172 Water 2016-06-24 TW2
Group	Analyte	MRL	Units	Guideline	
VOCs	Tetrachloroethylene	0.3	ug/L	MAC-30	<0.3
	Toluene	0.5	ug/L	AO-24	0.6
	Trichloroethylene	0.3	ug/L	MAC-5	<0.3
	Trichlorofluoromethane	0.5	ug/L		<0.5
	Vinyl Chloride	0.2	ug/L	MAC-2	<0.2
	Xylene; total	0.5	ug/L	AO-300	<0.5
VOCs Surrogates (%REC)	1,2-dichloroethane-d4	0	%		105
	4-bromofluorobenzene	0	%		120
	Toluene-d8	0	%		96

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Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Russell Chown
PO#:	
Invoice to:	Paterson Group

Report Number:	1610511
Date Submitted:	2016-06-24
Date Reported:	2016-07-04
Project:	PH 2723
COC #:	56556

QC Summary

Analyte	Blank	QC % Rec	QC Limits		
Run No 290004 Analysis/Extraction Date 2016-07-04 Analyst TJB					
Method CCME O.Reg 153/04					
Petroleum Hydrocarbons F1	<20 ug/L	103	60-140		
Method V 8260B					
Dichloropropene, 1, 3-					
Acetone	<30 ug/L	94	60-130		
Methyl Ethyl Ketone	<10 ug/L	87	60-130		
Methyl Isobutyl Ketone	<10 ug/L	83	60-130		
Methyl tert-Butyl Ether (MTBE)	<2 ug/L	80	60-130		
Run No 310325 Analysis/Extraction Date 20) 16-06-24 Analyst K	A			
Method C SM2130B					
Turbidity	<0.1 NTU	101	70-130		
Run No 310354 Analysis/Extraction Date 2016-06-27 Analyst JLD					
Method P 8270					
Methlynaphthalene, 1-	<0.1 ug/L	64	50-140		
Methlynaphthalene, 2-	<0.1 ug/L	62	50-140		
Acenaphthene	<0.1 ug/L	64	50-140		
Acenaphthylene	<0.1 ug/L	64	50-140		

Guideline = ODWSOG

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1



Client: Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Russell Chown Attention: PO#: Invoice to: Paterson Group

Report Number: 1610511 Date Submitted: Date Reported: Project: COC #: 56556

2016-06-24 2016-07-04 PH 2723

QC Summary

Analyte	Blank	QC % Rec	QC Limits	
Anthracene	<0.1 ug/L	68	50-140	
Benz[a]anthracene	<0.1 ug/L	68	50-140	
Benzo[a]pyrene	<0.01 ug/L	68	50-140	
Benzo[b]fluoranthene	<0.05 ug/L	63	50-140	
Benzo[ghi]perylene	<0.1 ug/L	72	50-140	
Benzo[k]fluoranthene	<0.05 ug/L	77	50-140	
Chrysene	<0.05 ug/L	74	50-140	
Dibenz[a h]anthracene	<0.1 ug/L	68	50-140	
Fluoranthene	<0.1 ug/L	68	50-140	
Fluorene	<0.1 ug/L	64	50-140	
Indeno[1 2 3-cd]pyrene	<0.1 ug/L	68	50-140	
Naphthalene	<0.1 ug/L	62	50-140	
Phenanthrene	<0.1 ug/L	64	50-140	
Pyrene	<0.1 ug/L	68	50-140	
Run No 310384 Analysis/Extraction Date 2016-06-27 Analyst C_N				
Method M SM3112B-3500B				
Mercury	<0.0001 mg/L	98	76-123	
Run No 310385 Analysis/Extraction Date 2016-06-27 Analyst AET				

Guideline = ODWSOG

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Client: Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Russell Chown Attention: PO#: Invoice to: Paterson Group

Report Number: 1610511 Date Submitted: 2016-06-24 Date Reported: 2016-07-04 Project: PH 2723 COC #: 56556

QC Summary

Analyte	Blank	QC % Rec	QC Limits	
Method C SM4500-H+B				
Alkalinity (CaCO3)	<5 mg/L	99	90-110	
Conductivity	<5 uS/cm	99	90-110	
F	<0.10 mg/L	101	90-110	
рН	5.86	99	90-110	
Run No 310387 Analysis/Extraction Date 20	016-06-28 Analyst Jl	_D		
Method CCME O.Reg 153/04				
Petroleum Hydrocarbons F2	<20 ug/L 110 60-140			
Petroleum Hydrocarbons F3	<50 ug/L 110 60-140			
Petroleum Hydrocarbons F4	<50 ug/L	110	60-140	
Run No 310389 Analysis/Extraction Date 2016-06-27 Analyst NP				
Method C SM4500-NO3-F				
N-NO2	<0.10 mg/L	103	80-120	
N-NO3	<0.10 mg/L	95	80-120	
Run No 310391 Analysis/Extraction Date 20	016-06-28 Analyst A	ET		
Method C SM2120C				
Colour	<2 TCU	100	90-110	
Run No 310396 Analysis/Extraction Date 2016-06-27 Analyst NP				
Method SM 4110				

Guideline = ODWSOG

* = Guideline Exceedence

All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario). Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Client: Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Attention: Mr. Russell Chown PO#: Invoice to: Paterson Group

Report Number: 1610511 Date Submitted: 2016-06-24 Date Reported: 2016-07-04 Project: PH 2723 COC #: 56556

QC Summary

Analyte	Analyte Blank		QC Limits
Chloride	<1 mg/L	102	90-110
SO4	<1 mg/L	104	90-110
Run No 310410 Analysis/Extraction Date 20	016-06-28 Analyst S	KH	
Method M SM3120B-3500C			
Calcium	<1 mg/L	98	90-110
Potassium	<1 mg/L	102	87-113
Magnesium	<1 mg/L	98	76-124
Sodium	<2 mg/L	101	82-118
Run No 310442 Analysis/Extraction Date 20	16-06-28 Analyst K	_A	
Method EPA 200.8			
Silver	<0.0001 mg/L	105	94-106
Aluminum	<0.01 mg/L	104	89-111
Arsenic	<0.001 mg/L	103	93-106
Boron (total)	<0.01 mg/L	102	88-112
Barium	<0.01 mg/L	106	91-109
Beryllium	<0.0005 mg/L	100	93-107
Cadmium	<0.0001 mg/L	104	93-107
Chromium Total	<0.001 mg/L	100	94-106

Guideline = ODWSOG

* = Guideline Exceedence

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1



Client: Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Russell Chown Attention: PO#: Invoice to: Paterson Group

Report Number: 1610511 Date Submitted: 2016-06-24 Date Reported: Project: COC #: 56556

2016-07-04 PH 2723

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Copper	<0.001 mg/L	99	93-106
Iron	<0.03 mg/L	104	92-107
Manganese	<0.01 mg/L	100	94-106
Molybdenum	<0.005 mg/L	104	94-106
Nickel	<0.005 mg/L	99	94-106
Lead	<0.001 mg/L	103	70-130
Antimony	<0.0005 mg/L	100	80-120
Selenium	<0.001 mg/L	101	91-108
Strontium	<0.001 mg/L	101	89-110
Thallium	<0.0001 mg/L	101	95-105
Uranium	<0.001 mg/L	101	94-106
Zinc	<0.01 mg/L	105	94-106
Run No 310600 Analysis/Extraction Date 20	016-06-27 Analyst R	K_K	
Method SUBCONTRACT P			
Chromium VI	<0.01 mg/L	104	
N-NH3	<0.01 mg/L	106	
Phenols	<0.001 mg/L	96	
S2-	<0.02 mg/L	104	

Guideline = ODWSOG

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

Page 11 of 14



Client: Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Attention: Mr. Russell Chown PO#: Invoice to: Paterson Group

Report Number: 1610511 Date Submitted: Date Reported: Project: COC #: 56556

2016-06-24 2016-07-04 PH 2723

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Tannin & Lignin	<0.1 mg/L	100	
Total Kjeldahl Nitrogen	<0.1 mg/L	99	
Run No 310645 Analysis/Extraction Date 20	016-06-30 Analyst T	JB	
Method V 8260B			
Tetrachloroethane, 1,1,1,2-	<0.5 ug/L	117	60-130
Trichloroethane, 1,1,1-	<0.4 ug/L	100	60-130
Tetrachloroethane, 1,1,2,2-	<0.5 ug/L	111	60-130
Trichloroethane, 1,1,2-	<0.4 ug/L	107	60-130
Dichloroethane, 1,1-	<0.4 ug/L	106	60-130
Dichloroethylene, 1,1-	<0.5 ug/L	92	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	110	60-130
Dichloroethane, 1,2-	<0.2 ug/L	100	60-130
Dichloropropane, 1,2-	<0.5 ug/L	104	60-130
Dichlorobenzene, 1,3-	<0.4 ug/L	107	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	98	60-130
Benzene	<0.5 ug/L	98	60-130
Bromodichloromethane	<0.3 ug/L	101	60-130
Bromoform	<0.4 ug/L	111	60-130

Guideline = ODWSOG

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1



Client: Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Russell Chown Attention: PO#: Invoice to: Paterson Group

Report Number: 1610511 Date Submitted: Date Reported: Project: COC #: 56556

2016-06-24 2016-07-04 PH 2723

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Bromomethane	<0.5 ug/L	87	60-130
Dichloroethylene, 1,2-cis-	<0.4 ug/L	103	60-130
Dichloropropene,1,3-cis-	<0.2 ug/L	104	60-130
Carbon Tetrachloride	<0.2 ug/L	95	60-130
Chloroform	<0.5 ug/L	100	60-130
Dibromochloromethane	<0.3 ug/L	102	60-130
Dichlorodifluoromethane	<0.5 ug/L	103	60-130
Methylene Chloride	<4.0 ug/L	82	60-130
Ethylbenzene	<0.5 ug/L	98	60-130
Ethylene dibromide	<0.2 ug/L	107	60-130
Hexane (n)	<5 ug/L	80	60-130
m/p-xylene	<0.4 ug/L	97	60-130
Chlorobenzene	<0.2 ug/L	93	60-130
o-xylene	<0.4 ug/L	101	60-130
Styrene	<0.5 ug/L	98	60-130
Dichloroethylene, 1,2-trans-	<0.4 ug/L	95	60-130
Dichloropropene,1,3-trans-	<0.2 ug/L	108	60-130
Tetrachloroethylene	<0.3 ug/L	98	60-130

Guideline = ODWSOG

* = Guideline Exceedence

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146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

Page 13 of 14



Client: Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Attention: Mr. Russell Chown PO#: Invoice to: Paterson Group

Report Number: 1610511 Date Submitted: 2016-06-24 Date Reported: 2016-07-04 Project: PH 2723 COC #: 56556

QC QC Analyte Blank % Rec Limits <0.5 ug/L 101 60-130 Toluene <0.3 ug/L 95 60-130 Trichloroethylene <0.5 ug/L 99 60-130 Trichlorofluoromethane <0.2 ug/L 93 60-130 Vinyl Chloride Run No 310647 Analysis/Extraction Date 2016-07-04 Analyst TJB Method V 8260B **Xylene Mixture Run No** 310657 Analysis/Extraction Date 2016-07-04 Analyst NP Method C lon Balance Ion Balance Method C SM2340B Hardness as CaCO3 Method C SM2540

QC Summary

TDS (COND - CALC) Analysis/Extraction Date 2016-07-04 Run No 310666 Analyst AET Method C SM5310C <0.5 mg/L 104 84-116 DOC

Guideline = ODWSOG

* = Guideline Exceedence

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MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Page 14 of 14

Certificate of Analysis



Client: Attention: PO#:	Paterson Group 154 Colonnade Rd South Nepean, ON K2E 7T7 Mr. Russell Chown		Report Number: Date Submitted: Date Reported: Project: COC #:	1610522 2016-06-24 2016-07-04 PH2723 56557
Invoice to:	Paterson Group	Page 1 of 3		

Dear Russell Chown:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL:

Nadine Pinsonneault Team Leader, Inorganics

All analysis is completed in Ottawa, Ontario (unless otherwise indicated).

Exova Ottawa is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on our CALA scope of accreditation. It can be found at http://www.cala.ca/scopes/2602.pdf.

Exova (Ottawa) is certified and accredited for specific parameters by OMAFRA, Ontario Ministry of Agriculture, Food and Rural Affairs (for farm soils). Licensed by Ontario MOE for specific tests in drinking water.

Exova (Mississauga) is accredited for specific parameters by SCC, Standards Council of Canada (to ISO 17025)

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Exova recommends consulting the official provincial or federal guideline as required.



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Russell Chown
PO#:	
Invoice to:	Paterson Group

Report Number:	1610522
Date Submitted:	2016-06-24
Date Reported:	2016-07-04
Project:	PH2723
COC #:	56557

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1247195 Water 2016-06-24 128 Apple	1247196 Water 2016-06-24 139 Apple	1247197 Water 2016-06-24 140 Wilson
Group	Analyte	MRL	Units	Guideline			
General Chemistry	DOC	0.5	mg/L	AO-5	1.7	2.0	1.9
	N-NO2	0.10	mg/L	MAC-1.0	<0.10	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC-10.0	0.20	<0.10	2.52
	NO2 + NO3 as N	0.10	mg/L	MAC-10.0	0.20	<0.10	2.52
Nutrients	N-NH3	0.025	mg/L		<0.025	<0.025	<0.025
	Organic Nitrogen	0.08	mg/L	OG-0.15	0.23*	0.12	0.23*
	Total Kjeldahl Nitrogen	0.07	mg/L		0.23	0.12	0.23

All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario). Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Client:	Paterson Group
	154 Colonnade Rd South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Russell Chown
PO#:	
Invoice to:	Paterson Group

Report Number:	1610522
Date Submitted:	2016-06-24
Date Reported:	2016-07-04
Project:	PH2723
COC #:	56557

QC Summary

Analyte	Blank	QC % Rec	QC Limits	
Run No 310389 Analysis/Extraction Date 20	16-06-27 Analyst N	Р		
Method C SM4500-NO3-F				
N-NO2	<0.10 mg/L	103	80-120	
N-NO3	<0.10 mg/L	97	80-120	
NO2 + NO3 as N	<0.10 mg/L	98	80-120	
Run No 310632 Analysis/Extraction Date 20	16-06-29 Analyst A	ET		
Method Exova Edmonton-SM4500-NH3-G				
N-NH3	<0.025 mg/L	99	80-120	
Run No 310634 Analysis/Extraction Date 2016-06-28 Analyst AET				
Method Exova Edmonton-ISO/TR 11905-2				
Total Kjeldahl Nitrogen <0.07 mg/L 93				
Run No 310640 Analysis/Extraction Date 20	16-07-04 Analyst N	P		
Method C SM4500-Norg-C				
Organic Nitrogen				
Run No 310666 Analysis/Extraction Date 20	16-07-04 Analyst A	ET		
Method C SM5310C				
DOC	<0.5 mg/L	104	84-116	

Guideline = ODWSOG

* = Guideline Exceedence

All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario). Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

Certificate of Analysis

Environment Testing

Client: Attention: PO#:	Paterson Group 154 Colonnade Rd. South Nepean, ON K2E 7T7 Mr. Kirby Magee-Dittburner		Report Number: Date Submitted: Date Reported: Project: COC #:	1968225 2021-12-07 2021-12-21 PH4398 883921
Invoice to:	Paterson Group	Page 1 of 8		

Dear Kirby Magee-Dittburner:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

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APPROVAL:

Long Qu, Organics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: <u>http://www.cala.ca/scopes/2602.pdf</u>.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.



Client:	Paterson	Group
	154 Colo	nnade Rd. South
	Nepean,	ON
	K2E 7T7	
Attenti	on: Mr. Kirby	Magee-Dittburner
PO#:		
Invoice	e to: Paterson	Group

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Report Number:	1968225
Date Submitted:	2021-12-07
Date Reported:	2021-12-21
Project:	PH4398
COC #:	883921

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1600428 GW 2021-12-07 TW1
Group	Analyte	MRL	Units	Guideline	
Metals	Ag	0.0001	mg/L		<0.0001
	As	0.001	mg/L		<0.001
	В	0.01	mg/L		0.15
	Ва	0.01	mg/L		0.21
	Be	0.0005	mg/L		<0.0005
	Cd	0.0001	mg/L		<0.0001
	Со	0.0002	mg/L		0.0002
	Cr	0.001	mg/L		<0.001
	Cr(VI)	0.01	mg/L		<0.01
	Cu	0.001	mg/L		0.002
	Hg	0.0001	mg/L		<0.0001
	Мо	0.005	mg/L		<0.005
	Na	2	mg/L		27
	Ni	0.005	mg/L		<0.005
	Pb	0.001	mg/L		<0.001
	Sb	0.0005	mg/L		<0.0005
	Se	0.001	mg/L		<0.001
	TI	0.0001	mg/L		<0.0001
	U	0.001	mg/L		0.002
	V	0.001	mg/L		<0.001
	Zn	0.01	mg/L		<0.01
PAH	1+2-methylnaphthalene	0.1	ug/L		<0.1
	1-methylnaphthalene	0.1	ug/L		<0.1
	2-methylnaphthalene	0.1	ug/L		<0.1
	Acenaphthene	0.1	ug/L		<0.1

Guideline =

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Client:	Paterson Group	Report Number:	1968225
	154 Colonnade Rd. South	Date Submitted:	2021-12-07
	Nepean, ON	Date Reported:	2021-12-21
	K2E 7T7	Project	PH4398
Attention:	Mr. Kirby Magee-Dittburner	COC #:	883921
PO#:			
Invoice to:	Paterson Group		

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1600428 GW 2021-12-07 TW1
Group	Analyte	MRL	Units	Guideline	
PAH	Acenaphthylene	0.1	ug/L		<0.1
	Anthracene	0.1	ug/L		<0.1
	Benzo(a)anthracene	0.1	ug/L		<0.1
	Benzo(a)pyrene	0.01	ug/L		<0.01
	Benzo(b)fluoranthene	0.05	ug/L		<0.05
	Benzo(g,h,i)perylene	0.1	ug/L		<0.1
	Benzo(k)fluoranthene	0.05	ug/L		<0.05
	Chrysene	0.05	ug/L		<0.05
	Dibenzo(a,h)anthracene	0.1	ug/L		<0.1
	Fluoranthene	0.1	ug/L		<0.1
	Fluorene	0.1	ug/L		<0.1
	Indeno(1,2,3-c,d)pyrene	0.1	ug/L		<0.1
	Naphthalene	0.1	ug/L		<0.1
	Phenanthrene	0.1	ug/L		<0.1
	Pyrene	0.1	ug/L		<0.1
PCB Surrogate	Decachlorobiphenyl	0	%		90
PCBs	Aroclor 1016	0.1	ug/L		<0.1
	Aroclor 1242	0.1	ug/L		<0.1
	Aroclor 1248	0.1	ug/L		<0.1
	Aroclor 1254	0.1	ug/L		<0.1
	Aroclor 1260	0.1	ug/L		<0.1
	Polychlorinated Biphenyls (PCBs)	0.1	ug/L		<0.1
VOCs Surrogates	Toluene-d8	0	%		100
Volatiles	Benzene	0.5	ug/L		<0.5
	Ethylbenzene	0.5	ug/L		<0.5

Guideline =

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Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

Certificate of Analysis

Environment Testing

Client:	Paterson Group	Report Number:	1968225
	154 Colonnade Rd. South	Date Submitted:	2021-12-07
	Nepean, ON	Date Reported:	2021-12-21
	K2E 7T7	Project:	PH4398
Attention:	Mr. Kirby Magee-Dittburner	COC #:	883921
PO#:			
Invoice to:	Paterson Group		

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1600428 GW 2021-12-07 TW1
Group	Analyte	MRL	Units	Guideline	
Volatiles	m/p-xylene	0.4	ug/L		<0.4
	o-xylene	0.4	ug/L		<0.4
	Toluene	0.5	ug/L		<0.5
	Xylene; total	0.5	ug/L		<0.5

Guideline =

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* = Guideline Exceedence

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Client:	Paterson Group
	154 Colonnade Rd. South
	Nepean, ON
	K2E 7T7
Attention: PO#:	Mr. Kirby Magee-Dittburner
Invoice to:	Paterson Group

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Report Number:	1968225
Date Submitted:	2021-12-07
Date Reported:	2021-12-21
Project:	PH4398
COC #:	883921

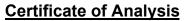
QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 413207 Analysis/Extraction Date 20 Method P 8270	021-12-10 Ana	llyst CM	
Methlynaphthalene, 1-	<0.1 ug/L	100	50-140
Methlynaphthalene, 2-	<0.1 ug/L	100	50-140
Acenaphthene	<0.1 ug/L	102	50-140
Acenaphthylene	<0.1 ug/L	100	50-140
Anthracene	<0.1 ug/L	100	50-140
Benz[a]anthracene	<0.1 ug/L	84	50-140
Benzo[a]pyrene	<0.01 ug/L	95	50-140
Benzo[b]fluoranthene	<0.05 ug/L	99	50-140
Benzo[ghi]perylene	<0.1 ug/L	100	50-140
Benzo[k]fluoranthene	<0.05 ug/L	104	50-140
Chrysene	<0.05 ug/L	111	50-140
Dibenz[a h]anthracene	<0.1 ug/L	82	50-140
Fluoranthene	<0.1 ug/L	94	50-140
Fluorene	<0.1 ug/L	96	50-140
Indeno[1 2 3-cd]pyrene	<0.1 ug/L	92	50-140
Naphthalene	<0.1 ug/L	104	50-140

Guideline =

* = Guideline Exceedence

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Client:	Paterson Group
	154 Colonnade Rd. South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Kirby Magee-Dittburner
PO#:	
Invoice to:	Paterson Group

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Report Number:	1968225
Date Submitted:	2021-12-07
Date Reported:	2021-12-21
Project:	PH4398
COC #:	883921

QC Summary

Analyt	e	Blank	QC % Rec	QC Limits
Phenanthrene		<0.1 ug/L	102	50-140
Pyrene		<0.1 ug/L	94	50-140
Run No 413771 And Method EPA 200.8	alysis/Extraction Date 20	021-12-09 Ana	alyst SD	
Silver		<0.0001 mg/L	114	80-120
Arsenic		<0.001 mg/L	102	80-120
Boron (total)		<0.01 mg/L	113	80-120
Barium		<0.01 mg/L	101	80-120
Beryllium		<0.0005 mg/L	116	80-120
Cadmium		<0.0001 mg/L	107	80-120
Cobalt		<0.0002 mg/L	106	80-120
Chromium Total		<0.001 mg/L	106	80-120
Copper		<0.001 mg/L	111	80-120
Mercury		<0.0001 mg/L	90	80-120
Molybdenum		<0.005 mg/L	100	80-120
Nickel		<0.005 mg/L	110	80-120
Lead		<0.001 mg/L	103	80-120
Antimony		<0.0005 mg/L	79	80-120

Guideline =

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Client:	Paterson Group
	154 Colonnade Rd. South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Kirby Magee-Dittburner
PO#:	
Invoice to:	Paterson Group

🛟 eurofins

Report Number:	1968225
Date Submitted:	2021-12-07
Date Reported:	2021-12-21
Project:	PH4398
COC #:	883921

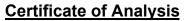
QC Summary

Analyte	Blank	QC % Rec	QC Limits
Selenium	<0.001 mg/L	108	80-120
Thallium	<0.0001 mg/L	102	80-120
Uranium	<0.001 mg/L	98	80-120
Vanadium	<0.001 mg/L	104	80-120
Zinc	<0.01 mg/L	114	80-120
Run No 413825 Analysis/Extraction Dat Method EPA 8260	e 2021-12-10 Ana	ilyst YH	
Benzene	<0.5 ug/L	88	60-130
Ethylbenzene	<0.5 ug/L	82	60-130
m/p-xylene	<0.4 ug/L	84	60-130
o-xylene	<0.4 ug/L	91	60-130
Toluene	<0.5 ug/L	88	60-130
Run No413834Analysis/Extraction DatMethodEPA 8260	e 2021-12-10 Ana	ilyst YH	
Xylene Mixture			
Run No413856Analysis/Extraction DatMethodM SM3120B-3500C	e 2021-12-10 Ana	llyst ZS	
Sodium	<2 mg/L	103	82-118

Guideline =

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Client:	Paterson Group
	154 Colonnade Rd. South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Kirby Magee-Dittburner
PO#:	
Invoice to:	Paterson Group

🛟 eurofins

Report Number:	1968225
Date Submitted:	2021-12-07
Date Reported:	2021-12-21
Project:	PH4398
COC #:	883921

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 413883 Analysis/Extraction Date 20 Method SM 3500-Cr B 20)21-12-10 Ana	ilyst SKH	
Chromium VI	<0.01 mg/L	94	80-120
Run No 413950 Analysis/Extraction Date 20 Method EPA 8081B	021-12-10 Ana	ilyst RG	
Aroclor 1016	<0.1 ug/L	120	
Aroclor 1242	<0.1 ug/L	120	60-140
Aroclor 1248	<0.1 ug/L	120	60-140
Aroclor 1254	<0.1 ug/L	120	60-140
Aroclor 1260	<0.1 ug/L	120	60-140
Polychlorinated Biphenyls	<0.1 ug/L	120	60-140
Run No413968Analysis/Extraction Date20MethodP8270	021-12-13 Ana	ilyst CM	
1+2-methylnaphthalene			

Guideline =

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

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Environment Testing America

ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC 2425 New Holland Pike Lancaster, PA 17601 Tel: (717)656-2300

Laboratory Job ID: 410-66404-1 Client Project/Site: 1968225-PH4398

For:

Eurofins Environment Testing Canada 146 Colonnade Road, No. 8 Ottawa, Ontario K2E 7Y1

Attn: Rebecca Koshy

Marrissa Williams

Authorized for release by: 12/15/2021 5:59:21 PM

Marrissa Williams, Project Manager (717)556-7246 Marrissa.Williams@eurofinset.com

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS Review your project results through TOTOLACCESS Have a Question? Ask

Visit us at: www.eurofinsus.com/Env

The

Expert

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

• QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.

• Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.

Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

This report shall not be reproduced except in full, without the written approval of the laboratory.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Marrissa Williams

Marrissa Williams Project Manager 12/15/2021 5:59:21 PM

Job ID: 410-66404-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative 410-66404-1

Receipt

The sample was received on 12/10/2021 9:56 AM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 11.6°C

Receipt Exceptions

The following sample was received at the laboratory outside the required temperature criteria: 1600428-TW1 (410-66404-1). The client was contacted regarding this issue, and the laboratory was instructed to proceed with analysis.

