PATERSON GROUP

Terrain Analysis and Hydrogeological Study

Proposed Residential Development

1934 Stagecoach Road
Ottawa, Ontario

Prepared for 7773226 Canada Inc.

Report PH3745-1 dated June 21, 2023

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1.0 Introduction

1.1. Terms of Reference

Paterson Group (Paterson) was commissioned by Fotenn Consultants Inc. (Fotenn) in 2007 to conduct a Terrain Analysis and Hydrogeological Study for a proposed rural residential subdivision on a 63 ha parcel of land, hereafter denoted as subject property, located on Part of the Rear of Lot 12, Concession 3, Parts 1-9, Plan 4R-19474 and as Part of the East Half of Lot 12, Concession 3, Part 1, Plan 5R2820, former Township of Osgoode, now in the City of Ottawa (Refer to Paterson Drawing PH4734-1 - Site Plan, located in Appendix 5). The subject site currently has a municipal address of 1934 Stagecoach Road, in Ottawa.

Work began on this subdivision in 2006, with an original Terrain Analysis and Hydrogeological Study Report being prepared and issued in April 2007. Several rounds of comments were addressed by Paterson pertaining to the review of the report by the South Nation Conservation (SNC) by means of an addendum report and several correspondence letters. However, in January 2008, work ceased on the site pending a change in ownership of the subject property.

In November 2009, Paterson was re-engaged by the new owner, Velika Realty Corporation of Ottawa, Ontario, to address the remaining concerns of the SNC and finalize the Hydrogeological Study.

An updated Terrain Analysis and Hydrogeological Study was released on June 23, 2011 titled Paterson Report PH0482-REP.02 – Terrain Analysis and Hydrogeological Study – Dated April 2, 2007 and updated June 23, 2011.

A Draft Plan of Submission Application was submitted on August 5, 2022 to address the clearance of conditions for the application. City of Ottawa comments regarding the submission were received on October 7, 2022. The applicants company changed to 7773226 Canada Inc. at that time.

Paterson Group completed an updated Geotechnical Investigation titled Paterson Report PG6532-1- Geotechnical Investigation dated December 14, 2022. The results of the Geotechnical Investigation were used to update this Terrain Analysis and Hydrogeological Study Report.

Paterson Group completed a Hydrogeological Study & Water Budget Assessment titled Paterson Report PH4734 - Hydrogeological Study & Water Budget Assessment dated June 21, 2023. The results of this Study were used to update this Terrain Analysis and Hydrogeological Study Report.

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 with minimal impact on groundwater resources. This report summarizes all of the additional works carried out and summarizes all of the associated findings.

The following report has been prepared specifically and solely for the aforementioned project which is described herein. It contains our findings and recommendations pertaining to the private services for the subject development as it is understood at the time of writing this report.

Paterson has also completed a Phase I - Environmental Site Assessment (ESA) for the subject lands, the results of which are recorded under in Paterson Report PE0969-REP.01

1.2. Background

The subject property encompasses a total area of approximately 62.57 ha (GeoOttawa) and is proposed to be subdivided into 66 residential lots and one stormwater management pond having a minimum lot size of approximately 0.8 ha. It is proposed that the subdivision will be serviced by individual onsite wells and septic systems.

Paterson has conducted extensive hydrogeological investigations in the vicinity of the subject property in recent years, especially in the Greely Village area. Paterson has carried out hydrogeological studies for the South Village and Woodstream Subdivisions located to the north of the subject site (G8105) and for lands to the east of Hwy. 31 for a combination commercial and residential developments (Paterson Project No. PH0145). This local expertise has been incorporated into this study, where applicable.

2.0 Method of Study

2.1. Terrain Analysis

As part of this study, a series of test pits were put down on the subject property to delineate the subsurface soil conditions beneath the site. The initial field investigation was conducted on August 29, 2006. During this investigation a total of 13 test pits were put down in the area of the residential lots, by means of a backhoe. The test pit locations were selected by Paterson personnel to ensure adequate representation of the subsurface soil profile that was delineated across the site. The 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 by Paterson personnel 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 further review in our laboratory. The depths at which the soil samples were recovered from the test holes are shown as “G” on the Soil Profile and Test Data sheets provided in Appendix 1.

On September 26, 2006, an additional seven (7) hand auger holes were put down in the area located along the central to western quadrant of the site, due to access limitations encountered with the backhoe during the initial field investigation. The subsurface conditions observed at both the test pits and auger hole locations are shown on the Soil Profile and Test Data sheets, in Appendix 1 of this report, and the locations are referenced on the Drawing No. PH0482-7 – Lot Development Plan in Appendix 5.

On August 6, 2010, a series of additional test pits were put down on the subject property to augment the original terrain analysis fieldwork program with specific focus on determining the surficial soil profiles within the southern central and southeastern quadrants of the site. During this investigation a total of ten (10) additional test pits were put down. Reference should be made to Appendix 1 for the Soil Profile and Test Data sheets for each of these test pits and their locations can be reference on the Lot Development Plan Drawing No. PH0482 - 7 located in Appendix 5.

A permeameter testing investigation was conducted using a Pask (Constant Head) Permeameter between October and November 2022. An 83 mm diameter hole was excavated using a Riverside/Bucket auger to the desired testing depth. Permeameter testing was conducted at 12 locations across the subject site. Two tests were conducted at each location, one at the invert elevation of the drainage ditch and another 0.5 m below the invert elevation. The permeameter testing locations were placed to provide general coverage of the proposed drainage ditch system. Additional information regarding the Pask Permeameter testing can be found in Paterson Report PH4734 - Hydrogeological Study & Water Budget Assessment dated June 21, 2023.

2.2. Test Well Installation

A rigorous review of available Water Well Records for the immediate area, published by the Ontario Ministry of the Environment (MECP) was undertaken prior to the placement of the test wells. Overburden thickness, depth of casing, aquifer interception points and reported well yields were reviewed in detail in order to establish a conceptual hydrogeological model for the site. Based on Paterson’s

previous experience in the area, and combined with the available Water Well Records, a conceptual hydrogeological model was established. A comprehensive well construction protocol was subsequently established based on the conceptual model and field results.

The general well locations were chosen in order to ensure adequate coverage across the site, while, at the same time, endeavoring to maintain sufficient proximity such that responses could be measured in observation wells during the pumping tests. The test well installation program was carried out by Air Rock Drilling Company Ltd. between February 9 to February 22, 2007 for TW1 to TW4. TW7 was constructed on December 19, 2008. TW4 was deepened on August 31, 2010 and TW8 and TW9 were constructed on August 23, 2010 and August 31, 2010, respectively. An engineer from Paterson was present during the creation of the casing hole, installation of the casing and grouting of the annular space for each test well constructed at the site. The Ministry of the Environment, Conservation and Parks (MECP) Water Well Records (WWR) for each test well can be found in Appendix 2.

2.3. Test Well Construction

TW 5 (Existing Well)

An existing, onsite well, hereafter referred to as TW5 for this study, is an existing drilled well which used to service a small residential dwelling, which was recently demolished, on the subject property. A water well record was obtained for this well (reference should be made to Appendix 2).

Based on the MECP WWR, the well was constructed in 1978 by Henry Mains Well Drilling. The well consisted of 30 m of casing set approximately 6.1 m into the March Formation, which was intercepted at a depth of approximately 24 m bgs. Cement grout was utilized to seal the annular space.

The aquifer intercept was reported to be located at a depth of approximately 51.5 m bgs. The reported well yield was upwards of 10 gallons per minute (gpm) (45.4 L/min), based on the one (1) hour pumping test.

TW 6 (Existing Well)

An existing offsite well, hereafter referred to as TW6 and located at 1897 Stagecoach Road, was identified to be accessible for testing and was subjected to a pumping test. An MECP WWR was obtained for this well (refer to the published WWR located in Appendix 2) as a result of the comprehensive WWR background search.

Based on the information contained within the published MECP WWR, the well was constructed using a 150 mm diameter casing having a length of 17.7 m and set approximately 1.5 m into the underlying limestone bedrock. The open borehole was extended to a depth of 22.9 m bgs. The aquifer intercept was noted to be within the Oxford Formation limestone at a depth of 18.3 m bgs. A recommended pumping rate of 5 gpm was set for this well.

TW1, TW2, and TW3 (New Wells)

With respect to the construction of TW1, TW2 and TW3, which took place in 2007, similar well construction methodology was utilized. First, a 228 mm diameter casing hole for each test well was advanced using a rotary tri-cone bit through the overburden, to the underlying limestone. The casing hole was advanced into the bedrock an additional 2.4 to 4.3 m to ensure that each casing was seated into competent bedrock.

Each casing hole was filled with a combination of neat cement and bentonite grout slurry having an observed consistency of at least 20% bentonite solids (by weight). A neat cement slurry was introduced into the lower 2 to 3 m of the casing hole through the tri-cone bit resting at the bottom of the casing hole. The tri-cone bit was raised 2.5 m off the bottom of the casing hole and the bentonite slurry was introduced down the drill stem and through the tri-cone bit and pumped upwards through the hole to the ground surface.

A new, 150 mm diameter steel casing, equipped with a drive shoe, was installed in the bentonite column. The density of the slurry in the casing hole was sufficient to prevent lateral movement of the casing as it was lowered into the hole, thereby ensuring proper casing alignment. The casing was seated into the bedrock and bentonite slurry. The inside of the casing was blown out prior to advancing the bit into the bedrock.

Once the water supply aquifer was encountered, the formation was repeatedly surged with air and allowed to clear. Preliminary well yield was estimated and the well was purged until the water was observed to be in a sand free state.

Following completion of the drilling and purging process, the static water level was allowed to stabilize. Air Rock, in accordance with Ontario Regulation 903, proceeded to chlorinate the well and complete the mandatory one hour constant rate pumping test. The rate chosen for the one (1) hour pumping test was based on the preliminary findings of the well contractor at the time of installation and are those which are reflected on the published MECP Water Well Records.

TW4

TW4 was constructed in the same manner as that described above for TW1, TW2 and TW3. TW4 was completed at, or near the base of the Oxford Formation at a depth of approximately 18.3 m bgs when it was constructed in 2007.

TW4 was deepened by Air Rock on August 31, 2010 in order to delineate the depth of the Oxford Formation/March Formation in relation to the rest of the site and to ensure that the water supply located within the March Formation could be adequately intercepted in the northwest quadrant of the site.

Air Rock deepened the well by utilizing a 150 mm diameter button bit and slowly advancing the open borehole through the Oxford Formation and into the March Formation. The water supply aquifer located within the March Formation was intercepted at a depth of approximately 44.5 m bgs and the open hole was advanced to 48.8 m bgs to provide for an adequate water column for testing and development purposes. Reference should be made to the amended WWR for TW4 which is located in Appendix 2.

TW7

TW7 was constructed by Air Rock on December 19, 2008. The construction methodology followed that of the other test wells, with the casing being installed upwards of 2.5 m into the Oxford Formation limestone. The open hole was extended through the Oxford Formation and intercepted a water supply aquifer contained within the March Formation.

During the original pumping test of TW7, it was noted that the water column could not be drawn down below the bottom of the casing. Furthermore, water quality results from the pumping test contained elevated concentrations of dissolved organic carbon, tannins and lignins, iron and colour.

Based on the apparent well yield, combined with the proximity of TW7 to the area of poor drainage containing peat and a high water table and the elevated parameters commonly associated with surface water interactions, a detailed investigation was undertaken in October 2009. Paterson undertook a detailed site investigation of TW7. The purpose of this investigation was to isolate the source of the surface water influx into the open borehole. The well was first purged using a high-capacity submersible pump in an attempt to draw the water column down and past the bottom of the casing so that a camera could be utilized to examine the casing shoe seating in the bedrock to look for evidence of surface water inflow. However, despite pumping at rates exceeding 120 L/min for upwards of four

(4) hours, the static water level of the water column in the well did not drop below the bottom of the casing.

Paterson then retained Air Rock to carry out a series of intrusive investigations of the existing well. Upon their initial arrival to the site, Air Rock proceeded to check that the casing was seated into the bedrock. The methodology of this work consisted of placing a hammer collar onto the existing well casing and attempt to move the casing using the 150 mm diameter button bit with moderate air pressure applied to hammer the casing. The casing stickup was measured before and after the casing evaluation. A difference of approximately 17 mm was noted upon completion of the casing evaluation. This indicated that the casing has moved 17 mm downward into the ground upon completion of the short duration of applied pressure.

Air Rock then proceeded to lower a surge block into the well. The surge block consisted of a series of rubber plates clamped together onto a drilling rod, thereby creating a thick rubber plug. The diameter of the block was measured to be approximately 160 mm in diameter which is generally sufficient to seal the block against the casing at is lowered down the well. The surge block was lowered down the existing well casing and the static water level was measured to be absent from the surge block after it had been lowered to a depth of approximately 6 m below the top of casing and let sit for upwards of 10 minutes. Next, the surge block was lowered to the bottom of the casing. As the surge block was pushed past the bottom of the casing, at a depth of approximately 9.7 m below the top of casing, a vacuum like suction sound was audibly detected from the hole. The surge block was retracted and a volume of black coloured, mal-odorous water was discharged from atop the block. Moreover, a gray and black silty clay was observed to be present on the top of the surge block upon visual inspection when it had been retracted.

The works carried out by Air Rock during the intrusive investigation, based on the findings presented above, confirmed that the surface water was entering into the well at the bottom of the casing. Moreover, based on the casing movement, it is likely that the casing was initially seated onto the bedrock and either the grout column did not adequately seal the annular space at that zone, or the bedrock became fractured as the open borehole was advanced after the casing was installed and the annular space had been grouted.

Air Rock then installed a 100 mm diameter Schedule 40 PVC sleeve into the well. Air Rock proceed to install the PVC sleeve to a depth of approximately 13 m, measured from the top of the casing (approximately 6 m below the bedrock surface and 4 m deeper than the original casing) and the annular space between the PVC and the existing well casing and bedrock face was sealed with a neat cement

slurry. The slurry was introduced using a tremie pipe and was pumped to the top of the well casing. The method of installation and grouting appears consistent with the requirements of Ontario Regulation 903.

Upon the completion of the updated pumping test, Air Rock subsequently abandoned the well in accordance with Ontario Regulation 903 requirements. All attempts were made to remove the existing casing, however the steel casing could not be removed from the ground. In light of this, the casing and PVC sleeve were cut back a total of 1.5 m bgs during the abandonment. The abandonment record for TW7 is included in Appendix 2.

TW8 and TW9

TW8, constructed on August 23, 2010 and August 31, 2010, respectively, were constructed utilizing the same general methodology as the other test wells.

During the construction of TW8, it was noted that the surface of the bedrock was much more fractured and less competent than in the other areas of the site. In order to ensure the casing was seated in competent bedrock and not subject to the same problems as had been experienced at TW7, the casing hole was extended until competent rock was encountered for a thickness of approximately 2 m. As such, the total length of casing is 11.5 m bgs. This compares to a length of PVC sleeve of 13 m in TW7.

Open borehole construction, surging and well development activities were carried out in conformity to the well construction program, as detailed in the construction of TW1. Each well was sufficiently chlorinated and subjected to a one hour constant rate pumping test by Air Rock, prior to Paterson carrying out any detailed testing.

2.4. Aquifer Analysis

Each of the nine (9) test wells were subjected to a constant rate pumping test set at the pumping rate recommended by Air Rock during their one hour constant rate pumping test. The duration for each test was specified to be the greater of the time in which steady state was achieved, or after six (6) hours of continuous pumping.

Each of the wells were pumped using a 1.5 horsepower (HP) electric submersible pump and portable generator package supplied by Air Rock. The pumping test configuration consisted of the submersible pump assembly discharging through a 10 m long discharge hose. The discharge hose was directed into a discharge piping system consisting of upwards of 20 m of 75 mm diameter solid bell and spigot PVC piping contiguously connected and laid over the ground surface to

direct the discharge water a sufficient distance away from the pumped well. In all cases, the discharge point for each pumping test was downgradient of the subject well at a sufficient distance to utilize the natural surface drainage features (i.e. roadside ditch, or sloping terrain). Given the locations of the discharge points, combined with the duration of pumping, the pumping test configuration is believed to have minimized the potential effects of recharge into the overburden aquifer.

For each of the test wells, the test rate was selected based on the drawdown observed and reported by Air Rock during the O.Reg 903 mandatory one hour pumping test. Based on the drawdown over the one hour period, a test rate was set with the expectation that the rate would stress the aquifer enough to result in a demonstrable reduction in potentiometric head (i.e. a lowering of the static water levels) within the observation wells intercepting the water supply aquifer being tested. In all cases, the design test rates were several times higher than the minimum volumes required by Section 4.3.2 of Procedure D-5-5 which provides for an increased factor of safety in interpretation of the anticipated well yield and potential well interference models presented and discussed in Section 7.0 of this report.

During the pumping test, the pumping rate was constantly monitored using the timed- volume correlation method at 60 minute intervals in order to ensure that the rate of discharge of the pumped water did not vary by more than 5%. There were no variations of more than 5% measured for any of the pumping tests during the course of pumping of each test well.

A series of physical and geochemical analyses of the pumped water were carried out at the well head during each pumping test. The parameters tested at the well head included: turbidity, free chlorine residual, total dissolved solids, pH, temperature and electrical conductivity. The turbidity and free chlorine residuals were monitored utilizing a Hanna C114 turbidity meter and the remaining parameters were analysed using a Hach combination multimeter. The field water quality results are tabulated and graphically presented in Appendix 4.

Observation wells were closely monitored during each pumping test, in order to attempt to utilize the drawdown data in the observation wells to accurately estimate the aquifer storativity. The observation well data is tabulated in Appendix 4 associated with the pumping test of each test well.

Recovery data was collected for each of the test wells following the completion of pumping. Recovery times varied from well to well with all wells achieving at least 95% recovery within 24 hours after the completion of each pumping test.

Pumping test data was analyzed using Aquifer Test v. 2.5 aquifer analysis software package, by Waterloo Hydrogeologic. The following analytical methods were applied (where data was available):

- ❑ Transmissivity Parameters: (Theis & Jacob Recovery); and
- ❑ Storativity Parameters: Cooper Jacob's Time-Drawdown and Theis (Curve Matching).

These analytical models are well recognized to be applicable based on the aquifer system within the subject area. The results of the aquifer analysis are presented and discussed in Section 7 of this report.

2.5. Topographical Survey

A field survey was carried out of the subject property by J.D. Barnes. The ground surface elevations are referenced to a geodetic datum. The test pit elevations and well head elevations have been interpolated based on this survey data provided.

2.6. Laboratory Testing

Gradation of Soils

The soil samples recovered from the test holes were returned to our laboratory and visually examined to review the results of the field logging. Four (4) representative samples were selected for grain size analyses in our laboratory. The results of the soil testing are provided on the Grain Size Distribution curves in Appendix 3.

2.7. Overburden Groundwater Assessment

At the time of the fieldwork, the groundwater levels were measured and are recorded as shown, where applicable, on the Soil Profile and Test Data sheets. Groundwater infiltration into the test holes varied across the site from 0.5 m to 2.2 m bgs at TP 1 and TP 9, respectively. Several of the test holes were reported to be dry upon completion (in the raised portion of the site).

Monitoring wells were installed in selected areas across the site in order to more accurately delineate the direction of flow within the overburden. The static water level measurements for the monitoring wells installed on the site, are summarized in Table 1, below.

SUMMARY OF WATER LEVELS MEASURED WITHIN THE SHALLOW OVERBURDEN GROUNDWATER AQUIFER ACROSS THE SUBJECT PROPERTY				
Monitoring Well No.	Water Level Measurement (Referenced to Geodetic Datum)			
	2010-08-26	2010-09-07	2010-09-14	2010-09-22
MW1-10	95.21	95.18	95.23	95.2
MW2-10	95.92	95.91	95.94	95.91
MW3-10	95.85	95.84	95.82	95.85
MW4-10	95.32	95.33	95.31	95.31
MW5-10	93.87	93.85	93.88	98.88
MW6-10	95.22	95.23	95.23	95.21

Table 1: Summary of water levels measured within the shallow overburden groundwater across the subject property

In addition to the quantitative and qualitative groundwater assessment in each test pit, groundwater samples were recovered from TP1-10, TP3-10, and TP13-10. Specifically, groundwater samples were recovered from each test pit while being excavated, under dry conditions. Each groundwater sample was extracted directly from the overburden groundwater and is considered to be directly indicative of the overburden groundwater in the sampled locations. The individual locations for sampling of the overburden groundwater were chosen in order to evaluate the background nitrate concentrations associated with areas where the existing sewage system is located (TP1-10) and in areas where there was the previous potential for agricultural uses (i.e. pasture land (TP1-10/TP3-10). In addition, TP13-10 was chosen as it reflects the central area of the subject property where existing drainage tends to focus the overburden groundwater.

These samples were submitted to Exova Accutest Laboratories, located in Ottawa, Ontario, for chemical analysis for relevant nitrogen species (i.e. nitrite and nitrate). The results of this analysis are summarized in Table 2, below and the laboratory report is provided in Appendix 3. The additional sampling carried out on the monitoring wells put down on the subject site, appear in Table 1, also.

SUMMARY OF BACKGROUND NITRATE CONCENTRATIONS REPORTED WITHIN THE SHALLOW OVERBURDEN GROUNDWATER AQUIFER			
Monitoring Well Location	TP1-10	TP3-10	TP13-10
N-NO2 (Nitrite) (mg/L)	<0.10	<0.10	<0.10
N-NO3 (Nitrate) (mg/L)	0.16	0.16	0.16

Table 2: Summary of background nitrate concentrations reported within the shallow overburden groundwater aquifer

A detailed discussion on the results of the overburden groundwater assessment can be found in Section 8.3 of this report.

2.8. Bedrock Aquifer Groundwater Assessment

Raw water samples were collected from each of the nine (9) test wells during the pumping tests. Specifically, one (1) sample was collected after three (3) hours of pumping and one (1) sample was collected at the completion of pumping.

Prior to collection of the water samples, the free chlorine residual was verified to be non detectable using the Hanna C-114 handheld turbidity/free chlorine multimeter. After collection, the water samples were properly stored in a refrigerated cooler and transported to Exova Accutest Laboratories, located in Ottawa, Ontario. The samples were submitted for comprehensive testing of bacteriological, chemical and physical water quality parameters consistent with a standard “Subdivision Assessment Package”. The results of the bedrock aquifer assessment are summarized in Section 7.0 of this report.

3.0 Site Description

3.1. Surface Conditions

At the time of the field investigations, the subject site was vacant and covered by shrubs and mature trees.

The site generally slopes from northeast to southwest with an undulating profile generally varying between 92 to 99 m asl with a localized high point located in the central to rear west quadrant of the property. From this high point, the land slopes off to areas of low topographical relief to the central quadrant of the subject property and westward towards a municipal drainage ditch located along the western property line. These low areas are heavily treed and have poor drainage characteristics.

3.2. Surrounding Land Uses with 500 m

The site, as previously mentioned is located in a rural setting. It is bordered to the east by Stagecoach Road followed by residential properties, and to the west by a municipal drain followed by recreational property. The neighbouring lands to the north and east consist of low-density residential dwellings. Undeveloped lands are present to the south.

One residence and accessory outbuildings is present on the subject site, situated approximately 100 to 150 m west of Stagecoach Road.

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.

With respect to the recharge areas for the Oxford Formation Limestone aquifer, published information has accurately identified the location of the recharge area for the limestone aquifer(s) to be located west of Richmond, Ontario. Similarly, the March Formation limestone-sandstone composite, and Nepean Formation sandstone, both regional aquifers, have been previously documented by Paterson and others, to obtain recharge waters from Mississippi Lake and the eastern portions of Beckwith Township/western portions of Goulbourn Township, respectively.

A search of the MECP Permit to Take Water (PTTW) database provided no active PTTW within 500 m of the subject site. A search of the MECP Environmental Activity and Sector Registry (EASR) database provided no water taking permits within 500 m of the subject site.

In consideration of the identification of sources of potential contamination of the deep bedrock aquifers, the Phase 1-Environmental Site Assessment, completed by Paterson in 2007 (Paterson Report No. PE0969-REP.01) did not identify any potential contaminant sources. As the locations of the recharge areas for the bedrock aquifers are located a considerable distance away from the subject property, it is anticipated that no surficial impacts, at the time of preparation of the original report to the date of issuance of this report, are present within the immediate vicinity of the subject property which would impair or compromise the safety of the water supply aquifer in the long term.

4.0 Geology

4.1. Surficial Geology

A review of available surficial soils mapping for the area in the vicinity of the subject property indicates that the site is located in an area known to be covered with several different soil types ranging from peat to silty clay.

Based on surficial mapping prepared by the Ontario Geological Survey, the subject site is located in an area where surficial geology consists of sand, gravel, minor silt and clay, and till. Please refer to Drawing PH4734-3 – Surficial Geology Plan in Appendix 5 for additional details.

Based on the results of the test pit excavation program, surficial soil deposits which were encountered onsite coincide with the available surficial geological mapping.

Silty clay was encountered in the central quadrant of the site where the drainage is poor, and the area remains heavily treed. The western quadrant was noted to contain silty sand to sandy gravel deposits. Pockets of sand, glacial till, and organic peat soils were encountered in the eastern quadrant of the site, which is consistent with the available soils mapping.

Based on the test pit excavation program and onsite WWR's, overburden thickness across the site is in excess of 4 m. Using well recognized techniques for the field identification of soils, five (5) unique stratigraphic units were identified in the areas investigated. The soils were classified using the Unified Soil Classification System (USCS). The stratigraphic units are summarized in Table 3, and the grain size distribution curves are provided in Appendix 3. As detailed in this report, the area of peat and organic material is limited to the southeast quadrant of the site and is relatively shallow in nature. It is underlain by a coarse sand which, in turn, is underlain by silty clay and a localized perched groundwater table is present.

The test hole locations are presented on Drawing PH0482 – 7 – Lot Development Plan, included in Appendix 5. The test pit logs are provided in Appendix 1. The surficial soils encountered during the onsite investigations are generally consistent with the published mapping.

SUMMARY OF UNIQUE STRATIGRAPHIC UNITS ENCOUNTERED ON SUBJECT PROPERTY BASED ON TEST PIT EXCAVATIONS* IN STUDY AREA		
Terrain Unit	USCS Classification	General Thickness (m)*
1	**SM** - compact to dense silty sand	0.2 to 2.2
2	**SM-SC-** compact to dense silty sand to sand-clay mixture	more than 3.0
3	**GW-SM** - compact well graded gravelly sand to silty sand	0.8 to 2.2
4	**SC-CL-** stiff silty clay to sandy clay	more than 2.4
5	**Organic**- peat	0.9 to 1.5
** Maximum depth of test pit excavation of 4.2 m. Organic deposit explored with hand auger equipment only.*		

Table 3: Summary of unique stratigraphic units encountered on subject property based on test pit excavations in study area

4.2. Bedrock Geology

Published geological mapping (Refer to Paterson Drawing PH4734 – 4 - Bedrock Geology Plan located in Appendix 5) (OGS MRD219) reveals that the site and immediate surroundings are underlain by dolostone of the Oxford Formation. Based on available bedrock lithology data, the Oxford Formation is, historically,

underlain by a thin layer of March Formation limestone-sandstone, which, in turn, is underlain by Nepean Formation Sandstone.

Although the overall maximum thickness of the Oxford Formation ranges from 69 m to 70 m in the Ottawa area, the formation is somewhat thinner in the subject area, based on available MECP Water Well Records. Available information indicates that the Oxford formation has an onsite overall thickness of approximately 10 to 30 m.

The March Formation, based on published data, is believed to have an estimated thickness of between 8 and 9 m in much of the Ottawa area. The March Formation is comprised of thick beds of grey sandstone alternating with thick beds of sandy blue-grey dolomite. The contact with the Nepean formation is generally placed at the lowest dolomitic layer, however it is often difficult to differentiate the Nepean and March formations due to similarities in appearance.

The Nepean Formation, the oldest member of the Paleozoic strata, consists of a cream coloured, coarse-grained sandstone with a weathered grey and irregular brown stained appearance. Near the top of the formation, the cement is either calcareous or of iron oxide, and the overall thickness of the formation varies considerably beneath the Ottawa area.

The MECP Water Well records, detailing the construction of the test wells, confirm the presence of limestone which is underlain by sandstone. Published MECP Water Well records in close proximity to the site substantiate the published bedrock mapping for the subject property.

A cursory review of the published MECP Water Well Records also confirms that the significant majority of the wells drilled in the immediate area have been constructed into the limestone of the Oxford Formation, and a fewer number have been advanced to the March or Nepean Formations.

5.0 Regional Hydrogeology

5.1. Water Well Construction and Aquifer Interception

A search of the available MECP Water Well Records (WWRs) as undertaken as part of the background works in order to prepare a conceptual hydrogeological model for the subject property. The MECP WWR search was completed within a search area consisting of a radial search centred on the subject property and extending to a radial length of 1500 m. The search returned over 180 individual MECP WWRs. Analysis of the individual MECP WWRs resulted in approximately 30 individual WWR's which could be identified as being within the immediate

vicinity of the subject property. The majority of these WWRs were located in the adjacent subdivisions situated immediately to the north of the subject property. The WWR search did confirm the WWR's for the existing drilled wells at the site (one of which is TW5) as well as the WWR for 1897 Stagecoach Road (TW6).

Several WWR were noted to lack sufficient aquifer intercept information to be included in the regional analysis and a couple of WWR's were noted to be a WWR abandonment record. In total, 30 MECP WWR's were analysed for well construction characteristics and aquifer intercept depths within the underlying bedrock strata. These WWRs are included for reference purposes in Appendix 2.

Of the 30 MECP WWRs included in the analysis, 100% of the wells were noted to be drilled wells with the casings completed into bedrock. The choice of grouting compounds were identified to be either a neat cement, or sodium bentonite slurry.

With respect to the depth of aquifer interception, 10 of the WWRs reported intercepting a water supply aquifer within the shallow portion of the Oxford Formation at a depth of less than 23 m below the existing ground surface. Of these 10 WWRs, three (3) were noted to have also intercepted a lower water supply aquifer within the Oxford Formation limestone at depths of the order of 35 m to 39 m bgs. In all instances, the length of well casing reported on the WWRs indicated that the casings terminated into only the upper few metres of the bedrock surface.

Conversely, the remaining MECP WWRs were noted to intercept a combination of the lower Oxford Formation limestone and the limestone-sandstone interbeds associated with the March Formation. A total of 5 WWRs intercepted the lower Oxford Formation between 35 m and 45 m bgs and the March Formation water supply aquifer at a depth of between 52 and 70 m bgs. The remaining 26 WWR's intercepted only the March Formation at depths of between 52 and 70 m bgs and did not report encountering the Oxford Formation water supply aquifers. In all instances, the length of well casing reported on these WWRs indicated that the casings terminated into only the upper few metres of the bedrock surface.

With respect to well yields, all of the 49 WWRs reported yields in excess of 23 L/min (5 gpm).

Summary

Although most of the available MECP WWRs within the adjacent developments are completed into the lower Oxford Formation limestone or the March Formation water supply aquifers, all of the WWR's reviewed indicated that the well casings terminated into only the first few metres of the surface of the bedrock. Moreover,

upwards of 5 of the 30 WWRs reviewed (10%) reported intercepted both the lower Oxford Formation and March Formation water supply aquifers.

5.2. Neighbouring Water Quality

The existing well located at 1897 Stagecoach Road (TW6) was the only well accessible and with a published water well record in which the construction methodology could be verified to be included in the study.

In addition to the residences located within the immediate vicinity of the site, Paterson approached the owners of the Sleepy Cedars Family Campground (Sleepy Cedars) located to the west of the subject property beyond the tributary of the Castor River. Sleepy Cedars, which is located at 1893 Manotick Station Road, Ottawa, Ontario, operates a seasonal campsite which utilizes a private well and onsite sewage system. Paterson has carried out analytical aquifer analysis and groundwater geochemistry testing, under J.D. Paterson & Associates Ltd. in 2001. The work was carried out in conjunction with a Provincial Order issued by the MECP and pertained to the existing water works at the site, in order to assess the applicability of Ontario Regulation 459/00.

The existing drilled well (refer to Appendix 2 for WWR) was constructed in 1978 to a depth of 50.3 m bgs. Based on the published information, the well intercepts the March Formation aquifer at a depth of approximately 48.8 m bgs. Well yield was reported to be of the order of 12 gpm.

Sleepy Cedars confirmed with Paterson that the original peak values of upwards of 10,000 L/day during summer periods remain valid for the purpose of carrying out well interference modelling. The maximum rate of supply of water, based on the configuration of the water system is only 34 L/min (48,960 L/day). As such, the well at this particular site acts as a single house well for the purposes of interference analysis.

The aquifer analysis carried out in 2001 utilized the data obtained from a 250 minute pumping test to fit a Cooper & Jacobs Time-Drawdown graphical analysis model. A transmissivity of 4.40 x 10-3 m^2/minute was calculated. The graphical analysis and information contained within the original MECP Provincial Offences order is provided in Appendix 2.

6.0 Site Hydrogeology

As previously stated in this report, a total of seven (7) test wells were constructed at the subject site during the well construction program and two (2) existing wells were utilized as part of the aquifer analysis (refer to Drawing No. PH0482 - 1- Test

Hole Location Plan in Appendix 5 for well locations). Hydrogeological details of the construction of each test well, based on the MECP Water Well Records, and engineering site notes, are graphically presented in the Generalized Hydrogeological Cross Section of the Subject Property- Drawing No. PH0482 - 4 in Appendix 5.

A review of Drawing No. PH0482 - 4 reveals that the hydrogeology of the test well construction is consistent with the other wells constructed in the immediate vicinity of the site. The water supply aquifer located within the Oxford Formation limestone appears, based on the finding of the pumping test program which are discussed in detail in Section 7.0, to be intermittent throughout the site and immediate area. Conversely, the March Formation was consistently intercepted by eight (8) of the nine (9) test wells at the site. TW6 (1897 Stagecoach Road) was not advanced to the March Formation as it intercepted a water supply aquifer present in the lower section of the Oxford Formation. The available water well records for wells located to the immediate vicinity of the site, including the well for Sleepy Cedars Campground to the West (refer to Section 5.2 for more information) of the subject property indicated that many of the surrounding wells have been advanced to the March Formation also.

The confining pressure and aquifer response of TW8 and TW9 to the pumping test, suggest that the preferred water supply aquifer system is behaving as a confined aquifer present between two (2) aquitards. By definition, "...the term aquitard has been coined to describe the less-permeable beds in a stratigraphic sequence." (Freeze & Cherry, 1979). The lower Oxford Formation, and underlying March/Nepean interface, if acting as aquitards, would explain the confining pressure measured in the wells and the corresponding Theis-like response to pumping. Analysis of the available MECP Water Well Records within a 500 m radius of the site indicate significant thicknesses of limestone are present between the surface of the ground and the depth of the water supply aquifer on most, if not all of the drilled wells. This fact, combined with the absence of nitrates in the preferred water supply aquifer zone (Lower Oxford and March Formations) further suggest the preferred water supply aquifer is hydraulically isolated from surficial impacts. However, the scope of this Hydrogeological Study did not include a detailed analysis of the preferred aquifer system focussed on demonstrating hydraulic isolation. As such, the information presented in this section adds a degree of security to the natural protection of the preferred aquifer system and only infers the system is hydraulically isolated, but does not corroborate this.

Direction of Groundwater Flow within the Combined Oxford and March Aquifer System

Typically, the static water levels in at least three (3) wells intercepting the same water supply aquifer is utilized to provide an interpolated direction of groundwater flow. In this instance, a total of seven (7) test wells (TW3 and TW6 omitted) were utilized to interpolate the direction of groundwater flow within the March Formation beneath the site. Based on an analysis of the static water levels found within these wells, the interpolated direction of groundwater flow within the water supply aquifer located in the March Formation, is in a south-southwest direction beneath the site.

7.0 Aquifer Analysis

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

7.1. Aquifer Characteristics

The aquifer characteristics determined from the compilations of the pumping tests for the nine (9) test wells are summarized below:

SUMMARY OF AQUIFER CHARACTERISTICS RESULTING FROM ANALYSIS OF PUMPING TEST DATA OBTAINED FROM CONSTANT RATE TESTING									
Parameter	Test Well Number								
	TW1	TW2	TW3	TW4	TW5	TW6	TW7	TW8	TW9
Transmissivity* (m2/d)	4.1	2.4	684	56.7	118	66	0.8	13.3	485
Storativity**	n/a	n/a	n/a	1.0 x 10-4	4.0 x 10-5	3.9 x 10-4	1.0 x 10-4	6.8 x 10-4	1.1 x 10-4
Pumping Rate (L/min)	24	36	114	75.7	42	44	22.8	45.4	75.6
Available Drawdown (m)	27.15	47.7	65.04	48.8	49	22.5	44.7	48.8	71.3
Maximum Drawdown (m)	5.28	10.46	0.34	0.67	0.49	1	19.8	13.8	0.47
% Drawdown	8.4	21.9	0.5	1.4	1	4.5	44.3	28.3	0.7
Specific Capacity (L/min/m dd)	4	3	228	113	86	43.8	0.7	3	161
20 Year Safe Yield (m3/day)	479	78	30251	1882	3932	1010	24	441	23416

** Transmissivity values calculated from numerical averages of values derived from the Theis & Jacobs Recovery method of analysis. In the case of TW3, transmissivity was calculated as the numerical average of the three (3) analytical results through the use of observation well data.*
*** Storativity values calculated based on the numerical averages of all storativity values obtained from both Theis and Cooper & Jacobs Time-Drawdown analytical methods.*

Table 4: Summary of aquifer characteristics resulting from analysis of pumping test data obtained from constant rate testing

7.2. Groundwater Geochemistry Assessment

As three (3) distinct water supply aquifers/aquifer combinations were encountered within the bedrock beneath the subject property, and the well construction program resulted in at least one (1) well intercepting each formation in isolation, the water quality data for each of the water supply aquifers is presented in tabular formation in each subsection, summarized below.

Data obtained from active well head water quality monitoring during the pumping tests is summarized, graphically, in Appendix 4.

Oxford Formation

Table 5 and Table 6, presented in this section, summarize the overall laboratory geochemistry of the Oxford Formation water supply aquifer located beneath the subject property. The water quality of this aquifer is presented based on the analysis of raw water recovered from TW1 and TW6.

SUMMARY OF HEALTH AND AESTHETIC/OPERATIONAL PARAMETERS FOR THE OXFORD FORMATION WATER SUPPLY AQUIFER (TW1 and TW6)							
Parameter	Units	TW1		TW6		Ontario Drinking Water Standards*	
		3 Hour	6 Hour	3 Hour	6 Hour	Type	Limit
Microbiological Parameters**							
Escherichia Coli	ct/100 mL	0	0	0	0	MAC	0
Faecal Coliforms	ct/100 mL	0	0	0	0	-	-
Faecal Strep.	ct/100 mL	0	0	0	0	-	-
HPC	ct/1 mL	0	0	0	1	-	-
Total Coliforms	ct/100 mL	0	0	0	0	MAC	0
Chemical Parameters (Health Related)							
Fluoride	mg/L	0.36	0.39	0.32	0.32	MAC	2.4
Nitrite	mg/L	<0.10	<0.10	<0.10	<0.10	MAC	1
Nitrate	mg/L	<0.10	<0.10	<0.10	<0.10	MAC	10
Chemical Parameters with Aesthetic Objectives/ Operational Guidelines							
Alkalinity	mg/L	242	243	227	226	OG	500
Chloride	mg/L	7	8	7	7	AO	250
Colour	TCU	2	<2	3	3	AO	5
DOC	mg/L	1.7	1.5	2	2.1	AO	5
Hydrogen Sulfide	mg/L	0.01	<0.01	0.01	<0.01	AO	0.05
pH		8.13	8.13	8.11	8.14	AO	6.5-8.5
Sulphate	mg/L	34	33	24	24	AO	500
Hardness	mg/L	232	211	222	229	OG	100
Sodium	mg/L	22	25	6	7	AO	20(200)
Iron	mg/L	0.86	0.47	0.17	0.18	AO	0.3
Manganese	mg/L	0.02	0.02	0.01	0.01	AO	0.05
TDS	mg/L	343	343	310	309	AO	500
Turbidity (laboratory)	NTU	12	4.6	1	1	AO/MAC	5/1
Turbidity (field)	NTU	9.15	0.92	0.09	0.06	AO/MAC	5/1

** Ontario Drinking Water Standards identifies the following types of parameters: MAC - Maximum Allowable Concentration; AO - Aesthetic Objective; OG - Operational Guideline*
*** Free Chlorine residuals verified to be non-detectable prior to collection of water samples*

Table 5: Summary of Health and Aesthetic/Operational Parameters for the Oxford Formation Water Supply Aquifer (TW1 and TW6)

SUMMARY OF GENERAL CHEMISTRY PARAMETERS FOR THE OXFORD FORMATION AS DEFINED BY THE RAW WATER QUALITY OBTAINED FROM TW1 AND TW6					
Parameter	Units	TW1		TW6	
		3 Hour	6 Hour	3 Hour	6 Hour
General Parameters					
Conductivity	uS/cm	527	527	477	476
N-NH3 (Ammonia)	mg/L	0.1	0.09	0.15	0.15
Phenols	mg/L	<0.001	<0.001	<0.001	<0.001
Tannin & Lignin	mg/L	0.2	0.2	0.2	0.2
Total Kjeldahl Nitrogen	mg/L	0.15	0.15	n/a	n/a
Ion Balance	Unitless	0.99	0.94	0.9	0.95
Calcium	mg/L	50	45	46	47
Magnesium	mg/L	26	24	26	27
Potassium	mg/L	5	4	3	3

Table 6: Summary of the General Chemistry Parameters for the Oxford Formation as defined by the Raw Water Quality obtained from TW1 and TW6.

Combined Oxford/March Formation

Table 7 and Table 8, presented in this section, summarize the overall laboratory geochemistry of the raw water resulting from the mixing of the upper Oxford Formation and the lower March Formation water supply aquifers located beneath the subject property. The water quality of this aquifer is presented based on the analysis of raw water recovered from TW2, TW4, TW5, and TW8. TW7, in which the water quality was suspected to be impacted by a short-circuiting of overburden groundwater into the water well through the base of the casing (refer to Section 2.3), was not included in the evaluation of the water quality from the Oxford/March Formation. The water quality summary for TW7 appears in Tables 11 and 12 and is included to demonstrate the degree of impact of the overburden groundwater on the combined water quality from the bedrock aquifers.

In addition to the reported water quality analysis for these wells, TW8 was sampled for heavy metals and select herbicides/pesticides during the 24th hour of the test. The results are provided for reference purposes in Appendix 3 for the TW8 data set. Analysis of the chemical analysis reveals an absence of both heavy metals and herbicides/pesticides in the combined Oxford/March Formation aquifer system.

SUMMARY OF HEALTH AND AESTHETIC/ OPERATIONAL PARAMETERS FOR THE COMBINED OXFORD FORMATION AND MARCH FORMATION WATER SUPPLY AQUIFERS AS DEFINED BY TW2, TW4, TW5, AND TW8												
		TW2		TW4		TW5		TW8			ODWS	
Parameter	Units	3 Hour	6 Hour	3 Hour	6 Hour	3 Hour	6 Hour	12 Hour	24 Hour	12h Repump	Type	Limit
Microbiological Parameters												
Escherichia Coli	ct/100 mL	0	0	0	0	0	0	0	0	0	MAC	0
Faecal Coliforms	ct/100 mL	0	0	0	0	0	0	0	0	0	-	-
Faecal Strep.	ct/100 mL	0	0	0	0	0	0	0	0	0	-	-
HPC	ct/1 mL	>500	185	82	58/0	17	21	88	85	0	-	-
Total Coliforms	ct/100 mL	0	0	OG	OG/0	0	0	2	1	0	MAC	0
Chemical Parameters (Health Related)												
Fluoride	mg/L	0.43	0.42	0.34	0.33	0.71	0.71	0.36	0.48	0.36	MAC	2.4
Nitrite	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	MAC	1
Nitrate	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	MAC	10
Chemical Parameters with Aesthetic Objectives/ Operational Guidelines												
Alkalinity	mg/L	193	199	195	195	178	178	294	286	207	OG	500
Chloride	mg/L	6	6	45	44	4	4	13	13	59	AO	250
Colour	TCU	<2	<2	<2	2	<2	3	13	12	<2	AO	5
DOC	mg/L	2.8	2.4	1.4	1.5	1.7	1.7	5	4.9	1.7	AO	5
Hydrogen Sulfide	mg/L	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	AO	0.05
pH		8.29	8.33	8.18	8.21	8.19	8.2	8.16	8.18	8.07	AO	6.5-8.5
Sulphate	mg/L	20	20	34	36	15	15	76	70	47	AO	500
Hardness	mg/L	204	213	217	215	121	127	248	233	254	OG	100
Sodium	mg/L	12	11	36	34	31	31	51	46	40	AO	20(200)
Iron	mg/L	1.47	0.33	0.26	0.12	0.05	0.05	0.41	0.41	0.21	AO	0.3
Manganese	mg/L	0.03	0.02	0.04	0.02	<0.01	<0.01	0.03	0.03	0.02	AO	0.05
TDS	mg/L	269	272	376	375	244	244	462	450	433	AO	500
Turbidity (laboratory)	NTU	23.4	15.6	0.6	0.4	0.3	0.6	0.9	0.7	1.1	AO/MAC	5/1
Turbidity (field)	NTU	17.7	0.94	0	0	0.09	0.06	0.1	0	0	AO/MAC	5/1

Table 7: Summary of Health and Aesthetic / Operational Parameters for the combined Oxford Formation and March Formation Water Supply Aquifers as defined by TW2, TW4, TW5, and TW8.

SUMMARY OF THE GENERAL CHEMISTRY PARAMETERS FOR THE COMBINED OXFORD FORMATION AND MARCH FORMATION WATER SUPPLY AQUIFERS DEFINED BY TW2, TW4, TW5, AND TW8										
		TW2		TW4		TW5		TW8		
Parameter	Units	3 Hour	6 Hour	3 Hour	6 Hour	3 Hour	6 Hour	12 Hour	24 Hour	12H Repump
General Parameters										
Conductivity	uS/cm	414	419	527	527	376	376	711	693	666
N-NH3 (Ammonia)	mg/L	0.23	0.23	0.1	0.09	0.14	0.14	0.21	0.21	0.07
Phenols	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Tannin & Lignin	mg/L	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.2	<0.01
Total Kjeldahl Nitrogen	mg/L	0.29	0.2	0.15	0.15	0.17	0.17	0.53	0.73	<0.10
Ion Balance	Unitless	1.06	1.06	0.99	0.94	0.96	1	0.94	0.9	1.02
Calcium	mg/L	37	39	50	45	22	23	50	47	54
Magnesium	mg/L	27	28	26	24	16	17	30	28	29
Potassium	mg/L	5	4	5	4	4	4	6	5	5

Table 8: Summary of the General Chemistry Parameters for the combined Oxford Formation and March Formation Water Supply Aquifers as defined by TW2, TW4, TW5, and TW8

Combined Oxford/March/Nepean Formations

Table 9 and Table 10, presented in this section, summarize the overall laboratory groundwater geochemistry of the raw water resulting from the mixing of the upper Oxford Formation, the March Formation and the lower Nepean Formation water supply aquifers. The water quality of this aquifer is presented based on the analysis of raw water recovered from TW3 and TW9.

SUMMARY OF HEALTH AND AESTHETIC/ OPERATIONAL PARAMETERS FOR THE COMBINED OXFORD FORMATION, MARCH FORMATION, AND NEPEAN FORMATION WATER SUPPLY AQUIFERS AS DEFINED BY TW3 and TW9								
Parameter	Units	TW3		TW9			ODWS*	
		3 Hour	6 Hour	3 Hour	6 Hour	6 Hour Repump	Type	Limit
Microbiological Parameters**								
Escherichia Coli	ct/100 mL	0	0	0	0	0	MAC	0
Faecal Coliforms	ct/100 mL	0	0	0	0	0	-	-
Faecal Strep.	ct/100 mL	0	0	0	0	0	-	-
HPC	ct/1 mL	0	0	107	46	6	-	-
Total Coliforms	ct/100 mL	0	0	89	68	0	MAC	0
Chemical Parameters (Health Related)								
Fluoride	mg/L	0.3	0.3	0.37	0.37	0.36	MAC	2.4
Nitrite	mg/L	<0.10	<0.10	<0.10	<0.10	0	MAC	1
Nitrate	mg/L	<0.10	<0.10	<0.10	<0.10	0	MAC	10
Chemical Parameters with Aesthetic Objectives/ Operational Guidelines								
Alkalinity	mg/L	212	212	201	204	202	OG	500
Chloride	mg/L	44	44	56	50	59	AO	250
Colour	TCU	2	<2	<2	<2	2	AO	5
DOC	mg/L	1.6	1.5	1.5	1.7	1.4	AO	5
Hydrogen Sulfide	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	AO	0.05
pH		7.97	8	8.04	8.12	8.02	AO	6.5-8.5
Sulphate	mg/L	48	48	54	50	48	AO	500
Hardness	mg/L	252	261	231	229	227	OG	100
Sodium	mg/L	32	32	34	34	35	AO	20(200)
Iron	mg/L	0.25	0.26	0.47	0.13	0.16	AO	0.3
Manganese	mg/L	0.02	0.02	0.03	0.02	0.02	AO	0.05
TDS	mg/L	401	402	430	427	417	AO	500
Turbidity (laboratory)	NTU	2.3	1.9	13.1	2.5	1.2	AO/MAC	5/1
Turbidity (field)	NTU	0.7	0.3	5.1	0	0	AO/MAC	5/1
* Ontario Drinking Water Standards identifies the following types of parameters: MAC - Maximum Allowable Concentration; AO - Aesthetic Objective; OG - Operational Guideline ** Free Chlorine residuals verified to be non-detectable prior to collection of water samples								

Table 9: Summary of the Health and Aesthetic / operational Parameters for the combined Oxford Formation, March Formation and Nepean Formation Water Supply Aquifers as defined by TW3 and TW9.

SUMMARY OF GENERAL CHEMISTRY PARAMETERS FOR THE COMBINED OXFORD FORMATION, MARCH FORMATION, AND NEPEAN FORMATION WATER SUPPLY AQUIFERS AS DEFINED BY TW3 and TW9					
Parameter	Units	TW3		TW9	
		3 Hour	6 Hour	3 Hour	6 Hour
General Parameters					
Conductivity	uS/cm	527	527	477	476
N-NH3 (Ammonia)	mg/L	0.1	0.09	0.15	0.15
Phenols	mg/L	<0.001	<0.001	<0.001	<0.001
Tannin & Lignin	mg/L	0.2	0.2	0.2	0.2
Total Kjeldahl Nitrogen	mg/L	0.15	0.15	n/a	n/a
Ion Balance	Unitless	0.99	0.94	0.9	0.95
Calcium	mg/L	50	45	46	47
Magnesium	mg/L	26	24	26	27
Potassium	mg/L	5	4	3	3

Table 10: Summary of the General Chemistry Parameters for the combined Oxford Formation, March Formation and Nepean Formation Water Supply Aquifers as defined by TW3 and TW9.

SUMMARY OF HEALTH AND AESTHETIC/ OPERATIONAL PARAMETERS FOR TW7 FOR BOTH UNSLEEVED AND SLEEVED WELL CONSTRUCTION CONDITIONS								
Parameter	Units	TW7 (NO SLEEVE)		TW7 (SLEEVED)			ODWS*	
		3 Hour	6 Hour	3 Hour	6 Hour	24 H Repump	Type	Limit
Microbiological Parameters**								
Escherichia Coli	ct/100 mL	0	0	0	0	0	MAC	0
Faecal Coliforms	ct/100 mL	0	0	0	0	0	-	-
Faecal Strep.	ct/100 mL	0	0	0	0	0	-	-
HPC	ct/1 mL	0	0	1	3	5	-	-
Total Coliforms	ct/100 mL	0	0	0	0	0	MAC	0
Chemical Parameters (Health Related)								
Fluoride	mg/L	<0.10	<0.10	0.14	0.14	0.22	MAC	2.4
Nitrite	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	MAC	1
Nitrate	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	MAC	10
Chemical Parameters with Aesthetic Objectives/ Operational Guidelines								
Alkalinity	mg/L	398	399	382	384	337	OG	500
Chloride	mg/L	20	20	16	16	15	AO	250
Colour	TCU	26	26	19	21	18	AO	5
DOC	mg/L	14.8	13.2	10.8	12.4	7.8	AO	5
Hydrogen Sulfide	mg/L	0.01	0.01	<0.01	<0.01	<0.01	AO	0.05
pH		7.95	7.95	7.96	7.97	7.85	AO	6.5-8.5
Sulphate	mg/L	202	200	122	130	112	AO	500
Hardness	mg/L	635	649	482	484	372	OG	100
Sodium	mg/L	13	13	14	15	27	AO	20(200)
Iron	mg/L	4.78	4.73	3.39	3.33	1.7	AO	0.3
Manganese	mg/L	0.3	0.3	0.2	0.2	0.1	AO	0.05
TDS	mg/L	708	708	610	612	534	AO	500
Turbidity (laboratory)	NTU	26.5	25.6	21	19	7	AO/MAC	5/1
Turbidity (field)	NTU	N/A	5.2	3.33	1.49	0	AO/MAC	5/1

* Ontario Drinking Water Standards identifies the following types of parameters: MAC - Maximum Allowable Concentration; AO - Aesthetic Objective; OG - Operational Guideline
** Free Chlorine residuals verified to be non-detectable prior to collection of water samples

Table 11: Summary of Health and Aesthetic / Operational Parameters for TW7 for both Unsleeved and Sleeved Well Construction Conditions

SUMMARY OF GENERAL CHEMISTRY PARAMETERS FOR TW7 FOR BOTH UNSLEEVED AND SLEEVED WELL CONSTRUCTION CONDITIONS						
Parameter	Units	TW7 (NO SLEEVE)		TW7 (SLEEVED)		
		3 Hour	6 Hour	3 Hour	6 Hour	24 H Repump
General Parameters						
Conductivity	uS/cm	1090	1090	938	941	821
N-NH3 (Ammonia)	mg/L	0.77	0.76	0.65	0.65	0.54
Phenols	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Tannin & Lignin	mg/L	1	1.1	0.8	0.8	0.5
Total Kjeldahl Nitrogen	mg/L	1.29	1.23	0.72	0.64	0.56
Ion Balance	Unitless	1.05	1.07	0.97	0.96	0.92
Calcium	mg/L	175	179	127	128	93
Magnesium	mg/L	48	49	40	40	34
Potassium	mg/L	2	2	2	2	3

Table 12: Summary of General Chemistry Parameters for TW7 for both Unsleeved and Sleeved Well Construction Conditions

7.3. Aquifer Analysis Summary

Water Quantity Assessment

Using the procedure summarized in the document entitled, "Procedure D-5-5 Technical Guideline for Private Wells: Water Supply Assessment", prepared by the Ontario Ministry of the Environment, last revised August 2006, an analysis of the suitability of the aquifer to supply the proposed development can be completed. Using the values contained within Procedure D-5-5, the per-person water requirement is set at 450 L/day. The peak demand, which occurs over a 120 minute period each day, equates to 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. As the proposed development will likely contain four-bedroom single family homes, using the Procedure D-5-5 methodology, the number of persons would be five (5) and the total peak demand rate is calculated to be 18.75 L/min. This estimated total peak demand is well below the well yields demonstrated for the preferred water supply aquifer.

Analysis of Table 4 in Section 7.1, reveals that the pumping rates chosen for each of the pumping wells are above this minimum pumping rate. Furthermore, all of the test wells were reported to have utilized less than 75 % of the available drawdown during the pumping tests. This information, combined with the calculated 20 year long term safe yield values, suggests that the specified well yields are representative of the yields which residents of the development are likely to obtain from future wells put down on the site. Long term offsite impacts on wells intercepting the March Formation are not anticipated, considering the drawdown experienced in TW8 from the 24 hour pumping test, the spacing of the wells on the site, and the intermittent nature of the water use.

Water Quality

Oxford Formation

A review of the water quality analysis data from Table 5 and Table 6, which represents the water supply aquifer located within the limestone in the upper portion of the Oxford Formation, reveals that the raw water meets all health related parameters of the Ontario Drinking Water Standards (ODWS).

The well head water quality monitoring, carried out on each of the two (2) test wells during the constant rate pumping test, indicated that the raw water had generally stabilized within three (3) to four (4) hours following the commencement of pumping.

With respect to aesthetic objectives and operational guidelines, the water contains modestly elevated concentrations of sodium, hardness, and iron.

Sodium (Na) concentrations in TW1 were noted to be present above a concentration of 20 mg/L (22 mg/L to 25 mg/L reported). The sodium concentrations do vary between the two (2) test wells, with TW6 reporting lower concentrations (6 mg/L to 7 mg/L). This may be a result of the active use of TW6 as a water supply well for a neighbouring residence and may indicate that the sodium concentrations within this formation may fall with continued well development.

Although sodium is not toxic and no maximum acceptable concentration has been set, concentrations above 20 mg/L require that the Medical Officer of Health be notified so that this information may be passed on to local physicians for use in treatment of those requiring a sodium-restricted diet.
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 hard to very hard. TW1 and TW6 had reported hardness concentrations below the reasonable treatable limit of 500 mg/L specified in Table 3 of the guidance document, entitled, “Procedure D-5-5: Technical Guideline for Private Wells: Water Supply Assessment”, published by the MECP in 1995.

Iron (Fe), an aesthetic water quality parameter, has an aesthetic objective set at 0.30 mg/L. This objective is set by appearance effects. Excessive iron concentrations in drinking water may impart a brownish colour to laundered goods and plumbing fixtures. The colour of the water may also be affected by excessive iron concentrations and the raw water can produce a bitter, astringent taste which may affect beverages.

Combined Oxford and March Formations

Analysis of Table 7 and Table 8, which reflect the general groundwater geochemistry associated with the combined Oxford Formation and March Formation water supply aquifers, reveals that the raw water meets all of the critical health related parameters of the Ontario Drinking Water Quality Standards (ODWS).

With respect to aesthetic water quality parameters, the raw water originating from this combined aquifer system shows similarly elevated concentrations of sodium, hardness and iron as was noted in the water quality summary for the Oxford Formation water supply aquifer, above.

It should be noted that, with respect to TW8, the 24 hour pumping test resulted in significant reductions to the iron and colour concentrations. Due to its proximity to TW7, which allowed overburden water into the combined aquifer system, it was necessary to pump for an additional period of time in order to remove the remaining aesthetic parameter exceedances by stabilizing the pH within the raw water. The stabilized pH, as noted in Table 7, is approaching the range of values summarized in Table 9. Table 9 reflects the water quality from the Oxford, March and Nepean Formations, however most of the influence on the water quality from those wells is believed to be from the March and Nepean Formations.

Turbidity was elevated in TW2 during the original pumping tests. Similarly, iron was also elevated. Additional well development through the pumping of future wells at a low flow rate, intended on drawing water from the formation(s) in a more laminar fashion, will reduce the turbidity to the desired values of less than 5 NTU. This is evidenced by the 2010 pumping tests carried out on TW4, TW8 and TW9.

Combined Oxford, March and Nepean Formation

The summarized raw water quality for TW3 and TW9, the wells which were confirmed to penetrate into the Nepean Formation, appears in Table 9 and Table 10. Analysis of the tabulated data, which reflect the general groundwater geochemistry associated with the combined Oxford Formation, March Formation, and Nepean Formation water supply aquifers, reveals that the raw water meets all of the critical health related parameters of the Ontario Drinking Water Quality Standards (ODWS).

With respect to aesthetic water quality parameters, the raw water originating from this combined aquifer system shows similarly elevated concentrations of sodium, hardness and, to a much lesser extent, iron, as was noted in the water quality summary for the Oxford Formation and Combined Oxford and March Formation aquifer systems, above. The noted iron concentrations, with the exception of the initial three (3) hour concentration measured for TW9, all fell below the 0.30 mg/L threshold. Additional discussions on this phenomenon are discussed in the water conditioning considerations in Section 8.8 of this report.

It should be noted that the initial development of future water wells will likely require a period of well development of a similar duration as the six (6) hour pumping tests carried out on these test wells in order to reduce initial turbidity levels and iron concentrations which will likely be elevated. This is evidenced by all of the pumping tests carried out on the test wells at this site.

8.0 Development Recommendations

The following sections outline the recommendations for development which have been formulated from the data collected in this study.

8.1. Site Development

Based on the results of our study, this site is considered to be suitable for the development of more than 66 lots as described in Section 1.0 of this report. The on-site sewage disposal needs can be accommodated with standard Class 4 sewage systems consisting of a septic tank and fully raised leaching bed, as per Part 8 of the Ontario Building Code. Furthermore, 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.

8.2. Lot Development Plan

One objective of the Hydrogeological Study is to enhance development and minimize the effects of sewage systems on the surrounding environment. This is achieved through prevention of the accumulation of surface water near sewage systems, by ensuring the proper construction of water supply wells and sewage systems, and by coordinating the overall positioning of the services to maximize separations. A minimum separation of 18 m for fully-raised systems is required between a well and a Class 4 sewage system. Clearance distances also apply to wells and septic systems located on neighbouring lots.

The proposed Lot Development Plan (Drawing No. PH0482-7) in Appendix 5 shows the proposed lot development plan for the site. 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 in this drawing covers a plan area of 510 m^2, assuming a four (4) bedroom, two-storey 300 m^2 home, and including a garage of 70 m^2 with a driveway area of 140 m^2 (7 m wide by 20 m long (on average)). This impervious area is considered to be moderately conservative, but is representative of the larger homes being constructed elsewhere in the Greely area. Each residence is serviced by a sewage system with the capacity of 3,000 L/day. In actuality, the daily sewage flows will likely be significantly lower than this value.

In all instances, careful, 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. PH0482-7) 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.

The required separation distance from a fully raised leaching bed to a surface water body or drilled well is 18 m. Furthermore, in accordance with Ontario Regulation 903, all drilled wells, in addition to the prescribed separation distances to the sewage system, must also be located a minimum of 15 m from a potential source of contamination. (i.e. fuel oil tanks, Regional Roads, etc.)