Dioxin

Method 1613B: Any peak area that is the result of interferences from poly-chlorinated diphenyl ethers observed in the sample has been removed from the calculated results prior to reporting the data for totals. 1600428-TW1 (410-66404-1)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: Eurofins Environment Testing Canada Project/Site: 1968225-PH4398

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-66404-1	1600428-TW1	Water	12/07/21 00:00	12/10/21 09:56

Job ID: 410-66404-1

Page 4 of 17

410-66404-1 1600428-TW1 Water 12/07/21 00:00 12/10/21 09:56

Client Sample ID: 1600428-TW1 Date Collected: 12/07/21 00:00 Date Received: 12/10/21 09:56

nalyte		Qualifier	RL	EDL		D	Prepared	Analyzed	Dil Fac
2,3,4,6,7,8-HpCDD	ND	cn	27		pg/L	_	12/13/21 16:35	12/14/21 13:50	1
,2,3,4,6,7,8-HpCDF	ND		27	0.068				12/14/21 13:50	1
2,3,4,7,8-HxCDD	ND		27	0.12				12/14/21 13:50	1
2,3,4,7,8-HxCDF	ND		27	0.69				12/14/21 13:50	1
,2,3,4,7,8,9-HpCDF		J I cn	27	0.096				12/14/21 13:50	1
,2,3,6,7,8-HxCDD	ND		27	0.12				12/14/21 13:50	1
,2,3,6,7,8-HxCDF	ND		27	0.70			12/13/21 16:35	12/14/21 13:50	1
,2,3,7,8-PeCDD	ND		27	0.19			12/13/21 16:35	12/14/21 13:50	1
,2,3,7,8-PeCDF	ND	cn	27	0.14			12/13/21 16:35	12/14/21 13:50	1
,2,3,7,8,9-HxCDD	ND	cn	27	0.12			12/13/21 16:35	12/14/21 13:50	1
,2,3,7,8,9-HxCDF	ND	cn	27	0.85			12/13/21 16:35	12/14/21 13:50	1
,3,4,6,7,8-HxCDF	ND	cn	27	0.69	pg/L		12/13/21 16:35	12/14/21 13:50	1
,3,4,7,8-PeCDF	ND	cn	27	0.11	pg/L		12/13/21 16:35	12/14/21 13:50	1
,3,7,8-TCDD	ND	cn	4.3	0.20			12/13/21 16:35	12/14/21 13:50	1
,3,7,8-TCDF	ND	cn	5.4	0.14			12/13/21 16:35	12/14/21 13:50	1
CDD	0.75	J I cn	120	0.17			12/13/21 16:35	12/14/21 13:50	1
CDF	ND	cn	54	0.15			12/13/21 16:35	12/14/21 13:50	1
otal HpCDD	ND		27		pg/L		12/13/21 16:35	12/14/21 13:50	1
otal HpCDF	0.31	J I B cn	27	0.082				12/14/21 13:50	1
otal HxCDD		JIBcn	27	0.12				12/14/21 13:50	1
otal HxCDF	ND		27	0.85				12/14/21 13:50	1
otal PeCDD	ND		27	0.19				12/14/21 13:50	1
otal PeCDF		JIBcn	27	0.12				12/14/21 13:50	1
otal TCDD	ND		5.4	0.20				12/14/21 13:50	1
otal TCDF		JIcn	5.4	0.14				12/14/21 13:50	
otal PCDD		JIBcn	5.4	0.79				12/14/21 13:50	1
otal PCDF		JIBCN	5.4	0.27				12/14/21 13:50	1
otal PCDD/PCDF		J I B cn	5.4	0.53				12/14/21 13:50	1
otope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
3C-1,2,3,4,6,7,8-HpCDD	81	cn	23 - 140				12/13/21 16:35	12/14/21 13:50	1
3C-1,2,3,4,6,7,8-HpCDF	94	cn	28 - 143				12/13/21 16:35	12/14/21 13:50	1
3C-1,2,3,4,7,8-HxCDD	84	cn	32 - 141				12/13/21 16:35	12/14/21 13:50	1
3C-1,2,3,4,7,8-HxCDF	92	cn	26 - 152				12/13/21 16:35	12/14/21 13:50	1
3C-1,2,3,4,7,8,9-HpCDF	92	cn	26 - 138				12/13/21 16:35	12/14/21 13:50	1
3C-1,2,3,6,7,8-HxCDD	86	cn	28 - 130				12/13/21 16:35	12/14/21 13:50	1
3C-1,2,3,6,7,8-HxCDF		cn	26 - 123					12/14/21 13:50	1
3C-1,2,3,7,8-PeCDD		cn	25 - 181					12/14/21 13:50	1
3C-1,2,3,7,8-PeCDF		cn	24 - 185					12/14/21 13:50	1
3C-1,2,3,7,8,9-HxCDD		cn	28 - 130					12/14/21 13:50	1
8C-1,2,3,7,8,9-HxCDF		cn	29 - 147					12/14/21 13:50	1
3C-2,3,4,6,7,8-HxCDF		cn	28 - 136					12/14/21 13:50	1
8C-2,3,4,7,8-PeCDF		cn	28 - 130 21 - 178					12/14/21 13:50	
3C-2,3,7,8-TCDD		cn	27 - 178 25 - 164					12/14/21 13:50	1
8C-2,3,7,8-TCDD 8C-2,3,7,8-TCDF		cn						12/14/21 13:50	1
8C-2,3,7,8-1CDF 8C-OCDD			24 - 169 17 - 157					12/14/21 13:50 12/14/21 13:50	1
3C-OCDD 3C-OCDF	87 89	cn	17 ₋ 157 17 - 157					12/14/21 13:50 12/14/21 13:50	1

Lab Sample ID: 410-66404-1

Matrix: Water

3

Client Sample ID: 1600428-TW1

Lab Sample ID: 410-66404-1

-						WHO 2	005		
						ND =	0		4
Analyte	Result	Qualifier	RL	EDL	Unit	TEF	TEQ	Method	
1,2,3,4,6,7,8-HpCDD	ND	cn	27	3.3	pg/L	0.01	0.00	1613B	5
1,2,3,4,6,7,8-HpCDF	ND	cn	27	0.068	pg/L	0.01	0.00	1613B	
1,2,3,4,7,8-HxCDD	ND	cn	27	0.12	pg/L	0.1	0.00	1613B	
1,2,3,4,7,8-HxCDF	ND	cn	27		pg/L	0.1	0.00	1613B	
1,2,3,4,7,8,9-HpCDF	0.31	JIcn	27	0.096	pg/L	0.01	0.0031	1613B	
1,2,3,6,7,8-HxCDD	ND	cn	27	0.12	pg/L	0.1	0.00	1613B	
1,2,3,6,7,8-HxCDF	ND	cn	27		pg/L	0.1	0.00	1613B	
1,2,3,7,8-PeCDD	ND	cn	27		pg/L	1	0.00	1613B	0
1,2,3,7,8-PeCDF	ND	cn	27		pg/L	0.03	0.00	1613B	
1,2,3,7,8,9-HxCDD	ND	cn	27		pg/L	0.1	0.00	1613B	
1,2,3,7,8,9-HxCDF	ND	cn	27		pg/L	0.1	0.00	1613B	
2,3,4,6,7,8-HxCDF	ND	cn	27		pg/L	0.1	0.00	1613B	
2,3,4,7,8-PeCDF	ND	cn	27		pg/L	0.3	0.00	1613B	
2,3,7,8-TCDD	ND	cn	4.3		pg/L	1	0.00	1613B	
2,3,7,8-TCDF	ND	cn	5.4		pg/L	0.1	0.00	1613B	
OCDD	0.75	JIcn	120	0.17		0.0003	0.00023	1613B	
OCDF	ND	cn	54	0.15	pg/L	0.0003	0.00	1613B	
-						WHO 2	005		
						ND =	0		
Analyte	Result	Qualifier	NONE	NONE	Unit	TEF	TEQ	Method	
Total Toxic Dioxins and Furans					pg/L		0.0033	TEQ	

TEF Reference:

WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners

Client Sample ID: Method Blank

Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters)

Lab Sample ID: MB 410-204823/1-A Matrix: Water

13C-OCDF

	023/1-A								
Matrix: Water								Prep Type: T	
Analysis Batch: 205076								Prep Batch:	204823
Analyte		MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	ND		25		pg/L			12/14/21 13:01	1
1,2,3,4,6,7,8-HpCDF	0.563	JI	25	0.079			12/13/21 16:35	12/14/21 13:01	1
1,2,3,4,7,8-HxCDD	ND		25		pg/L			12/14/21 13:01	1
1,2,3,4,7,8-HxCDF	ND		25		pg/L			12/14/21 13:01	1
1,2,3,4,7,8,9-HpCDF	ND		25		pg/L		12/13/21 16:35	12/14/21 13:01	1
1,2,3,6,7,8-HxCDD	ND		25		pg/L		12/13/21 16:35	12/14/21 13:01	1
1,2,3,6,7,8-HxCDF	2.57	JI	25		pg/L		12/13/21 16:35	12/14/21 13:01	1
1,2,3,7,8-PeCDD	0.623	JI	25		pg/L		12/13/21 16:35	12/14/21 13:01	1
1,2,3,7,8-PeCDF	ND		25	0.15	pg/L		12/13/21 16:35	12/14/21 13:01	1
1,2,3,7,8,9-HxCDD	ND		25	0.15	pg/L		12/13/21 16:35	12/14/21 13:01	1
1,2,3,7,8,9-HxCDF	ND		25	0.58	pg/L		12/13/21 16:35	12/14/21 13:01	1
2,3,4,6,7,8-HxCDF	ND		25	0.47	pg/L		12/13/21 16:35	12/14/21 13:01	1
2,3,4,7,8-PeCDF	ND		25	0.13	pg/L		12/13/21 16:35	12/14/21 13:01	1
2,3,7,8-TCDD	ND		4.0	0.22	pg/L		12/13/21 16:35	12/14/21 13:01	1
2,3,7,8-TCDF	ND		5.0	0.18	pg/L		12/13/21 16:35	12/14/21 13:01	1
OCDD	ND		110	0.19	pg/L		12/13/21 16:35	12/14/21 13:01	1
OCDF	ND		50	0.16	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total HpCDD	ND		25	0.80	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total HpCDF	0.563	JI	25	0.094	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total HxCDD	1.28	JI	25		pg/L		12/13/21 16:35	12/14/21 13:01	1
Total HxCDF	2.57	JI	25	0.49	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total PeCDD	0.623	JI	25	0.21	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total PeCDF	1.19	JI	25		pg/L		12/13/21 16:35	12/14/21 13:01	1
Total TCDD	ND		5.0	0.22	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total TCDF	ND		5.0	0.18	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total PCDD	1.90	JI	5.0	0.31	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total PCDF	4.32	JI	5.0	0.21	pg/L		12/13/21 16:35	12/14/21 13:01	1
Total PCDD/PCDF	6.22	I	5.0	0.26	pg/L		12/13/21 16:35	12/14/21 13:01	1
	MB	MB							
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	73		23 - 140					12/14/21 13:01	1
13C-1,2,3,4,6,7,8-HpCDF	86		28 - 143					12/14/21 13:01	1
13C-1,2,3,4,7,8-HxCDD	72		32 - 141				12/13/21 16:35	12/14/21 13:01	1
13C-1,2,3,4,7,8-HxCDF	79		26 - 152				12/13/21 16:35	12/14/21 13:01	1
13C-1,2,3,4,7,8,9-HpCDF	81		26 - 138				12/13/21 16:35	12/14/21 13:01	1
13C-1,2,3,6,7,8-HxCDD	77		28 - 130				12/13/21 16:35	12/14/21 13:01	1
13C-1,2,3,6,7,8-HxCDF	87		26 - 123				12/13/21 16:35	12/14/21 13:01	1
13C-1,2,3,7,8-PeCDD	54		25 - 181				12/13/21 16:35	12/14/21 13:01	1
13C-1,2,3,7,8-PeCDF	60		24 - 185				12/13/21 16:35	12/14/21 13:01	1
13C-1,2,3,7,8,9-HxCDD	70		28 - 130				12/13/21 16:35	12/14/21 13:01	1
13C-1,2,3,7,8,9-HxCDF	74		29 - 147				12/13/21 16:35	12/14/21 13:01	1
13C-2,3,4,6,7,8-HxCDF	73		28 - 136				12/13/21 16:35	12/14/21 13:01	1
13C-2,3,4,7,8-PeCDF	57		21 - 178				12/13/21 16:35	12/14/21 13:01	1
13C-2,3,7,8-TCDD	65		25 - 164				12/13/21 16:35	12/14/21 13:01	1
13C-2,3,7,8-TCDF	59		24 - 169				12/13/21 16:35	12/14/21 13:01	1
13C-OCDD	79		17 - 157				12/13/21 16:35	12/14/21 13:01	1
100 0005							10/10/01 10 05	10/11/01 10 01	4

12/13/21 16:35 12/14/21 13:01

17 - 157

83

1

5

Client Sample ID: Lab Control Sample

Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters) (Continued)

Lab Sample ID: LCS 410-204823/2-A	
Matrix: Water	

Matrix: Water	0-204023/2-A					Cile	ant Sai	inple iD	Prep Type: Total/NA
Analysis Batch: 205076									Prep Batch: 204823
Analysis Batch. 2030/10	,		Spike	LCS	LCS				%Rec.
Analyte			Added		Qualifier	Unit	D	%Rec	Limits
1,2,3,4,6,7,8-HpCDD			1000	970		pg/L		97	70 - 140
1,2,3,4,6,7,8-HpCDF			1000	991		pg/L		99	82 - 122
1,2,3,4,7,8-HxCDD			1000	1040		pg/L		104	70 - 164
1,2,3,4,7,8-HxCDF			1000	1040		pg/L		104	72 - 134
1,2,3,4,7,8,9-HpCDF			1000	967		pg/L		97	78 - 138
1,2,3,6,7,8-HxCDD			1000	1020		pg/L		102	76 - 134
1,2,3,6,7,8-HxCDF			1000	1000		pg/L		100	84 - 130
1,2,3,7,8-PeCDD			1000	1060		pg/L		106	70 - 142
1,2,3,7,8-PeCDF			1000	1040		pg/L		104	80 - 134
1,2,3,7,8,9-HxCDD			1000	1070		pg/L		107	64 - 162
1,2,3,7,8,9-HxCDF			1000	1010		pg/L		101	78 - 130
2,3,4,6,7,8-HxCDF			1000	996		pg/L		100	70 - 156
2,3,4,7,8-PeCDF			1000	1040		pg/L		104	68 - 160
2,3,7,8-TCDD			200	199		pg/L		100	67 - 158
2,3,7,8-TCDF			200	208		pg/L		104	75 - 158
OCDD			2000	1950		pg/L		97	78 - 144
OCDF			2000	2060		pg/L		103	63 - 170
	LCS	LCS				1.5			
Isotope Dilution	%Recovery		Limits						
13C-1,2,3,4,6,7,8-HpCDD	67		26 - 166						
13C-1,2,3,4,6,7,8-HpCDF	77		21 - 158						
13C-1,2,3,4,7,8-HxCDD	69		21 - 193						
13C-1,2,3,4,7,8-HxCDF	75		19 - 202						
13C-1,2,3,4,7,8,9-HpCDF	75		20 - 186						
13C-1,2,3,6,7,8-HxCDD	74		25 - 163						
13C-1,2,3,6,7,8-HxCDF	79		21 - 159						
13C-1,2,3,7,8-PeCDD	53		21 - 227						
13C-1,2,3,7,8-PeCDF	58		21 - 192						
13C-1,2,3,7,8,9-HxCDD	66		25 - 163						
13C-1,2,3,7,8,9-HxCDF	71		17 - 205						
13C-2,3,4,6,7,8-HxCDF	71		22 - 176						
13C-2,3,4,7,8-PeCDF	60		13 - 328						
13C-2,3,7,8-TCDD	64		20 - 175						
13C-2,3,7,8-TCDF	62		22 - 152						
13C-OCDD	74		13 - 199						
13C-OCDF	75		13 - 199						

Specialty Organics

Prep Batch: 204823

Job ID: 410-66404-1

6

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-66404-1	1600428-TW1	Total/NA	Water	1613B	
MB 410-204823/1-A	Method Blank	Total/NA	Water	1613B	
LCS 410-204823/2-A	Lab Control Sample	Total/NA	Water	1613B	
Analysis Batch: 205	076				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-66404-1	1600428-TW1	Total/NA	Water	1613B	204823
MB 410-204823/1-A	Method Blank	Total/NA	Water	1613B	204823
LCS 410-204823/2-A	Lab Control Sample	Total/NA	Water	1613B	204823

Matrix: Water

Lab Sample ID: 410-66404-1

Client Sample ID: 1600428-TW1 Date Collected: 12/07/21 00:00 Date Received: 12/10/21 09:56

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			204823	12/13/21 16:35	X5YV	ELLE
Total/NA	Analysis	1613B		1	205076	12/14/21 13:50	RGA5	ELLE

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Client: Eurofins Environment Testing Canada Project/Site: 1968225-PH4398

Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters)

Matrix: Water

Prep Type: Total/NA

5

			Perce	ent Isotope	Dilution Re	covery (Ac	ceptance L	imits)	
		HpCDD	HpCDF	HxCDD	HxCDF	HpCDF2	HxDD	HxDF	PeCDD
Lab Sample ID	Client Sample ID	(23-140)	(28-143)	(32-141)	(26-152)	(26-138)	(28-130)	(26-123)	(25-181)
410-66404-1	1600428-TW1	81 cn	94 cn	84 cn	92 cn	92 cn	86 cn	93 cn	61 cn
MB 410-204823/1-A	Method Blank	73	86	72	79	81	77	87	54
			Perce	ent Isotope	Dilution Re	covery (Ac	ceptance L	imits)	
		PeCDF	13CHxCD	HxCF	13CHxCF	PeCF	TCDD	TCDF	OCDD
Lab Sample ID	Client Sample ID	(24-185)	(28-130)	(29-147)	(28-136)	(21-178)	(25-164)	(24-169)	(17-157)
410-66404-1	1600428-TW1	65 cn	82 cn	85 cn	85 cn	66 cn	70 cn	70 cn	87 cn
MB 410-204823/1-A	Method Blank	60	70	74	73	57	65	59	79
			Perce	ent Isotope	Dilution Re	covery (Ac	ceptance L	imits)	
		OCDF				• •	-		
Lab Sample ID	Client Sample ID	(17-157)							
410-66404-1	1600428-TW1	89 cn							
MB 410-204823/1-A	Method Blank	83							
Surrogate Legend									
HpCDD = 13C-1,2,3,4	4,6,7,8-HpCDD								
HpCDF = 13C-1,2,3,4	4,6,7,8-HpCDF								
HxCDD = 13C-1,2,3,4	1,7,8-HxCDD								
HxCDF = 13C-1,2,3,4	I,7,8-HxCDF								
HpCDF2 = 13C-1,2,3	,4,7,8,9-HpCDF								
HxDD = 13C-1,2,3,6,	7,8-HxCDD								
HxDF = 13C-1,2,3,6,7	7,8-HxCDF								
PeCDD = 13C-1,2,3,7	7,8-PeCDD								
PeCDF = 13C-1,2,3,7	7,8-PeCDF								
13CHxCD = 13C-1,2,	3,7,8,9-HxCDD								

HxCF = 13C-1,2,3,7,8,9-HxCDF 13CHxCF = 13C-2,3,4,6,7,8-HxCDF

PeCF = 13C-2,3,4,7,8-PeCDF

TCDD = 13C-2,3,7,8-TCDD

TCDF = 13C-2,3,7,8-TCDF OCDD = 13C-OCDD

OCDF = 13C-OCDF

Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters)

Matrix: Water

Prep Type: Total/NA

_			Perce	ent Isotope	Dilution Re	covery (Ac	ceptance L	imits)	
		HpCDD	HpCDF	HxCDD	HxCDF	HpCDF2	HxDD	HxDF	PeCDD
Lab Sample ID	Client Sample ID	(26-166)	(21-158)	(21-193)	(19-202)	(20-186)	(25-163)	(21-159)	(21-227)
LCS 410-204823/2-A	Lab Control Sample	67	77	69	75	75	74	79	53
			Perce	ent Isotope	Dilution Re	covery (Ac	ceptance L	imits)	
		PeCDF	13CHxCD	HxCF	13CHxCF	PeCF	TCDD	TCDF	OCDD
Lab Sample ID	Client Sample ID	(21-192)	(25-163)	(17-205)	(22-176)	(13-328)	(20-175)	(22-152)	(13-199)
LCS 410-204823/2-A	Lab Control Sample	58	66	71	71	60	64	62	74
			Perce	ent Isotope	Dilution Re	covery (Ac	ceptance L	imits)	
		OCDF							
Lab Sample ID	Client Sample ID	(13-199)							
LCS 410-204823/2-A	Lab Control Sample	75							
Surrogate Legend									

HpCDD = 13C-1,2,3,4,6,7,8-HpCDD

Isotope Dilution Summary

Client: Eurofins Environment Testing Canada Project/Site: 1968225-PH4398 HpCDF = 13C-1,2,3,4,6,7,8-HpCDF HxCDD = 13C-1,2,3,4,7,8-HxCDD HxCDF = 13C-1,2,3,4,7,8-HxCDF HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF HxDD = 13C-1,2,3,6,7,8-HxCDD HxDF = 13C-1,2,3,6,7,8-HxCDF PeCDD = 13C-1,2,3,7,8-PeCDD PeCDF = 13C-1,2,3,7,8-PeCDF 13CHxCD = 13C-1,2,3,7,8,9-HxCDD HxCF = 13C-1,2,3,7,8,9-HxCDF 13CHxCF = 13C-2,3,4,6,7,8-HxCDF PeCF = 13C-2,3,4,7,8-PeCDF TCDD = 13C-2,3,7,8-TCDD TCDF = 13C-2,3,7,8-TCDF OCDD = 13C-OCDD OCDF = 13C-OCDF

Accreditation/Certification Summary

Client: Eurofins Environment Testing Canada Project/Site: 1968225-PH4398

Laboratory: Eurofins Lancaster Laboratories Env, LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

5 6

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Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	1.01	11-30-22
2LA	ISO/IEC 17025	0001.01	11-30-22
laska	State	PA00009	06-30-22
laska (UST)	State	17-027	02-28-22
rizona	State	AZ0780	03-12-22
rkansas DEQ	State	88-0660	08-10-22
alifornia	State	2792	02-02-22
olorado	State	PA00009	06-30-22
onnecticut	State	PH-0746	06-30-23
E Haz. Subst. Cleanup Act (HSCA)	State	019-006 (PA cert)	01-31-22
elaware (DW)	State	N/A	02-01-22
orida	NELAP	E87997	06-30-22
eorgia (DW)	State	C048	01-31-22
awaii	State	N/A	01-31-22
nois	NELAP	200027	01-31-23
Va	State	361	03-02-22
ansas	NELAP	E-10151	10-31-22
entucky (DW)	State	KY90088	01-01-22
entucky (UST)	State	1.01	11-30-22
entucky (WW)	State	KY90088	12-31-21
uisiana	NELAP	02055	06-30-22
line	State	2019012	03-12-22
ryland	State	100	06-30-22
ssachusetts	State	M-PA009	06-30-22
higan	State	9930	01-31-22
inesota	NELAP	042-999-487	12-31-22
souri	State	450	01-31-25
ntana (DW)	State	0098	01-01-22
braska	State	NE-OS-32-17	01-31-22
w Hampshire	NELAP	2730	01-10-22
v Jersey	NELAP	PA011	06-30-22
w York	NELAP	10670	04-01-22
rth Carolina (DW)	State	42705	07-31-22
th Carolina (WW/SW)	State	521	12-31-21
rth Dakota	State	R-205	01-31-22
klahoma	NELAP	R-205	01-31-22
egon	NELAP	PA200001	08-31-22
egon LA	Canada	1978	09-11-22
LA nnsylvania	NELAP	36-00037	09-16-24
ode Island	State	LAO00338	01-31-22
uth Carolina	State	89002002	01-31-22
inessee	State	02838	01-31-22
kas	NELAP	T104704194-21-40	08-31-22
ah	NELAP	PA000092019-16	03-01-22
ermont	State	VT - 36037	10-28-22
rginia	NELAP	460182	06-14-22
-			04-12-22
			12-31-21
-			12-31-21
rginia ashington est Virginia (DW) est Virginia DEP yoming	NELAP State State State State	460182 C457 9906 C 055 8TMS-L	04- 12-

Accreditation/Certification Summary Client: Eurofins Environment Testing Canada Job ID: 410-66404-1										
Project/Site: 1968225-PH4	1398			2						
· · · · · · · · · · · · · · · · · · ·	B Lancaster Laboratories E and by this laboratory are listed. Not all ac		o this report.	3						
Authority	Program	Identification Number	Expiration Date	4						
Wyoming (UST)	A2LA	1.01	11-30-22	5						
				6						
				8						

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	CLIENT INFORMATION						u, on, nat	INVOICE INFORM											y	'ES 🗌	NO 🗌)	
Company: Shoroh	ins Ortau	JA		1				Company: 410-66404 Chain of							ain of	Custod	У	DACIDAL				
Contact: Rebect	a Roshy		_					Contact:							-	Email:	***					
Address:	đ			Address:											Email:	#2:		-				
Telephone:	Cell:							Telepho	ne:							PO #:						
Email: #1:					4							RI	GUL	ATION	I/GUI	DELIN	NE RE	QUIRE	D	6 6		100
Email: #2:	14					5			Sanitary	Sewer, C	lty:				-		O. Re	eg 153				-
Project: 968	225-PH430	8	Quote #	:					Storm Se	wer, City	/:				-			sults from th	163	Table #	, Coarse / Fine, subsurface	, Surface /
	TURN-AROUND TIME (Business								ODWSO	G (Use D)	W CoC If	analyzing	drinking	water)		Record	of Site Con 53/04. Ana	dition (RSC) lysis of full pa	under		nd / Res-Park / A Other / Sedimen	
1 Day* (100%)		ys (25%)			5-7 Da	ys (Stand	lard)		PWQO								Yes	oniy No				
*For results reported	Please contact Lab in advance to determine rush av d after rush due date, surcharges will apply: before :			12:00 - 50	1%.		_		O.Reg 34	7							O. Reg	406 Exc	cess Soi	ls		
**For results reported	ed after rush due date, surcharges will apply: before	12:00 - 50)%, after	12:00 - 25	%.				Other: _							Та	ible # T	Fu Type: Com-			ng/mSPLP Leach All Other	hate
		Cample	Details	1			-											Catego	ory: Surfa	ce /Subsur	lace	
	g transport should be less than 10°C. Sample(s) ated or agreed upon with the Laboratory. Note	Field Filt	-	T				1			1	2)	1								RN#	
that this COC is not to be used for drinkli	ng water samples. The COC must be complete III be a \$25 surcharge if required information is					O.Re	g.153 par	ameters	1 6		2	5								(Lab Use Only)	
	leids are shaded in grey).	trix	Ders						rganic		1-	R										
		e Ma	ontair	E -					oul +	luos)č.	E										
Sample ID	Date/Time Collected	Sample Matrix	# of Containers	PHC F1	BTEX	VOC	PAHs	PCB.	Metals + Inorgani	Metals only	5-	F										
60042	87122021	W	2		-							-										
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PRINT					SIGN					DATE	/TIME		TEM	IP (°C)	сомм	ENTS:						
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Received By: 401 Magnetic Drive,	<i>Foreman</i> Unit #1, North York, ON, M3J 3H9 - Telephone: 4	16-661-52	287 🧲	-380 Van	sickle Roa	ad, Unit #	630, St. C	atharines,	ON, 1250	110/2 185 - Tele	phone: 9	05-680-8	1			DDY SEA1		YES 2R9 - Tele		513-634-93	L	V No VA
Page of	a los rempe							0000.8								3						v - Samnle
TOVS	- or TAYS Code 11 10 Page 15 of 17 Copies: White - Laboratory, Yellow - Sample 12/15/2021																					

12/15/2021

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Page 15 of 17

Login Sample Receipt Checklist

Client: Eurofins Environment Testing Canada

Login Number: 66404 List Number: 1 Creator: Bryan, Debra A

Question	Answer	Comment
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	No ice present, no attempt to chill
Cooler Temperature is acceptable (=6C, not frozen).</td <td>False</td> <td>Refer to Job Narrative for details.</td>	False	Refer to Job Narrative for details.
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (=6C, not frozen).</td <td>True</td> <td></td>	True	
WV: Container Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	

List Source: Eurofins Lancaster Laboratories Env, LLC

Job Number: 410-66404-1

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Qualifiers

Abbreviation	These commonly used abbreviations may or may not be present in this report.	
Glossary		7
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.	
I	Value is EMPC (estimated maximum possible concentration).	
cn	Refer to Case Narrative for further detail	5
В	Compound was found in the blank and sample.	_
Dioxin Qualifier	Qualifier Description	
Qualifiers		3

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.			
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis			
%R	Percent Recovery			
1C	Result is from the primary column on a dual-column method.			
2C	Result is from the confirmation column on a dual-column method.			
CFL	Contains Free Liquid			
CFU	Colony Forming Unit			
CNF	Contains No Free Liquid			
DER	Duplicate Error Ratio (normalized absolute difference)			
Dil Fac	Dilution Factor			
DL	Detection Limit (DoD/DOE)			
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample			
DLC	Decision Level Concentration (Radiochemistry)			
EDL	Estimated Detection Limit (Dioxin)			
LOD	Limit of Detection (DoD/DOE)			
LOQ	Limit of Quantitation (DoD/DOE)			
MCL	EPA recommended "Maximum Contaminant Level"			
MDA	Minimum Detectable Activity (Radiochemistry)			
MDC	Minimum Detectable Concentration (Radiochemistry)			
MDL	Method Detection Limit			
ML	Minimum Level (Dioxin)			
MPN	Most Probable Number			
MQL	Method Quantitation Limit			
NC	Not Calculated			
ND	Not Detected at the reporting limit (or MDL or EDL if shown)			
NEG	Negative / Absent			
POS	Positive / Present			
PQL	Practical Quantitation Limit			
PRES	Presumptive			
QC	Quality Control			
RER	Relative Error Ratio (Radiochemistry)			
RL	Reporting Limit or Requested Limit (Radiochemistry)			
RPD	Relative Percent Difference, a measure of the relative difference between two points			
TEF	Toxicity Equivalent Factor (Dioxin)			
TEQ	Toxicity Equivalent Quotient (Dioxin)			
TNTC	Too Numerous To Count			



Certificate of Analysis

Environment Testing

Client:	Paterson Group
	154 Colonnade Rd. South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Kirby Magee-Dittburner
Invoice to:	Paterson Group
PO#:	33461

Report Number: 1968398 Date Submitted: Date Reported: Project: COC #: Temperature (C): 19 Custody Seal:

2021-12-09 2021-12-21 PH4398 884073

Page 1 of 11

Dear Kirby Magee-Dittburner:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

Long Qu, Organics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated

Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accrteditation. The scope is available at http://www.cala.ca/scopes/2602.pdf

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.



Certificate of Analysis

Environment Testing

Paterson Group
154 Colonnade Rd. South
Nepean, ON
K2E 7T7
Mr. Kirby Magee-Dittburner
33461
Paterson Group

 Report Number:
 1968398

 Date Submitted:
 2021-12-09

 Date Reported:
 2021-12-21

 Project:
 PH4398

 COC #:
 884073

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

Certificate of Analysis

Environment Testing

Client:	Paterson Group
	154 Colonnade Rd. South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Kirby Magee-Dittburner
PO#:	33461
Invoice to:	Paterson Group

Report Number:	1968398
Date Submitted:	2021-12-09
Date Reported:	2021-12-21
Project:	PH4398
COC #:	884073

Guideline = O.Reg 1	53-T1-Ground	dwater	San San	Lab I.D. Sample Matrix Sample Type Sample Date		1600847 GW153	1600848 GW153	1600849 GW153
<u>Metals</u>			San	nple Date npling Time nple I.D.	2021-12-08 TW2	2021-12-08 TW3	2021-12-08 BH1	2021-12-08 BH2
Analyte	Batch No	MRL	Units	Guideline			Bill	DITE
Antimony	413977	0.5	ug/L	STD 1.5	<0.5	<0.5	<0.5	<0.5
Arsenic	413977	1	ug/L	STD 13	<1	<1	<1	<1
Barium	413977	10	ug/L	STD 610	240	230	250	220
Beryllium	413977	0.5	ug/L	STD 0.5	<0.5	<0.5	<0.5	<0.5
Boron (total)	413977	10	ug/L	STD 1700	130	130	70	50
Cadmium	413977	0.1	ug/L	STD 0.5	<0.1	<0.1	<0.1	<0.1
Chromium Total	413977	1	ug/L	STD 11	<1	<1	<1	<1
Chromium VI	413883	10	ug/L	STD 25	<10	<10	<10	<10
Cobalt	413977	0.2	ug/L	STD 3.8	<0.2	<0.2	0.2	<0.2
Copper	413977	1	ug/L	STD 5	2	2	<1	<1
Lead	413977	1	ug/L	STD 1.9	<1	<1	<1	<1
Mercury	414089	0.1	ug/L	STD 0.1	<0.1	<0.1	<0.1	
	414172	0.1	ug/L	STD 0.1				<0.1
Molybdenum	413977	5	ug/L	STD 23	<5	<5	<5	<5
Nickel	413977	5	ug/L	STD 14	<5	<5	<5	<5
Selenium	413977	1	ug/L	STD 5	<1	<1	<1	<1
Silver	413977	0.1	ug/L	STD 0.3	<0.1	<0.1	<0.1	<0.1
Sodium	413967	2000	ug/L	STD 490000	22000	28000	12000	8000
Thallium	413977	0.1	ug/L	STD 0.5	<0.1	<0.1	<0.1	<0.1
Uranium	413977	1	ug/L	STD 8.9	2	3	2	2
Vanadium	413977	1	ug/L	STD 3.9	<1	<1	2	<1
Zinc	413977	10	ug/L	STD 160	<10	<10	<10	<10

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

Certificate of Analysis

Environment Testing

Client:	Paterson Group
	154 Colonnade Rd. South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Kirby Magee-Dittburner
PO#:	33461
Invoice to:	Paterson Group

Report Number: Date Submitted: Date Reported: Project: COC #:

1968398 2021-12-09 2021-12-21 PH4398 884073

Buideline = O.Reg 153-T1-Groundwater			San San San San	Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.		1600847 GW153 2021-12-08 TW3	1600848 GW153 2021-12-08 BH1	1600849 GW153 2021-12-08 BH2
Analyte	Batch No	MRL	Units	Guideline	TW2			
1+2-methylnaphthalene	414118	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
Acenaphthene	413207	0.1	ug/L	STD 4.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	413207	0.1	ug/L	STD 1	<0.1	<0.1	<0.1	<0.1
Anthracene	413207	0.1	ug/L	STD 0.1	<0.1	<0.1	<0.1	<0.1
Benz[a]anthracene	413207	0.1	ug/L	STD 0.2	<0.1	<0.1	<0.1	<0.1
Benzo[a]pyrene	413207	0.01	ug/L	STD 0.01	<0.01	<0.01	<0.01	<0.01
Benzo[b]fluoranthene	413207	0.05	ug/L	STD 0.1	<0.05	<0.05	<0.05	<0.05
Benzo[ghi]perylene	413207	0.1	ug/L	STD 0.2	<0.1	<0.1	<0.1	<0.1
Benzo[k]fluoranthene	413207	0.05	ug/L	STD 0.1	<0.05	<0.05	<0.05	<0.05
Chrysene	413207	0.05	ug/L	STD 0.1	<0.05	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	413207	0.1	ug/L	STD 0.2	<0.1	<0.1	<0.1	<0.1
Fluoranthene	413207	0.1	ug/L	STD 0.4	<0.1	<0.1	<0.1	<0.1
Fluorene	413207	0.1	ug/L	STD 120	<0.1	<0.1	<0.1	<0.1
Indeno[1 2 3-cd]pyrene	413207	0.1	ug/L	STD 0.2	<0.1	<0.1	<0.1	<0.1
Methlynaphthalene, 1-	413207	0.1	ug/L	STD 2	<0.1	<0.1	<0.1	<0.1
Methlynaphthalene, 2-	413207	0.1	ug/L	STD 2	<0.1	<0.1	<0.1	<0.1
Naphthalene	413207	0.1	ug/L	STD 7	<0.1	<0.1	<0.1	<0.1
Phenanthrene	413207	0.1	ug/L	STD 0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	413207	0.1	ug/L	STD 0.2	<0.1	<0.1	<0.1	<0.1

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Certificate of Analysis

Environment Testing

Client:	Paterson Group
	154 Colonnade Rd. South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Kirby Magee-Dittburner
PO#:	33461
Invoice to:	Paterson Group

Guideline = O.Reg 153-T1-Groundwater

Dittburner			COC #:		884073	
-Groundwater	Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time	1600846 GW153 2021-12-08	1600847 GW153 2021-12-08	1600848 GW153 2021-12-08	1600849 GW153 2021-12-08	

Report Number:

Date Submitted:

Date Reported:

Project:

1968398

PH4398

2021-12-09

2021-12-21

		Sample I.D.				TW3	BH1	BH2
Analyte	Batch No	MRL	Units	Guideline				
Benzene	413921	0.5	ug/L	STD 0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	413921	0.5	ug/L	STD 0.5	<0.5	<0.5	<0.5	<0.5
Toluene	413921	0.5	ug/L	STD 0.8	<0.5	<0.5	<0.5	<0.5
Xylene Mixture	413921	0.5	ug/L	STD 72	<0.5	<0.5	<0.5	<0.5
Xylene, m/p-	413921	0.4	ug/L		<0.4	<0.4	<0.4	<0.4
Xylene, o-	413921	0.4	ug/L		<0.4	<0.4	<0.4	<0.4

<u>PCBs</u>			Sam Sam Sam	I.D. ple Matrix ple Type ple Date pling Time ple I.D.	1600846 GW153 2021-12-08 TW2	1600847 GW153 2021-12-08 TW3	1600848 GW153 2021-12-08 BH1	1600849 GW153 2021-12-08 BH2
Analyte	Batch No	MRL	Units	Guideline				
Aroclor 1016	414140	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
Aroclor 1242	414140	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
Aroclor 1248	414140	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
Aroclor 1254	414140	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
Aroclor 1260	414140	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
Polychlorinated Biphenyls	414140	0.1	ug/L	STD 0.2	<0.1	<0.1	<0.1	<0.1

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Certificate of Analysis

Environment Testing

Client:	Paterson Group
	154 Colonnade Rd. South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Kirby Magee-Dittburner
PO#:	33461
Invoice to:	Paterson Group

Report Number:	1968398
Date Submitted:	2021-12-09
Date Reported:	2021-12-21
Project:	PH4398
COC #:	884073

Guideline = 0 Reg 153								
Guideline = O.Reg 153-T1-Groundwater				I.D.	1600846	1600847	1600848	1600849
		nple Matrix nple Type	GW153	GW153	GW153	GW153		
PCB Surrogate	San	nple Date npling Time	2021-12-08	2021-12-08	2021-12-08	2021-12-08		
	Sample I.D.		TW2	TW3	BH1	BH2		
Analyte	Batch No	MRL	Units	Guideline				
Decachlorobiphenyl	414143	0	%		69	117	69	62

<u>VOCs Surrogates</u>			Sam Sam Sam	I.D. pple Matrix pple Type pple Date ppling Time pple I.D.	1600846 GW153 2021-12-08 TW2	1600847 GW153 2021-12-08 TW3	1600848 GW153 2021-12-08 BH1	1600849 GW153 2021-12-08 BH2
Analyte	Batch No	MRL	Units	Guideline				
Toluene-d8	413921	0	%		98	97	100	99

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Certificate of Analysis

Environment Testing

Client:	Paterson Group
	154 Colonnade Rd. South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Kirby Magee-Dittburner
PO#:	33461
Invoice to:	Paterson Group

Report Number:19Date Submitted:20Date Reported:20Project:PHCOC #:88

1968398 2021-12-09 2021-12-21 PH4398 884073

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
413207	Methlynaphthalene, 1-	<0.1 ug/L	100	50-140		50-140		0-30
413207	Methlynaphthalene, 2-	<0.1 ug/L	100	50-140		50-140		0-30
413207	Acenaphthene	<0.1 ug/L	102	50-140		50-140		0-30
413207	Acenaphthylene	<0.1 ug/L	100	50-140		50-140		0-30
413207	Anthracene	<0.1 ug/L	100	50-140		50-140		0-30
413207	Benz[a]anthracene	<0.1 ug/L	84	50-140		50-140		0-30
413207	Benzo[a]pyrene	<0.01 ug/L	95	50-140		50-140		0-30
413207	Benzo[b]fluoranthene	<0.05 ug/L	99	50-140		50-140		0-30
413207	Benzo[ghi]perylene	<0.1 ug/L	100	50-140		50-140		0-30
413207	Benzo[k]fluoranthene	<0.05 ug/L	104	50-140		50-140		0-30
413207	Chrysene	<0.05 ug/L	111	50-140		50-140		0-30
413207	Dibenz[a h]anthracene	<0.1 ug/L	82	50-140		50-140		0-30
413207	Fluoranthene	<0.1 ug/L	94	50-140		50-140		0-30
413207	Fluorene	<0.1 ug/L	96	50-140		50-140		0-30
413207	Indeno[1 2 3-cd]pyrene	<0.1 ug/L	92	50-140		50-140		0-30
413207	Naphthalene	<0.1 ug/L	104	50-140		50-140		0-30
413207	Phenanthrene	<0.1 ug/L	102	50-140		50-140		0-30
413207	Pyrene	<0.1 ug/L	94	50-140		50-140		0-30
413883	Chromium VI	<10 ug/L	94	80-120	88	70-130	0	0-35
413921	Benzene	<0.5 ug/L	88	60-130	101	50-140	0	0-30
413921	Ethylbenzene	<0.5 ug/L	82	60-130	90	50-140	0	0-30
413921	Xylene, m/p-	<0.4 ug/L	84	60-130	97	50-140	0	0-30
413921	Xylene, o-	<0.4 ug/L	91	60-130	97	50-140	0	0-30
413921	Toluene	<0.5 ug/L	88	60-130	102	50-140	0	0-30
413921	Xylene Mixture	<0.5 ug/L						
413967	Sodium	<2000 ug/L	108	82-118	80	80-120	0	0-20
413977	Silver	<0.1 ug/L	111	80-120	124	70-130	17	0-20
413977	Arsenic	<1 ug/L	101	80-120	116	70-130	0	0-20
413977	Boron (total)	<10 ug/L	110	80-120		80-120	0	0-20
413977	Barium	<10 ug/L	90	80-120	13	70-130	0	0-20
413977	Beryllium	<0.5 ug/L	116	80-120	120	70-130	0	0-20
413977	Cadmium	<0.1 ug/L	105	80-120	122	70-130	0	0-20
413977	Cobalt	<0.2 ug/L	97	80-120	97	70-130	0	0-20

Quality Assurance Summary

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

Certificate of Analysis

Environment Testing

Client:	Paterson Group
	154 Colonnade Rd. South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Kirby Magee-Dittburner
PO#:	33461
Invoice to:	Paterson Group

Report Number:196Date Submitted:202Date Reported:202Project:PHCOC #:884

1968398 2021-12-09 2021-12-21 PH4398 884073

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
413977	Chromium Total	<1 ug/L	96	80-120	103	70-130	0	0-20
413977	Copper	<1 ug/L	102	80-120	92	70-130	2	0-20
413977	Molybdenum	<5 ug/L	94	80-120	103	70-130	0	0-20
413977	Nickel	<5 ug/L	106	80-120	100	70-130	0	0-20
413977	Lead	<1 ug/L	89	80-120	93	70-130	0	0-20
413977	Antimony	<0.5 ug/L	107	80-120	111	70-130	0	0-20
413977	Selenium	<1 ug/L	114	80-120	142	70-130	0	0-20
413977	Thallium	<0.1 ug/L	91	80-120	96	70-130	0	0-20
413977	Uranium	<1 ug/L	92	80-120	107	70-130	0	0-20
413977	Vanadium	<1 ug/L	98	80-120	107	70-130	0	0-20
413977	Zinc	<10 ug/L	113	80-120	137	70-130	0	0-20
414089	Mercury	<0.1 ug/L	98	76-123	96	70-130	0	0-20
414118	1+2-methylnaphthalene							
414140	Aroclor 1016	<0.1 ug/L	120		N/A		N/A	
414140	Aroclor 1242	<0.1 ug/L	120	60-140	N/A	60-140	N/A	0-30
414140	Aroclor 1248	<0.1 ug/L	120	60-140	N/A	60-140	N/A	0-30
414140	Aroclor 1254	<0.1 ug/L	120	60-140	N/A	60-140	N/A	0-30
414140	Aroclor 1260	<0.1 ug/L	120	60-140	N/A	60-140	N/A	0-30
414140	Polychlorinated Biphenyls	<0.1 ug/L	120	60-140		60-140		0-30
414172	Mercury	<0.1 ug/L	118	76-123	91	70-130	0	0-20

Quality Assurance Summary

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Certificate of Analysis

Environment Testing

Client:	Paterson Group
	154 Colonnade Rd. South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Kirby Magee-Dittburner
PO#:	33461
Invoice to:	Paterson Group

Report Number:196Date Submitted:202Date Reported:202Project:PHCOC #:884

1968398 2021-12-09 2021-12-21 PH4398 884073

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
413207	Methlynaphthalene, 1-	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Methlynaphthalene, 2-	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Acenaphthene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Acenaphthylene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Anthracene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Benz[a]anthracene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Benzo[a]pyrene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Benzo[b]fluoranthene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Benzo[ghi]perylene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Benzo[k]fluoranthene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Chrysene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Dibenz[a h]anthracene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Fluoranthene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Fluorene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Indeno[1 2 3-cd]pyrene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Naphthalene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Phenanthrene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413207	Pyrene	GC-MS	2021-12-14	2021-12-14	C_M	P 8270
413883	Chromium VI		2021-12-10	2021-12-10	SKH	SM 3500-Cr B
413921	Benzene	GC-MS	2021-12-03	2021-12-11	YH	EPA 8260
413921	Ethylbenzene	GC-MS	2021-12-03	2021-12-11	ΥH	EPA 8260
413921	Xylene, m/p-	GC-MS	2021-12-03	2021-12-11	YH	EPA 8260
413921	Xylene, o-	GC-MS	2021-12-03	2021-12-11	ΥH	EPA 8260
413921	Toluene	GC-MS	2021-12-03	2021-12-11	YH	EPA 8260
413921	Xylene Mixture	GC-MS	2021-12-13	2021-12-13	ΥH	EPA 8260
413967	Sodium	ICP-OES	2021-12-13	2021-12-13	Z_S	M SM3120B-3500C
413977	Silver	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Arsenic	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Boron (total)	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Barium	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Beryllium	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Cadmium	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Cobalt	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8

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Certificate of Analysis

Environment Testing

Client:	Paterson Group
	154 Colonnade Rd. South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Kirby Magee-Dittburner
PO#:	33461
Invoice to:	Paterson Group

 Report Number:
 1968398

 Date Submitted:
 2021-12-09

 Date Reported:
 2021-12-21

 Project:
 PH4398

 COC #:
 884073

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
413977	Chromium Total	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Copper	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Molybdenum	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Nickel	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Lead	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Antimony	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Selenium	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Thallium	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Uranium	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Vanadium	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
413977	Zinc	ICAPQ-MS	2021-12-13	2021-12-13	SD	EPA 200.8
414089	Mercury	CV AA	2021-12-14	2021-12-14	AaN	M SM3112B-3500B
414118	1+2-methylnaphthalene	GC-MS	2021-12-15	2021-12-15	C_M	P 8270
414140	Aroclor 1016	GC/ECD	2021-12-14	2021-12-15	ZoB	EPA 8081B
414140	Aroclor 1242	GC/ECD	2021-12-14	2021-12-15	ZoB	EPA 8081B
414140	Aroclor 1248	GC/ECD	2021-12-14	2021-12-15	ZoB	EPA 8081B
414140	Aroclor 1254	GC/ECD	2021-12-14	2021-12-15	ZoB	EPA 8081B
414140	Aroclor 1260	GC/ECD	2021-12-14	2021-12-15	ZoB	EPA 8081B
414140	Polychlorinated Biphenyls	GC/ECD	2021-12-14	2021-12-15	ZoB	EPA 8081B
414172	Mercury	CV AA	2021-12-15	2021-12-15	AaN	M SM3112B-3500B

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Certificate of Analysis

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	154 Colonnade Rd. South
	Nepean, ON
	K2E 7T7
Attention:	Mr. Kirby Magee-Dittburner
PO#:	33461
Invoice to:	Paterson Group

Report Number:1968Date Submitted:202'Date Reported:202'Project:PH4COC #:8840

1968398 2021-12-09 2021-12-21 PH4398 884073

CWS for Petroleum Hydrocarbons in Soil - Tier 1

Notes:

- 1. The laboratory method complies with CCME Tier 1 reference method for PHC in soil. It is validated for laboratory use.
- 2. Where the F1 fraction (C6 to C10) and BTEX are both measured, F1-BTEX is reported.
- 3. Where the F2 fraction (C10 to C16) and naphthalene are both measured, F2-naphthalene is reported.
- 4. Where the F3 fraction (C16 to C34) and PAHs* are both measured, F3-PAH is reported.
- 5. F4G is analyzed if the chromatogram does not descend to baseline before C50. Where F4 (C34 to C50) and F4G are both reported, the higher result is compared to the standard.
- 6. Unless otherwise stated in the sample comments, the following criteria have been met where applicable:

- nC6 and nC10 response factors within 30% of response factor for toluene;

- nC10, nC16, and nC34 response factors within 10% of each other;
- C50 response factors within 70% of nC10 + nC16 + nC34 average; and,
- Linearity is within 15%.
- 7. Unless otherwise stated in the sample comments, sampling requirements and analytical holding times have been met.
- 8. Gravimetric heavy hydrocarbons (F4G) cannot be added to the C6 and C50 hydrocarbons.
- 9. *PAHs = phenanthrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene and pyrene.

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

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884073

STANDARD CHAIN-OF-CUSTODY

Eurofins Workorder #:_____

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

		CLIENT INFORMATIO	N				1				CE IN			N (SA	ME A	S CLI	ENTI	NFOR	MAT	ON:	YES 🖌 NO 🚺)
Company:	Paterson Group			112		in the			Compa	ny:							Fax:				
Contact:	Kirby Magee-Dittbu	rner							Contac	t:							Email:	#1:			
Address:	154 Colonnade Roa	ad South							Addres	s:							Email:	#2:			
Telephone:	613-218-3444	Cell:							Teleph	one:		and the state				-	PO #:	33	461		
Email:	#1: eardley@paterso	ongroup.ca, mlaflamme@pat	ersongr	oup.ca	a				1				R	EGUL	ATIO	V/GU	IDELI			ED	
Email:		ner@patersongroup.ca		Sec.		-				Sanitar	y Sewer, (City: Ott						O. Reg			
Project:	PH4398	ine Cpateroongroupieu		Quote	#:				IH		iewer, Cit					_	1	1001-00			
		URN-AROUND TIME (Busine	ss Davs							ODWSC						_	h				/ Fine, Surface / subsurface. / Agri / GW / All Other / Sediment
1 Da			Days (25%)			√ 5-	7 Days (S	tandard)		PWQO								Excess S	oil, Table		Type:
		ease contact Lab in advance to determine rus ter rush due date, surcharges will apply: befo			12:00 - 5	0%.			10	O. Reg	347/558										
		fter rush due date, surcharges will apply: bef								Other:							The				ubmission will form part of a formal
			190							None								Record	d of Site	ondition Yes	n (RSC) under O.Reg. 153/04 No
		ansport should be less than 10°C. Sample	s)	e Details		1	I III	in the			Samp	le Anal	ysis Requ	ired							
and the second second second second second second second second second second second second second second second		l or agreed upon with the Laboratory. Not ter samples. The COC must be complete up	e	lered>		101/52	O.Re	g.153 pa	rameters		Sec. 1	1 7		1		10	1000	9	0	1	RN# (Lab Use Only)
submission of	the samples, there will be a \$25 (required fields are	surcharge if required information is missi shaded in grey).	ng x	2		- 11				anics		ded p	C only			Metals			uran		
Daily .			Matri	Itaine	I					Inorg	Vino	tacher	division S					mir	S&F		S. 37
Sample ID		Date/Time Collected	ample	of Contair	HCFI	BTEX	8	PAHS	B	etals +	letais	See at	Subdiv Bacti 2	ISS	H	Total	Рd	Chromium	Dioxin		Sec. Sec.
Sample ID	TW2	December 8, 2021	GW	#	-					2	2				F	1					1600846
	TW3	December 8, 2021	GW	1	F		H		V		H		H	H	H		7	7	7	H	
	BH1	December 8, 2021	GW	1	F		H		V	TH	H	F	F	H	H			17		H	47
	BH2	December 8, 2021	GW	1	F		H	17	T	TH	H		H	F	H	7	7			H	49
	a and series		-		F	F	F	F	T		H		F	H	H	H	H	H	H	H	M
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	PRINT			,		SIGN		-			DATE	/TIME	100	TEN	IP (°C)	COMME	NTS:	-	Recorded and	- Annual	
Sampled By:	Kirby Magee-Dittb	urner		1	1	/,	M	-	2.9	De	cembe	er 8, 2	2021								all all
Relinquished B	Kirby Magaa Ditth		1	10	y	1	1	1		De	cembe	er 9, 2	2021	10	2	- 21					11 12 19
Developed Dev					1	Q	Th	1		17	dan		12	19		CUSTO	DY SEAL:	Г	YES	NO	Ice packs submitted: Yes No

401 Magnetic Drive, Unit #1, North York, ON, M3J 3H9 - Telephone: 416-661-5287 • 380 Vansickle Road, Unit #630, St. Catharines, ON, L2S 0B5 - Telephone: 905-680-8887 • 608 Norris Court, Kingston, ON, K7P 2R9 - Telephone: 613-634-9307

🔅 eurofins

Environment Testing America

ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC 2425 New Holland Pike Lancaster, PA 17601 Tel: (717)656-2300

Laboratory Job ID: 410-67026-1 Client Project/Site: P968398-PH9398

For:

Eurofins Environment Testing Canada 146 Colonnade Road, No. 8 Ottawa, Ontario K2E 7Y1

Attn: Rebecca Koshy

Marrissa Williams

Authorized for release by: 12/21/2021 8:12:57 AM

Marrissa Williams, Project Manager (717)556-7246 Marrissa.Williams@eurofinset.com

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

..... Links **Review your project** results through **Total** Access Have a Question? Ask-The Expert

Visit us at: www.eurofinsus.com/Env Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

• QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.

• Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.

Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

This report shall not be reproduced except in full, without the written approval of the laboratory.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Marrissa Williams

Marrissa Williams Project Manager 12/21/2021 8:12:57 AM

Job ID: 410-67026-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative 410-67026-1

Receipt

The samples were received on 12/15/2021 9:37 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 13.8°C

Receipt Exceptions

The following samples were received at the laboratory outside the required temperature criteria: P968398-PH9398 1600846-tw2 (410-67026-1), P968398-PH9398 1600847-tw3 (410-67026-2), P968398-PH9398 1600848-BH1 (410-67026-3) and P968398-PH9398 1600848-BH2 (410-67026-4). The laboratory was instructed to proceed with analysis.

Any peak area that is the result of interferences from poly-chlorinated diphenyl ethers observed in the sample has been removed from the calculated results prior to reporting the data for totals.

Dioxin

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: Eurofins Environment Testing Canada Project/Site: P968398-PH9398

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-67026-1	P968398-PH9398 1600846-tw2	Water	12/08/21 00:00	12/15/21 09:37
410-67026-2	P968398-PH9398 1600847-tw3	Water	12/08/21 00:00	12/15/21 09:37
410-67026-3	P968398-PH9398 1600848-BH1	Water	12/08/21 00:00	12/15/21 09:37
410-67026-4	P968398-PH9398 1600848-BH2	Water	12/08/21 00:00	12/15/21 09:37

Client Sample ID: P968398-PH9398 1600846-tw2 Date Collected: 12/08/21 00:00 Date Received: 12/15/21 09:37

Lab Sample ID: 410-67026-1 Matrix: Water

026-1 Water

ND								
		31	0.31	pg/L		12/16/21 15:00	12/17/21 14:59	1
0.37	JI	31	0.029	pg/L		12/16/21 15:00	12/17/21 14:59	
ND		31	0.048	pg/L		12/16/21 15:00	12/17/21 14:59	
0.48	JIB	31	0.16	pg/L		12/16/21 15:00	12/17/21 14:59	
ND		31	0.043	pg/L		12/16/21 15:00	12/17/21 14:59	
0.23	JIB	31	0.046	pg/L		12/16/21 15:00	12/17/21 14:59	
ND		31	0.15	pg/L		12/16/21 15:00	12/17/21 14:59	
ND		31				12/16/21 15:00	12/17/21 14:59	
0.56	JIB	31				12/16/21 15:00	12/17/21 14:59	
		31				12/16/21 15:00	12/17/21 14:59	• • • • • •
		31				12/16/21 15:00	12/17/21 14:59	
ND		31				12/16/21 15:00	12/17/21 14:59	
ND		31				12/16/21 15:00	12/17/21 14:59	
	JI	5.0				12/16/21 15:00	12/17/21 14:59	
ND		6.2				12/16/21 15:00	12/17/21 14:59	
	JIB	140				12/16/21 15:00	12/17/21 14:59	• • • • • • • •
ND		62				12/16/21 15:00	12/17/21 14:59	
ND		31				12/16/21 15:00	12/17/21 14:59	
	JIB	31				12/16/21 15:00	12/17/21 14:59	
		31				12/16/21 15:00	12/17/21 14:59	
		31				12/16/21 15:00	12/17/21 14:59	
		31				12/16/21 15:00	12/17/21 14:59	
		31					12/17/21 14:59	
		6.2				12/16/21 15:00	12/17/21 14:59	
								· · · · · · · · .
			0.10	r J' -				
	Qualifier							Dil Fa
71		28 - 130						
63						12/16/21 15:00		
68		28 - 136				12/16/21 15:00	12/17/21 14:59	
63		21 - 178				12/16/21 15:00	12/17/21 14:59	
67		25 - 164				12/16/21 15:00	12/17/21 14:59	
64		24 - 169				12/16/21 15:00	12/17/21 14:59	
69		17 _ 157				12/16/21 15:00	12/17/21 14:59	1
	0.48 ND 0.23 ND ND 0.56 0.26 0.54 ND ND 0.19 ND 2.5 ND ND 0.37 1.2 1.0 0.64 0.37 1.2 1.0 0.64 0.91 0.19 0.59 4.5 2.9 7.4 %Recovery 68 64 70 71 57 71 59 64 71 63 68 63 63 67 64	0.48 JIB ND ND 0.23 JIB ND ND 0.56 JIB 0.26 JI 0.54 JIB ND ND 0.19 JI ND 2.5 JIB ND ND 0.37 JIB 1.2 JIB 1.0 JIB 0.64 JB 0.91 JIB 0.64 JB 0.91 JIB 0.64 JB 0.91 JIB 0.59 JIB 4.5 JIB 2.9 JIB 7.4 I %Recovery Qualifier 68 64 70 71 57 71 57 71 59 64 71 63 63 63 63 63 63 67 64	0.48 JIB 31 ND 31 0.23 JIB 31 ND 31 ND 31 ND 31 ND 31 0.56 JIB 31 0.56 JIB 31 0.56 JIB 31 0.56 JIB 31 0.54 JIB 31 0.54 JIB 31 0.54 JIB 31 0.55 JIB 140 ND 62 31 0.19 JIB 31 0.37 JIB 31 0.41 JIB 31 0.59 JIB 6.2 2.9 JIB 6.2 2.9 JIB 6.2 2.9 <td>0.48 JIB 31 0.16 ND 31 0.043 0.23 JIB 31 0.043 0.23 JIB 31 0.046 ND 31 0.15 ND 31 0.075 0.56 JIB 31 0.043 0.26 JI 31 0.043 0.54 JIB 31 0.043 0.19 JI 5.0 0.10 ND 31 0.083 0.19 2.5 JIB 140 0.075 ND 31 0.31 0.31 0.37 JIB 31 0.046 1.0 JIB 31 0.075 0.91 JIB 6.2 0.12</td> <td>0.48 JIB 31 0.043 pg/L ND 31 0.043 pg/L 0.23 JIB 31 0.046 pg/L ND 31 0.15 pg/L ND 31 0.075 pg/L 0.56 JIB 31 0.10 pg/L 0.26 JI 31 0.043 pg/L 0.54 JIB 31 0.14 pg/L 0.54 JIB 31 0.14 pg/L ND 31 0.14 pg/L ND 31 0.14 pg/L ND 31 0.17 pg/L ND 31 0.18 pg/L ND 31 0.19 pg/L ND 31 0.36 pg/L ND 31 0.36 pg/L ND 31 0.075 pg/L 0.37 JIB 31 0.075 12 JIB<</td> <td>0.48 JIB 31 0.043 pg/L ND 31 0.043 pg/L 0.23 JIB 31 0.046 pg/L ND 31 0.075 pg/L ND 31 0.075 pg/L 0.56 JIB 31 0.10 pg/L 0.56 JIB 31 0.13 pg/L 0.54 JIB 31 0.14 pg/L 0.54 JIB 31 0.18 pg/L ND 31 0.037 pg/L 0.057 pg/L ND 62 0.051 pg/L 0.37 pg/L 0.31 0.31 pg/L ND 31 0.31 pg/L 0.37 pg/L 0.31 0.31 pg/L ND 31 0.36 pg/L 0.37 pg/L 0.31 0.36 pg/L 1.0 JIB 31 0.046 pg/L 0.59 pg/L 0.55</td> <td>0.48 J I B 31 0.16 pg/L 12/16/21 15:00 ND 31 0.043 pg/L 12/16/21 15:00 ND 31 0.15 pg/L 12/16/21 15:00 ND 31 0.075 pg/L 12/16/21 15:00 0.56 J I B 31 0.043 pg/L 12/16/21 15:00 0.56 J I B 31 0.043 pg/L 12/16/21 15:00 0.54 J I B 31 0.18 pg/L 12/16/21 15:00 ND 31 0.083 pg/L 12/16/21 15:00 ND 62 0.051 pg/L 12/16/21 15:00 ND 62 0.071 pg/L 12/16/21 15:00 ND 31 0.31 0.31 12/16/21 15:00 ND 31 0.31 pg/L 12/16/21 15:00 ND 31 0.31 pg/L 12/16/21</td> <td>0.48 J I B 31 0.16 pg/L 12/16/21 15:00 12/17/21 14:59 0.23 J I B 31 0.046 pg/L 12/16/21 15:00 12/17/21 14:59 0.23 J I B 31 0.046 pg/L 12/16/21 15:00 12/17/21 14:59 ND 31 0.075 pg/L 12/16/21 15:00 12/17/21 14:59 0.56 J I B 31 0.10 pg/L 12/16/21 15:00 12/17/21 14:59 0.56 J I B 31 0.18 pg/L 12/16/21 12/17/21 14:59 0.54 J I B 31 0.18 pg/L 12/16/21 12/17/21 14:59 0.54 J I B 31 0.16 pg/L 12/16/21 12/17/21 14:59 0.57 J I B 31 0.36 pg/L 12/16/21 12/17/21 14:59 0.57 J I B 31 0.075 pg/L</td>	0.48 JIB 31 0.16 ND 31 0.043 0.23 JIB 31 0.043 0.23 JIB 31 0.046 ND 31 0.15 ND 31 0.075 0.56 JIB 31 0.043 0.26 JI 31 0.043 0.54 JIB 31 0.043 0.19 JI 5.0 0.10 ND 31 0.083 0.19 2.5 JIB 140 0.075 ND 31 0.31 0.31 0.37 JIB 31 0.046 1.0 JIB 31 0.075 0.91 JIB 6.2 0.12	0.48 JIB 31 0.043 pg/L ND 31 0.043 pg/L 0.23 JIB 31 0.046 pg/L ND 31 0.15 pg/L ND 31 0.075 pg/L 0.56 JIB 31 0.10 pg/L 0.26 JI 31 0.043 pg/L 0.54 JIB 31 0.14 pg/L 0.54 JIB 31 0.14 pg/L ND 31 0.14 pg/L ND 31 0.14 pg/L ND 31 0.17 pg/L ND 31 0.18 pg/L ND 31 0.19 pg/L ND 31 0.36 pg/L ND 31 0.36 pg/L ND 31 0.075 pg/L 0.37 JIB 31 0.075 12 JIB<	0.48 JIB 31 0.043 pg/L ND 31 0.043 pg/L 0.23 JIB 31 0.046 pg/L ND 31 0.075 pg/L ND 31 0.075 pg/L 0.56 JIB 31 0.10 pg/L 0.56 JIB 31 0.13 pg/L 0.54 JIB 31 0.14 pg/L 0.54 JIB 31 0.18 pg/L ND 31 0.037 pg/L 0.057 pg/L ND 62 0.051 pg/L 0.37 pg/L 0.31 0.31 pg/L ND 31 0.31 pg/L 0.37 pg/L 0.31 0.31 pg/L ND 31 0.36 pg/L 0.37 pg/L 0.31 0.36 pg/L 1.0 JIB 31 0.046 pg/L 0.59 pg/L 0.55	0.48 J I B 31 0.16 pg/L 12/16/21 15:00 ND 31 0.043 pg/L 12/16/21 15:00 ND 31 0.15 pg/L 12/16/21 15:00 ND 31 0.075 pg/L 12/16/21 15:00 0.56 J I B 31 0.043 pg/L 12/16/21 15:00 0.56 J I B 31 0.043 pg/L 12/16/21 15:00 0.54 J I B 31 0.18 pg/L 12/16/21 15:00 ND 31 0.083 pg/L 12/16/21 15:00 ND 62 0.051 pg/L 12/16/21 15:00 ND 62 0.071 pg/L 12/16/21 15:00 ND 31 0.31 0.31 12/16/21 15:00 ND 31 0.31 pg/L 12/16/21 15:00 ND 31 0.31 pg/L 12/16/21	0.48 J I B 31 0.16 pg/L 12/16/21 15:00 12/17/21 14:59 0.23 J I B 31 0.046 pg/L 12/16/21 15:00 12/17/21 14:59 0.23 J I B 31 0.046 pg/L 12/16/21 15:00 12/17/21 14:59 ND 31 0.075 pg/L 12/16/21 15:00 12/17/21 14:59 0.56 J I B 31 0.10 pg/L 12/16/21 15:00 12/17/21 14:59 0.56 J I B 31 0.18 pg/L 12/16/21 12/17/21 14:59 0.54 J I B 31 0.18 pg/L 12/16/21 12/17/21 14:59 0.54 J I B 31 0.16 pg/L 12/16/21 12/17/21 14:59 0.57 J I B 31 0.36 pg/L 12/16/21 12/17/21 14:59 0.57 J I B 31 0.075 pg/L