8.3. Predictive Impact Assessment

Hydrogeological Sensitivity

In accordance with Section 5.0 of the MECP publication, entitled, “Procedure D-5-4 Technical Guidelines for Individual On-site Sewage Systems: Water Quality Impact Risk Assessment”, the groundwater impacts from on-site sewage systems must be addressed in a step-wise manner. In order to establish the initial step, it is essential to demonstrate whether or not the site is considered hydrogeologically sensitive.

Hydrogeological Sensitivity as defined by the City of Ottawa refers to bedrock within 2.0 m of the ground surface. Available drift thickness mapping shows an onsite drift thickness between 5 to 15 m. Bedrock was not encountered onsite in any of the test pits, with the exception of TP 5 which notes a inferred bedrock surface at 1.3 m bgs. As TP12-10 was completed adjacent to TP 5, and extended to 3.2 m bgs, it is inferred that the refusal encountered in TP 5 was refusal on till. Furthermore, the soil description on the soil profile for TP12-10 notes sand with boulders, which is the likely cause of refusal. TW4 was also completed near TP5, and notes an overburden thickness of 4.0 m on the WWR. This is further corroborated by the WWR’s for the onsite Test Wells which demonstrate that bedrock was encountered between 3.7 and 17.7 m bgs on the subject site.

As such, the subject site is not considered to be hydrogeologically sensitive based on the overburden thickness being greater than 2.0 m across the subject site.

Isolation of Supply Aquifer

As established in Section 6.0 of this report, the confining pressure and aquifer analyses suggest that the preferred water supply aquifer system, as defined by TW9, exhibits an aquifer response indicative of a confined aquifer present between two (2) aquitards. However, the scope of this Hydrogeological Study did not include a detailed analysis of the preferred aquifer system and focussed on demonstrating hydraulic isolation. As such, the information presented in this section adds a degree of security to the natural protection of the preferred aquifer system and only infers the system is hydraulically isolated, but does not corroborate this.

Predictive Impact Assessment for Nitrate

Nitrate is considered to be a critical parameter of concern when assessing impacts to groundwater quality downgradient of an onsite sewage system. MECP Procedure D-5-4 applies for the proposed development. For the purpose of this guideline, the Ontario Drinking Water Objective of 10 mg/L of nitrate is the maximum allowable concentration detectable in the groundwater prior to the property line.
Guideline D-5-4 indicates that where the average lot size is 1.0 ha or larger, a detailed assessment is typically not required since it is considered be a low-risk development and that adequate surplus water is available in the soils to appropriately dilute the nitrate output on the property. The proposed severed lots have an average size of less than 1.0 ha and, as such, a detailed impact assessment has been completed.

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

- ❑ Site area — 62.6 ha
- ❑ Impervious area % — 20 %
  (Although impervious area calculations result in an area of 9% (based on a 300 m2 home, a garage of 70 m2, a driveway area of 140 m2 and a subdivision road length of 22,000 m^2) the Stormwater Managements Design Brief completed by JFSA with Project Ref # P584-06 dated May 11, 2022 notes a impervious area of 20%. The impervious area of 20% was used to demonstrate that the NIA calculation would work for the subdivision using a conservative approach.)
- ❑ Daily sewage flow — 66,000 l/day (66 Lots)
  (Based on Ontario Guideline D-5-4)

- ❑ Concentration of nitrate in effluent 40 mg/L
  (Value based on typical effluent concentration)

- ❑ Surplus Water 361 mm/year
  (The surplus water value was estimated based on Environment Canada Climate Office values with a soil type comprised of clay loam (Urban Lawn/Shallow Rooted Crops) and anthropogenic sources, which can be found attached. Although there is a significant amount of sand across the subject site, the value for clay loam was used in order to be conservative)

- ❑ Combined infiltration factor based on: 0.45
  - Topography infiltration factor 0.15
  - Soil texture infiltration factor 0.20
  - Cover infiltration factor 0.10

The topography infiltration factor of 0.15 is based upon a average of rolling land with a average slope of 2.8 to 2.8 m/km and hilly land with an average slope of 28 m to 47 m/km for the proposed development.

The soil texture infiltration factor was based on a medium combination of clay and loam with a value of 0.2 which is a reasonable generalization based upon the geotechnical field investigation, available geological mapping and surrounding WWR's. Although there is a significant amount of sand across the subject site, the value for clay loam was used in order to be conservative.

The vegetative cover infiltration factor was calculated as 0.1 based the value for cultivated land (0.1).

Based on Ontario Guideline D-5-4 Individual On-Site Sewage Systems: Water Quality Impact Risk Assessment, the predictive nitrate impact assessment reviewed the potential impacts using a value of 1,000 L/day per lot. The calculation for a standard septic system results in a predicted nitrate concentration of 9.14 mg/L nitrate concentration for the subject sites, using a value of 40 mg/L nitrate concentration within the effluent.

Background nitrate concentrations of 0.16 mg/L from the background nitrogen family results were detected in the overburden groundwater across the subject site, and as such, were included in the Nitrate Impact Assessment Calculation.

Based on the results of the predicted nitrate impact assessment, it is our opinion that the proposed residential subdivision can adequately support the proposed single family dwellings without having an adverse impact on the underlying bedrock aquifer.

The groundwater within the bedrock aquifers will be protected from sewage system effluent by the considerable overburden thickness combined with the massive layer of Oxford Formation limestone above the shallowest point of groundwater interception. The general overburden groundwater flow direction will be controlled by the undulating topography on the site, due to the relative impervious nature of the overburden soils. However, the flow would tend to be contained onsite through the construction of a series of roadside ditches.

With respect to the utilization of stormwater runoff in the calculations, the drainage at the site is proposed to consist of a series of grassed ditches and subdrains. As such, most of the stormwater runoff can be justified to be utilized for the purposes of the predictive impact assessment as the distance of travel across the individual lots and into the drainage network is sufficiently long. In order to simplify the predictive impact assessment, however, stormwater runoff has not been included in the available dilution water calculations. Attention should be made to the discussion on best management practices for promoting the infiltration of surface water into the shallow overburden and for the reuse of the greywater, etc., to reduce long term demands of the preferred water supply aquifer.

8.4. Sewage System Design

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. It is proposed that this site be serviced with traditional Class 4 sewage systems consisting of a septic tank and separate leaching bed.

OBC requirements state that the 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. Some lots are located in areas with permeable cover which may permit either in-ground or partially raised leaching beds. Where lots are located in areas with moderately low permeable silty clayey sand and silty sand within the overburden soils, combined with the flat topography, most Class 4 absorption trench style leaching beds are expected to be fully raised above the existing ground surface. An imported sand mantle having a minimum thickness of 250 mm and extending a minimum of 15 m beyond the absorption trenches in the direction of effluent flow would also be required.

Based on OBC design sewage flow tables, a 4 bedroom residence with a finished floor area of 300 m^2 may produce in the order of 3,000 L/day of sewage effluent per day. Based on the quality of the sand deposits available in the local pits, imported sand is anticipated to have a percolation rate (a.k.a. T-time) of between

6 and 8 min/cm. Considering the design flows and percolation rate of the available imported sand, a tile length of 140 metres is required. The Lot Development Plan (PH0482-7) illustrates the size of such tile beds, complete with minor alternative configurations due to irregular lot shapes and other constraints.

The sewage system layouts detailed in Drawing No. PH0482-7 are shown to be fully raised leaching beds with a 15 m imported sand mantle. With due consideration to the more permeable terrain unit which dominates the subject property, the Lot Development Plan (Drawing No. PH0482-7) has been prepared to illustrate that the maximum foreseeable size of leaching bed utilized on any given lot, can be easily accommodated. Moreover, the purpose of the drawing is to illustrate that adequate space exists on each lot to accommodate such a sewage system. The end, or toe, of the mantles will be required to be unobstructed and free draining; the existing topsoil layer is likely to receive the polished effluent from the toe.

With respect to the presence of peat and a perched water table located within the southeastern quadrant of the site, specialized construction will be required. In order to prevent uneven settlement of both the building foundations and sewage systems, the peat and all other organic materials will be required to be excavated within the footprint of the building and within the limits of the distribution piping for the leaching beds proposed in this quadrant. It is also prudent for the peat to be removed from the mantle area(s) also, to minimize overall differential settlement within/near the leaching bed area.

The leaching beds will be fully raised within the southeast quadrant also. As such, it will be required to place imported sand fill into the excavation resulting from the excavation and removal of the peat within the specified limits of the leaching bed areas.

8.5. Long Term Safe Yield Calculation

The twenty-year safe well yield calculation is used to estimate the long-term safe pumping rate for a well and can be calculated using the following equation (Farvolden 1959):

$$Q_{20} = 0.683*T*H_A*S_f$$

Where:

- Q_{20} = 20 year safe pumping rate for the well (m^3/d)
- T = Transmissivity (m^2/day)
- H_A = Available Head (m)
- S_f = Safety Factor = 0.7 (no units)

The most conservative transmissivity value from the pumping tests completed on the onsite test wells was used to complete this calculation (i.e T = 2.4 m^2/day). The safe yield was calculated to be 54.5 m^3/day or 37.8 L/min constantly during a day. This value is more than twice the anticipated peak draw of 18.75 L/min that would be expected for 2 hours per day or more than 18 times the average water demand per day (3,000 L/day).

8.6. Potential Well Interference

It is anticipated that a series of individual water supply wells, in addition to the existing test wells, will be constructed at the subject property in order to provide individual water supplies for each lot. As these wells are anticipated to intercept aquifers located in the March Formation, and considering the inherent intermittent nature of pumping, potential well interference with offsite uses is anticipated to be negligible. This is further corroborated by the 20 year safe yield estimates established earlier in this report.

As the pumping is anticipated to be intermittent with several wells in operation at any given time, a potential well interference model was created to reflect a hypothetical worst case scenario for drawdown at the site. The essence of the predictive model assimilates a total of 66 individual pumping wells and simulates the drawdown from a single centrally located imaginary pumping well set at a pumping rate of 3,000 L/day/lot (i.e. 198,000 L/day). Figure A4-1, located in Appendix 4, summarizes the prediction of drawdown versus time for a constant pumping rate of 198,000 L/day.

The recovery data was utilized in the Theis & Jacob Recovery analysis which specifies a transmissivity of the order of 13.3 m^2/day. The value for storativity (6.8×10^{-4}) was calculated based on the Cooper & Jacob's Time-Drawdown analysis of the observation well data for TW8. The chosen transmissivity value is considered to be conservative in that it reflects a lower transmissivity value for the preferred water supply aquifer. The storativity value is considered to be consistent and representative of a confined limestone aquifer.

It is prudent to note that this model is considered to be very conservative as the governing assumption of a single well pumping at the combined rates of the individuals, does not consider the separation distances of the individual wells. As such, the model will inherently over estimate the drawdown at both the location of pumping, and in the vicinity of the highest density of the proposed development. As the distance from the centre of the development increases, the model should provide a better prediction of offsite well interference.

In the long-term model, the maximum anticipated drawdown predicted at the imaginary pumping well, based on 66 lots continuously pumping for 9,125 days, or approximately 25 years, is of the order of 10.42 m. As the available drawdown in the future well in the site are upwards of 48 m, this corresponds to a reduction in available drawdown of approximately 22 %. Considering the very conservative nature of the model, this predicted loss of available storage in wells near the center of the proposed development is considered to be satisfactory.

Offsite Potential Well Interference

Figure A4-2, in Appendix 4, presents a prediction of drawdown versus time for an imaginary production well pumping at a constant rate of 50,000 L/day. The nearest offsite wells are located approximately 250 m away from the centre of the site, where the imaginary well is located. A conservative radius of impact of 100 m was used to support this assessment. Based on this radial distance, the closest offsite wells would experience a drawdown of 0.48 m at 1 day of pumping and approximately 3.2 m at 9,125 days (25 years) of continuous pumping. As the available drawdown in the offsite wells, located in the immediate vicinity of the site, are of the order of 48 m, based on the published water well records, this corresponds to a loss of available storage of approximately 5% at 365 days (1 year) and 7% after 9,125 days (25 years) of pumping. Based on the available water well records, the Sleepy Cedars Campground, which has a static water level of approximately 5 m below top of casing and a depth of approximately 53 m, the long term pumping would reduce the static water level from 5 to approximately 8 m after 9,125 days (25 years) of continuous pumping. This would leave 45 m of available drawdown in that well. The same analysis can be extended to the other neighbouring wells located to the immediate north and east of the site which intercept and draw water from the combined Oxford, March, and Nepean Formations. The available well records suggest that the houses to the immediate east of the site, as evidenced by TW6 in the aquifer analysis program, are completed in the Upper Oxford Formation and are not expected to exhibit any well interference from the future wells at this site, if constructed in accordance with the recommendations for the well construction presented in Section 8.7 below.

Given the very conservative nature of the model presented above, it is opined that the potential well interference between wells, and beyond the property limits is acceptable in the worst case scenario model. Considering the intermittent pumping, rapid recovery values and significant 20 year safe yield estimates, actual drawdown in offsite wells is anticipated to be negligible.

8.7. Future Water Well Design

Drilled wells, completed in the bedrock aquifer, should be used for the water supply in this development. The wells should be drilled by a licensed well contractor experienced in the study area and should be completed in accordance with Ontario Regulation 903, as amended.

A minimum well yield of 5 gpm is recommended for an average residence and is considered to be readily obtainable on this site. As it is desirable to drill the future wells to achieve the highest quality water, the proposed well construction methodology should endeavor to extend the casing hole through the overburden and should be advanced a minimum of 18 to 24 m bgs or at least 6 m into competent bedrock. Based on a casing length of 24 m bgs, this should result in a casing penetration of sufficient depth to ensure the casings are set into sound bedrock.

The casing should then be installed and grouted in place utilizing either a neat cement grout or sodium bentonite grout slurry introduced from the bottom of the annular space to the surface of the ground in accordance with Ontario Regulation 903 (wells). 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.

With respect to the presence of peat in the southeast quadrant and it's impact on well construction, the thickness of the peat, as determined by the field investigation suggests the maximum thickness of the peat to be less than 3 m. As such, it is recommended that the peat be removed within a minimum of 3 m radius around the proposed location of the well, prior to constructing the well at the site. The peat can be replaced with uncontaminated imported fill, or select, site excavated, non-organic material.

The 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 Ontario Regulation 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 the thorough vertical mixing of the chlorine over the entire depth of the well. The chlorine should then be left for 24 hours and purged out of the well until it can be determined that a free chlorine residual of 0 mg/L is present.

The 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 the well casing should be slightly elevated to direct surface runoff away from the well. The casing should project approximately 400 mm above the mounded soil within 3 m in all directions form the casing.

With respect to the existing test wells, all of the wells completed on the site, with the exception of TW7 which was previously abandoned, are considered to be acceptable for reuse as future wells as they meet the intent of the well construction specifications presented above. The use of the existing wells for the future servicing of proposed lots, is subject to the finalized lot fabric and road alignment. Should any of the wells be ultimately located in a location which they will not be utilized for private servicing, they must be abandoned in strict conformity with Ontario regulation 903.

8.8. Water Conditioning Considerations

As the water within the preferred zone of aquifer interception contains elevated hardness and, to a lesser extent, iron, the raw water can be suitably conditioned to remove these two aesthetic parameters. A standard residential grade water softener can be installed to remove both the hardness and iron concentrations in the raw water. Regeneration rates may be slightly higher given the concentration of iron in a few of the test wells, however the iron concentrations are not anticipated to substantially contribute to a reduction in resin capacity.

As the water is considered to be hard, it is strongly recommended that should a water softener be selected for installation, that consideration be made to installing a separate tap for drinking water which bypasses the softener. This will minimize the consumption of an increased sodium concentration resulting from the ion exchange process.

Additional well development should be undertaken upon completion of the construction of future water wells at this site. The wells should be subjected to a period of well development of at least six (6) hours at a rate of approximately 23 L/min (5 gpm) in order to stabilize the raw water within the aquifer system in the immediate vicinity of the constructed well. Water samples, for verification of raw water quality in anticipation of water conditioning, should not be collected until the pH measured at the wellhead does not vary by more than 20% during a 30-minute interval during pumping.

With respect to the slightly increased turbidity in both the field and laboratory samples, as there is no need for water treatment to control bacteriological parameters, the turbidity values are considered to be within the acceptable range of values contained within Procedure D-5-5. It is anticipated that extended well development, at a rate of not more than 5 L/min for at least 24 hours, will be sufficient to remove any residual turbidity resulting from well construction for each newly constructed well at the site.

8.9. Implementation of Best Management Practices

The surficial soils present throughout most of the site are conducive to the implementation of rainwater infiltration and retention technologies, including, but not limited, to infiltration trenches and shallow rear yard swales complete with subdrains.

Backwash water from water softeners is suitable for discharge into infiltration galleries located a minimum of 5 m from the leaching bed area and should be set on sufficient in situ or imported sand fill to be incorporated into proposed lot drainage patterns. Backwash water from a water softener, based on the anticipated regeneration cycle, can be directed to the sewage system, provided the sewage system components are sized and designed accordingly. As a minimum, the backwash cycle should be assumed to be once per day at a volume of upwards of 150 L. The septic tank, if conventional sewage treatment technologies are employed, should be fitted with a high quality plate/tube style effluent filter in order to minimize suspended solids migration. With respect to the efficient and effective utilization of the effective building areas on each of the proposed lots, it will be advantageous to consider the selection of advanced wastewater treatment systems in place of the more traditional fill based Class 4 sewage systems. The reduction in height and area will have a beneficial impact on preserving existing forested areas.

With respect to residential water use, it is recommended that individual homeowners utilize water conserving plumbing fixtures and follow lawn irrigation strategies created by the City of Ottawa. Irrigation systems for lawn irrigation are discouraged from use in this development.

8.10. Subdivision Phasing Plan

The City of Ottawa's Official Plan related to phased subdivision development requires the submission and acceptance of a Servicing Review Study for each phase of rural development. The intent of this study is to review the sewage system

and well construction being carried out in the first/previous phase(s) in order to evaluate if, and how, the subsequent phases should proceed.

The lot fabric of the proposed subdivision consists of a total of 40 lots in Phase 1, and the balance of the lots (26) reserved for Phase 2. The proposed layout for lots in Phase 1 is such that most of the lots are situated along the upgradient end of the southerly flow of overburden groundwater beneath the site. As such, the following methodology should be employed to complete the Servicing Review Study.

- ❑ The existing test wells in both Phase 1 and Phase 2 should be purged and sampled for a comprehensive suite of groundwater parameters consistent with the original Hydrogeological Study report. This update water quality should be compared against the original baseline data to determine the presence/extent of surficial impacts, if any, and to confirm the baseline water quality as it related to recommendations for water conditioning, etc.
- ❑ The water well records for the constructed wells should be reviewed in order to confirm that the wells are intercepting the preferred water supply aquifer, if the wells are intercepting the preferred water supply aquifer the sampling regime should focus on the health-related parameters within the newly constructed homes with a representative cross section of the wells being sampled for the comprehensive suite of groundwater parameters carried out for the test wells. If the wells constructed in Phase 1 do not intercept the preferred water supply aquifer, these wells should be sampled for the comprehensive suite of groundwater parameters included in the original baseline water quality plan for the Hydrogeological Study.
- ❑ Collect representative samples of the overburden groundwater located downgradient of the sewage system installations at the upgradient limits of Phase1/Phase 2 development line, and at the downgradient property limits beyond Phase 2. The water samples should be analysed for the full nitrogen species, sodium, chloride, total coliforms, faecal coliforms, and E.coli.
- ❑ The sewage system design, construction and operation should be reviewed for each of the systems installed and approved with the Ottawa Septic System Office.

It has been generally accepted by the City of Ottawa, historically, that the Servicing Review study should be initiated when a minimum of 20% of the lots in each phase (i.e 8 lots of 40 possible lots) have been occupied for a minimum of three (3) seasons. This condition, in our opinion, should be considered to be the minimum trigger point to initiate the Servicing Review Study. Notwithstanding the above, the City of Ottawa, in March 2011, approved a series of standard draft conditions for the subdivision development. In this approved conditions, the City of Ottawa has provided clear direction regarding the trigger point at which a Servicing Review

Study should be initiated for a subdivision utilizing private services. Specifically, the draft conditions read as follows:

"The registration of this subdivision shall be phased. Each phase of registration is to contain not more than 40 lots. Prior to the registration of each phase other than the first phase, the Owner shall submit a performance review of the operation of wells and private sewage disposal systems in the previous phase(s) of the development. Such review shall demonstrate that the previous phase(s) are operating satisfactorily. A Professional Engineer, with experience in hydrogeology, or a professional geoscientist shall prepare the performance review. The final number of lots required for analysis must be supported in the performance review, but in any case the performance review shall only be prepared and submitted for review when a minimum of 50% of the lots in the previous phase have been built and occupied for not less than three seasons, and, when requesting the registration of any phase beyond the second phase, a representative number of lots, to the satisfaction of the General Manger, Planning and growth Management, in the older phases must also be analysed. Further, the Owner agrees that prior to the registration of each phase, lots in that phase or any subsequent phase will not be offered for sale."

Given that this above noted draft condition is endorsed by City Council, it appears prudent to start the Phase 1 review at the stage where 20 lots have been built in Phase 1 and occupied for a minimum of three (3) seasons. It remains that the recommended minimum number of lots that should be used in the analysis be set at no less than eight (8), however, the location of the lots used in the study should be reflective of site conditions and their logical downgradient impacts on Phase 2 development. Obviously, in the even that impacts are measured, or discrepancies noted, for the cross section of lots used in the study, the scope of the study should be increased to provide the necessary information.

9.0 Conclusions

Based on the information contained within the body of this report, the following conclusions can be drawn:

1. The subject property is situated in an area noted to be generally flat with good to poor surficial drainage patterns. The site can be divided into two (2) distinct drainage areas resulting from a topographical high point located along the southwestern quadrant and extending several hundred metres northward.
2. The surficial soils coverage on the subject property are conducive to the subsurface dispersion of sewage system effluent and are not considered to be hydrogeologically sensitive.
3. Surrounding land uses are consistent with the intended residential use for this property. Offsite impacts on the subject property have been assessed and are considered to be negligible.
4. The surficial geology of the subject property generally consists of a mixture of silty clayey sand to sandy till deposits overlying bedrock, at depth, across the subject area. The soils types and areal delineation are consistent with available soils mapping with some noted exceptions.
5. The bedrock geology directly beneath the site consists of limestone of the Oxford Formation. The Oxford Formation is underlain by the March Formation, followed by the Nepean Formation. The preferred water supply aquifers are located within the Oxford and March Formations, creating a combined aquifer system for future water wells.
6. The construction of the test wells on the subject property appear to have intercepted at least two (2) individual water supply aquifers of suitable quantity: the Oxford Formation and the March Formation. The quality of the March Formation water supply aquifer is such that it is the preferred aquifer for future wells. An additional water supply aquifer is located within the shallowest portion of the Nepean Formation.
7. The most consistent zones of aquifer intercept within the combined Oxford and March Formation aquifer system as reported in the test wells and neighbouring wells is between 28 m and 56 m bgs.
8. Significant confining pressures are present on the water supply aquifer at the interception points. An adequate quantity of water is present in all of the encountered aquifers and free flowing artesian conditions are not anticipated.
9. Water quality of the Oxford, March and Nepean Formations is considered to be sufficient for domestic use. Domestic water conditioning equipment may be utilized to reduce hardness and iron levels for aesthetic requirements only.

10. Potential well interference with neighbouring, offsite wells, is considered to be minimal and, based on the aquifer parameters determined by this study, the anticipated water demand from this subdivision will have minimal impact on the safe yield of the water supply aquifers.
11. Sewage systems, containing fully raised leaching beds, are easily accommodated on each of the proposed lots. The proposed development may be serviced using sewage systems which are either in-ground or partially raised. Site specific soil morphology analysis, carried out by a qualified geotechnical engineer, should be completed for each individual sewage system design.
12. The subject property is suitable for development as a residential subdivision at the proposed density. Impacts to the neighbouring low density residential development area are expected to be minimal.

10.0 Recommendations

Based on the information presented in the body of this report, the following recommendations can be made:

1. In accordance with the intent of Procedure D-5-5, the Medical Officer of Health must be notified where sodium concentrations in the new wells exceed 20 mg/L. This requirement is specified in order for the information to be disseminated to local physicians in order to treat persons with sodium reduced dietary needs.
2. The raw water found in the preferred water supply aquifer system is considered to be hard to very hard and may contain iron levels which may result in the visible iron staining to plumbing fixtures and clothing. A residential grade water softener is recommended where these aesthetic parameters are deemed unsuitable to the future homeowner. If the use of water softeners are considered by the future homeowner, it is recommended that a separate water supply tap be installed. This tap should bypass the water softener to prevent the increased sodium concentration which will result by softening the water with sodium chloride. In all cases, the raw water should be sampled and submitted for comprehensive chemical analysis for the same parameters tested in this study only after the well and distribution system have been properly flushed and the well has been in use for an extended period.
3. It is recommended, in keeping with the intent of the Osgoode Bylaw, that the casing hole extend a minimum of 6 m into the underlying bedrock to ensure the casing extends into sound bedrock. Given the test well construction methodology employed on the site, a casing length of between 18 m and 24 m will be required in order to achieve the necessary bedrock penetration. The well contractor should review the proposed well

construction methodology specified in this report prior to proceeding with any site works.

4. The preferred zone of aquifer interception for future wells should be set at approximately 28 m to 56 m measured below the ground surface. Wells should be constructed with a rotary air drilling rig.
5. The recommended minimum range of well yields is set at 23 L/min.
6. 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 of Ontario. Furthermore, it is recommended that a qualified Professional Engineer or Professional Geoscientist of Ontario oversee the construction of the open borehole in order to ensure well depths do not exceed those recommended in this study. All well construction must be carried out by a qualified and experienced well technician.
7. 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 wells should be subjected to a period of well development of at least six (6) hours at a rate of approximately 23 L/min (5 gpm) in order to stabilize the raw water within the aquifer system in the immediate vicinity of the constructed well. Water samples, for verification of raw water quality in anticipation of water conditioning, should not be collected until the pH measured at the wellhead does not vary by more than 20% during a 30 minute interval during pumping.
8. All future water wells should 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. Moreover, the grade should slope away from the wellhead for a distance of at least 3 m. It is recommended that the homeowner consult the comprehensive reference document entitled, “Water Supply Wells - Requirements and Best Management Practices (December 2009)”, prepared by the Ontario Ministry of the Environment and familiarize themselves on their legal obligations to maintain and protect their well.
9. Individual future well owner(s) should carry out semi annual verification of potability of the raw water supply. Moreover, the well owner should ensure that they maintain the wellhead and immediate area in accordance with the requirements of Ontario Regulation 903.
10. Irrigation systems for cosmetic watering which utilize water from the preferred water supply aquifer are not recommended for use at this site.

11. The Servicing Review Study Report, required to be completed and approved prior to releasing Phase 2 of the development, cannot be initiated until at least 20 homes are built and occupied for three (3) seasons. The minimum number of lots used in the analysis for the Study should be set at eight (8).

In summary, it is our 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, will ensure that the development takes place in an effective manner, with a minimal impact on the natural environment.

We trust that the current submission satisfies your immediate requirements.

Best Regards,

Paterson Group Inc.

Erik Ardley, P.Geo

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June 21, 2023
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3667
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APPENDIX 1

Soil Profile and Test Data Sheets

Symbols and Terms

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Consulting Engineers

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE & TEST DATA

Geotechnical Investigation
1934 Stagecoach Road
Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Backhoe

DATE 29 AUG 06

FILE NO. PH0482

HOLE NO. TP 1

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL 0.15							
Loose, red-brown medium **SAND** with cobbles		G	1			1	
1.00							
Grey-brown SILTY fine **SAND** with cobbles and boulders		G	2			2	
2.20							
GLACIAL TILL: Dense, grey clayey silt with sand, gravel and cobbles 2.40							
End of Test Pit							
TP terminated in dense till @ 2.60m depth							
(Water infiltration @ 1.6m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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DATE 29 AUG 06

FILE NO. PH0482

HOLE NO. TP 2

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL 0.25							
Dense, yellowish brown SAND-GRAVEL 0.60		G	3				
Compact to dense, grey SILTY FINE SAND 2.10		G	4			1	
Very stiff, grey CLAYEY SILT		G	5			2	
						3	
4.00							
Dense GLACIAL TILL 4.10						4	
End of Test Pit							
(Water infiltration @ 3.9m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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REMARKS

BORINGS BY Backhoe

DATE 29 AUG 06

FILE NO. PH0482

HOLE NO. TP 3

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL 0.15							
Red-brown SAND-GRAVEL, some cobbles		G	6			1	
1.50							
GLACIAL TILL: Grey silty sand and gravel with cobbles and boulders		G	7			2	
2.90							
End of Test Pit Refusal on inferred bedrock surface @ 2.90m depth (Water infiltration @ 2.4m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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DATE 29 AUG 06

FILE NO. PH0482

HOLE NO. TP 4

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL 0.15							
GLACIAL TILL: Grey-brown sand and gravel with cobbles and boulders		G	8			1	
3.20						2	
End of Test Pit Refusal on inferred bedrock surface @ 3.20m depth (Water infiltration @ 2.9m depth)						3	

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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FILE NO. PH0482

HOLE NO. TP 5

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0			
TOPSOIL 0.24									
Light brown SILTY fine SAND with gravel and cobbles		G	9			1			
1.30 End of Test Pit									
TP terminated on inferred bedrock surface @ 1.30m depth									
(TP dry upon completion)									

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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REMARKS

BORINGS BY Backhoe

DATE 29 AUG 06

FILE NO. PH0482

HOLE NO. TP 6

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL 0.30							
Yellow-brown SAND-GRAVEL with cobbles and boulders						1	
1.70							
GLACIAL TILL: Grey-brown silty sand and gravel with cobbles and boulders		G	10			2	
2.40							
End of Test Pit							
Refusal on inferred bedrock surface @ 2.40m depth							
(TP dry upon completion)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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BORINGS BY Backhoe

DATE 29 AUG 06

FILE NO. PH0482

HOLE NO. TP 7

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0		20 40 60 80	
TOPSOIL 0.36									
Yellow-brown SAND-GRAVEL with cobbles 1.40						1			
GLACIAL TILL: Grey-brown silty sand and gravel with cobbles and boulders 2.10						2			
End of Test Pit TP terminated on inferred bedrock surface @ 2.10m depth (TP dry upon completion)								20 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded	

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BORINGS BY Backhoe

DATE 29 AUG 06

FILE NO. PH0482

HOLE NO. TP 8

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL 0.25							
Brown SAND with gravel and cobbles 0.40							
Grey-brown SANDY SILT with cobbles		G	11			1	
						2	
3.00						3	
End of Test Pit							
(Water infiltration @ 2.6m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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BORINGS BY Backhoe

DATE 29 AUG 06

FILE NO. PH0482

HOLE NO. TP 9

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0		20 40 60 80	
TOPSOIL 0.30									
Red-brown SAND 0.70						1			
GLACIAL TILL: Grey-brown silty sand and gravel with cobbles and boulders 1.50									
End of Test Pit TP terminated in dense till @ 1.50m depth (TP dry upon completion)									

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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REMARKS

BORINGS BY Backhoe

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FILE NO. PH0482

HOLE NO. TP10

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0			
TOPSOIL 0.22									
GLACIAL TILL: Grey-brown silty sand with gravel, cobbles and boulders		G	12			1			
1.50									
End of Test Pit Practical refusal to excavation in dense till or bedrock surface (TP dry upon completion)									

Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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REMARKS

BORINGS BY Backhoe

DATE 29 AUG 06

FILE NO. PH0482

HOLE NO. TP11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0		20 40 60 80	
TOPSOIL 0.20									
Grey coarse SAND		G	13			1			▽
1.50									
End of Test Pit									
(Water infiltration @ 0.5m depth)									

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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REMARKS

BORINGS BY Backhoe

DATE 29 AUG 06

FILE NO. PH0482

HOLE NO. TP12

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0			
FILL: Silty sand and gravel with cobbles and topsoil, some asphalt and cement pieces		G	14			1			
						2			
2.30									
Grey coarse SAND									
2.70									
End of Test Pit									
(Water infiltration @ 2.3m depth)									

Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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DATE 29 AUG 06

FILE NO. PH0482

HOLE NO. TP13

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
FILL: Silty sand with gravel, cobbles and topsoil, some wood pieces							
1.10						1	
Grey coarse SAND							
2.00						2	
End of Test Pit (Water infiltration @ 1.3m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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REMARKS

BORINGS BY Hand Auger

DATE 26 SEP 06

FILE NO. PH0482

HOLE NO. AH 1

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0			
TOPSOIL 0.20									
Brown SILTY SAND 0.40									
Stiff, grey SILTY CLAY to CLAYEY SILT		G	1			1			
1.35									
SILTY fine SAND, trace gravel 1.60									
End of Auger Hole Refusal on inferred glacial till @ 1.60m depth (Water infiltration at 0.90m depth)									

Water Content % scale: 20 40 60 80

Shear Strength (kPa) scale: 20 40 60 80 100

▲ Undisturbed △ Remoulded

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Consulting Engineers

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REMARKS

BORINGS BY Hand Auger

DATE 26 SEP 06

FILE NO. PH0482

HOLE NO. AH 2

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0			
TOPSOIL									
0.60									
Stiff, grey-brown SANDY CLAY		G	2						
1.00						1			
Grey CLAYEY SILT, trace fine sand		G	3						
1.25									
Grey SILTY CLAY to CLAYEY SILT, trace fine sand									
1.60									
AH terminated in soft silty clay @ 1.60m depth									

Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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REMARKS

BORINGS BY Hand Auger

DATE 26 SEP 06

FILE NO. PH0482

HOLE NO. AH 3

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL							
0.40							
SANDY SILT to SANDY CLAY (medium density)							
1.00						1	
Grey SILTY CLAY							
1.80							
AH terminated in silty clay @ 1.80m depth							
(Water infiltration at 1.60m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

Piezometer Construction

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BORINGS BY Hand Auger

DATE 26 SEP 06

FILE NO. PH0482

HOLE NO. AH 4

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0			
TOPSOIL									
0.40									
Brown SILTY SAND									
0.60									
SAND, some gravel						1			
1.20									
Refusal on inferred Glacial Till									

Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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REMARKS

BORINGS BY Hand Auger

DATE 26 SEP 06

FILE NO. PH0482

HOLE NO. AH 5

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL							
0.20							
Grey SILTY CLAY							
0.40							
SANDY SILT, trace clay (medium density)							
1.00						1	
PEAT							
1.20							
Soft to stiff, grey SILTY **CLAY**							
1.60							
Soft to stiff, grey SILTY **CLAY** to **SANDY CLAY**, trace fine sand							
1.80							
End of Auger Hole							
Auger hole terminated in silty clay to sand clay at 1.80m depth							
(Water infiltration at 1.60m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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Consulting Engineers

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE & TEST DATA

Geotechnical Investigation
1934 Stagecoach Road
Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Hand Auger

DATE 26 SEP 06

FILE NO. PH0482

HOLE NO. AH 6

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0			
TOPSOIL 0.15									
Brown SILTY SAND						1			
1.10									
Stiff SILTY CLAY to CLAYEY SILT									
1.50									
AH terminated in stiff silty clay to clayey silt @ 1.50m depth									

Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE & TEST DATA

Geotechnical Investigation
1934 Stagecoach Road
Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Hand Auger

DATE 26 SEP 06

FILE NO. PH0482

HOLE NO. AH 7

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0			
TOPSOIL 0.10									
CLAYEY SAND, trace silt 0.30									
Grey SILTY SAND						1			
1.20									
AH terminated in silty sand @ 1.20 m depth									
(Water infiltration at 0.20m depth)									

Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision
1934 Stagecoach Road
Ottawa, Ontario

DATUM Ground surface elevations interpolated from topo survey plan.

FILE NO. **PH0482**

REMARKS

HOLE NO. **TP1/MW1-1(**

BORINGS BY Backhoe

DATE 6 August 2010

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL 0.30							
SAND with marl		G	1			1	
2.00						2	
SILTY CLAY		G	2				
2.50							
End of Test Pit							
(GWL @ 0.7m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision
1934 Stagecoach Road
Ottawa, Ontario

DATUM Ground surface elevations interpolated from topo survey plan.

FILE NO. **PH0482**

REMARKS

HOLE NO. **TP 2-10**

BORINGS BY Backhoe

DATE 6 August 2010

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.25						0			
SAND with gravel		G	3			1			▽
2.40						2			
SILTY CLAY 2.80		G	4						
End of Test Pit (GWL @ 0.7m depth)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision
1934 Stagecoach Road
Ottawa, Ontario

DATUM Ground surface elevations interpolated from topo survey plan.

FILE NO. **PH0482**

REMARKS

HOLE NO. **TP3/MW2-1(**

BORINGS BY Backhoe

DATE 6 August 2010

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL 0.27							
FILL: Silty sand with cobbles 0.96		G	5			1	
Coarse SAND 2.60		G	6			2	
SILTY CLAY 3.00						3	
End of Test Pit (GWL @ 1.5m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision
1934 Stagecoach Road
Ottawa, Ontario

DATUM Ground surface elevations interpolated from topo survey plan.

FILE NO. **PH0482**

REMARKS

HOLE NO. **TP 4-10**

BORINGS BY Backhoe

DATE 6 August 2010

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL 0.23							
Coarse **SAND**		G	7			1	
2.30						2	
SILTY CLAY		G	8				
2.70							
End of Test Pit							
(GWL @ 0.4m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision
1934 Stagecoach Road
Ottawa, Ontario

DATUM Ground surface elevations interpolated from topo survey plan.

FILE NO. **PH0482**

REMARKS

HOLE NO. **TP 5-10**

BORINGS BY Backhoe

DATE 6 August 2010

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0			
TOPSOIL 0.18									
FILL: Sandy silt with gravel and cobbles 1.20		G	9			1			
SANDY SILT with marl 2.00		G	10			2			
SILTY CLAY 2.60		G	11						
End of Test Pit (TP dry upon completion)									

Water Content % scale: 20 40 60 80

Shear Strength (kPa) scale: 20 40 60 80 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision
1934 Stagecoach Road
Ottawa, Ontario

DATUM Ground surface elevations interpolated from topo survey plan.

FILE NO. **PH0482**

REMARKS

HOLE NO. **TP6/MW4-1(**

BORINGS BY Backhoe

DATE 6 August 2010

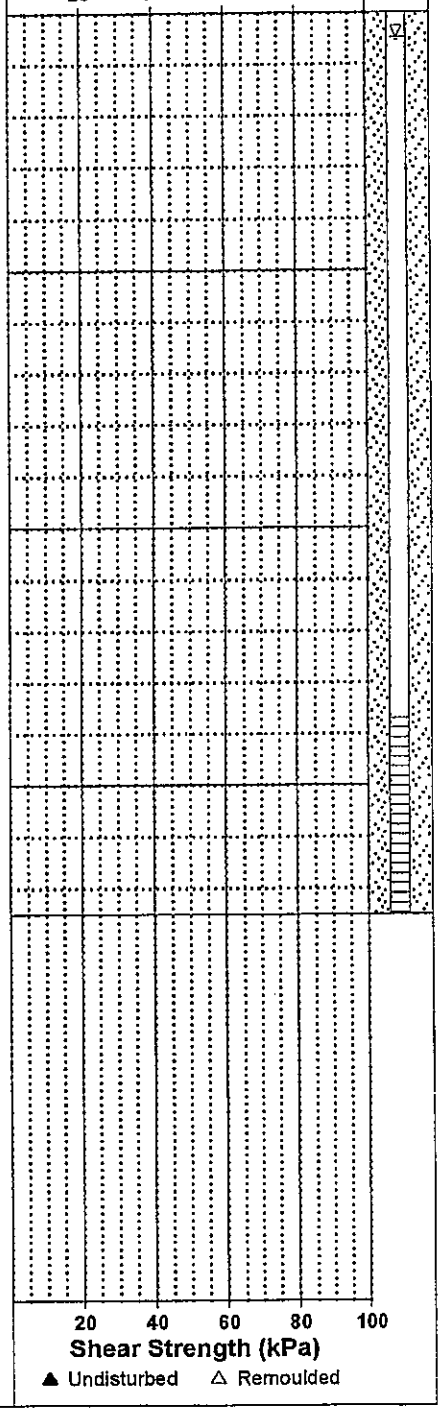
SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL 0.15							
SAND with marl		G	12			1	
1.40							
SILTY SAND with boulders		G	13			2	
						3	
3.50							
End of Test Pit							
(GWL @ 0.1m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

Piezometer Construction



20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision
1934 Stagecoach Road
Ottawa, Ontario

DATUM Ground surface elevations interpolated from topo survey plan.

FILE NO. **PH0482**

REMARKS

HOLE NO. **TP7/MW3-1**

BORINGS BY Backhoe

DATE 6 August 2010

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL 0.14							
SILTY SAND		G	14				
- with clay by 0.4m depth		G	15			1	
1.10							
SAND with marl		G	16				
1.50						2	
SILTY CLAY		G	17				
3.00						3	
End of Test Pit							
(GWL @ 0.1m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision
1934 Stagecoach Road
Ottawa, Ontario

DATUM Ground surface elevations interpolated from topo survey plan.

FILE NO. **PH0482**

REMARKS

HOLE NO. **TP 8-10**

BORINGS BY Backhoe

DATE 6 August 2010

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0			
TOPSOIL 0.20									
SAND		G	18			1			
0.85									
SILT		G	19			2			
- with boulders by 3.1m depth						3			
3.50									
End of Test Pit									
(TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision
1934 Stagecoach Road
Ottawa, Ontario

DATUM Ground surface elevations interpolated from topo survey plan.

FILE NO. **PH0482**

REMARKS

HOLE NO. **TP 9-10**

BORINGS BY Backhoe

DATE 6 August 2010

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0			
TOPSOIL 0.23									
SAND 0.80		G	20			1			
SILT		G	21			2			
3.50						3			
End of Test Pit (TP dry upon completion)									

Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100 ▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision
1934 Stagecoach Road
Ottawa, Ontario

DATUM Ground surface elevations interpolated from topo survey plan.

FILE NO. **PH0482**

REMARKS

HOLE NO. **TP10/MW5-1**

BORINGS BY Backhoe

DATE 6 August 2010

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL 0.29							
SILTY SAND with boulders		G	22			1	
1.50							
SILTY CLAY with gravel and boulders		G	23			2	
2.60							
End of Test Pit Practical refusal to excavation on inferred boulders @ 2.60m depth (GWL @ 2.5m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision
1934 Stagecoach Road
Ottawa, Ontario

DATUM Ground surface elevations interpolated from topo survey plan.

FILE NO. **PH0482**

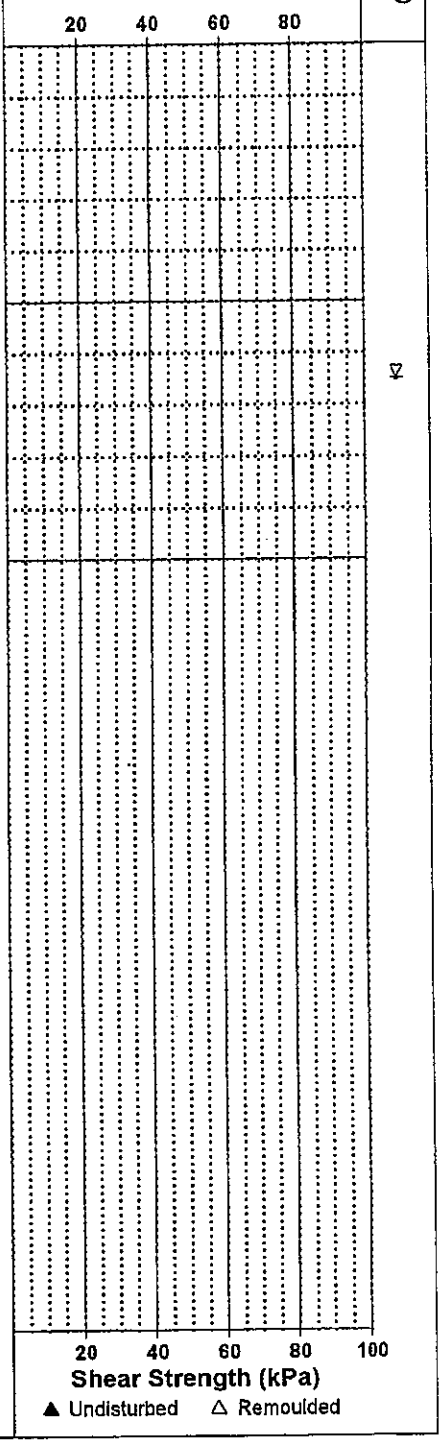
REMARKS

HOLE NO. **TP11-10**

BORINGS BY Backhoe

DATE 6 August 2010

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0			
TOPSOIL 0.35									
SAND with silt 0.63		G	24						
SILTY SAND with boulders		G	25			1			
2.00						2			
End of Test Pit Practical refusal to excavation on inferred boulders @ 2.00m depth (GWL @ 1.3m depth)									



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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision
1934 Stagecoach Road
Ottawa, Ontario

DATUM Ground surface elevations interpolated from topo survey plan.

FILE NO. **PH0482**

REMARKS

HOLE NO. **TP12-10**

BORINGS BY Backhoe

DATE 6 August 2010

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0			
TOPSOIL 0.24									
SILTY SAND with boulders		G	26			1			
						2			
3.20						3			
End of Test Pit Practical refusal to excavation on inferred boulders @ 3.20m depeth (TP dry upon completion)									

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision
1934 Stagecoach Road
Ottawa, Ontario

DATUM Ground surface elevations interpolated from topo survey plan.

FILE NO. **PH0482**

REMARKS

HOLE NO. **TP13/MW6-1**

BORINGS BY Backhoe

DATE 6 August 2010

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL 0.23							
SAND 0.75		G	27				
SILTY CLAY		G	28			1	
						2	
						3	
3.40							
End of Test Pit Practical refusal to excavation on inferred boulders @ 3.40m depth (GWL @ 3.1m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision
1934 Stagecoach Road
Ottawa, Ontario

DATUM Ground surface elevations interpolated from topo survey plan.

FILE NO. **PH0482**

REMARKS

HOLE NO. **AH 1-10**

BORINGS BY Hand Shovel/Hand Auger DATE 15 October 2010

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	96.60		
PEAT									
0.87									
FINE SAND						1	95.60		
1.35									
End of Auger Hole									
(GWL @ ground surface)									

Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision
1934 Stagecoach Road
Ottawa, Ontario

DATUM Ground surface elevations interpolated from topo survey plan.

FILE NO. **PH0482**

REMARKS

HOLE NO. **AH 2-10**

BORINGS BY Hand Shovel/Hand Auger

DATE 15 October 2010

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	96.30
PEAT							
						1	95.30
1.05							
FINE SAND							
1.40							
End of Auger Hole							
(GWL @ ground surface)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Proposed Residential Subdivision
1934 Stagecoach Road
Ottawa, Ontario

DATUM Ground surface elevations interpolated from topo survey plan.

FILE NO. **PH0482**

REMARKS

HOLE NO. **AH 3-10**

BORINGS BY Hand Shovel/Hand Auger

DATE 15 October 2010

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	96.60
PEAT							
0.96						1	95.60
FINE SAND							
1.40							
End of Auger Hole							
(GWL @ ground surface)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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%	-	Natural moisture content or water content of sample, %
LL	-	Liquid Limit, % (water content above which soil behaves as a liquid)
PL	-	Plastic limit, % (water content above which soil behaves plastically)
PI	-	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
Cc	-	Concavity coefficient = $(D30)^2$ / (D10 x 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 $Cu > 4$
Well-graded sands have: $1 < Cc < 3$ and $Cu > 6$
Sands 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

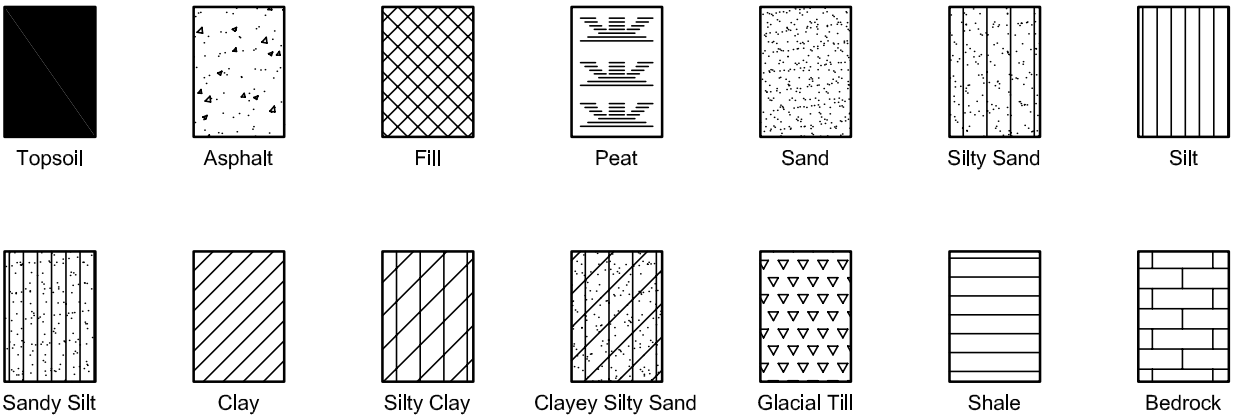
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void Ratio		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.

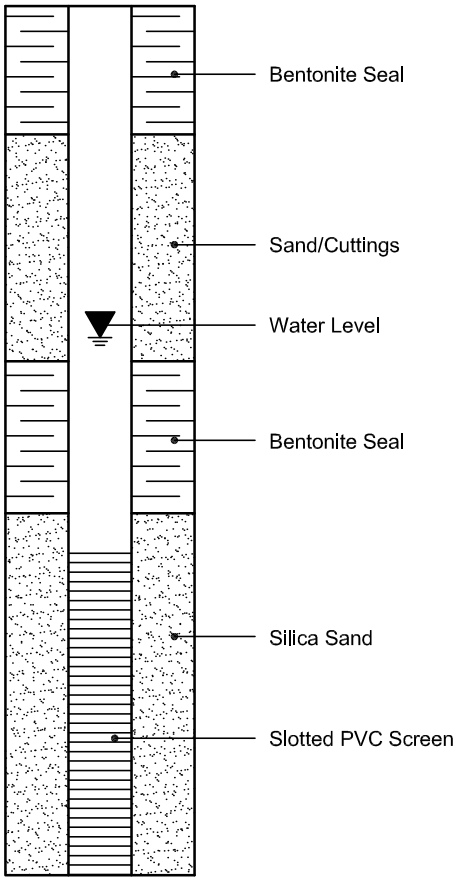
SYMBOLS AND TERMS (continued)

STRATA PLOT

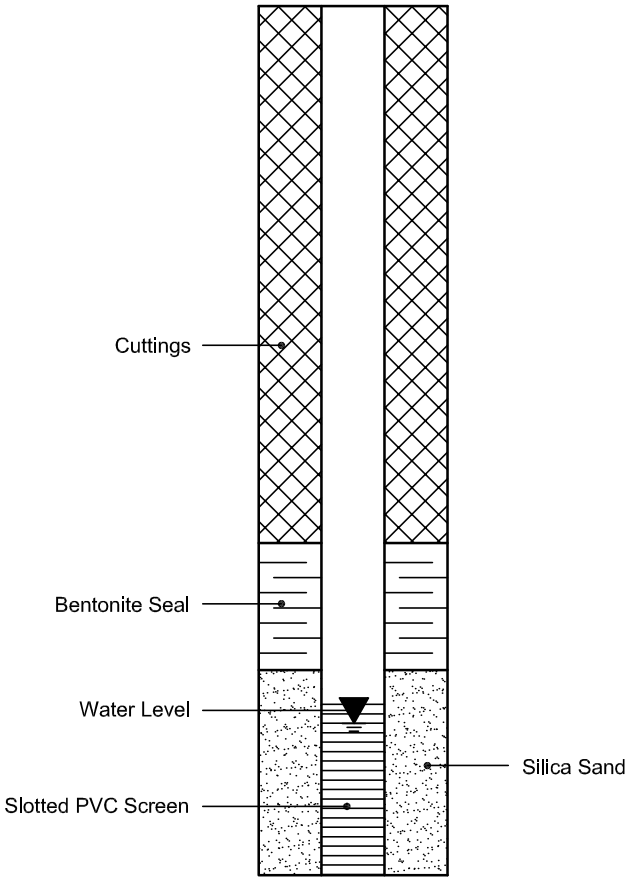


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



APPENDIX 2

Published MECP Well Data for Test Wells

Local Well Records (Regional Hydrogeology)

MECP Provincial Offences order - Sleepy Cedars

TW1

Ontario Ministry of the Environment

Well Tag A 052507

A052507

Well Record

Regulation 903 Ontario Water Resources Act

page __ of __

Instructions for Completing Form

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- All Sections must be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
- Questions regarding completing this application can be directed to the Water Well Help Desk (Toll Free) at 1-888-396-9355.
- All metre measurements shall be reported to 1/10th of a metre.
- Please print clearly in blue or black ink only.

Ministry Use Only: MUN | CON | LOT

Well Owner's Information and Location of Well Information

Field	Entry
First Name / Last Name	ABS Advanced building Systems
Mailing Address (Street Number/Name, RR, Lot, Concession)	457 Bank Street
County/District/Municipality	
Township/City/Town/Village	Ottawa
Province	Ontario
Postal Code	K2P 1Y7
Telephone Number (include area code)	
Address of Well Location (County/District/Municipality)	Ottawa-Carleton
Township	Osgoode
Lot	12
Concession	3
RR#/Street Number/Name	#1934 Stagecoach
City/Town/Village	Greely
Site/Compartment/Block/Tract etc.	
GPS Reading: NAD	83
Zone	18
Easting	454671
Northing	5008457
Unit Make/Model	Magellan
Mode of Operation	☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From (Metres)	Depth To (Metres)
	Sand			0	1.52
	Clay			1.52	3.35
	Sand, Gravel, Boulder			3.35	17.68
	Sandy Limestone			17.68	30.48

Hole Diameter

Depth From (Metres)	Depth To (Metres)	Diameter Centimetres
0	30.48	14.91

Water Record

Water found at Metres	Kind of Water
22.17	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☒ Minerals ☐ Other
25.30	☐ Fresh ☒ Sulphur ☐ Gas ☐ Salty ☒ Minerals ☐ Other
28.35	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other

After test of well yield, water was: ☐ Clear and sandfree ☐ Other, specify TESTED

Chlorinated ☒ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From (Metres)	Depth To (Metres)
Casing				
15.88	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.480	0	20.12
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen (Outside diam)	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
No Casing or Screen	☒ Open hole		19.51	30.48

Test of Well Yield

Item	Entry
Pumping test method	Sub Pump
Pump intake set at (metres)	28.38
Pumping rate (litres/min)	38
Duration of pumping	1 hrs + 0 min
Final water level end of pumping	13.33 metres
Recommended pump type	☐ Shallow ☒ Deep
Recommended pump depth	28 metres
Recommended pump rate (litres/min)	38
If flowing give rate (litres/min)	
If pumping discontinued, give reason	

Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Static Level	1.96		15.33
1	3.25	1	10.64
2	3.68	2	9.27
3	3.32	3	8.26
4	4.04	4	7.03
5	4.54	5	6.31
10	6.77	10	2.74
15	7.27	15	1.96
20	9.56	20	
25	10.62	25	
30	11.68	30	
40	13.07	40	
50	14.20	50	
60	13.33	60	

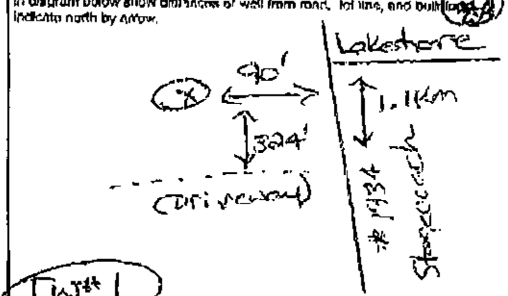
Plugging and Sealing Record

☒ Annular space ☐ Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
19.51	16.46	Neat Cement Slurry	.227
16.46	0	Bentonite Slurry	.858

Location of Well

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.



Method of Construction

☐ Cable Tool ☐ Rotary (conventional) ☐ Rotary (reverse) ☐ Rotary (air) ☒ Air percussion ☐ Boring ☐ Diamond ☐ Jetting ☐ Driving ☐ Digging ☐ Other

Water Use

☒ Domestic ☐ Stock ☐ Irrigation ☐ Industrial ☐ Commercial ☐ Municipal ☐ Public Supply ☐ Not used ☐ Cooling & air conditioning ☐ Other

Final Status of Well

☐ Water Supply ☐ Observation well ☒ Test Hole ☐ Recharge well ☐ Abandoned, insufficient supply ☐ Abandoned, poor quality ☐ Unfinished ☐ Dewatering ☐ Replacement well ☐ Abandoned, (Other)

TW#1

Audit No. Z 64701

Date Well Completed: 2007 03 13

Was the well owner's information package delivered? ☒ Yes ☐ No

Date Delivered: 2007 03 15

Well Contractor/Technician Information

Field	Entry
Name of Well Contractor	Air Rock Drilling Co LTD
Well Contractor's Licence No.	1119
Business Address (street name, number, city etc.)	6071 Richmond Ont K0A 2Z0
Name of Well Technician (last name, first name)	Purcell Shannon
Well Technician's Licence No.	T2122
Signature of Technician/Contractor	X [signature]
Date Submitted	YYYY MM DD

Ministry Use Only

Data Source | Contractor | Date Received YYYY MM DD | Date of Inspection YYYY MM DD | Remarks | Well Record Number

TW2

Ontario Ministry of the Environment

Well Tag: A 052502 (A052502)

Well Record

Regulation 903 Ontario Water Resources Act

page ___ of ___

Instructions for Completing Form

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- All Sections must be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
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- All metre measurements shall be reported to 1/10th of a metre.
- Please print clearly in blue or black ink only.

Ministry Use Only: MUN | CON | LOT

Well Owner's Information and Location of Well Information

Field	Value
First Name	ABS
Last Name	Advanced Building Systems
Mailing Address (Street Number/Name, RR, Lot, Concession)	427 Bank Street
County/District/Municipality	
Township/City/Town/Village	Ottawa
Province	Ontario
Postal Code	K2P 1Y7
Telephone Number (include area code)	
Address of Well Location (County/District/Municipality)	Ottawa-Carleton
Township	Osgoode
Lot	12
Concession	3
RR#/Street Number/Name	#1934 Stage Coach
City/Town/Village	Greely
Site/Compartment/Block/Tract etc.	
GPS Reading: NAD	83
Zone	18
Easting	454395
Northing	5007985
Unit Make/Model	Magellan
Mode of Operation	☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From (Metres)	Depth To (Metres)
	Sand Gravel			0	5.79
	Limestone			5.79	15.24
	Sandstone			15.24	22.86
	Limestone			22.86	24.38
	Sandstone			24.38	42.67
	Limestone			42.67	48.77

Hole Diameter

Depth From (Metres)	Depth To (Metres)	Diameter (Centimetres)
0	48.77	14.91

Water Record

Water found at Metres	Kind of Water
41.15	☐ Fresh ☐ Sulphur ☐ Salty ☒ Minerals ☐ Gas ☐ Other
	☐ Fresh ☒ Sulphur ☐ Salty ☐ Minerals ☐ Gas ☐ Other
	☐ Fresh ☐ Sulphur ☐ Salty ☐ Minerals ☐ Gas ☐ Other

After test of well yield, water was: ☐ Clear and sediment free ☐ Other, specify: NOT TESTED

Chlorinated ☒ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From (Metres)	Depth To (Metres)
Casing				
15.88	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.48	0	8.53
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen (Outside diam)	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
No Casing or Screen	☒ Open hole		7.92	48.77

Test of Well Yield

Field	Value
Pumping test method	Submersible
Pump intake set at (metres)	45.72
Pumping rate (litres/min)	22.71
Duration of pumping	1 hrs + 0 min
Final water level end of pumping	[illegible] metres
Recommended pump type	☐ Shallow ☒ Deep
Recommended pump depth	45.72 metres
Recommended pump rate (litres/min)	22.71
If flowing give rate (litres/min)	
If pumping discontinued, give reason	

Draw Down Time min	Water Level Metres	Recovery Time min	Water Level Metres
Static Level	3.99		9.71
1	5.18	1	7.55
2	5.58	2	6.40
3	6.03	3	6.00
4	6.38	4	5.72
5	6.67	5	5.47
10	7.63	10	4.73
15	8.04	15	4.48
20	8.45	20	4.19
25	8.60	25	4.04
30	8.76	30	3.99
40	9.07	40	
50	9.38	50	
60	9.71	60	

Plugging and Sealing Record

☒ Annular space ☐ Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
7.92	4.88	Neat Cement Slurry	.1362
4.88	0	Bentonite Slurry	.613

Method of Construction

☐ Cable Tool ☐ Rotary (conventional) ☐ Rotary (reverse) ☐ Rotary (air) ☒ Air percussion ☐ Boring ☐ Diamond ☐ Jetting ☐ Driving ☐ Digging ☐ Other

Water Use

☒ Domestic ☐ Stock ☐ Irrigation ☐ Industrial ☐ Commercial ☐ Municipal ☐ Public Supply ☐ Not used ☐ Cooling & air conditioning ☐ Other

Final Status of Well

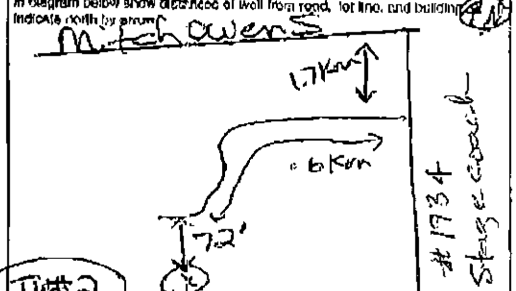
☐ Water Supply ☐ Observation well ☒ Test Hole ☐ Recharge well ☐ Abandoned, insufficient supply ☐ Abandoned, poor quality ☐ Unfinished ☐ Dewatering ☐ Replacement well ☐ Abandoned, (Other)

Well Contractor/Technician Information

Field	Value
Name of Well Contractor	Air Rock Drilling Co Ltd
Well Contractor's Licence No.	1119
Business Address (street name, number, city etc.)	RR #1 Richmond Ont K0A 2Z0
Name of Well Technician (last name, first name)	Desaulniers Ken
Well Technician's Licence No.	T24
Signature of Technician/Contractor	X (signature)
Date Submitted	YYYY MM DD

Location of Well

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.