RL

EDL Unit

D

Prepared

Analyte

13C-OCDF

Client Sample ID: P968398-PH9398 1600847-tw3 Date Collected: 12/08/21 00:00 Date Received: 12/15/21 09:37

Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters)

Result Qualifier

Lab Sample ID: 410-67026-2 Matrix: Water

Analyzed

3

		Quanto	=		•		/	2
1,2,3,4,6,7,8-HpCDD	1.3	JIB	26	0.060	pg/L	12/16/21 15:00	12/17/21 15:51	1
1,2,3,4,6,7,8-HpCDF	ND		26	0.025	pg/L	12/16/21 15:00	12/17/21 15:51	1
1,2,3,4,7,8-HxCDD	ND		26	0.042	pg/L	12/16/21 15:00	12/17/21 15:51	1
1,2,3,4,7,8-HxCDF	ND		26	0.026	pg/L	12/16/21 15:00	12/17/21 15:51	1
1,2,3,4,7,8,9-HpCDF	ND		26	0.036	pg/L	12/16/21 15:00	12/17/21 15:51	1
1,2,3,6,7,8-HxCDD	ND		26	0.038	pg/L	12/16/21 15:00	12/17/21 15:51	1
1,2,3,6,7,8-HxCDF	ND		26	0.027	pg/L	12/16/21 15:00	12/17/21 15:51	1
1,2,3,7,8-PeCDD	ND		26	0.092	pg/L	12/16/21 15:00	12/17/21 15:51	1
1,2,3,7,8-PeCDF	0.51	JIB	26	0.049	pg/L	12/16/21 15:00	12/17/21 15:51	1
1,2,3,7,8,9-HxCDD	ND		26	0.037	pg/L	12/16/21 15:00	12/17/21 15:51	1
1,2,3,7,8,9-HxCDF	ND		26	0.033	pg/L	12/16/21 15:00	12/17/21 15:51	1
2,3,4,6,7,8-HxCDF	ND		26	0.026	pg/L	12/16/21 15:00	12/17/21 15:51	1
2,3,4,7,8-PeCDF	ND		26	0.037	pg/L	12/16/21 15:00	12/17/21 15:51	1
2,3,7,8-TCDD	0.13	JI	4.1	0.078	pg/L	12/16/21 15:00	12/17/21 15:51	1
2,3,7,8-TCDF	ND		5.2	0.054	pg/L	12/16/21 15:00	12/17/21 15:51	1
OCDD	ND		110	0.060	pg/L	12/16/21 15:00	12/17/21 15:51	1
OCDF	0.087	JIB	52	0.057	pg/L	12/16/21 15:00	12/17/21 15:51	1
Total HpCDD	1.3	JIB	26	0.060	pg/L	12/16/21 15:00	12/17/21 15:51	1
Total HpCDF	ND		26	0.036	pg/L	12/16/21 15:00	12/17/21 15:51	1
Total HxCDD	1.8	JIB	26	0.039	pg/L	12/16/21 15:00	12/17/21 15:51	1
Total HxCDF	ND		26	0.033	pg/L	12/16/21 15:00	12/17/21 15:51	1
Total PeCDD	0.93	JIB	26	0.092	pg/L	12/16/21 15:00	12/17/21 15:51	1
Total PeCDF	0.51	JIB	26	0.043	pg/L	12/16/21 15:00	12/17/21 15:51	1
Total TCDD	1.3	JIB	5.2	0.078	pg/L	12/16/21 15:00	12/17/21 15:51	1
Total TCDF	0.17	JIB	5.2	0.054	pg/L	12/16/21 15:00	12/17/21 15:51	1
Total PCDD	5.3	I B	5.2	0.066	pg/L	12/16/21 15:00	12/17/21 15:51	1
Total PCDF	0.77	JIB	5.2	0.044	pg/L	12/16/21 15:00	12/17/21 15:51	1
Total PCDD/PCDF	6.1	I	5.2	0.055	pg/L	12/16/21 15:00	12/17/21 15:51	1
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	68		23 - 140			12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,4,6,7,8-HpCDF	67		28 - 143			12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,4,7,8-HxCDD	70		32 - 141			12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,4,7,8-HxCDF	68		26 - 152			12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,4,7,8,9-HpCDF	61		26 - 138			12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,6,7,8-HxCDD	74		28 - 130			12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,6,7,8-HxCDF	72		26 - 123			12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,7,8-PeCDD	60		25 - 181			12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,7,8-PeCDF	62		24 - 185			12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,7,8,9-HxCDD	70		28 - 130			12/16/21 15:00	12/17/21 15:51	1
13C-1,2,3,7,8,9-HxCDF	63		29 - 147			12/16/21 15:00	12/17/21 15:51	1
13C-2,3,4,6,7,8-HxCDF	68		28 - 136			12/16/21 15:00	12/17/21 15:51	1
13C-2,3,4,7,8-PeCDF	62		21 - 178			12/16/21 15:00	12/17/21 15:51	1
13C-2,3,7,8-TCDD	64		25 - 164			12/16/21 15:00	12/17/21 15:51	1
13C-2,3,7,8-TCDF	59		24 - 169			12/16/21 15:00	12/17/21 15:51	1
13C-OCDD	75		17 _ 157			12/16/21 15:00	12/17/21 15:51	1
(40.0005								

12/16/21 15:00 12/17/21 15:51

17 - 157

64

RL

32

32

32

EDL Unit

0.31 pg/L

0.034 pg/L

0.052 pg/L

D

Prepared

12/16/21 15:00

12/16/21 15:00

12/16/21 15:00

Analyte

1,2,3,4,6,7,8-HpCDD

1,2,3,4,6,7,8-HpCDF

1,2,3,4,7,8-HxCDD

Client Sample ID: P968398-PH9398 1600848-BH1 Date Collected: 12/08/21 00:00 Date Received: 12/15/21 09:37

Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters)

Result Qualifier

1.9 JIB

0.25 JI

0.66 JI

Lab Sample ID: 410-67026-3 Matrix: Water

Analyzed

12/17/21 16:40

12/17/21 16:40

12/17/21 16:40

Prepared	Analvzed	Dil Fac	
12/16/21 15:00	12/17/21 16:40	1	
	12/17/21 16:40		
12/16/21 15:00	12/17/21 16:40	1	
12/16/21 15:00	12/17/21 16:40	1	
12/16/21 15:00	12/17/21 16:40		
12/16/21 15:00	12/17/21 16:40	1	
12/16/21 15:00	12/17/21 16:40	1	
12/16/21 15:00	12/17/21 16:40	1	
12/16/21 15:00	12/17/21 16:40	1	
12/16/21 15:00	12/17/21 16:40	1	
12/16/21 15:00	12/17/21 16:40	1	
	12/17/21 16:40		
12/16/21 15:00	12/17/21 16:40	1	
12/16/21 15:00	12/17/21 16:40	1	12
12/16/21 15:00	12/17/21 16:40	1	
12/16/21 15:00	12/17/21 16:40	1	11
	12/17/21 16:40		
12/16/21 15:00	12/17/21 16:40	1	10
12/16/21 15:00	12/17/21 16:40	1	40
	12/17/21 16:40		9
	12/17/21 16:40		0
12/16/21 15:00	12/17/21 16:40	1	

T	1,2,3,4,7,0-HXCDD	0.00	J I	52		pg/L	12/10/21 15:00	12/11/21 10.40	
	1,2,3,4,7,8-HxCDF	ND		32	0.12	pg/L	12/16/21 15:00	12/17/21 16:40	1
	1,2,3,4,7,8,9-HpCDF	ND		32	0.050	pg/L	12/16/21 15:00	12/17/21 16:40	1
	1,2,3,6,7,8-HxCDD	ND		32	0.053	pg/L	12/16/21 15:00	12/17/21 16:40	1
	1,2,3,6,7,8-HxCDF	0.41	JIB	32	0.12	pg/L	12/16/21 15:00	12/17/21 16:40	1
	1,2,3,7,8-PeCDD	ND		32	0.087	pg/L	12/16/21 15:00	12/17/21 16:40	1
	1,2,3,7,8-PeCDF	0.34	JIB	32	0.062	pg/L	12/16/21 15:00	12/17/21 16:40	1
	1,2,3,7,8,9-HxCDD	ND		32	0.052	pg/L	12/16/21 15:00	12/17/21 16:40	1
	1,2,3,7,8,9-HxCDF	0.42	JIB	32	0.13	pg/L	12/16/21 15:00	12/17/21 16:40	1
	2,3,4,6,7,8-HxCDF	ND		32	0.12	pg/L	12/16/21 15:00	12/17/21 16:40	1
	2,3,4,7,8-PeCDF	ND		32	0.050	pg/L	12/16/21 15:00	12/17/21 16:40	1
	2,3,7,8-TCDD	ND		5.1	0.10	pg/L	12/16/21 15:00	12/17/21 16:40	1
	2,3,7,8-TCDF	ND		6.4	0.070	pg/L	12/16/21 15:00	12/17/21 16:40	1
	OCDD	14	JB	140	0.086	pg/L	12/16/21 15:00	12/17/21 16:40	1
	OCDF	0.82	JIB	64	0.078	pg/L	12/16/21 15:00	12/17/21 16:40	1
	Total HpCDD	1.9	JIB	32	0.31	pg/L	12/16/21 15:00	12/17/21 16:40	1
l	Total HpCDF	0.42	JIB	32	0.042	pg/L	12/16/21 15:00	12/17/21 16:40	1
	Total HxCDD	3.8	JIB	32	0.052	pg/L	12/16/21 15:00	12/17/21 16:40	1
	Total HxCDF	0.83	JIB	32	0.12	pg/L	12/16/21 15:00	12/17/21 16:40	1
l	Total PeCDD	0.38	JB	32	0.087	pg/L	12/16/21 15:00	12/17/21 16:40	1
	Total PeCDF	0.34	JIB	32	0.056	pg/L	12/16/21 15:00	12/17/21 16:40	1
	Total TCDD	0.13	JIB	6.4	0.10	pg/L	12/16/21 15:00	12/17/21 16:40	1
l	Total TCDF	ND		6.4	0.070	pg/L	12/16/21 15:00	12/17/21 16:40	1
	Total PCDD	20	IB	6.4	0.13	pg/L	12/16/21 15:00	12/17/21 16:40	1
- 1	IOIdi FODD			0.1	0.10	P 3' -			
	Total PCDF		JIB	6.4	0.074		12/16/21 15:00	12/17/21 16:40	1
			JIB		0.074			12/17/21 16:40 12/17/21 16:40	
	Total PCDF	2.4	JIB I	6.4	0.074	pg/L	12/16/21 15:00		1
	Total PCDF Total PCDD/PCDF	2.4 22	J I B I	6.4 6.4	0.074	pg/L	12/16/21 15:00 12/16/21 15:00	12/17/21 16:40	1 1
	Total PCDF Total PCDD/PCDF Isotope Dilution	2.4 22 %Recovery	J I B I	6.4 6.4 <i>Limits</i>	0.074	pg/L	12/16/21 15:00 12/16/21 15:00 Prepared	12/17/21 16:40 Analyzed	1 1 Dil Fac
	Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD	2.4 22 <u>%Recovery</u> 58	J I B I	6.4 6.4 <u>Limits</u> 23 - 140	0.074	pg/L	12/16/21 15:00 12/16/21 15:00 Prepared 12/16/21 15:00	12/17/21 16:40 Analyzed 12/17/21 16:40	1 1 <u>Dil Fac</u> 1
	Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF	2.4 22 %Recovery 58 56	J I B I	6.4 6.4 <u>Limits</u> 23 - 140 28 - 143	0.074	pg/L	12/16/21 15:00 12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00	12/17/21 16:40 Analyzed 12/17/21 16:40 12/17/21 16:40	1 1 Dil Fac 1 1
	Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD	2.4 22 %Recovery 58 56 60	J I B I	6.4 6.4 <u>Limits</u> 23 - 140 28 - 143 32 - 141	0.074	pg/L	12/16/21 15:00 12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 16:40 Analyzed 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40	1 1 Dil Fac 1 1
	Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDD	2.4 22 %Recovery 58 56 60 60	J I B I	6.4 6.4 <u>Limits</u> 23 - 140 28 - 143 32 - 141 26 - 152	0.074	pg/L	12/16/21 15:00 12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 16:40 Analyzed 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40	1 1 Dil Fac 1 1 1 1
	Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HpCDF	2.4 22 %Recovery 58 56 60 60 51	J I B I	6.4 6.4 <u>Limits</u> 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138	0.074	pg/L	12/16/21 15:00 12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 16:40 Analyzed 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40	1 1 1 1 1 1 1 1 1
	Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF	2.4 22 %Recovery 58 56 60 60 51 64	J I B I	6.4 6.4 <u>Limits</u> 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138 28 - 130	0.074	pg/L	12/16/21 15:00 12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 16:40 Analyzed 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40	1 1 Dil Fac 1 1 1 1 1
	Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDF	2.4 22 %Recovery 58 56 60 60 51 64 61	J I B I	6.4 6.4 <u>Limits</u> 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138 28 - 130 26 - 123	0.074	pg/L	12/16/21 15:00 12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 16:40 Analyzed 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40	1 1 1 1 1 1 1 1 1 1 1
	Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,6,7,8-HxCDD	2.4 22 %Recovery 58 56 60 60 51 64 61 51	J I B I	6.4 6.4 <u>Limits</u> 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138 28 - 130 26 - 123 25 - 181	0.074	pg/L	12/16/21 15:00 12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 16:40 Analyzed 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40	1 1 1 1 1 1 1 1 1 1 1 1 1 1
	Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,7,8-PeCDD 13C-1,2,3,7,8-PeCDF	2.4 22 %Recovery 58 56 60 60 51 64 61 51 53	J I B I	6.4 6.4 <u>Limits</u> 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138 28 - 130 26 - 123 25 - 181 24 - 185	0.074	pg/L	12/16/21 15:00 12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 16:40 Analyzed 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40	1 1 1 1 1 1 1 1 1 1 1 1 1 1
	Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,6,7,8-HxCDF 13C-1,2,3,7,8-PeCDD 13C-1,2,3,7,8-PeCDF 13C-1,2,3,7,8-PeCDF	2.4 22 %Recovery 58 56 60 60 51 64 61 51 51 53 61	J I B I	6.4 6.4 <u>Limits</u> 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138 28 - 130 26 - 123 25 - 181 24 - 185 28 - 130	0.074	pg/L	12/16/21 15:00 12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 16:40 Analyzed 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40	1 1 1 1 1 1 1 1 1 1 1 1 1 1
	Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,6,7,8-HxCDF 13C-1,2,3,7,8-PeCDD 13C-1,2,3,7,8-PeCDF 13C-1,2,3,7,8-PeCDF 13C-1,2,3,7,8-PeCDF 13C-1,2,3,7,8-PeCDF 13C-1,2,3,7,8-PeCDF 13C-1,2,3,7,8-PeCDF	2.4 22 %Recovery 58 56 60 60 51 64 61 51 53 61 55	J I B I	6.4 6.4 <u>Limits</u> 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138 28 - 130 26 - 123 25 - 181 24 - 185 28 - 130 29 - 147	0.074	pg/L	12/16/21 15:00 12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 16:40 Analyzed 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDF 13C-1,2,3,7,8-PeCDD 13C-1,2,3,7,8,9-HxCDF 13C-1,2,3,7,8,9-HxCDD 13C-1,2,3,7,8,9-HxCDF 13C-1,2,3,7,8,9-HxCDF	2.4 22 %Recovery 58 56 60 60 51 64 61 51 53 61 55 59	J I B I	6.4 6.4 <u>Limits</u> 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138 28 - 130 26 - 123 25 - 181 24 - 185 28 - 130 29 - 147 28 - 136	0.074	pg/L	12/16/21 15:00 12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 16:40 Analyzed 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40 12/17/21 16:40	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-PhpCDF 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,7,8-PeCDF 13C-1,2,3,7,8,9-HxCDD 13C-1,2,3,7,8,9-HxCDF 13C-1,2,3,7,8,9-HxCDF 13C-2,3,4,6,7,8-HxCDF 13C-2,3,4,6,7,8-PeCDF	2.4 22 %Recovery 58 56 60 60 51 64 61 51 53 61 53 61 55 59 54	J I B I	6.4 6.4 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138 28 - 130 26 - 123 25 - 181 24 - 185 28 - 130 29 - 147 28 - 136 21 - 178	0.074	pg/L	12/16/21 15:00 12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 16:40 Analyzed 12/17/21 16:40 12/17/21 16:40	1 1 1 1 1 1 1 1 1 1 1 1 1 1
	Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-PeCDF 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,7,8-PeCDF 13C-1,2,3,7,8,9-HxCDD 13C-1,2,3,7,8,9-HxCDF 13C-1,2,3,7,8,9-HxCDF 13C-2,3,4,6,7,8-PeCDF 13C-2,3,4,6,7,8-PeCDF 13C-2,3,4,6,7,8-PeCDF 13C-2,3,4,7,8-PeCDF 13C-2,3,7,8,9-HxCDF 13C-2,3,7,8-PeCDF 13C-2,3,7,8-PeCDF	2.4 22 %Recovery 58 56 60 60 51 64 61 51 53 61 55 59 54 54	J I B I	6.4 6.4 23 - 140 28 - 143 32 - 141 26 - 152 26 - 152 26 - 138 28 - 130 26 - 123 25 - 181 24 - 185 28 - 130 29 - 147 28 - 136 21 - 178 25 - 164	0.074	pg/L	12/16/21 15:00 12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00	12/17/21 16:40 Analyzed 12/17/21 16:40 12/17/21 16:40	1 1 1 1 1 1 1 1 1 1 1 1 1 1
	Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,7,8-PeCDF 13C-1,2,3,7,8,9-HxCDD 13C-1,2,3,7,8,9-HxCDD 13C-1,2,3,7,8,9-HxCDF 13C-2,3,4,6,7,8-HxCDF 13C-2,3,7,8,9-HxCDF 13C-2,3,7,8-TCDD 13C-2,3,7,8-TCDF	2.4 22 %Recovery 58 56 60 60 51 64 61 51 53 61 55 59 54 54 54	J I B I Qualifier	6.4 6.4 Limits 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138 28 - 130 26 - 123 25 - 181 24 - 185 28 - 130 29 - 147 28 - 136 21 - 178 25 - 164 24 - 169	0.074	pg/L	12/16/21 15:00 12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00	12/17/21 16:40 Analyzed 12/17/21 16:40 12/17/21 16:40	1 1 1 1 1 1 1 1 1 1 1 1 1 1

Client Sample ID: P968398-PH9398 1600848-BH2 Date Collected: 12/08/21 00:00 Date Received: 12/15/21 09:37

Job ID: 410-67026-1

Analyte	Result	Qualifier	RL	EDL	Unit	<u>D</u>	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	1.8	JIB	26	0.21	pg/L		12/16/21 15:00	12/17/21 17:29	1
1,2,3,4,6,7,8-HpCDF	0.24	JI	26	0.028	pg/L		12/16/21 15:00	12/17/21 17:29	1
1,2,3,4,7,8-HxCDD	ND		26	0.046	pg/L		12/16/21 15:00	12/17/21 17:29	1
1,2,3,4,7,8-HxCDF	ND		26	0.12	pg/L		12/16/21 15:00	12/17/21 17:29	1
1,2,3,4,7,8,9-HpCDF	ND		26	0.037	pg/L		12/16/21 15:00	12/17/21 17:29	1
1,2,3,6,7,8-HxCDD	ND		26	0.041	pg/L		12/16/21 15:00	12/17/21 17:29	1
1,2,3,6,7,8-HxCDF	0.27	JIB	26	0.12	pg/L		12/16/21 15:00	12/17/21 17:29	1
1,2,3,7,8-PeCDD	ND		26	0.11	pg/L		12/16/21 15:00	12/17/21 17:29	1
1,2,3,7,8-PeCDF	0.40	JIB	26	0.050	pg/L		12/16/21 15:00	12/17/21 17:29	1
1,2,3,7,8,9-HxCDD	0.38	JI	26	0.043	pg/L		12/16/21 15:00	12/17/21 17:29	1
1,2,3,7,8,9-HxCDF	0.54	JIB	26	0.14	pg/L		12/16/21 15:00	12/17/21 17:29	1
2,3,4,6,7,8-HxCDF	ND		26	0.11	pg/L		12/16/21 15:00	12/17/21 17:29	1
2,3,4,7,8-PeCDF	0.37	JIB	26	0.042	pg/L		12/16/21 15:00	12/17/21 17:29	1
2,3,7,8-TCDD	ND		4.2	0.086	pg/L		12/16/21 15:00	12/17/21 17:29	1
2,3,7,8-TCDF	ND		5.3	0.055	pg/L		12/16/21 15:00	12/17/21 17:29	1
OCDD	1.4	JIB	120	0.090	pg/L		12/16/21 15:00	12/17/21 17:29	1
OCDF	ND		53	0.082	pg/L		12/16/21 15:00	12/17/21 17:29	1
Total HpCDD	1.8	JIB	26	0.21	pg/L		12/16/21 15:00	12/17/21 17:29	1
Total HpCDF	0.47	JIB	26	0.033	pg/L		12/16/21 15:00	12/17/21 17:29	1
Total HxCDD	0.88	JIB	26	0.044	pg/L		12/16/21 15:00	12/17/21 17:29	1
Total HxCDF	0.82	JIB	26	0.12	pg/L		12/16/21 15:00	12/17/21 17:29	1
Total PeCDD	0.65	JIB	26	0.11	pg/L		12/16/21 15:00	12/17/21 17:29	1
Total PeCDF	0.77	JIB	26	0.046	pg/L		12/16/21 15:00	12/17/21 17:29	1
Total TCDD	1.1	JIB	5.3	0.086	pg/L		12/16/21 15:00	12/17/21 17:29	1
Total TCDF	0.14	JIB	5.3	0.055	pg/L		12/16/21 15:00	12/17/21 17:29	1
Total PCDD	5.8	IB	5.3	0.11	pg/L		12/16/21 15:00	12/17/21 17:29	1
Total PCDF	2.2	JIB	5.3	0.067	pg/L		12/16/21 15:00	12/17/21 17:29	1
Total PCDD/PCDF	8.0	I	5.3	0.087	pg/L		12/16/21 15:00	12/17/21 17:29	1
sotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	52		23 - 140				12/16/21 15:00	12/17/21 17:29	1
13C-1,2,3,4,6,7,8-HpCDF	50		28 - 143				12/16/21 15:00	12/17/21 17:29	1
13C-1,2,3,4,7,8-HxCDD	54		32 - 141				12/16/21 15:00	12/17/21 17:29	1
13C-1,2,3,4,7,8-HxCDF	54		26 - 152				12/16/21 15:00	12/17/21 17:29	
13C-1,2,3,4,7,8,9-HpCDF	48		26 - 138				12/16/21 15:00	12/17/21 17:29	1
13C-1,2,3,6,7,8-HxCDD	57		28 - 130				12/16/21 15:00	12/17/21 17:29	1
13C-1,2,3,6,7,8-HxCDF	54		26 - 123				12/16/21 15:00	12/17/21 17:29	
13C-1,2,3,7,8-PeCDD	45		25 - 181				12/16/21 15:00	12/17/21 17:29	1
13C-1,2,3,7,8-PeCDF	52		24 - 185				12/16/21 15:00	12/17/21 17:29	1
13C-1,2,3,7,8,9-HxCDD	53		28 - 130				12/16/21 15:00	12/17/21 17:29	
13C-1,2,3,7,8,9-HxCDF	49		29 - 147				12/16/21 15:00	12/17/21 17:29	1
13C-2,3,4,6,7,8-HxCDF	51		28 - 136				12/16/21 15:00	12/17/21 17:29	1
13C-2,3,4,7,8-PeCDF	49		21 - 178				12/16/21 15:00	12/17/21 17:29	
13C-2,3,7,8-TCDD	50		25 - 164				12/16/21 15:00	12/17/21 17:29	1
13C-2,3,7,8-TCDF	51		24 - 169				12/16/21 15:00	12/17/21 17:29	1
13C-OCDD	60		17 - 157				12/16/21 15:00	12/17/21 17:29	
13C-OCDF	52		17 - 157				12/16/21 15:00	12/17/21 17:29	1

RL

31

31

31

31

31

31

31

31

31

31

31

31

31

5.0

6.2

140

EDL Unit

0.16 pg/L

0.043 pg/L

0.046 pg/L

0.15 pg/L

0.075 pg/L

0.10 pg/L

0.043 pg/L

0.18 pg/L

0.14 pg/L

0.083 pg/L

0.10 pg/L

0.051 pg/L

0.075 pg/L

pg/L

pg/L

pg/L

0.31

0.029

0.048

Client: Eurofins Environment Testing Canada Project/Site: P968398-PH9398

Analyte

1,2,3,4,6,7,8-HpCDD

1,2,3,4,6,7,8-HpCDF

1,2,3,4,7,8-HxCDD

1,2,3,4,7,8-HxCDF

1,2,3,4,7,8,9-HpCDF

1,2,3,6,7,8-HxCDD

1,2,3,6,7,8-HxCDF

1,2,3,7,8-PeCDD

1,2,3,7,8-PeCDF

1,2,3,7,8,9-HxCDD

1,2,3,7,8,9-HxCDF

2,3,4,6,7,8-HxCDF

2,3,4,7,8-PeCDF

2,3,7,8-TCDD

2,3,7,8-TCDF

OCDD

Client Sample ID: P968398-PH9398 1600846-tw2

Result Qualifier

ND

0.37 JI

ND

ND

ND

ND

0.26 JI

0.54 JIB

ND

ND

ND

0.19 JI

2.5 JIB

0.48 JIB

0.23 JIB

0.56 JIB

Method

1613B

Lab Sample ID: 410-67026-1

TEQ

0.00

0.00

0.048

0.00

0.023

0.00

0.00

0.017

0.026

0.054

0.00

0.00

0.19

0.00

Lab Sample ID: 410-67026-2

0.00075

0.0037

WHO 2005

ND = 0

TEF

0.01

0.01

0.1

0.1

0.01

0.1

0.1

0.03

0.1

0.1

0.1

0.3

0.1

0.0003

1

1

OCDF	ND	62	0.071	pg/L	0.0003	0.00	1613B
Γ					WHO 2005		
					ND = 0		
Analyte	Result Qualifier	NONE	NONE	Unit	TEF	TEQ	Method
Total Toxic Dioxins and Furans				pg/L		0.36	TEQ

Client Sample ID: P968398-PH9398 1600847-tw3

						WHO 2	2005	
						ND =	: 0	
Analyte	Result	Qualifier	RL	EDL	Unit	TEF	TEQ	Method
1,2,3,4,6,7,8-HpCDD	1.3	JIB	26	0.060	pg/L	0.01	0.013	1613B
1,2,3,4,6,7,8-HpCDF	ND		26	0.025	pg/L	0.01	0.00	1613B
1,2,3,4,7,8-HxCDD	ND		26	0.042	pg/L	0.1	0.00	1613B
1,2,3,4,7,8-HxCDF	ND		26	0.026	pg/L	0.1	0.00	1613B
1,2,3,4,7,8,9-HpCDF	ND		26	0.036	pg/L	0.01	0.00	1613B
1,2,3,6,7,8-HxCDD	ND		26	0.038	pg/L	0.1	0.00	1613B
1,2,3,6,7,8-HxCDF	ND		26	0.027	pg/L	0.1	0.00	1613B
1,2,3,7,8-PeCDD	ND		26	0.092	pg/L	1	0.00	1613B
1,2,3,7,8-PeCDF	0.51	JIB	26	0.049	pg/L	0.03	0.015	1613B
1,2,3,7,8,9-HxCDD	ND		26	0.037	pg/L	0.1	0.00	1613B
1,2,3,7,8,9-HxCDF	ND		26	0.033	pg/L	0.1	0.00	1613B
2,3,4,6,7,8-HxCDF	ND		26	0.026	pg/L	0.1	0.00	1613B
2,3,4,7,8-PeCDF	ND		26	0.037	pg/L	0.3	0.00	1613B
2,3,7,8-TCDD	0.13	JI	4.1	0.078	pg/L	1	0.13	1613B
2,3,7,8-TCDF	ND		5.2	0.054	pg/L	0.1	0.00	1613B
OCDD	ND		110	0.060	pg/L	0.0003	0.00	1613B
OCDF	0.087	JIB	52	0.057	pg/L	0.0003	0.000026	1613B

TEF Reference:

WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners

Toxicity Summary

Job ID: 410-67026-1

Lab Sample ID: 410-67026-3

Lab Sample ID: 410-67026-4

Client Sample ID: P968398-PH9398 1600847-tw3 (Continued) Lab Sample ID: 410-67026-2

Γ					WHO 2005			
					ND = 0			
Analyte Res	ult Qua	alifier NONE	NONE	Unit	TEF	TEQ	Method	
Total Toxic Dioxins and Furans				pg/L		0.16	TEQ	

Client Sample ID: P968398-PH9398 1600848-BH1

						WHO 20		
Analyte	Result	Qualifier	RL	EDL	Unit	TEF	TEQ	Method
1,2,3,4,6,7,8-HpCDD	1.9	JIB	32	0.31	pg/L	0.01	0.019	1613B
1,2,3,4,6,7,8-HpCDF	0.25	JI	32	0.034	pg/L	0.01	0.0025	1613B
1,2,3,4,7,8-HxCDD	0.66	JI	32	0.052	pg/L	0.1	0.066	1613B
1,2,3,4,7,8-HxCDF	ND		32	0.12	pg/L	0.1	0.00	1613B
1,2,3,4,7,8,9-HpCDF	ND		32	0.050	pg/L	0.01	0.00	1613B
1,2,3,6,7,8-HxCDD	ND		32	0.053	pg/L	0.1	0.00	1613B
1,2,3,6,7,8-HxCDF	0.41	JIB	32	0.12	pg/L	0.1	0.041	1613B
1,2,3,7,8-PeCDD	ND		32	0.087	pg/L	1	0.00	1613B
1,2,3,7,8-PeCDF	0.34	JIB	32	0.062	pg/L	0.03	0.010	1613B
1,2,3,7,8,9-HxCDD	ND		32	0.052	pg/L	0.1	0.00	1613B
1,2,3,7,8,9-HxCDF	0.42	JIB	32	0.13	pg/L	0.1	0.042	1613B
2,3,4,6,7,8-HxCDF	ND		32	0.12	pg/L	0.1	0.00	1613B
2,3,4,7,8-PeCDF	ND		32	0.050	pg/L	0.3	0.00	1613B
2,3,7,8-TCDD	ND		5.1	0.10	pg/L	1	0.00	1613B
2,3,7,8-TCDF	ND		6.4	0.070	pg/L	0.1	0.00	1613B
OCDD	14	JB	140	0.086	pg/L	0.0003	0.0042	1613B
OCDF	0.82	JIB	64	0.078	pg/L	0.0003	0.00025	1613B
						WHO 2	005	
						ND =	0	
Analyte	Result	Qualifier	NONE	NONE	Unit	TEF	TEQ	Method
Total Toxic Dioxins and Furans					pg/L		0.18	TEQ

Client Sample ID: P968398-PH9398 1600848-BH2

						WHO 20	05	
						ND = (0	
Analyte	Result	Qualifier	RL	EDL	Unit	TEF	TEQ	Method
1,2,3,4,6,7,8-HpCDD	1.8	JIB	26	0.21	pg/L	0.01	0.018	1613B
1,2,3,4,6,7,8-HpCDF	0.24	JI	26	0.028	pg/L	0.01	0.0024	1613B
1,2,3,4,7,8-HxCDD	ND		26	0.046	pg/L	0.1	0.00	1613B
1,2,3,4,7,8-HxCDF	ND		26	0.12	pg/L	0.1	0.00	1613B
1,2,3,4,7,8,9-HpCDF	ND		26	0.037	pg/L	0.01	0.00	1613B
1,2,3,6,7,8-HxCDD	ND		26	0.041	pg/L	0.1	0.00	1613B
1,2,3,6,7,8-HxCDF	0.27	JIB	26	0.12	pg/L	0.1	0.027	1613B
1,2,3,7,8-PeCDD	ND		26	0.11	pg/L	1	0.00	1613B
1,2,3,7,8-PeCDF	0.40	JIB	26	0.050	pg/L	0.03	0.012	1613B
1,2,3,7,8,9-HxCDD	0.38	JI	26	0.043	pg/L	0.1	0.038	1613B
1,2,3,7,8,9-HxCDF	0.54	JIB	26	0.14	pg/L	0.1	0.054	1613B
2,3,4,6,7,8-HxCDF	ND		26	0.11	pg/L	0.1	0.00	1613B

TEF Reference:

WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners

Client Sample ID: P968398-PH9398 1600848-BH2 (Continued)

						WHO 20	005	
						ND = (0	
Analyte	Result	Qualifier	RL	EDL	Unit	TEF	TEQ	Method
2,3,4,7,8-PeCDF	0.37	JIB	26	0.042	pg/L	0.3	0.11	1613B
2,3,7,8-TCDD	ND		4.2	0.086	pg/L	1	0.00	1613B
2,3,7,8-TCDF	ND		5.3	0.055	pg/L	0.1	0.00	1613B
OCDD	1.4	JIB	120	0.090	pg/L	0.0003	0.00042	1613B
OCDF	ND		53	0.082	pg/L	0.0003	0.00	1613B
						WHO 20	005	
						ND = (0	
Analyte	Result	Qualifier	NONE	NONE	Unit	TEF	TEQ	Method
Total Toxic Dioxins and Furans					pg/L		0.26	TEQ

WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners

Job ID: 410-67026-1

RL

25

25

25

25 25

25 25

Lab Sample ID: MB 410-206460/1-A

Matrix: Water

1,2,3,4,6,7,8-HpCDD

1,2,3,4,6,7,8-HpCDF

1,2,3,4,7,8-HxCDD

1,2,3,4,7,8-HxCDF

1,2,3,4,7,8,9-HpCDF

1,2,3,6,7,8-HxCDD

1,2,3,6,7,8-HxCDF

Analyte

Analysis Batch: 206661

MB MB

2.21 JI

ND

ND

0.713 JI

0.526 J

0.388 JI

0.267 JI

Result Qualifier

4	otal/NA	mple ID: Metho Prep Type: 1 Prep Batch:	Client Sa			
5						
	Dil Fac	Analyzed	Prepared	<u>D</u>	Unit	EDL
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.29
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.028
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.047
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.071
8	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.040
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.044
9	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.073
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.076
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.071
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.049
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.090
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.079
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.065
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.13
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.059
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.076
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.063
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.29
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.034
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.047
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.078
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.076
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.068
	1	12/17/21 14:11	12/16/21 15:00		pg/L	0.13

1,2,0,0,1,01,021				0.010	1.2			
1,2,3,7,8-PeCDD	0.495	JI	25	0.076	pg/L	12/16/21 15:00	12/17/21 14:11	1
1,2,3,7,8-PeCDF	0.763	JI	25	0.071	pg/L	12/16/21 15:00	12/17/21 14:11	1
1,2,3,7,8,9-HxCDD	ND		25	0.049	pg/L	12/16/21 15:00	12/17/21 14:11	1
1,2,3,7,8,9-HxCDF	0.907	J	25	0.090	pg/L	12/16/21 15:00	12/17/21 14:11	1
2,3,4,6,7,8-HxCDF	0.647	JI	25	0.079	pg/L	12/16/21 15:00	12/17/21 14:11	1
2,3,4,7,8-PeCDF	0.426	JI	25	0.065	pg/L	12/16/21 15:00	12/17/21 14:11	1
2,3,7,8-TCDD	ND		4.0	0.13	pg/L	12/16/21 15:00	12/17/21 14:11	1
2,3,7,8-TCDF	0.138	JI	5.0	0.059	pg/L	12/16/21 15:00	12/17/21 14:11	1
OCDD	1.54	JI	110	0.076	pg/L	12/16/21 15:00	12/17/21 14:11	1
OCDF	0.984	JI	50	0.063	pg/L	12/16/21 15:00	12/17/21 14:11	1
Total HpCDD	2.21	JI	25	0.29	pg/L	12/16/21 15:00	12/17/21 14:11	1
Total HpCDF	0.526	J	25	0.034	pg/L	12/16/21 15:00	12/17/21 14:11	1
Total HxCDD	1.35	JI	25	0.047	pg/L	12/16/21 15:00	12/17/21 14:11	1
Total HxCDF	2.91	JI	25	0.078	pg/L	12/16/21 15:00	12/17/21 14:11	1
Total PeCDD	0.495	JI	25	0.076	pg/L	12/16/21 15:00	12/17/21 14:11	1
Total PeCDF	1.60	JI	25	0.068	pg/L	12/16/21 15:00	12/17/21 14:11	1
Total TCDD	0.923	JI	5.0	0.13	pg/L	12/16/21 15:00	12/17/21 14:11	1
Total TCDF	0.733	JI	5.0	0.059	pg/L	12/16/21 15:00	12/17/21 14:11	1
Total PCDD	6.52	1	5.0	0.12	pg/L	12/16/21 15:00	12/17/21 14:11	1
Total PCDF	6.75	I	5.0	0.060	pg/L	12/16/21 15:00	12/17/21 14:11	1
	6.75 ND	1	5.0 5.0	0.060 0.092		12/16/21 15:00 12/16/21 15:00	12/17/21 14:11 12/17/21 14:11	1 1
Total PCDF	ND	। <i>МВ</i>						
Total PCDF	ND	МВ						
Total PCDF Total PCDD/PCDF	ND MB	МВ	5.0			12/16/21 15:00	12/17/21 14:11	1
Total PCDF Total PCDD/PCDF Isotope Dilution	ND MB %Recovery	МВ	5.0 Limits			12/16/21 15:00 Prepared	12/17/21 14:11 Analyzed	1 Dil Fac
Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD	ND MB 62	МВ	5.0 Limits 23 - 140			12/16/21 15:00 <i>Prepared</i> 12/16/21 15:00	12/17/21 14:11 Analyzed 12/17/21 14:11	1 1
Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF	ND MB %Recovery 62 66	МВ	5.0 Limits 23 - 140 28 - 143			12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00	12/17/21 14:11 Analyzed 12/17/21 14:11 12/17/21 14:11	1 Dil Fac 1 1
Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD	ND MB %Recovery 62 66 65	МВ	5.0 Limits 23 - 140 28 - 143 32 - 141			12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 14:11 Analyzed 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11	1 <u>Dil Fac</u> 1 1 1
Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF	ND MB %Recovery 62 66 65 67	МВ	5.0 Limits 23 - 140 28 - 143 32 - 141 26 - 152			12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 14:11 Analyzed 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11	1 1 1 1 1
Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8,9-HpCDF	ND MB %Recovery 62 66 65 67 59	МВ	5.0 Limits 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138			12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 14:11 Analyzed 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11	1 <u>Dil Fac</u> 1 1 1 1 1
Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8,9-HpCDF 13C-1,2,3,4,7,8,9-HpCDF	ND MB %Recovery 62 66 65 67 59 68	МВ	5.0 Limits 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138 28 - 130			12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 14:11 Analyzed 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11	1 <u>Dil Fac</u> 1 1 1 1 1 1
Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8,9-HpCDF 13C-1,2,3,4,7,8,9-HpCDF 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF	ND MB %Recovery 62 66 65 67 59 68 70	МВ	5.0 Limits 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138 28 - 130 26 - 123			12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 14:11 Analyzed 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11	1 <u>Dil Fac</u> 1 1 1 1 1 1 1 1
Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDF 13C-1,2,3,7,8-PeCDD	ND MB %Recovery 62 66 65 67 59 68 70 53	МВ	5.0 Limits 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138 28 - 130 26 - 123 25 - 181			12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 14:11 Analyzed 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11	1 Dil Fac 1 1 1 1 1 1 1 1 1 1 1 1
Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,7,8-PeCDD 13C-1,2,3,7,8-PeCDF	ND MB %Recovery 62 66 65 67 59 68 70 53 62	МВ	5.0 Limits 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138 28 - 130 26 - 123 25 - 181 24 - 185			12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 14:11 Analyzed 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11	1 Dil Fac 1 1 1 1 1 1 1 1 1 1 1 1 1
Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,7,8-PeCDD 13C-1,2,3,7,8-PeCDF 13C-1,2,3,7,8,9-HxCDD	ND MB %Recovery 62 66 65 67 59 68 70 53 62 59	МВ	5.0 Limits 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138 28 - 130 26 - 123 25 - 181 24 - 185 28 - 130			12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 14:11 Analyzed 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11	1 <u>Dil Fac</u> 1 1 1 1 1 1 1 1 1 1 1 1 1
Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDF 13C-1,2,3,7,8-PeCDD 13C-1,2,3,7,8-PeCDF 13C-1,2,3,7,8-PHXCDD 13C-1,2,3,7,8,9-HxCDF	ND MB %Recovery 62 66 65 67 59 68 70 53 62 59 53 62 59 53	МВ	5.0 Limits 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138 28 - 130 26 - 123 25 - 181 24 - 185 28 - 130 29 - 147			12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 14:11 Analyzed 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11 12/17/21 14:11	1 <i>Dil Fac</i> 1 1 1 1 1 1 1 1 1 1 1 1 1
Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,7,8-PeCDD 13C-1,2,3,7,8,9-HxCDF 13C-1,2,3,7,8,9-HxCDF 13C-1,2,3,7,8,9-HxCDF 13C-1,2,3,7,8,9-HxCDF 13C-1,2,3,7,8,9-HxCDF	ND MB %Recovery 62 66 65 67 59 68 70 53 62 59 57 56	МВ	5.0 Limits 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138 28 - 130 26 - 123 25 - 181 24 - 185 28 - 130 29 - 147 28 - 136			12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 14:11 Analyzed 12/17/21 14:11 12/17/21 14:11	1 <i>Dil Fac</i> 1 1 1 1 1 1 1 1 1 1 1 1 1
Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,7,8-PeCDF 13C-1,2,3,7,8,9-HxCDF 13C-1,2,3,7,8,9-HxCDF 13C-1,2,3,7,8,9-HxCDF 13C-2,3,4,6,7,8-HxCDF 13C-2,3,4,6,7,8-PeCDF	ND MB %Recovery 62 66 65 67 59 68 70 53 62 59 57 56 54	МВ	5.0 Limits 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138 28 - 130 26 - 123 25 - 181 24 - 185 28 - 130 29 - 147 28 - 136 21 - 178			12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00 12/16/21 15:00	12/17/21 14:11 Analyzed 12/17/21 14:11 12/17/21 14:11	1 Dil Fac 1 1 1 1 1 1 1 1 1 1 1 1 1
Total PCDF Total PCDD/PCDF Isotope Dilution 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,4,6,7,8-HpCDF 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,4,7,8-HxCDF 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,7,8-PeCDF 13C-1,2,3,7,8,9-HxCDF 13C-1,2,3,7,8,9-HxCDF 13C-1,2,3,7,8,9-HxCDF 13C-2,3,4,6,7,8-HxCDF 13C-2,3,4,6,7,8-PeCDF 13C-2,3,4,7,8-PeCDF 13C-2,3,4,7,8-PeCDF 13C-2,3,4,7,8-PeCDF	ND MB %Recovery 62 66 65 67 59 68 70 53 62 59 57 56 54 56	МВ	5.0 Limits 23 - 140 28 - 143 32 - 141 26 - 152 26 - 138 28 - 130 26 - 123 25 - 181 24 - 185 28 - 130 29 - 147 28 - 136 21 - 178 25 - 164			12/16/21 15:00 Prepared 12/16/21 15:00 12/16/21 15:00	12/17/21 14:11 Analyzed 12/17/21 14:11 12/17/21 14:11	1 Dil Fac 1 1 1 1 1 1 1 1 1 1 1 1 1

Eurofins Lancaster Laboratories Env, LLC

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Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters) (Continued)

Matrix: Water									Prep Type: Total
Analysis Batch: 206661									Prep Batch: 206
			Spike	LCS	LCS				%Rec.
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits
1,2,3,4,6,7,8-HpCDD			1000	987		pg/L		99	70 - 140
1,2,3,4,6,7,8-HpCDF			1000	951		pg/L		95	82 - 122
1,2,3,4,7,8-HxCDD			1000	1000		pg/L		100	70 - 164
I,2,3,4,7,8-HxCDF			1000	944		pg/L		94	72 - 134
1,2,3,4,7,8,9-HpCDF			1000	989		pg/L		99	78 - 138
1,2,3,6,7,8-HxCDD			1000	955		pg/L		96	76 - 134
,2,3,6,7,8-HxCDF			1000	954		pg/L		95	84 _ 130
1,2,3,7,8-PeCDD			1000	1080		pg/L		108	70 - 142
I,2,3,7,8-PeCDF			1000	1050		pg/L		105	80 - 134
,2,3,7,8,9-HxCDD			1000	963		pg/L		96	64 - 162
,2,3,7,8,9-HxCDF			1000	975		pg/L		97	78 - 130
2,3,4,6,7,8-HxCDF			1000	956		pg/L		96	70 - 156
,3,4,7,8-PeCDF			1000	1030		pg/L		103	68 - 160
2,3,7,8-TCDD			200	176		pg/L		88	67 _ 158
2,3,7,8-TCDF			200	203		pg/L		101	75 - 158
DCDD			2000	1950		pg/L		98	78 - 144
DCDF			2000	1990		pg/L		99	63 - 170
	LCS	LCS							
sotope Dilution	%Recovery	Qualifier	Limits						
13C-1,2,3,4,6,7,8-HpCDD	70		26 - 166						
3C-1,2,3,4,6,7,8-HpCDF	69		21 - 158						
3C-1,2,3,4,7,8-HxCDD	69		21 _ 193						
13C-1,2,3,4,7,8-HxCDF	78		19 - 202						
13C-1,2,3,4,7,8,9-HpCDF	63		20 - 186						
13C-1,2,3,6,7,8-HxCDD	73		25 - 163						
3C-1,2,3,6,7,8-HxCDF	81		21 - 159						
13C-1,2,3,7,8-PeCDD	64		21 - 227						
13C-1,2,3,7,8-PeCDF	83		21 _ 192						
3C-1,2,3,7,8,9-HxCDD	73		25 - 163						
3C-1,2,3,7,8,9-HxCDF	67		17 - 205						
3C-2,3,4,6,7,8-HxCDF	74		22 - 176						
13C-2,3,4,7,8-PeCDF	71		13 - 328						
13C-2,3,7,8-TCDD	71		20 - 175						
13C-2,3,7,8-TCDF	72		22 - 152						
13C-OCDD	76		13 - 199						
13C-OCDF	67		13 - 199						

QC Association Summary

Lab Control Sample

Specialty Organics

Prep Batch: 206460

LCS 410-206460/2-A

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67026-1	P968398-PH9398 1600846-tw2	Total/NA	Water	1613B	
410-67026-2	P968398-PH9398 1600847-tw3	Total/NA	Water	1613B	
410-67026-3	P968398-PH9398 1600848-BH1	Total/NA	Water	1613B	
410-67026-4	P968398-PH9398 1600848-BH2	Total/NA	Water	1613B	
MB 410-206460/1-A	Method Blank	Total/NA	Water	1613B	
LCS 410-206460/2-A	Lab Control Sample	Total/NA	Water	1613B	
Analysis Batch: 20666	1				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67026-1	P968398-PH9398 1600846-tw2	Total/NA	Water	1613B	206460
410-67026-2	P968398-PH9398 1600847-tw3	Total/NA	Water	1613B	206460
410-67026-3	P968398-PH9398 1600848-BH1	Total/NA	Water	1613B	206460
410-67026-4	P968398-PH9398 1600848-BH2	Total/NA	Water	1613B	206460
MB 410-206460/1-A	Method Blank	Total/NA	Water	1613B	206460

Total/NA

Water

1613B

Dilution

Factor

Dilution

Factor

1

1

Run

Run

Batch

Number

206460

206661

Batch

Number

206460

206661

Prepared

or Analyzed

12/16/21 15:00

12/17/21 14:59

Prepared

or Analyzed

12/16/21 15:00

12/17/21 15:51

Analyst

CPV9

UA2A

Analyst

CPV9

UA2A

Lab

ELLE

ELLE

Lab

ELLE

ELLE

Batch

Туре

Prep

Analysis

Batch

Туре

Prep

Analysis

Date Collected: 12/08/21 00:00

Date Received: 12/15/21 09:37

Date Collected: 12/08/21 00:00

Date Received: 12/15/21 09:37

Prep Type

Total/NA

Total/NA

Ргер Туре

Total/NA

Total/NA

Client Sample ID: P968398-PH9398 1600846-tw2

Client Sample ID: P968398-PH9398 1600847-tw3

Client Sample ID: P968398-PH9398 1600848-BH1

Batch

Method

1613B

1613B

Batch

Method

1613B

1613B

Matrix: Water

Matrix: Water

Lab Sample ID: 410-67026-1

Lab Sample ID: 410-67026-2

Lab Sample ID: 410-67026-4

Lab Sample ID: 410-67026-3

Matrix: Water

Matrix: Water

Date Collected: 12/08/21 00:00 Date Received: 12/15/21 09:37

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			206460	12/16/21 15:00	CPV9	ELLE
Total/NA	Analysis	1613B		1	206661	12/17/21 16:40	UA2A	ELLE

Client Sample ID: P968398-PH9398 1600848-BH2 Date Collected: 12/08/21 00:00 Date Received: 12/15/21 09:37

Batch Batch Dilution Batch Prepared Prep Type Method Туре Run Factor Number or Analyzed Analyst Lab Total/NA Prep 1613B 206460 12/16/21 15:00 CPV9 ELLE Total/NA Analysis 1613B 206661 12/17/21 17:29 UA2A ELLE 1

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Eurofins Lancaster Laboratories Env, LLC

Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters) Matrix: Water

Prep Type: Total/NA

5

-			P	ercent Isotop	e Dilution Re	covery (Acc	eptance Limi	ts)	
		HpCDD	HpCDF	HxCDD	HxCDF	HpCDF2	HxDD	HxDF	PeCDD
Lab Sample ID	Client Sample ID	(23-140)	(28-143)	(32-141)	(26-152)	(26-138)	(28-130)	(26-123)	(25-181)
410-67026-1	P968398-PH9398 1600846-tw2	68	64	70	71	57	71	72	59
410-67026-2	P968398-PH9398 1600847-tw3	68	67	70	68	61	74	72	60
410-67026-3	P968398-PH9398 1600848-BH1	58	56	60	60	51	64	61	51
410-67026-4	P968398-PH9398 1600848-BH2	52	50	54	54	48	57	54	45
MB 410-206460/1-A	Method Blank	62	66	65	67	59	68	70	53
			P	ercent Isotop	e Dilution Re	covery (Acc	eptance Limi	ts)	
		PeCDF	13CHxCD	HxCF	13CHxCF	PeCF	TCDD	TCDF	OCDD
Lab Sample ID	Client Sample ID	(24-185)	(28-130)	(29-147)	(28-136)	(21-178)	(25-164)	(24-169)	(17-157)
410-67026-1	P968398-PH9398 1600846-tw2	64	71	63	68	63	67	64	69
410-67026-2	P968398-PH9398 1600847-tw3	62	70	63	68	62	64	59	75
410-67026-3	P968398-PH9398 1600848-BH1	53	61	55	59	54	54	52	59
410-67026-4	P968398-PH9398 1600848-BH2	52	53	49	51	49	50	51	60
MB 410-206460/1-A	Method Blank	62	59	57	56	54	56	55	67
			P	ercent Isotor	e Dilution Re	coverv (Acc	eptance Limi	ts)	
		OCDF	-			,		,	
Lab Sample ID	Client Sample ID	(17-157)							
410-67026-1	P968398-PH9398 1600846-tw2	59							
410-67026-2	P968398-PH9398 1600847-tw3	64							
410-67026-3	P968398-PH9398 1600848-BH1	52							
410-67026-4	P968398-PH9398 1600848-BH2	52							
MB 410-206460/1-A	Method Blank	60							
Surrogate Legend									
HpCDD = 13C-1,2,3,4,0	6,7,8-HpCDD								
HpCDF = 13C-1,2,3,4,6	6,7,8-HpCDF								
HxCDD = 13C-1,2,3,4,7	7,8-HxCDD								
HxCDF = 13C-1,2,3,4,7	7,8-HxCDF								
HpCDF2 = 13C-1,2,3,4	,7,8,9-HpCDF								
HxDD = 13C-1,2,3,6,7,	8-HxCDD								
HxDF = 13C-1,2,3,6,7,8	3-HxCDF								
PeCDD = 13C-1,2,3,7,8									
PeCDF = 13C-1,2,3,7,8	3-PeCDF								
13CHxCD = 13C-1,2,3,	7,8,9-HxCDD								
HxCF = 13C-1,2,3,7,8,9	9-HxCDF								
13CHxCF = 13C-2,3,4,	6,7,8-HxCDF								
PeCF = 13C-2,3,4,7,8-I	PeCDF								
TCDD = 13C-2,3,7,8-T									
TCDF = 13C-2,3,7,8-T(
OCDD = 13C-OCDD									
OCDF = 13C-OCDF									

Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters) Matrix: Water

Prep Type: Total/NA

			P	ercent Isotop	e Dilution Re	covery (Acce	ptance Limit	ts)	
		HpCDD	HpCDF	HxCDD	HxCDF	HpCDF2	HxDD	HxDF	PeCDD
Lab Sample ID	Client Sample ID	(26-166)	(21-158)	(21-193)	(19-202)	(20-186)	(25-163)	(21-159)	(21-227)
LCS 410-206460/2-A	Lab Control Sample	70	69	69	78	63	73	81	64

Prep Type: Total/NA

5

Method: 1613B - 2,3,7,8-TCDD Only (Drinking Waters) (Continued)

Matrix: Water

			_								
	Percent Isotope Dilution Recovery (Acceptance Limits)										
		PeCDF	13CHxCD	HxCF	13CHxCF	PeCF	TCDD	TCDF	OCDD		
Lab Sample ID	Client Sample ID	(21-192)	(25-163)	(17-205)	(22-176)	(13-328)	(20-175)	(22-152)	(13-199)		
LCS 410-206460/2-A	Lab Control Sample	83	73	67	74	71	71	72	76		
			Pe	ercent Isotop	be Dilution Re	covery (Acc	eptance Limi	ts)			
		OCDF		-			-				
Lab Sample ID	Client Sample ID	(13-199)									
LCS 410-206460/2-A	Lab Control Sample	67									
Sumo note Lenand											
Surrogate Legend HpCDD = 13C-1,2,3,4,6,7,8-H	~CDD										
•	•										
HpCDF = 13C-1,2,3,4,6,7,8-H											
HxCDD = 13C-1,2,3,4,7,8-HxC											
HxCDF = 13C-1,2,3,4,7,8-HxC											
HpCDF2 = 13C-1,2,3,4,7,8,9-h	HpCDF										
HxDD = 13C-1,2,3,6,7,8-HxCE	DD										
HxDF = 13C-1,2,3,6,7,8-HxCE)F										
PeCDD = 13C-1,2,3,7,8-PeCD	D										
PeCDF = 13C-1,2,3,7,8-PeCD	F										
13CHxCD = 13C-1,2,3,7,8,9-H	IxCDD										
HxCF = 13C-1,2,3,7,8,9-HxCE)F										
13CHxCF = 13C-2,3,4,6,7,8-H	IxCDF										
PeCF = 13C-2,3,4,7,8-PeCDF											
TCDD = 13C-2,3,7,8-TCDD											
TCDF = 13C-2,3,7,8-TCDF											
OCDD = 13C-OCDD											
OCDF = 13C-OCDF											

Accreditation/Certification Summary

Identification Number

1.01

0001.01

PA00009

Expiration Date

11-30-22

11-30-22 06-30-22

Authority

A2LA

A2LA

Alaska

Vermont

Virginia

Washington

Wyoming

West Virginia (DW)

West Virginia DEP

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Eurofins Lancaster Laboratories Env, LLC

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	Alaska (UST)	State	17-027	02-28-22
	Arizona	State	AZ0780	03-12-22
	Arkansas DEQ	State	88-0660	08-10-22
	California	State	2792	02-02-22
	Colorado	State	PA00009	06-30-22
	Connecticut	State	PH-0746	06-30-23
	DE Haz. Subst. Cleanup Act (HSCA)	State	019-006 (PA cert)	01-31-22
	Delaware (DW)	State	N/A	02-01-22
	Florida	NELAP	E87997	06-30-22
	Georgia (DW)	State	C048	01-31-22
	Hawaii	State	N/A	01-31-22
	Illinois	NELAP	200027	01-31-23
	lowa	State	361	03-02-22
	Kansas	NELAP	E-10151	10-31-22
	Kentucky (DW)	State	KY90088	01-01-22
	Kentucky (UST)	State	1.01	11-30-22
	Kentucky (WW)	State	KY90088	12-31-21
	Louisiana	NELAP	02055	06-30-22
	Maine	State	2019012	03-12-22
	Maryland	State	100	06-30-22
	Massachusetts	State	M-PA009	06-30-22
	Michigan	State	9930	01-31-22
	Minnesota	NELAP	042-999-487	12-31-22
	Missouri	State	450	01-31-25
	Montana (DW)	State	0098	01-01-22
	Nebraska	State	NE-OS-32-17	01-31-22
	New Hampshire	NELAP	2730	01-10-22
	New Jersey	NELAP	PA011	06-30-22
	New York	NELAP	10670	04-01-22
	North Carolina (DW)	State	42705	07-31-22
	North Carolina (WW/SW)	State	521	12-31-21
	North Dakota	State	R-205	01-31-22
	Oklahoma	NELAP	R-205	08-31-22
	Oregon	NELAP	PA200001	09-11-22
	PALA	Canada	1978	09-16-24
	Pennsylvania	NELAP	36-00037	01-31-22
	Rhode Island	State	LAO00338	01-31-22
	South Carolina	State	89002002	01-31-22
	Tennessee	State	02838	01-31-22
	Texas	NELAP	T104704194-21-40	08-31-22
	Utah	NELAP	PA000092019-16	03-01-22
τ.				