Field	Value
Audit No.	Z 64742
Date Well Completed	2007 02 09
Was the well owner's information package delivered?	☒ Yes ☐ No
Date Delivered	2007 03 10

Ministry Use Only: Data Source | Contractor | Date Received YYYY MM DD | Date of Inspection YYYY MM DD | Remarks | Well Record Number

0506E (05/2006) **Ministry's Copy** *Cette formule est disponible en français*

Ontario Ministry of the Environment

Well Tag A 052450 (print below)

A052450

TW3

Well Record

Regulation 903 Ontario Water Resources Act

page ___ of ___

Instructions for Completing Form

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- All metre measurements shall be reported to 1/10th of a metre.
- Please print clearly in blue or black ink only.

Ministry Use Only: MUN | CON | LOT

Well Owner's Information and Location of Well Information

First Name: ABS | Last Name: Advanced Building Systems | Mailing Address (Street Number/Name, RR, Lot, Concession): 421 Bank Street

County/District/Municipality: | Township/City/Town/Village: Ottawa | Province: Ontario | Postal Code: K2P 1Y7 | Telephone Number (include area code):

Address of Well Location (County/District/Municipality): Ottawa-Carleton | Township: Osgoode | Lot: 12 | Concession: 3

RR#/Street Number/Name: #1934 Stagecoach | City/Town/Village: Greely | Site/Compartment/Block/Tract etc.:

GPS Reading: NAD 83 | Zone 18 | Easting 453684 | Northing 5007642 | Unit Make/Model: Magellan | Mode of Operation: ☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth (Metres) From	To
	Sandy Clay			0	3.66
	Limestone			3.66	35.10
	Sandstone			35.10	71.65

Hole Diameter

Depth (Metres) From	To	Diameter (Centimetres)
0	71.65	15.23

Construction Record

Inside diam (centimetres)	Material	Wall thickness (centimetres)	Depth (Metres) From	To
Casing				
15.88	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.48	0	7.31
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
No Casing or Screen				
	☒ Open hole		6.71	71.65

Water Record

Water found at Metres	Kind of Water
60 m	☐ Fresh ☒ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other
m	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other
m	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other

After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify: TESTED

Chlorinated ☒ Yes ☐ No

Test of Well Yield

Pumping test method: Sub Pump

Pump intake set at (metres): 48

Pumping rate (litres/min): 91

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping: 6.84 metres

Recommended pump type: ☐ Shallow ☒ Deep

Recommended pump depth: 60.96 metres

Recommended pump rate: (litres/min) 91

If flowing give rate (litres/min):

If pumping discontinued, give reason:

Draw Down Time min	Water Level Metres	Recovery Time min	Water Level Metres
Static Level	6.56		6.84
1	6.83	1	6.60
2	6.84	2	6.60
3	6.84	3	6.58
4	6.84	4	6.56
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
50		50	
60		60	

Plugging and Sealing Record

☒ Annular space ☐ Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
6.71	3.66	Neat Cement Slurry	.1362
3.66	0	Bentonite Slurry	.245

Method of Construction

☐ Cable Tool ☐ Rotary (conventional) ☐ Rotary (reverse) ☐ Rotary (air) ☒ Air percussion ☐ Boring ☐ Diamond ☐ Jetting ☐ Driving ☐ Digging ☐ Other

Water Use

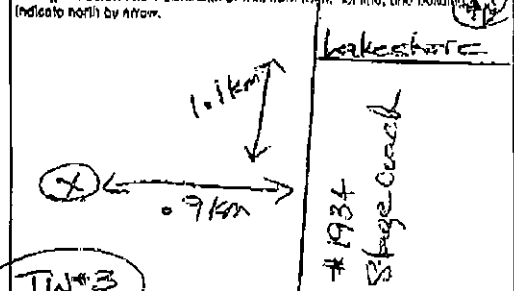
☒ Domestic ☐ Stock ☐ Irrigation ☐ Industrial ☐ Commercial ☐ Municipal ☐ Public Supply ☐ Not used ☐ Cooling & air conditioning ☐ Other

Final Status of Well

☐ Water Supply ☐ Observation well ☒ Test Hole ☐ Recharge well ☐ Abandoned, insufficient supply ☐ Abandoned, poor quality ☐ Unfinished ☐ Dewatering ☐ Replacement well ☐ Abandoned, (Other)

Location of Well

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.



Audit No. Z 64774 | Date Well Completed: 2007 03 23

Was the well owner's information package delivered? ☒ Yes ☐ No | Date Delivered: 2007 03 23

Well Contractor/Technician Information

Name of Well Contractor: A.R. Rook Drilling Co Ltd | Well Contractor's Licence No.: 1119

Business Address (street name, number, city etc.): RR1 Richmond Ont K0A 2Z0

Name of Well Technician (last name, first name): Purcell Shannon | Well Technician's Licence No.: T0122

Signature of Technician/Contractor: [signature] | Date Submitted YYYY MM DD

Ministry Use Only

Data Source | Contractor | Date Received YYYY MM DD | Date of Inspection YYYY MM DD | Remarks | Well Record Number

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TW4

Ontario Ministry of the Environment

Well Tag: A 052467 (A052467)

Well Record

Regulation 903 Ontario Water Resources Act

page ___ of ___

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- All metre measurements shall be reported to 1/10th of a metre.
- Please print clearly in blue or black ink only.

Ministry Use Only: MUN | CON | LOT

Well Owner's Information and Location of Well Information

Field	Entry
First Name / Last Name	ABS Advanced Building Systems
Mailing Address (Street Number/Name, RR, Lot, Concession)	427 Bank Street
County/District/Municipality	
Township/City/Town/Village	Ottawa
Province	Ontario
Postal Code	K2P 1Y7
Telephone Number (include area code)	
Address of Well Location (County/District/Municipality)	Ottawa-Carleton
Township	Osgoode
Lot	12
Concession	3
RR#/Street Number/Name	1934 Stagecoach
City/Town/Village	Greely
Site/Compartment/Block/Tract etc.	
GPS Reading	NAD 83, Zone 18, Easting 453735, Northing 5007884
Unit Make/Model	Magellan
Mode of Operation	☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth Metres From	To
	Clay			0	3.44
	Sand & boulders			3.44	3.96
	Rock			3.96	6.10
	Limestone			6.10	13.72
	Sandstone			13.72	18.29

Hole Diameter

Depth Metres From	To	Diameter Centimetres
0	18.29	14.71

Water Record

Water found at Metres	Kind of Water
0.0	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other — No
16.76 m	☐ Fresh ☒ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other — No Test
m	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other

After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify: Tested

Chlorinated ☐ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth Metres From	To
Casing				
15.88	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.48	0	6.71
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
No Casing or Screen				
	☒ Open hole		6.10	18.29

Test of Well Yield

Field	Entry
Pumping test method	Sub Pump
Pump intake set at (metres)	3.72
Pumping rate (litres/min)	91
Duration of pumping	1 hrs + 0 min
Final water level end of pumping	5.31 metres
Recommended pump type	☐ Shallow ☒ Deep
Recommended pump depth	3.72 metres
Recommended pump rate (litres/min)	91
If flowing give rate (litres/min)	
If pumping discontinued, give reason	

Draw Down Time min	Water Level Metres	Recovery Time min	Water Level Metres
Static Level	1.65		5.31
1	4.40	1	2.10
2	4.60	2	1.84
3	4.80	3	1.80
4	4.90	4	1.77
5	5.00	5	1.75
10	5.23	10	1.70
15	5.27	15	1.68
20	5.30	20	1.67
25	5.30	25	1.66
30	5.30	30	1.65
40	5.31	40	
50	5.31	50	
60	5.31	60	

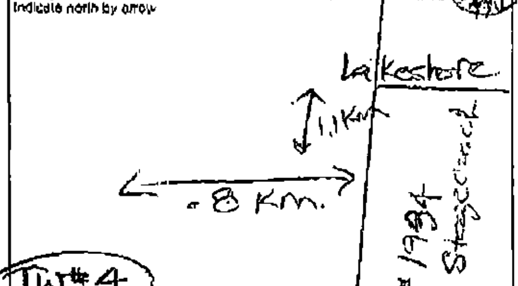
Plugging and Sealing Record

☒ Annular space ☐ Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
6.10	3.05	Neat Cement Slurry	.1316
3.05	0	Bentonite Slurry	.470

Location of Well

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.



Method of Construction

☐ Cable Tool ☐ Rotary (air) ☐ Diamond ☐ Digging ☐ Rotary (conventional) ☒ Air percussion ☐ Jetting ☐ Other ☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

☒ Domestic ☐ Industrial ☐ Public Supply ☐ Other ☐ Stock ☐ Commercial ☐ Not used ☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

☐ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned, (Other) ☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering ☒ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

TW#4

Audit No. Z 64776

Date Well Completed: 2007 03 02

Was the well owner's information package delivered? ☒ Yes ☐ No

Date Delivered: 2007 03 03

Well Contractor/Technician Information

Field	Entry
Name of Well Contractor	Air Rock Drilling Co Ltd
Well Contractor's Licence No.	1119
Business Address (street name, number, city etc.)	RR1 Richmond Ont K0A 2Z0
Name of Well Technician (last name, first name)	Purcell Shannon
Well Technician's Licence No.	T2022
Signature of Technician/Contractor	X [signature]
Date Submitted	

Ministry Use Only

Data Source | Contractor | Date Received | Date of Inspection | Remarks | Well Record Number

0506E (09/2006) **Ministry's Copy** *Cette formule est disponible en français*

Ontario Ministry of the Environment

Measurements recorded in: ☐ Metric ☒ Imperial

Well Tag No. (Place Sticker and/or Print Below) A052467

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

Twp (DEEPENED)

Well Owner's Information

First Name: | Last Name / Organization: VELIKA REALTY | E-mail Address: | ☐ Well Constructed by Well Owner

Mailing Address (Street Number/Name): #900-275 Slater Road | Municipality: Ottawa | Province: Ont | Postal Code: K1P5H9 | Telephone No. (inc. area code):

Well Location

Address of Well Location (Street Number/Name): #1934 Stagecoach Road | Township: Osgoode | Lot: 12 | Concession: 3

County/District/Municipality: Ottawa-Carleton | City/Town/Village: Greely | Province: Ontario | Postal Code:

UTM Coordinates: Zone | Easting | Northing | Municipal Plan and Sublot Number | Other

NAD 8 3: 18 453735 5007884

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
	Deepen Existing Well			[redacted]	60'
Grey	Limestone			60'	75'
Grey	Limestone & Sandstone Mix			75'	135'
Grey	Limestone			135'	160'

TW#4 - Drilled Feb 23 2007 - Audit 264776

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, specify

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, specify
☐ Other, specify: Deepen

Water Details

Water found at Depth (m/ft)	Kind of Water	Fresh	Untested
118	☐ Gas ☐ Other, specify	☐	☒
146	☐ Gas ☐ Other, specify	☐	☒
	☐ Gas ☐ Other, specify	☐	☐

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
60'	160'	5 7/8"

Well Contractor and Well Technician Information

Business Name of Well Contractor: AIR ROCK DRILLING CO LTD | Well Contractor's Licence No.: 1119

Business Address (Street Number/Name): RR#1 | Municipality: RICHMOND

Province: ONT | Postal Code: K0A2Z0 | Business E-mail Address:

Bus. Telephone No. (inc. area code): 6138382170 | Name of Well Technician (Last, First Name): GRAHAM RYAN

Well Technician's Licence No.: T3484 | Signature of Technician and/or Contractor | Date Submitted:

Results of Well Yield Testing

After test of well yield, water was: ☒ Clear and sand free ☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft): 150'

Pumping rate (l/min / GPM): 20

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 135

If flowing give rate (l/min / GPM):

Recommended pump depth (m/ft): 150'

Recommended pump rate (l/min / GPM): 20

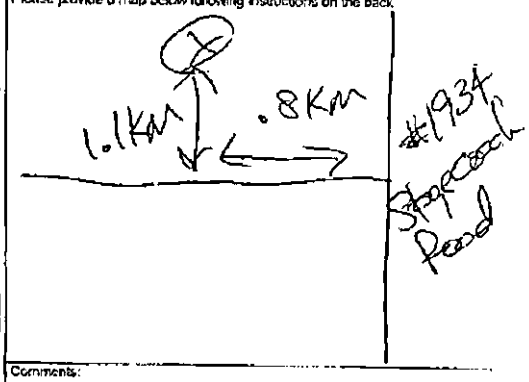
Well production (l/min / GPM): 20+

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level	6.4		8.65
1	8.3	1	6.80
2	8.45	2	6.75
3	8.55	3	6.7
4	8.61	4	6.65
5	8.62	5	6.6
10	8.61	10	6.50
15	8.66	15	
20	8.65	20	
25	8.66	25	
30	8.65	30	
40	8.7	40	
50	8.65	50	
60	8.65	60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well owner's information package delivered: ☐ Yes ☒ No

Date Package Delivered: 2010/08/14

Date Work Completed: 2010/08/31

Ministry Use Only

Audit No.: z110735

Received

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Ministry's Copy

31644

1934 STAGE COACH TW5

The Ontario Water Resources Act

WATER WELL RECORD

Ontario

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

(11) 1516878 MUNICIP. 15009 CON CON 03

COUNTY/DISTRICT: Carleton | TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Osgoode | CON., BLOCK, TRACT, SURVEY, ETC.: Con 3 | LOT: N012

[redacted] ADDRESS: RR#1, Osgoode Ont. | DATE COMPLETED: DAY 19 MO 12 YR 78

(21) ZONE 18 | EASTING 454420 | NORTHING 5007960 | LOC. METHOD 4 | ORIGIN CODE 4 | 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
grey	hardpan	gravel		0	37
grey	limestone			37	80
grey blk	limestone	sandstone mixed		80	169

(31) 0037 2 4 1 1 | 0 0 8 0 2 1 5 | 0 1 6 9 2 1 5 1 8

(32)

(47) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0048	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
0058	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
0169	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

(51) CASING & OPEN HOLE RECORD

INSIDE OPEN INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
5	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	100
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.) | DIAMETER INCHES | LENGTH FEET

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

(61) PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT NEAT CEMENT GROUT SAND PACKER ETC.)
0	100	cement grout

(71) PUMPING TEST

METHOD: 1 ☐ PUMP 2 ☒ BAILER | PUMPING RATE: 005 GPM | DURATION OF PUMPING: HOURS 01 20 MINUTES

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
018 FEET	040 FEET		040 FEET	040 FEET	040 FEET	040 FEET

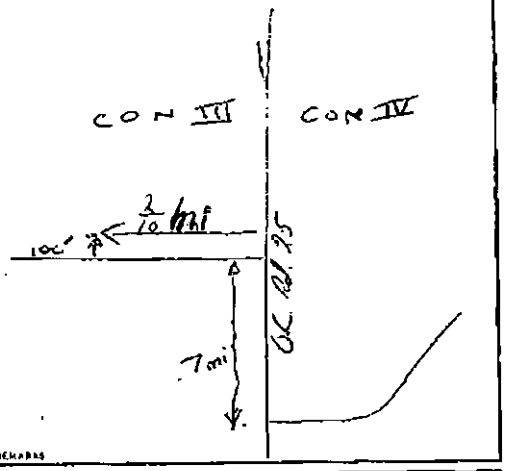
IF FLOWING, GIVE RATE: GPM | PUMP INTAKE SET AT: FEET | WATER AT END OF TEST: 1 ☐ CLEAR 2 ☒ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP | RECOMMENDED PUMP SETTING: 050 FEET | RECOMMENDED PUMPING RATE: 0010 GPM

GPM/FT SPECIFIC CAPACITY

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



FINAL STATUS OF WELL: 1 ☒ WATER SUPPLY; 2 ☐ OBSERVATION WELL; 3 ☐ TEST HOLE; 4 ☐ RECHARGE WELL; 5 ☐ ABANDONED, INSUFFICIENT SUPPLY; 6 ☐ ABANDONED, POOR QUALITY; 7 ☐ UNFINISHED

WATER USE 0: 1 ☒ DOMESTIC; 2 ☐ STOCK; 3 ☐ IRRIGATION; 4 ☐ INDUSTRIAL; 5 ☐ COMMERCIAL; 6 ☐ MUNICIPAL; 7 ☐ PUBLIC SUPPLY; 8 ☐ COOLING OR AIR CONDITIONING; 9 ☐ NOT USED; O ☐ OTHER

METHOD OF DRILLING: 1 ☒ CABLE TOOL; 2 ☐ ROTARY (CONVENTIONAL); 3 ☐ ROTARY (REVERSE); 4 ☐ ROTARY (AIR); 5 ☒ AIR PERCUSSION; 6 ☐ BORING; 7 ☐ DIAMOND; 8 ☐ JETTING; 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Henry Mains Well Drilling | LICENCE NUMBER: 3644

ADDRESS: Box 326, Richmond Ont.

NAME OF DRILLER OR BORER: Henry Mains | LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: H. Mains | SUBMISSION DATE: DAY 21 MO 12 YR 78

OFFICE USE ONLY

DATA SOURCE: 1 | CONTRACTOR: 3644 | DATE RECEIVED: 180179

DATE OF INSPECTION: 28/5/79 | INSPECTOR: M. T. E. P. P.

REMARKS:

P

WI

MINISTRY OF THE ENVIRONMENT COPY

FORM 7 MOE 07-091

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

1897 STAGECOACH TW6

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

1529623

Municipality 15009 Con CON 04

County or District	Township/Borough/City/Town/Village	Con	block	tract	survey, etc.	Lot
Ottawa Carleton	Osgoode		4			12

Owner's surname [redacted] First name

Address: 1897 Stagecoach Rd. Greely, Ontario K4P 1G1

Date completed: day 5 month 9 year 97

Zone | Easting | Northing | RC | Elevation | RC | Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
Brown	Sand			0	8
Gray	Sand		Wet	8	15
Gray	Clay	Stones		15	50
Gray	Sand & Gravel			50	52
Gray	Limestone			52	75

WATER RECORD

Water found at – feet	Kind of water
60	Fresh / Salty / Sulphur / Minerals / Gas
NOT TESTED	Fresh / Salty / Sulphur / Minerals / Gas
	Fresh / Salty / Sulphur / Minerals / Gas
	Fresh / Salty / Sulphur / Minerals / Gas
	Fresh / Salty / Sulphur / Minerals / Gas

CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6 1/4	Steel / Galvanized / Concrete / Open hole / Plastic	.188	0	58'
6	Steel / Galvanized / Concrete / Open hole / Plastic		58	75
	Steel / Galvanized / Concrete / Open hole / Plastic			

SCREEN

Sizes of opening (Slot No.) | Diameter inches | Length feet

Material and type | Depth at top of screen feet

PLUGGING & SEALING RECORD

Annular space / Abandonment

Depth set at – feet From	To	Material and type (Cement grout, bentonite, etc.)
40	0	Cement Grouted (5)

PUMPING TEST

Pumping test method: Pump / Bailer | Pumping rate: 15 GPM | Duration of pumping: Hours Mins

Static level: 5 feet | Water level end of pumping: 40 feet | Water levels during: Pumping / Recovery

15 minutes	30 minutes	45 minutes	60 minutes
7 feet	5 1/2 feet	5 feet	5 feet

If flowing give rate: GPM | Pump intake set at: feet | Water at end of test: Clear / Cloudy

Recommended pump type: Shallow / Deep | Recommended pump setting: 40 feet | Recommended pump rate: 5 GPM

FINAL STATUS OF WELL

Water supply / Observation well / Test hole / Recharge well / Abandoned, insufficient supply / Abandoned, poor quality / Abandoned (Other) / Dewatering / Unfinished / Replacement well

WATER USE

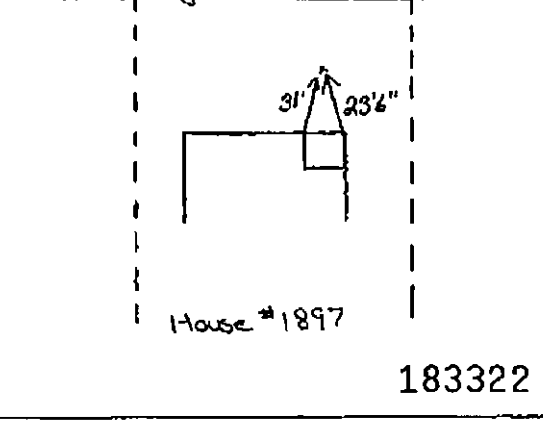
Domestic / Stock / Irrigation / Industrial / Commercial / Municipal / Public supply / Cooling & air conditioning / Not used / Other

METHOD OF CONSTRUCTION

Cable tool / Rotary (conventional) / Rotary (reverse) / Rotary (air) / Air percussion / Boring / Diamond / Jetting / Driving / Digging / Other

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



183322

Name of Well Contractor: ~~Rapital Water Supply Ltd.~~ | Well Contractor's Licence No.: ~~1558~~

Address: ~~P.O. Box 490 Stittsville, Ontario K2S 1A6~~

Name of Well Technician: S. Miller | Well Technician's Licence No.: T0097

Signature of Technician/Contractor | Submission date: day 8 mo 9 yr 97

MINISTRY USE ONLY: Data source | Contractor 1558 | Date received OCT 17 1997 | Date of Inspection | Inspector | Remarks

2 - MINISTER OF ENVIRONMENT & ENERGY COPY

0506 (07/94) Front Form 9

Tw7

Ontario Ministry of the Environment

Well Tag Number: A 072333 (Print Below) A072333

Well Record

Regulation 903 Ontario Water Resources Act

Page ___ of ___

Well Owner's Information

First Name / Last Name: ABS Advanced Building Systems

Mailing Address (Street Number/Name, RR): 427 Bank Street | Municipality: Ottawa | Province: Ont | Postal Code | Telephone No.

☐ Well Constructed by Well Owner

Well Location

Address of Well Location (Street Number/Name, RR): #1934 Stagecoach | Township: Osgoode | Lot: 12 | Concession: 3

County/District/Municipality: Ottawa-Carleton | City/Town/Village: Greely | Province: Ontario | Postal Code

UTM Coordinates Zone, Easting, Northing: NAD 83 18 454496 5008224 | GPS Unit Make / Model: Magellan 280 | Mode of Operation: ☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify

Overburden and Bedrock Materials/Abandonment Sealing Record

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
	Sand & Boulders			0	7
	Grey Limestone			7	38
	Grey Sandstone			38	48

Test Well #5

Annular Space

Depth Set at (Metres) From	To	Type of Sealant Used (Material and Type)	Volume Placed (Cubic Metres)
9.14	6.10	Neat Cement Slurry	.454
6.10	0	Bentonite Slurry	.735

Method of Construction

☐ Cable Tool ☐ Rotary (Conventional) ☐ Rotary (Reverse) ☐ Rotary (Air) ☒ Air percussion ☐ Other, specify ☐ Diamond ☐ Jetting ☐ Driving ☐ Digging ☐ Boring

Well Use

☐ Public ☒ Domestic ☐ Livestock ☐ Irrigation ☐ Industrial ☐ Other, specify ☐ Commercial ☐ Municipal ☐ Test Hole ☐ Cooling & Air Conditioning ☐ Not used ☐ Dewatering ☐ Monitoring

Status of Well

☒ Water Supply ☐ Replacement Well ☒ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☐ Abandoned, other, specify ☐ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Other, specify

Results of Well Yield Testing

Check box if after test of well yield, water was: ☐ Clear and sand free ☐ Other, specify: TESTED

If pumping discontinued, give reason:

Pumping test method: Sub Pump

Pump intake set at (Metres): 42.67

Pumping rate (Litres/min): 56.78

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (Metres): 7.20

Recommended pump type: ☐ Shallow ☒ Deep

Recommended pump depth (Metres): 42

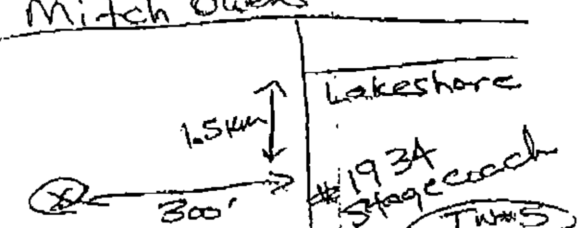
Recommended pump rate (Litres/min): 56.78

Flowing give rate (Litres/min):

Time (Min)	Draw Down Water Level (Metres)	Recovery Time (Min)	Recovery Water Level (Metres)
Static Level	2.69		
1	3.50	1	
2	4	2	
3	4.56	3	4
4	4.96	4	4.
5	5.24	5	
10	5.75	10	
15	6.10	15	
20	6.34	20	
25	6.22	25	
30	6.69	30	
40	6.84	40	
50	7.5	50	
60	7.20	60	

Map of Well Location

Please provide a map below showing:
- all property boundaries, and measurements sufficient to locate the well in relation to fixed points,
- an arrow indicating the North direction
- detailed drawings can be provided as attachments no larger than legal size (8.5" by 14")
- digital pictures of inside of well can also be provided



Water Details

Water found at Depth: 29.56 Metres ☐ Gas | Kind of Water: ☐ Fresh ☐ Salty ☐ Sulphur — Not Tested

Water found at Depth: 43 Metres ☐ Gas | Kind of Water: ☐ Fresh — Not Tested

Water found at Depth: ___ Metres ☐ Gas | Kind of Water: ☐ Fresh ☐ Salty ☐ Sulphur

Casing Details / Hole Diameter

☐ Galvanized ☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete

Diameter of the Hole (Centimetres): 24

Depth of the Hole (Metres): 48

Wall Thickness (Millimetres): .48cm

Inside Diameter of the Casing: 15.83

Depth of the Casing (Metres): 9.15

No Casing and Screen Used

☒ Open Hole 9.14 - 48.77

Disinfected? ☒ Yes ☐ No

Date Well Completed (yyyy/mm/dd): 2007-12-19

Was the well owner's information package delivered? ☒ Yes ☐ No

Date the Well Record and Package Delivered to Well Owner (yyyy/mm/dd): 2007-12-20

Well Contractor and Well Technician Information

Business Name of Well Contractor: Air Rock Drilling Co LTD | Well Contractor's Licence No.: 1119

Business Address (Street No./Name, number, RR): RR#1 | Municipality: Richmond

Province: ONT | Postal Code: K0A2Z0 | Business E-mail Address

Bus. Telephone No. (inc. area code): 6138383770 | Name of Well Technician (Last Name, First Name): Purcell Shannon

Well Technician's Licence No.: T2122 | Signature of Technician | Date Submitted (yyyy/mm/dd)

Ministry Use Only

Audit No.: Z 60124 | Well Contractor No.

Date Received (yyyy/mm/dd) | Date of Inspection (yyyy/mm/dd)

Remarks

0506E (11/2006) Ministry's Copy

Ontario Ministry of the Environment

Well Tag No. A105371

Well Record

Regulation 903 Ontario Water Resources Act

TW8

Measurements recorded in: ☐ Metric ☒ Imperial

Page ___ of ___

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
VELIKA	REALTY		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
#900 - 275 Slater Road	Ottawa	Ont	K1P5H9	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
#1934 Stagecoach Road	Osgoode	12	3

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa - Carleton	Greely	Ontario	

UTM Coordinates Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83 18	454510	5008991		

Overburden and Bedrock Materials/Abandonment Sealing Record

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
	Sand			0'	10'
	Grey Clay			10'	15'
	Sand & Gravel			15'	21'
	Gray Limestone			21'	95'
	Gray Limestone + Sandstone Mix			95'	125'
	Grey Limestone			125'	160'

Test Well #6

Annular Space

Depth Set at From	To	Type of Sealant Used (Material and Type)	Volume Placed
38'	28'	Neat Cement Slurry	7.8
28'	0'	Neat Bentonite Slurry	29.4

Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify: [illegible]

If pumping discontinued, give reason:

Pump intake set at (m/ft): 140'

Pumping rate (l/min / GPM): 20

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 47'

If flowing give rate (l/min / GPM):

Recommended pump depth (m/ft): 140'

Recommended pump rate (l/min / GPM): 20

Well production (l/min / GPM): 20

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Water Level	Recovery Time (min)	Water Level
Static Level	16'5"		47'
1	24'2"	1	28'
2	27'5"	2	25'
3	30'4"	3	22'
4	32'5"	4	20'
5	34'	5	18'
10	38'8"	10	16'5"
15	40'4"	15	
20	42'1"	20	
25	43'8"	25	
30	43'5"	30	
40	44'8"	40	
50	46'2"	50	
60	47'	60	

Method of Construction

☐ Cable Tool ☐ Rotary (Conventional) ☐ Rotary (Reverse) ☐ Boring ☒ Air percussion ☐ Other, specify ☐ Diamond ☐ Jetting ☐ Driving ☐ Digging

Well Use

☐ Public ☒ Domestic ☐ Livestock ☐ Irrigation ☐ Industrial ☐ Other, specify ☐ Commercial ☐ Municipal ☐ Test Hole ☐ Cooling & Air Conditioning ☐ Not used ☐ Dewatering ☐ Monitoring

Construction Record - Casing

Inside Diameter	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness	Depth From	Depth To
6"	Steel	.188"	+2'	38'
5 15/16"	Open Hole		38'	160'

Status of Well

☒ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☐ Abandoned, other, specify ☐ Other, specify

Construction Record - Screen

Outside Diameter	Material (Plastic, Galvanized, Steel)	Slot No.	Depth From	Depth To

Water Details

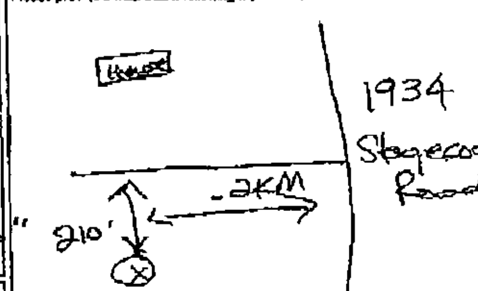
Water found at Depth	Kind of Water
92 (ft)	☐ Fresh ☒ Untested
111 (ft)	☐ Fresh ☒ Untested
146 (ft)	☐ Fresh ☒ Untested

Hole Diameter

Depth From	Depth To	Diameter
0'	38'	6"
38'	160'	5 15/16"

Map of Well Location

Please provide a map below following instructions on the back.



Well Contractor and Well Technician Information

Business Name of Well Contractor: Air Rock Drilling Co LTD — Well Contractor's Licence No. 1119

Business Address (Street Number/Name): RR#1 — Municipality: Richmond

Province: ONT — Postal Code: K0A2Z0 — Business E-mail Address:

Bus. Telephone No. (inc. area code): 613 838 2170 — Name of Well Technician (Last Name, First Name): Graham, Ryan

Well Technician's Licence No.: T3484 — Signature of Technician and/or Contractor — Date Submitted

Comments: TW#6.

Well owner's information package delivered: ☒ Yes ☐ No

Date Package Delivered: 2010 08 25

Date Work Completed: 2010 08 23

Ministry Use Only — Audit No. Z110791 — Received

A105360

Tw9

Ontario Ministry of the Environment

Well Tag No. (Place Sticker and/or Print Below): A105360

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

Measurements recorded in: ☐ Metric ☒ Imperial

Well Owner's Information

First Name / Last Name / Organization: VELIKA REALTY

E-mail Address:

☐ Well Constructed by Well Owner

Mailing Address (Street Number/Name): # 900 - 275 Slater Road

Municipality: Ottawa

Province: Ont

Postal Code: K1P 5H9

Telephone No. (inc. area code):

Well Location

Address of Well Location (Street Number/Name): #1934 Stagecoach Road

Township: Osgoode

Lot: 12

Concession: 3

County/District/Municipality: Ottawa-Carleton

City/Town/Village: Greely

Province: Ontario

Postal Code:

UTM Coordinates Zone: 18 Easting: 454192 Northing: 5008205 NAD 83

Municipal Plan and Sublot Number:

Other:

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth From (ft)	Depth To (ft)
	Sand			0'	12'
	Sandy Grey Clay			12'	20'
	Sand, Gravel + Boulders			20'	28'
	Grey Limestone			28'	92'
	Grey Limestone and Sandstone Mix			92'	234'

Test Well # 7

Annular Space

Depth Set at (ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (ft³)
38'	28'	Neat Cement Slurry	7.8
28'	0'	Neat Bentonite Slurry	21

Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify: Tested

If pumping discontinued, give reason: X

Pump intake set at (ft): 220'

Pumping rate (l/min / GPM): 20

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (ft): 13'6"

If flowing give rate (l/min / GPM): X

Recommended pump depth (ft): 100'

Recommended pump rate (l/min / GPM): 20

Well production (l/min / GPM): 20+

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Water Level (ft)	Recovery Time (min)	Water Level (ft)
Static Level	13'3"		13'6"
1	13'6"	1	13'3"
2	13'6"	2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
50		50	
60		60	

Method of Construction

☐ Cable Tool ☐ Rotary (Conventional) ☐ Rotary (Reverse) ☐ Boring ☒ Air percussion ☐ Other, specify ☐ Diamond ☐ Jetting ☐ Driving ☐ Digging

Well Use

☐ Public ☒ Domestic ☐ Livestock ☐ Irrigation ☐ Industrial ☐ Other, specify ☐ Commercial ☐ Municipal ☐ Test Hole ☐ Cooling & Air Conditioning ☐ Not used ☐ Dewatering ☐ Monitoring

Construction Record - Casing

Inside Diameter (in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (in)	Depth (ft) From	To
6"	Steel	.188"	+2'	38'
6"	Open hole		38'	234'

Status of Well

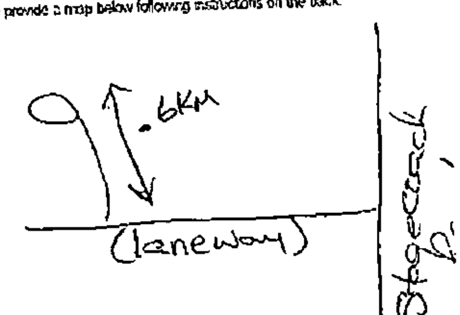
☒ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☐ Abandoned, other, specify ☒ Other, specify: TW #7

Construction Record - Screen

Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (ft) From	To
X				

Map of Well Location

Please provide a map below following instructions on the back.



Water Details

Water found at Depth: 152 (ft) Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify

Water found at Depth: 225 (ft) Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify

Water found at Depth: (ft) Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify

Hole Diameter

Depth (ft) From	To	Diameter (in)
0'	234'	6"

Well Contractor and Well Technician Information

Business Name of Well Contractor: AIR Rock DRILLING Co LTD

Well Contractor's Licence No.: 1119

Business Address (Street Number/Name): RR#1

Municipality: RICHMOND

Province: ONT

Postal Code: K0A 2Z0

Business E-mail Address:

Bus. Telephone No. (inc. area code): 613 838 2170

Name of Well Technician (Last Name, First Name): GRAHAM RYAN

Well Technician's Licence No.: T3484

Signature of Technician and/or Contractor / Date Submitted:

Comments: TW # 7

Well owner's information package delivered: ☒ Yes ☐ No

Date Package Delivered: 20100902

Date Work Completed: 20100831

Ministry Use Only — Audit No. Z110756

Received:

0506E (2007/12) © Queen's Printer for Ontario, 2007

Ministry's Copy

Ontario Ministry of the Environment

Well Tag No. (Place Sticker and/or Print Below) N/A

Well Record

Regulation 903 Ontario Water Resources Act

Page ___ of ___

Measurements recorded in: ☐ Metric ☑ Imperial

Well Owner's Information

First Name: VELIKA | Last Name / Organization: REALTY | E-mail Address: | ☐ Well Constructed by Well Owner

Mailing Address (Street Number/Name): Suite 900 - 275 Slater Road | Municipality: Ottawa | Province: Ont | Postal Code: K1P 5H9 | Telephone No. (inc. area code):

Well Location

Address of Well Location (Street Number/Name): #1934 Stagecoach Road | Township: Osgoode | Lot: 12 | Concession: 3

County/District/Municipality: Ottawa-Carleton | City/Town/Village: Greely | Province: Ontario | Postal Code:

UTM Coordinates Zone: 18 Easting: 454476 Northing: 5008224 NAD 83 | Municipal Plan and Sublot Number: | Other:

Overburden and Bedrock Materials/Abandonment Sealing Record

General Colour	Most Common Material	Other Materials	General Description	Depth (ft) From	To
	6" Drilled Well Abandonment			0'	160'

* Audit Z60124 - Well Tag A 072333 - Drilled Dec 19/07
* Test Well #5 (Under ABS Advanced Bldg)

Annular Space

Depth Set at (ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (ft³)
160'	4'	Quick Grout	33.6
4'	0'	Backfill	

Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify
If pumping discontinued, give reason:
Pump intake set at (m/ft)
Pumping rate (l/min / GPM)
Duration of pumping ___ hrs + ___ min
Final water level end of pumping (m/ft)
If flowing give rate (l/min / GPM)
Recommended pump depth (m/ft)
Recommended pump rate (l/min / GPM)
Well production (l/min / GPM)
Disinfected? ☐ Yes ☑ No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
50		50	
60		60	

Method of Construction: ☐ Cable Tool ☐ Rotary (Conventional) ☐ Rotary (Reverse) ☐ Boring ☐ Air percussion ☐ Other, specify ☐ Diamond ☐ Jetting ☐ Driving ☐ Digging

Well Use: ☐ Public ☐ Domestic ☐ Livestock ☐ Irrigation ☐ Industrial ☐ Other, specify ☐ Commercial ☐ Municipal ☐ Test Hole ☐ Cooling & Air Conditioning ☐ Not used ☐ Dewatering ☐ Monitoring

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To

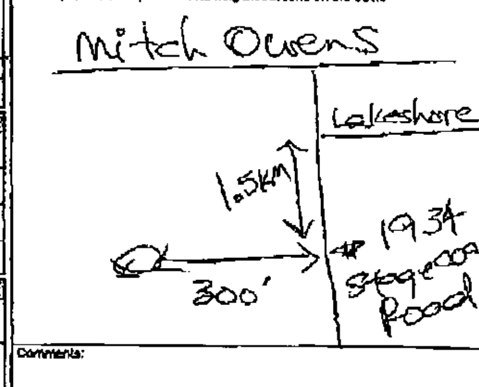
Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To

Status of Well: ☐ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☒ Abandoned, other, specify: NOT USEABLE

Map of Well Location

Please provide a map below following instructions on the back.



Water Details

Water found at Depth ___ (m/ft) Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify
Water found at Depth ___ (m/ft) Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify
Water found at Depth ___ (m/ft) Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify

Hole Diameter: Depth (m/ft) From | To | Diameter (cm/in)

Well Contractor and Well Technician Information

Business Name of Well Contractor: AIR ROCK DRILLING Co LTD | Well Contractor's Licence No.: 1119
Business Address (Street Number/Name): RR#1 | Municipality: RICHMOND
Province: ONT | Postal Code: K0A 2Z0 | Business E-mail Address:
Bus. Telephone No. (inc. area code): 613 838 2170 | Name of Well Technician (Last Name, First Name): Desaulniers Ken
Well Technician's Licence No.: T141 | Signature of Technician and/or Contractor: [signature] | Date Submitted: YYYY MM DD

Comments:

Well owner's information package delivered: ☐ Yes ☑ No | Date Package Delivered: YYYY MM DD | Date Work Completed: 2010 10 22

Ministry Use Only — Audit No.: Z110795 | Received:

The Ontario Water Resources Act

WATER WELL RECORD

31G/4

Ontario

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 | 1515767 | MUNICIP. 15009 | CON. CON. | 04

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Carleton	Osgoode	4	013

[redacted]

ADDRESS: RR 1 Osgoode

DATE COMPLETED: DAY 05 MO Oct YR 76

21 | 18 | EASTING 455100 | NORTHING 5007150 | RC 5 | ELEVATION 0310 | RC 5 | BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
Blue	Clay			0	30
	Sand fine			30	36
	Limestone			36	70

31 | 0030 14 | 0036 08 | 0070 15

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0050	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
05	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188		0036
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE		36	0070
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.) | DIAMETER INCHES | LENGTH FEET

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER | PUMPING RATE 0003 GPM | DURATION OF PUMPING 02 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
020 FEET	055 FEET	055 FEET	055 FEET	055 FEET	055 FEET

WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY

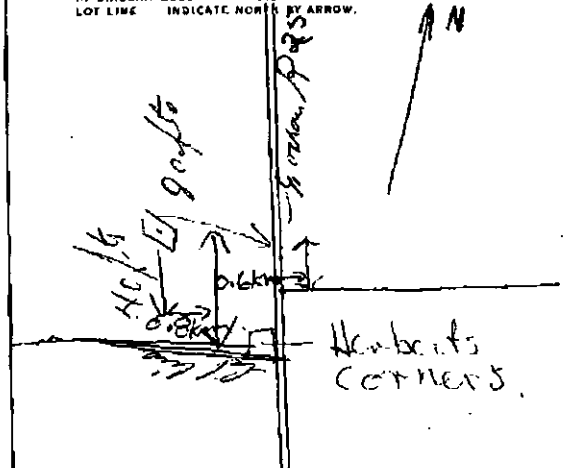
IF FLOWING, GIVE RATE ___ GPM | PUMP INTAKE SET AT 5 FEET | WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP | RECOMMENDED PUMP SETTING 068 FEET | RECOMMENDED PUMPING RATE 0003 GPM

GPM / FT. SPECIFIC CAPACITY

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS

FINAL STATUS OF WELL 1	1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL	5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED
WATER USE 01	1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER	5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED
METHOD OF DRILLING 1	1 ☒ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION	6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Armand Gauthier | LICENCE NUMBER: 2308

ADDRESS: Russell ont

NAME OF DRILLER OR BORER | LICENCE NUMBER

SIGNATURE OF CONTRACTOR: Armand Gauthier | SUBMISSION DATE: DAY 5 MO Oct YR 76

OFFICE USE ONLY

DATA SOURCE 1 | CONTRACTOR 2308 | DATE RECEIVED 101276

DATE OF INSPECTION 6/7/77 | INSPECTOR

REMARKS

P V

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FORM 7 MOE 07-091

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The Ontario Water Resources Act

WATER WELL RECORD

316/42

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 | 1514483 | RUN 1500 9 | CON. CON | LOT 04

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Carleton	Osgoode	4	04

OWNER (SURNAME FIRST) [redacted]

ADDRESS: 2438 Dwight Place Ottawa, Ontario

DATE COMPLETED: DAY 18 MO 12 YR 74

21 | ZONE 18 | EASTING 454080 | NORTHING 5008855 | ACC. [4] | ELEVATION 0315 | ACC. [4] | DATUM CODE [2] [6]

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
brown	sand			0	8
	gravel	stones	fine	8	20
	gravel	stones	loose	20	31

31 | 0008 | 0020 | 0031

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0031	1 ■ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
06	1 ■ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	0031
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT NEAT PACKER ETC.)

PUMPING TEST

71 | PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER | PUMPING RATE: 0025 GPM | DURATION OF PUMPING: 01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
007 FEET	020 FEET		020 FEET	020 FEET	020 FEET	020 FEET

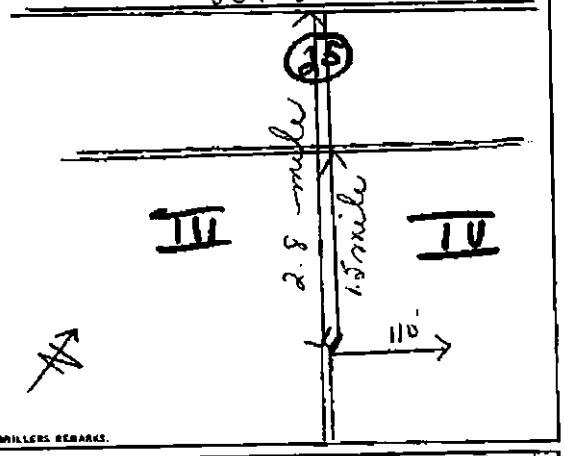
IF FLOWING GIVE RATE: GPM | PUMP INTAKE SET AT: FEET | WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☒ SHALLOW ☐ DEEP | RECOMMENDED PUMP SETTING: 020 FEET | RECOMMENDED PUMPING RATE: 0005 GPM

0017.9 GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL 5408

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



MILLERS REMARKS:

FINAL STATUS OF WELL 1 — 1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE 01 — 1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED ☐ OTHER

METHOD OF DRILLING 5 — 1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☒ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Capital Water Supply Ltd. | LICENCE NUMBER: 1558

ADDRESS: Box 490 Stittsville, Ontario

NAME OF DRILLER OR BORER: D. McDougall | LICENCE NUMBER

SIGNATURE OF CONTRACTOR: Walter Kavanagh | SUBMISSION DATE: DAY 23 MO 12 YR 74

OFFICE USE ONLY

DATA SOURCE 1 | CONTRACTOR 1538 | DATE RECEIVED 100175

DATE OF INSPECTION | INSPECTOR

REMARKS: P ✓ WI

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Ontario

The Ontario Water Resources Act

WATER WELL RECORD

31C44

1. PRINT ONLY IN SPACES PROVIDED
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(11) 1516813 MUNICIP 15009 CON. CON 03

COUNTY OR DISTRICT: Carleton
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Osgoode
CON. BLOCK, TRACT, SURVEY, ETC.: Con 3
LOT: 012
ADDRESS: [redacted] RR#1 Osgoode Ont
DATE COMPLETED: DAY 16 MO 11 YR 78

(21) ZONE 18 EASTING 454440 NORTHING 5008000 FC 4 ELEVATION 0315 SC 4 MAIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
grey	hardpan	gravel		0	37
grey	limestone			37	64

(31) 0037 1611 0064 215

(32)

(41) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
048	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
058	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

(51) CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH FEET FROM	DEPTH FEET TO
6	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	041
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.) | DIAMETER INCHES | LENGTH FEET
MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

(61) PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

(71) PUMPING TEST

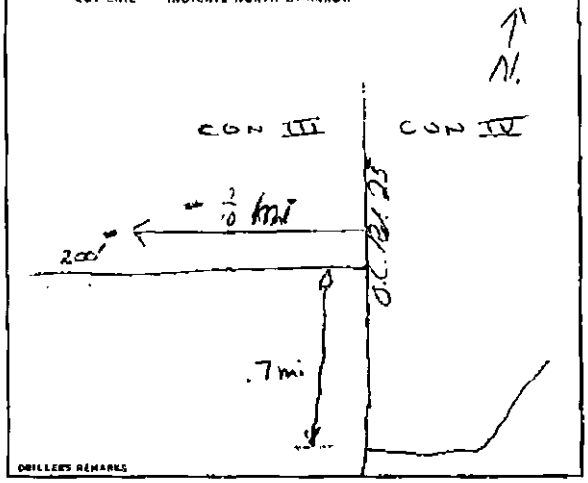
PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER
PUMPING RATE: 0008 GPM
DURATION OF PUMPING: 01 HOURS 00 MINUTES
FINAL WATER LEVEL END OF PUMPING: 050 FEET
IF PUMPING ☐ RECOVERY

STATIC LEVEL	WATER LEVELS DURING: 15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
015 FEET	050 FEET	050 FEET	050 FEET	050 FEET

IF FLOWING GIVE RATE: GPM
PUMP INTAKE SET AT: FEET
WATER AT END OF TEST: 1 ☐ CLEAR 2 ☒ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING: 050 FEET
RECOMMENDED PUMPING RATE: 0008 GPM
GPM / FT. SPECIFIC CAPACITY

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW



DRILLER'S REMARKS:

FINAL STATUS OF WELL (1): 1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE (01): 1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED ☐ OTHER

METHOD OF DRILLING (5): 1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☒ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Henry Mann Well Drilling
LICENCE NUMBER: 3644
ADDRESS: Box 326 Richmond Ont.
NAME OF DRILLER OR BORER: Henry Mann
LICENCE NUMBER:
SIGNATURE OF CONTRACTOR: Henry Mann
SUBMISSION DATE: DAY 16 MO 11 YR 78

OFFICE USE ONLY

DATA SOURCE: 1
CONTRACTOR: 3644
DATE RECEIVED: 2 71178
DATE OF INSPECTION: 28/5/79
INSPECTOR: km J.P.P.
REMARKS:
P
WI

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FORM 7 MOE 07-091

The Ontario Water Resources Act

WATER WELL RECORD

Ontario

319/4R

1. PRINT ONLY IN SPACES PROVIDED
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11 | 1513546 | 15009 | CON | 031

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Carleton	Osgoode	3	011

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
[redacted]	R.R.# 1 Osgoode, Ont.	DAY 06 MO 09 YR 73

21 1513546 18 454466 5008430 4 313 4 26 MAR 17, 1975 247

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
brown	gravel	stones	loose	0	5
grey	sand	stones	packed	5	35
grey	gravel	sand & boulders	packed	35	58
grey	limestone		medium	58	102

31 0005 6 1 1 12 | 0035 28 12 | 0058 11 2813 | 0102 15

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0102	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
~~6¼~~ 06	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE ~~4 ☐ OPEN HOLE~~	188	0	0058
~~5⅞~~			~~58~~	~~102~~
05	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE		58	0102
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ PUMP 2 ☐ BAILER	0030 GPM	01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
001 FEET	030 FEET	030 FEET	030 FEET	030 FEET	030 FEET

WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY

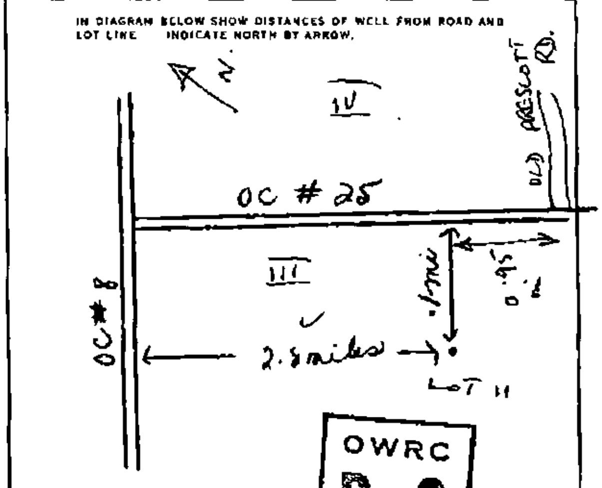
IF FLOWING GIVE RATE: GPM | PUMP INTAKE SET AT: FEET | WATER AT END OF TEST: 1 ☐ CLEAR 2 ☒ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP | RECOMMENDED PUMP SETTING 050 FEET | RECOMMENDED PUMPING RATE 0015 GPM

001.0

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY
2 ☐ OBSERVATION WELL
3 ☐ TEST HOLE
4 ☐ RECHARGE WELL
5 ☐ ABANDONED, INSUFFICIENT SUPPLY
6 ☐ ABANDONED, POOR QUALITY
7 ☐ UNFINISHED

WATER USE 01

1 ☒ DOMESTIC
2 ☐ STOCK
3 ☐ IRRIGATION
4 ☐ INDUSTRIAL
☐ OTHER
5 ☐ COMMERCIAL
6 ☐ MUNICIPAL
7 ☐ PUBLIC SUPPLY
8 ☐ COOLING OR AIR CONDITIONING
9 ☐ NOT USED

METHOD OF DRILLING

1 ☐ CABLE TOOL
2 ☐ ROTARY (CONVENTIONAL)
3 ☐ ROTARY (REVERSE)
4 ☐ ROTARY (AIR)
5 ☒ AIR PERCUSSION
6 ☐ BORING
7 ☐ DIAMOND
8 ☐ JETTING
9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Capital Water Supply Ltd. | LICENCE NUMBER: 1558

ADDRESS: Box 490 Stittsville

NAME OF DRILLER OR BORER: Lenny Dryman | LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: Wallace Kavanagh | SUBMISSION DATE: DAY 7 MO. 9 YR 73

OFFICE USE ONLY

DATA SOURCE: 1 | CONTRACTOR: 1558 | DATE RECEIVED: 20 ... 73

OWRC P 8

DATE OF INSPECTION | INSPECTOR

REMARKS: P-R

MINISTRY OF THE ENVIRONMENT COPY

FORM 7 07-091

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1 PRINT ONLY IN SPACES PROVIDED
2 CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 1526782 MUNICIPALITY 15009 CON. CON 03

COUNTY OR DISTRICT: Ottawa Carleton
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Osgood
CON. BLOCK, TRACT, SURVEY, ETC.: part Lot 4 Con 3
LOT: 13
ADDRESS OF WELL LOCATION: [redacted] Corn Field
DATE COMPLETED: DAY 10 MO 10 YR 92
21 ZONE | EASTING | NORTHING | ELEVATION | BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Sand	Rock	Loose	0	4
Grey	Limestone	Sand Stone Layers	Hard	4	186

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
178	1 ☑ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☒ MINERALS 5 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
64	1 ☑ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	188	0	42
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SLOT NO. | DIAMETER (INCHES) | LENGTH (FEET)
MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN (FEET)

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD, PACKER, ETC.)
6	42	Cement Grout

71 PUMPING TEST

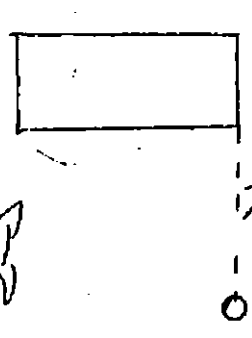
METHOD: 1 ☑ PUMP 2 ☐ BAILER — Air
PUMPING RATE: 25 GPM
DURATION OF PUMPING: 1 HOURS
1 ☐ PUMPING 2 ☑ RECOVERY

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 10 MINUTES	20 MINUTES	45 MINUTES	60 MINUTES
31 FEET	63 FEET	37 FEET	34 FEET	31 FEET	FEET

IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: FEET
WATER AT END OF TEST: 1 ☑ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☑ DEEP
RECOMMENDED PUMP SETTING: 180 FEET
RECOMMENDED PUMPING RATE: 20 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



Corn Field

DRILLERS REMARKS: 128348

FINAL STATUS OF WELL

1 ☑ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNCOMPLETED ☐ DEWATERING

WATER USE

1 ☑ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☑ COOLING OR AIR CONDITIONING ☐ OTHER Discharge 9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☑ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Bill Molloy Jnr
WELL CONTRACTOR'S LICENCE NUMBER: 3749
ADDRESS: 2344 Mitchell Ont
NAME OF WELL TECHNICIAN:
WELL TECHNICIAN'S LICENCE NUMBER: 40505
SIGNATURE OF TECHNICIAN/CONTRACTOR:
SUBMISSION DATE: DAY 10 MO. 10 YR. 92

OFFICE USE ONLY

DATA ENTRY: CONTRACTOR 3749 DATE RECEIVED: DEC 03 1992
DATE OF INSPECTION: INSPECTOR
REMARKS: CCCES

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Ministry of the Environment
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 1526783 15099 CON 03

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Ottawa Carleton	Osgood	Part Lot 4 con 3	13 4

[redacted] ADDRESS Corn Field — DATE COMPLETED DAY 8 MO 10 YR 92

21 ZONE / EASTING / NORTHING / RC / ELEVATION / RC / BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
Brown	Sand	Rocks	Loose	0	7
Grey	Limestone	Sandstone Layers	Hard	7	190

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
180	1 ☑ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
6¼	1 ☑ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	42
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN: SIZES OF OPENING (SLOT NO.) / DIAMETER INCHES / LENGTH FEET / MATERIAL AND TYPE / DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
7	42	Cement Grout

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☑ PUMP 2 ☐ BAILER — PUMPING RATE 28 GPM — DURATION OF PUMPING 1 HOURS MINS

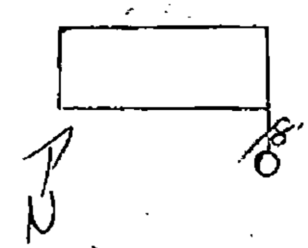
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING (☐ PUMPING ☑ RECOVERY) 15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
31 FEET	61 FEET	38 FEET	33 FEET	32 FEET	— FEET

IF FLOWING GIVE RATE GPM — PUMP INTAKE SET AT FEET — WATER AT END OF TEST 1 ☑ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE ☐ SHALLOW ☑ DEEP — RECOMMENDED PUMP SETTING 180 FEET — RECOMMENDED PUMPING RATE 20 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



Corn Field

DRILLERS REMARKS Pitless 123380

FINAL STATUS OF WELL: 1 ☑ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED ☐ DEWATERING

WATER USE: 1 ☑ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF CONSTRUCTION: 1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☑ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR
NAME OF WELL CONTRACTOR: Bill Molouglney JR — WELL CONTRACTOR'S LICENCE NUMBER 3749
ADDRESS: 2344 Midway Ott
NAME OF WELL TECHNICIAN — WELL TECHNICIAN'S LICENCE NUMBER T0505
SIGNATURE OF TECHNICIAN/CONTRACTOR — SUBMISSION DATE DAY 8 MO 10 YR 92

OFFICE USE ONLY
DATA SOURCE — CONTRACTOR 3749 — DATE RECEIVED DEC 03 1992
DATE OF INSPECTION — INSPECTOR
REMARKS

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 | 1527996 | MUNICIP 15009 | CON. CON | 03

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Ottawa Carleton	Osgoode	3	13

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
[redacted]	18 Queen Ann St.,R.R. #2 Ottawa,Ontario K2C 3H1	DAY 16 MO 6 YR 94

21 ZONE / EASTING / NORTHING / RC / ELEVATION / RC / BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
Black	Loam			0	2
Brown	Clay			2	6
Gray	Clay			6	29
Gray	Gravel	Boulders	Wet	29	40
Gray	Limestone			40	98

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
50	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
90	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	NOT TESTED
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
6 17/4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	48
5 13/16	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		48	98
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.) | DIAMETER INCHES | LENGTH FEET
MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
42	0	Grouted Cement (5)

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ PUMP 2 ☐ BAILER	10 GPM	1 HOURS MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
11 6" FEET	25 FEET	3 FEET	2 FEET	11 6" FEET	11 6" FEET

WATER LEVELS DURING: 1 ☐ PUMPING 2 ☒ RECOVERY

IF FLOWING GIVE RATE: GPM | PUMP INTAKE SET AT: FEET | WATER AT END OF TEST: 1 ☐ CLEAR 2 ☒ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP | RECOMMENDED PUMP SETTING: 60 FEET | RECOMMENDED PUMPING RATE: 5 GPM

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY
2 ☐ OBSERVATION WELL
3 ☐ TEST HOLE
4 ☐ RECHARGE WELL
5 ☐ ABANDONED, INSUFFICIENT SUPPLY
6 ☐ ABANDONED, POOR QUALITY
7 ☐ UNFINISHED
☐ DEWATERING

WATER USE

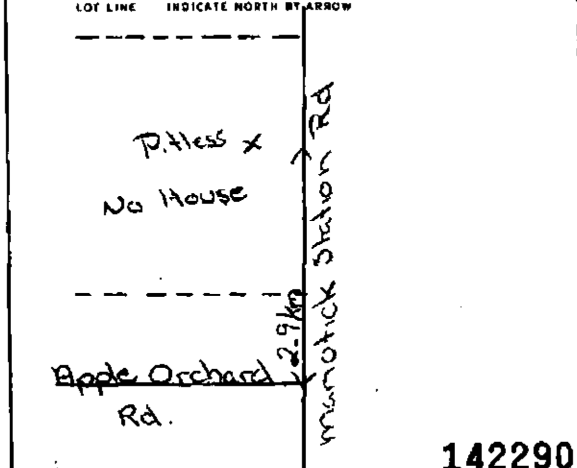
1 ☒ DOMESTIC
2 ☐ STOCK
3 ☐ IRRIGATION
4 ☐ INDUSTRIAL
☐ OTHER
5 ☐ COMMERCIAL
6 ☐ MUNICIPAL
7 ☐ PUBLIC SUPPLY
8 ☐ COOLING OR AIR CONDITIONING
9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☐ CABLE TOOL
2 ☐ ROTARY (CONVENTIONAL)
3 ☐ ROTARY (REVERSE)
4 ☐ ROTARY (AIR)
5 ☒ AIR PERCUSSION
6 ☐ BORING
7 ☐ DIAMOND
8 ☐ JETTING
9 ☐ DRIVING
☐ DIGGING ☐ OTHER

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW



142290

DRILLERS REMARKS

CONTRACTOR

NAME OF WELL CONTRACTOR	WELL CONTRACTOR'S LICENCE NUMBER
Capital Water Supply Ltd.	1558

ADDRESS: Box 490 Stittsville, Ontario K2S 1A6

NAME OF WELL TECHNICIAN	WELL TECHNICIAN'S LICENCE NUMBER
S. Miller	T0097

SIGNATURE OF TECHNICIAN/CONTRACTOR: [signature] | SUBMISSION DATE: DAY 16 MO 6 YR 94

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR 1558 | DATE RECEIVED JUL 19 1994
DATE OF INSPECTION | INSPECTOR
REMARKS

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ontario 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.

11 **1531551** Municipality 15002 Con CON 04

County or District: Ottawa Carleton
Township/Borough/City/Town/Village: Osgoode
Address: Greely Ont
Con block tract survey, etc.: 4
Lot: 11
Date completed: 29 day 9 month 00 year

21 Zone Easting Northing Elevation Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
grey	Sand Boulders			0	32
"	Limestone			32	108
"	Sandstone			108	180

31
32

41 WATER RECORD

Water found at - feet	Kind of water
125	1 Fresh ☐ 2 Salty ☐ 3 Sulphur ☐ 4 Minerals ☐ 5 Gas ☐ 6
	1 Fresh ☐ 2 Salty ☐ 3 Sulphur ☐ 4 Minerals ☐ 5 Gas ☐ 6
	1 Fresh ☐ 2 Salty ☐ 3 Sulphur ☐ 4 Minerals ☐ 5 Gas ☐ 6
	1 Fresh ☐ 2 Salty ☐ 3 Sulphur ☐ 4 Minerals ☐ 5 Gas ☐ 6
	1 Fresh ☐ 2 Salty ☐ 3 Sulphur ☐ 4 Minerals ☐ 5 Gas ☐ 6

51 CASING & OPEN HOLE RECORD

Inside diam Inches	Material	Wall thickness Inches	Depth - feet From	Depth - feet To
6 1/4	1 Steel ☒ 2 Galvanized ☐ 3 Concrete ☐ 4 Open hole ☐ 5 Plastic ☐	188	0	40
8 3/4	1 Steel ☐ 2 Galvanized ☐ 3 Concrete ☐ 4 Open hole ☒ 5 Plastic ☐		0	38
6	1 Steel ☐ 2 Galvanized ☐ 3 Concrete ☐ 4 Open hole ☒ 5 Plastic ☐		38	180

SCREEN

Slot No.	Diameter Inches	Length feet

Material and type: | Depth at top of screen feet:

61 PLUGGING & SEALING RECORD

☒ Annular space ☐ Abandonment

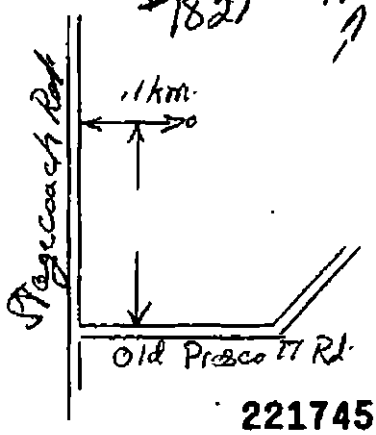
Depth set at - feet From	To	Material and type (Cement grout, bentonite, etc.)
0	38	clay grout

71 PUMPING TEST

Pumping test method: 1 ☒ Pump 2 ☐ Bailer
Pumping rate: 21 GPM
Duration of pumping: 7 Hours Mins
Static level: 18 feet
Water level end of pumping: 90 feet
Water levels during: 1 ☐ Pumping 2 ☒ Recovery
15 minutes: 18 feet
30 minutes: 18 feet
45 minutes: 18 feet
60 minutes: 18 feet
If flowing give rate: GPM
Pump intake set at: feet
Water at end of test: ☒ Clear ☐ Cloudy
Recommended pump type: ☐ Shallow ☒ Deep
Recommended pump setting: 100 feet
Recommended pump rate: 21 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



221745

FINAL STATUS OF WELL

1 ☒ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

1 ☒ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not use 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☒ Rotary (air) 5 ☒ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

Name of Well Contractor: Air Rock Drilling Co. Ltd.
Well Contractor's Licence No.: 1119
Address: RR#2 Jasper Ont K0G 1G0
Name of Well Technician: Shawn Pickell
Well Technician's Licence No.: 72122
Signature of Technician/Contractor:
Submission date: 02 day Oct 18 month 00 year

MINISTRY USE ONLY

Data source
Contractor: 1119
Date received: NOV 24 2000
Date of inspection
Inspector
Remarks: CSS.ES0

0506 (11/96) Front Form 9

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Ontario

The Ontario Water Resources Act

WATER WELL RECORD

31G4h

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 1516761 MUNICIP. 15009 CON. CON 03

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Carleton	Osgoode	Con 3	012

OWNER [redacted] ADDRESS RR#1, Osgoode — DATE COMPLETED DAY 28 MO 07 YR 78

21 ZONE 18 EASTING 452780 NORTHING 5007180 RC 4 ELEVATION 0305 4 BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
grey	sand	stones		0	40
grey	limestone			40	120
white	sandstone	& grey limestone mixed		120	165

31 0040228121 0120215 0165111819

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0120	☒ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
0140	☒ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
0160	☒ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
	☐ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
	☐ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
06 1/4	☒ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE	.188	0	0042
06"	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☒ OPEN HOLE		42	0165
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.) — DIAMETER INCHES — LENGTH FEET
MATERIAL AND TYPE — DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
☒ PUMP ☐ BAILER	0012 GPM	01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
025 FEET	120 FEET	120	120	120	120 FEET

WATER LEVELS DURING ☒ PUMPING ☐ RECOVERY

IF FLOWING GIVE RATE: GPM — PUMP INTAKE SET AT: FEET — WATER AT END OF TEST: ☐ CLEAR ☒ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP — RECOMMENDED PUMP SETTING: 120 FEET — RECOMMENDED PUMPING RATE: 0010 GPM

GPM./FT. SPECIFIC CAPACITY

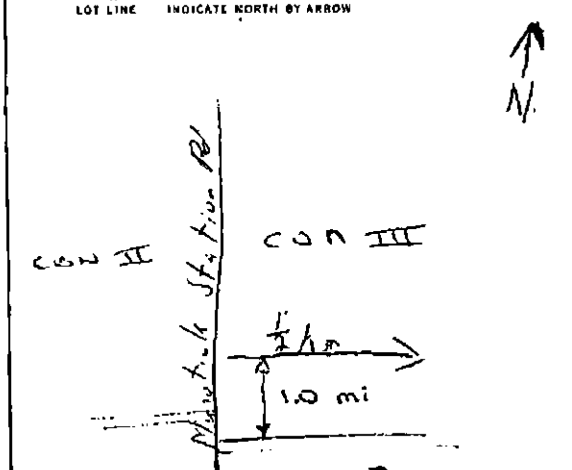
FINAL STATUS OF WELL 1 — ☒ WATER SUPPLY ☐ OBSERVATION WELL ☐ TEST HOLE ☐ RECHARGE WELL ☐ ABANDONED, INSUFFICIENT SUPPLY ☐ ABANDONED, POOR QUALITY ☐ UNFINISHED

WATER USE 07 — ☐ DOMESTIC ☐ STOCK ☐ IRRIGATION ☐ INDUSTRIAL ☐ OTHER ☐ COMMERCIAL ☐ MUNICIPAL ☒ PUBLIC SUPPLY ☐ COOLING OR AIR CONDITIONING ☐ NOT USED

METHOD OF DRILLING 5 — ☐ CABLE TOOL ☐ ROTARY (CONVENTIONAL) ☐ ROTARY (REVERSE) ☐ ROTARY (AIR) ☒ AIR PERCUSSION ☐ BORING ☐ DIAMOND ☐ JETTING ☐ DRIVING

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW



DRILLERS REMARKS

CONTRACTOR

NAME OF WELL CONTRACTOR: Henry Mains Well Drilling — LICENCE NUMBER: 3644

ADDRESS: Box 326, Richmond Ont

NAME OF DRILLER OR BORER — LICENCE NUMBER

SIGNATURE OF CONTRACTOR: Henry Mains — SUBMISSION DATE DAY MO. YR

OFFICE USE ONLY

DATA SOURCE 1 — CONTRACTOR 3644 — DATE RECEIVED 271178

DATE OF INSPECTION 28/5/79 — INSPECTOR Km / J.P.P.

REMARKS — P — WI

MINISTRY OF THE ENVIRONMENT COPY

FORM 7 MOE 07-091

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 — 1522207

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON	BLOCK	TRACT	SURVEY	LOT
Ottawa-Carleton	Osgoode	Conc. 3				12

OWNER: [redacted] ADDRESS: Osgoode, Ontario. K0A 2W0 DATE COMPLETED: DAY 20 MO 11 YR 87

21

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Sand			0	3
Brown	Clay			3	6
Gray	Sandy Clay	Boulders		6	30
Gray	Sand, Gravel and Boulders			30	42
Gray	Limestone			42	55

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
50	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 5 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6¼	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	43
6	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		43	55
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SLOT NO. OF OPENING	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER — PUMPING RATE: 15 GPM — DURATION OF PUMPING: 1 HOURS

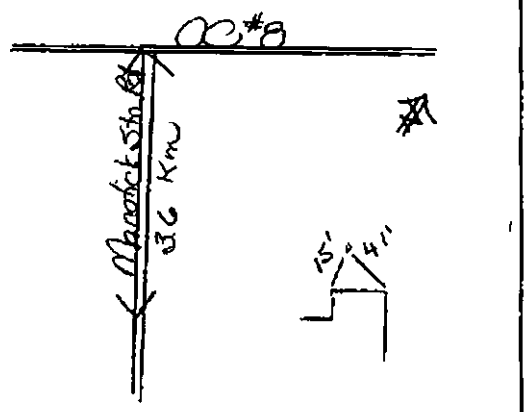
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
3 FEET	20 FEET	20 FEET	20 FEET	20 FEET	20 FEET

IF FLOWING GIVE RATE: GPM — PUMP INTAKE SET AT: 20 FEET — WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP — RECOMMENDED PUMP SETTING: 30 FEET — RECOMMENDED PUMPING RATE: 5 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



25089

DRILLERS REMARKS

FINAL STATUS OF WELL
1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED INSUFFICIENT SUPPLY 6 ☐ ABANDONED POOR QUALITY 7 ☐ UNFINISHED 9 ☐ DEWATERING

WATER USE
1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING ☐ OTHER 9 ☐ NOT USED

METHOD OF CONSTRUCTION
1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☒ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Capital Water Supply Ltd. — WELL CONTRACTOR'S LICENCE NUMBER: 1558

ADDRESS: Box 490; Stittsville, Ontario. K0A 3G0

NAME OF WELL TECHNICIAN: S. Miller — WELL TECHNICIAN'S LICENCE NUMBER:

SIGNATURE OF TECHNICIAN/CONTRACTOR — SUBMISSION DATE: DAY 30 MO. 11 87

OFFICE USE ONLY

DATA SOURCE — CONTRACTOR — DATE RECEIVED: FEB 01 1988

DATE OF INSPECTION — INSPECTION

REMARKS

CSS.EP

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

LOT 12 The Ontario Water Resources Commission Act

WATER WELL RECORD

Water management in Ontario

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 | 1510478 | MUNICIP. 15009 | CON CON 03

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
CARLETON	OSGOODE	3	012

OWNER (SURNAME FIRST): [redacted] ADDRESS: OSGOODE ONT. DATE COMPLETED: DAY 31 MO. 12 YR. 69

21 | ZONE 18 | EASTING 454540 | NORTHING 5008120 | RC 5 | ELEVATION 0311 | RC 4 | BASIN CODE 25

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH – FEET FROM	TO
	CLAY			0	5
	GRAVEL	BOULDERS		5	28
GREY	LIMESTONE		HARD	28	52

31 | 0005 bst | 0028 lmst | 0052 |

32

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
0042	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH – FEET FROM	TO
06 6¼	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	.188	0	0029 ~~29~~
06 6¼	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE		29	0052 ~~52~~
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN: SIZE(S) OF OPENING (SLOT NO.) / DIAMETER INCHES / LENGTH FEET / MATERIAL AND TYPE / DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT – FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
8	10	~~CEMENT GROUT~~

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER | PUMPING RATE 0004 GPM | DURATION OF PUMPING 01 HOURS 30 MINS.

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING (1 ☐ PUMPING 2 ☒ RECOVERY) 15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
012 FEET	017 FEET	013 FEET	012 FEET	012 FEET	012 FEET

IF FLOWING, GIVE RATE ___ GPM. | PUMP INTAKE SET AT 30 FEET | WATER AT END OF TEST: 1 ☐ CLEAR 2 ☒ CLOUDY

RECOMMENDED PUMP TYPE: ☒ SHALLOW ☐ DEEP | RECOMMENDED PUMP SETTING 030 FEET | RECOMMENDED PUMPING RATE 0004 GPM

000.8 GPM./FT. SPECIFIC CAPACITY

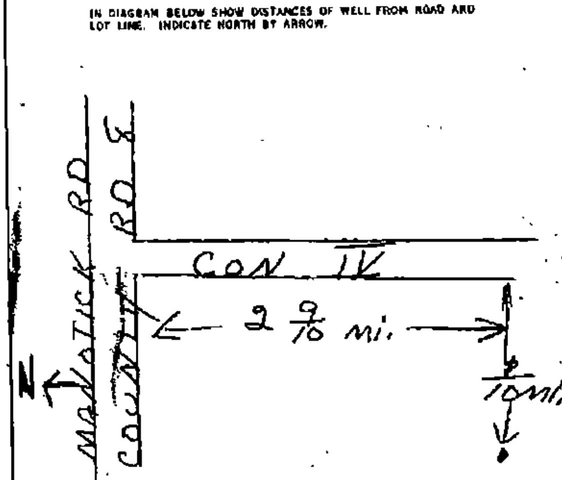
FINAL STATUS OF WELL: 1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE 01: 1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING: 1 ☒ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS:

CONTRACTOR

NAME OF WELL CONTRACTOR: MCLEAN WATER SUPPLY LTD | LICENCE NUMBER 3386
ADDRESS: 1532 RAVEN AVE OTTAWA 3
NAME OF DRILLER OR BORER: H. SALLY | LICENCE NUMBER
SIGNATURE OF CONTRACTOR: [signature] | SUBMISSION DATE DAY 3 MO. 1 YR. 70

OFFICE USE ONLY

DATA SOURCE 1 | CONTRACTOR 3504 | DATE RECEIVED 010270
DATE OF INSPECTION | INSPECTOR
REMARKS:

OWRC COPY

1341 21474

UTM | 1 | 18 | z | 4 | 5 | 5 | 0 | 0 | 0 | E
Cbr R | E | 0 | 0 | 8 | 0 | 2 | 0 | N
Elev | bath R | 0 | 3 | 1 | 5 |
Basin | 2 | 5 |

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District: Carleton — Township, Village, Town or City: Osgoode

Con.: IV — Lot: 13 — Date completed: 4 (day) May (month) 1965 (year)

Owner: [redacted] (print in block letters) — Address: 123 Buell, Ottawa

Casing and Screen Record

Inside diameter of casing	6 1/4"
Total length of casing	52'
Type of screen	none
Length of screen	—
Depth to top of screen	—
Diameter of finished hole	6 1/4"

Pumping Test

Static level	3'
Test-pumping rate	15 G.P.M.
Pumping level	8'
Duration of test pumping	1 hr
Water clear or cloudy at end of test	clear
Recommended pumping rate	15 G.P.M.
with pump setting of	30 feet below ground surface

Well Log / Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
sand	0	48		
gravel	48	52	52	Fresh

For what purpose(s) is the water to be used? household

Is well on upland, in valley, or on hillside? upland

Drilling or Boring Firm: McLean Water Supply LT.

Address: 1532 Raven Ave, Ottawa 3

Licence Number: 1686

Name of Driller or Borer: H. Sally

Address:

Date: May 5, 1965

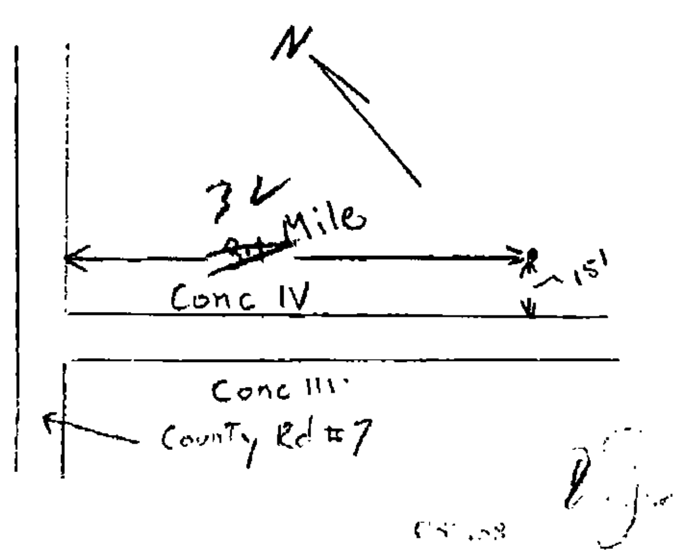
C.D. McLean
(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138

WRC COPY

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



The Ontario Water Resources Commission Act

WATER WELL RECORD

5164h

Water management in Ontario

1 PRINT ONLY IN SPACES PROVIDED
2 CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 | 1510689 | MUNICIP 16009 | CON. EON | 04

COUNTY OR DISTRICT: Carleton | TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Osgoode | CON., BLOCK, TRACT, SURVEY, ETC.: 4 | LOT 12 013

OWNER: [redacted] | ADDRESS | DATE COMPLETED: DAY 22 MO 07 YR 90

21 | UTM ZONE 18 | EASTING 451000 | NORTHING 5010820 | RC | ELEVATION 0311 | RC | DATUM CODE ES

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Gray			Hard Pan	1	35
Black			Gravel	35	40

31 | 0935214 | 0045081

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0038	1 ☒ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
05	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	1/4	0	0940 46
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

GAUGE(S) OF OPENING (SLOT NO.): 1 | DIAMETER: 5 INCHES | LENGTH: 4 FEET
MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN: FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER | PUMPING RATE: 0010 GPM | DURATION OF PUMPING: 01 HRS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
015 FEET	025 FEET	020 FEET	030 FEET	030 FEET	030 FEET

1 ☒ PUMPING 2 ☐ RECOVERY

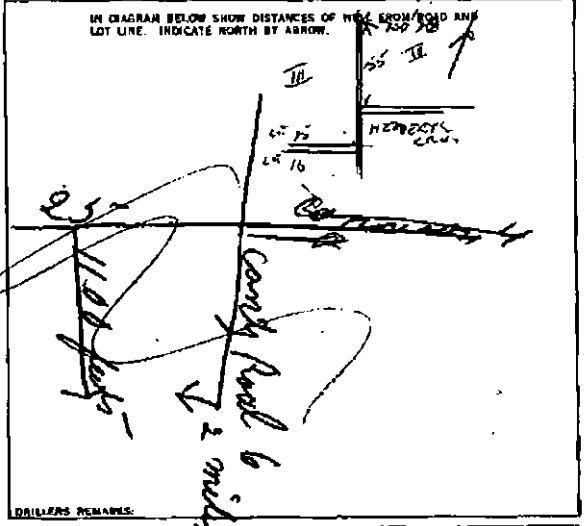
IF FLOWING, GIVE RATE: GPM | PUMP INTAKE SET AT: FEET | WATER AT END OF TEST: 1 ☐ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP | RECOMMENDED PUMP SETTING: 30 FEET | RECOMMENDED PUMPING RATE: 0006 GPM

001.0 GPM/FT. SPECIFIC CAPACITY

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS:

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE 01

1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED ☐ OTHER

METHOD OF DRILLING

1 ☒ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Maurice Cayen | LICENCE NUMBER: 1517
ADDRESS: Casselman
NAME OF DRILLER OR BORER: Maurice Cayen | LICENCE NUMBER: 1517
SIGNATURE OF CONTRACTOR | SUBMISSION DATE: DAY MO YR

OFFICE USE ONLY

DATA SOURCE: 1 | CONTRACTOR: 1517 | DATE RECEIVED: 230770
DATE OF INSPECTION | INSPECTOR
REMARKS:

OWRC COPY

Ontario Ministry of the Environment

Measurements recorded in: Metric X Imperial

Well Tag No. A 079500 A079366

Well Record

Regulation 903 Ontario Water Resources Act

Page ___ of ___

Well Owner's Information

[redacted]

Well Location

Address of Well Location (Street Number/Name): 101 Reindeer Way

Township: Osgoode

Lot: PTL 9

Concession: 3

County/District/Municipality: Ottawa Carleton

City/Town/Village: Greely

Province: Ontario

Postal Code:

UTM Coordinates Zone: NAD 8 3 Easting: 18453212 Northing: 5009081

Municipal Plan and Sublot Number: Plan 4M-1285

Other: S/L 9

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
	Clay			0	15'
	Sand			15	25'
	Gravel			25	35'
	Grey Limestone			35	208'
	Mix Grey Limestone & White Sandstone			208	260'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Neat cement grout, Bentonite slurry)	Volume Placed (m³)
4	335	335 Neat Cement Slurry	6.24
335	0	Bentonite Slurry	29.4

Method of Construction

Cable Tool, Diamond, Rotary (Conventional), Rotary (Reverse), Boring, Air Percussion, Other (specify), Driving, Digging

Well Use

Domestic, Commercial, Municipal, Test Hole, Cooling & Air Conditioning, Industrial, Other (specify), Not used, Dewatering, Monitoring

Construction Record - Casing

Inside Diameter	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (inches)	Depth (m/ft) From	To
6"	Steel	.188	12	435
6 1/8	Open hole		435	80
5 1/4/140	Open hole		80	260

Status of Well

Water Supply, Replacement Well, Test Hole, Recharge Well, Dewatering Well, Observation and/or Monitoring Hole, Alteration (Construction), Abandoned, Insufficient Supply, Abandoned, Poor Water Quality, Abandoned, other specify, Other, specify

Construction Record - Screen

Outside Diameter | Material (Plastic, Galvanized, Steel) | Slot No. | Depth From | To

Water Details

Water found at Depth	Kind of Water		Hole Diameter Depth From	To	Diameter (inches)
246'	Fresh X	Untested	0	80'	6 1/8
	Fresh	Untested	80'	260'	5 1/4/16
	Fresh	Untested			

Gas: ___ Other, specify: ___

Results of Well Yield Testing

After test of well yield, water was: Clear and sediment free; Other, specify: CLEARED

If pumping discontinued, give reason:

Pump intake set at (m/ft): 200

Pumping rate (l/m / GPM): 20

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 28.7

If flowing give rate (l/m / GPM):

Recommended pump depth (m/ft): 140

Recommended pump rate: 20

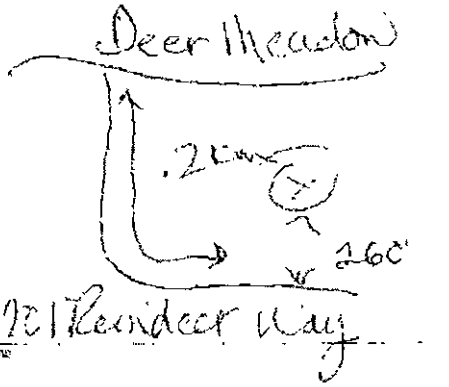
Well production (l/m / GPM): 25

Disinfected? Yes / No

Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	11.9		28.7
1	14.3	1	16.9
2	17	2	12.3
3	18.8	3	11.1
4	20.1	4	10.7
5	21.1	5	10.3
10	24	10	9.7
15	25.5	15	9.3
20	26.3	20	8.7
25	26.8	25	8.2
30	29.4	30	7.10
40	28	40	
50	28.5	50	
60	28.7	60	

Map of Well Location

Please provide a map below following instructions on the back



101 Reindeer Way

City/Town

Well Contractor and Well Technician Information

Business Name of Well Contractor: AIR ROCK DRILLING CO LTD.

Well Contractor's Licence No: 1119

Business Address (Street Number/Name): RR 1

Municipality: Richmond

Province: Ont

Postal Code: K0A2Z0

Business E-mail Address:

Business Telephone No. (inc. area code): 613 838 2170

Name of Well Technician (Last Name, First Name): Hogan, Dan

Well Technician's Licence No: 13058

Signature of Technician and/or Contractor: [signature]

Date Submitted: 2009/01/16

Well owner's information package delivered: Yes X / No

Date Package Delivered: 2008/12/11

Date Work Completed: 2008/12/04

Ministry Use Only

Audit No. Z 94761

JAN 23 2009

Ministry's Copy

Ontario 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.

11 **1531424** Municipality 15009 Con CON 03

County or District	Township/Borough/City/Town/Village	Con	block	tract	survey, etc.	Lot
Ottawa Carleton	Osgoode		3			9

Owner's surname [redacted] First Name [redacted]

Address: 6346 Deermeadows Dr., Greely, Ontario

Date completed: 13 day 9 month 00 year

21 Zone Easting Northing RC K4P 1M9 Elevation RC Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Brown	Sand			0	12
Gray	Sand			12	20
Gray	Sand Gravel	Boulders	Packed	20	30
Gray	Limestone		Hard	30	140
Gray & White	Sandstone		Very Hard	140	175

31

32

41 WATER RECORD

Water found at - feet	Kind of water
171	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
NOT TESTED	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6 1/4	1 ☑ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	0	34
5	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☒ Open hole 5 ☐ Plastic		34	175
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter inches	Length feet

Material and type | Depth at top of screen feet

61 PLUGGING & SEALING RECORD

☑ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
33	0	Grouted – Bentonite (6) Cement (1)

71 PUMPING TEST

Pumping test method: 1 ☑ Pump 2 ☐ Bailer

Pumping rate: 50 GPM

Duration of pumping: 1 Hours ... Mins

Static level: 21'2" feet

Water level end of pumping: 75 feet

Water levels during: 1 ☑ Pumping 2 ☐ Recovery

15 minutes	30 minutes	45 minutes	60 minutes
170 feet	125 feet	100 feet	75 feet

If flowing give rate: ... GPM

Pump intake set at: ... feet

Water at end of test: ☐ Clear ☑ Cloudy

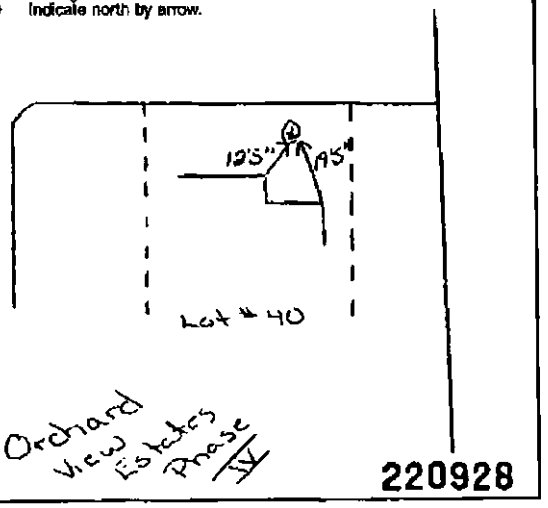
Recommended pump type: ☐ Shallow ☑ Deep

Recommended pump setting: 100 feet

Recommended pump rate: 5 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



220928

FINAL STATUS OF WELL

1 ☑ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

1 ☑ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not use 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☑ Rotary (air) & mud 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

Name of Well Contractor	Well Contractor's Licence No.
Capital Water Supply Ltd.	1558

Address: P.O. Box 490 Stittsville, Ontario K2S 1A6

Name of Well Technician	Well Technician's Licence No.
S. Miller	20097

Signature of Well Contractor: [signature]

Submission date: day 14 mo 9 yr 00

MINISTRY USE ONLY

Data source | Contractor 1558 | Date received OCT 18 2000

Date of inspection | Inspector

Remarks: CSS.ES0

0506 (11/98) Front Form 9

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Ontario Ministry of the Environment

Measurements recorded in: ☒ Metric ☐ Imperial

Well Tag No. (Place Sticker and/or Print Below) A076884 **A076884**

Well Record

under 903 Ontario Water Resources Act

Page ____ of ____

Well Owner's Information

[redacted]

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
1700 Reindeer Way	Osgoode	9	3

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Greely	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	458271	5008985		

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Sandy Soil	Stones		0	3.65
Gray	Clay	Stones		3.65	10.05
Gray	Limestone			10.05	22.24

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
13.10	0	Grouted Bentonite Slurry	.734m³

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☒ Rotary (Reverse) Mud ☐ Driving
☐ Boring ☐ Digging
☒ Air percussion
☐ Other, specify

Well Use

☐ Public ☐ Commercial ☐ Not used
☒ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
15.86	Steel	.48	+.45	13.10

Status of Well

☒ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, specify
☐ Other, specify

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To

Water Details

Water found at Depth	Kind of Water	Hole Diameter Depth From	Depth To	Diameter (cm/in)
19.81 (m/ft) ☐ Gas	☐ Fresh ☒ Untested ☐ Other, specify	0	13.10	15.86
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify	13.10	22.24	15.25
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify			

Results of Well Yield Testing

After test of well yield, water was:
☒ Clear and sand free
☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft): 15.23

Pumping rate (l/min / GPM): 54.6

Duration of pumping: 1 hrs + ____ min

Final water level end of pumping (m/ft): 4.18

If flowing give rate (l/min / GPM):

Recommended pump depth (m/ft): 15.23

Recommended pump rate (l/min / GPM): 45.5

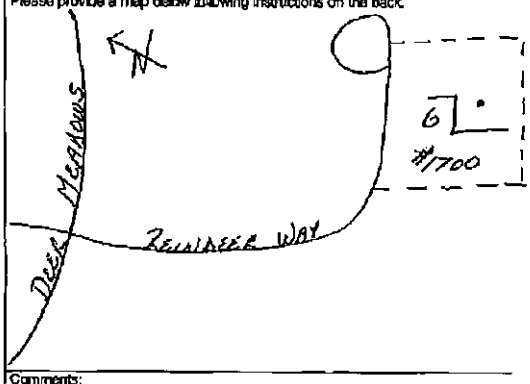
Well production (l/min / GPM):

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	2.22		
1	3.26	1	3.55
2	3.40	2	3.46
3	3.48	3	3.40
4	3.55	4	3.36
5	3.62	5	3.33
10	3.78	10	3.23
15	3.86	15	3.17
20	3.93	20	3.11
25	3.99	25	3.07
30	4.04	30	3.04
40	4.11	40	2.99
50	4.14	50	
60	4.18	60	2.92

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Capital Water Supply Ltd.	1558

Business Address (Street Number/Name)	Municipality
Box 490	Stittsville

Province	Postal Code	Business E-mail Address
Ontario	K2S 1A6	office@capitalwater.ca

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
613 836 1766	Miller, Stephen

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
10097		2009 10 06

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☒ Yes ☐ No	2009 10 16	2009 10 16

Ministry Use Only

Audit No. Z101740

Received FEB 16 2010

Ontario 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.

11 **1532052** Municipality 15009 Con. CON 03

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
Ottawa Carleton	Osgoode	3	7/8

Owner's surname [redacted] First Name [redacted] Address 6346 Deermeadows Dr., Greely ON. K4P 1M9 Date completed 19 day 06 month 01 year

21 Zone Easting Northing RC Elevation RC Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Brown	sand		dry	0	6
Grey	sand		wet	6	12
Grey	clay	stones	stickey	12	20
Grey	limestone		med hard	20	125
		NOTE: Casing was left 1 ft. above ground level at time of drilling.			

31

32

41 WATER RECORD

Water found at - feet	Kind of water
55	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas 6 Not Tested
110	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas 6 Not Tested
	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas 6 Not Tested
	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas 6 Not Tested
	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas 6 Not Tested

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6 1/4	1 Steel 2 Galvanized 3 Concrete 4 Open hole 5 Plastic	.188	0	25
6 1/8	1 Steel 2 Galvanized 3 Concrete 4 Open hole 5 Plastic		25	125
	1 Steel 2 Galvanized 3 Concrete 4 Open hole 5 Plastic			

SCREEN

Slot No.	Diameter inches	Length feet
Material and type	Depth at top of screen feet	

61 PLUGGING & SEALING RECORD

Annular space ☐ Abandonment

Depth set at - feet From	To	Material and type (Cement grout, bentonite, etc.)
25	0	Grouted-cement(3)

71 PUMPING TEST

Pumping test method 1 ☒ Pump 2 ☐ Bailer | Pumping rate 10-12 GPM | Duration of pumping ___ Hours ___ Mins

Static level	Water level end of pumping	Water levels during 1 ☒ Pumping 2 ☐ Recovery			
7'8" feet	75 feet	15 minutes 120 feet	30 minutes 100 feet	45 minutes 100 feet	60 minutes 75 feet

If flowing give rate ___ GPM | Pump intake set at ___ feet | Water at end of test ☐ Clear ☒ Cloudy

Recommended pump type ☐ Shallow ☒ Deep | Recommended pump setting 110 feet | Recommended pump rate 5 GPM

FINAL STATUS OF WELL

1 ☒ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

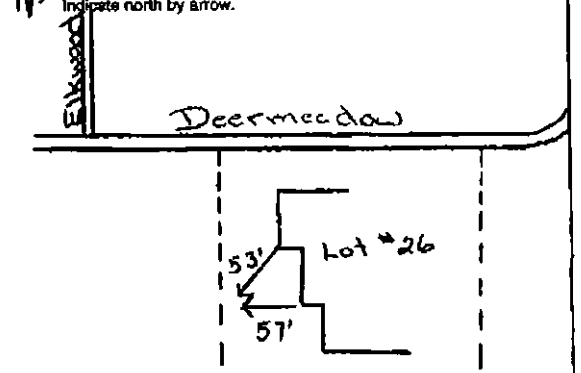
1 ☒ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not use 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☐ Rotary (air) 5 ☒ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



230133

Name of Well Contractor	Well Contractor's Licence No.
Capital Water Supply Ltd.	1558
Address: Box 490, Stittsville, ON. K2S 1A6	
Name of Well Technician: S. Miller	Well Technician's Licence No.: T0097
Signature of Technician/Contractor	Submission date: day 20 mo 06 yr 01

MINISTRY USE ONLY: Data source 58 | Contractor 1558 | Date received JUL 18 2001 | Date of inspection | Inspector | Remarks: OSS.ES1

0505 (07/00) Front Form 9

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Ontario 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.

11 **1532053** Municipality 15009 Con. CON 03

County or District	Township/Borough/City/Town/Village	Con	block	tract	survey, etc.	Lot
Ottawa Carleton	Osgoode	3				7/8

Owner's surname [redacted] First Name

Address: 6346 Deermeadows Dr. Greely ON. K4P 1M9

Date completed: 19 day 06 01 month year

21 Zone Easting Northing RC Elevation RC Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Brown	sand			0	8
Grey	clay	stones		8	22
Grey	limestone			22	60
	NOTE: Casing was left 1 1/2 ft. above ground level at time of drilling.				

31

32

41 WATER RECORD

Water found at - feet	Kind of water
44	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6 1/4	1 ☒ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	0	26
6 1/8	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☒ Open hole 5 ☐ Plastic		26	60
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Size of opening (Slot No.)	Diameter inches	Length feet

Material and type: | Depth at top of screen feet:

61 PLUGGING & SEALING RECORD

☒ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
26	0	Grounted-cement(3)

71 PUMPING TEST

Pumping test method: 1 ☒ Pump 2 ☐ Bailer

Pumping rate: 25 GPM

Duration of pumping: 1 Hours Mins

Static level	Water level end of pumping	Water levels during: 1 ☒ Pumping 2 ☐ Recovery			
7'1" feet	30 feet	15 minutes: 58 feet	30 minutes: 50 feet	45 minutes: 30 feet	60 minutes: 30 feet

If flowing give rate: GPM

Pump intake set at: feet

Water at end of test: ☐ Clear ☒ Cloudy

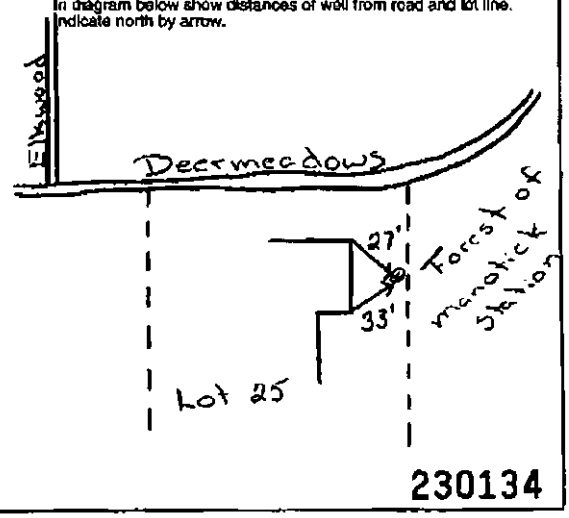
Recommended pump type: ☐ Shallow ☒ Deep

Recommended pump setting: 40 feet

Recommended pump rate: 5 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



230134

FINAL STATUS OF WELL

1 ☒ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

1 ☒ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not used 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☒ Rotary (air) 5 ☒ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

Name of Well Contractor	Well Contractor's Licence No.
Capital Water Supply Ltd.	1558

Address: Box 490, Stittsville, ON.K2S 1A6

Name of Well Technician	Well Technician's Licence No.
S. Miller	T0097

Signature of Technician/Contractor: [signature] Submission date: day 20 mo 06 yr 01

MINISTRY USE ONLY

Data source | Contractor 1558 | Date received JUL 18 2001

Date of Inspection | Inspector

Remarks: 338.ES1

0506 (07/00) Front Form 8

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Ontario 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.

1532293

Municipality 15009 Con. CON 03

County or District	Township/Borough/City/Town/Village	Con	block	tract	survey, etc.	Lot
Ottawa Carleton	Osgoode	3				8

Address: 6346 Deermeadows Dr., Greely, ON. K4P 1M9

Date completed: 29 day 08 month 01 year

Zone | Easting | Northing | RC | Elevation | RC | Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Brown	sand			0	4
Grey	sand			4	12
Grey	sand & gravel	boulders		12	17
Grey	limestone			17	60
	NOTE: casing was left 12" above ground level at time of drilling.				

41 WATER RECORD

Water found at - feet	Kind of water
47	NOT TESTED; 2 Salty; 3 Sulphur; 4 Minerals; 5 Gas
	1 Fresh; 2 Salty; 3 Sulphur; 4 Minerals; 5 Gas
	1 Fresh; 2 Salty; 3 Sulphur; 4 Minerals; 5 Gas
	1 Fresh; 2 Salty; 3 Sulphur; 4 Minerals; 5 Gas
	1 Fresh; 2 Salty; 3 Sulphur; 4 Minerals; 5 Gas

51 CASING & OPEN HOLE RECORD

Inside diam Inches	Material	Wall thickness Inches	Depth - feet From	Depth - feet To
6 1/4	1 Steel; 2 Galvanized; 3 Concrete; 4 Open hole; 5 Plastic	.188	0	27
6 1/8	1 Steel; 2 Galvanized; 3 Concrete; 4 Open hole; 5 Plastic		27	60
	1 Steel; 2 Galvanized; 3 Concrete; 4 Open hole; 5 Plastic			

SCREEN

Sizes of opening (Slot No.) | Diameter inches | Length feet

Material and type | Depth at top of screen feet

61 PLUGGING & SEALING RECORD

Annular space ☐ Abandonment

Depth set at - feet From	To	Material and type (Cement grout, bentonite, etc.)
27	0	Grouted-Bentonite(5)

71 PUMPING TEST

Pumping test method: 1 Pump 2 Bailer

Pumping rate: 12 GPM

Duration of pumping: 1 Hours Mins

Static level	Water level end of pumping	Water levels during: 1 Pumping 2 Recovery			
		15 minutes	30 minutes	45 minutes	60 minutes
6 feet	25 feet	58 feet	50 feet	50 feet	25 feet

If flowing give rate: GPM

Pump intake set at: feet

Water at end of test: ☐ Clear ☒ Cloudy

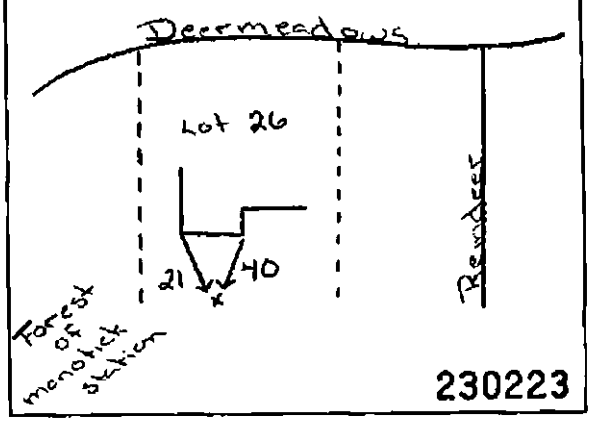
Recommended pump type: ☐ Shallow ☒ Deep

Recommended pump setting: 50 feet

Recommended pump rate: 5 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



230223

FINAL STATUS OF WELL

1 ☒ Water supply; 2 ☐ Observation well; 3 ☐ Test hole; 4 ☐ Recharge well; 5 ☐ Abandoned, insufficient supply; 6 ☐ Abandoned, poor quality; 7 ☐ Abandoned (Other); 8 ☐ Dewatering; 9 ☐ Unfinished; 10 ☐ Replacement well

WATER USE

1 ☒ Domestic; 2 ☐ Stock; 3 ☐ Irrigation; 4 ☐ Industrial; 5 ☐ Commercial; 6 ☐ Municipal; 7 ☐ Public supply; 8 ☐ Cooling & air conditioning; 9 ☐ Not used; 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool; 2 ☐ Rotary (conventional); 3 ☐ Rotary (reverse); 4 ☒ Rotary (air) Mud; 5 ☒ Air percussion; 6 ☐ Boring; 7 ☐ Diamond; 8 ☐ Jetting; 9 ☐ Driving; 10 ☐ Digging; 11 ☐ Other

Name of Well Contractor	Well Contractor's Licence No.
Capital Water Supply Ltd.	1558
Address: Box 490, Stittsville, ON. K2S 1A6	
Name of Well Technician: S. Miller	Well Technician's Licence No.: T0097
Signature of Technician/Contractor	Submission date: day 29 mo 8 yr 01

MINISTRY USE ONLY

Data source | Contractor 1558 | Date received SEP 17 2001

Date of inspection | Inspector

Remarks: OSS.ES1

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Ontario 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.

11 1532535 Municipality 15009 Con. CON 03

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
Ottawa Carleton	Osgoode	3	8

Address: [redacted] 6346 Deermeadow Greely ON. K4P 1M9

Date completed: 20 day 11 month 01 year

21 Zone Easting Northing RC Elevation RC Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Brown	sand			0	5
Grey	sand		wet	5	12
Grey	clay	stones		12	16
Grey	limestone			16	48

Note casing was left 12" above ground level at time of drilling.

31

32

41 WATER RECORD

Water found at - feet	Kind of water
37	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas
	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas
	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas
	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas
	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6 1/4	1 Steel 2 Galvanized 3 Concrete 4 Open hole 5 Plastic	.188	0	26
6	1 Steel 2 Galvanized 3 Concrete 4 Open hole 5 Plastic		26	48
	1 Steel 2 Galvanized 3 Concrete 4 Open hole 5 Plastic			

SCREEN

Sizes of opening (Slot No.) | Diameter inches | Length feet

Material and type | Depth at top of screen feet

61 PLUGGING & SEALING RECORD

Annular space ☐ Abandonment

Depth set at - feet From	To	Material and type (Cement, grout, bentonite, etc.)
26	0	Grouted-cement (3)

71 PUMPING TEST

Pumping test method: 1 Pump 2 Bailer

Pumping rate: 25 GPM

Duration of pumping: 1 Hours Mins

Water levels during: 1 Pumping 2 Recovery

Static level	Water level end of pumping	15 minutes	30 minutes	45 minutes	60 minutes
7'2" feet	15 feet	45 feet	30 feet	30 feet	15 feet

If flowing give rate: GPM

Pump intake set at: feet

Water at end of test: ☐ Clear ☐ Cloudy

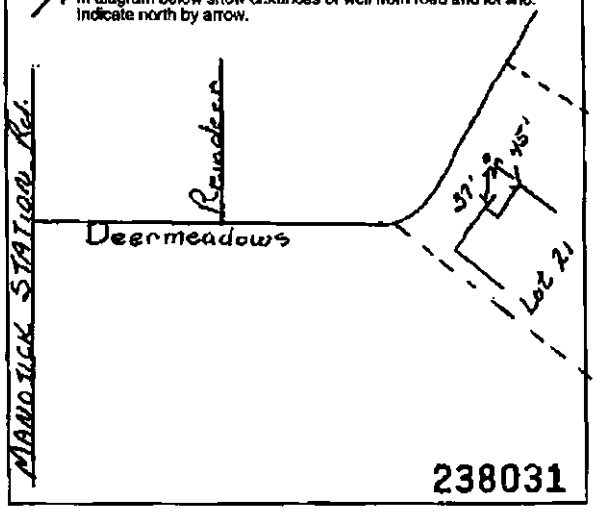
Recommended pump type: ☐ Shallow ☐ Deep

Recommended pump setting: 25 feet

Recommended pump rate: 5 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



238031

FINAL STATUS OF WELL

1 ☒ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

1 ☒ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not used 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☒ Rotary (air) 5 ☒ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

Name of Well Contractor	Well Contractor's Licence No.
Capital Water Supply Ltd.	1558
Address: Box 490, Stittsville, ON. K2S 1A6	
Name of Well Technician: S. Miller	Well Technician's Licence No.: T0097
Signature of Technician/Contractor	Submission date: day mo yr

MINISTRY USE ONLY

Data source | Contractor 1558 | Date received JAN 17 2002

Date of inspection | Inspector

Remarks: CSS.ES2

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Ontario 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.

11 — 1532536 — Municipality 15009 — Con. CON — 03

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
Ottawa Carleton	Osgoode	3	8

Last Name [redacted] — First Name — Address: 6346 Deermeadows Dr. Greely ON. K4P 1M9 — Date completed: 20 11 01 (year month day)

21 — Zone — Easting — Northing — RC — Elevation — RC — Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Brown	sand	stones		0	5
Grey	sand			5	9
Grey	sand & gravel	boulders		9	24
Grey	limestone			24	73

Note casing was left 12" above ground level at time of drilling.

31

32

41 WATER RECORD

Water found at - feet	Kind of water
66	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas — NOT TESTED
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6 1/4	1 ☑ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	0	33
6	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☑ Open hole 5 ☐ Plastic		33	73
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Size of opening (Slot No.)	Diameter inches	Length feet

Material and type — Depth at top of screen feet

61 PLUGGING & SEALING RECORD

☐ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
33	0	Grouted-cement (a)

71 PUMPING TEST

Pumping test method: 1 ☑ Pump 2 ☐ Bailer — Pumping rate: 20 GPM — Duration of pumping: 1 hours ___ mins

Static level	Water level end of pumping	Water levels during: 1 ☑ Pumping 2 ☐ Recovery			
		15 minutes	30 minutes	45 minutes	60 minutes
8'6"	25 feet	70 feet	70 feet	50 feet	25 feet

If flowing give rate: GPM — Pump intake set at: feet — Water at end of test: ☐ Clear ☐ Cloudy

Recommended pump type: ☐ Shallow ☑ Deep — Recommended pump setting: 50 feet — Recommended pump rate: 5 GPM

FINAL STATUS OF WELL

1 ☑ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

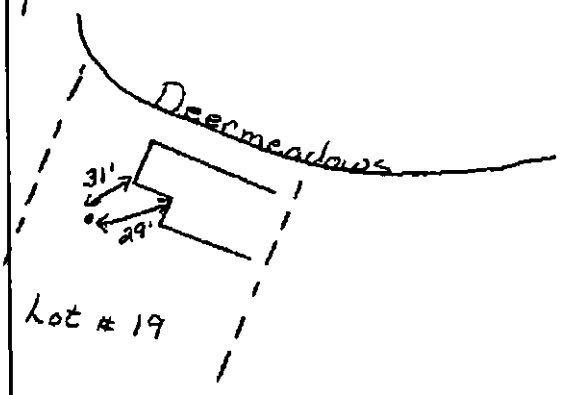
1 ☑ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not use 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☑ Rotary (air) mud 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



238032

Name of Well Contractor	Well Contractor's Licence No.
Capital Water Supply Ltd.	1558
Address: Box 490, Stittsville, ON. K2S 1A6	
Name of Well Technician: S. Miller	Well Technician's Licence No.: T0097
Signature of Technician/Contractor	Submission date: day mo yr

MINISTRY USE ONLY — Data source — Contractor: 1558 — Date received: JAN 17 2002 — Date of inspection — Inspector — Remarks: CSS.ES2

0506 (07/00) Front Form 9

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Ontario 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.

11 1532537 Municipality 15009 Con. CON 09

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
Ottawa Carleton	Osgoode	3	8

[redacted]

Address: 6346 Deermeadows Dr. Greely, Ontario

Date completed: 21 day 11 month 01 year

21 Zone Easting Northing RC Quarter K4P 1W9 RC Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Brown	Sand			0	5
Gray	Sand			5	11
Gray	Clay			11	20
Gray	Sand, Gravel	Boulders		20	24
Gray	Limestone			24	110
Gray & White	Sandstone			110	185
		Note: Casing was left 1.5 feet above ground level			
		at time of drilling			

31

32

41 WATER RECORD

Water found at - feet	Kind of water
181	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
NOT TESTED	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas

61 CASING & OPEN HOLE RECORD

Inside diam Inches	Material	Wall thickness Inches	Depth - feet From	Depth - feet To
6 1/4	1 ☑ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	0	26.5
6	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☑ Open hole 5 ☐ Plastic		26.5	185
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Slots of opening (Slot No.)	Diameter Inches	Length feet
Material and type	Depth at top of screen feet	

61 PLUGGING & SEALING RECORD

☑ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
25	0	Grouted - Cement (1)
		Bentonite (2)

71 PUMPING TEST

Pumping test method: 1 ☑ Pump 2 ☐ Bailer

Pumping rate: 20 GPM

Duration of pumping: 1 Hours

Static level: 14'10"

Water level end of pumping: 60 feet

Water levels during: 1 ☒ Pumping 2 ☐ Recovery

15 minutes	30 minutes	45 minutes	60 minutes
180 feet	150 feet	100 feet	60 feet

If flowing give rate: GPM

Pump intake set at: feet

Water at end of test: ☐ Clear ☒ Cloudy

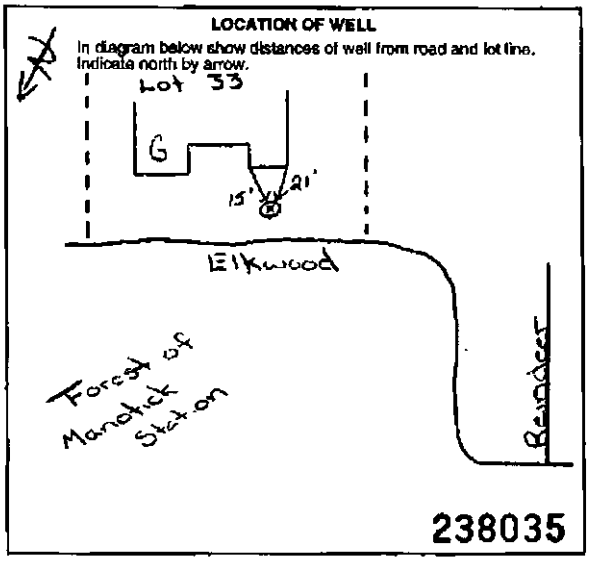
Recommended pump type: ☐ Shallow ☑ Deep

Recommended pump setting: 100 feet

Recommended pump rate: 5 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



238035

FINAL STATUS OF WELL

1 ☒ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

1 ☒ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not use 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☒ Rotary (air) mud 5 ☑ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

Name of Well Contractor	Well Contractor's Licence No.
Capital Water Supply Ltd.	1558
Address: P.O. Box 490 Stittsville, Ontario K2S1A6	
Name of Well Technician: S. Miller	Well Technician's Licence No. 70097
Signature of Technician/Contractor	Submission date: day 22 mo 11 yr 01

MINISTRY USE ONLY

Data source: Contractor 1558 Date received: JAN 17 2002

Date of inspection: Inspection

Remarks: CSS.ES2

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Ontario 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.

11 1532538 Municipality 15009 Con. CON 03

County or District	Township/Borough/City/Town/Village	Con	block	tract	survey, etc.	Lot
Ottawa Carleton	Osgoode	3				8

Address: 6346 Deermeadows Drive Greely,Ontario

Date completed: 22 day 11 month 01 year

21 UTM Zone Easting Northing RC Elevation RC Basin Code: K4P 1M9

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Brown	Hardpan	Boulders		0	12
Gray	Sand	Stones		12	28
Gray	Limestone			28	115
Gray & White	Sandstone			115	255
		Note: Casing was left 1 foot above ground level at time of drilling			

31

32

41 WATER RECORD

Water found at - feet	Kind of water
250	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas 6 NOT TESTED
	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas
	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas
	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas
	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6 1/4	1 Steel 2 Galvanized 3 Concrete 4 Open hole 5 Plastic	.188	0	31
5 15/16	1 Steel 2 Galvanized 3 Concrete 4 Open hole 5 Plastic		31	250
	1 Steel 2 Galvanized 3 Concrete 4 Open hole 5 Plastic			

SCREEN

Slot No.	Diameter inches	Length feet

Material and type: | Depth at top of screen feet:

61 PLUGGING & SEALING RECORD

☒ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
31	0	Grouted - Bentonite (2

71 PUMPING TEST

Pumping test method: 1 ☒ Pump 2 ☐ Bailer

Pumping rate: 12 GPM

Duration of pumping: 1 Hours ___ Minutes

Static level	Water level end of pumping	Water levels during ☒ Pumping ☐ Recovery 15 minutes	30 minutes	45 minutes	60 minutes
27' 2"	125 feet	250 feet	200 feet	150 feet	125 feet

If flowing give rate: GPM

Pump intake set at: feet

Water at end of test: ☐ Clear ☒ Cloudy

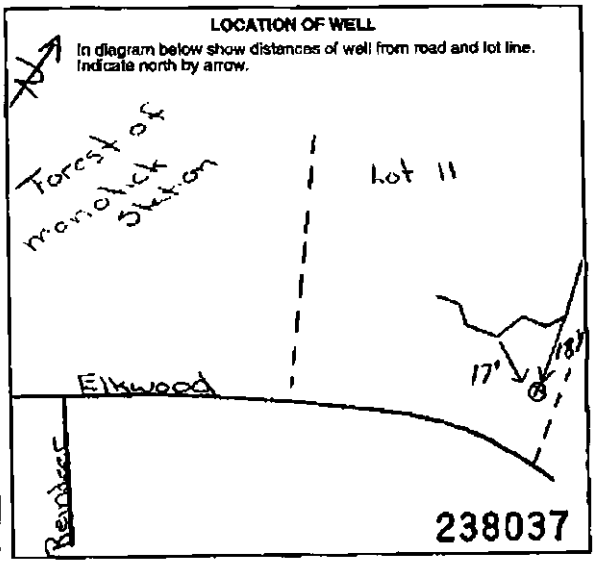
Recommended pump type: ☐ Shallow ☒ Deep

Recommended pump setting: 175 feet

Recommended pump rate: 5 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



FINAL STATUS OF WELL

1 ☒ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

1 ☒ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not use 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☒ Rotary (air) mud 5 ☒ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

Name of Well Contractor	Well Contractor's Licence No.
Capital Water Supply Ltd.	1558
Address: P.O. Box 490 Stittsville,Ontario K2S1A6	
Name of Well Technician	Well Technician's Licence No.
S. Miller	T0097
Signature of Technician/Contractor	Submission date: day 23 mo 11 yr 01

MINISTRY USE ONLY

Data source	Contractor	Date received
	1558	JAN 17 2002
Date of inspection	Inspector	
Remarks		CSS.ES2

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Ontario 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.

11 — 1532703 — Municipality 15009 — Con. CON 03

County or District	Township/Borough/City/Town/Village	Con	block	tract	survey, etc.	Lot
Ottawa Carleton	Osgoode	3				8

Owner's surname [redacted] First Name

Address: 6346 Deermeadows Dr., Greely, Ontario — Date completed: 14 day 3 month 02 year

21 — Zone — Easting — Northing — NC — Elevation: K4P 1P9 — NC — Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Brown	Sand			0	7
Gray	Sand			7	12
Gray	Sand, Gravel	Boulders		12	16
Gray	Limestone		Layered	16	22
Gray	Limestone		Medium Hard	22	47
		Note: Casing was left 1 foot above ground level			
		at time of drilling			

31

32

41 WATER RECORD

Water found at - feet	Kind of water
30-35	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
NOT TESTED	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6 1/4	1 ☑ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	0	27
6	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☑ Open hole 5 ☐ Plastic		27	47
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Size of opening (Slot No.)	Diameter inches	Length feet

Material and type | Depth at top of screen feet

61 PLUGGING & SEALING RECORD

☑ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
26	0	Grouted - Cement (1)
		Bentonite (10)

71 PUMPING TEST

Pumping test method: 1 ☑ Pump 2 ☐ Bailer — Pumping rate: 30 GPM — Duration of pumping: 1 Hours — minutes

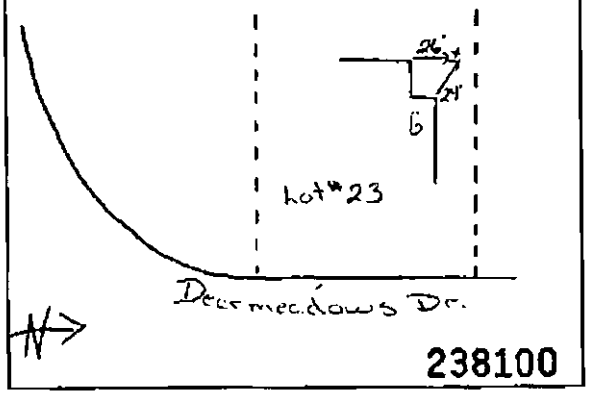
Static level	Water level end of pumping	Water levels during: 1 ☑ Pumping 2 ☐ Recovery			
		15 minutes	30 minutes	45 minutes	60 minutes
5 feet	10 feet	45 feet	25 feet	25 feet	10 feet

If flowing give rate: GPM — Pump intake set at: feet — Water at end of test: ☐ Clear ☐ Cloudy

Recommended pump type: ☐ Shallow ☑ Deep — Recommended pump setting: 15 feet — Recommended pump rate: 5 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



238100

FINAL STATUS OF WELL

1 ☑ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

1 ☑ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not used 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☑ Rotary (air) 5 ☑ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

Name of Well Contractor	Well Contractor's Licence No.
Capital Water Supply Ltd.	1558
Address: P.O. Box 490 Stittsville, Ontario K2S1A6	
Name of Well Technician	Well Technician's Licence No.
S. Miller	T0097
Signature of Technician/Contractor	Submission date: day 15 mo 3 yr 022

MINISTRY USE ONLY: Data source — Contractor 1558 — Date received APR 17 2002 — Date of inspection — Inspector — Remarks: CSS.ES2

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Ontario 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.

11 **1532862** Municipality 15009 Con. CON 03

County or District	Township/Borough/City/Town/Village	Con	block	tract	survey, etc.	Lot
Ottawa Carleton	OSgoode	3				7/8

[redacted] Address: 6346 Deermeadows Dr. Greely,Ontario

Date completed: 22 day 5 month 02 year 02

21 Zone | Easting | Northing | RC | Elevation | RC | Basin Code: K4P 1M9

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Brown	Sand			0	22
Gray	sand			22	26
gray	Limestone			26	109
	Note: Casing was left 3.5 feet above ground level				
		at time of drilling			

31

32

41 WATER RECORD

Water found at - feet	Kind of water
107	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
NOT TESTED	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam. inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6 1/4	1 ☒ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	0	34.5
6	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☒ Open hole 5 ☐ Plastic		34.5	109
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Slot No.	Diameter inches	Length feet

Material and type: | Depth at top of screen feet:

61 PLUGGING & SEALING RECORD

☒ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
31	0	Grouted - Bentonite ((2)
		Cement (1)

71 PUMPING TEST

Pumping test method: 1 ☒ Pump 2 ☐ Bailer

Pumping rate: 15 GPM

Duration of pumping: 1 Hours ___ Mins

Static level	Water level end of pumping	Water levels during: 1 ☒ Pumping 2 ☐ Recovery			
		15 minutes	30 minutes	45 minutes	60 minutes
14 feet	40 feet	100 feet	75 feet	60 feet	40 feet

If flowing give rate: GPM

Pump intake set at: feet

Water at end of test: ☐ Clear ☒ Cloudy

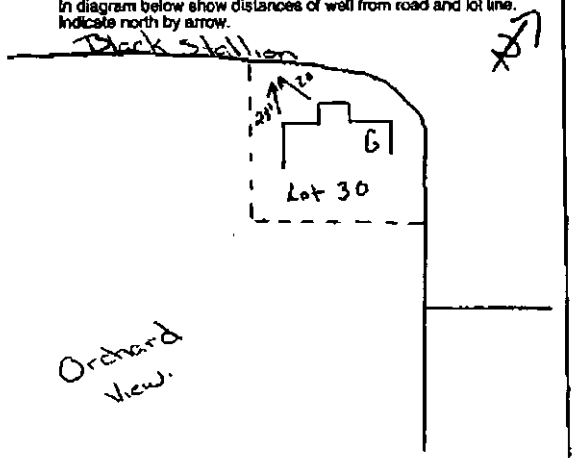
Recommended pump type: ☐ Shallow ☒ Deep

Recommended pump setting: 75 feet

Recommended pump rate: 5 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



238158

FINAL STATUS OF WELL 54

1 ☒ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE 56-58

1 ☒ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not used 10 ☐ Other

METHOD OF CONSTRUCTION 57

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☒ Rotary (air) ground 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

Name of Well Contractor	Well Contractor's Licence No.
Capital Water Supply Ltd.	1558
Address: P.O. Box 490 Stittsville, Ontario K2S 1A6	
Name of Well Technician: S. Miller	Well Technician's Licence No.: T0097
Signature of Technician/Contractor	Submission date: day 27 mo 5 yr 02

MINISTRY USE ONLY

Data source	Contractor	Date received
	1558	JUN 24 2002
Date of inspection	Inspector	
Remarks: CSS.ES2		

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Ontario 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.

11 **1532863** Municipality 15009 Con. CON 03

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
Ottawa Carleton	Osgoode	3	7/8

Owner's surname [redacted] First Name

Address: 6346 Deermeadows Dr. Greely, Ontario

Date completed: 23 day 5 month 02 year

21 Zone Easting Northing PC Elevation RC Basin Code: K4P 1M9

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see Instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Brown	Hardpan	Boulders		0	12
Gray	Limestone		Broken	12	20
Gray	Limestone		Medium Hard	20	78
		Note: Casing was left 1 foot above ground level at time of drilling			

31

32

41 WATER RECORD

Water found at - feet	Kind of water
77	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas
	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas
	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas
	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas
	1 Fresh 2 Salty 3 Sulphur 4 Minerals 5 Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6 1/4	1 Steel 2 Galvanized 3 Concrete 4 Open hole 5 Plastic	.188	0	20
6	1 Steel 2 Galvanized 3 Concrete 4 Open hole 5 Plastic		24	78
	1 Steel 2 Galvanized 3 Concrete 4 Open hole 5 Plastic			

SCREEN

Slots of opening (Slot No.)	Diameter inches	Length feet
Material and type	Depth at top of screen feet	

61 PLUGGING & SEALING RECORD

☑ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
23	0	Grouted – Bentonite (7)

71 PUMPING TEST

Pumping test method: 1 ☑ Pump 2 ☐ Bailer

Pumping rate: 20 GPM

Duration of pumping: 1 Hours ... Mins

Static level	Water level end of pumping	Water levels during ☑ Pumping ☐ Recovery			
		15 minutes	30 minutes	45 minutes	60 minutes
11 feet 3 inches	30 feet	75 feet	50 feet	50 feet	39 feet

If flowing give rate: ... GPM

Pump intake set at: ... feet

Water at end of test: ☐ Clear ☒ Cloudy

Recommended pump type: ☐ Shallow ☒ Deep

Recommended pump setting: 50 feet

Recommended pump rate: 5 GPM

FINAL STATUS OF WELL

1 ☑ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

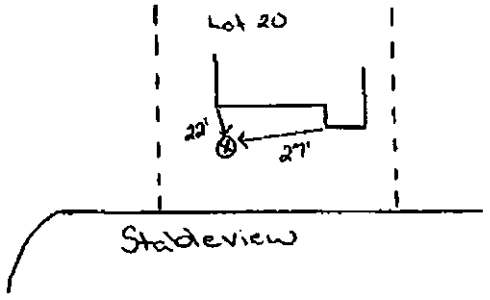
1 ☑ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not use 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☒ Rotary (air) 5 ☒ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



238157

Name of Well Contractor: Capital Water Supply Ltd.