Laboratory: Eurofins Lancaster Laboratories Env, LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

ISO/IEC 17025

Dept. of Defense ELAP

Program

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12-31-21

01-31-22

Laboratory: Eurofins Lancaster Laboratories Env, LLC (Continued) All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Wyoming (UST)	A2LA	1.01	11-30-22

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Company: EUXORIO	1 (SHE	MIN	a					11		Company	r: ``						1	Fax:	41	0-67026	8 Chair	n of Custody
Contact:											Contact:								Email:	#1:			
Address:											Address:			-					Emall:	#2:			
Telephone:	_			Cell:							Telephor	ie:		-					PO #:				
Email: #1:												-			R	GULA	TION	/GUI	DELIN	IE RE	QUIRE	D	
Email: #2:			-	111-						1		Sanitary	Sewer, C	:ity:							eg 153		
Project: 196839	X -	DH	439	78		Quote #	h:					Storm Se	wer, City	γ:				_			esults from ti		Table #, Coarse / Fine, Surface / subsurface
110001	TUR	N-AROUI	122	VE (Busine	ss Days)		r (* *				opwsod	G (Use D	W CoC If a	inalyzing	drinking	water)	- 1	Record o	of Site Con	idition (RSC)) under	Type: Com-ind / Res-Park / Agri / GW / All Other / Sediment
1 Day* (100%)	2 Da	y** (50%)		3-5	Days (25%)			5-7 Da	iys (Stand	tard)		PWQO								list Yes [No .		
*For results report				to determine rush s will apply: befor			12:00 - 50	0%.				O.Reg 34	7							O. Reg	406 Ex	cess Sc	ils
**For results repo	orted after r	rush due date,	, surcharg	es will apply: befo	ore 12:00 - 5	0%, after	12:00 - 25	5%.				Other: _	_						Та	ble #			n/Strat/Ceiling/mSPLP Leachate
																				ľ			s-Park /Agri/All Other ace /Subsurface
The optimal temperature conditions during transport should be less than 10°C. Sampi cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. N					s)	e Details	1		1				1	1	_								
that this COC is not to be used for drin	king water	r samples. Th	he COC m	ust be complete		Itered>			O.Re	g.153 par	rameters	L		80									RN# (Lab Use Only)
upon submission of the samples, there missing (required				ed information i		e3		1		0.014		ganic		20	P								
					Sample Matrix	of Containers	1-F4	41				Metals + Inorgani	Metals only	JUNUK Y									
Sample ID	Di	ate/Time C	ollected		Samp	# of C	PHC F1 - F4	BTEX	VDCs	PAHs	Ğ	Metal	Meta	àr	/								
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1600847 - tu	13		1											/									
1600848-81	1-P		1						_					/									
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Sampled By:							\bigcap)0					1	1									
Relinquished By: Renot	05	RIG	X	es			LA	X				15	3/12	2/25	521	10)°						
Received By:	_	Orema	-			-	1	Y				12	115	121	093	$p \sim$	-	CUSTO	DDY SEAL	. [YES	NO	ice packs submit Yes No

401 Magnetic Drive, Unit #1, North York, ON, M3J 3H9 - Telephone: 416-661-5287 • 380 Vansickle Road, Unit #630, St. Catharines, ON, L28 OB5 - Telephone: 905-680-8887 • 608 Norris Court, Kingston, ON, K7P 2R9 - Telephone: 613-634-9307

Login Sample Receipt Checklist

Client: Eurofins Environment Testing Canada

Login Number: 67026 List Number: 1 Creator: Dawodu, Habibah

Question	Answer	Comment
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	No ice present, no attempt to chill
Cooler Temperature is acceptable (=6C, not frozen).</td <td>False</td> <td>Refer to Job Narrative for details.</td>	False	Refer to Job Narrative for details.
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (=6C, not frozen).</td <td>N/A</td> <td></td>	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	False	No time on COC or sample containers.
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	

Job Number: 410-67026-1

List Source: Eurofins Lancaster Laboratories Env, LLC

Definitions/Glossary

Job ID: 410-67026-1

12

Qualifiers

Qualifiers		_ 3
Dioxin Qualifier	Qualifier Description	
В	Compound was found in the blank and sample.	_
I	Value is EMPC (estimated maximum possible concentration).	5
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.	
Glossary		- 6
Abbreviation	These commonly used abbreviations may or may not be present in this report.	7
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	- /
%R	Percent Recovery	0
1C	Result is from the primary column on a dual-column method.	0
2C	Result is from the confirmation column on a dual-column method.	
CFL	Contains Free Liquid	9
CFU	Colony Forming Unit	
CNF	Contains No Free Liquid	
DER	Duplicate Error Ratio (normalized absolute difference)	
Dil Fac	Dilution Factor	

Glossary	
Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

TNTC Too Numerous To Count

Appendix 4

- Pumping Test Field Data Sheets
- Aquifer Analysis Data For Test Wells
- Determination of Potential Well Interference
- Predictive Impact Assessment for Nitrates
- Langlier and Ryzner Index Calculations

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	Jun							pervisor:	-				
	Project No.:		Carlinger						Ayo 1 4 2				
	Water Level Dat						Page: rge Data		Logger Data				
1			11017m		Pump Rate:		259/min		Logger Serial No.:	93092			
	Stick-up:		0.4{w	•••••	Depth of		70 ft		Logger Depth:	15m			
		wdown [Measure	ments						
	Clock Time	Time (Min.)	Drawdown (m)	Turbidity (NTU)	Temp (°C)	Hđ	Conductivity (us)	TDS (mg/L)	Comments				
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		1 2	11:26										
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Project No.:		PH172	Pt1723 Carl		tes/	Page:		2012		
Water Level D				IV C	Discharge Data		Logger Data			
Static Level: Stick-up:				Pump Rate: Depth of Pump:				Logger Serial No.:		
								Logger Depth:		
	wdown I	Data		Field Measure		ments		Logger Depail.		
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Project N			23		ł	Page:		10/2	(
		evel Data	4	Discharge Data					ger Data
Static Lev	el:	6.0-	<i>l</i>	Pump Ra		25BP		Logger Serial No.:	15m 151 04
Stick-up:		ŏ.40		Depth of		674	13.24m	Logger Depth:	15m
Drav	vdown			Field	Measure				
Clock Time	Time (Min.)	Drawdown (m)	Turbidity (NTU)	Temp (°C)	Hď	Conductivity (us)	TDS (mg/L)	Cor	nments
8:10-	0	8.07							······································
	2		i		·				
	3	6-40							
	4	6.44							
	5	646							
	6 7	6.47	. <u> </u>						
	8	6 51			···				
	9	A.52							
905	10	6.54						· Trotal for (hlomde, no Chie
9:10	15	6.59						1 11	1 the well.
9:15	20 25	6.54				-	·	•	•
9:20 9:25	30	6.545	8						
9:35	40	6.59	·						
9:45	50	6.74				-			
4:55	60	6.76							
10:10	75	6.52						~	
10:25	90	6.81							
10:55	120 150	6.84	0.80	8.500	. 6 5	005	618	TWI Stutic : TWZ Stutic :	11.6 m
11:10	180	6.2	0-10	-20	2000	905		Sivile 2	1. DUM
11:55 12:25 12:55	210	6.83	0-65	9-10	7.98	8n	642		
12:55	240	6 83						Two, Stuhic:	1.64
<u>T:25</u> 1:55	270	6-83	0.44	9.2°C	808	870	580	Two Stufic	= 9.67
1:55	300	6-80	<u></u>				ļ		
2:25	330 360	6.84	<u> </u>	8.8%	7.90	897	600		
2:55	500	683				·			
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12/2 = 00

10.52 = 19.52 154 Colonnade Road , Ottawa, Ontario-K1V 1X2 Tel: 613-226-7381 Fax: 613-226-6344

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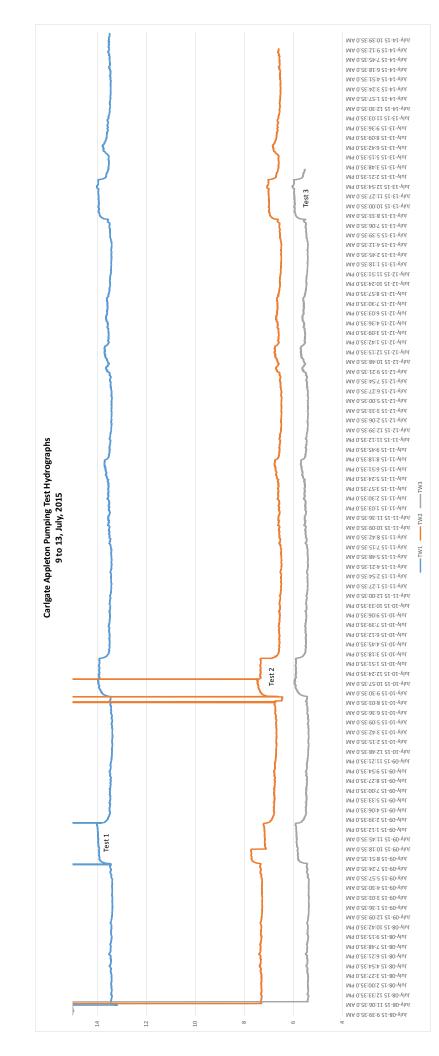
Consulting Engineers www.patersongroup.ca

<u>م</u>					<u>د</u> ر	ony			
					RAWDOW	/N / RECO	VERY M	EASUREMENT DATA	L
Date:		JM	y W	2015	-	Test Wel	l No:	TW3	
Client:		<u> </u>	Voyate			Field Sup	ervisor:	Hy Un	
Project N	No.:	PH.	1723			Page:		Tw3 As°On' Zof 2	
	Water Le	evel Data			Dischar	rge Data			ger Data
Static Le	vel:	O.C.	07	Pump Ra	ate:	R/1A		Logger Serial No.:	
Stick-up:		0.4	HD	Depth of		18-274m L		Logger Depth:	15m
Dra	wdown E	Data		Field	Measure	ments			
Clock Time	Time (Min.)	Drawdown (m)	Turbidity (NTU)	Temp (°C)	. Ha	Conductivity (us)	TDS (mg/L)	Con	nments
	0	6.84							
	1 2	6.40							
	3	6.35							
<u> </u>	4	6.35							
	5	1-34							
	6 7	6.33	e.						
	8	6.29					····	······	
	9								
	10	6.28 6.27					-		
	15 20	6-22				·			
	20	6.18		·					
	30							· · · ·	· · ·
	40							· · · · · · · · · · · · · · · · · · ·	
	50 60			·					
	75						· · · · · · · · ·		
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	120								
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154 Colonnade Road , Ottawa, Ontario K1V 1X2 Tel: 613-226-7381 Fax: 613-226-6344 3

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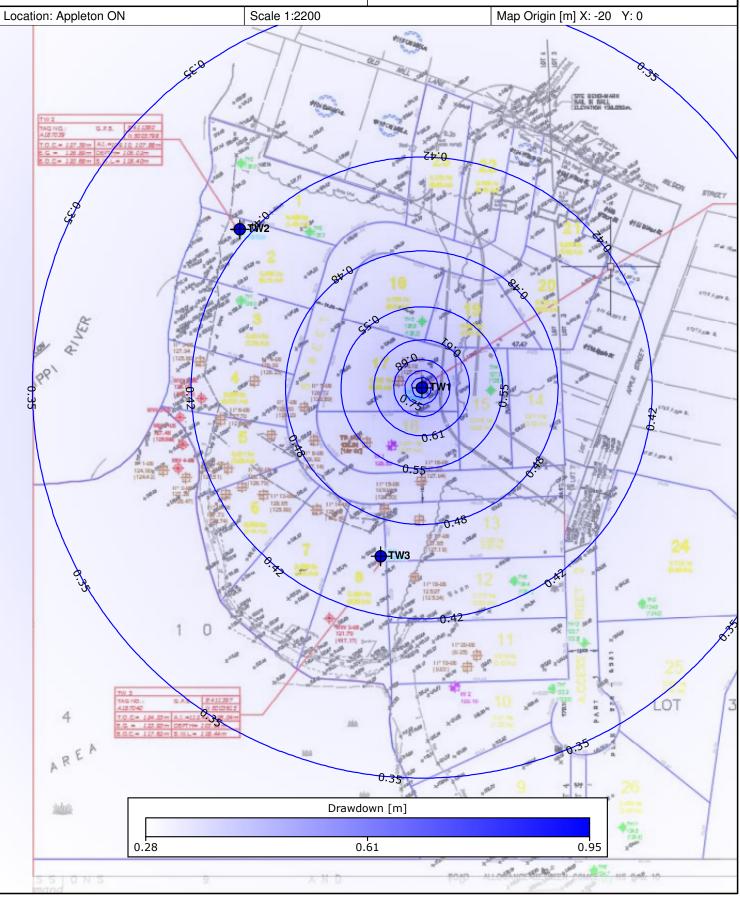
Paterson Group Consulting Engineers 154 Colonnade Road South Ottawa - Ontario - K2E 7J5

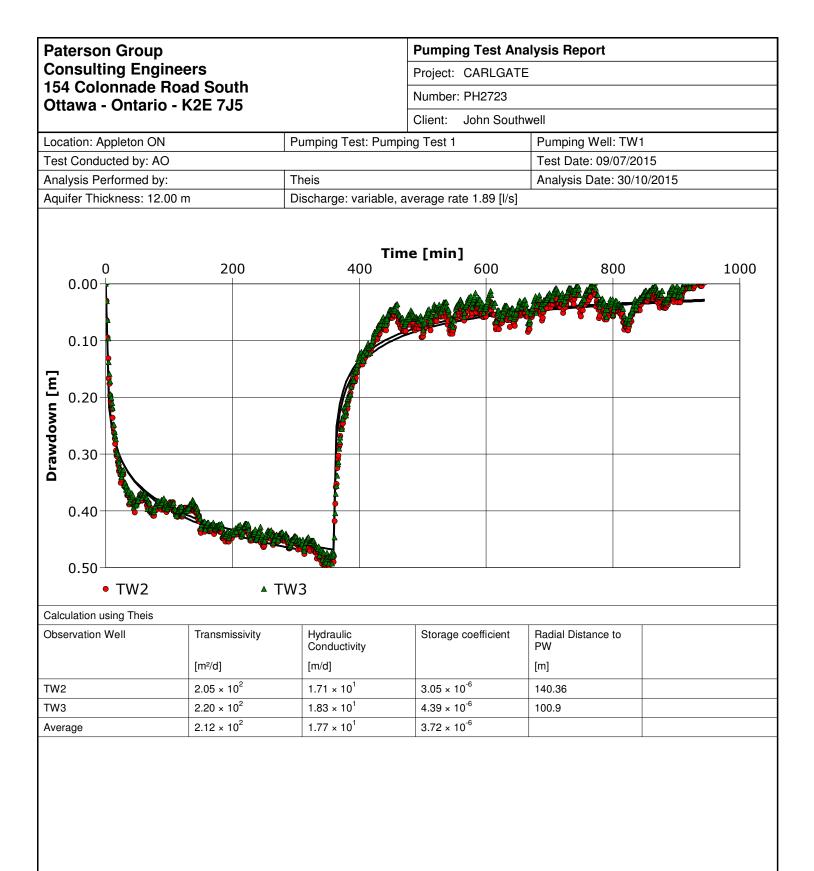
Site Plan

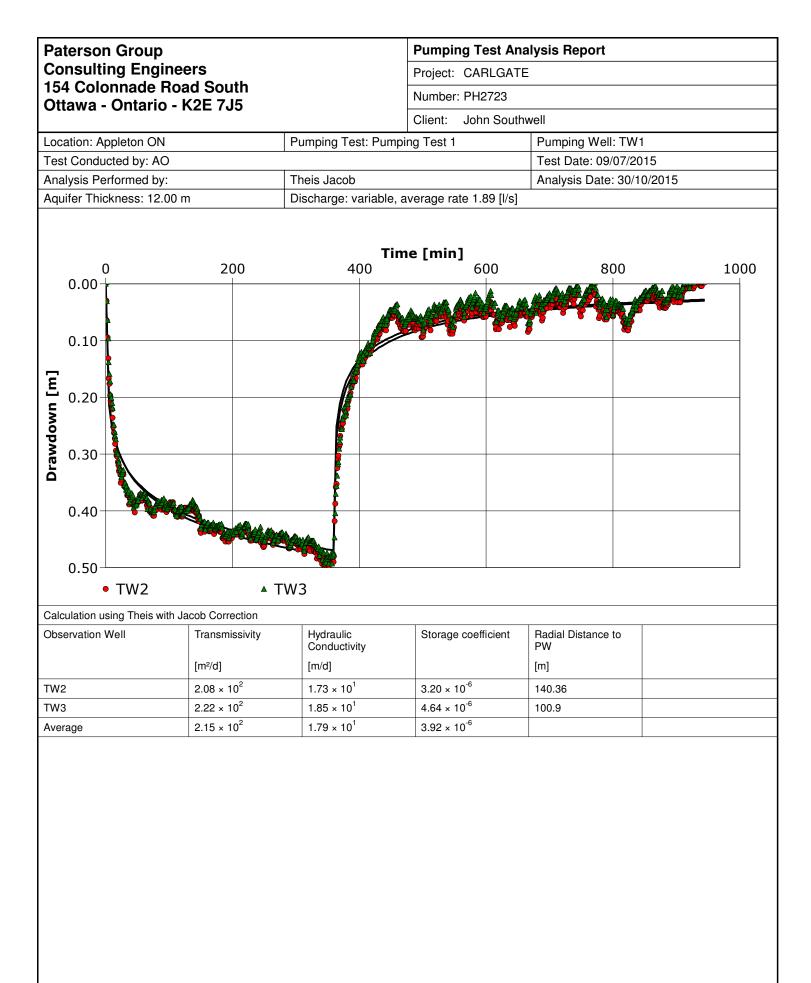
Project: CARLGATE

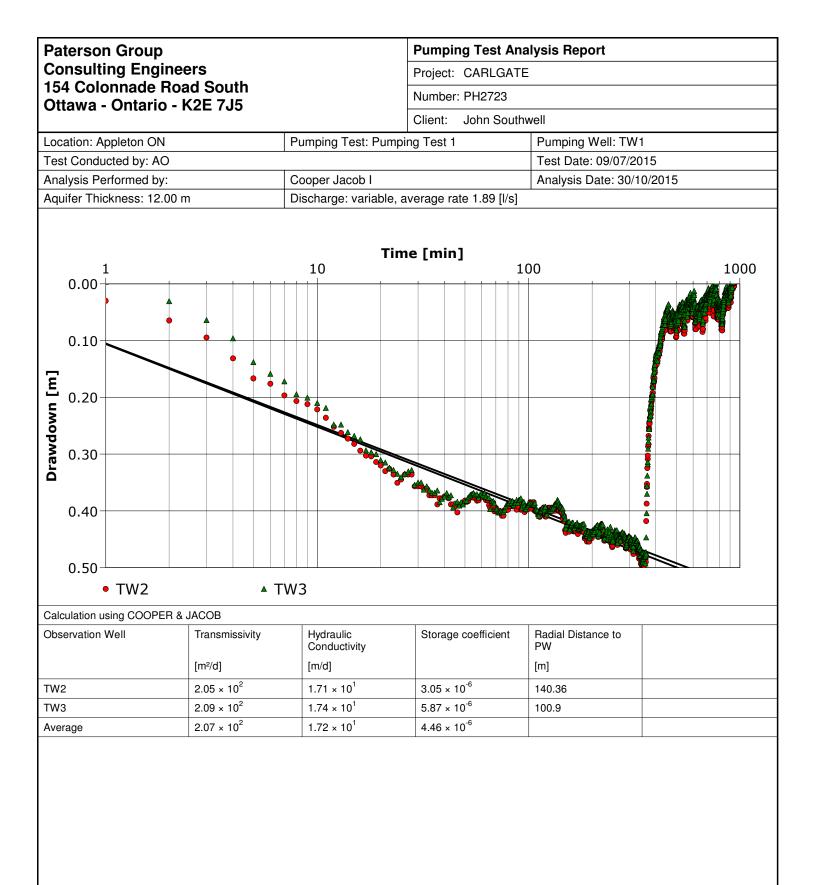
Number: PH2723

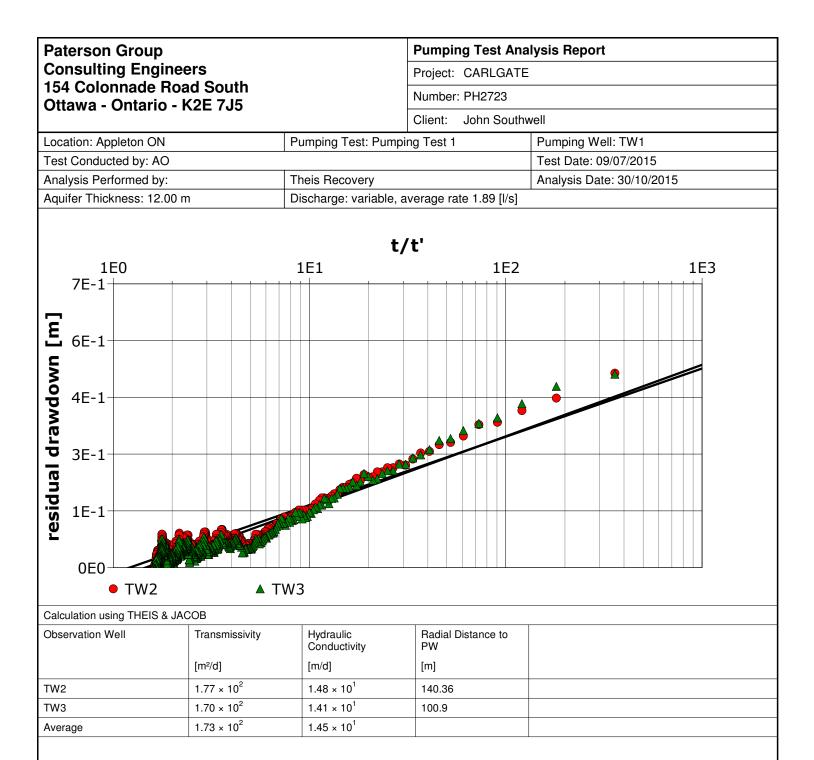
Client: John Southwell











Pa	terson Group				Pumping	Test Ana	lysis Re	port		
	onsulting Engin		Project: CARLGATE							
154 Colonnade Road South Ottawa - Ontario - K2E 7J5					Number: F	PH2723				
					Client: J	ohn Southv	vell			
Loc	ation: Appleton ON		Pumping Tes	st: Pumpi	ng Test 1		Pumpin	g Well: TW1		
Test Conducted by: AO					Test Date: 09/07/2015					
Aquifer Thickness: 12.00 m Discharge: variable, a				ariable, a	verage rate	1.89 [l/s]				
	Analysis Name	Analysis Performed by	Analysis Date	Method r	Method name		Well		K [m/d]	S
1	Theis		30/10/2015	Theis		TW2		2.05×10^2	1.71 × 10 ¹	3.05 × 10 ⁻⁶
2	Theis		30/10/2015	Theis		TW3		2.20×10^2	1.83×10^{1}	4.39 × 10 ⁻⁶
3	Theis Jacob		30/10/2015	Theis wit	th Jacob Corr	e/TW2		2.08 × 10 ²	1.73 × 10 ¹	3.20 × 10 ⁻⁶
4	Theis Jacob		30/10/2015	Theis wit	th Jacob Corr	erTW3		2.22×10^2	1.85 × 10 ¹	4.64 × 10 ⁻⁶
5	Cooper Jacob I		30/10/2015	Cooper &	& Jacob I	TW2		2.05×10^2	1.71 × 10 ¹	3.05 × 10 ⁻⁶
6	Cooper Jacob I		30/10/2015	Cooper & Jacob I		ТѠЗ		2.09 × 10 ²	1.74 × 10 ¹	5.87 × 10 ⁻⁶
7	Theis Recovery		30/10/2015	Theis Recovery		TW2		1.77 × 10 ²	1.48 × 10 ¹	NAN
8	Theis Recovery		30/10/2015	5 Theis Recovery		ТѠЗ		1.70 × 10 ²	1.41 × 10 ¹	NAN
							Average	2.02 × 10 ²	1.68 × 10 ¹	NAN