Well Contractor's Licence No.: 1558

Address: P.O. Box 490 Stittsville, Ontario K2S 1A6

Name of Well Technician: S. Miller

Well Technician's Licence No.: T0097

Signature of Technician/Contractor

Submission date: day 24 mo 5 yr 02

MINISTRY USE ONLY

Data source ... Contractor 1558 Date received JUN 24 2002

Date of inspection ... Inspector ...

Remarks: CSS.ES2

0506 (07/00) Front Form 9

2 - MINISTRY OF THE ENVIRONMENT COPY

Ontario 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.

11 — 1532961 — Municipality 15009 — Con. CON 09

County or District	Township/Borough/City/Town/Village	Con	block	tract	survey, etc.	Lot
Ottawa Carleton	Osgoode	3				15

[redacted] — Address: Greely, Ont — Date completed: 04 (day) 06 (month) 02 (year)

21 — Zone — Easting — Northing — RC — Elevation — RC — Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
	Sand	boulders		0	56
grey	limestone			56	82

31

32

41 WATER RECORD

Water found at - feet	Kind of water
70	1 Fresh ☒ 2 Salty ☐ — 3 Sulphur ☐ 4 Minerals ☐ 5 Gas ☐
73	1 Fresh ☐ 2 Salty ☒ — 3 Sulphur ☐ 4 Minerals ☐ 5 Gas ☐
	1 Fresh ☐ 2 Salty ☐ — 3 Sulphur ☐ 4 Minerals ☐ 5 Gas ☐
	1 Fresh ☐ 2 Salty ☐ — 3 Sulphur ☐ 4 Minerals ☐ 5 Gas ☐
	1 Fresh ☐ 2 Salty ☐ — 3 Sulphur ☐ 4 Minerals ☐ 5 Gas ☐

61 CASING & OPEN HOLE RECORD

Inside diam. inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6 1/4	1 Steel ☒ 2 Galvanized ☐ 3 Concrete ☐ 4 Open hole ☐ 5 Plastic ☐	188	0	62
8 3/4	1 Steel ☐ 2 Galvanized ☐ 3 Concrete ☐ 4 Open hole ☒ 5 Plastic ☐		0	60
6	1 Steel ☐ 2 Galvanized ☐ 3 Concrete ☐ 4 Open hole ☒ 5 Plastic ☐		60	82

SCREEN

Size of opening (Slot No.)	Diameter inches	Length feet

Material and type — Depth at top of screen feet

61 PLUGGING & SEALING RECORD

☒ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
2	62	bentonite

71 PUMPING TEST

Pumping test method: 1 ☒ Pump 2 ☐ Bailer — Pumping rate: 15 GPM — Duration of pumping: 1 Hours ___ Mins

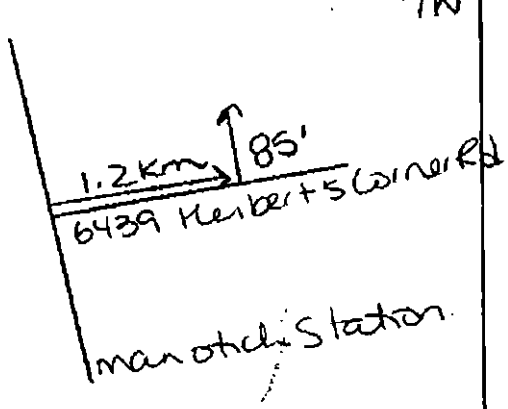
Static level	Water level end of pumping	Water levels during: 1 ☐ Pumping 2 ☒ Recovery			
		15 minutes	30 minutes	45 minutes	60 minutes
8 feet	70 feet	8 feet	8 feet	8 feet	8 feet

If flowing give rate: ___ GPM — Pump intake set at: ___ feet — Water at end of test: ☐ Clear ☒ Cloudy

Recommended pump type: ☐ Shallow ☒ Deep — Recommended pump setting: 70 feet — Recommended pump rate: 15 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



237891

FINAL STATUS OF WELL

☒ 1 Water supply ☐ 2 Observation well ☐ 3 Test hole ☐ 4 Recharge well ☐ 5 Abandoned, insufficient supply ☐ 6 Abandoned, poor quality ☐ 7 Abandoned (Other) ☐ 8 Dewatering ☐ 9 Unfinished ☐ 10 Replacement well

WATER USE

☒ 1 Domestic ☐ 2 Stock ☐ 3 Irrigation ☐ 4 Industrial ☐ 5 Commercial ☐ 6 Municipal ☐ 7 Public supply ☐ 8 Cooling & air conditioning ☐ 9 Not used ☐ 10 Other

METHOD OF CONSTRUCTION

☐ 1 Cable tool ☐ 2 Rotary (conventional) ☐ 3 Rotary (reverse) ☐ 4 Rotary (air) ☒ 5 Air percussion ☐ 6 Boring ☐ 7 Diamond ☐ 8 Jetting ☐ 9 Driving ☐ 10 Digging ☐ 11 Other

Name of Well Contractor: Ark Rock Drilling Ltd — Well Contractor's Licence No.: 1119

Address: RR#1 Richmond Ont

Name of Well Technician: Shannon Purcell — Well Technician's Licence No.: T0122

Signature of Technician/Contractor: [signature] — Submission date: 2 (day) 06 (month) 02 (year)

MINISTRY USE ONLY

Data source — Contractor: 1119 — Date received: JUL 26 2002

Date of inspection — Inspector

Remarks: CSS.ES2

0506 (07/00) Front Form 9

2 - MINISTRY OF THE ENVIRONMENT COPY

Ontario 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.

11 1533136 Municipality 15009 Con CON 03

#2 OTTAWA-CARLETON

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
City of Ottawa	Osgoode	3 Plan 4M-1151	10
[redacted]	Address 1594 Scott arme Crock	Date completed 23/08/02 (day month year)	

21 Zone Easting Northing RC Elevation RC Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	To
Brown	Till	Boulders	Dense	0	10
Grey	Clay		Dense	10	22
Grey	Gravel	Sand Boulders	Loose	22	32
Grey	Limestone Rock		Layered	32	125

31
32

41 WATER RECORD

Water found at - feet	Kind of water
110	☑ Fresh
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	To
8 3/4"	☑ Open hole		0	42
6 1/4"	☑ Steel	1.88	+2	42
6"	☑ Open hole		42	125

SCREEN: Sizes of opening (Slot No.) / Diameter inches / Length feet / Material and type / Depth at top of screen feet

61 PLUGGING & SEALING RECORD

☑ Annular space ☐ Abandonment

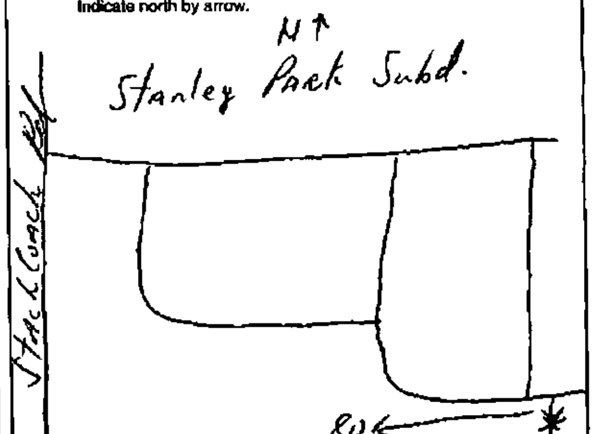
Depth set at - feet From	To	Material and type (Cement grout, bentonite, etc.)
0	42	Cement grout

71 PUMPING TEST

Pumping test method	Air
Pumping rate	20 GPM
Duration of pumping	1 Hours 0 Mins
Static level	12 feet
Water level end of pumping	125 feet
Water levels during	☑ Recovery
15 minutes	12 feet
30 minutes	12 feet
45 minutes	12 feet
60 minutes	12 feet
If flowing give rate	GPM
Pump intake set at	125 feet
Water at end of test	☑ Cloudy
Recommended pump type	☑ Deep
Recommended pump setting	100 feet
Recommended pump rate	10 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



240437

FINAL STATUS OF WELL

☑ Water supply ☐ Observation well ☐ Test hole ☐ Recharge well ☐ Abandoned, insufficient supply ☐ Abandoned, poor quality ☐ Abandoned (Other) ☐ Dewatering ☐ Unfinished ☐ Replacement well

WATER USE

☑ Domestic ☐ Stock ☐ Irrigation ☐ Industrial ☐ Commercial ☐ Municipal ☐ Public supply ☐ Cooling & air conditioning ☐ Not use ☐ Other

METHOD OF CONSTRUCTION

☐ Cable tool ☐ Rotary (conventional) ☐ Rotary (reverse) ☑ Rotary (air) ☐ Air percussion ☐ Boring ☐ Diamond ☐ Jetting ☐ Driving ☐ Digging ☐ Other

Name of Well Contractor	Gilles Bourgeois Well Drill
Well Contractor's Licence No.	1414
Address	St-Albert Ont.
Name of Well Technician	Jacques Raymond
Well Technician's Licence No.	0264
Signature of Technician/Contractor	[signature]
Submission date	23

MINISTRY USE ONLY: Data source / Contractor 1414 / Date received SEP 13 2002 / Date of inspection / Inspector / Remarks CSS.ES2

2 - MINISTRY OF THE ENVIRONMENT COPY

0506 (07/00) Front Form 9

Ontario 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.

11 **1533137** Municipality 15009 Con.

County or District: Ottawa Carleton | Township/Borough/City/Town/Village: Osgoode | Con. block tract survey, etc.: Plan SR-13176 | Lot: 10

Owner: [redacted] | Address: 1441 Stage Coach Rd Greely Ont. | Date completed: 19 / 09 / 02 (day / month / year)

21 Zone | Easting | Northing | RC | Elevation | RC | Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Brown	Till	Boulders	Dense	0	16
Grey	"	"	"	16	20
Grey	Limestone Rock		Layered	20	100

31

32

41 WATER RECORD

Water found at - feet	Kind of water				
90	1 ☑ Fresh 2 ☐ Salty	3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas			
	1 ☐ Fresh 2 ☐ Salty	3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas			
	1 ☐ Fresh 2 ☐ Salty	3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas			
	1 ☐ Fresh 2 ☐ Salty	3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas			
	1 ☐ Fresh 2 ☐ Salty	3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas			

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
8 3/4"	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☑ Open hole 5 ☐ Plastic		0	30
6 1/4"	1 ☑ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	+2	30
6"	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☑ Open hole 5 ☐ Plastic		30	100

SCREEN

Slot No. | Diameter inches | Length feet | Material and type | Depth at top of screen feet

61 PLUGGING & SEALING RECORD

☑ Annular space ☐ Abandonment

Depth set at - feet From	To	Material and type (Cement grout, bentonite, etc.)
0	30	Cement grout

71 PUMPING TEST

Pumping test method: 1 ☐ Pumping 2 ☑ Bailer | Pumping rate: 12 GPM | Duration of pumping: 1 Hours 0 Minutes

Static level	Water level end of pumping	Water levels during: 1 ☐ Pumping 2 ☐ Recovery			
30 feet	100 feet	15 minutes: 30 feet	30 minutes: 30 feet	45 minutes: 30 feet	60 minutes: 30 feet

If flowing give rate: GPM | Pump intake set at: 100 feet | Water at end of test: ☐ Clear ☑ Cloudy

Recommended pump type: ☐ Shallow ☑ Deep | Recommended pump setting: 90 feet | Recommended pump rate: 10 GPM

FINAL STATUS OF WELL

1 ☑ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

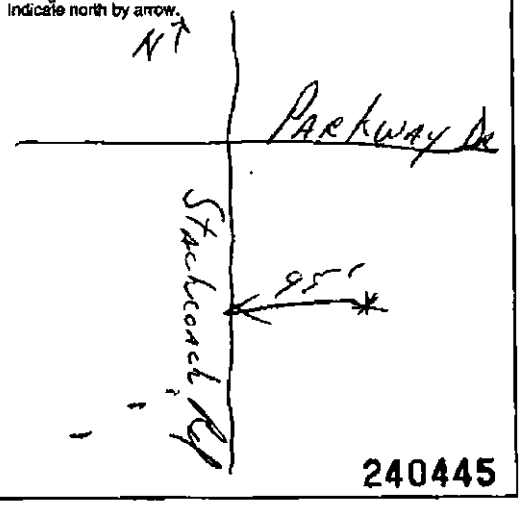
1 ☑ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not use 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Boring (reverse) 4 ☑ Rotary (air) 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



240445

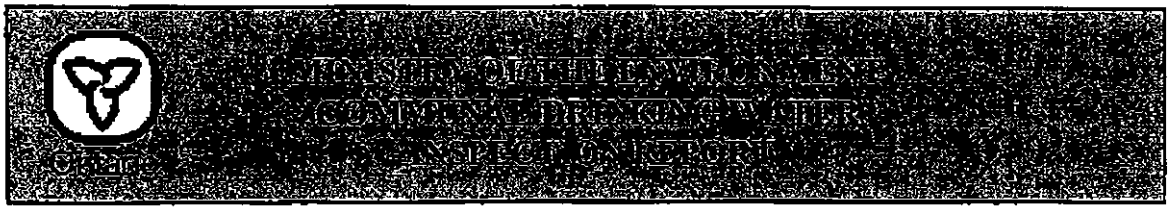
Name of Well Contractor: Gilles Bourgeois Well Drilling | Well Contractor's Licence No.: 1414
Address: St-Albert

Name of Well Technician: Jacques Raymond | Well Technician's Licence No.: T0264
Signature of Technician/Contractor | Submission date: 27/09/02 (day / mo / yr)

MINISTRY USE ONLY
Data source | Contractor: 1414 | Date received: SEP 30 2002
Date of inspection | Inspector
Remarks: CSS.ES2

0508 (07/00) Front Form 9

2 - MINISTRY OF THE ENVIRONMENT COPY



INSPECTION ID#: 869

COMPANY/MUNICIPALITY: Sleepy Cedars Family Camping

MAILING ADDRESS: 1893 Manotick Station Road, Ottawa, ON K4P 1H2

INSPECTION SITE ADDRESS: Sleepy Cedars Family Camping
1893 Manotick Station Road, Ottawa, ON K4P 1H2

City of Ottawa (former Osgoode Township)
K4P 1H2

CONTACT NAME: Jim Lefebvre **TITLE:** owner

CONTACT TELEPHONE: 613-821-0756 **FAX:** none

INSPECTION DATE: 2001/06/12

DATE OF LAST INSPECTION:

WATER WORKS NUMBER: Not Applicable

OPERATING AUTHORITY: Sleepy Cedars Family Camping (878854 Ontario Inc.)

OP. AUTHORITY ADDRESS: 1893 Manotick Station Road, Ottawa, ON K4P 1H2

OP. AUTHORITY TOWN/CITY: City of Ottawa (former Osgoode Township)

OP. AUTHORITY POSTAL CODE: K4P 1H2

OP. AUTHORITY CONTACT NAME: Jim Lefebvre **TITLE:** owner

OP. AUTHORITY TELEPHONE: **FAX:**

1.0 INTRODUCTION

The Sleepy Cedars Campground was inspected in order to determine applicability of the water works pertaining to the Ontario Water Resources Act (OWRA) s.52 and Ontario Regulation 459/00 (O.R. 459/00). The ground water facility was inspected to assess compliance with the Ministry of the Environment's requirements concerning treatment process, process management, monitoring, record keeping and reporting.

An Occurrence Report (oris no. 990037645) was generated for this site concerning an adverse water quality event on May 29, 2001. Tracy Zakordonski of the Ottawa Public Health Laboratory advised the Spills Action Centre of a total coliform count of 1. Subsequent re-sampling of the well produced a total coliform count of 0 coliforms.

Certificate of Approval List:

Not Applicable

2.0 INSPECTION OBSERVATIONS

2.1 SYSTEM DESCRIPTION

Drinking water at this site is supplied from a 6 inch diameter drilled well completed to a reported depth of 165 feet and constructed in 1979 (as reported by previous owner - Art Albert). Water is distributed to 100 individual campsites without the benefit of disinfection or filtration. Typical residency of the campground is 35 - 40 percent. There is currently only one full time resident at the park.

The eight inch diameter well head extends 25 centimetres above grade and is secured with a steel expansion cap attached to the top of the casing. The discharge line and electrical connections enter the well through the top of the cap. The well and associated plumbing is housed in a padlocked garden shed, located 25 metres north of the park office. The land is graded away from the well head and is separated from the nearest sanitary weeping bed by a height of land and a distance exceeding 50 metres. A totalizing flow meter was installed in the discharge line at the well head, on April 30, 2001. No other visible sources of contamination were identified.

2.2 PERMIT TO TAKE WATER ASSESSMENT

PERMIT NUMBERS	SOURCE	RENEWAL DATES	PERMITTED AMOUNT OF TAKING	UNITS
NA	Drilled Well			

2.3 CAPACITY ASSESSMENT

ITEM	1998	1999	2000
Avg. Day Flow m^3/day			
Max. Day Flow m^3/day			
Rated capacity m^3/day			
% (Maximum Day/Rated Capacity)			

A capacity assessment was not completed upon this well. A flow meter installed April 30, 2001 indicates that the average daily discharge is less than 9000 litres during the operating season.

2.4 PLANT TREATMENT REQUIREMENTS

A) SURFACE WATER SOURCE(S)

Does the plant comply with the requirements of Ontario Regulation 459/00 regarding treatment requirements for surface water?

N/A

Does the plant provide the following:

Chemically-assisted filtration: N/A
Disinfection: N/A

If the plant does not provide minimum level of treatment for surface water as per Ontario Regulation 459/00 s.5(2), has the owner delivered a written notice to the Director by October 31, 2000 in accordance with Ontario Regulation s.5(5)(b), describing a timetable of actions required to achieve compliance?

N/A

Do records show that water entering the water distribution system has been treated with chlorination (or another treatment that, in the Director's opinion, is as effective as chlorination to achieve disinfection that persists into the distribution system) in accordance with Ontario Regulation 459/00 s.5(3) and any applicable instrument or authorizing document (i.e. Order, Certificate of Approval)?

N/A

B) GROUND WATER SOURCE(S)

Does the plant comply with the requirements of Ontario Regulation 459/00 regarding treatment requirements for **ground water** (i.e. Disinfection) ?

NO

Chlorination or any other approved disinfection process is not practised upon this ground water supply.

Do records show that water entering the water distribution system has been treated with chlorination (or another treatment that, in the Director's opinion, is as effective as chlorination to achieve disinfection that persists into the distribution system) in accordance with Ontario Regulation 459/00 s.5(3) and any applicable instrument or authorizing document (i.e. Order, Certificate of Approval)?

NO

If the plant does not provide minimum level of treatment of **ground water** as per Ontario Regulation 459/00 s.5(1), has the owner:

(i) delivered a written notice to the Director by October 31, 2000 in accordance with Ontario Regulation s.5(5)(b), describing a timetable of actions required to achieve compliance or their intention to seek a variance in their Certificate of Approval in accordance with Ontario Regulation 459/00 s.6(2)(b), or

(ii) obtained a variance in their Certificate of Approval in accordance with Ontario Regulation 459/00 s.6(2)(b)?

NO

2.5 SAMPLING AND ANALYSIS REQUIREMENTS

Does the plant comply with all sampling and analysis requirements in accordance with Ontario Regulation 459/00 s.7 and any applicable Order and Certificate of Approval?

NO

The only sampling completed upon the water supply consists of bacteriologic submissions to the Public Health Unit, every two weeks during the operating season of the campground as well as regular Health Unit inspection and sampling of the swimming pool water.

2.6 WATER QUALITY ASSESSMENT

Specifically with regard to health-related water quality parameters **only**, is the plant meeting the water quality requirements of its Certificate of Approval, Ontario Drinking Water Standards, or an Order or direction?

NO

2.7 MINISTRY SAMPLE RESULTS

Were Ministry samples collected during the inspection?
YES

Do sample results show compliance with Ontario Drinking Water Standards and any applicable instrument or authorizing document (i.e. Order, Certificate of Approval) for those parameters which were required to be analysed?
YES

Comment:

The Ministry sample results indicated that the turbidity analysis of 1.37 NTU was in exceedance of the MAC value of 1.0 NTU for treated water leaving the plant. This MAC value was established to ensure efficiency of the disinfection process and disinfection is not currently practiced at this facility.

2.8 REPORTING REQUIREMENTS

Is the owner complying with reporting requirements of Ontario Regulation 459/00 s.12 (quarterly reports), section 13 (engineer's reports), section 8 (adverse water quality notification), and those of any applicable instrument or authorizing document (i.e. Order, Certificate of Approval)?
NO

2.9 PLANT AND OPERATOR CERTIFICATION

a) Plant Certification
   i) Facility Level: Not Applicable
   ii) Certificate Number: Not Applicable
   iii) Date of Issue:

b) Do the plant operators have the appropriate level of certificate for this plant?
NO

Jim Lefebvre, owner of Sleepy Cedars Family Camping, is resposible for the operations, maintenance and sampling of the water works.

2.10 PROCESS WASTEWATER

Is the process waste water treated prior to discharge?
N/A

No process waste water is generated at this water works.

Does the discharge meet the requirements outlined in:
a) its Certificate of Approval N/A
b) Ministry policy? N/A

3.0 REVIEW OF PREVIOUS NON-COMPLIANCE ISSUES

There are no previous non-compliance issues associated with this facility.

4.0 SUMMARY OF INSPECTION FINDINGS (HEALTH/ENVIRONMENTAL IMPACT)

Was there any indication of a known or anticipated human health impact during the inspection and/or review of relevant material, related to this Ministry's mandate ?

YES

The level of treatment provided fails to conform with that identified in O.R.459/00.

Specifics:
The operating authority fails to provide disinfection which is identified as the minimum level of treatment for ground water sources of drinking water (O.R. 459/00 s.4).

Was there any indication of a known or anticipated environmental impact during the inspection and/or review of relevant material ?
NO

a) If the CofA contains conditions dictating monitoring and/or effluent quality for process wastewater treatment, is the facility operating in compliance with those conditions?

b) If the water works has no process wastewater treatment provisions in place, is there evidence that untreated discharges have adversely impacted the environment or have a significant potential to adversely impact sensitive receivers?

Specifics:

Was there any indication of a known or suspected violation of a legal requirement during the inspection and/or review of relevant material which could cause a human health impact or environmental impairment?
YES

a) Do the maximum water takings comply with those prescribed in applicable Permits To Take Water?

b) Has the water works complied with sampling and analysis provisions contained in O.R. 459/00, or all MAC-related monitoring provisions contained in a CofA and Orders?
Sampling and analysis is currently provided for bacteriologic parameters, only.

c) Are all operators licensed as required under O. R. 435/93?

Specifics:
Mr. Lefebvre is not a licensed operator. Operations presently consist solely of maintenance and repairs to the pump and distribution system as well as bi-monthly bacteriologic sampling.

Was there any indication of a potential for environmental impairment during the inspection and/or the review of relevant material?
NO

Specifics:

5.0 ACTION(S) REQUIRED

A Provincial Officers Order was issued to for the owner to attain the services of a qualified consultant to assess the water works with respect to the applicability of the Ontario Water Resources Act and Ontario Regulation 459/00.

ACTIONS TAKEN

ACTION	ORDER ISSUED	COMPLIANCE DATE	COMPLIED WITH
Assessment of water works	YES	2001/09/30	PENDING

Provincial Officers Order # P805-010712-01

6.0 OTHER INSPECTION FINDINGS

Casing stick-up is slightly less than the requirements of Ontario Regulation 903 s.13(3). Casing should be extended to correct height or granular backfill material removed to ensure a minimum extension of 30 centimetres above ground surface.

The operator of the water works does not possess the appropriate certification for this facility as required under O.R. 435/93.

Minimum level of treatment for a groundwater supply water works (ie. disinfection)is not provided as indicated by O.R. 459/00 section 5.(1).

Containers of paint and other non-essential materials should be removed from the structure enclosing the well head.

A system of record keeping should be established to document analytical results and flow volumes.

7.0 OCCURRENCE REPORT # :

9940008744

A Provincial Officers Order was issued August 20, 2001 to Jim Lefebvre (owner) to attain the services of a qualified consultant to undertake an assessment of the water works to determine the applicability of Section 52 of the Ontario Water Resources Act and Ontario Regulation 459/00 and to provide a written report of this assessment to the Provincial Officer.

PREPARED BY ENVIRONMENTAL OFFICER:

Timothy O'Brien	Tim O'Brien	Ottawa	2001/08/20
(Print)	(Signature)	(District Office)	(Date)

ENDORSED BY DISTRICT SUPERVISOR:

Paul Kehoe	Paul Kehoe	Ottawa	Aug 22/01
(Print)	(Signature)	(District Office)	(Date)

REPORT MAILED OUT ON: **STATUS: FINAL**
LAB RESULTS MAILED OUT ON:

NOTE: "This inspection does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they apply or may apply to this facility. It is, and remains, the responsibility of the owner and/or the operating authority to ensure compliance with all applicable legislative and regulatory requirements."

CHEMICAL/PHYSICAL OBJECTIVES
HEALTH RELATED
(Sleepy Cedars July 12/01)

PARAMETER (mg/L unless specified)	Sample Results	MAC[1]	IMAC[2]	AO[3]
Alachlor	NA		0.005	
Aldicarb	NA	0.009		
Aldrin + Dieldrin	NA	0.0007		
Arsenic	0.0		0.025	
Atrazine + – dealkylated metabolites	NA		0.005	
Azinphos-methyl	NA	0.02		
Barium	0.0805	1		
Bendiocarb	NA	0.04		
Benzene	0.0	0.005		
Benzo(a)pyrene	NA	0.00001		
Boron	0.121		5	
Bromoxynil	NA		0.005	
Cadmium	0.0	0.005		
Carbaryl (Sevin)	NA	0.09		
Carbofuran	NA	0.09		
Carbon Tetrachloride	0.0	0.005		
Chlordane [4]	NA	0.007		
Chloramines	NA	3.0		
Chlorpyrifos (Dursban)	NA	0.09		
Chromium	0.0026	0.05		
Cyanazine (Bladex)	NA		0.01	
Diazinon	NA	0.02		
Dicamba	NA	0.12		
1,2-Dichlorobenzene	0.0	0.2		0.003
1,4-Dichlorobenzene	0.0	0.005		0.001
DDT + metabolites [5]	NA	0.03		
1,2-Dichloroethane	0.0		0.005	
1,1-Dichloroethylene (vinylidene chloride)	NA	0.014		
Dichloromethane	0.0	0.05		
2,4-Dichlorophenol	NA	0.9		0.0003
2,4-Dichlorophenoxy acetic acid (2,4-D)	NA		0.1	
Diclofop-methyl	NA	0.009		
Dimethoate	NA		0.02	
Diquat	NA	0.07		
Diuron	NA	0.15		
Fluoride	0.41	b		
Heptachlor + Heptachlor Epoxide	NA	0.003		
Lead	0.00017	0.01 c		

(Hexachlorocyclohexane (Lindane)	NA	0.004		
Malathion	NA	0.19		
Mercury	0.0	0.001		
Methoxychlor (DMDT)	NA	0.9		
Metolachlor	NA		0.05	
Metribuzin (Sencor)	NA	0.08		
Monochlorobenzene	NA	0.08		0.03
Nitrate (as Nitrogen)	0.013	10.0 d		
Nitrite (as Nitrogen)	0.003	1.0 d		
Nitrate + Nitrite	0.016	10.0 d		
Nitrotiacedic Acid (NTA)	NA	0.4		
Nitrosodimethylamine (NDMA)	NA		0.000009	
Paraquat	NA		0.01	
Parathion	NA	0.05		
Pentachlorophenol	NA	0.06		0.03
Phorate (Thimet)	NA		0.002	
Pichloram	NA		0.19	
Polychlorinated Biphenyls (PCB)	NA		0.003	
Prometryne	NA		0.001	
Selenium	0.001	0.01		
Simazine	NA		0.01	
Temephos	NA		0.28	
Terbufos	NA		0.001	
Tetrachloroethylene (perchloroethylene)	NA	0.03		
2,3,4,6-Tetrachlorophenol	NA	0.1		0.001
Triallate	NA	0.23		
Trichloroethylene	NA	0.05		
2,4,6-Trichlorophenol	NA	0.005		0.002
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	NA	0.28		0.02
Trifluralin	NA		0.045	
Trihalomethanes	0.00	0.1 e		
Turbidity (NTU)	1.37	f		f
Uranium	0.00012	0.1		
Vinyl Chloride (chloroethylene)	NA	0.002		

Shortforms:

<T	- A measurable trace amount; interpret with caution	NS	- Not sampled
<W	- No measurable response (zero)	NTU	- Nephelometric Turbidity Unit
ND	- Not detected	ng/L	- Nanograms per litre
!NP	- No appropriate procedure available	Φg/L	- Micrograms per litre
NA	- Result not available	mg/L	- Milligrams per litre

Footnotes:

1 Maximum Acceptable Concentration (MAC)

2 Interim Maximum Acceptable Concentration (IMAC)

3 Aesthetic Objective (AO)

4 Includes □-Chlordane, □-Chlordane and Oxychlordane

5 Includes *p,p'-DDE, o,p'-DDT, p,p'-DDD and p,p'DDT*

INSPECTION STATUS: FINAL

a) Total toxic equivalents when compared with 2,3,7,8-TCDD (tetrachlorodibenzo-p-dioxin)

b) Where fluoridation of drinking water is practised, it is recommended that the concentration be adjusted to 1.0 (+/- 0.2) mg/L, the optimum level for control of dental caries. Communities in Northern Ontario, where the annual mean daily maximum temperature is less than 10 °C may wish to consider adjusting the fluoride concentration to 1.2 (+/- 0.2) mg/L. Adverse effects of fluoride in drinking water above 1.5 mg/L and below 2.4 mg/L are cosmetic in nature (dental mottling in a small portion of the population). Levels above 1.5 mg/L should be reported to the local medical officer of health.

c) This objective applies to water at the point of consumption. Since lead is a component in some plumbing systems, first flush water may contain higher concentrations of lead than water that has been flushed for five minutes. Faucets, therefore, should be thoroughly flushed before water is taken for consumption.

d) Where nitrate and nitrite are present, the total of the two should not exceed 10 mg/L.

e) The interim maximum acceptable concentration (IMAC) for total trihalomethanes (THMs) in drinking water is 0.1 mg/L (100 ug/L), expressed as a running annual average of quarterly samples. This IMAC is based on the risk associated with chloroform, the THM most often present and generally found in the greatest concentrations in drinking water. The guideline is designated as interim until such time as the risks from other disinfection byproducts are ascertained.

f) A MAC for turbidity of 1 NTU in drinking water leaving the treatment plant was established to ensure the efficiency of the disinfection process. Treatment processes can result in increased turbidity in the distribution system. To ensure that the aesthetic objective for turbidity at the free flowing outlet of the ultimate consumer has been set at 5 NTU.

MICROBIOLOGICAL OBJECTIVES
HEALTH RELATED
(Sleepy Cedars July 12/01)

PARAMETER (organisms/100 mL)	SAMPLE RESULTS	MAXIMUM ACCEPTABLE CONCENTRATION
Total Coliforms	0.0	0
E. Coli*	0.0	0
Background	NA	200**
Standard Plate Count	NA	500**

Footnotes:

* *Escherichia coli* is a more definitive indicator of fecal contamination than other fecal coliforms or total coliforms.

** At elevated levels, the general bacterial population may interfere with the detection of coliforms. This general population can be estimated from either background colony counts on the total coliform membrane filters or heterotrophic plate counts (HPC). If the membrane filter contains more than 200 background colonies on a total coliform medium per 100 mL or if the HPC exceeds 500 colonies per mL, the site should be resampled. If there is a recurrence of unacceptable background or heterotrophic plate counts, an inspection of the site should be undertaken to determine the cause.

CHEMICAL/PHYSICAL OBJECTIVES
NON-HEALTH RELATED
(Sleepy Cedars July 12/01)

PARAMETERS (mg/L-unless specified)	Sample Results	Objective	Type of Objective
Aluminum	0.0182	0.1	OG
Copper	0.0031	1	AO
Ethylbenzene	0.0	0.0024	AO
Iron	0.115	0.3	AO
Manganese	0.0117	0.05	AO
Toluene	0.0	0.024	AO
Total Dissolved Solids	NA	500	AO
Xylenes	0.0	0.3	AO
Zinc	0.0064	5	AO

Shortforms:

<T	- A measurable trace amount; interpret with caution	<W	- No measurable response (zero)
NA	- Result not available	NS	- Not sampled
ND	- Not detected	mg/L	- milligrams per litre
Φg/L	- micrograms per litre	AO	- Aesthetic Objective
OG	- Operational Guideline	TCU	- True Colour Units

MUNICIPALITY CONCESSION ETC	LOT	WELL NO	UTM EASTING NORTHING	ELEV FEET	DATE	DRILLER	CSG DIA INS	KIND OF WATER	WATER FOUND FEET	STAT LVL FEET	PUMP LVL FEET	TEST RATE GPM	TEST TIME HR:MN	WATER USE	SCREEN DEPTH FEET	SCREEN LENGTH FEET	OWNER DEPTHS IN FEET TO WHICH FORMATIONS EXTEND
CONTINUING... OSGOODE TOWNSHIP																	
CON	03	009	15-30072	999999 9999999		1998/06	1558	06	UK	0210	16	125	10	1 :0	DO		T. PRINCIOTTA CONST. BRWN SAND DRY 0003 GREY SAND WBRG 0009 GREY CLAY STKY 0020 GREY SAND GRVL PCKD 0035 GREY LMSN HARD 0112 WHIT SNDS HARD 0220
CON	03	009	15-30076	999999 9999999		1998/06	1558	06	UK	0190	27	245	6	1 :0	DO		T. PRINCIOTTA CONST. BRWN LOAM BLDR PCKD 0007 GREY LMSN HARD 0143 WHIT SNDS HARD 0250
CON	03	009	15-07186	452530 5008190	340	1963/11	3113	04	FR	0068	15	15	7	1 :0	ST DO		PIPER G RED MSND 0030 GREY LMSN 0068
CON	03	009	15-13297	452448 5007994	320	1973/04	3644	05	FR	0081	4	40	15	1 :0	DO		BROADFOOT W GREY SAND 0028 GREY LMSN 0081
CON	03	010	15-26997	999999 9999999		1992/11	3749	06	FR	0194	46	145	21	1 :0	ST		RICKOL CONST. BRWN FILL STNS LOOS 0005 GREY LMSN MGRD HARD 0205
CON	03	010	15-27989	999999 9999999		1994/05	1558	06	UK	0217	14	25	6	1 :0	DO		RAINA, JAMES BRWN SAND BLDR PCKD 0010 BRWN SAND STNS WBRG 0050 GREY SAND GRVL WBRG 0040 GREY LMSN MGRD HARD 0160 GREY SNDS 0223
CON	03	010	15-14287	452533 5007883	320	1974/08	1558	06	FR	0040	5	20	25	1 :0	DO		BANNER CONSTRUCTION BRWN SAND 0012 GRVL BLDR 0040 BLCK LMSN 0041
CON	03	010	15-30103	999999 9999999		1998/06	4006	06	UK	0094	23	47	5	1 :0	DO		HUTT, PAUL BRWN SAND STNS 0006 BRWN HPAN GRVL SAND 0035 GREY LMSN FCRD 0041 GREY LMSN MGRD 0068 GREY LMSN HARD 0100
CON	03	010	15-13545	454210 5008896	320	1973/09	1558	06	FR	0048	12	30	15	1 :0	DO		NEUENDORF CONSTR LTD BRWN SAND BLDR 0025 GREY HPAN BLDR 0036 BLCK LMSN 0048
CON	03	011	15-28582	999999 9999999		1995/06	1119	06	UK	0100	12	90	13	1 :0	DO		PHILLIPPEE, MARCEL SAND BLDR 0049 GREY LMSN 0107
CON	03	011	15-14452	454444 5008631	315	1974/11	1558	06	SU	0045	4	20	50	1 :0	DO		J&R BARLOW EXCAV CO GREY SAND 0010 GRVL BLDR 0041 BLCK LMSN 0046
CON	03	011	15-14306	454440 5008540	312	1974/09	2557	06	FR	0170	22	70	12	1 :30	ST DO		O'BRIEN JOHN SAND GRVL 0036 GREY LMSN 0170
CON	03	011	15-07187	452700 5007520	320	1962/03	1603	02	FR	0089	13	25	8	3 :0	ST DO		ADAMS S BLDR MSND GRVL 0051 GREY LMSN 0089
CON	03	011	15-11310	454510 5008330	308	1971/07	3504	06	FR	0110	1	1	20	1 :30	DO		MAI J SAND SILT 0015 CSND 0040 GRVL BLDR 0048 HPAN 0056 LMSN 0115
CON	03	011	15-13546	454466 5008430	313	1973/09	1558	06	FR	0102	1	30	30	1 :0	DO		MAI G BRWN GRVL STNS 0005 GREY SAND STNS 0035 GREY GRVL SAND BLDR 0058 GREY LMSN 0102
CON	03	012	15-30321	999999 9999999		1998/06	1119	06	FR	0074	15	60	20	1 :	DO		GORD WIENA CONST SAND GRVL 0048 GREY LMSN 0080
CON	03	012	15-22207	999999 9999999		1987/11	1558	06	FR	0050	3	20	15	1 :0	DO		C V CONST. LTD. BRWN SAND 0003 BRWN CLAY 0006 GREY CLAY SNDY BLDR 0030 GREY SAND GRVL BLDR 0042 GREY LMSN 0055
CON	03	012	15-16813	454440 5008000	315	1978/11	3644	06	FR	0058	15	50	8	1 :0	DO		POWERS M GREY HPAN GRVL 0037 GREY LMSN 0064
CON	03	012	15-16761	452780 5007180	305	1978/07	3644	06	FR	0160	25	120	12	1 :0	PS		ALBERT A GREY SAND STNS 0040 GREY LMSN 0120 WHIT SNDS LMSN 0165

capable 40,000 L/day.

JOHN D. PATERSON AND ASSOCIATES LIMITED
Consulting Engineers
28 Concourse Gate, Unit 1, Ottawa, Ontario K2E 7T7 Tel: (613) 225 7381 Fax: (613) 225-1337

November 26, 2001
File No. G8399.LET.01

Ministry of the Environment
2435 Holly Lane
Ottawa, Ontario
K1V7P2

Attention: **Mr. Tim O'Brien**

Subject: **Assessment of Existing Water Works**
Sleepy Cedars Family Campground
1893 Manotick Station Road
Ottawa (Manotick Station), Ontario

Dear Sir:

Pursuant to the Provincial Officer Order, P805-010712-01, the owners of the Sleepy Cedars Family Campground have engaged the services of John D. Paterson & Associates Limited to carry out an assessment of the existing water works to determine the applicability of Ontario Regulation 459/00.

Sleepy Cedars Family Campground is a privately owned seasonal operation with approximately 100 campsites. The park is in operation for approximately 6 months of the year between the months of May and October. The potable water supply park is serviced by single drilled well. Based on the information obtained from the water well data system, the well was drilled in 1978 to a depth of 50.3 metres.

The well is equipped with a submersible well pump, which feeds two pressure storage tanks. The well water is pumped to each site through a shallow 25 mm diameter piping distribution network. The well and distribution piping network is contained completely on the subject property. No water treatment or disinfection system is in place. A water meter was installed on the well head in April, 2000 and the peak daily flow recorded in the summer, when the park was near full occupancy, was approximately 10, 000 litres. It is our understanding that no Certificate of Approval exists for the subject water works.

A constant discharge pump test was carried out, by this firm, on October 22, 2001. The main purpose of the pump test was to determine the capability of the existing water works. In addition, an analysis of the water bearing aquifer has been carried out to determine its characteristics. The existing well pump and existing water line in the well was used for this test. The existing water distribution line was disconnected from the pressure tanks and rerouted to the nearby field. The submersible pump consists of a one-half horsepower Gould pump Model 5GS05. The flow range for this pump according to the manufacturer's specifications is 6.8 L/min to 34.0 L/min (1.5 igpm to 7.5 igpm).

The existing well was pumped for a total of 250 minutes. Water meter readings were recorded throughout the pump test and based on these readings, the total volume of water pumped over duration of the test was 7.995 m^3. As such, the average pump rate for the test duration was calculated to be 31.98 L/ min (7.03 igpm). In addition, the pump rate of the existing water works was measured at random times during the pump test using a fixed volume container. Using this method the average pumping rate was calculated to be 34 L/min (7.5 igpm).

Using the pump test data, the aquifer was evaluated using the Cooper & Jacob Time-Drawdown method, the results of which have been attached to this submission. At a pumping rate of 34 L/min, the water level in the well was lowered 4.285 m. The rate of recovery was rapid with the water level returning to approximately 96% of the static level in approximately 33 minutes. A transmissivity of 4.40×10^{-3} m^2/min was calculated from the test data. A transmissivity of this magnitude is considered to be moderately acceptable.

Based on our findings, it is our opinion that the aquifer at this site is capable of supplying water in excess of 50,000 L/day. However, the existing water works is only capable of supplying water at a maximum rate of 34 L/min or 48,960 L/day. As such, since the existing water works is not capable of supplying water at a rate greater than 50,000 litres per day, it is our interpretation of the regulations that no Certificate of Approval is required according to Section 52 of the OWRA. Since no Certificate of Approval is required, the water works is also exempt from Regulation 459/00, which mandates a minimum level of treatment (i.e. disinfection).

Although, the existing water works is, in our opinion, exempt from Regulation 459/00, the owner of the facility is encouraged to continue weekly bacteriological testing when the facility is in operation. Also, regular maintenance of the pump and distribution system of the water works, is recommended.

We trust that this submission satisfy your requirements. Should you have any questions please do not hesitate to contact us.

Yours truly

JOHN D. PATERSON & ASSOCIATES LTD.

Albert Van Schie, C.E.T.

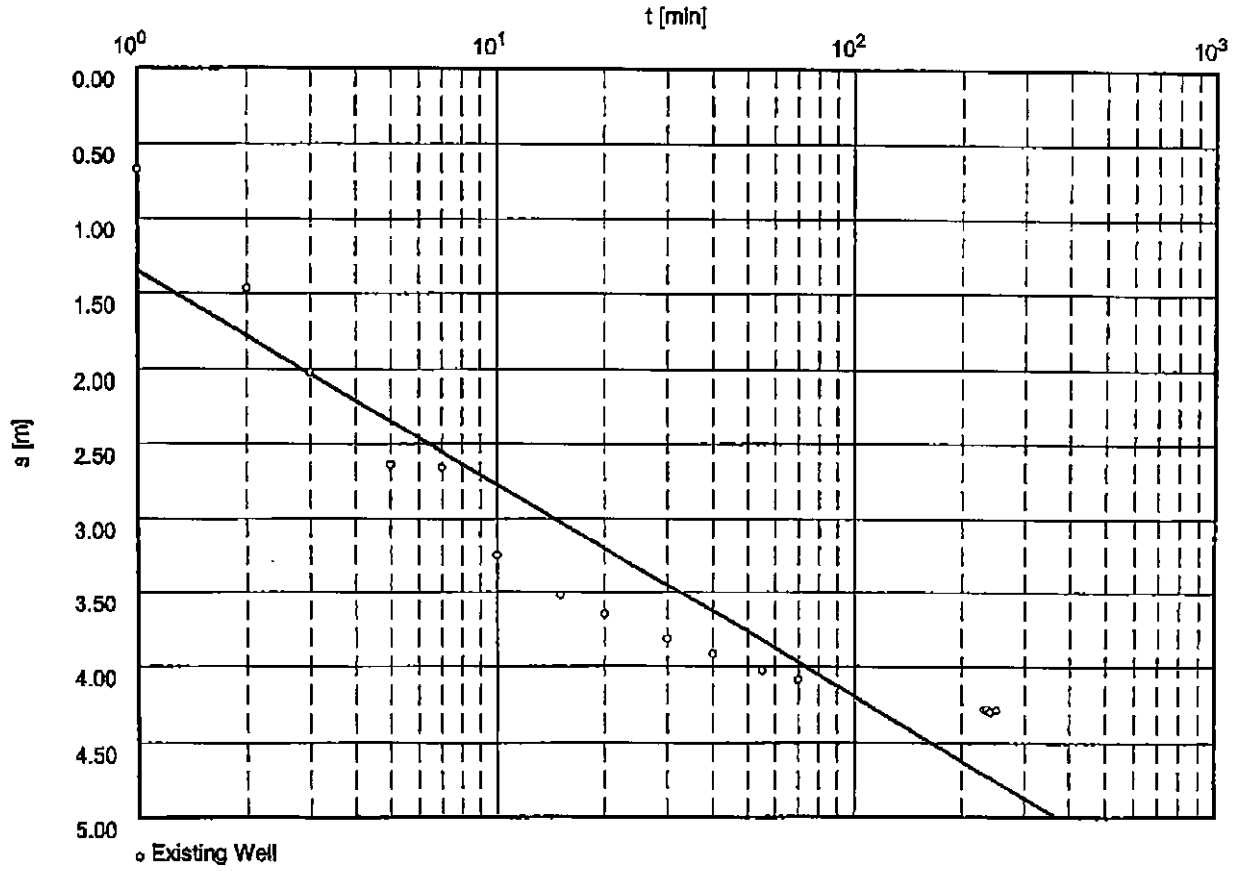
Andrew J. Tovell, P.Eng.

REGISTERED PROFESSIONAL ENGINEER
A. J. TOVELL
PROVINCE OF ONTARIO

cc. Sleepy Cedars Family Campground

John D. Paterson & Associates Ltd. 1-28 Concourse Gate Nepean, Ontario K2E 7T7	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: 21.11.2001	Page 1
		Project: Sleepy Cedars Family Camping	
		Evaluated by: SJW	

Pumping Test No. 1	Test conducted on: 02.11.2001
Existing Well	
Discharge 0.57 l/s	



Transmissivity [m²/min]: 4.40×10^{-3}

John D. Paterson & Associates Ltd. 1-28 Concourse Gate Nepean, Ontario K2E 7T7	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: 21.11.2001	Page 2
		Project: Sleepy Cedars Family Camping	
		Evaluated by: SJW	

Pumping Test No. 1	Test conducted on: 02.11.2001
Existing Well	Existing Well
Discharge 0.57 l/s	Distance from the pumping well 0.150 m

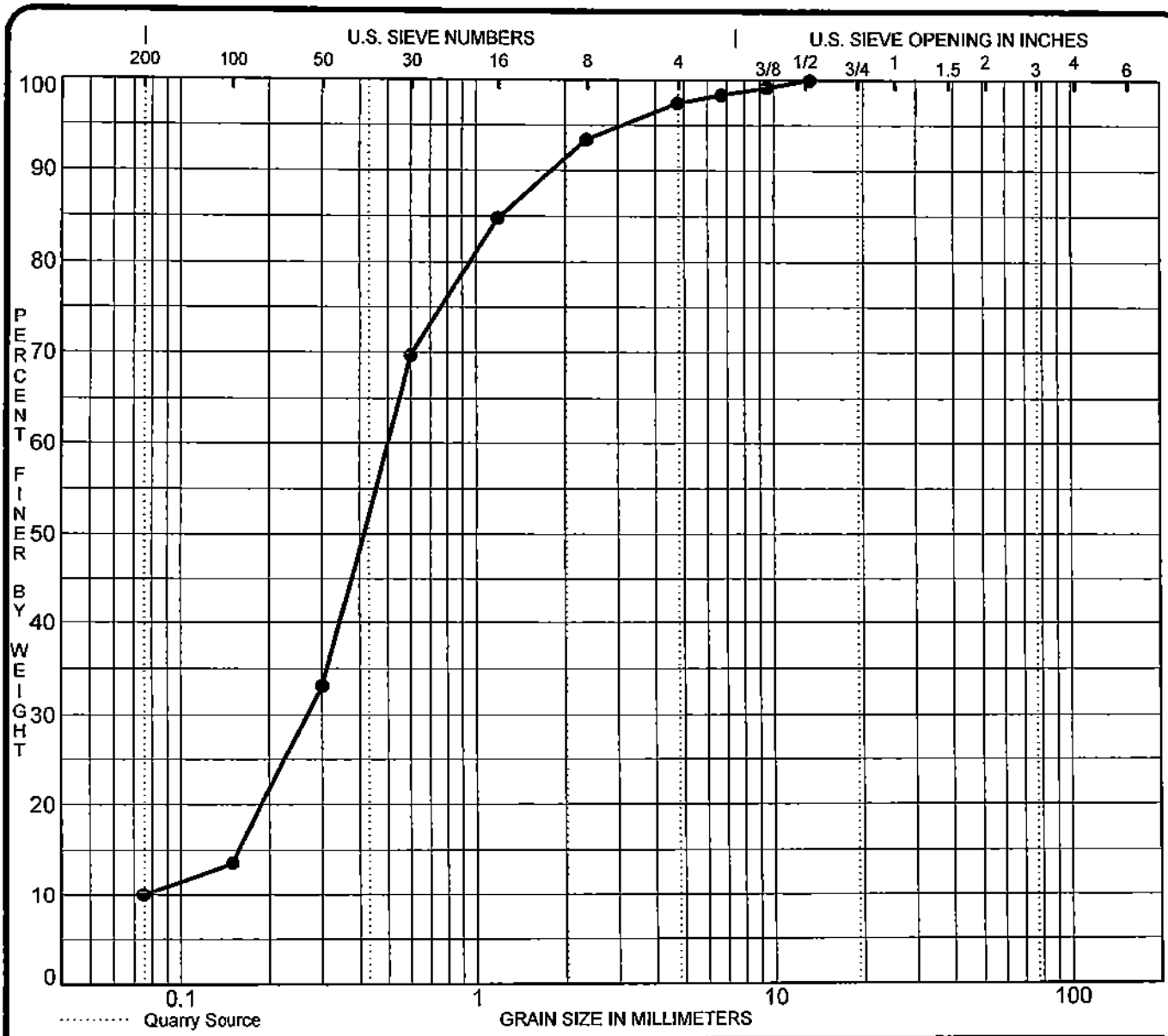
Static water level: 5.180 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
1	1.00	5.850	0.670
2	2.00	6.650	1.470
3	3.00	7.200	2.020
4	5.00	7.820	2.640
5	7.00	7.840	2.660
6	10.00	8.430	3.250
7	15.00	8.700	3.520
8	20.00	8.830	3.650
9	30.00	9.000	3.820
10	40.00	9.100	3.920
11	55.00	9.210	4.030
12	70.00	9.270	4.090
13	232.00	9.460	4.280
14	235.00	9.460	4.280
15	240.00	9.475	4.295
16	250.00	9.465	4.285

APPENDIX 3

Soil Laboratory Test Results

Water Laboratory Test Results



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**31599M**	SAND (SW)					**1.92**	**6.7**
⊠								
▲								
★								

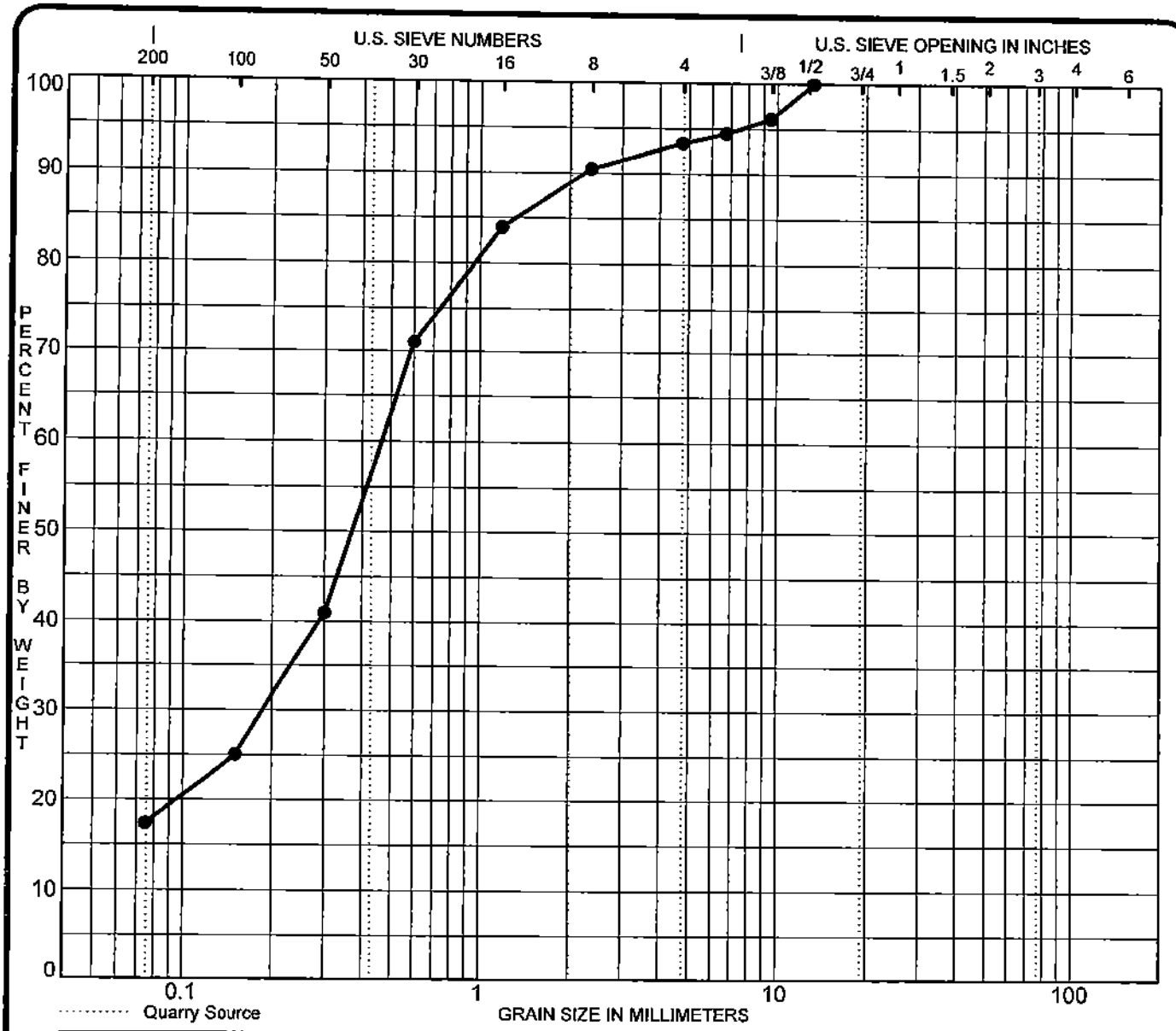
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**31599M**	**13.20**	**0.50**	**0.268**	**0.0750**	**2.5**	**87.5**	**10.0**	
⊠									
▲									
★									

CLIENT **ABS Construction** FILE NO. **PH0482**

PROJECT **Laboratory Testing - Zone # 3 - Depth 0.3 - 0.45** DATE **22 Feb 10**

patersongroup Consulting Engineers
28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● 31600M	SAND (SW) - ... TO GRAVELLY SAND						
⊠							
▲							
★							

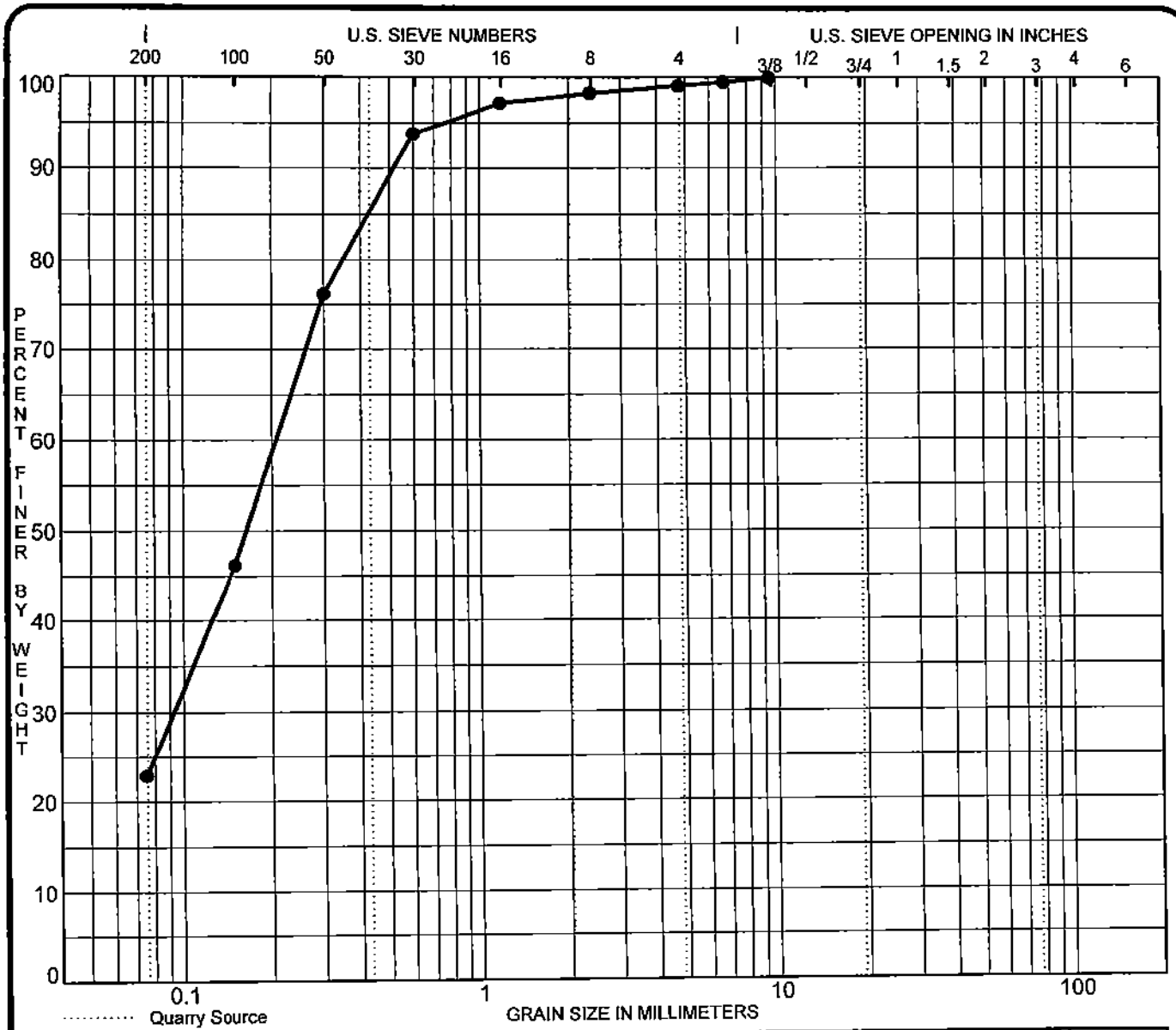
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 31600M	13.20	0.46	0.186		6.6	76.1	17.3	
⊠								
▲								
★								

CLIENT **ABS Construction** FILE NO. **PH0482**

PROJECT **Laboratory Testing - Zone # 4 - Depth 0.3 - 0.45** DATE **22 Feb 10**

patersongroup Consulting Engineers
28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● 31598M	SILTY SAND						
⊠							
▲							
★							

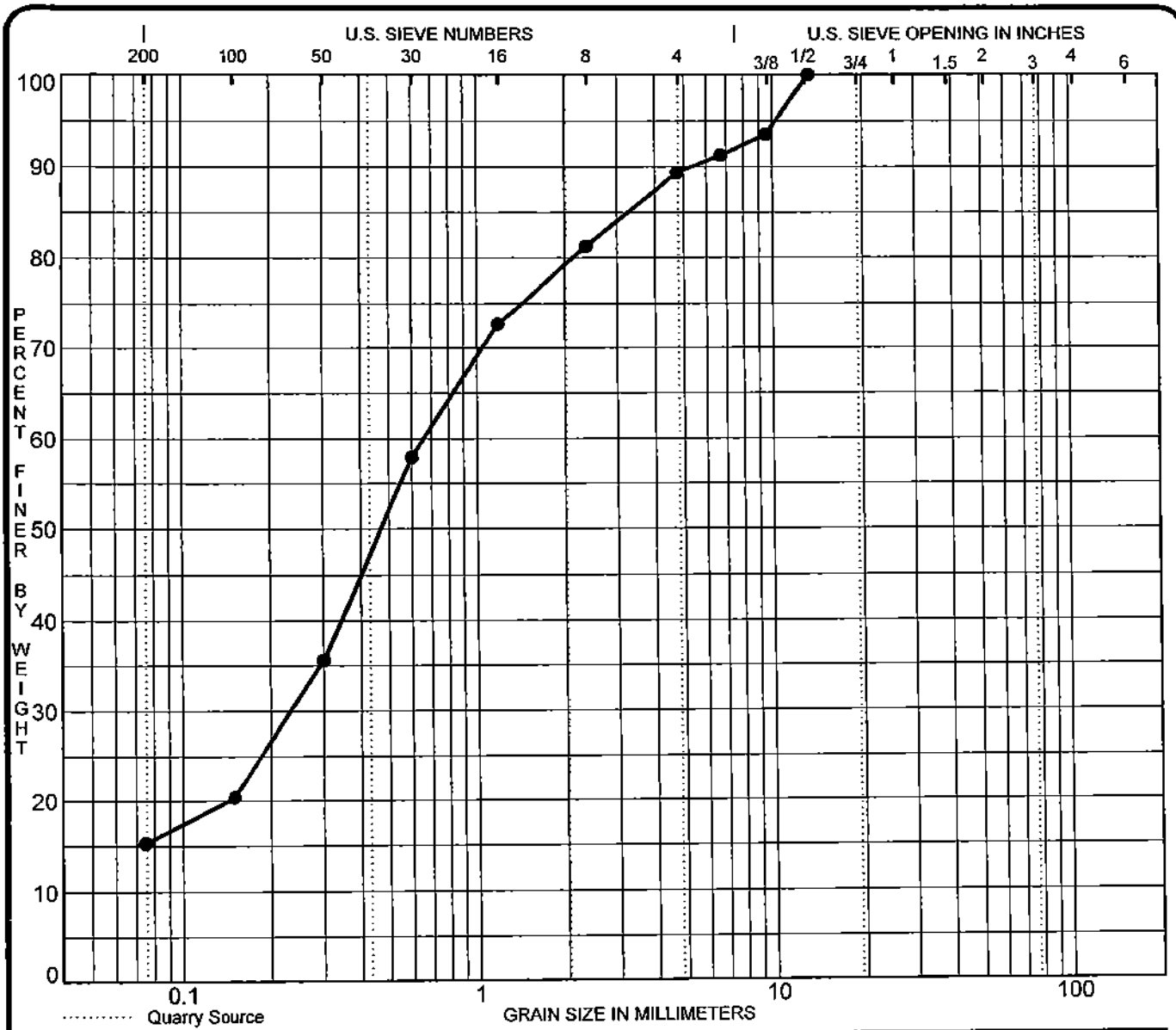
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 31598M	9.50	0.21	0.093		0.9	76.2	22.9	
⊠								
▲								
★								

CLIENT **ABS Construction** FILE NO. **PH0482**

PROJECT **Laboratory Testing - Zone # 2 - Depth 0.3 - 0.45** DATE **22 Feb 10**

patersongroup Consulting Engineers
28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● 31597M	SILTY SAND 1(SC-SM)						
⊠							
▲							
★							

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 31597M	13.20	0.66	0.232		10.6	74.1	15.3	
⊠								
▲								
★								

CLIENT **ABS Construction** FILE NO. **PH0482**

PROJECT **Laboratory Testing - Zone # 1 - Depth 0.3 - 0.45** DATE **19 Feb 10**

patersongroup Consulting Engineers
28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

GRAIN SIZE DISTRIBUTION

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 2703126
Date: 2007-02-19
Date Submitted: 2007-02-14

Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: 49792

P.O. Number: 5391
Matrix: Water

			LAB ID:	524516	524517				GUIDELINE		
			Sample Date:	2007-02-14	2007-02-14						
			Sample ID:	TW1 WS1	TW1 WS2				ODWSOG		
PARAMETER	UNITS	MDL							TYPE	LIMIT	UNITS
Total Coliforms	cf/100mL			0	0				MAC	0	cf/100mL
Escherichia Coli	cf/100mL			0	0				MAC	0	cf/100mL
Heterotrophic Plate Count	cf/1mL			0	0						
Faecal Coliforms	cf/100mL			0	0						
Faecal Streptococcus	cf/100mL			0	0						

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration
Comment.