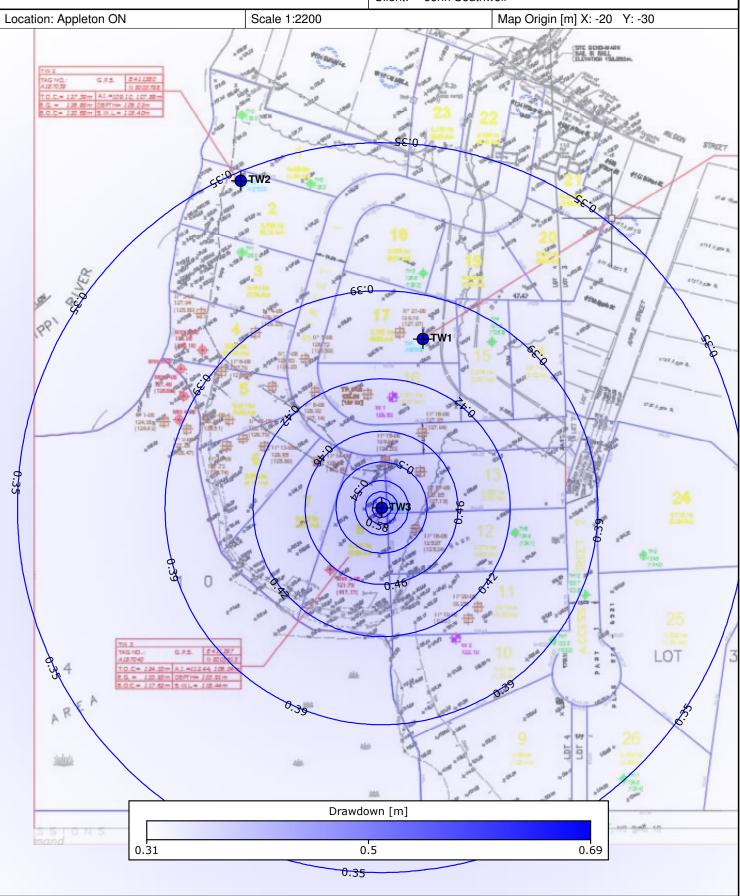
Paterson Group Consulting Engineers 154 Colonnade Road South Ottawa - Ontario - K2E 7J5

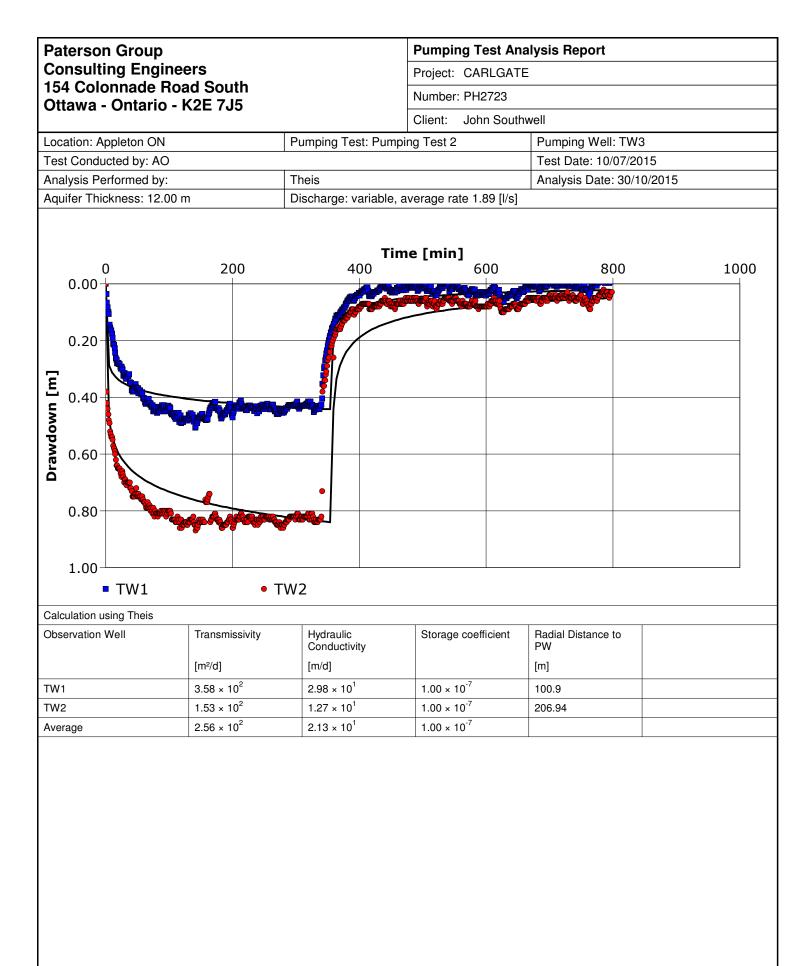
Site Plan

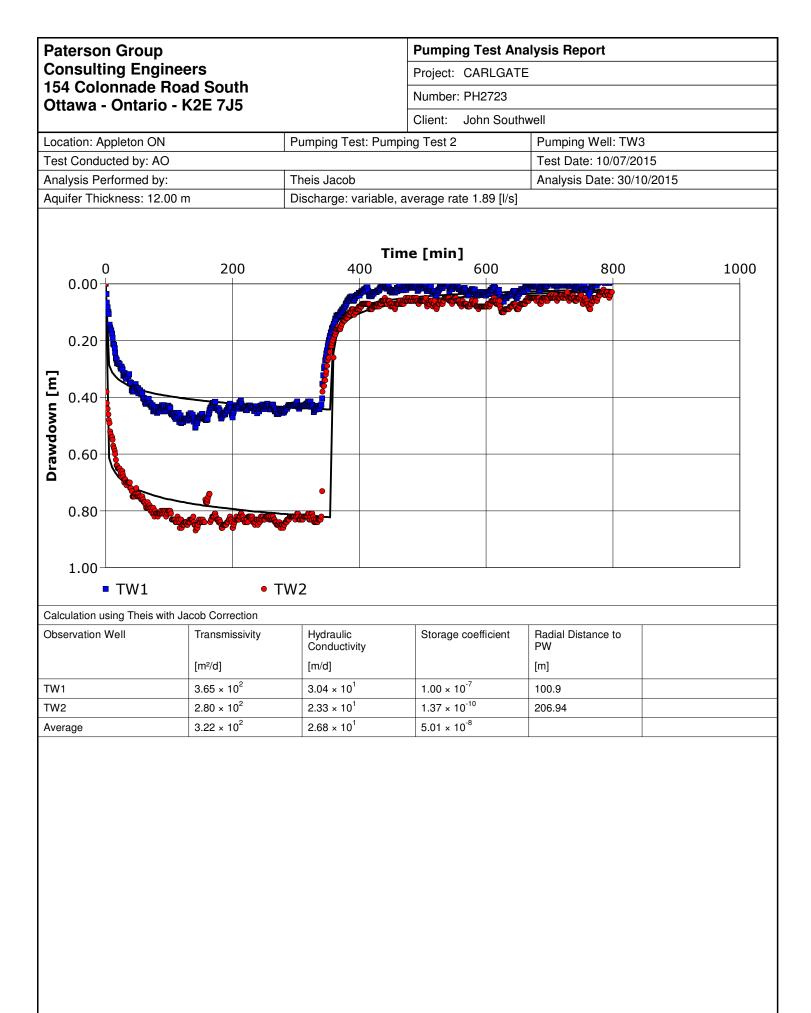
Project: CARLGATE

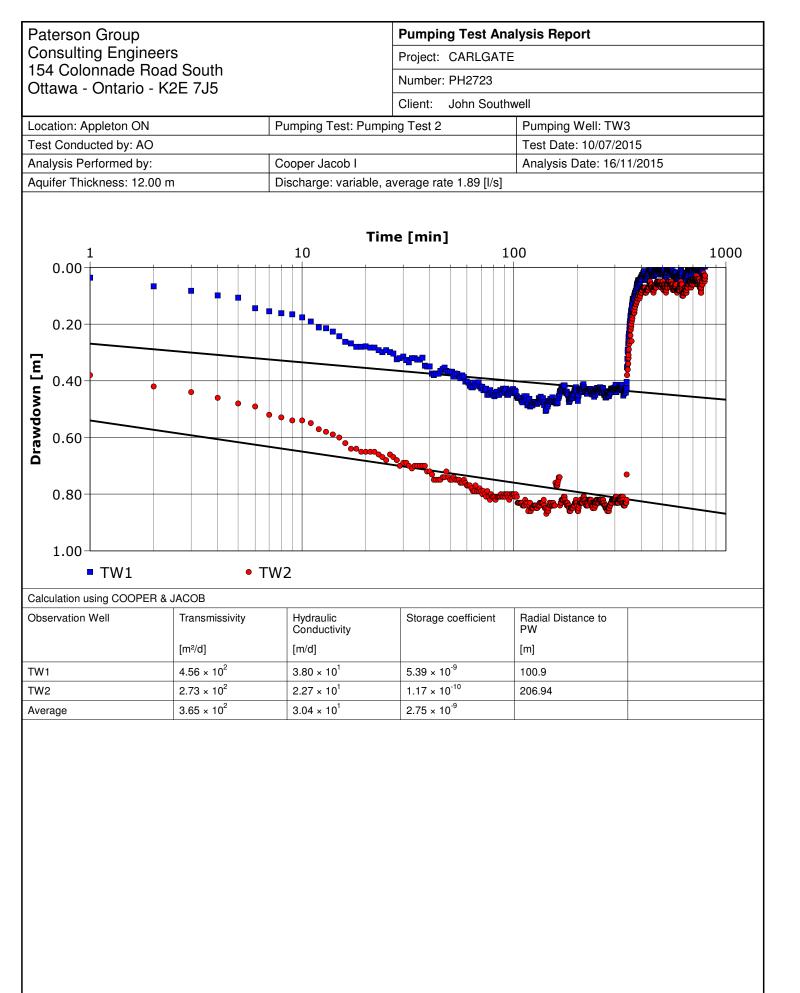
Number: PH2723

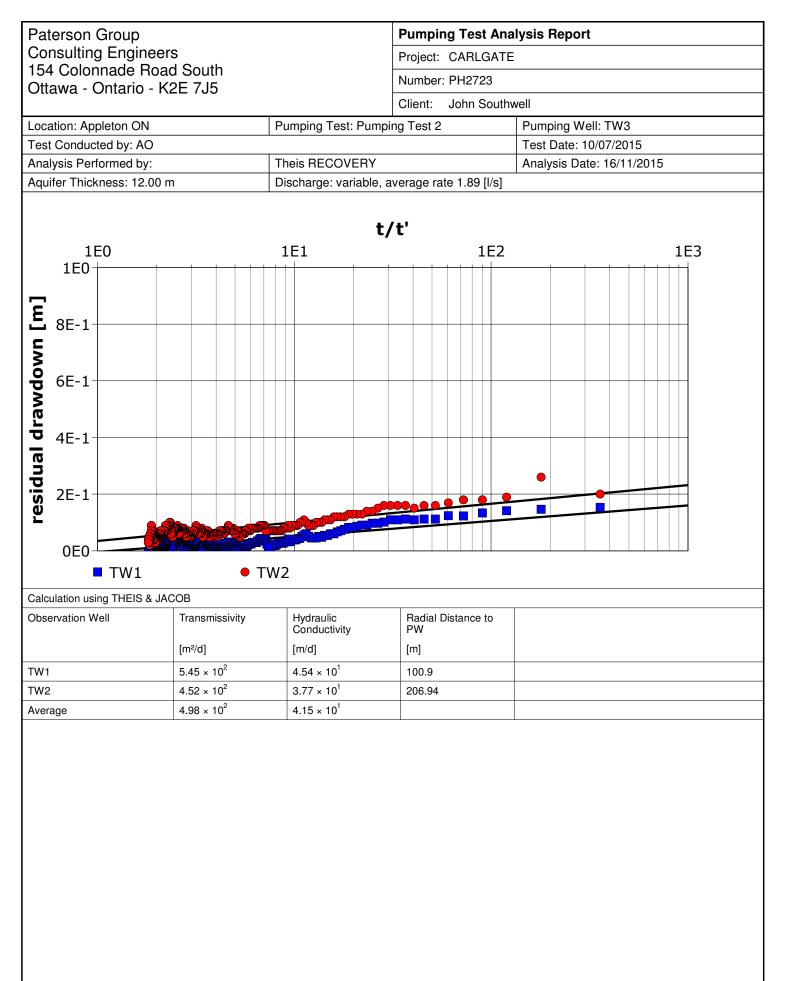
Client: John Southwell











Pa	Paterson Group					Test Ana	lysis Rep	oort			
Consulting Engineers					Project: CARLGATE						
154 Colonnade Road South					Number: P	H2723					
Ottawa - Ontario - K2E 7J5					Client: Jo	ohn Southw	vell				
Loc	ation: Appleton ON		Pumping Tes	t: Pumpir	ng Test 2		Pumping	Well: TW3			
Tes	st Conducted by: AO						Test Dat	e: 10/07/201	15		
Aquifer Thickness: 12.00 m Discharge: variable, a				ariable, av	verage rate	1.89 [l/s]					
	Analysis Name	Analysis Performed by	Analysis Date	Method name		Well		T [m²/d]	K [m/d]	S	
1	Theis		30/10/2015	Theis		TW1		3.58 × 10 ²	2.98 × 10 ¹	1.00 × 10 ⁻⁷	
2	Theis		30/10/2015	Theis		TW2		1.53 × 10 ²	1.27 × 10 ¹	1.00 × 10 ⁻⁷	
3	Theis Jacob		30/10/2015	Theis wit	h Jacob Corre	erTW1		3.65 × 10 ²	3.04×10^{1}	1.00 × 10 ⁻⁷	
4	Theis Jacob		30/10/2015	Theis wit	h Jacob Corre	etW2		2.80 × 10 ²	2.33×10^{1}	1.37 × 10 ⁻¹⁰	
5	Cooper Jacob I		16/11/2015	Cooper &	Jacob I	TW1		4.56 × 10 ²	3.80 × 10 ¹	5.39 × 10 ⁻⁹	
6	Cooper Jacob I		16/11/2015	Cooper &	Jacob I	TW2		2.73 × 10 ²	2.27 × 10 ¹	1.17 × 10 ⁻¹⁰	
7	Theis RECOVERY		16/11/2015	Theis Recovery		TW1		5.45 × 10 ²	4.54×10^{1}	NAN	
8	Theis RECOVERY		16/11/2015	16/11/2015 Theis Recovery		TW2		4.52 × 10 ²	3.77 × 10 ¹	NAN	
	· · ·					-	Average	3.60 × 10 ²	3.00×10^{1}	NAN	

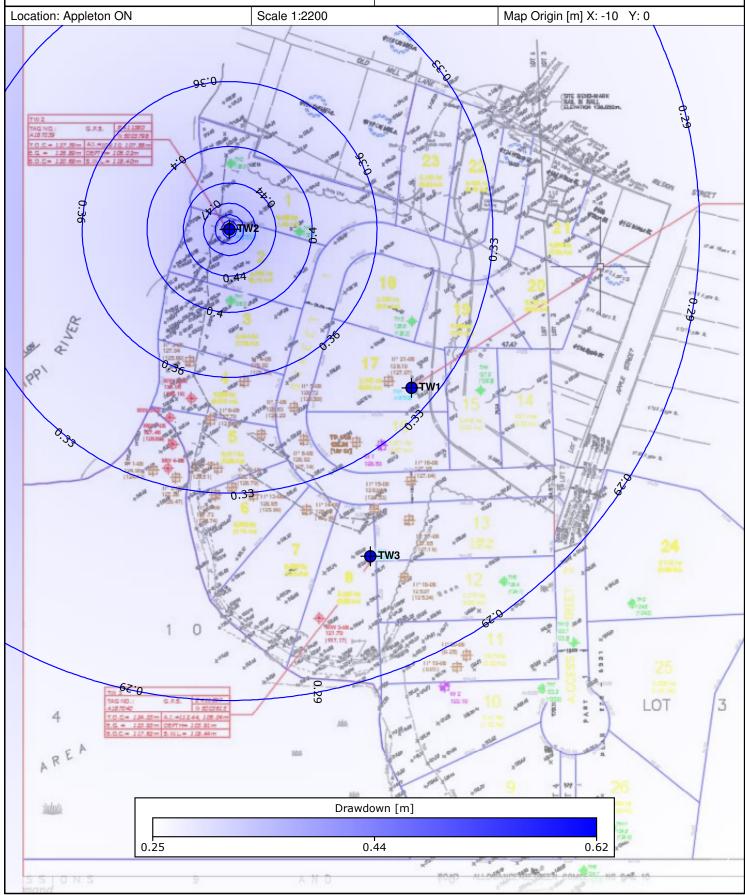
Paterson Group Consulting Engineers 154 Colonnade Road South Ottawa - Ontario - K2E 7J5

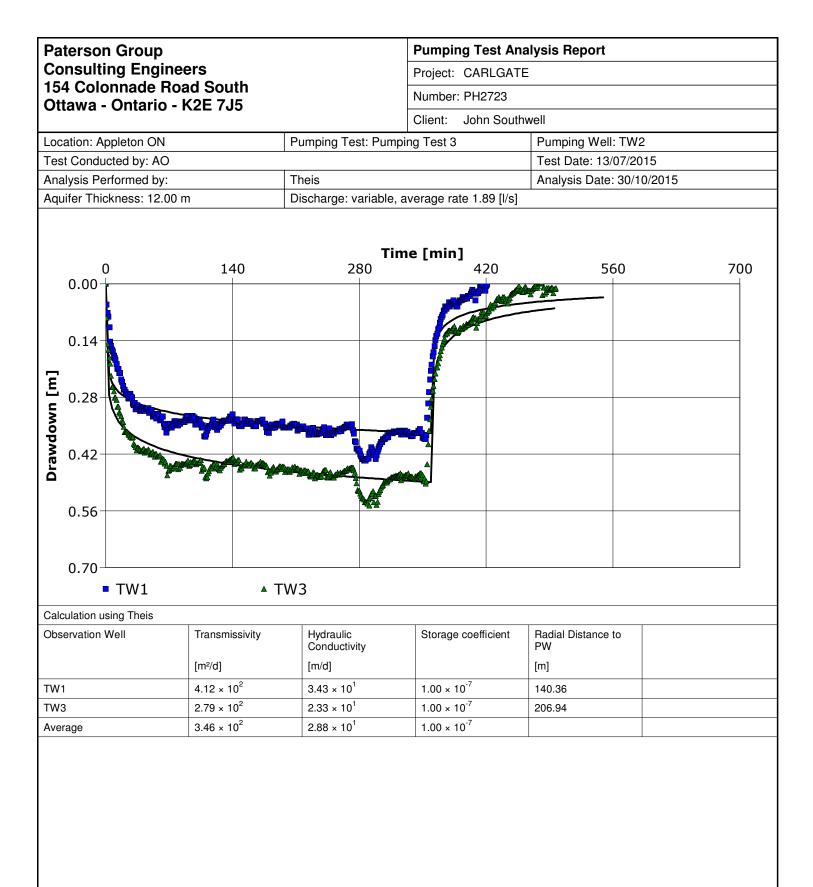
Site Plan

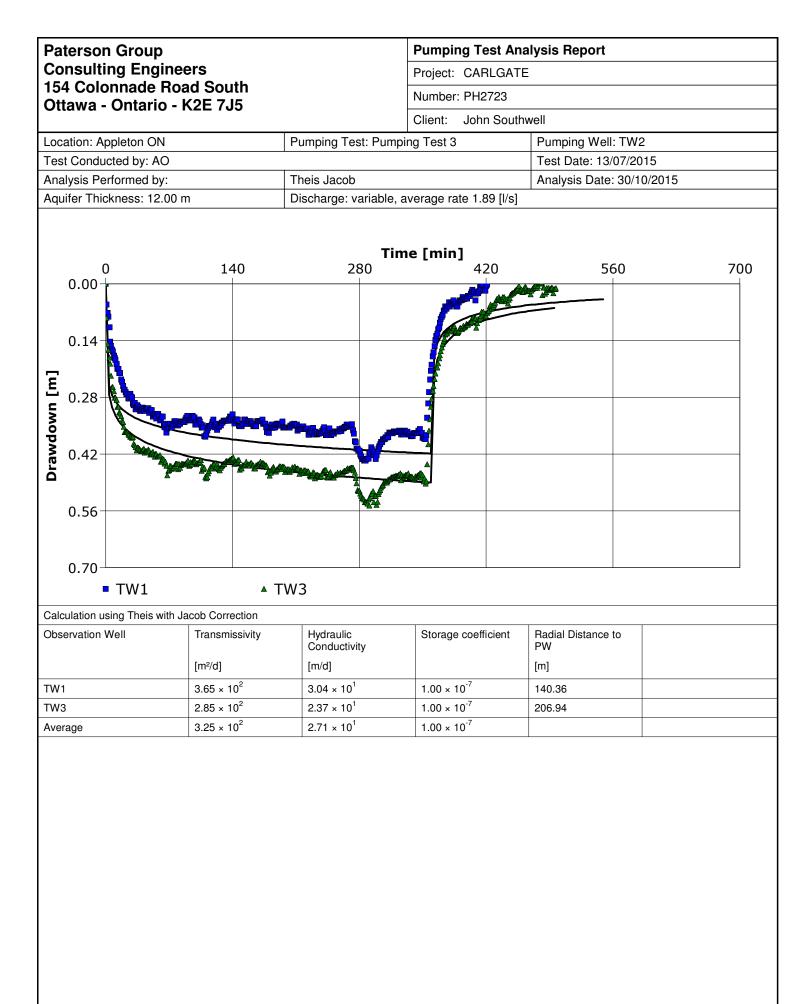
Project: CARLGATE

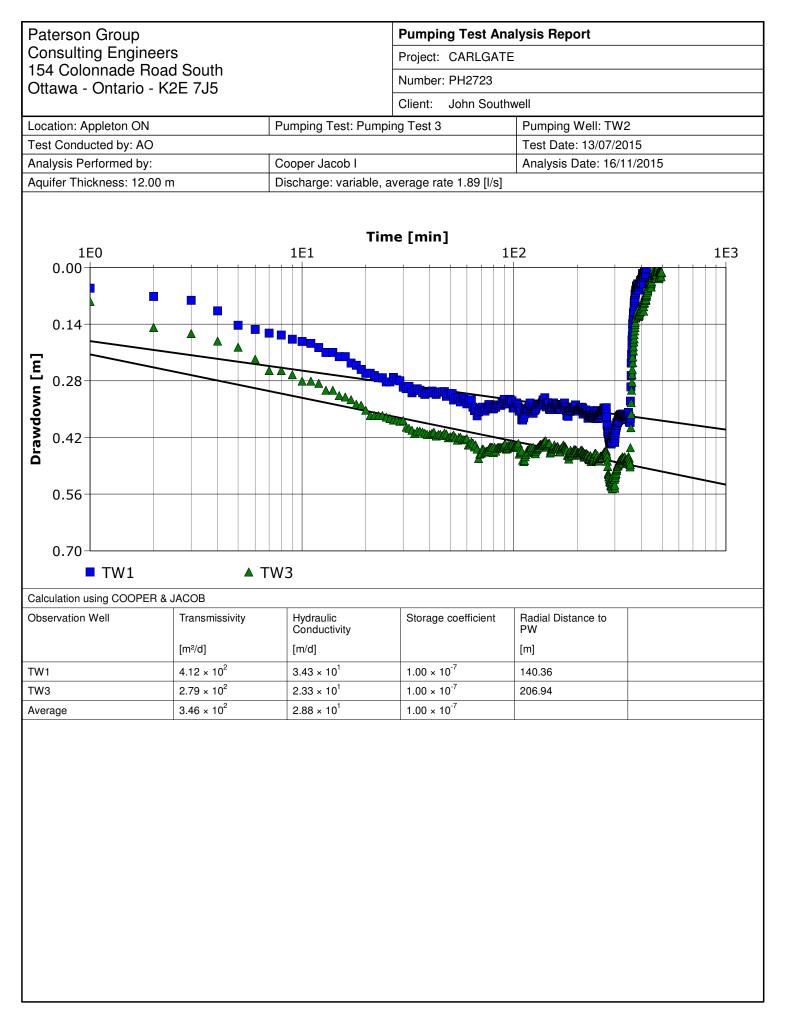
Number: PH2723

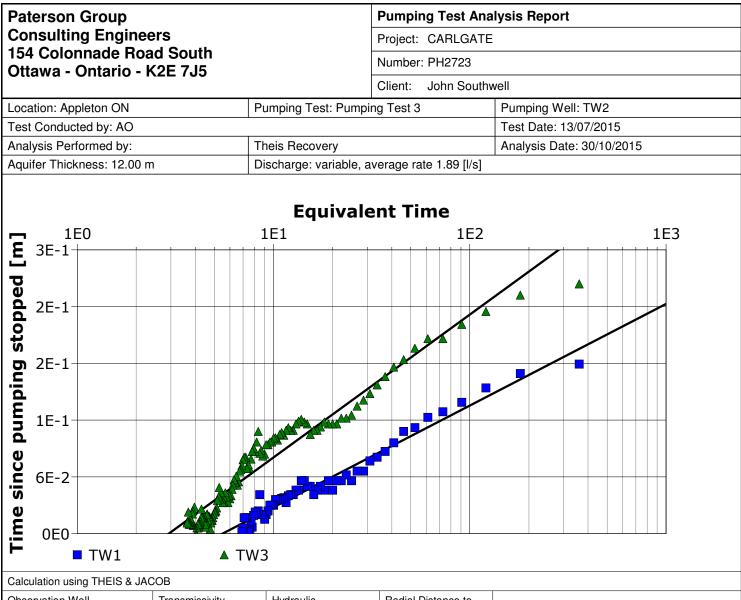
Client: John Southwell











Observation Well	Transmissivity	Hydraulic Conductivity	Radial Distance to PW	
	[m²/d]	[m/d]	[m]	
TW1	2.78 × 10 ²	2.32 × 10 ¹	140.36	
TW3	1.98 × 10 ²	1.65 × 10 ¹	206.94	
Average	2.38×10^{2}	1.98 × 10 ¹		

Ра	Paterson Group					Test Ana	lysis Rej	oort			
Consulting Engineers					Project: CARLGATE						
154 Colonnade Road South Ottawa - Ontario - K2E 7J5					Number: P	H2723					
	lawa - Ontario - Ki	.22 700			Client: J	ohn Southw	vell				
Loc	ation: Appleton ON		Pumping Tes	t: Pumpir	ng Test 3		Pumping	Well: TW2			
Tes	st Conducted by: AO	I					Test Dat	e: 13/07/201	15		
Aquifer Thickness: 12.00 m Discharge: variable, a					verage rate	1.89 [l/s]	1				
	Analysis Name A	Analysis Performed by	Analysis Date	Method name		Well		T [m²/d]	K [m/d]	S	
1	Theis		30/10/2015	Theis		TW1		4.12 × 10 ²	3.43×10^{1}	1.00 × 10 ⁻⁷	
2	Theis		30/10/2015	Theis		TW3		2.79 × 10 ²	2.33 × 10 ¹	1.00 × 10 ⁻⁷	
3	Theis Jacob		30/10/2015	Theis wit	h Jacob Corre	cTW1		3.65 × 10 ²	3.04 × 10 ¹	1.00 × 10 ⁻⁷	
4	Theis Jacob		30/10/2015	Theis wit	h Jacob Corre	cTW3		2.85 × 10 ²	2.37 × 10 ¹	1.00 × 10 ⁻⁷	
5	Theis Recovery		30/10/2015	Theis Re	covery	TW1		2.78 × 10 ²	2.32 × 10 ¹	NAN	
6	Theis Recovery		30/10/2015	Theis Re	covery	тwз		1.98 × 10 ²	1.65×10^{1}	NAN	
7	Cooper Jacob I		16/11/2015	Cooper & Jacob I		TW1		4.12 × 10 ²	3.43×10^{1}	1.00 × 10 ⁻⁷	
8	Cooper Jacob I		16/11/2015	Cooper & Jacob I		ТW3		2.79 × 10 ²	2.33 × 10 ¹	1.00 × 10 ⁻⁷	
							Average	3.13 × 10 ²	2.61 × 10 ¹	NAN	

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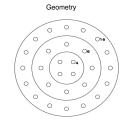
Carlgate Development Inc.

Determination of Potential Well Interference

Based on Average Values of Transmissivity and Storativity

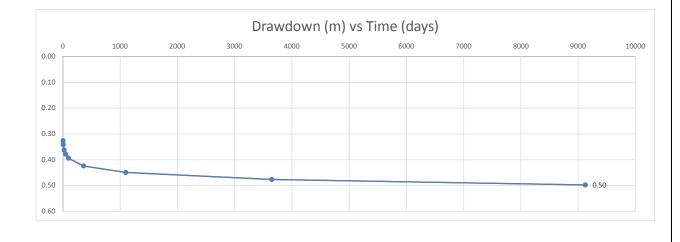
Pumping Rate (Q) m3/day	3
Transmissivity (T) m2/day	291.9166667
Average Well Spacing (m) r	30
Coefficient of Storage S	1.39E-06
Pi	3.14E+00

Thies (1935) nonequilibrium equation	
u=r2S/4Tt	
W(u) = exponential integral (of u)	



Analysis Assumes Continuous Pumping of 28 Wells

			r		1		
	1st Well Grouping	4	2nd Well Grouping	8	3rd Well Grouping	16	
Time (days)	u	W(u)	u	W(u)	u	W(u)	Drawdown
5	1.1E-07	15.47	3.2E-07	14.37	5.4E-07	13.86	0.33
10	5.4E-08	16.16	1.6E-07	15.06	2.7E-07	14.55	0.34
25	2.2E-08	17.08	6.5E-08	15.98	1.1E-07	15.47	0.36
50	1.1E-08	17.77	3.2E-08	16.67	5.4E-08	16.16	0.38
100	5.4E-09	18.46	1.6E-08	17.37	2.7E-08	16.85	0.39
365	1.5E-09	19.76	4.4E-09	18.66	7.4E-09	18.15	0.42
1100	4.9E-10	20.86	1.5E-09	19.76	2.4E-09	19.25	0.45
3650	1.5E-10	22.06	4.4E-10	20.96	7.4E-10	20.45	0.48
9125	5.9E-11	22.98	1.8E-10	21.88	2.9E-10	21.37	0.50



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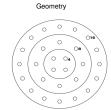
Carlgate Development Inc.

Determination of Potential Well Interference

Based on Worst Case Values of Transmissivity and Storativity

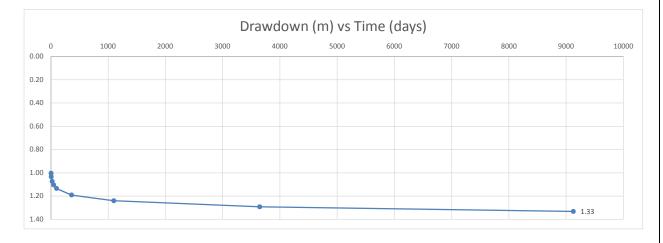
Pumping Rate (Q) m3/day	3
Transmissivity (T) m2/day	1.53E+02
Average Well Spacing (m) r	30
Coefficient of Storage S	1.17E-10
Pi	3.14E+00

Thies (1935) nonequilibrium equation
u=r2S/4Tt
W(u) = exponential integral (of u)



Analysis Assumes Continuous Pumping of 28 Wells

	1st Well Grouping	4	2nd Well Grouping	8	3rd Well Grouping	16	
Time (days)	u	W(u)	u	W(u)	u	W(u)	Drawdown
5	1.7E-11	24.21	5.2E-11	23.11	8.6E-11	22.60	1.00
10	8.6E-12	24.90	2.6E-11	23.80	4.3E-11	23.29	1.03
25	3.4E-12	25.82	1.0E-11	24.72	1.7E-11	24.21	1.07
50	1.7E-12	26.51	5.2E-12	25.41	8.6E-12	24.90	1.10
100	8.6E-13	27.20	2.6E-12	26.11	4.3E-12	25.59	1.13
365	2.4E-13	28.50	7.1E-13	27.40	1.2E-12	26.89	1.19
1100	7.8E-14	29.60	2.3E-13	28.50	3.9E-13	27.99	1.24
3650	2.4E-14	30.80	7.1E-14	29.70	1.2E-13	29.19	1.29
9125	9.4E-15	31.72	2.8E-14	30.62	4.7E-14	30.11	1.33



patersongroup 122 Old Mill Lane, Appleton

PREDICTIVE NITRATE I	MPACT ASSESSE	EMENT
Infiltration Factors		
Topography	0.25	
Soil	0.30	
Cover	0.15	
Total	0.70	
Site Characteristics		
Area of Site :	196100	m²
Area of Subdivision:	69900	m²
Proposed subdivision as % of subject property:	36	%
Area of each roof:	300	m²
Total of roof areas:	4200	m²
Area of each paved driveway:	200	m²
Total area of paved driveway areas:	2800	m²
Roof + paved driveway areas + paved roadway	13300	m²
Length of paved roadways:	2100	m
Width of paved roadways:	3	m
Total area of paved roadways:	6300	m²
mpervious Area	13300	m ²
Percent Impervious Area =	7	%
nfiltration Area =	182800	m²
Septic Effluent		
Concentration of Effluent (Cs) =	40	mg/L
Daily Sewage Flow (Qs)=	1	m ³
See Notes below.		
Infiltration Calculation		
Nitrate concentration in precipitation $(C_i) =$	0	mg/L
Surplus Water (Environment Canada)	342	mm/yr
Factored Water Surplus =	239	mm/yr
nfiltration % due to stormwater management measures	-	·
nfiltration rate from stormwater management measures =	0	mm/yr
nfiltration Flow Entering the System $(Q_i) =$	120	m ³ /day
Mass Balance Model (MOEE, 1995) $C_T = (Q_F C_F + Q_C C_F + Q_C C_F)/(Q_F + Q_F + $) = Cumulative Nitrate Concentration	
Q_{b} = flow entering the system across the upgradient area	0	m ³ /day
C_b = background nitrate concentration	1.4	mg/L
Q_{e} = flow entering the system from the septic drainfield	14	m ³ /day
C_{e} = concentration of nitrates in the septic effluent	40	mg/L
Q_i = flow entering the system from infiltration	120	m³/day
$C_i = Concentration of nitrates in the infiltrate$	0	mg/L
	C _T = 4.18	mg/L
Estimate Number of Lots	14	lots

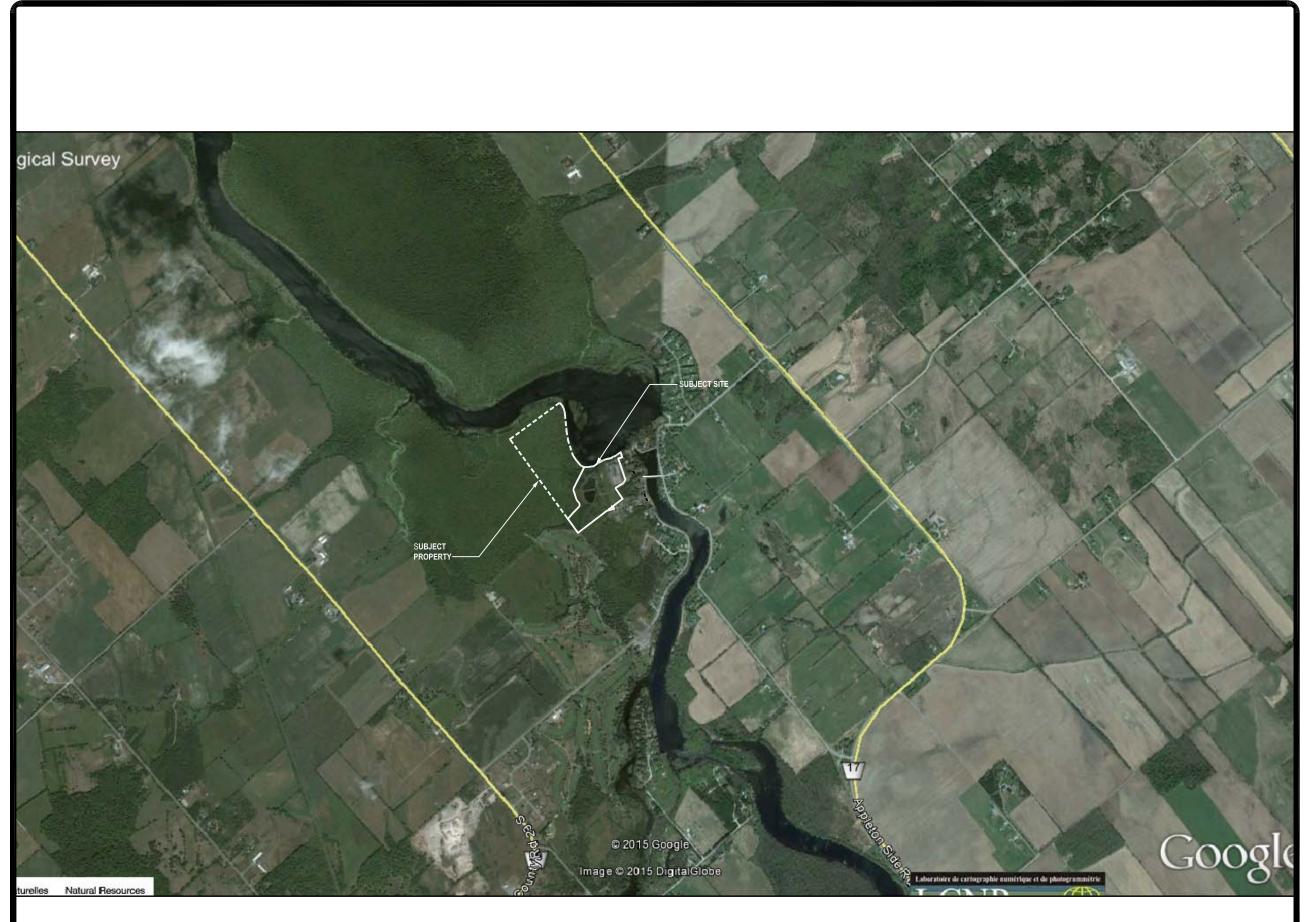
WATER BUDGET MEANS FOR THE PERIOD 1992-2021 DC20492 LAT.... 45.18 WATER HOLDING CAPACITY...100 MM HEAT INDEX... 37.24 LONG... 76.12 LOWER ZONE..... 60 MM A..... 1.088 TEMP (C) PCPN RAIN MELT ΡE DEF SURP SNOW SOIL ACC P DATE AE 31- 1 -9.5 28- 2 -8.1 31- 3 -2.3 30- 4 5.8 31- 5 13.2 30- 6 18.3 -4 31- 7 20.7 -20 19.7 31- 8 -26 30-9 15.4 -7 31-10 8.6 30-11 1.7 31-12 -5.2 AVE 6.6 TTL -57

Appleto	on		STAN	DARD D	EVIATI	ONS FO	DR THE	PERIOD	1992-	2021	DC20492
DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	3.1	27	19	22	1	1	0	38	35	6	51
28- 2	2.8	21	15	20	1	1	0	29	40	4	55
31- 3	2.6	25	19	33	6	6	0	36	48	0	62
30-4	1.5	39	38	47	7	7	0	59	0	1	79
31- 5	1.6	36	36	0	11	11	0	22	0	25	95
30- 6	1.2	38	38	0	8	11	11	13	0	39	109
31- 7	1.4	53	53	0	10	31	35	24	0	35	135
31- 8	1.2	45	45	0	8	28	32	7	0	34	140
30- 9	1.5	36	36	0	8	13	15	3	0	37	131
31-10	1.6	34	35	4	7	7	1	24	2	30	34
30-11	2.0	24	24	9	5	5	0	34	12	14	46
31-12	2.7	25	19	15	2	2	0	28	30	7	51

Appleton

Appendix 5

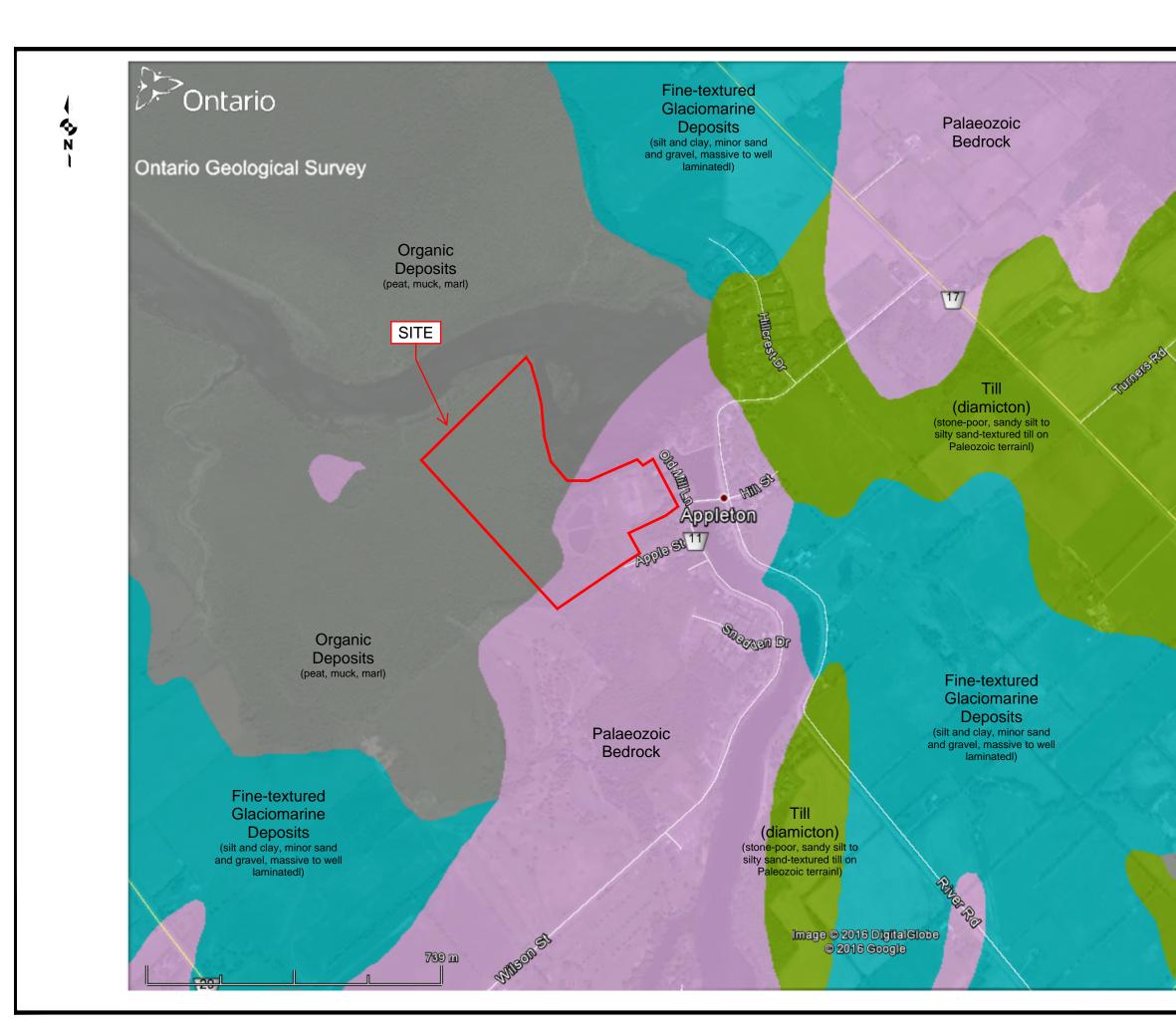
- Figure-1 Site Location Plan
- Figure-2 Overburden Geology
- Figure-3 Bedrock Geology
- Figure-4 MECP Water Well Location Plan
- Figure-5 Generalized North South Site Cross-Section
- Drawing PH4398-1- Lot Development Plan
- Drawing PH4398-2 Test Hole Location Plan



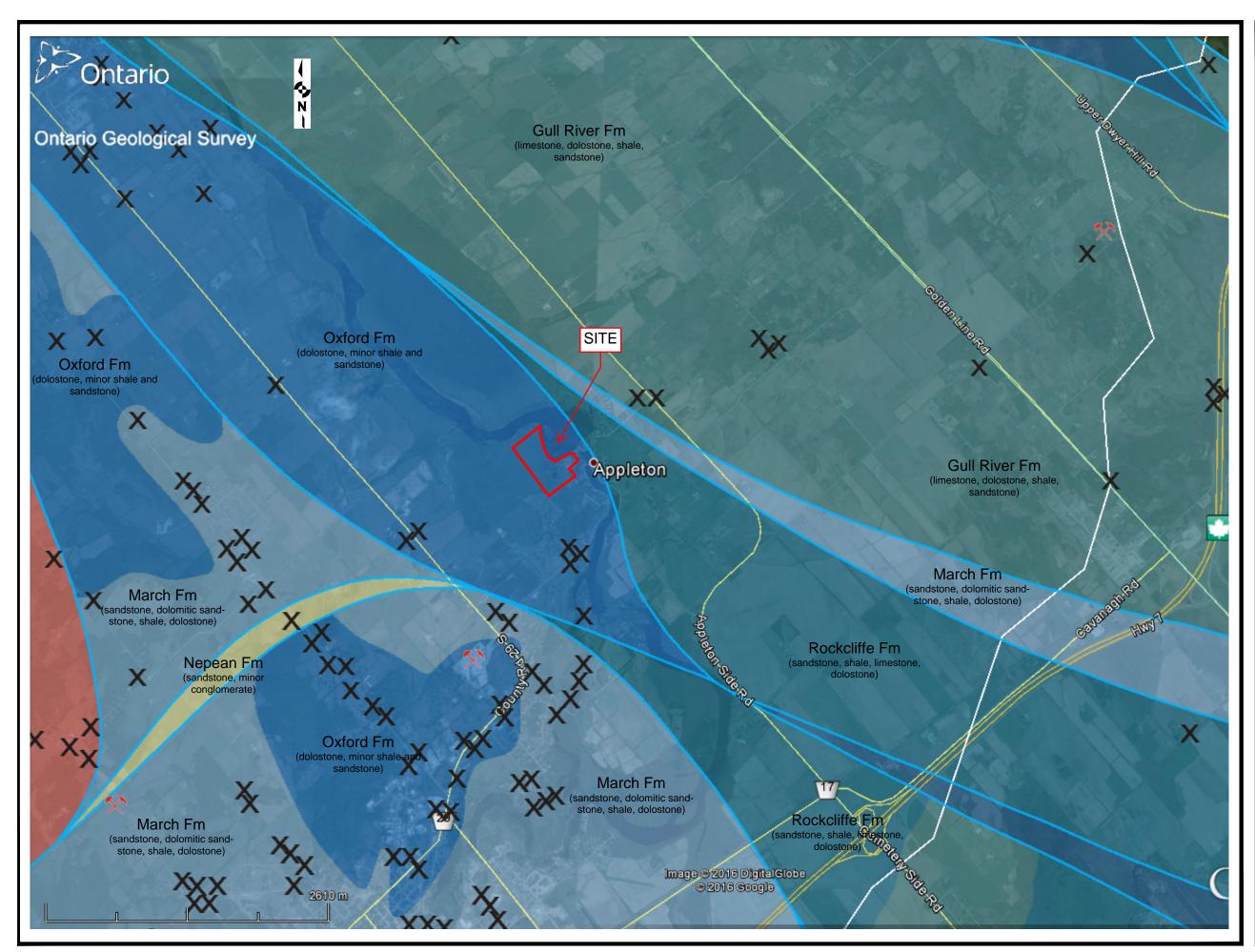
____ Property Boundary Site Boundary **REFERENCE:** Information reproduced from Google Earth 2015 20/10/2015 ISSUED WITH REPORT PH2723-REP-01 DESCRIPTION DD/MM/YY REV. Consultant: patersongroup consulting engineers Client: SOUTHWELL HOMES LTD. Project: **PROPOSED RESIDENTIAL** SUBDIVISION OLD MILL LANE APPLETON, ONTARIO Drawing: SITE LOCATION PLAN Scale: Drawn by: 1:20000 AO Checked by: File: PH2723 RLC Drawing No.: **FIGURE-1**

p:\autocad drawings\hydrogeology\ph27xx\ph2723-appleton\ph2723-figures.dwg

LEGEND:



2003. St	urficial Geo	Geological Survey blogy of	<i>י</i> .			
Souther	n Ontario.					
	L	EGEND				
	Fill					
	Organic Depo	sits: peat, muck and mar	1			
	Silt					
	Silt					
	Sand					
	Gravel					
	Till (Diamicton)				
	Sedimentary (Paleozoic) bedrock				
	Precambrian b	edrock				
22-AUG-16	PH27	23-REP.01R1				
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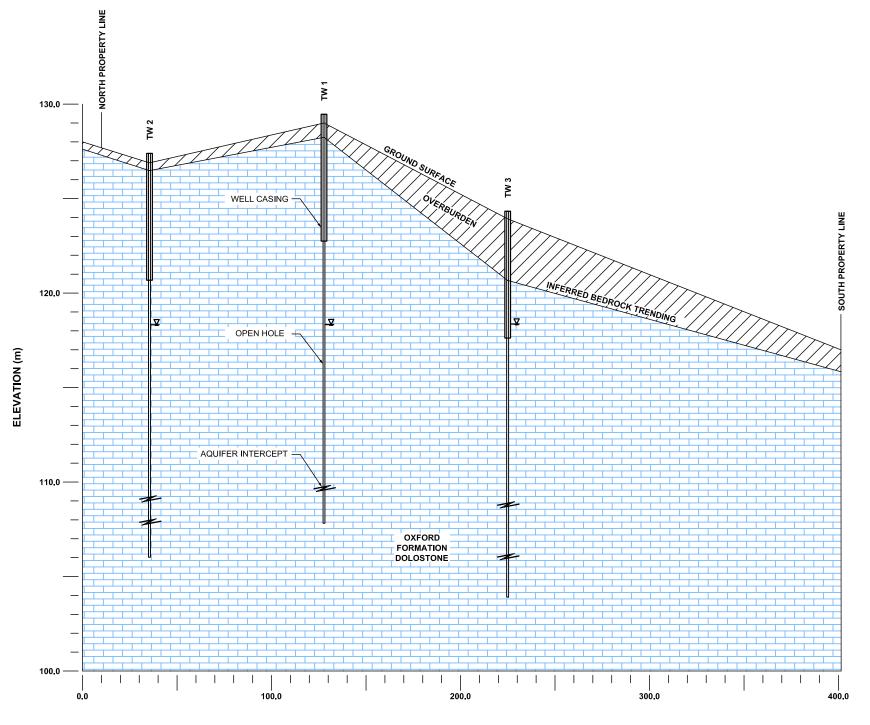


Middle Ordovici Simcoe Grou									
Simcoe Gro									
11 Lindsay Formation: limestone; nodular to black laminated (-Collingwood Member or Eastview Member in eastern Ontario)									
	lingwood Member or F am Formation: limes		Ontario)					
9 Bobcaygeon Formation: limestone, with minor shales in upper part									
Gull River Formation: limestone, with dolostone beds towards base Shadow Lake Formation: shale, argillaceous sandstone, silty dolostone									
6 Rockcliffe Formation: sandstone, shale, limestone, dolostone									
Lower Ordovicia									
Beekmantov 5 Oxfo		ne, minor shale and sandsto	ne						
4 Marc	h Formation: sandstor	ne, dolomitic sandstone, dol	ostone						
Cambrian									
Potsdam Gr									
		ne, minor conglomerate spathic conglomerate, impu	re sandst	tone					
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REF: Armstrong, D.K. and Dodge, J.E.P. Paleozoic Geology Map of Southern Ontario; Ontario Geological Survey, Miscel-

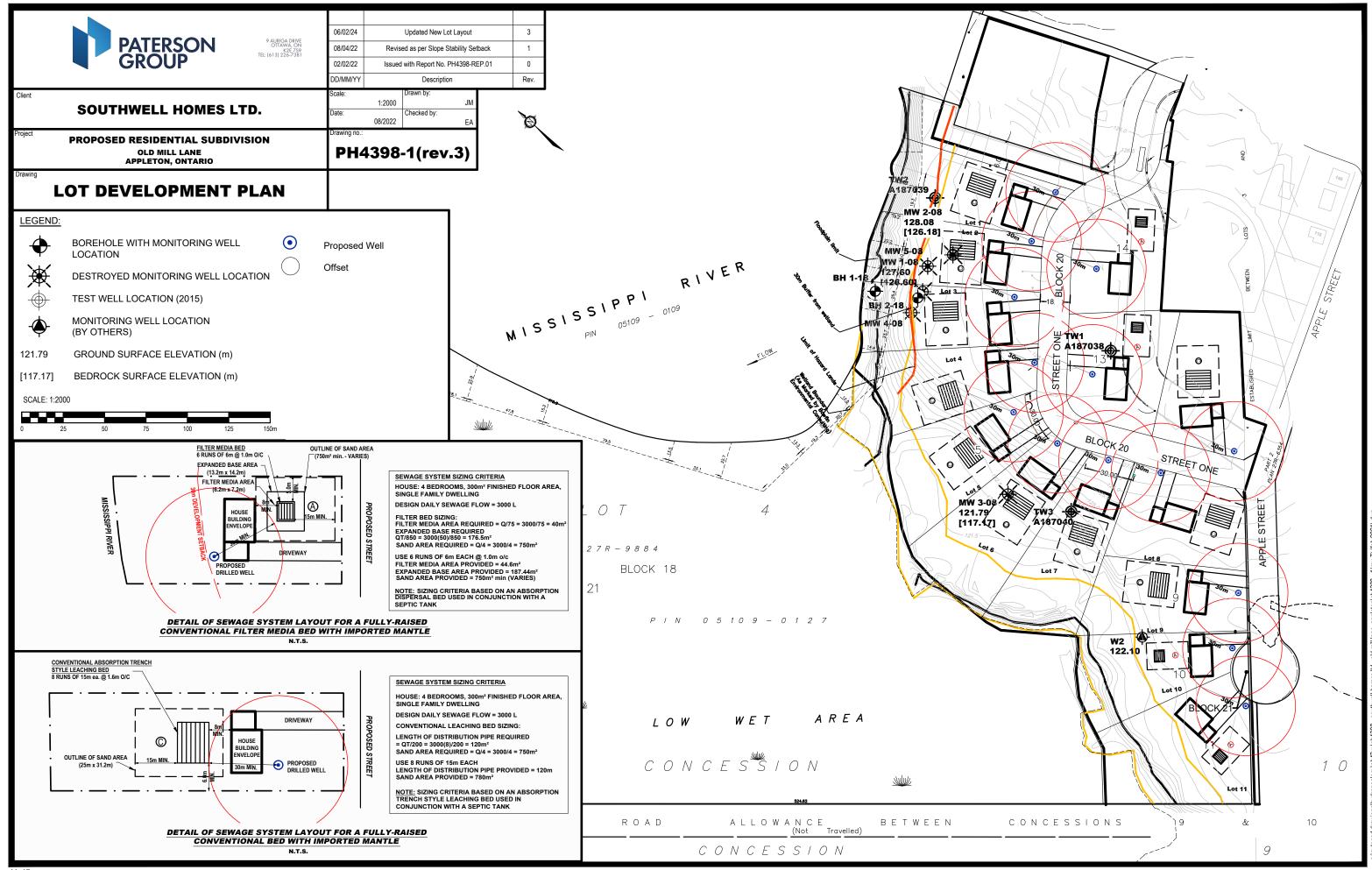


22-AUG-16 PH2723-REP.01R1 DIMMYY DESCRIPTION DDIMMYY DESCRIPTION REV. Consultant: PACEOSOG COUP Consulting engineers Client: SOUTHWELL HOMES LTD. Project: OLD MILL LANE APPLETON, ONTARIO Drawing: WATER WELL RECORDS Scale: see Figure Drawn by: RLC FIGURE 4			ontario.ca/er nap-well-rec		
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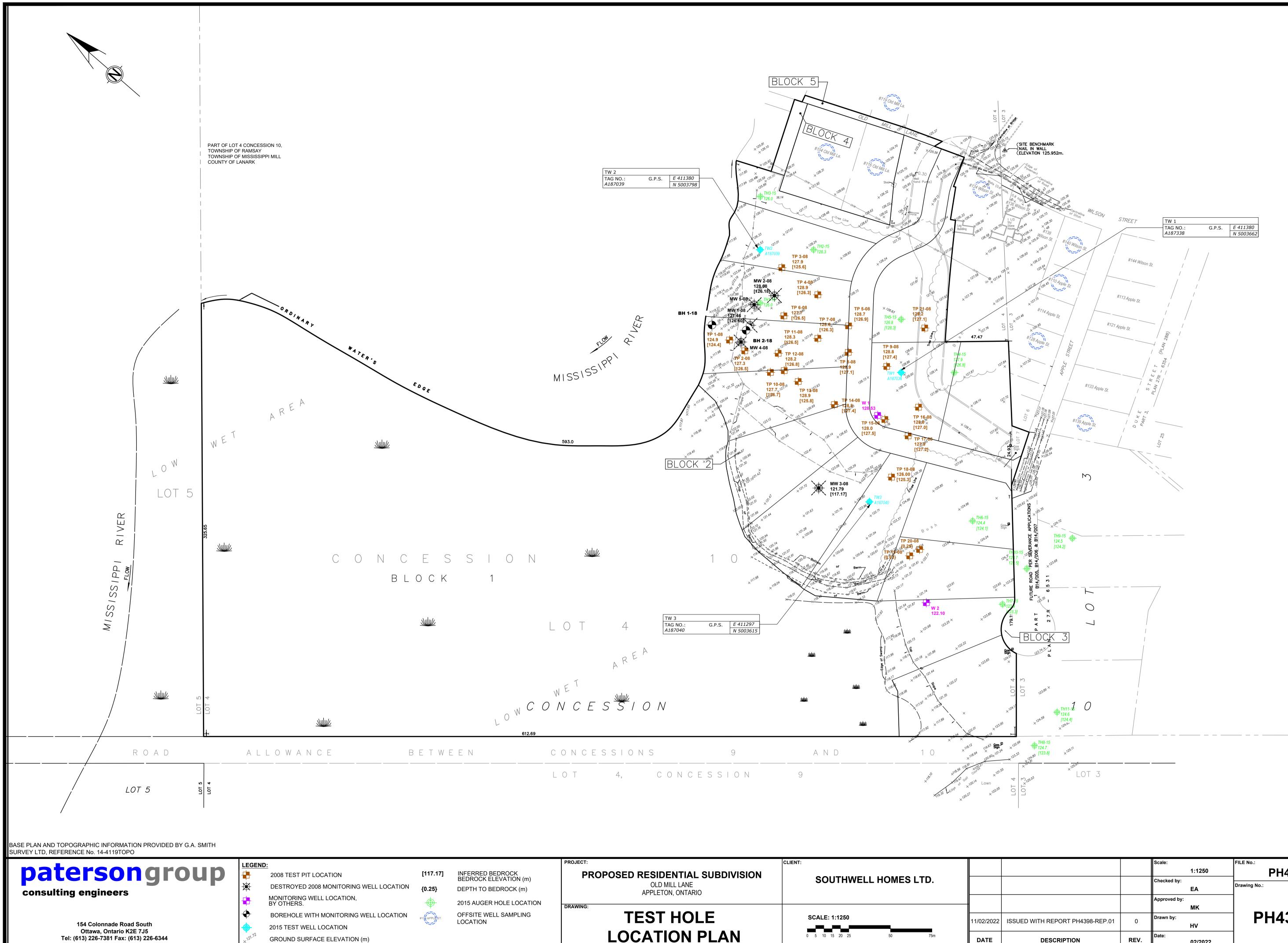


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	LOCATION PLAN	0 5 10 15 20 25 50 75m	DATE	

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		Checked by:	EA	Drawing No.:	
		Approved by:	МК		
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DESCRIPTION	REV.	Date:	02/2022		