APPROVAL:
Krista Quantrill
Microbiology Analyst

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 2703139
Date: 2007-02-16
Date Submitted: 2007-02-14

Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: 49792

P.O. Number: 5391
Matrix: Water

			LAB ID:	524535					GUIDELINE	
			Sample Date:	2007-02-14						
			Sample ID:	TW1 WS2					ODWSOG	
PARAMETER	**UNITS**	**MDL**							**TYPE**	**LIMIT**	**UNITS**
Alkalinity as CaCO3	mg/L	5	243						OG	500	mg/L
Chloride	mg/L	1	8						AO	250	mg/L
Colour	TCU	2	<2						AO	5	TCU
Conductivity	uS/cm	5	527								
Dissolved Organic Carbon	mg/L	0.5	1.5						AO	5	mg/L
Fluoride	mg/L	0.10	0.39						MAC	1.5	mg/L
Hydrogen Sulphide	mg/L	0.01	<0.01						AO	0.05	mg/L
N-NH3 (Ammonia)	mg/L	0.02	0.09								
N-NO2 (Nitrite)	mg/L	0.10	<0.10						MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.10	<0.10						MAC	10.0	mg/L
pH			8.13						AO	6.5-8.5	
Phenols	mg/L	0.001	<0.001								
Sulphate	mg/L	1	33						AO	500	mg/L
Tannin & Lignin	mg/L	0.1	0.2								
TDS (COND - CALC)	mg/L	5	343						AO	500	mg/L
Total Kjeldahl Nitrogen	mg/L	0.05	0.15								
Turbidity	NTU	0.1	4.6						AO	1.0	NTU
Hardness as CaCO3	mg/L	1	211						OG	100	mg/L
Ion Balance		0.01	0.94								
Calcium	mg/L	1	45								
Magnesium	mg/L	1	24								
Potassium	mg/L	1	4								
Sodium	mg/L	2	25						AO	20	mg/L
Iron	mg/L	0.03	0.47						AO	0.3	mg/L
Manganese	mg/L	0.01	0.02						AO	0.05	mg/L

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

Comment:

APPROVAL

Ewan McPeddie
Inorganic Lab Supervisor

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 2703136
Date: 2007-02-19
Date Submitted: 2007-02-14
Project: PH0462

INVOICE: Paterson Group Inc.
Chain of Custody Number: 49792
P.O. Number: 5391
Matrix: Water

			LAB ID:	524534					GUIDELINE		
			Sample Date:	2007-02-14							
			Sample ID:	TW1 WS1					ODWSOG		
PARAMETER	UNITS	MDL							TYPE	LIMIT	UNITS
Alkalinity as CaCO3	mg/L	5	242						OG	500	mg/L
Chloride	mg/L	1	7						AO	250	mg/L
Colour	TCU	2	2						AO	5	TCU
Conductivity	uS/cm	5	527								
Dissolved Organic Carbon	mg/L	0.5	1.7						AO	5	mg/L
Fluoride	mg/L	0.10	0.36						MAC	1.5	mg/L
Hydrogen Sulphide	mg/L	0.01	0.01						AO	0.05	mg/L
N-NH3 (Ammonia)	mg/L	0.02	0.10								
N-NO2 (Nitrite)	mg/L	0.10	<0.10						MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.10	<0.10						MAC	10.0	mg/L
pH			8.10						AO	6.5-8.5	
Phenols	mg/L	0.001	<0.001								
Sulphate	mg/L	1	34						AO	500	mg/L
Tannin & Lignin	mg/L	0.1	0.2								
TDS (COND - CALC)	mg/L	5	343						AO	500	mg/L
Total Kjeldahl Nitrogen	mg/L	0.05	0.15								
Turbidity	NTU	0.1	12.0						AO	1.0	NTU
Hardness as CaCO3	mg/L	1	232						OG	100	mg/L
Ion Balance		0.01	0.99								
Calcium	mg/L	1	50								
Magnesium	mg/L	1	26								
Potassium	mg/L	1	5								
Sodium	mg/L	2	22						AO	20	mg/L
Iron	mg/L	0.03	0.66						AO	0.3	mg/L
Manganese	mg/L	0.01	0.02						AO	0.05	mg/L

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

APPROVAL:
Ewa Merkowicz
Inorganic Lab Supervisor

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 2704804
Date: 2007-03-15
Date Submitted: 2007-03-12

Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: 51925

P.O. Number: 4247
Matrix: Water

			LAB ID:	529574	529575				GUIDELINE		
			Sample Date:	2007-03-12	2007-03-12						
			Sample ID:	TW2 WS1	TW2 WS2				ODWSOG		
PARAMETER	**UNITS**	**MDL**							**TYPE**	**LIMIT**	**UNITS**
Total Coliforms	ct/100mL			0	0				MAC	0	ct/100mL
Escherichia Coli	ct/100mL			0	0				MAC	0	ct/100mL
Heterotrophic Plate Count	ct/1mL			>500	185						
Faecal Coliforms	ct/100mL			0	0						
Faecal Streptococcus	ct/100mL			0	0						

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

Comment:

APPROVAL: Krista Quantrill
Krista Quantrill
Microbiology Analyst

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 2704803
Date: 2007-03-15
Date Submitted: 2007-03-12
Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: 51925

P.O. Number: 4247
Matrix: Water

	LAB ID:	529572	529573				GUIDELINE		
	Sample Date:	2007-03-12	2007-03-12						
	Sample ID:	TW2 WS1	TW2 WS2				ODWSOG		
PARAMETER	UNITS	MDL					TYPE	LIMIT	UNITS
Alkalinity as CaCO3	mg/L	5	193	199			OG	500	mg/L
Chloride	mg/L	1	6	6			AO	250	mg/L
Colour	TCU	2	<2	<2			AO	5	TCU
Conductivity	uS/cm	5	414	419					
Dissolved Organic Carbon	mg/L	0.5	2.8	2.4			AO	5	mg/L
Fluoride	mg/L	0.10	0.40	0.42			MAC	1.5	mg/L
Hydrogen Sulphide	mg/L	0.01	0.02	0.02			AO	0.05	mg/L
N-NH3 (Ammonia)	mg/L	0.02	0.23	0.23					
N-NO2 (Nitrite)	mg/L	0.10	<0.10	<0.10			MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.10	<0.10	<0.10			MAC	10.0	mg/L
pH			8.29	8.33			AO	6.5-8.5	
Phenols	mg/L	0.001	<0.001	<0.001					
Sulphate	mg/L	1	20	20			AO	500	mg/L
Tannin & Lignin	mg/L	0.1	0.2	0.1					
TDS (COND - CALC)	mg/L	5	269	272			AO	500	mg/L
Total Kjeldahl Nitrogen	mg/L	0.05	0.29	0.20					
Turbidity	NTU	0.1	23.4	15.6			AO	1.0	NTU
Hardness as CaCO3	mg/L	1	204	213			OG	100	mg/L
Ion Balance		0.01	1.06	1.06					
Calcium	mg/L	1	37	39					
Magnesium	mg/L	1	27	28					
Potassium	mg/L	1	5	4					
Sodium	mg/L	2	12	11			AO	20	mg/L
Iron	mg/L	0.03	1.47	0.33			AO	0.3	mg/L
Manganese	mg/L	0.01	0.03	0.02			AO	0.05	mg/L

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

Comment:
529572: Holding time for turbidity analysis was exceeded
529573: Holding time for turbidity analysis was exceeded.

APPROVAL:
Ewan MacRobbie
Inorganic Lab Supervisor

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 2704187
Date: 2007-03-08
Date Submitted: 2007-03-02

Project: PHO482

INVOICE: Paterson Group Inc.
Chain of Custody Number: 55862

P.O. Number: 4251
Matrix: Water

	LAB ID:	527607	527608				GUIDELINE		
	Sample Date:	2007-03-01	2007-03-01						
	Sample ID:	TW3 WS1	TW3 WS2				ODWSOG		
PARAMETER	UNITS	MDL					TYPE	LIMIT	UNITS
Alkalinity as CaCO3	mg/L	5	212	212			OG	500	mg/L
Chloride	mg/L	1	44	44			AO	250	mg/L
Colour	TCU	2	2	<2			AO	5	TCU
Conductivity	uS/cm	5	617	619					
Dissolved Organic Carbon	mg/L	0.5	1.6	1.5			AO	5	mg/L
Fluoride	mg/L	0.10	0.30	0.30			MAC	1.5	mg/L
Hydrogen Sulphide	mg/L	0.01	<0.01	<0.01			AO	0.05	mg/L
N-NH3 (Ammonia)	mg/L	0.02	0.08	<0.02					
N-NO2 (Nitrite)	mg/L	0.10	<0.10	<0.10			MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.10	<0.10	<0.10			MAC	10.0	mg/L
pH			7.97	8.00			AO	6.5-8.5	
Phenols	mg/L	0.001	<0.001	<0.001					
Sulphate	mg/L	1	48	48			AO	500	mg/L
Tannin & Lignin	mg/L	0.1	<0.1	<0.1					
TDS (COND - CALC)	mg/L	5	401	402			AO	500	mg/L
Total Kjeldahl Nitrogen	mg/L	0.05	0.11	0.09					
Turbidity	NTU	0.1	2.3	1.9			AO	1.0	NTU
Hardness as CaCO3	mg/L	1	252	261			OG	100	mg/L
Ion Balance		0.01	1.01	1.03					
Calcium	mg/L	1	58	60					
Magnesium	mg/L	1	26	27					
Potassium	mg/L	1	4	4					
Sodium	mg/L	2	32	32			AO	20	mg/L
Iron	mg/L	0.03	0.25	0.26			AO	0.3	mg/L
Manganese	mg/L	0.01	0.02	0.02			AO	0.05	mg/L

MDL = Method Detection 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

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: **Paterson Group**
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: **Mr. Robert Passmore**

Report Number: 2704188
Date: 2007-03-05
Date Submitted: 2007-03-02

Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: 55962

P.O. Number:
Matrix: Water

			LAB ID:	527614	527615				GUIDELINE		
			Sample Date:	2007-03-01	2007-03-01						
			Sample ID:	TW3 WS1	TW3 WS2				ODWSOG		
PARAMETER	UNITS	MDL							TYPE	LIMIT	UNITS
Total Coliforms	cf/100mL			0	0				MAC	0	cf/100mL
Escherichia Coli	cf/100mL			0	0				MAC	0	cf/100mL
Heterotrophic Plate Count	cf/1mL			0	0						
Faecal Coliforms	cf/100mL			0	0						
Faecal Streptococcus	cf/100mL			0	0						

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

APPROVAL:
Krista Quantrill
Microbiology Analyst

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

INVOICE: Paterson Group Inc.
Chain of Custody Number: 55863

Report Number: 2704215
Date: 2007-03-12
Date Submitted: 2007-03-02

Project: PH0482

P.O. Number: 4251
Matrix: Water

			LAB ID:	527650	527651				GUIDELINE		
			Sample Date:	2007-03-02	2007-03-02						
			Sample ID:	TW4 WS1	TW4 WS2				ODWSOG		
PARAMETER	UNITS	MDL							TYPE	LIMIT	UNITS
Alkalinity as CaCO3	mg/L	5		240	242				OG	500	mg/L
Chloride	mg/L	1		5	2				AO	250	mg/L
Colour	TCU	2		<2	<2				AO	5	TCU
Conductivity	uS/cm	5		525	525						
Dissolved Organic Carbon	mg/L	0.5		1.2	1.3				AO	5	mg/L
Fluoride	mg/L	0.10		0.12	0.12				MAC	1.5	mg/L
Hydrogen Sulphide	mg/L	0.01		<0.01	N/A				AO	0.05	mg/L
N-NH3 (Ammonia)	mg/L	0.02		0.03	<0.02						
N-NO2 (Nitrite)	mg/L	0.10		<0.10	<0.10				MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.10		<0.10	<0.10				MAC	10.0	mg/L
pH				7.84	7.90				AO	6.5-8.5	
Phenols	mg/L	0.001		<0.001	<0.001						
Sulphate	mg/L	1		43	44				AO	500	mg/L
Tannin & Lignin	mg/L	0.1		<0.1	<0.1						
TDS (COND - CALC)	mg/L	5		341	341				AO	500	mg/L
Total Kjeldahl Nitrogen	mg/L	0.05		<0.05	<0.05						
Turbidity	NTU	0.1		10.8	64.9				AO	1.0	NTU
Hardness as CaCO3	mg/L	1		288	291				OG	100	mg/L
Ion Balance		0.01		1.04	1.05						
Calcium	mg/L	1		71	72						
Magnesium	mg/L	1		27	27						
Potassium	mg/L	1		1	1						
Sodium	mg/L	2		6	6				AO	20	mg/L
Iron	mg/L	0.03		0.26	0.69				AO	0.3	mg/L
Manganese	mg/L	0.01		0.04	0.06				AO	0.05	mg/L

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

527651: H2S analysis is not available due to cloudy sample N/A = Not Available.

APPROVAL:
Ewan M. Rebbeck
Inorganic Lab Supervisor

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 2704213
Date: 2007-03-05
Date Submitted: 2007-03-02
Project: PH0482
P.O. Number: 4251
Matrix: Water

INVOICE: Paterson Group Inc
Chain of Custody Number: 55863

	LAB ID:	527648	527649				GUIDELINE		
	Sample Date:	2007-03-02	2007-03-02						
	Sample ID:	TW4 WS1	TW4 WS2				ODWSOG		
PARAMETER	UNITS	MDL					TYPE	LIMIT	UNITS
Total Coliforms	ct/100mL		0	0			MAC	0	ct/100mL
Escherichia Coli	ct/100mL		0	0			MAC	0	ct/100mL
Heterotrophic Plate Count	ct/1mL		0	0					
Faecal Coliforms	ct/100mL		0	0					
Faecal Streptococcus	ct/100mL		0	0					

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

APPROVAL

Krista Quantrill
Microbiology Analyst

EXOVA ACCUTEST

REPORT OF ANALYSIS

Exova Accutest

Client: **Paterson Group**
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: **Mr. Robert Passmore**

Report Number: 1025567
Date: 2010-10-25
Date Submitted: 2010-10-18

Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: **124240**

P.O. Number:
Matrix: Water

			LAB ID:					GUIDELINE		
			Sample Date:							
			Sample ID:							
PARAMETER	**UNITS**	**MRL**						**TYPE**	**LIMIT**	**UNITS**
Total Coliforms	CFU/100mL		0							
Escherichia Coli	CFU/100mL		0							
Heterotrophic Plate Count	CFU/1mL		0							
Faecal Coliforms	CFU/100mL		0							
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:
Jennifer Mitchell
Microbiology Lab Supervisor

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

EXOVA ACCUTEST

REPORT OF ANALYSIS

Exova Accutest

Client: **Paterson Group**
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: **Mr. Robert Passmore**

Report Number: 1022331
Date: 2010-09-20
Date Submitted: 2010-09-15

Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: 129681

P.O. Number: 7892
Matrix: Water

			LAB ID:	828613	828614				**GUIDELINE**	
			Sample Date:	2010-09-14	2010-09-14					
			Sample ID:	WS1-TW4-14/09/10	WS2-TW4-14/09/10				ODWSOG	
PARAMETER	**UNITS**	**MRL**							**TYPE**	**LIMIT**	**UNITS**
Total Coliforms	CFU/100mL			OG	OG				MAC	0	CFU/100mL
Escherichia Coli	CFU/100mL			0	0				MAC	0	CFU/100mL
Heterotrophic Plate Count	CFU/1mL			82	58						
Faecal Coliforms	CFU/100mL			0	0						
Faecal Streptococcus	CFU/100mL			0	0						

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

Comment:
828613: OG = Overgrown.
828614: OG = Overgrown.

APPROVAL:
Jennifer Mitchell
Microbiology Lab Supervisor

EXOVA ACCUTEST

REPORT OF ANALYSIS

Exova Accutest

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Paesmore

Report Number: 1022296
Date: 2010-09-21
Date Submitted: 2010-09-14

Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: 129681

P.O. Number:
Matrix: Water

			LAB ID:	828519	828520				GUIDELINE		
			Sample Date:	2010-09-14	2010-09-14				ODWSOG		
			Sample ID:	WS1-TW4-14/09/10	WS2-TW4-14/09/10						
PARAMETER	UNITS	MRL							TYPE	LIMIT	UNITS
Alkalinity as CaCO3	mg/L	5		195	195				OG	500	mg/L
Chloride	mg/L	1		45	44				AO	250	mg/L
Colour	TCU	2		<2	2				AO	5	TCU
Conductivity	uS/cm	5		579	577						
Dissolved Organic Carbon	mg/L	0.5		1.4	1.5				AO	5	mg/L
Fluoride	mg/L	0.1		0.34	0.33				MAC	1.5	mg/L
Hydrogen Sulphide	mg/L	0.01		<0.01	<0.01				AO	0.05	mg/L
N-NH3 (Ammonia)	mg/L	0.02		0.03	0.03						
N-NO2 (Nitrite)	mg/L	0.1		<0.10	<0.10				MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.1		<0.10	<0.10				MAC	10.0	mg/L
pH				8.18	8.21					6.5-8.5	
Phenols	mg/L	0.001		<0.001	<0.001						
Sulphate	mg/L	1		37	36				AO	500	mg/L
Tannin & Lignin	mg/L	0.1		<0.1	<0.1						
Total Dissolved Solids (COND - CALC)	mg/L	5		376	375				AO	500	mg/L
Total Kjeldahl Nitrogen	mg/L	0.1		<0.10	<0.10						
Turbidity	NTU	0.1		0.6	0.4				MAC	1.0	NTU
Hardness as CaCO3	mg/L	1		217	215				OG	100	mg/L
Ion Balance		0.01		1.01	0.99						
Calcium	mg/L	1		49	48						
Magnesium	mg/L	1		23	23						
Potassium	mg/L	1		4	4						
Sodium	mg/L	2		36	34				AO	200	mg/L
Iron	mg/L	0.03		0.12	0.11				AO	0.3	mg/L
Manganese	mg/L	0.01		0.02	0.02				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

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 2704935
Date: 2007-03-19
Date Submitted: 2007-03-14

Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: 51926

P.O. Number: 4247
Matrix: Water

			LAB ID:	529993	529994				GUIDELINE		
			Sample Date:	2007-03-13	2007-03-13						
			Sample ID:	TW5 WS1	TW5 WS2				ODWSOG		
PARAMETER	UNITS	MDL							TYPE	LIMIT	UNITS
Total Coliforms	ct/100mL			3	0				MAC	0	ct/100mL
Escherichia Coli	ct/100mL			0	0				MAC	0	ct/100mL
Heterotrophic Plate Count	ct/1mL			17	21						
Faecal Coliforms	ct/100mL			0	0						
Faecal Streptococcus	ct/100mL			0	0						

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

APPROVAL: Krista Quantrill
Microbiology Analyst

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: **Paterson Group**
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: **Mr. Robert Passmore**

Report Number: 2704924
Date: 2007-03-19
Date Submitted: 2007-03-14

Project: PH0462

INVOICE: Paterson Group Inc.
Chain of Custody Number: **51926**

P.O. Number: 4247
Matrix: Water

	LAB ID:	529977	529978				GUIDELINE		
	Sample Date:	2007-03-13	2007-03-13						
	Sample ID:	TW5 WS1	TW5 WS2				ODWSOG		
PARAMETER	**UNITS**	**MDL**					**TYPE**	**LIMIT**	**UNITS**
Alkalinity as CaCO3	mg/L	5	178	178			OG	500	mg/L
Chloride	mg/L	1	4	4			AO	250	mg/L
Colour	TCU	2	<2	3			AO	5	TCU
Conductivity	uS/cm	5	376	376					
Dissolved Organic Carbon	mg/L	0.5	1.7	1.7			AO	5	mg/L
Fluoride	mg/L	0.10	0.71	0.71			MAC	1.5	mg/L
Hydrogen Sulphide	mg/L	0.01	<0.01	<0.01			AO	0.05	mg/L
N-NH3 (Ammonia)	mg/L	0.02	0.14	0.14					
N-NO2 (Nitrite)	mg/L	0.10	<0.10	<0.10			MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.10	<0.10	<0.10			MAC	10.0	mg/L
pH			8.19	8.20			AO	6.5-8.5	
Phenols	mg/L	0.001	<0.001	<0.001					
Sulphate	mg/L	1	15	15			AO	500	mg/L
Tannin & Lignin	mg/L	0.1	0.1	0.1					
TDS (COND - CALC)	mg/L	5	244	244			AO	500	mg/L
Total Kjeldahl Nitrogen	mg/L	0.05	0.17	0.17					
Turbidity	NTU	0.1	0.3	0.6			AO	1.0	NTU
Hardness as CaCO3	mg/L	1	121	127			OG	100	mg/L
Ion Balance		0.01	0.96	1.00					
Calcium	mg/L	1	22	23					
Magnesium	mg/L	1	16	17					
Potassium	mg/L	1	4	4					
Sodium	mg/L	2	31	31			AO	20	mg/L
Iron	mg/L	0.03	0.06	0.05			AO	0.3	mg/L
Manganese	mg/L	0.01	<0.01	<0.01			AO	0.05	mg/L

MDL = Method Detection 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

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 2705468
Date: 2007-03-26
Date Submitted: 2007-03-22

Project: PH0452

P.O. Number:
Matrix: Water

INVOICE: Paterson Group Inc.
Chain of Custody Number: 52194

			LAB ID:	531325	531326				GUIDELINE		
			Sample Date:	2007-03-21	2007-03-21				ODWSOG		
			Sample ID:	TW6 WS1	TW6 WS2						
PARAMETER	UNITS	MDL							TYPE	LIMIT	UNITS
Total Coliforms	ct/100mL			0	0				MAC	0	ct/100mL
Escherichia Coli	ct/100mL			0	0				MAC	0	ct/100mL
Heterotrophic Plate Count	ct/1mL			0	1						
Faecal Coliforms	ct/100mL			0	0						
Faecal Streptococcus	ct/100mL			0	0						

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

Comment:

APPROVAL: Krista Quantrill
Microbiology Analyst

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: **Paterson Group**
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 2705474
Date: 2007-03-26
Date Submitted: 2007-03-22

Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: 52194

P.O. Number:
Matrix: Water

	LAB ID:	531353	531354				GUIDELINE		
	Sample Date:	2007-03-21	2007-03-21				ODWSOG		
	Sample ID:	TW6 WS1	TW6 WS2						
PARAMETER	UNITS	MDL					TYPE	LIMIT	UNITS
Alkalinity as CaCO3	mg/L	5	227	226			OG	500	mg/L
Chloride	mg/L	1	7	7			AO	250	mg/L
Colour	TCU	2	3	3			AO	5	TCU
Conductivity	uS/cm	5	477	476					
Dissolved Organic Carbon	mg/L	0.5	2.0	2.1			AO	5	mg/L
Fluoride	mg/L	0.10	0.32	0.32			MAC	1.5	mg/L
Hydrogen Sulphide	mg/L	0.01	0.01	<0.01			AO	0.05	mg/L
N-NH3 (Ammonia)	mg/L	0.02	0.15	0.15					
N-NO2 (Nitrite)	mg/L	0.10	<0.10	<0.10			MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.10	<0.10	<0.10			MAC	10.0	mg/L
pH			8.11	8.14			AO	6.5-8.5	
Phenols	mg/L	0.001	<0.001	<0.001					
Sulphate	mg/L	1	24	24			AO	500	mg/L
Tannin & Lignin	mg/L	0.1	0.2	0.2					
TDS (COND - CALC)	mg/L	5	310	309			AO	500	mg/L
Total Kjeldahl Nitrogen	mg/L	0.05	[redacted]	[redacted]					
Turbidity	NTU	0.1	1.0	1.0			AO	1.0	NTU
Hardness as CaCO3	mg/L	1	222	229			OG	100	mg/L
Ion Balance		0.01	0.91	0.95					
Calcium	mg/L	1	46	47					
Magnesium	mg/L	1	26	27					
Potassium	mg/L	1	3	3					
Sodium	mg/L	2	6	7			AO	20	mg/L
Iron	mg/L	0.03	0.17	0.18			AO	0.3	mg/L
Manganese	mg/L	0.01	0.01	0.01			AO	0.05	mg/L

MDL = Method Detection 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

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 2801811
Date: 2008-01-28
Date Submitted: 2008-01-25

Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: 74467

P.O. Number: 5758
Matrix: Water

			LAB ID:	600527	600528				GUIDELINE		
			Sample Date:	2008-01-24	2008-01-24						
			Sample ID:	~~TW5~~ WS1 ~~TW7~~	TW5 WS2 ~~TW7~~				ODWSOG		
PARAMETER	UNITS	MRL							TYPE	LIMIT	UNITS
Total Coliforms	ct/100mL			0	0				MAC	0	ct/100mL
Escherichia Coli	ct/100mL			0	0				MAC	0	ct/100mL
Heterotrophic Plate Count	ct/1mL			0	0						
Faecal Coliforms	ct/100mL			0	0						
Faecal Streptococcus	ct/100mL			0	0						

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

APPROVAL:
Tim McCooeye
QC Manager

ACCUTEST LABORATORIES LTD

REPORT OF ANALYSIS

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 2801841
Date: 2008-01-30
Date Submitted: 2008-01-25
Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: 74467

P.O. Number: 5758
Matrix: Water

	LAB ID:	600605	600606				GUIDELINE		
	Sample Date:	2008-01-24	2008-01-24						
	Sample ID:	~~TW5~~ WS1 ~~TW7~~	TW5 WS2 ~~TW7~~				ODWSOG		
PARAMETER	UNITS	MRL					TYPE	LIMIT	UNITS
Alkalinity as CaCO3	mg/L	5	398	399			OG	500	mg/L
Chloride	mg/L	1	20	20			AO	250	mg/L
Colour	TCU	2	26	26			AO	5	TCU
Conductivity	uS/cm	5	1090	1090					
Dissolved Organic Carbon	mg/L	0.5	14.8	13.2			AO	5	mg/L
Fluoride	mg/L	0.10	<0.10	<0.10			MAC	1.5	mg/L
Hydrogen Sulphide	mg/L	0.01	0.01	0.01			AO	0.05	mg/L
N-NH3 (Ammonia)	mg/L	0.02	0.77	0.76					
N-NO2 (Nitrite)	mg/L	0.10	<0.10	<0.10			MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.10	<0.10	<0.10			MAC	10.0	mg/L
pH			7.95	7.95			AO	6.5-8.5	
Phenols	mg/L	0.001	<0.001	<0.001					
Sulphate	mg/L	1	202	200			AO	500	mg/L
Tannin & Lignin	mg/L	0.1	1.0	1.1					
TDS (COND - CALC)	mg/L	5	708	708			AO	500	mg/L
Total Kjeldahl Nitrogen	mg/L	0.10	1.29	1.23					
Turbidity	NTU	0.1	26.5	27.6			AO	1.0	NTU
Hardness as CaCO3	mg/L	1	635	649			OG	100	mg/L
Ion Balance		0.01	1.05	1.07					
Calcium	mg/L	1	175	179					
Magnesium	mg/L	1	48	49					
Potassium	mg/L	1	2	2					
Sodium	mg/L	2	13	13			AO	20	mg/L
Iron	mg/L	0.03	4.78	4.73			AO	0.3	mg/L
Manganese	mg/L	0.01	0.30	0.30			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 McCobbie
Inorganic Lab Supervisor

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 2929266
Date: 2009-11-30
Date Submitted: 2009-11-27

Project: PH04B2

INVOICE: Paterson Group Inc.
Chain of Custody Number: 105053

P.O. Number: 8378
Matrix: Water

			LAB ID:	763514	763515				GUIDELINE		
			Sample Date:	2009-11-27	2009-11-27						
			Sample ID:	TW7-WS1-09	TW7-WS2-09				ODWSOG		
PARAMETER	UNITS	MRL							TYPE	LIMIT	UNITS
Total Coliforms	CFU/100mL			0	0				MAC	0	CFU/100mL
Escherichia Coli	CFU/100mL			0	0				MAC	0	CFU/100mL
Heterotrophic Plate Count	CFU/1mL			1	3						
Faecal Coliforms	CFU/100mL			0	0						
Faecal Streptococcus	CFU/100mL			0	0						

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
Nepean, ON
K2E 7T7
Attention: Mr. Robert Pasmore

Report Number: 2929267
Date: 2009-12-03
Date Submitted: 2009-11-27
Project: PH04B2

INVOICE: Paterson Group Inc.
Chain of Custody Number: 105053

P.O. Number: 8378
Matrix: Water

			LAB ID:	763516	763517				GUIDELINE		
			Sample Date:	2009-11-27	2009-11-27						
			Sample ID:	TW7- WS1-09	TW7- WS2-09				ODWSOG		
PARAMETER	UNITS	MRL							TYPE	LIMIT	UNITS
Alkalinity as CaCO3	mg/L	5		382	384				OG	500	mg/L
Chloride	mg/L	1		16	16				AO	250	mg/L
Colour	TCU	2		19	21				AO	5	TCU
Conductivity	uS/cm	5		938	941						
Dissolved Organic Carbon	mg/L	0.5		10.8	12.4				AO	5	mg/L
Fluoride	mg/L	0.1		0.14	0.14				MAC	1.5	mg/L
Hydrogen Sulphide	mg/L	0.01		<0.01	<0.01				AO	0.05	mg/L
N-NH3 (Ammonia)	mg/L	0.02		0.65	0.65						
N-NO2 (Nitrite)	mg/L	0.1		<0.10	<0.10				MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.1		<0.10	<0.10				MAC	10.0	mg/L
pH				7.96	7.97					6.5-8.5	
Phenols	mg/L	0.001		<0.001	<0.001						
Sulphate	mg/L	1		122	130				AO	500	mg/L
Tannin & Lignin	mg/L	0.1		0.8	0.8						
Total Dissolved Solids (COND - CALC)	mg/L	5		610	612				AO	500	mg/L
Total Kjeldahl Nitrogen	mg/L	0.1		0.72	0.64						
Turbidity	NTU	0.1		21.0	19.0				MAC	1.0	NTU
Hardness as CaCO3	mg/L	1		482	484				OG	100	mg/L
Ion Balance		0.01		0.97	0.96						
Calcium	mg/L	1		127	128						
Magnesium	mg/L	1		40	40						
Potassium	mg/L	1		2	2						
Sodium	mg/L	2		14	15				AO	200	mg/L
Iron	mg/L	0.03		3.39	3.33				AO	0.3	mg/L
Manganese	mg/L	0.01		0.20	0.20				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

EXOVA ACCUTEST

REPORT OF ANALYSIS

Exova Accutest

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 1000576
Date: 2010-01-14
Date Submitted: 2010-01-12

Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: 106392

P.O. Number:
Matrix: Water

			LAB ID:	770701					**GUIDELINE**	
			Sample Date:	2010-01-12						
			Sample ID:	WS Jan 12/10					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		5								
Faecal Coliforms	CFU/100mL		0								
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

EXOVA ACCUTEST

REPORT OF ANALYSIS

Exova Accutest

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 1000596
Date: 2010-01-20
Date Submitted: 2010-01-12

Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: 106392

P.O. Number:
Matrix: Water

								GUIDELINE		
		LAB ID:	770726							
		Sample Date:	2010-01-12							
		Sample ID:	WS JAN 12/10					ODWSOG		
PARAMETER	UNITS	MRL						TYPE	LIMIT	UNITS
Alkalinity as CaCO3	mg/L	5	337					OG	500	mg/L
Chloride	mg/L	1	15					AO	250	mg/L
Colour	TCU	2	18					AO	5	TCU
Conductivity	uS/cm	5	821							
Dissolved Organic Carbon	mg/L	0.5	7.8					AO	5	mg/L
Fluoride	mg/L	0.1	0.22					MAC	1.5	mg/L
Hydrogen Sulphide	mg/L	0.01	<0.01					AO	0.05	mg/L
N-NH3 (Ammonia)	mg/L	0.02	0.54							
N-NO2 (Nitrite)	mg/L	0.1	<0.10					MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.1	<0.10					MAC	10.0	mg/L
pH			7.85						6.5-8.5	
Phenols	mg/L	0.001	<0.001							
Sulphate	mg/L	1	112					AO	500	mg/L
Tannin & Lignin	mg/L	0.1	0.5							
Total Dissolved Solids (COND - CALC)	mg/L	5	534					AO	500	mg/L
Total Kjeldahl Nitrogen	mg/L	0.1	0.56							
Turbidity	NTU	0.1	7.0					MAC	1.0	NTU
Hardness as CaCO3	mg/L	1	372					OG	100	mg/L
Ion Balance		0.01	0.92							
Calcium	mg/L	1	93							
Magnesium	mg/L	1	34							
Potassium	mg/L	1	3							
Sodium	mg/L	2	27					AO	200	mg/L
Iron	mg/L	0.03	1.70					AO	0.3	mg/L
Manganese	mg/L	0.01	0.10					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

EXOVA ACCUTEST

REPORT OF ANALYSIS

Exova Accutest

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

INVOICE: Paterson Group Inc.
Chain of Custody Number: 106397

Report Number: 1001869
Date: 2010-02-01
Date Submitted: 2010-01-29

Project: PH0482

P.O. Number: 7886
Matrix: Water

	LAB ID:	774085					GUIDELINE		
	Sample Date:	2010-01-29					ODWSOG		
	Sample ID:	WS1-29-10 2							
PARAMETER	UNITS	MRL					TYPE	LIMIT	UNITS
Colour	TCU	2	7				AO	5	TCU
Turbidity	NTU	0.1	3.4				MAC	1.0	NTU
Iron	mg/L	0.03	0.87				AO	0.3	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

EXOVA ACCUTEST

REPORT OF ANALYSIS

Exova Accutest

Client: **Paterson Group**
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: **Mr. Robert Passmore**

Report Number: 1022585
Date: 2010-09-20
Date Submitted: 2010-09-17

Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: **129664**

P.O. Number: 7892
Matrix: Water

								GUIDELINE		
			LAB ID:	829312						
			Sample Date:	2010-09-17						
			Sample ID:	TW6-WS2				ODWSOG		
PARAMETER	**UNITS**	**MRL**						**TYPE**	**LIMIT**	**UNITS**
Total Coliforms	CFU/100mL		1					MAC	0	CFU/100mL
Escherichia Coli	CFU/100mL		0					MAC	0	CFU/100mL
Heterotrophic Plate Count	CFU/1mL		86							
Faecal Coliforms	CFU/100mL		0							
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:
Jennifer Mitchell
Microbiology Lab Supervisor

EXOVA ACCUTEST

REPORT OF ANALYSIS

Exova Accutest

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 1022567
Date: 2010-09-21
Date Submitted: 2010-09-17

Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: 106399

P.O. Number: 7892
Matrix: Water

		LAB ID:	829275					**GUIDELINE**	
		Sample Date:	2010-09-16						
		Sample ID:	TW8-WS1					ODWSOG	
PARAMETER	**UNITS**	**MRL**						**TYPE**	**LIMIT**	**UNITS**
Alkalinity as CaCO3	mg/L	5	294					OG	500	mg/L
Chloride	mg/L	1	13					AO	250	mg/L
Colour	TCU	2	13					AO	5	TCU
Conductivity	uS/cm	5	711							
Dissolved Organic Carbon	mg/L	0.5	5.0					AO	5	mg/L
Fluoride	mg/L	0.1	0.41					MAC	1.5	mg/L
Hydrogen Sulphide	mg/L	0.01	<0.01					AO	0.05	mg/L
N-NH3 (Ammonia)	mg/L	0.02	0.21							
N-NO2 (Nitrite)	mg/L	0.1	<0.10					MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.1	<0.10					MAC	10.0	mg/L
pH			8.16						6.5-8.5	
Phenols	mg/L	0.001	<0.001							
Sulphate	mg/L	1	76					AO	500	mg/L
Tannin & Lignin	mg/L	0.1	0.2							
Total Dissolved Solids (COND - CALC)	mg/L	5	462					AO	500	mg/L
Total Kjeldahl Nitrogen	mg/L	0.1	0.53							
Turbidity	NTU	0.1	0.9					MAC	1.0	NTU
Hardness as CaCO3	mg/L	1	248					OG	100	mg/L
Ion Balance		0.01	0.94							
Calcium	mg/L	1	50							
Magnesium	mg/L	1	30							
Potassium	mg/L	1	6							
Sodium	mg/L	2	51					AO	200	mg/L
Iron	mg/L	0.03	0.44					AO	0.3	mg/L
Manganese	mg/L	0.01	0.03					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

EXOVA ACCUTEST

REPORT OF ANALYSIS

Exova Accutest

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 1022614
Date: 2010-09-21
Date Submitted: 2010-09-17

Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: 129684

P.O. Number: 7892
Matrix: Water

			LAB ID:	829452					GUIDELINE		
			Sample Date:	2010-09-17							
			Sample ID:	TW8-WS2					ODWSOG		
PARAMETER	UNITS	MRL							TYPE	LIMIT	UNITS
Alkalinity as CaCO3	mg/L	5	286						OG	500	mg/L
Chloride	mg/L	1	13						AO	250	mg/L
Colour	TCU	2	12						AO	5	TCU
Conductivity	uS/cm	5	693								
Dissolved Organic Carbon	mg/L	0.5	4.9						AO	5	mg/L
Fluoride	mg/L	0.1	0.41						MAC	1.5	mg/L
Hydrogen Sulphide	mg/L	0.01	<0.01						AO	0.05	mg/L
N-NH3 (Ammonia)	mg/L	0.02	0.21								
N-NO2 (Nitrite)	mg/L	0.1	<0.10						MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.1	<0.10						MAC	10.0	mg/L
pH			8.18							6.5-8.5	
Phenols	mg/L	0.001	<0.001								
Sulphate	mg/L	1	70						AO	500	mg/L
Tannin & Lignin	mg/L	0.1	0.2								
Total Dissolved Solids (COND - CALC)	mg/L	5	450						AO	500	mg/L
Total Kjeldahl Nitrogen	mg/L	0.1	0.73								
Turbidity	NTU	0.1	0.7						MAC	1.0	NTU
Hardness as CaCO3	mg/L	1	233						OG	100	mg/L
Ion Balance		0.01	0.90								
Calcium	mg/L	1	47								
Magnesium	mg/L	1	28								
Potassium	mg/L	1	5								
Sodium	mg/L	2	46						AO	200	mg/L
Aluminum	mg/L	0.01	<0.01						OG	0.1	mg/L
Antimony	mg/L	0.0005	<0.0005						IMAC	0.006	mg/L
Arsenic	mg/L	0.001	<0.001						IMAC	0.025	mg/L
Barium	mg/L	0.01	0.34						MAC	1.0	mg/L
Beryllium	mg/L	0.001	<0.001								
Boron	mg/L	0.01	0.16						IMAC	5.0	mg/L
Cadmium	mg/L	0.0001	<0.0001						MAC	0.005	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

REPORT OF ANALYSIS

Client: **Paterson Group**
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 1022614
Date: 2010-09-21
Date Submitted: 2010-09-17

Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: 129684

P.O. Number: 7892
Matrix: Water

			LAB ID:	829452					GUIDELINE		
			Sample Date:	2010-09-17							
			Sample ID:	TW8-WS2					ODWSOG		
PARAMETER	**UNITS**	**MRL**							**TYPE**	**LIMIT**	**UNITS**
Chromium	mg/L	0.001	0.002						MAC	0.05	mg/L
Cobalt	mg/L	0.0002	<0.0002								
Copper	mg/L	0.001	<0.001						AO	1.0	mg/L
Iron	mg/L	0.03	0.41						AO	0.3	mg/L
Lead	mg/L	0.001	<0.001						MAC	0.010	mg/L
Manganese	mg/L	0.01	0.03						AO	0.05	mg/L
Mercury	mg/L	0.0001	<0.0001						MAC	0.001	mg/L
Molybdenum	mg/L	0.005	<0.005								
Nickel	mg/L	0.005	<0.005								
Selenium	mg/L	0.001	<0.001						MAC	0.01	mg/L
Silicon	mg/L	0.1	6.7								
Silver	mg/L	0.0001	<0.0001								
Strontium	mg/L	0.001	1.76								
Thallium	mg/L	0.0001	<0.0001								
Titanium	mg/L	0.01	<0.01								
Vanadium	mg/L	0.001	0.002								
Zinc	mg/L	0.01	<0.01						AO	5.0	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

REPORT OF ANALYSIS

Exova Accutest

Client: **Paterson Group**
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: **Mr. Robert Passmore**

Report Number: 1022614
Date: 2010-09-21
Date Submitted: 2010-09-17

Project: PH0482

INVOICE: Paterson Group Inc.
Chain of Custody Number: 129684

P.O. Number: 7892
Matrix: Water

								GUIDELINE		
		LAB ID:	829452							
		Sample Date:	2010-09-17							
		Sample ID:	TW8-WS2					ODWSOG		
PARAMETER	UNITS	MRL						TYPE	LIMIT	UNITS
TRIAZINE & RELATED HERBICIDES										
Atrazine	ug/L	0.2	<0.2							
De-ethylated atrazine	ug/L	0.5	<0.5							
Cyanazine	ug/L	1	<1					IMAC	10	ug/L
Metolachlor	ug/L	0.5	<0.5					IMAC	50	ug/L
Prometryne	ug/L	0.25	<0.25					IMAC	1	ug/L
Simazine	ug/L	1	<1					IMAC	10	ug/L

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

APPROVAL:
Charlie Qu
Organic Lab Team Leader

REPORT OF ANALYSIS

Exova Accutest

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son Group Inc.
Chain o. . dy Number: 129682

Report Number: 1022429
Date: 2010-09-20
Date Submitted: 2010-09-15

Project: PH0482

P.O. Number: 7892
Matrix: Water

			LAB ID:	828874	828875				GUIDELINE		
			Sample Date:	2010-09-15	2010-09-15				ODWSOG		
			Sample ID:	WS1-TW9	WS2-TW9						
PARAMETER	UNITS	MRL							TYPE	LIMIT	UNITS
Total Coliforms	CFU/100mL			89	68				MAC	0	CFU/100mL
Escherichia Coli	CFU/100mL			0	0				MAC	0	CFU/100mL
Heterotrophic Plate Count	CFU/1mL			107	46						
Faecal Coliforms	CFU/100mL			0	0						
Faecal Streptococcus	CFU/100mL			0	0						

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

APPROVAL:
Jennifer Mitchell
Microbiology Lab Supervisor

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 1022441
Date: 2010-09-21
Date Submitted: 2010-09-15

Project: PH0452

INVOICE: Paterson Group Inc.
Chain of Custody Number: 129682

P.O. Number: 7892
Matrix: Water

			LAB ID:	828919	828920				GUIDELINE		
			Sample Date:	2010-09-15	2010-09-15						
			Sample ID:	WS1-TW9	WS2-TW9				ODWSOG		
PARAMETER	**UNITS**	**MRL**							**TYPE**	**LIMIT**	**UNITS**
Alkalinity as CaCO3	mg/L	5		201	204				OG	500	mg/L
Chloride	mg/L	1		56	55				AO	250	mg/L
Colour	TCU	2		<2	<2				AO	5	TCU
Conductivity	uS/cm	5		662	657						
Dissolved Organic Carbon	mg/L	0.5		1.5	1.7				AO	5	mg/L
Fluoride	mg/L	0.1		0.37	0.37				MAC	1.5	mg/L
Hydrogen Sulphide	mg/L	0.01		<0.1	<0.01				AO	0.05	mg/L
N-NH3 (Ammonia)	mg/L	0.02		0.05	0.04						
N-NO2 (Nitrite)	mg/L	0.1		<0.10	<0.10				MAC	1.0	mg/L
N-NO3 (Nitrate)	mg/L	0.1		<0.10	<0.10				MAC	10.0	mg/L
pH				8.04	8.12					6.5-8.5	
Phenols	mg/L	0.001		<0.001	<0.001						
Sulphate	mg/L	1		54	50				AO	500	mg/L
Tannin & Lignin	mg/L	0.1		<0.1	<0.1						
Total Dissolved Solids (COND - CALC)	mg/L	5		430	427				AO	500	mg/L
Total Kjeldahl Nitrogen	mg/L	0.1		0.21	0.32						
Turbidity	NTU	0.1		13.1	2.5				MAC	1.0	NTU
Hardness as CaCO3	mg/L	1		231	229				OG	100	mg/L
Ion Balance		0.01		0.92	0.92						
Calcium	mg/L	1		48	47						
Magnesium	mg/L	1		27	27						
Potassium	mg/L	1		5	5						
Sodium	mg/L	2		34	34				AO	200	mg/L
Iron	mg/L	0.03		0.47	0.13				AO	0.3	mg/L
Manganese	mg/L	0.01		0.03	0.02				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:
828919: H2S MRL elevated due to sample turbidity.

APPROVAL:
Ewan McRobbie
Inorganic Lab Supervisor

EXOVA ACCUTEST

REPORT OF ANALYSIS

Exova Accutest

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

INVOICE: Paterson Group Inc.
Chain of Custody Number: 129698

Report Number: 1023312
Date: 2010-09-27
Date Submitted: 2010-09-24

Project: PH0482

P.O. Number:
Matrix: Water

	LAB ID:	631312	GUIDELINE		
	Sample Date:	2010-09-23			
	Sample ID:	TW9-WS3 23-09-10	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		6			
Faecal Coliforms	CFU/100mL		0			
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:
Jennifer Mitchell
Microbiology Lab Supervisor

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

EXOVA ACCUTEST

REPORT OF ANALYSIS

Exova Accutest

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

Report Number: 1023306
Date: 2010-09-30
Date Submitted: 2010-09-24

Project: PH04682

INVOICE: Paterson Group Inc.
Chain of Custody Number: 129698

P.O. Number:
Matrix: Water

			LAB ID:	831305					GUIDELINE		
			Sample Date:	2010-09-23							
			Sample ID:	TW9-WS3-23/09/10					ODWSOG		
PARAMETER	UNITS	MRL							TYPE	LIMIT	UNITS
Alkalinity as CaCO3	mg/L	5	202								
Chloride	mg/L	1	59						OG	500	mg/L
Colour	TCU	2	2						AO	250	mg/L
Conductivity	uS/cm	5	642						AO	5	TCU
Dissolved Organic Carbon	mg/L	0.5	1.4								
Fluoride	mg/L	0.1	0.36						AO	5	mg/L
Hydrogen Sulphide	mg/L	0.01	<0.01						MAC	1.5	mg/L
N-NH3 (Ammonia)	mg/L	0.02	0.09						AO	0.05	mg/L
N-NO2 (Nitrite)	mg/L	0.1	<0.10								
N-NO3 (Nitrate)	mg/L	0.1	<0.10						MAC	1.0	mg/L
pH			8.02						MAC	10.0	mg/L
Phenols	mg/L	0.001	<0.001							6.5-8.5	
Sulphate	mg/L	1	48								
Tannin & Lignin	mg/L	0.1	<0.1						AO	500	mg/L
Total Dissolved Solids (COND - CALC)	mg/L	5	417								
Total Kjeldahl Nitrogen	mg/L	0.1	<0.10						AO	500	mg/L
Turbidity	NTU	0.1	1.2								
Hardness as CaCO3	mg/L	1	227						MAC	1.0	NTU
Ion Balance		0.01	0.92						OG	100	mg/L
Calcium	mg/L	1	48								
Magnesium	mg/L	1	26								
Potassium	mg/L	1	5								
Sodium	mg/L	2	35								
Iron	mg/L	0.03	0.16						AO	200	mg/L
Manganese	mg/L	0.01	0.02						AO	0.3	mg/L
									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

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

EXOVA ACCUTEST

REPORT OF ANALYSIS

Exova Accutest

Client: Paterson Group
28 Concourse Gate, Unit 1
Nepean, ON
K2E 7T7
Attention: Mr. Robert Passmore

INVOICE: Paterson Group Inc.
Chain of Custody Number: 127884

Report Number: 1027490
Date: 2010-11-10
Date Submitted: 2010-11-09

Project: PH0482

P.O. Number: 10041
Matrix: Water

	LAB ID:	843639	843640	843641			GUIDELINE		
	Sample Date:	2010-11-08	2010-11-08	2010-11-08					
	Sample ID:	MW1-10	MW2-10	MW6-10					
PARAMETER	UNITS	MRL					TYPE	LIMIT	UNITS
N-NO2 (Nitrite)	mg/L	0.1	<0.10	<0.10	<0.10				
N-NO3 (Nitrate)	mg/L	0.1	0.16	0.16	0.16				
NO2 + NO3 as N	mg/L	0.1	0.16	0.16	0.16				

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

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

APPENDIX 4

Aquifer Analysis Data

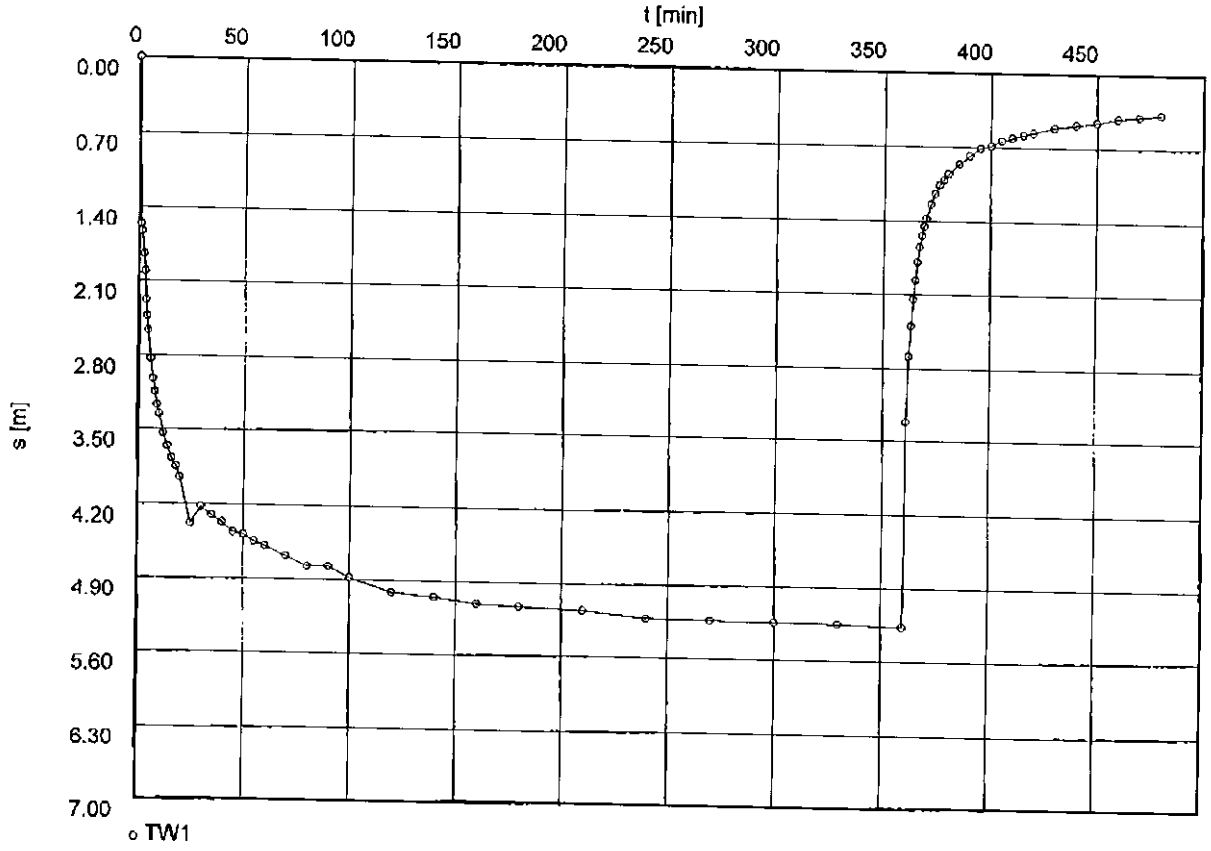
Graphical Summary of Field Water Quality Data for Test wells

Figure - A4 – 1 - Potential Well Interference Model 1 (Cumulative Drawdown)

Figure - A4 – 2 - Potential Well Interference Model 2 (Individual Drawdown)

Detailed Nitrate Impact Assessment Data

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown plot	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	
Pumping Test No. 1		Test conducted on: Feb. 14/07	
TW1			
Discharge 0.40 l/s			



Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown plot	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Feb. 14/07
TW1	TW1
Discharge 0.40 l/s	Distance from the pumping well 0.150 m

Static water level: 3.930 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
1	0.00	3.930	0.000	
2	1.00	5.490	1.560	
3	1.50	5.560	1.630	
4	2.50	5.780	1.850	
5	3.00	5.940	2.010	
6	3.50	6.210	2.280	
7	4.00	6.360	2.430	
8	4.50	6.490	2.560	
9	6.00	6.760	2.830	
10	7.00	6.950	3.020	
11	8.00	7.070	3.140	
12	9.00	7.200	3.270	
13	10.00	7.290	3.360	
14	12.00	7.470	3.540	
15	14.00	7.590	3.660	
16	16.00	7.700	3.770	
17	18.00	7.780	3.850	
18	20.00	7.880	3.950	
19	25.00	8.305	4.375	
20	30.00	8.150	4.220	
21	35.00	8.225	4.295	
22	40.00	8.290	4.360	
23	45.00	8.380	4.450	
24	50.00	8.400	4.470	
25	55.00	8.465	4.535	
26	60.00	8.505	4.575	
27	70.00	8.600	4.670	
28	80.00	8.700	4.770	
29	90.00	8.700	4.770	
30	100.00	8.810	4.880	
31	120.00	8.950	5.020	
32	140.00	8.990	5.060	
33	160.00	9.050	5.120	
34	180.00	9.070	5.140	
35	210.00	9.095	5.165	
36	240.00	9.160	5.230	
37	270.00	9.170	5.240	
38	300.00	9.180	5.250	
39	330.00	9.190	5.260	
40	360.00	9.210	5.280	
41	361.00	7.250	3.320	
42	362.00	6.620	2.690	
43	363.00	6.330	2.400	
44	364.00	6.080	2.150	
45	365.00	5.900	1.970	
46	366.00	5.730	1.800	
47	367.00	5.580	1.650	
48	368.00	5.470	1.540	
49	369.00	5.380	1.450	
50	370.00	5.300	1.370	

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown plot	Date: 25.04.2007	none, Page 3
		Project: PH0482	
		Evaluated by: RAP	

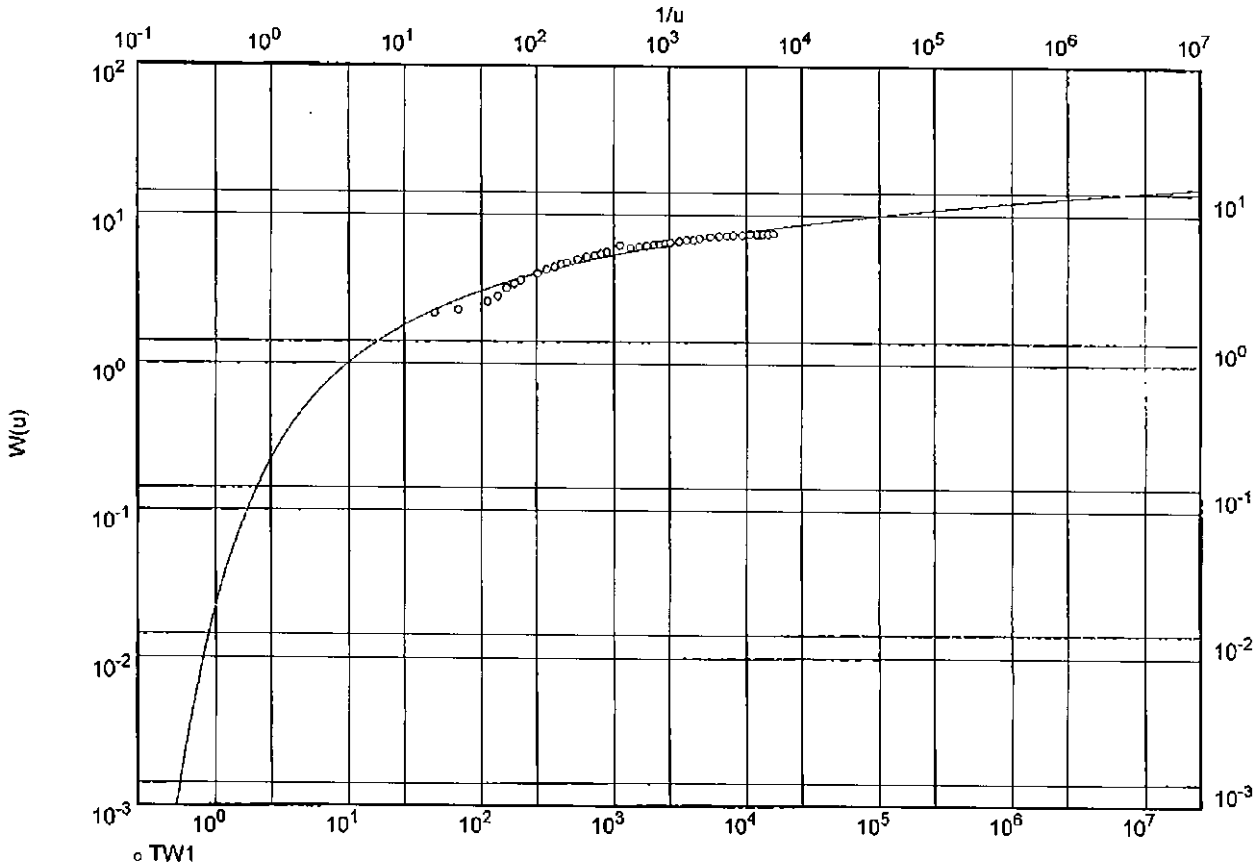
Pumping Test No. 1	Test conducted on: Feb. 14/07
TW1	TW1
Discharge 0.40 l/s	Distance from the pumping well 0.150 m

Static water level: 3.930 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
51	372.00	5.170	1.240	
52	374.00	5.070	1.140	
53	376.00	4.990	1.060	
54	378.00	4.940	1.010	
55	380.00	4.880	0.950	
56	385.00	4.790	0.860	
57	390.00	4.710	0.780	
58	395.00	4.640	0.710	
59	400.00	4.615	0.685	
60	405.00	4.570	0.640	
61	410.00	4.540	0.610	
62	415.00	4.510	0.580	
63	420.00	4.490	0.560	
64	430.00	4.440	0.510	
65	440.00	4.410	0.480	
66	450.00	4.389	0.459	
67	460.00	4.350	0.420	
68	470.00	4.330	0.400	
69	480.00	4.310	0.380	

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Theis analysis method Confined aquifer	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Feb. 14/07
TW1	
Discharge 0.40 l/s	



Transmissivity [m²/min]: 2.70×10^{-3}

Storativity: 2.82×10^{-2}

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Theis analysis method Confined aquifer	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

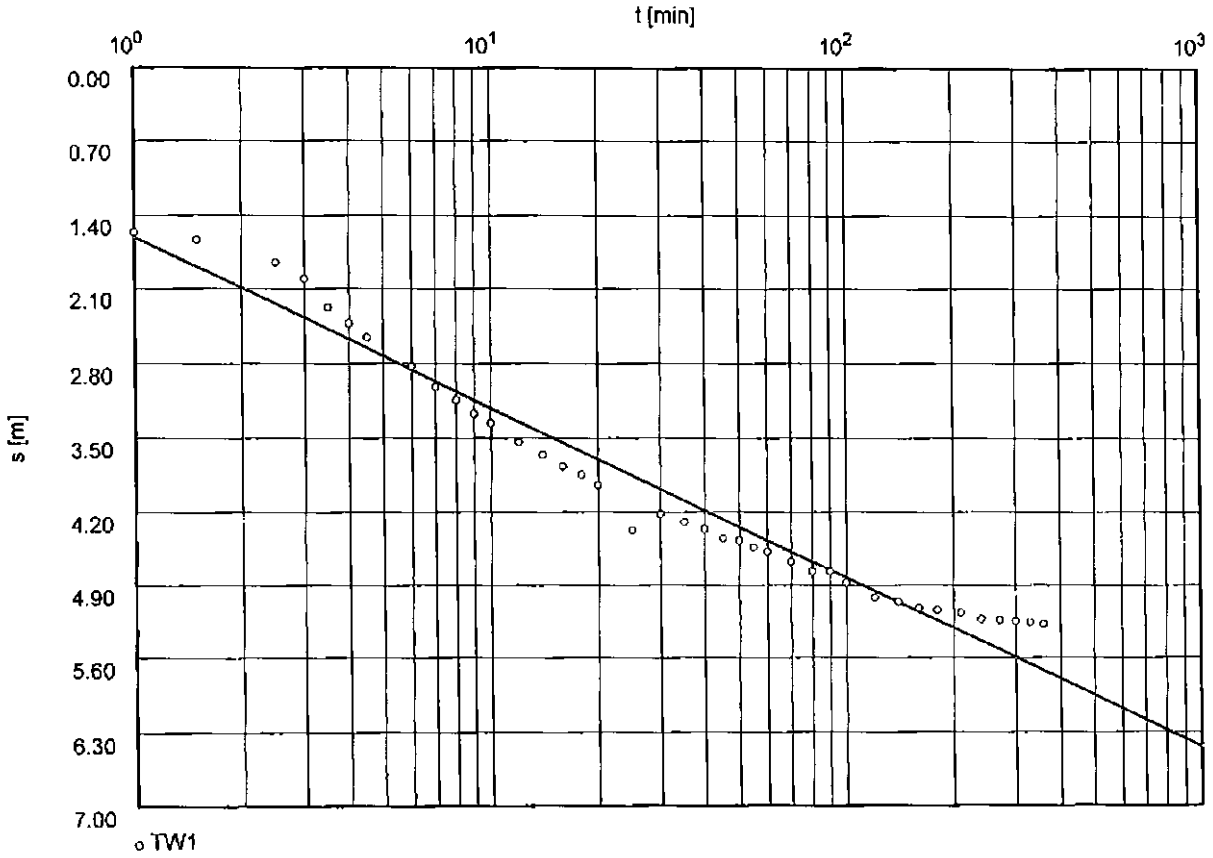
Pumping Test No. 1	Test conducted on: Feb. 14/07
TW1	TW1
Discharge 0.40 l/s	Distance from the pumping well 0.150 m

Static water level: 3.930 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	1.00	5.490	1.560	
3	1.50	5.560	1.630	
4	2.50	5.780	1.850	
5	3.00	5.940	2.010	
6	3.50	6.210	2.280	
7	4.00	6.360	2.430	
8	4.50	6.490	2.560	
9	6.00	6.760	2.830	
10	7.00	6.950	3.020	
11	8.00	7.070	3.140	
12	9.00	7.200	3.270	
13	10.00	7.290	3.360	
14	12.00	7.470	3.540	
15	14.00	7.590	3.660	
16	16.00	7.700	3.770	
17	18.00	7.780	3.850	
18	20.00	7.880	3.950	
19	25.00	8.305	4.375	
20	30.00	8.150	4.220	
21	35.00	8.225	4.295	
22	40.00	8.290	4.360	
23	45.00	8.380	4.450	
24	50.00	8.400	4.470	
25	55.00	8.465	4.535	
26	60.00	8.505	4.575	
27	70.00	8.600	4.670	
28	80.00	8.700	4.770	
29	90.00	8.700	4.770	
30	100.00	8.810	4.880	
31	120.00	8.950	5.020	
32	140.00	8.990	5.060	
33	160.00	9.050	5.120	
34	180.00	9.070	5.140	
35	210.00	9.095	5.165	
36	240.00	9.160	5.230	
37	270.00	9.170	5.240	
38	300.00	9.180	5.250	
39	330.00	9.190	5.260	
40	360.00	9.210	5.280	

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Feb. 14/07
TW1	
Discharge 0.40 l/s	



Transmissivity [m²/min]: 2.72×10^{-3}

Storativity: 2.74×10^{-2}

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

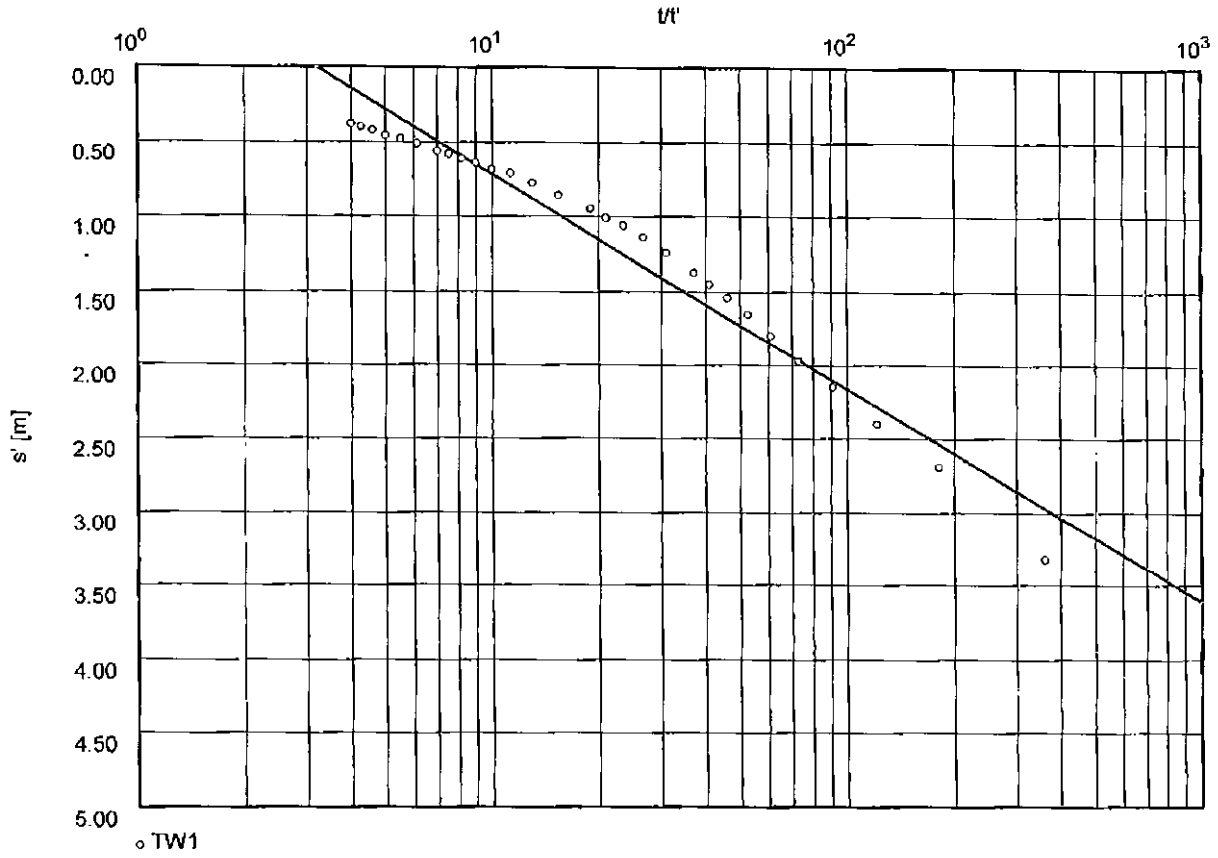
Pumping Test No. 1	Test conducted on: Feb. 14/07
TW1	TW1
Discharge 0.40 l/s	Distance from the pumping well 0.150 m

Static water level: 3.930 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	1.00	5.490	1.560	
3	1.50	5.560	1.630	
4	2.50	5.780	1.850	
5	3.00	5.940	2.010	
6	3.50	6.210	2.280	
7	4.00	6.360	2.430	
8	4.50	6.490	2.560	
9	6.00	6.760	2.830	
10	7.00	6.950	3.020	
11	8.00	7.070	3.140	
12	9.00	7.200	3.270	
13	10.00	7.290	3.360	
14	12.00	7.470	3.540	
15	14.00	7.590	3.660	
16	16.00	7.700	3.770	
17	18.00	7.780	3.850	
18	20.00	7.880	3.950	
19	25.00	8.305	4.375	
20	30.00	8.150	4.220	
21	35.00	8.225	4.295	
22	40.00	8.290	4.360	
23	45.00	8.380	4.450	
24	50.00	8.400	4.470	
25	55.00	8.465	4.535	
26	60.00	8.505	4.575	
27	70.00	8.600	4.670	
28	80.00	8.700	4.770	
29	90.00	8.700	4.770	
30	100.00	8.810	4.880	
31	120.00	8.950	5.020	
32	140.00	8.990	5.060	
33	160.00	9.050	5.120	
34	180.00	9.070	5.140	
35	210.00	9.095	5.165	
36	240.00	9.160	5.230	
37	270.00	9.170	5.240	
38	300.00	9.180	5.250	
39	330.00	9.190	5.260	
40	360.00	9.210	5.280	

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Feb. 14/07
TW1	
Discharge 0.40 l/s	
	Pumping test duration: 360.00 min



Transmissivity [m²/min]: 3.03×10^{-3}

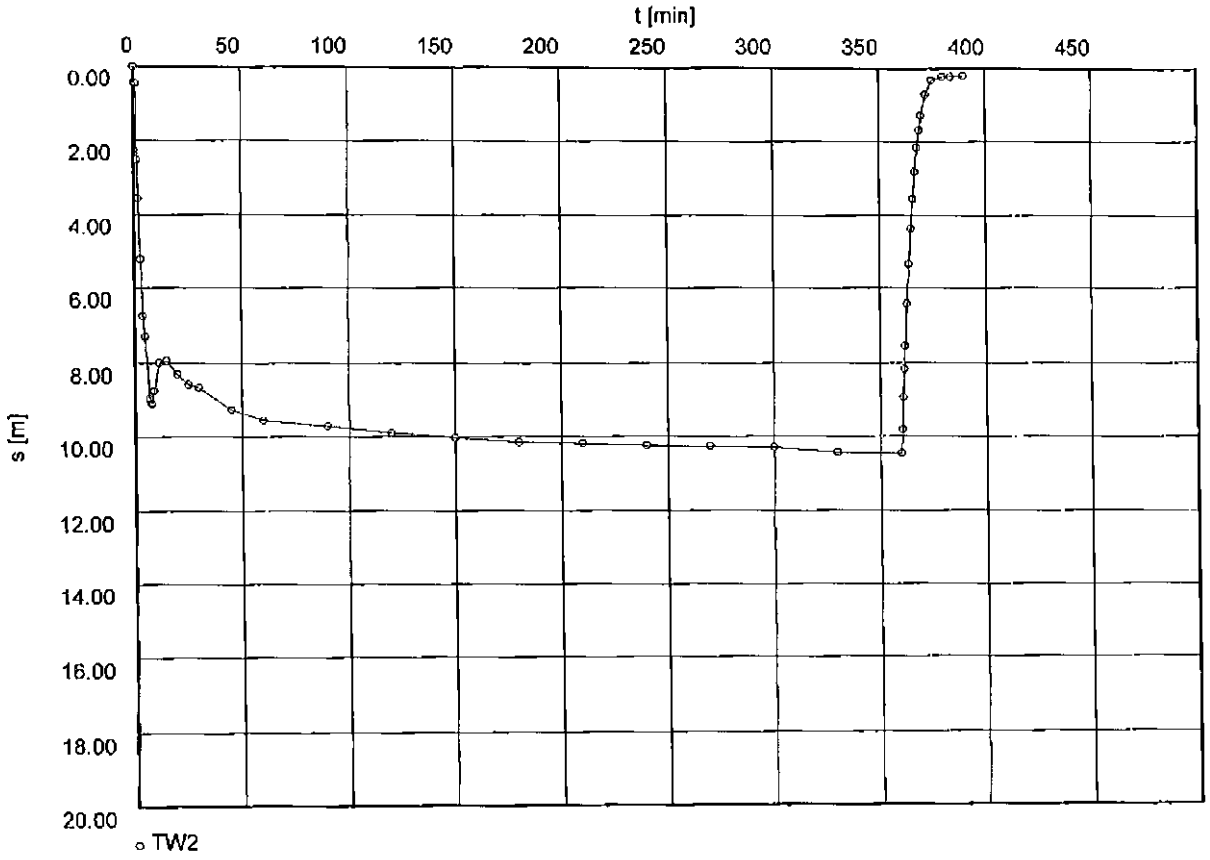
Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Feb. 14/07
TW1	TW1
Discharge 0.40 l/s	Distance from the pumping well 0.150 m
Static water level: 3.930 m below datum	Pumping test duration: 360.00 min

	Time from end of pumping [min]	Water level [m]	Residual drawdown [m]
1	1.00	7.250	3.320
2	2.00	6.620	2.690
3	3.00	6.330	2.400
4	4.00	6.080	2.150
5	5.00	5.900	1.970
6	6.00	5.730	1.800
7	7.00	5.580	1.650
8	8.00	5.470	1.540
9	9.00	5.380	1.450
10	10.00	5.300	1.370
11	12.00	5.170	1.240
12	14.00	5.070	1.140
13	16.00	4.990	1.060
14	18.00	4.940	1.010
15	20.00	4.880	0.950
16	25.00	4.790	0.860
17	30.00	4.710	0.780
18	35.00	4.640	0.710
19	40.00	4.615	0.685
20	45.00	4.570	0.640
21	50.00	4.540	0.610
22	55.00	4.510	0.580
23	60.00	4.490	0.560
24	70.00	4.440	0.510
25	80.00	4.410	0.480
26	90.00	4.389	0.459
27	100.00	4.350	0.420
28	110.00	4.330	0.400
29	120.00	4.310	0.380

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown plot	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 2	Test conducted on: Mar. 12/07
TW2	
Discharge 0.60 l/s	



Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown plot	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

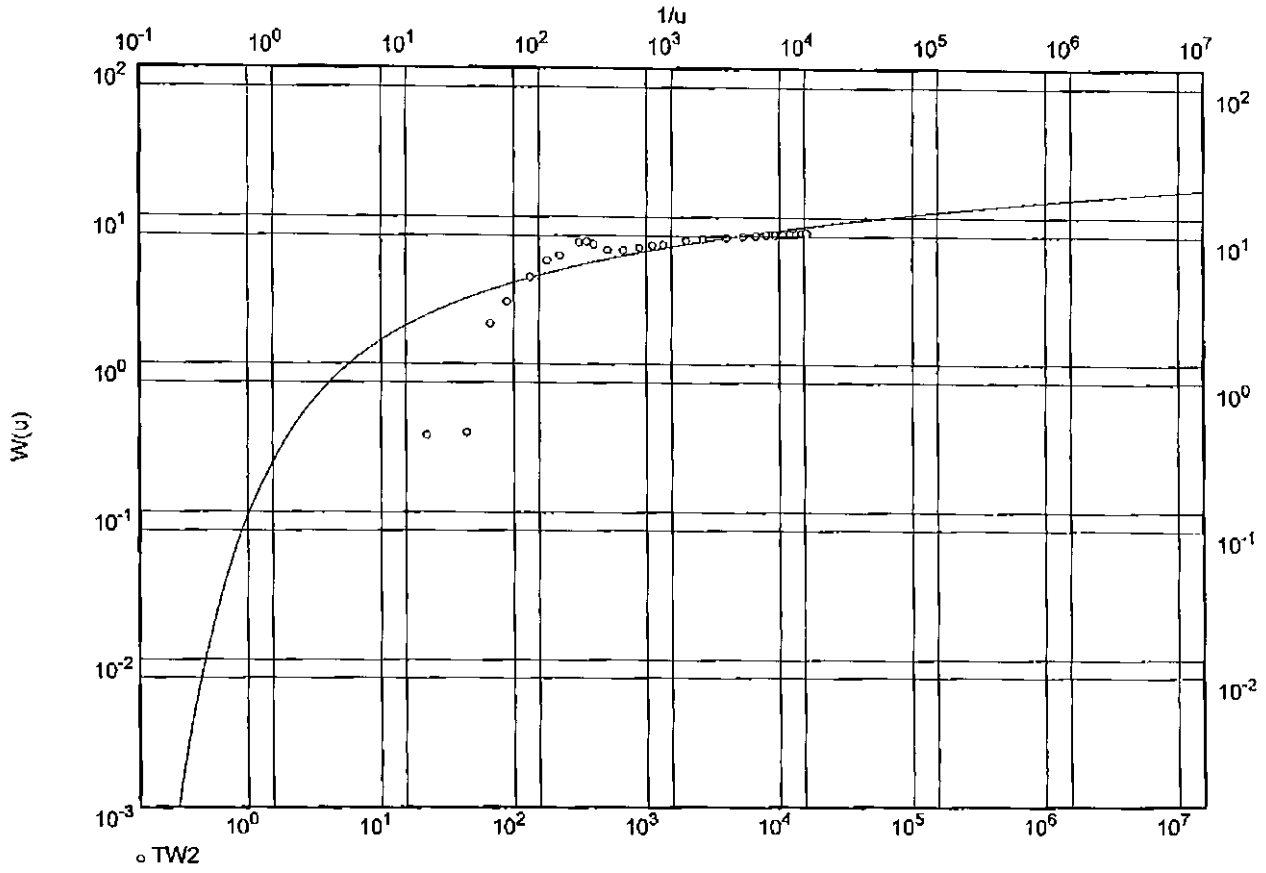
Pumping Test No. 2	Test conducted on: Mar. 12/07
TW2	TW2
Discharge 0.60 l/s	Distance from the pumping well 0.150 m

Static water level: 1.670 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
1	0.00	1.670	0.000
2	0.50	2.110	0.440
3	1.00	2.130	0.460
4	1.50	4.190	2.520
5	2.00	5.230	3.560
6	3.00	6.900	5.230
7	4.00	8.440	6.770
8	5.00	8.970	7.300
9	7.00	10.620	8.950
10	8.00	10.750	9.080
11	9.00	10.400	8.730
12	11.50	9.650	7.980
13	15.00	9.600	7.930
14	20.00	9.960	8.290
15	25.00	10.240	8.570
16	30.00	10.310	8.640
17	45.00	10.930	9.260
18	60.00	11.210	9.540
19	90.00	11.380	9.710
20	120.00	11.570	9.900
21	150.00	11.700	10.030
22	180.00	11.830	10.160
23	210.00	11.860	10.190
24	240.00	11.910	10.240
25	270.00	11.940	10.270
26	300.00	11.960	10.290
27	330.00	12.100	10.430
28	360.00	12.130	10.460
29	360.50	11.480	9.810
30	361.00	10.580	8.910
31	361.50	9.630	8.160
32	362.00	9.220	7.550
33	363.00	8.100	6.430
34	364.00	7.020	5.350
35	365.00	6.040	4.370
36	366.00	5.230	3.560
37	367.00	4.490	2.820
38	368.00	3.840	2.170
39	369.00	3.370	1.700
40	370.00	2.970	1.300
41	372.00	2.400	0.730
42	375.00	2.000	0.330
43	380.00	1.900	0.230
44	384.00	1.900	0.230
45	390.00	1.880	0.210

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Theis analysis method Confined aquifer	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 2	Test conducted on: Mar. 12/07
TW2	
Discharge 0.60 l/s	



Transmissivity [m²/min]: 2.14×10^{-3}

Storativity: 1.32×10^{-2}

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Theis analysis method Confined aquifer	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

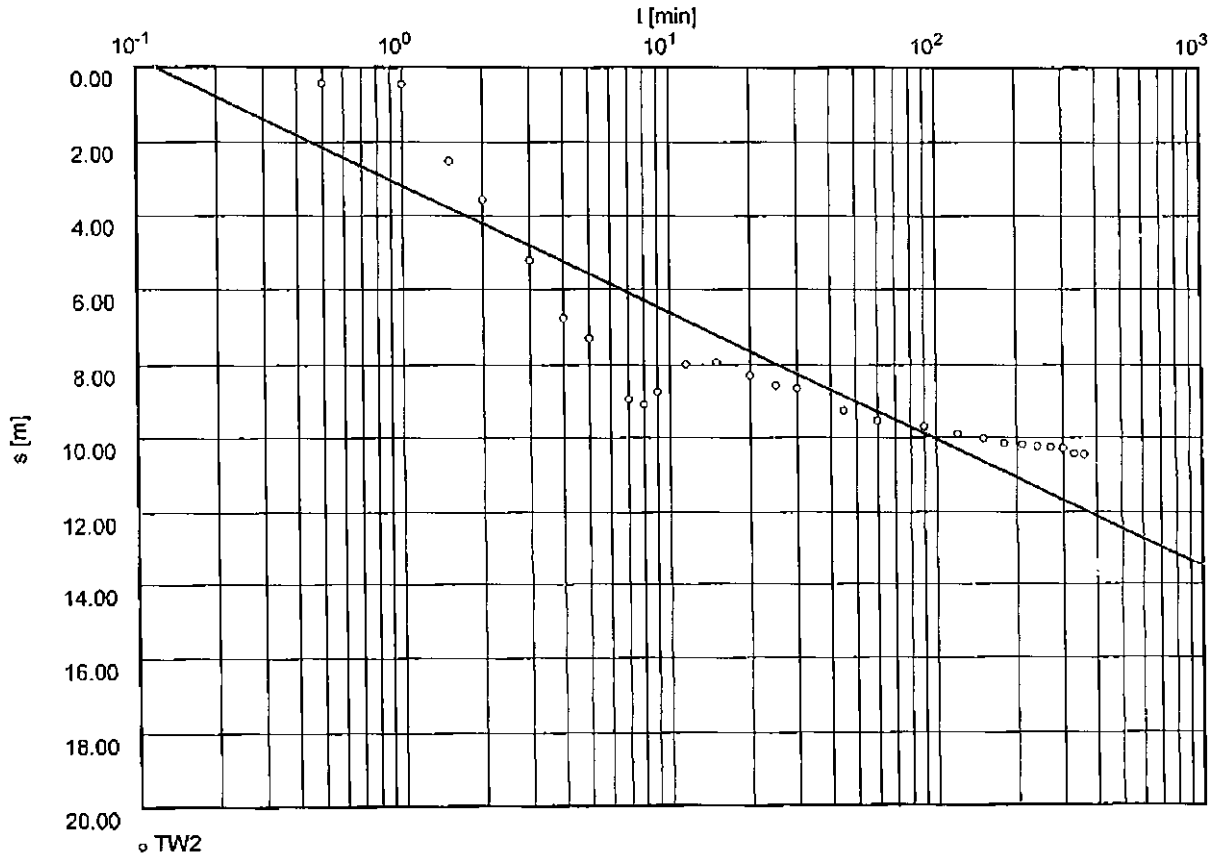
Pumping Test No. 2	Test conducted on: Mar. 12/07
TW2	TW2
Discharge 0.60 l/s	Distance from the pumping well 0.150 m

Static water level: 1.670 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	0.50	2.110	0.440	
3	1.00	2.130	0.460	
4	1.50	4.190	2.520	
5	2.00	5.230	3.560	
6	3.00	6.900	5.230	
7	4.00	8.440	6.770	
8	5.00	8.970	7.300	
9	7.00	10.620	8.950	
10	8.00	10.750	9.080	
11	9.00	10.400	8.730	
12	11.50	9.650	7.980	
13	15.00	9.600	7.930	
14	20.00	9.960	8.290	
15	25.00	10.240	8.570	
16	30.00	10.310	8.640	
17	45.00	10.930	9.260	
18	60.00	11.210	9.540	
19	90.00	11.380	9.710	
20	120.00	11.570	9.900	
21	150.00	11.700	10.030	
22	180.00	11.830	10.160	
23	210.00	11.860	10.190	
24	240.00	11.910	10.240	
25	270.00	11.940	10.270	
26	300.00	11.960	10.290	
27	330.00	12.100	10.430	
28	360.00	12.130	10.460	

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 2	Test conducted on: Mar. 12/07
TW2	
Discharge 0.60 l/s	



Transmissivity [m²/min]: 1.92×10^{-3}

Storativity: 2.27×10^{-2}

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

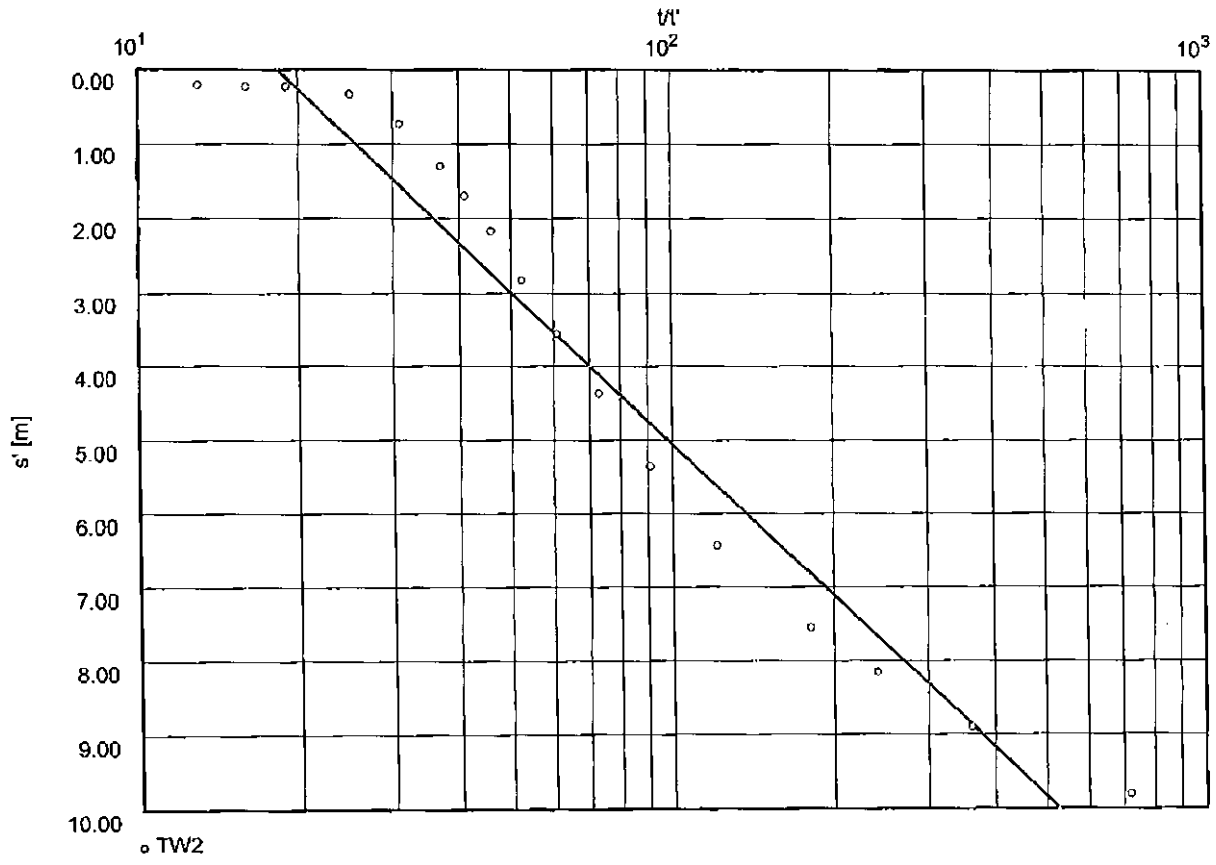
Pumping Test No. 2	Test conducted on: Mar. 12/07
TW2	TW2
Discharge 0.60 l/s	Distance from the pumping well 0.150 m

Static water level: 1.670 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	0.50	2.110	0.440
3	1.00	2.130	0.460
4	1.50	4.190	2.520
5	2.00	5.230	3.560
6	3.00	6.900	5.230
7	4.00	8.440	6.770
8	5.00	8.970	7.300
9	7.00	10.620	8.950
10	8.00	10.750	9.080
11	9.00	10.400	8.730
12	11.50	9.650	7.980
13	15.00	9.600	7.930
14	20.00	9.960	8.290
15	25.00	10.240	8.570
16	30.00	10.310	8.640
17	45.00	10.930	9.260
18	60.00	11.210	9.540
19	90.00	11.380	9.710
20	120.00	11.570	9.900
21	150.00	11.700	10.030
22	180.00	11.830	10.160
23	210.00	11.860	10.190
24	240.00	11.910	10.240
25	270.00	11.940	10.270
26	300.00	11.960	10.290
27	330.00	12.100	10.430
28	360.00	12.130	10.460

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 2	Test conducted on: Mar. 12/07
TW2	
Discharge 0.60 l/s	
	Pumping test duration: 360.00 min



Transmissivity [m²/min]: 9.61×10^{-4}

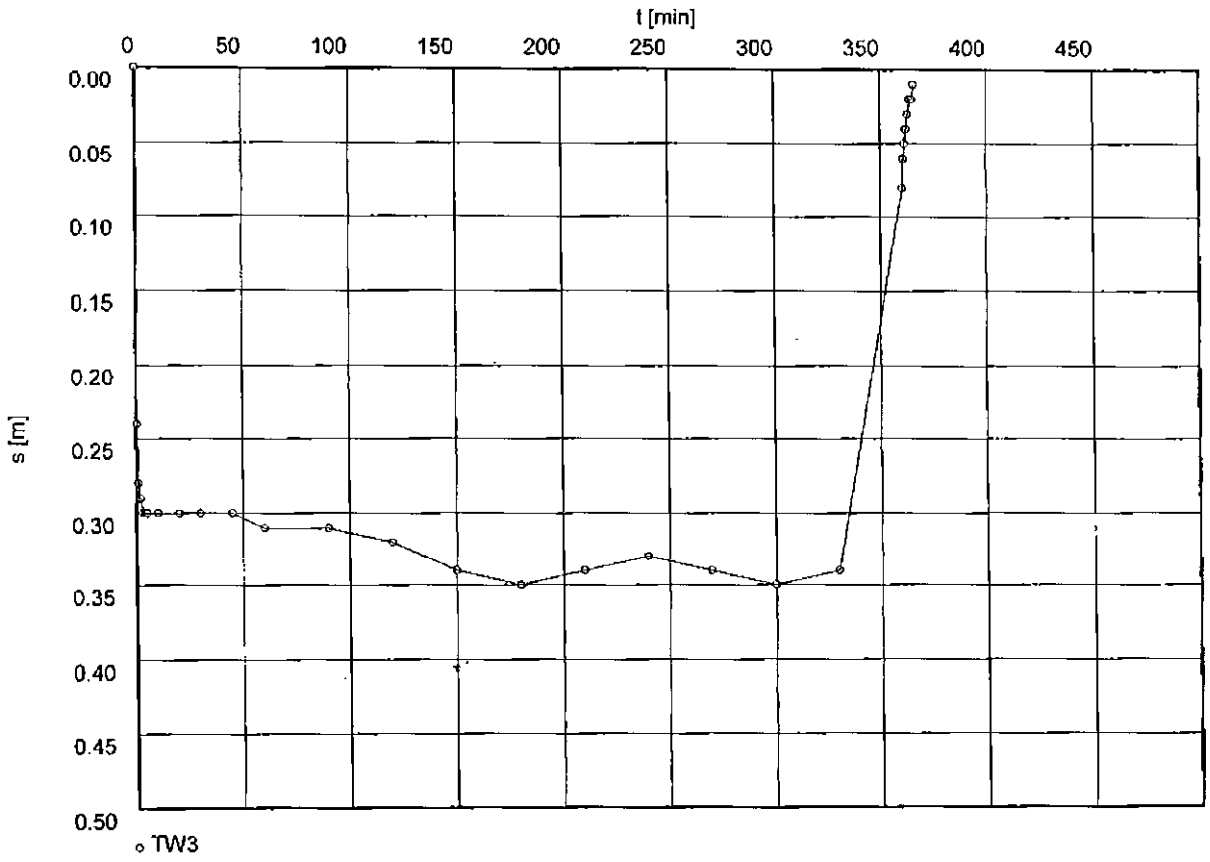
Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date: 25.04.2007	none, Page 2
		Project: PH0462	
		Evaluated by: RAP	

Pumping Test No. 2	Test conducted on: Mar. 12/07
TW2	TW2
Discharge 0.60 l/s	Distance from the pumping well 0.150 m
Static water level: 1.670 m below datum	Pumping test duration: 360.00 min

	Time from end of pumping [min]	Water level [m]	Residual drawdown [m]
1	0.50	11.480	9.810
2	1.00	10.580	8.910
3	1.50	9.830	8.160
4	2.00	9.220	7.550
5	3.00	8.100	6.430
6	4.00	7.020	5.350
7	5.00	6.040	4.370
8	6.00	5.230	3.560
9	7.00	4.490	2.820
10	8.00	3.840	2.170
11	9.00	3.370	1.700
12	10.00	2.970	1.300
13	12.00	2.400	0.730
14	15.00	2.000	0.330
15	20.00	1.900	0.230
16	24.00	1.900	0.230
17	30.00	1.880	0.210

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown plot	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Mar. 1/07
TW3	
Discharge 1.90 l/s	



Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown plot	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

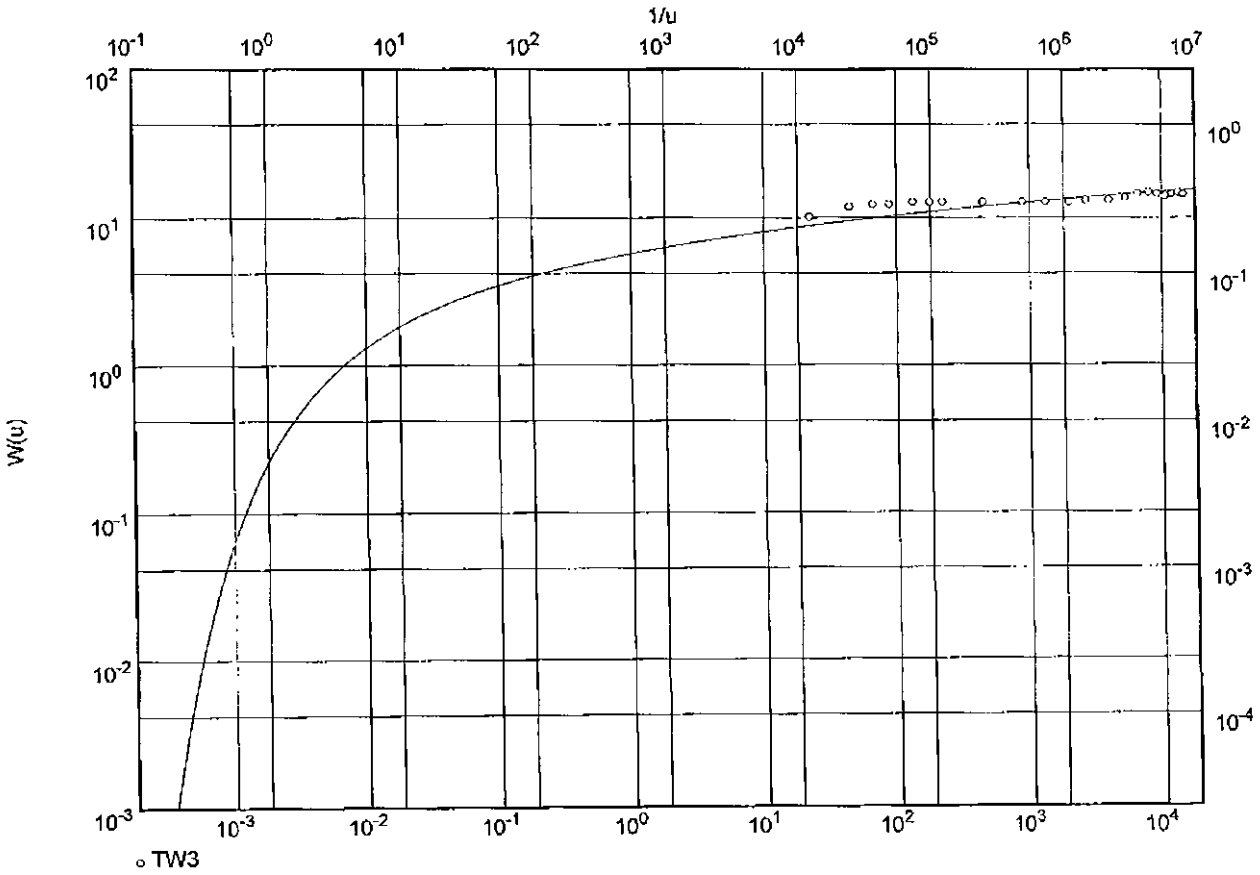
Pumping Test No. 1	Test conducted on: Mar. 1/07
TW3	TW3
Discharge 1.90 l/s	Distance from the pumping well 0.150 m

Static water level: 6.610 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
1	0.00	6.610	0.000
2	0.50	6.850	0.240
3	1.00	6.890	0.280
4	1.50	6.900	0.290
5	2.00	6.900	0.290
6	3.00	6.910	0.300
7	4.00	6.910	0.300
8	5.00	6.910	0.300
9	10.00	6.910	0.300
10	20.00	6.910	0.300
11	30.00	6.910	0.300
12	45.00	6.910	0.300
13	60.00	6.920	0.310
14	90.00	6.920	0.310
15	120.00	6.930	0.320
16	150.00	6.950	0.340
17	180.00	6.960	0.350
18	210.00	6.950	0.340
19	240.00	6.940	0.330
20	270.00	6.950	0.340
21	300.00	6.960	0.350
22	330.00	6.950	0.340
23	360.50	6.690	0.080
24	361.00	6.670	0.060
25	361.50	6.660	0.050
26	362.00	6.650	0.040
27	362.50	6.650	0.040
28	363.00	6.640	0.030
29	364.00	6.630	0.020
30	365.00	6.630	0.020
31	366.00	6.620	0.010

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Theis analysis method Confined aquifer	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Mar. 1/07
TW3	
Discharge 1.90 l/s	



Transmissivity [m²/min]: 3.81×10^{-1}

Storativity: 2.75×10^{-3}

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Theis analysis method Confined aquifer	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

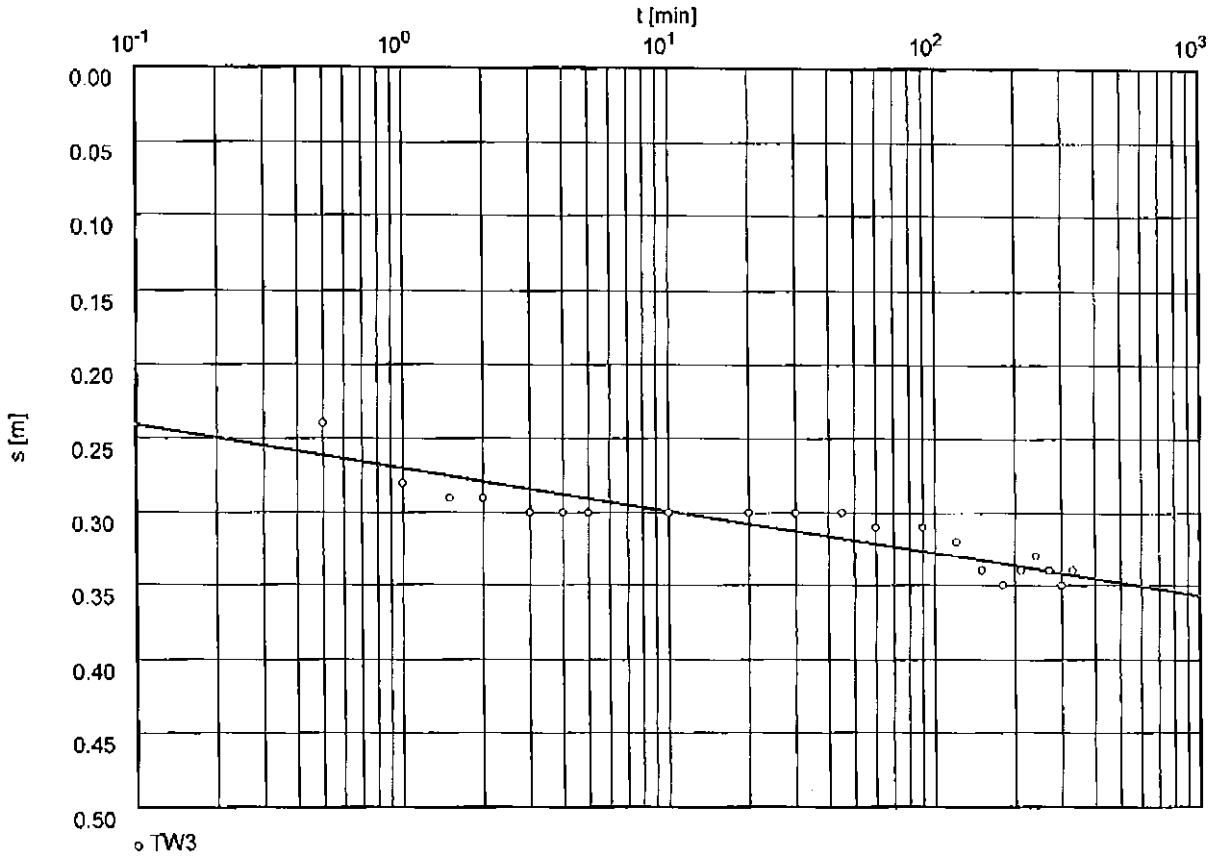
Pumping Test No. 1	Test conducted on: Mar. 1/07
TW3	TW3
Discharge 1.90 l/s	Distance from the pumping well 0.150 m

Static water level: 6.610 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	0.50	6.850	0.240	
3	1.00	6.890	0.280	
4	1.50	6.900	0.290	
5	2.00	6.900	0.290	
6	3.00	6.910	0.300	
7	4.00	6.910	0.300	
8	5.00	6.910	0.300	
9	10.00	6.910	0.300	
10	20.00	6.910	0.300	
11	30.00	6.910	0.300	
12	45.00	6.910	0.300	
13	60.00	6.920	0.310	
14	90.00	6.920	0.310	
15	120.00	6.930	0.320	
16	150.00	6.950	0.340	
17	180.00	6.960	0.350	
18	210.00	6.950	0.340	
19	240.00	6.940	0.330	
20	270.00	6.950	0.340	
21	300.00	6.960	0.350	
22	330.00	6.950	0.340	

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Mar. 1/07
TW3	
Discharge 1.90 l/s	



Transmissivity [m²/min]: 7.18×10^{-1}

Storativity: 3.64×10^{-8}

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

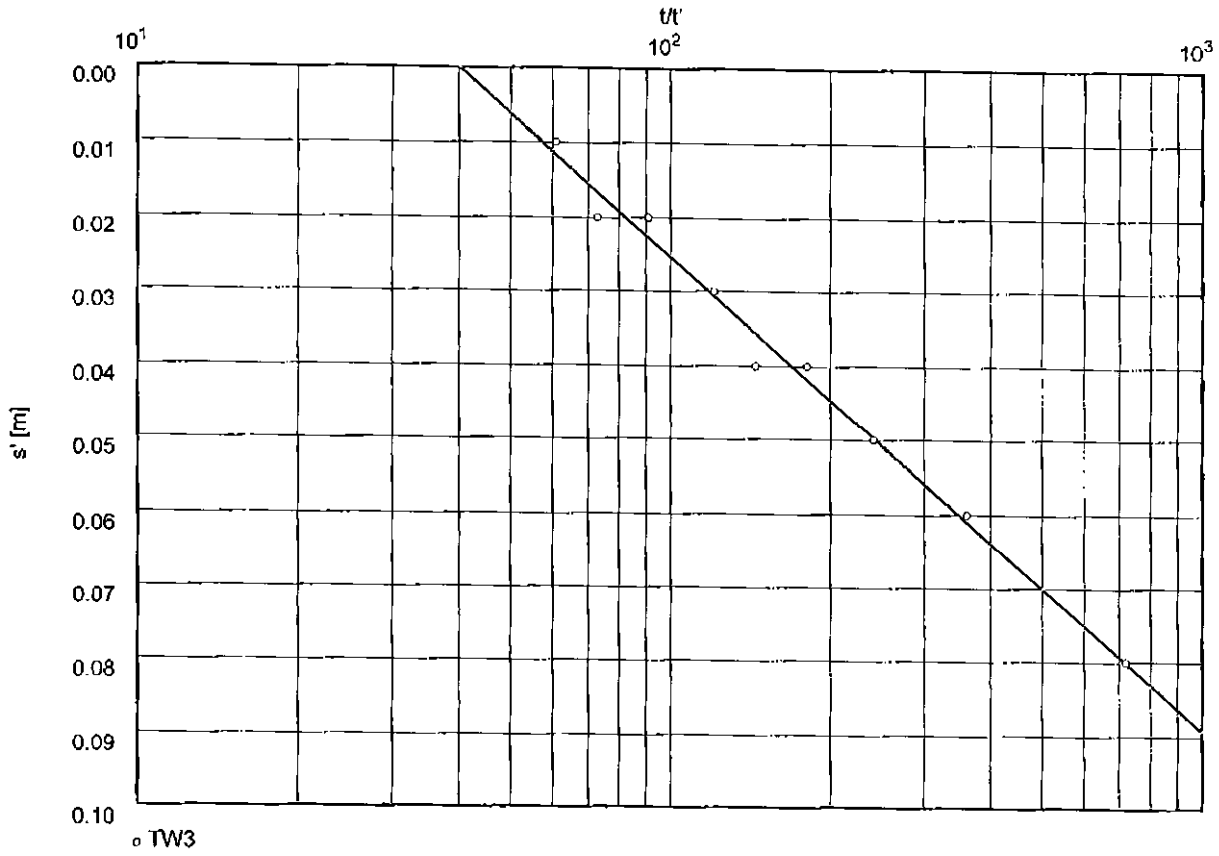
Pumping Test No. 1	Test conducted on: Mar. 1/07
TW3	TW3
Discharge 1.90 l/s	Distance from the pumping well 0.150 m

Static water level: 6.610 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	0.50	6.850	0.240	
3	1.00	6.890	0.280	
4	1.50	6.900	0.290	
5	2.00	6.900	0.290	
6	3.00	6.910	0.300	
7	4.00	6.910	0.300	
8	5.00	6.910	0.300	
9	10.00	6.910	0.300	
10	20.00	6.910	0.300	
11	30.00	6.910	0.300	
12	45.00	6.910	0.300	
13	60.00	6.920	0.310	
14	90.00	6.920	0.310	
15	120.00	6.930	0.320	
16	150.00	6.950	0.340	
17	180.00	6.960	0.350	
18	210.00	6.950	0.340	
19	240.00	6.940	0.330	
20	270.00	6.950	0.340	
21	300.00	6.960	0.350	
22	330.00	6.950	0.340	

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Mar. 1/07
TW3	
Discharge 1.90 l/s	
	Pumping test duration: 360.00 min



Transmissivity [m²/min]: 3.26×10^{-1}

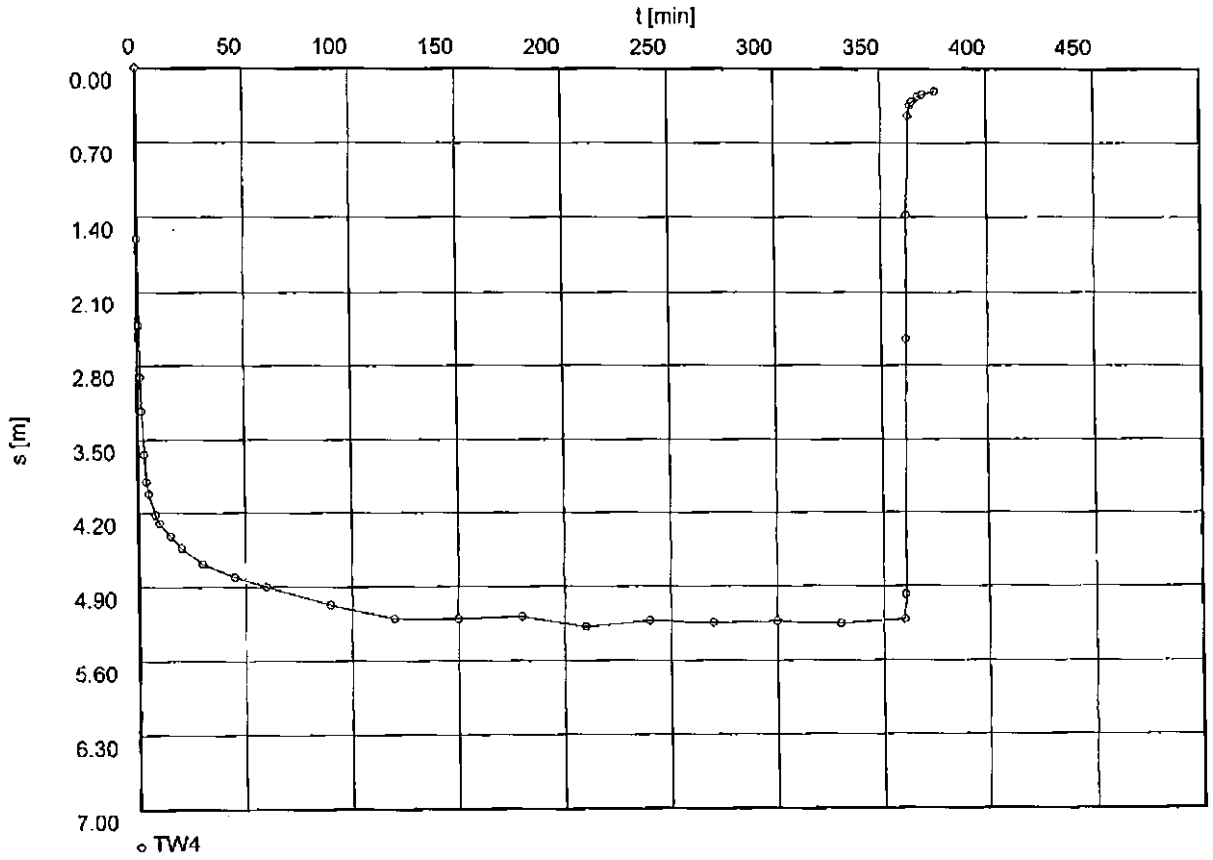
Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Mar. 1/07
TW3	TW3
Discharge 1.90 l/s	Distance from the pumping well 0.150 m
Static water level: 6.610 m below datum	Pumping test duration: 360.00 min

	Time from end of pumping [min]	Water level [m]	Residual drawdown [m]
1	0.50	6.690	0.080
2	1.00	6.670	0.060
3	1.50	6.660	0.050
4	2.00	6.650	0.040
5	2.50	6.650	0.040
6	3.00	6.640	0.030
7	4.00	6.630	0.020
8	5.00	6.630	0.020
9	6.00	6.620	0.010

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown plot	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Mar. 2/07
TW4	
Discharge 1.90 l/s	



Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown plot	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

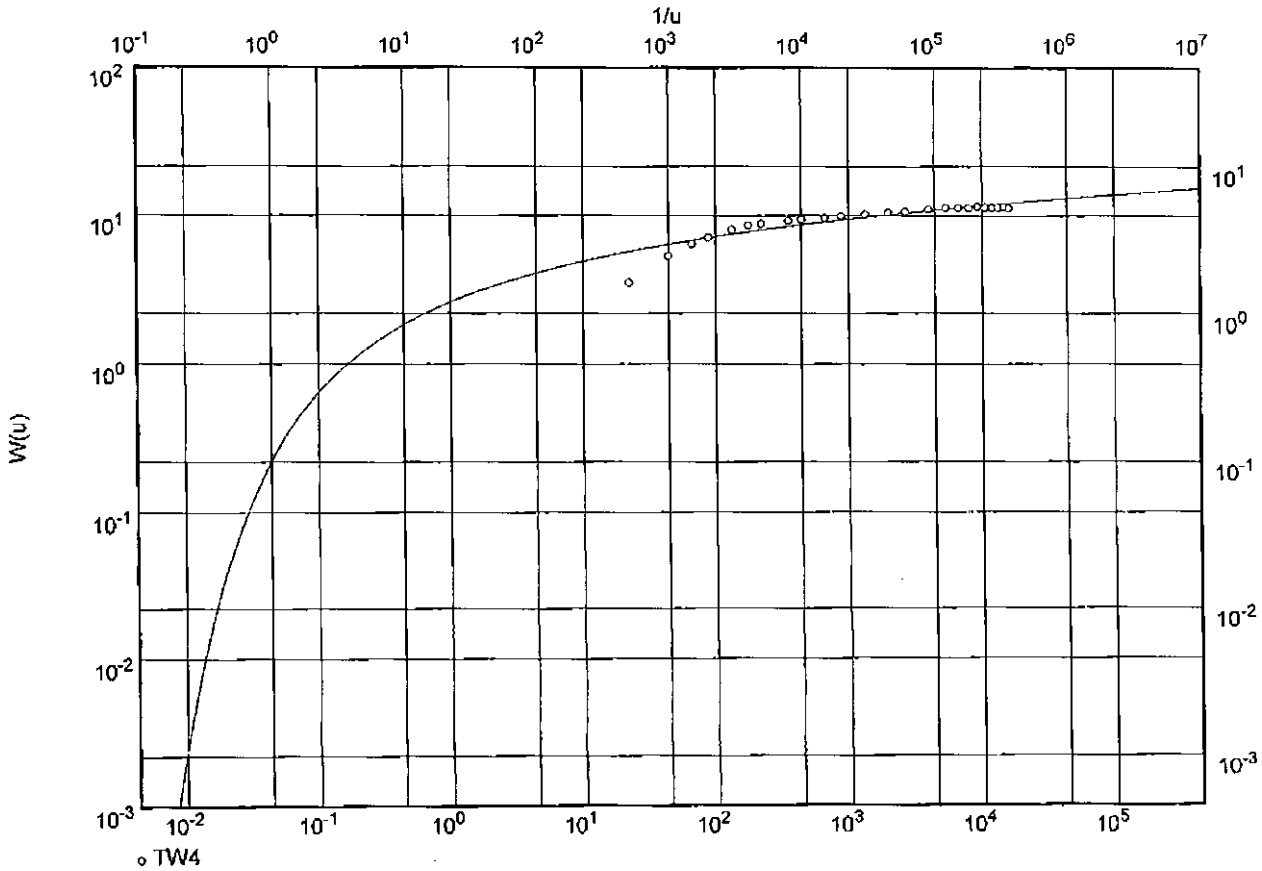
Pumping Test No. 1	Test conducted on: Mar. 2/07
TW4	TW4
Discharge 1.90 l/s	Distance from the pumping well 0.150 m

Static water level: 1.640 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
1	0.00	1.640	0.000
2	0.50	3.240	1.600
3	1.00	4.060	2.420
4	1.50	4.550	2.910
5	2.00	4.870	3.230
6	3.00	5.280	3.640
7	4.00	5.540	3.900
8	5.00	5.660	4.020
9	8.00	5.860	4.220
10	10.00	5.940	4.300
11	15.00	6.060	4.420
12	20.00	6.170	4.530
13	30.00	6.330	4.690
14	45.00	6.450	4.810
15	60.00	6.540	4.900
16	90.00	6.710	5.070
17	120.00	6.840	5.200
18	150.00	6.840	5.200
19	180.00	6.820	5.180
20	210.00	6.920	5.280
21	240.00	6.860	5.220
22	270.00	6.880	5.240
23	300.00	6.870	5.230
24	330.00	6.890	5.250
25	360.00	6.850	5.210
26	360.50	6.620	4.980
27	361.50	4.190	2.550
28	362.00	3.020	1.380
29	363.00	2.080	0.440
30	364.00	1.980	0.340
31	365.00	1.950	0.310
32	367.50	1.900	0.260
33	370.00	1.880	0.240
34	376.00	1.850	0.210

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Theis analysis method Confined aquifer	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Mar. 2/07
TW4	
Discharge 1.90 l/s	



Transmissivity [m²/min]: 1.97×10^{-2}

Storativity: 3.48×10^{-3}

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Theis analysis method Confined aquifer	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

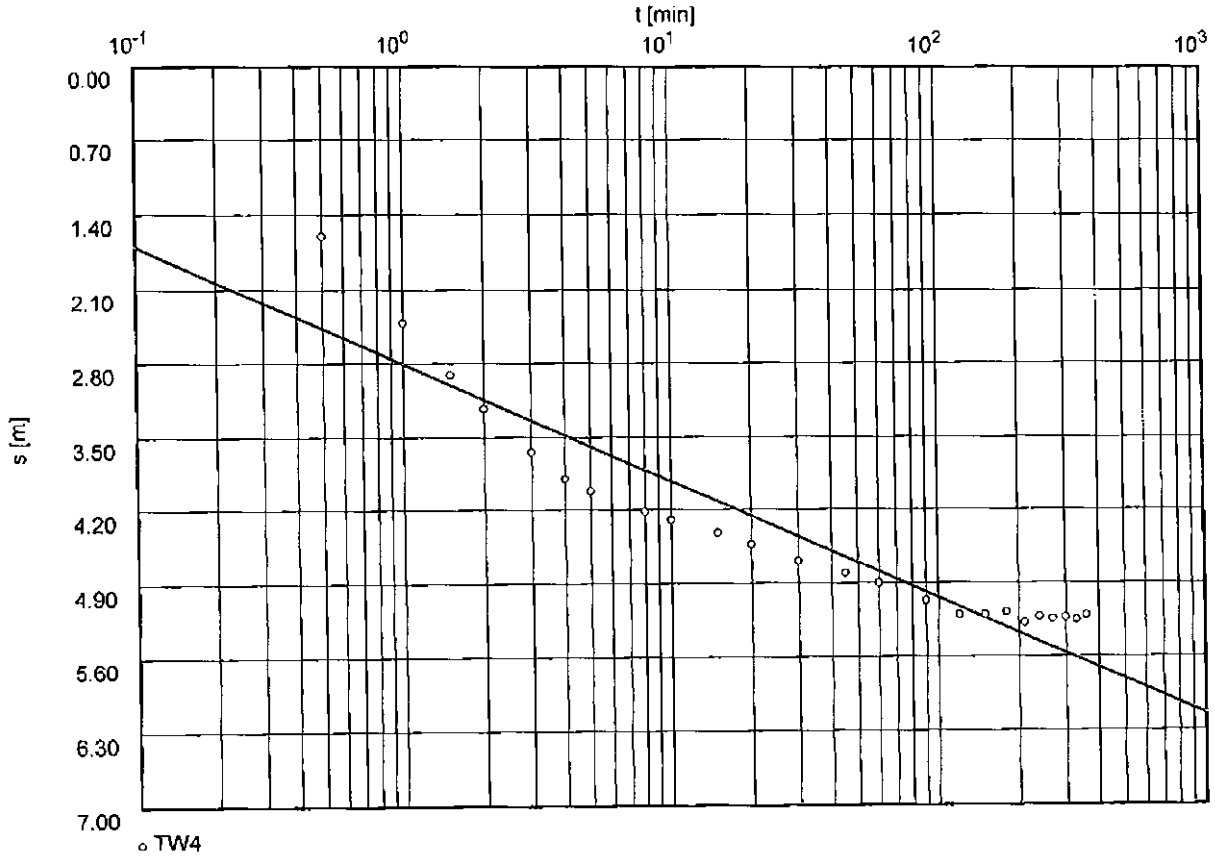
Pumping Test No. 1	Test conducted on: Mar. 2/07
TW4	TW4
Discharge 1.90 l/s	Distance from the pumping well 0.150 m

Static water level: 1.640 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	0.50	3.240	1.600	
3	1.00	4.060	2.420	
4	1.50	4.550	2.910	
5	2.00	4.870	3.230	
6	3.00	5.280	3.640	
7	4.00	5.540	3.900	
8	5.00	5.660	4.020	
9	8.00	5.860	4.220	
10	10.00	5.940	4.300	
11	15.00	6.060	4.420	
12	20.00	6.170	4.530	
13	30.00	6.330	4.690	
14	45.00	6.450	4.810	
15	60.00	6.540	4.900	
16	90.00	6.710	5.070	
17	120.00	6.840	5.200	
18	150.00	6.840	5.200	
19	180.00	6.820	5.180	
20	210.00	6.920	5.280	
21	240.00	6.860	5.220	
22	270.00	6.880	5.240	
23	300.00	6.870	5.230	
24	330.00	6.890	5.250	
25	360.00	6.850	5.210	

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: 25.04.2007	none, Page 1
		Project: PH0462	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Mar. 2/07
TW4	
Discharge 1.90 l/s	



Transmissivity [m²/min]: 1.87×10^{-2}

Storativity: 5.62×10^{-3}

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

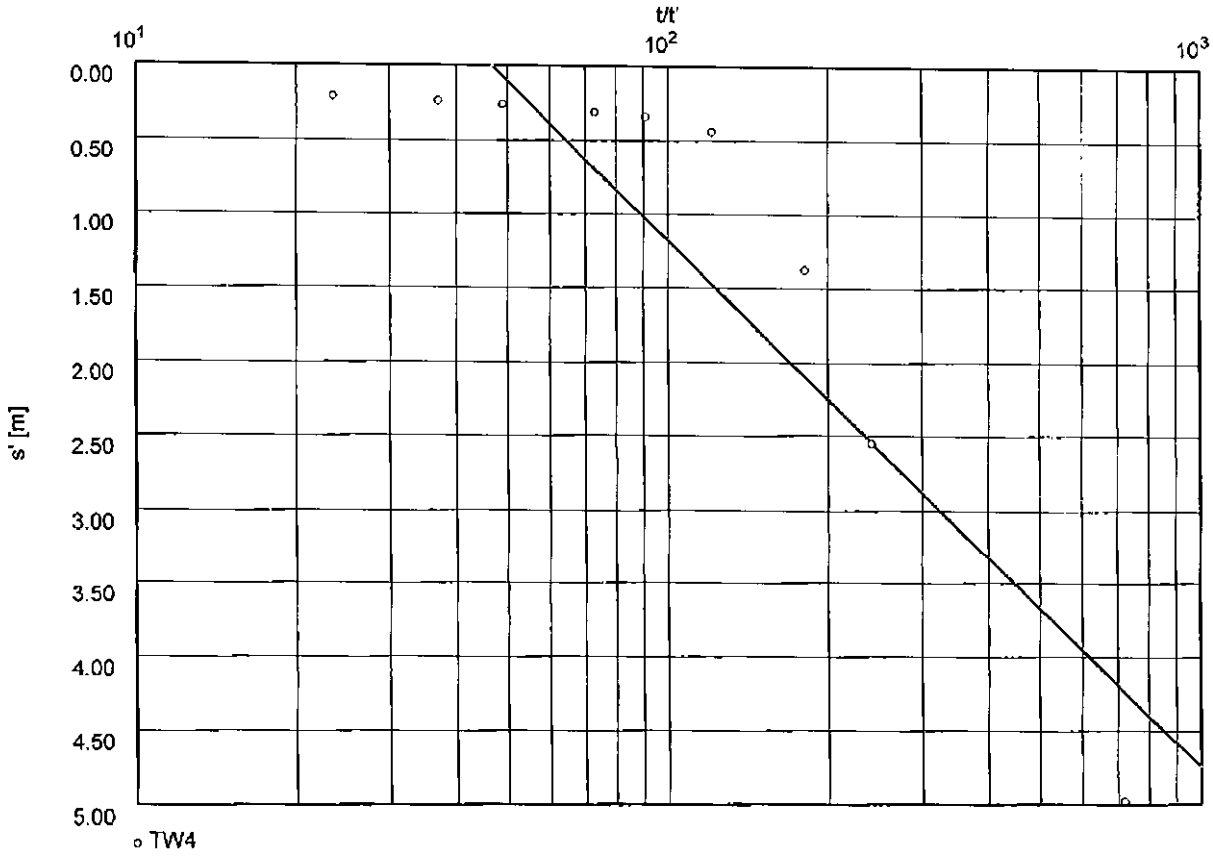
Pumping Test No. 1	Test conducted on: Mar. 2/07
TW4	TW4
Discharge 1.90 l/s	Distance from the pumping well 0.150 m

Static water level: 1.640 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	0.50	3.240	1.600
3	1.00	4.060	2.420
4	1.50	4.550	2.910
5	2.00	4.870	3.230
6	3.00	5.280	3.640
7	4.00	5.540	3.900
8	5.00	5.660	4.020
9	8.00	5.860	4.220
10	10.00	5.940	4.300
11	15.00	6.060	4.420
12	20.00	6.170	4.530
13	30.00	6.330	4.690
14	45.00	6.450	4.810
15	60.00	6.540	4.900
16	90.00	6.710	5.070
17	120.00	6.840	5.200
18	150.00	6.840	5.200
19	180.00	6.820	5.180
20	210.00	6.920	5.280
21	240.00	6.860	5.220
22	270.00	6.880	5.240
23	300.00	6.870	5.230
24	330.00	6.890	5.250
25	360.00	6.850	5.210

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Mar. 2/07
TW4	
Discharge 1.90 l/s	
	Pumping test duration: 360.00 min



Transmissivity [m²/min]: 5.84×10^{-3}

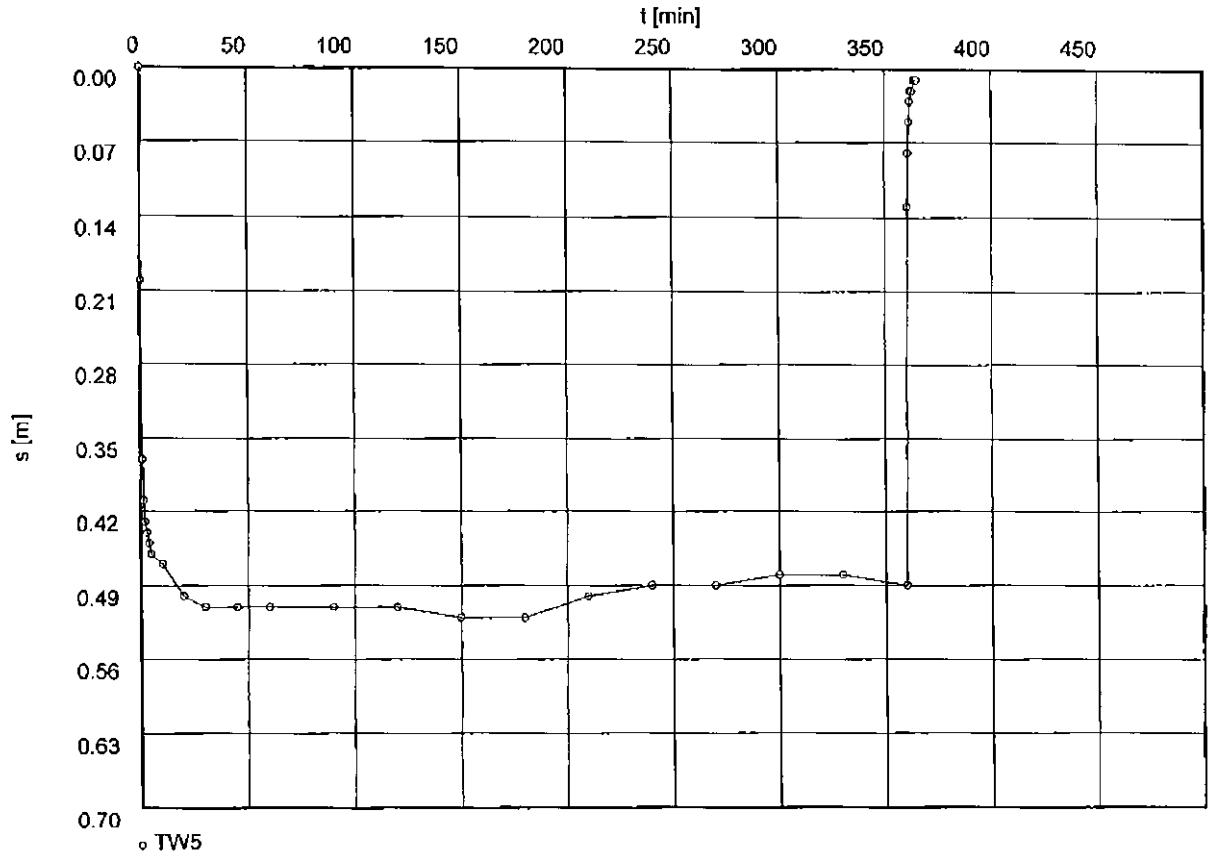
Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Mar. 2/07
TW4	TW4
Discharge 1.90 l/s	Distance from the pumping well 0.150 m
Static water level: 1.640 m below datum	Pumping test duration: 360.00 min

	Time from end of pumping [min]	Water level [m]	Residual drawdown [m]	
1	0.50	6.620	4.980	
2	1.50	4.190	2.550	
3	2.00	3.020	1.380	
4	3.00	2.080	0.440	
5	4.00	1.980	0.340	
6	5.00	1.950	0.310	
7	7.50	1.900	0.260	
8	10.00	1.880	0.240	
9	16.00	1.850	0.210	

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown plot	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: March 13/07
TW5	
Discharge 0.70 l/s	



Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown plot	Date: 25.04.2007	none, Page 2
		Project: PH0462	
		Evaluated by: RAP	

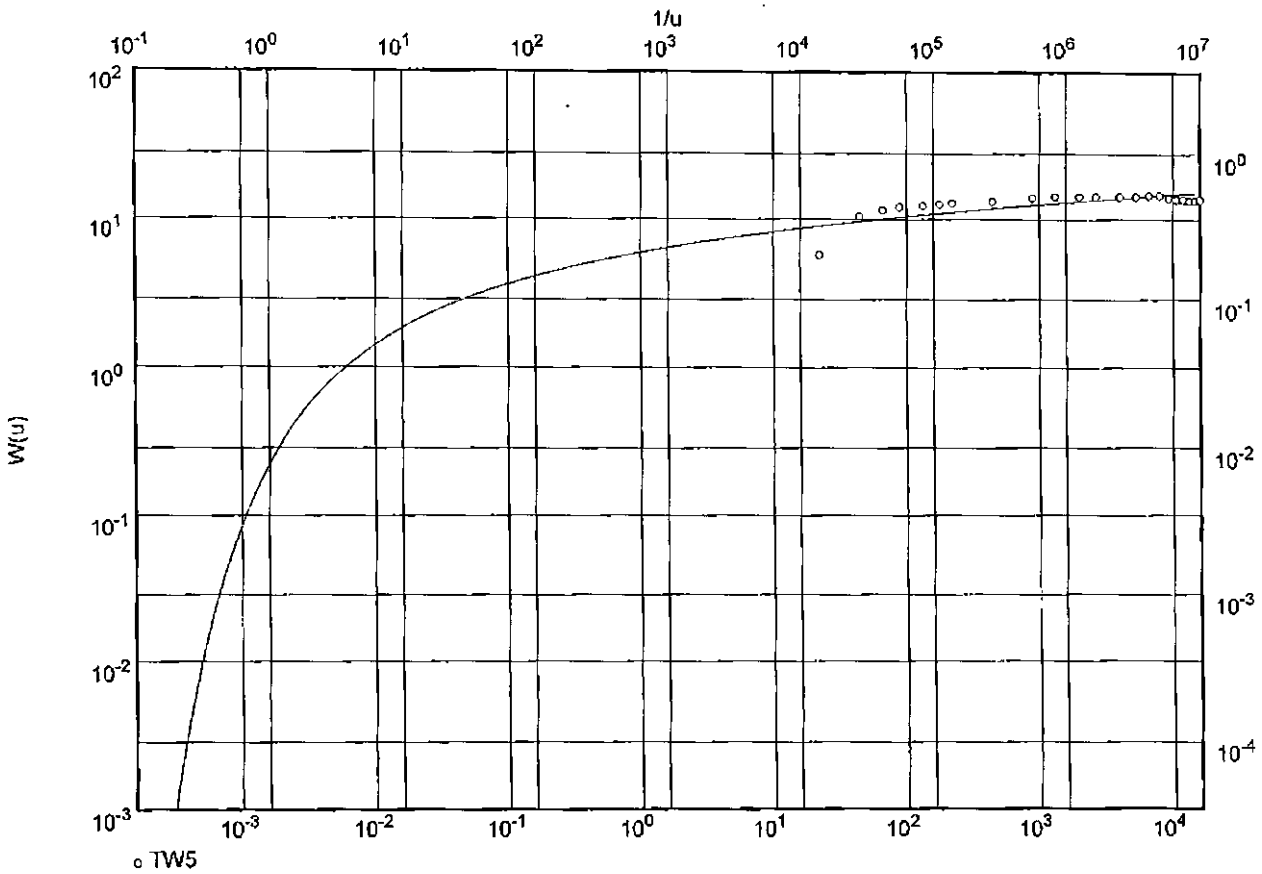
Pumping Test No. 1	Test conducted on: March 13/07
TW5	TW5
Discharge 0.70 l/s	Distance from the pumping well 0.150 m

Static water level: 5.730 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
1	0.00	5.730	0.000
2	0.50	5.930	0.200
3	1.00	6.100	0.370
4	1.50	6.140	0.410
5	2.00	6.160	0.430
6	3.00	6.170	0.440
7	4.00	6.180	0.450
8	5.00	6.190	0.460
9	10.00	6.200	0.470
10	20.00	6.230	0.500
11	30.00	6.240	0.510
12	45.00	6.240	0.510
13	60.00	6.240	0.510
14	90.00	6.240	0.510
15	120.00	6.240	0.510
16	150.00	6.250	0.520
17	180.00	6.250	0.520
18	210.00	6.230	0.500
19	240.00	6.220	0.490
20	270.00	6.220	0.490
21	300.00	6.210	0.480
22	330.00	6.210	0.480
23	360.00	6.220	0.490
24	360.50	5.860	0.130
25	361.00	5.810	0.080
26	361.50	5.780	0.050
27	362.00	5.760	0.030
28	362.50	5.750	0.020
29	363.00	5.750	0.020
30	364.00	5.740	0.010
31	365.00	5.740	0.010

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Theis analysis method Confined aquifer	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: March 13/07
TW5	
Discharge 0.70 l/s	



Transmissivity [m²/min]: 9.46×10^{-2}

Storativity: 6.05×10^{-4}

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Theis analysis method Confined aquifer	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

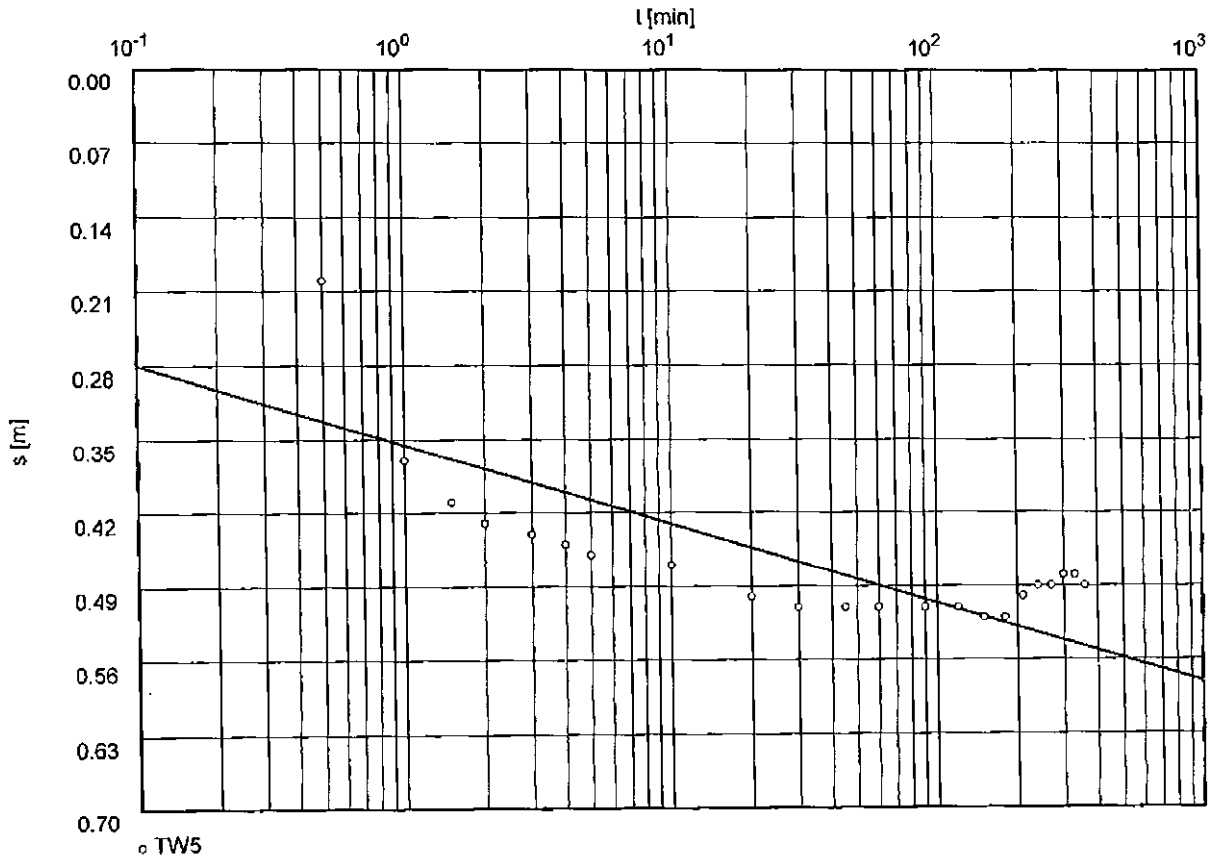
Pumping Test No. 1	Test conducted on: March 13/07
TW5	TW5
Discharge 0.70 l/s	Distance from the pumping well 0.150 m

Static water level: 5.730 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	0.50	5.930	0.200	
3	1.00	6.100	0.370	
4	1.50	6.140	0.410	
5	2.00	6.160	0.430	
6	3.00	6.170	0.440	
7	4.00	6.180	0.450	
8	5.00	6.190	0.460	
9	10.00	6.200	0.470	
10	20.00	6.230	0.500	
11	30.00	6.240	0.510	
12	45.00	6.240	0.510	
13	60.00	6.240	0.510	
14	90.00	6.240	0.510	
15	120.00	6.240	0.510	
16	150.00	6.250	0.520	
17	180.00	6.250	0.520	
18	210.00	6.230	0.500	
19	240.00	6.220	0.490	
20	270.00	6.220	0.490	
21	300.00	6.210	0.480	
22	330.00	6.210	0.480	
23	360.00	6.220	0.490	

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: March 13/07
TW5	
Discharge 0.70 l/s	



Transmissivity [m²/min]: 1.01×10^{-1}

Storativity: 1.97×10^{-4}

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

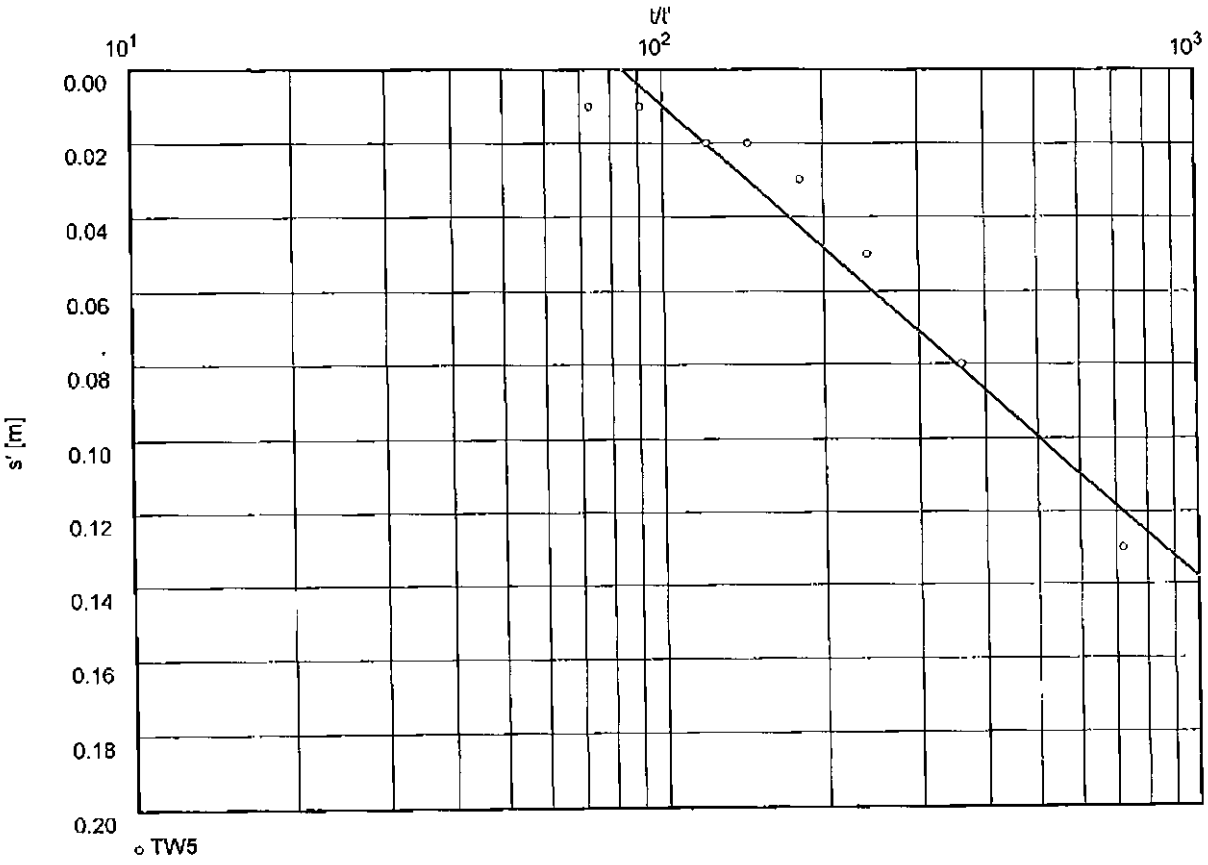
Pumping Test No. 1	Test conducted on: March 13/07
TW5	TW5
Discharge 0.70 l/s	Distance from the pumping well 0.150 m

Static water level: 5.730 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	0.50	5.930	0.200	
3	1.00	6.100	0.370	
4	1.50	6.140	0.410	
5	2.00	6.160	0.430	
6	3.00	6.170	0.440	
7	4.00	6.180	0.450	
8	5.00	6.190	0.460	
9	10.00	6.200	0.470	
10	20.00	6.230	0.500	
11	30.00	6.240	0.510	
12	45.00	6.240	0.510	
13	60.00	6.240	0.510	
14	90.00	6.240	0.510	
15	120.00	6.240	0.510	
16	150.00	6.250	0.520	
17	180.00	6.250	0.520	
18	210.00	6.230	0.500	
19	240.00	6.220	0.490	
20	270.00	6.220	0.490	
21	300.00	6.210	0.480	
22	330.00	6.210	0.480	
23	360.00	6.220	0.490	

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: March 13/07
TW5	
Discharge 0.70 l/s	
	Pumping test duration: 360.00 min



Transmissivity [m²/min]: 5.98×10^{-2}

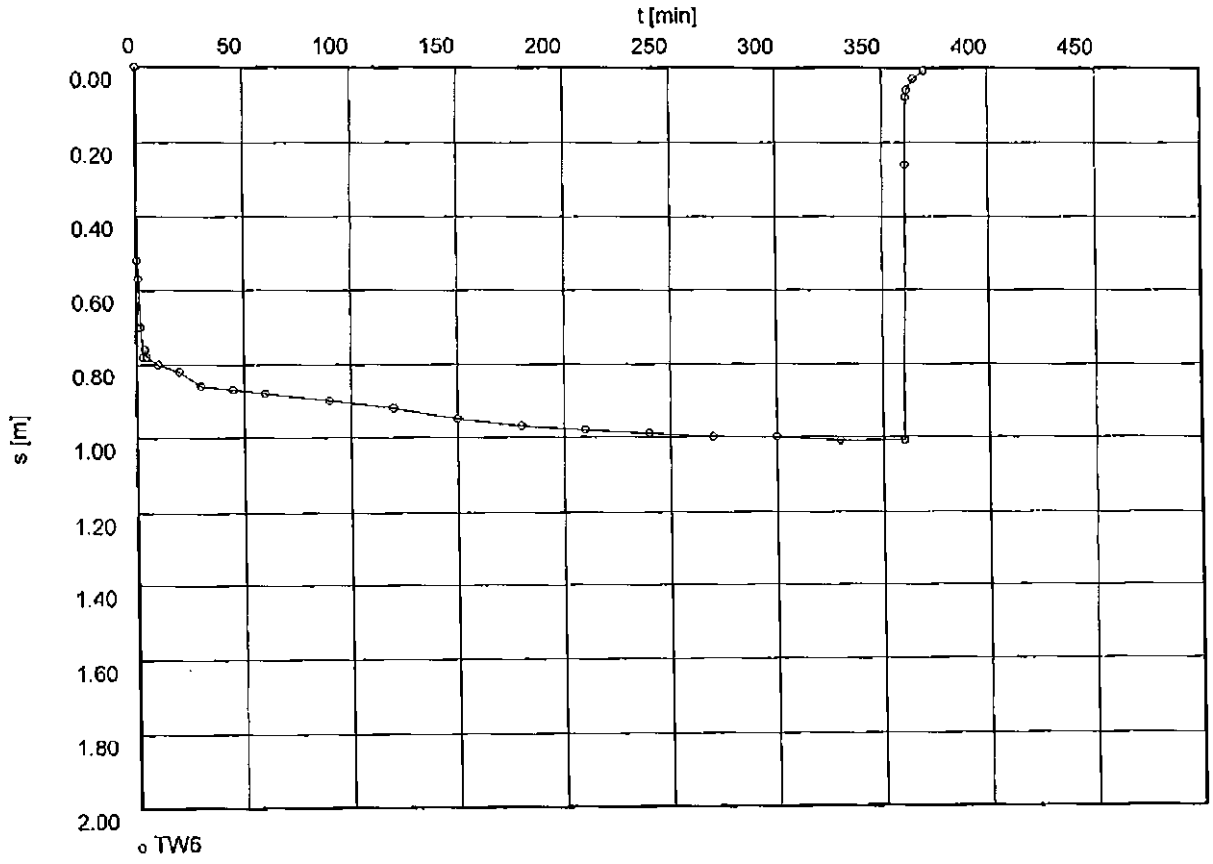
Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: March 13/07
TW5	TW5
Discharge 0.70 l/s	Distance from the pumping well 0.150 m
Static water level: 5.730 m below datum	Pumping test duration: 360.00 min

	Time from end of pumping [min]	Water level [m]	Residual drawdown [m]	
1	0.50	5.860	0.130	
2	1.00	5.810	0.080	
3	1.50	5.780	0.050	
4	2.00	5.760	0.030	
5	2.50	5.750	0.020	
6	3.00	5.750	0.020	
7	4.00	5.740	0.010	
8	5.00	5.740	0.010	

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown plot	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Mar 21/07
TW6	
Discharge 0.73 l/s	



Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown plot	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

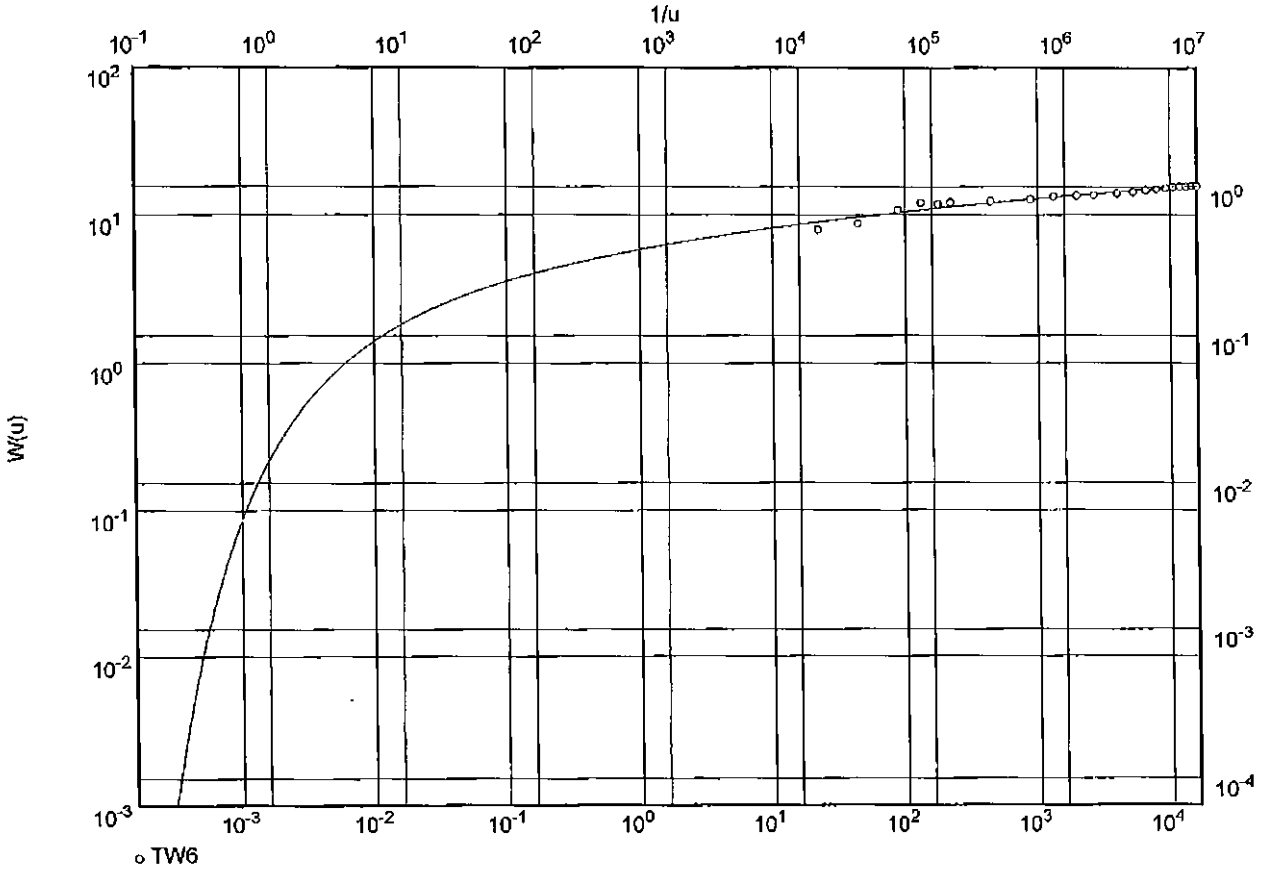
Pumping Test No. 1	Test conducted on: Mar 21/07
TW6	TW6
Discharge 0.73 l/s	Distance from the pumping well 0.150 m

Static water level: 2.320 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
1	0.00	2.320	0.000	
2	0.50	2.840	0.520	
3	1.00	2.890	0.570	
4	2.00	3.020	0.700	
5	3.00	3.100	0.780	
6	4.00	3.080	0.760	
7	5.00	3.100	0.780	
8	10.00	3.120	0.800	
9	20.00	3.140	0.820	
10	30.00	3.180	0.860	
11	45.00	3.190	0.870	
12	60.00	3.200	0.880	
13	90.00	3.220	0.900	
14	120.00	3.240	0.920	
15	150.00	3.270	0.950	
16	180.00	3.290	0.970	
17	210.00	3.300	0.980	
18	240.00	3.310	0.990	
19	270.00	3.320	1.000	
20	300.00	3.320	1.000	
21	330.00	3.330	1.010	
22	360.00	3.330	1.010	
23	361.00	2.580	0.260	
24	361.50	2.400	0.080	
25	362.00	2.380	0.060	
26	365.00	2.350	0.030	
27	370.00	2.330	0.010	

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Theis analysis method Confined aquifer	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Mar 21/07
TW6	
Discharge 0.73 l/s	



Transmissivity [m²/min]: 5.33×10^{-2}

Storativity: 3.41×10^{-4}

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Theis analysis method Confined aquifer	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

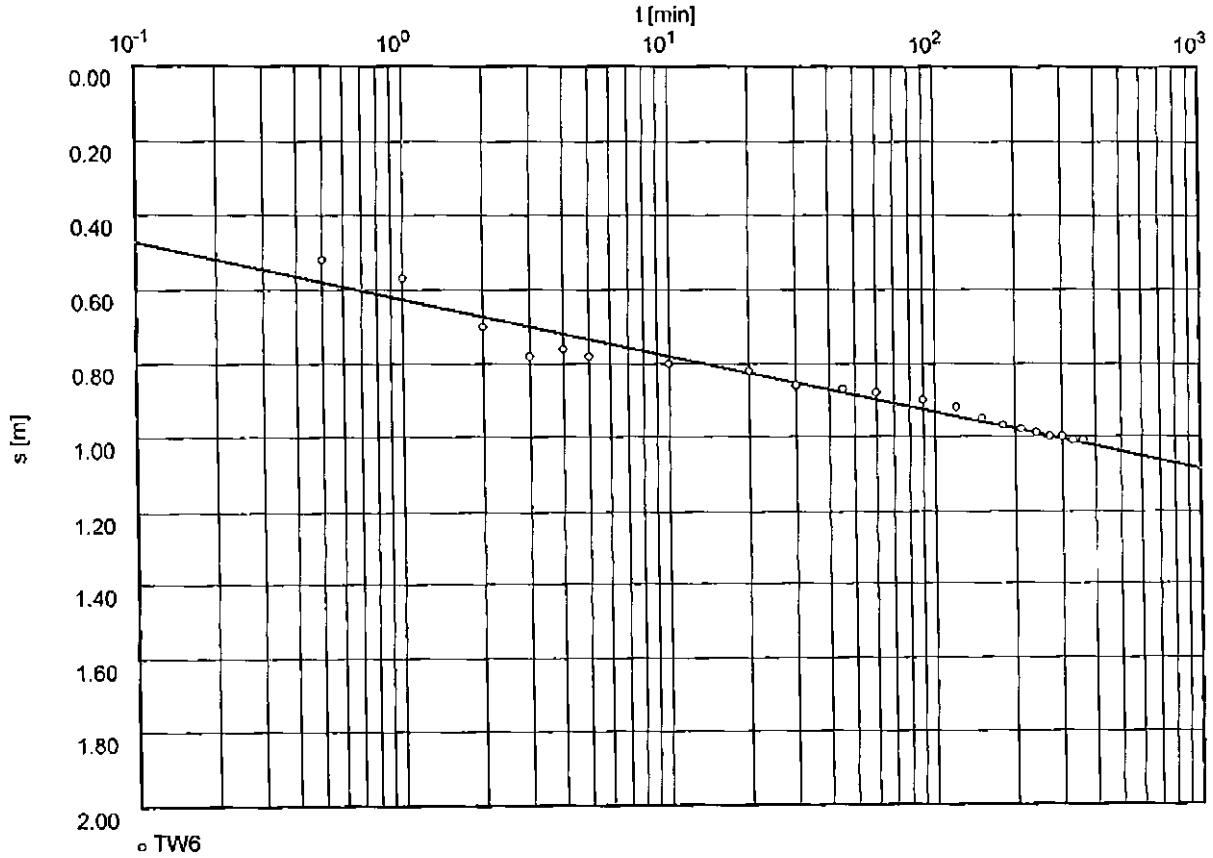
Pumping Test No. 1	Test conducted on: Mar 21/07
TW6	TW6
Discharge 0.73 l/s	Distance from the pumping well 0.150 m

Static water level: 2.320 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	0.50	2.840	0.520
3	1.00	2.890	0.570
4	2.00	3.020	0.700
5	3.00	3.100	0.780
6	4.00	3.080	0.760
7	5.00	3.100	0.780
8	10.00	3.120	0.800
9	20.00	3.140	0.820
10	30.00	3.180	0.860
11	45.00	3.190	0.870
12	60.00	3.200	0.880
13	90.00	3.220	0.900
14	120.00	3.240	0.920
15	150.00	3.270	0.950
16	180.00	3.290	0.970
17	210.00	3.300	0.980
18	240.00	3.310	0.990
19	270.00	3.320	1.000
20	300.00	3.320	1.000
21	330.00	3.330	1.010
22	360.00	3.330	1.010

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Mar 21/07
TW6	
Discharge 0.73 l/s	



Transmissivity [m²/min]: 5.22×10^{-2}

Storativity: 4.32×10^{-4}

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

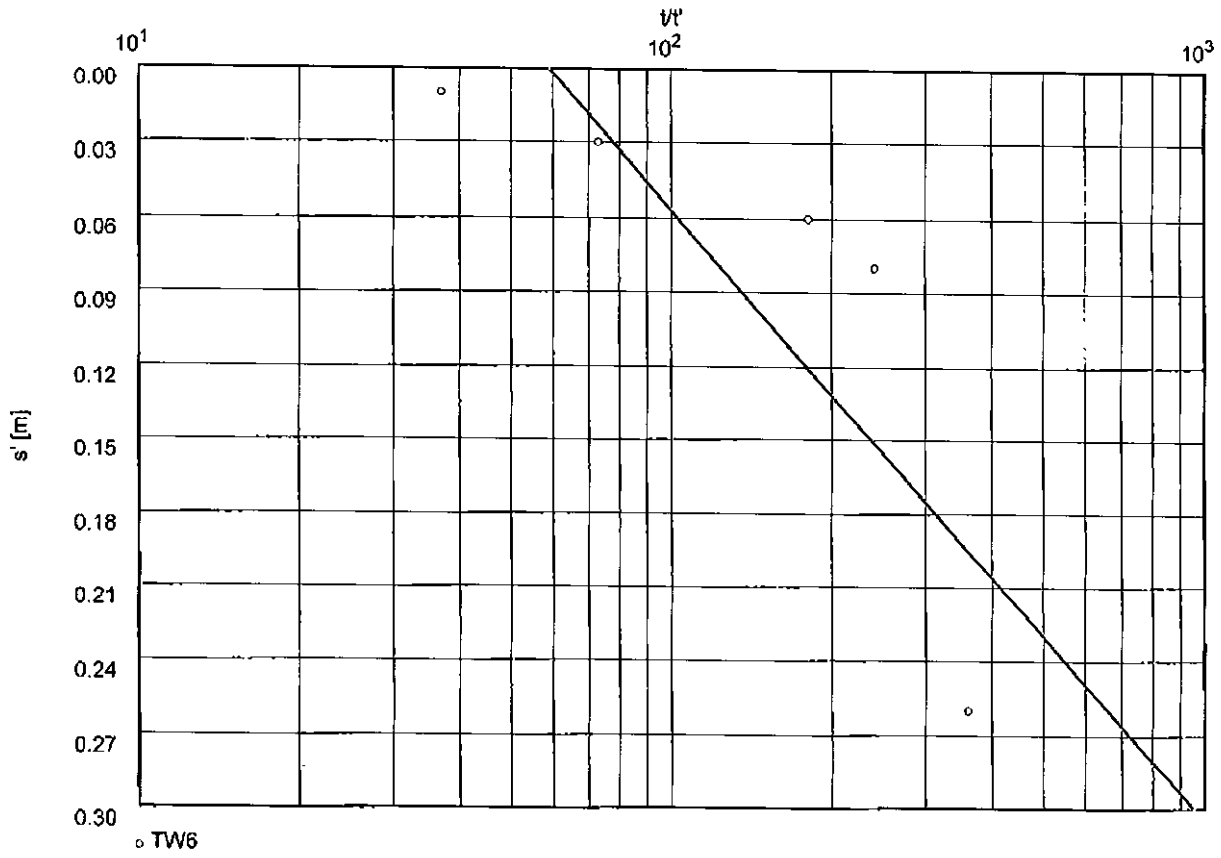
Pumping Test No. 1	Test conducted on: Mar 21/07
TW6	TW6
Discharge 0.73 l/s	Distance from the pumping well 0.150 m

Static water level: 2.320 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	0.50	2.840	0.520	
3	1.00	2.890	0.570	
4	2.00	3.020	0.700	
5	3.00	3.100	0.780	
6	4.00	3.080	0.760	
7	5.00	3.100	0.780	
8	10.00	3.120	0.800	
9	20.00	3.140	0.820	
10	30.00	3.180	0.860	
11	45.00	3.190	0.870	
12	60.00	3.200	0.880	
13	90.00	3.220	0.900	
14	120.00	3.240	0.920	
15	150.00	3.270	0.950	
16	180.00	3.290	0.970	
17	210.00	3.300	0.980	
18	240.00	3.310	0.990	
19	270.00	3.320	1.000	
20	300.00	3.320	1.000	
21	330.00	3.330	1.010	
22	360.00	3.330	1.010	

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date: 25.04.2007	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Mar 21/07
TW6	
Discharge 0.73 l/s	
	Pumping test duration: 360.00 min



Transmissivity [m²/min]: 3.23×10^{-2}

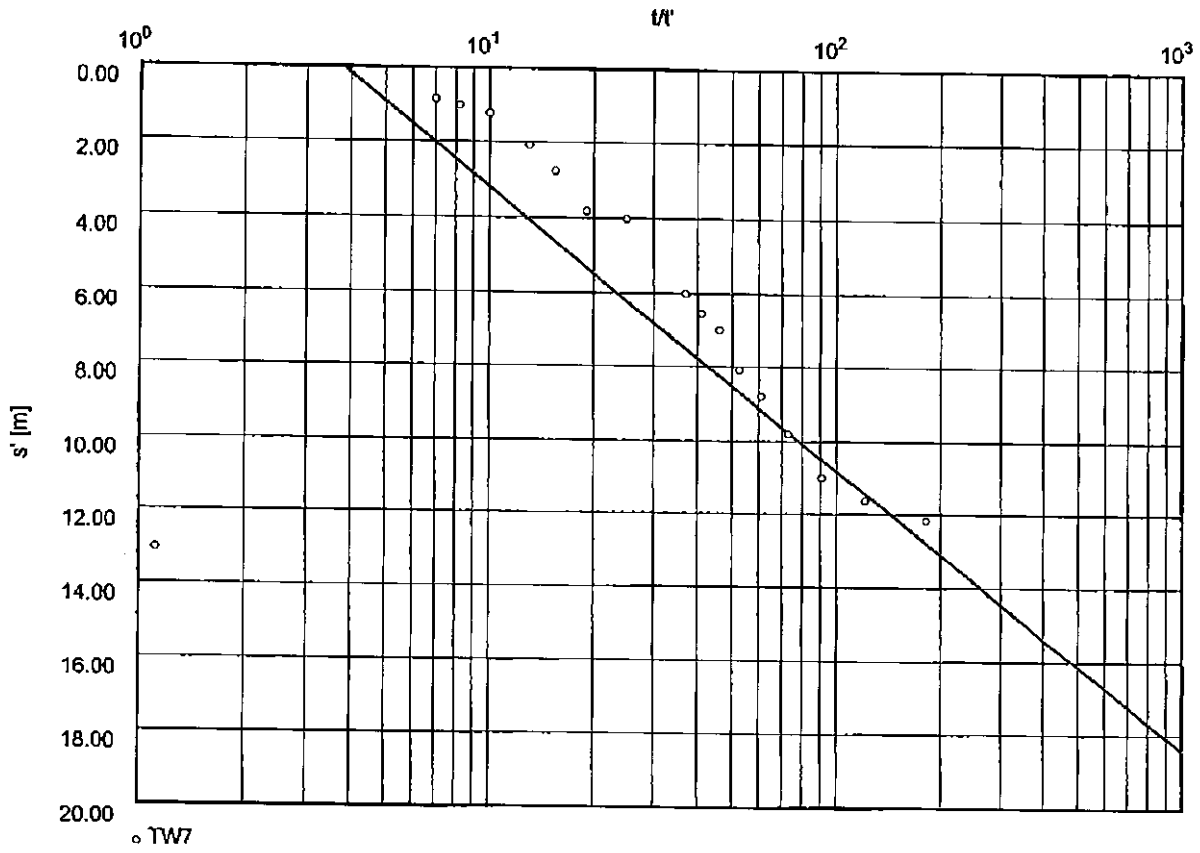
Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date: 25.04.2007	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No. 1	Test conducted on: Mar 21/07
TW6	TW6
Discharge 0.73 l/s	Distance from the pumping well 0.150 m
Static water level: 2.320 m below datum	Pumping test duration: 360.00 min

	Time from end of pumping [min]	Water level [m]	Residual drawdown [m]	
1	1.00	2.580	0.260	
2	1.50	2.400	0.080	
3	2.00	2.380	0.060	
4	5.00	2.350	0.030	
5	10.00	2.330	0.010	

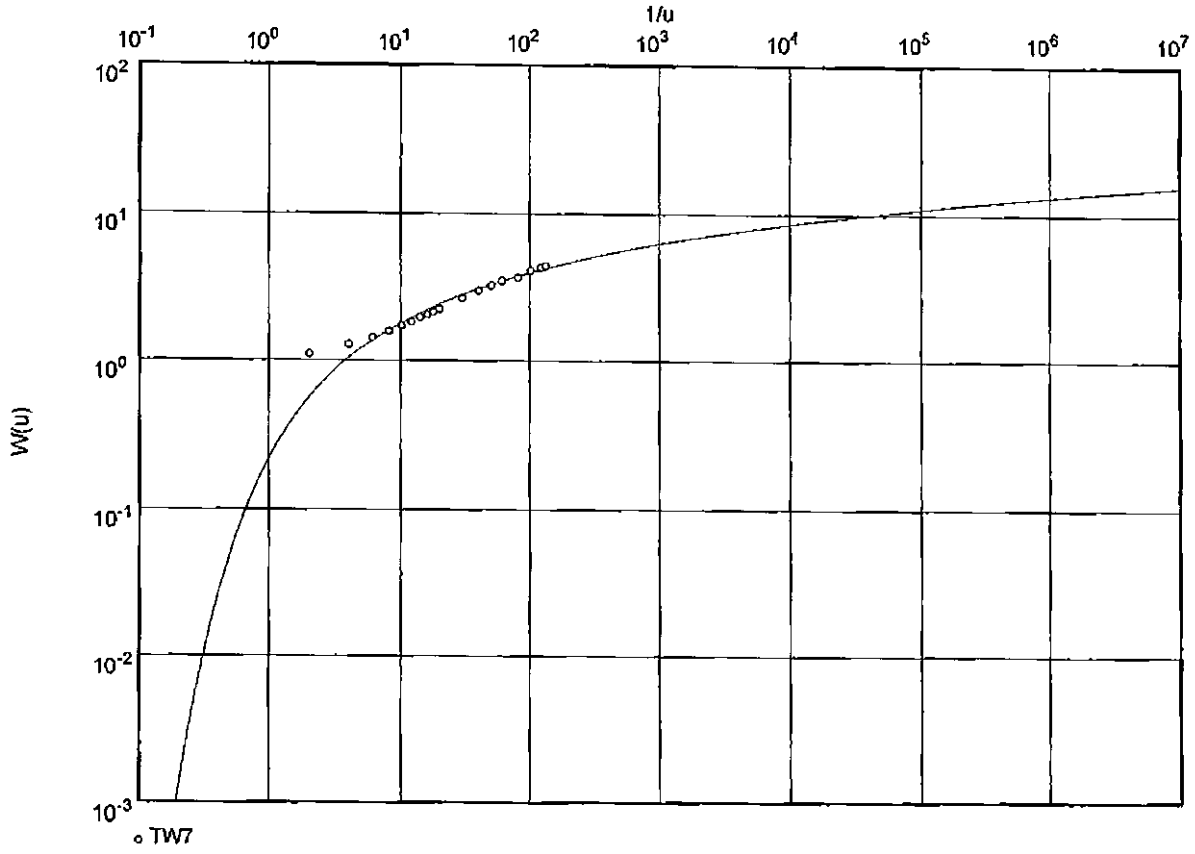
Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date:	Page 1
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 2	Test conducted on: Nov. 27, 2009
TW7 (RETEST)	
Discharge 0.38 l/s	
	Pumping test duration: 360.00 min



Transmissivity [m²/min]: 5.48×10^{-4}

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	Page 1
		Project: PH0482	
		Evaluated by:	
Pumping Test No. 2		Test conducted on: Nov. 27, 2009	
TW7 (RETEST)			
Discharge 0.38 l/s			

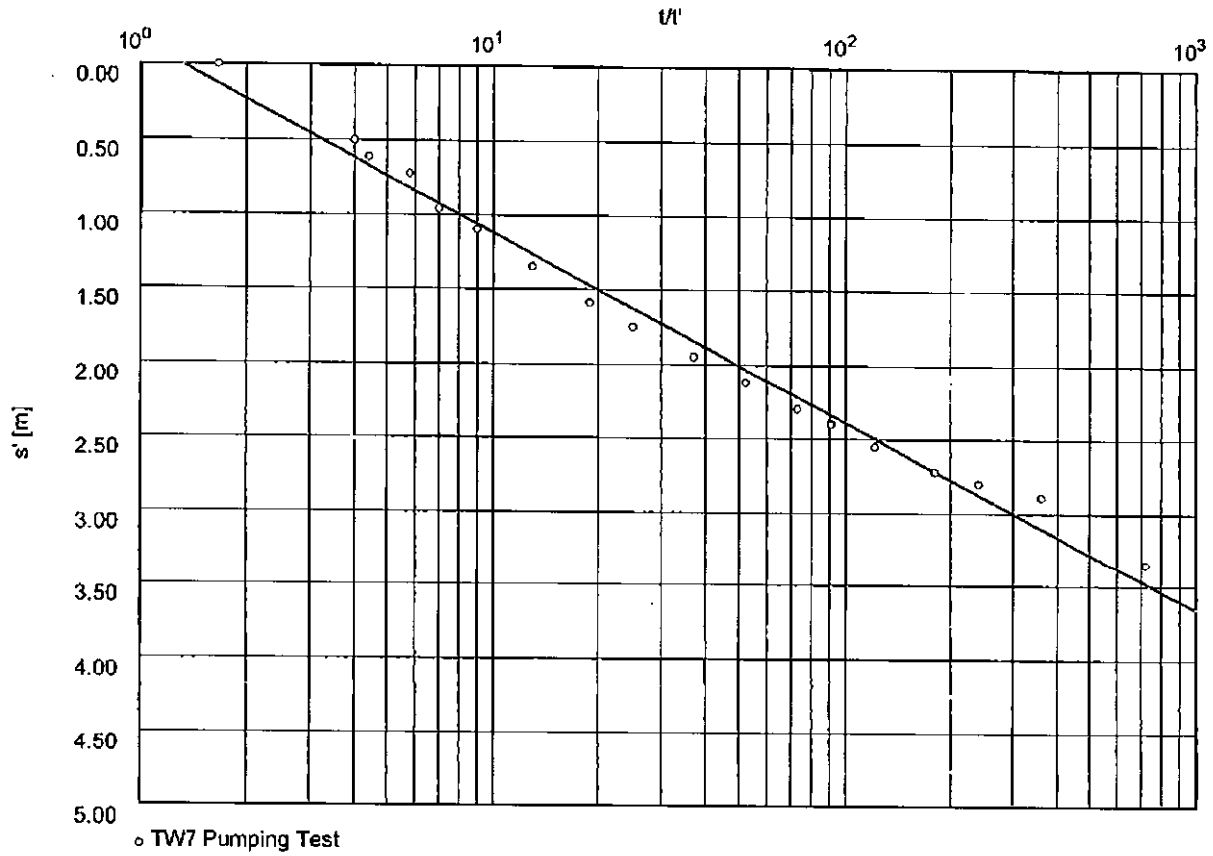


Transmissivity [m^2/min]: 1.93×10^{-4}

Storativity: 4.23×10^{-3}

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date:	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No.	Test conducted on: January 24, 2008
TW7	
Discharge 0.76 l/s	
	Pumping test duration: 360.00 min



Transmissivity [m²/min]: 6.56×10^{-3}

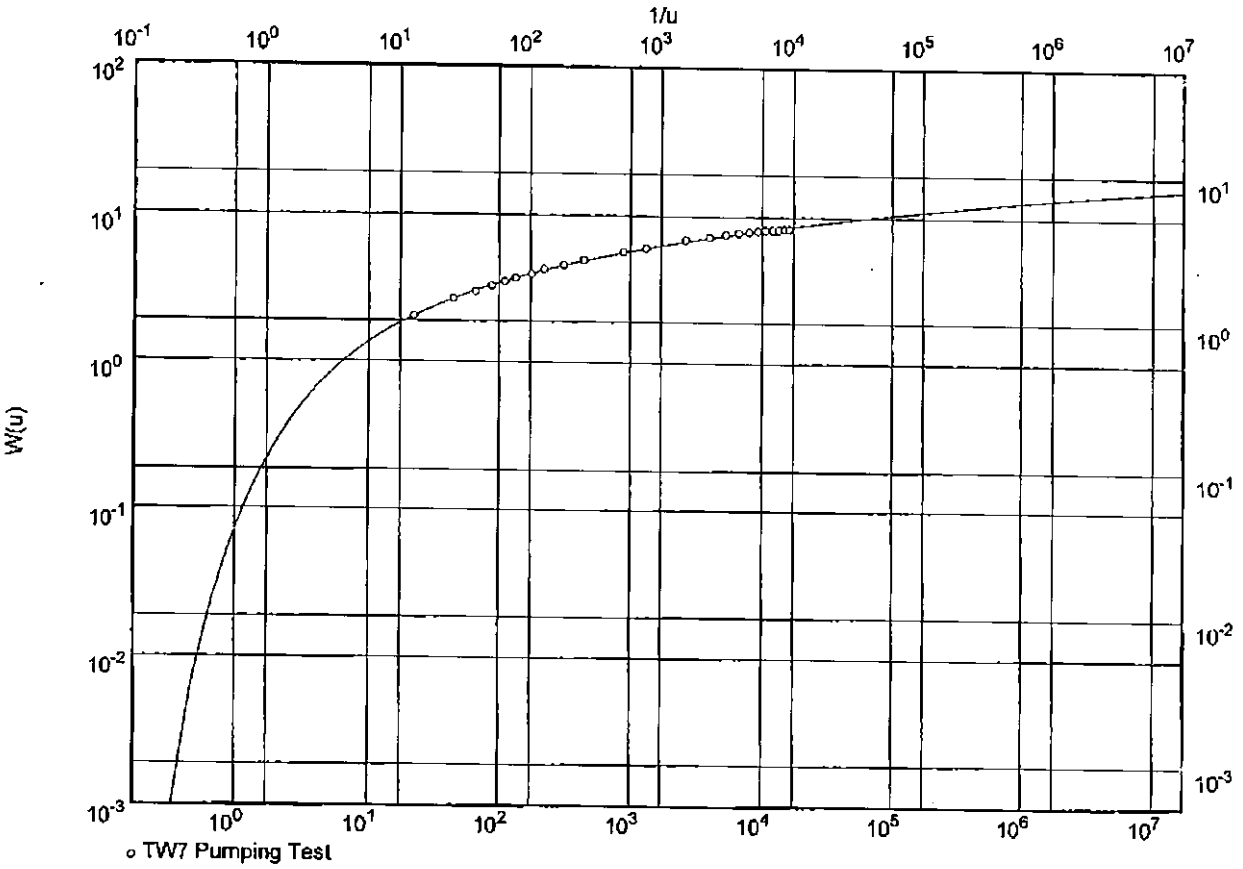
Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date:	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No.	Test conducted on: January 24, 2008
TW7	TW7 Pumping Test
Discharge 0.76 l/s	Distance from the pumping well 0.150 m
Static water level: 2.350 m below datum	Pumping test duration: 360.00 min

	Time from end of pumping [min]	Water level [m]	Residual drawdown [m]
1	0.50	5.700	3.350
2	1.00	5.240	2.890
3	1.50	5.150	2.800
4	2.00	5.070	2.720
5	3.00	4.900	2.550
6	4.00	4.750	2.400
7	5.00	4.650	2.300
8	7.00	4.470	2.120
9	10.00	4.300	1.950
10	15.00	4.100	1.750
11	20.00	3.940	1.590
12	30.00	3.700	1.350
13	45.00	3.450	1.100
14	60.00	3.310	0.960
15	75.00	3.070	0.720
16	105.00	2.960	0.610
17	120.00	2.850	0.500
18	540.00	2.350	0.000

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No.	Test conducted on: January 24, 2008
TW7	
Discharge 0.76 l/s	



Transmissivity [m²/min]: 6.88×10^{-3}

Storativity: 4.76×10^{-2}

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

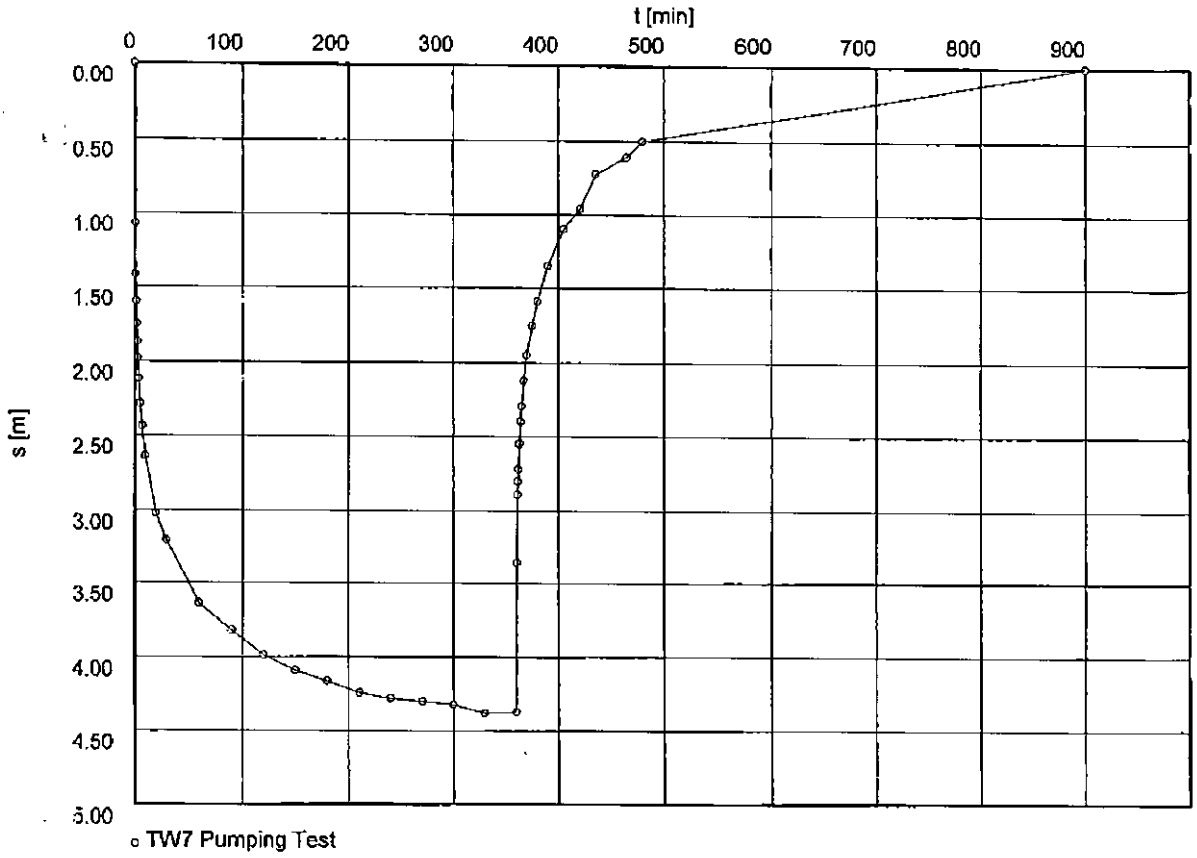
Pumping Test No.	Test conducted on: January 24, 2008
TW7	TW7 Pumping Test
Discharge 0.76 l/s	Distance from the pumping well 0.150 m

Static water level: 2.350 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	0.50	3.420	1.070	
3	1.00	3.770	1.420	
4	1.50	3.950	1.600	
5	2.00	4.100	1.750	
6	2.50	4.220	1.870	
7	3.00	4.330	1.980	
8	4.00	4.470	2.120	
9	5.00	4.640	2.290	
10	7.00	4.790	2.440	
11	10.00	4.990	2.640	
12	20.00	5.370	3.020	
13	30.00	5.550	3.200	
14	60.00	5.990	3.640	
15	90.00	6.170	3.820	
16	120.00	6.340	3.990	
17	150.00	6.440	4.090	
18	180.00	6.510	4.160	
19	210.00	6.590	4.240	
20	240.00	6.630	4.280	
21	270.00	6.650	4.300	
22	300.00	6.670	4.320	
23	330.00	6.730	4.380	
24	360.00	6.720	4.370	

Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown plot	Date:	none, Page 1
		Project: PH0482	
		Evaluated by: RAP	

Pumping Test No.	Test conducted on: January 24, 2008
TW7	
Discharge 0.76 l/s	



Paterson Group Ltd. 1-28 Concourse Gate Nepean, ON K2E 7T7	Pumping test analysis Time-Drawdown plot	Date:	none, Page 2
		Project: PH0482	
		Evaluated by: RAP	

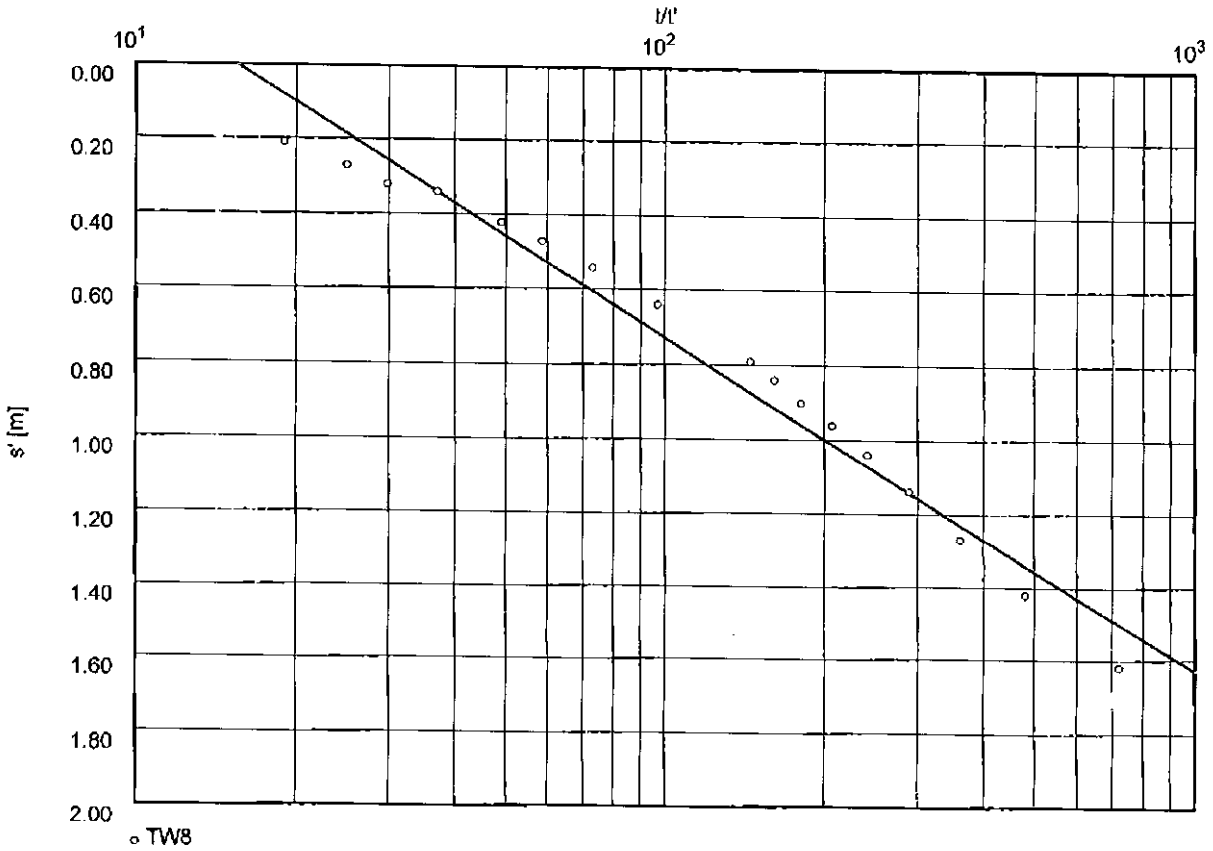
Pumping Test No.	Test conducted on: January 24, 2008
TW7	TW7 Pumping Test
Discharge 0.76 l/s	Distance from the pumping well 0.150 m

Static water level: 2.350 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
1	0.00	2.350	0.000
2	0.50	3.420	1.070
3	1.00	3.770	1.420
4	1.50	3.950	1.600
5	2.00	4.100	1.750
6	2.50	4.220	1.870
7	3.00	4.330	1.980
8	4.00	4.470	2.120
9	5.00	4.640	2.290
10	7.00	4.790	2.440
11	10.00	4.990	2.640
12	20.00	5.370	3.020
13	30.00	5.550	3.200
14	60.00	5.990	3.640
15	90.00	6.170	3.820
16	120.00	6.340	3.990
17	150.00	6.440	4.090
18	180.00	6.510	4.160
19	210.00	6.590	4.240
20	240.00	6.630	4.280
21	270.00	6.650	4.300
22	300.00	6.670	4.320
23	330.00	6.730	4.380
24	360.00	6.720	4.370
25	360.50	5.700	3.350
26	361.00	5.240	2.890
27	361.50	5.150	2.800
28	362.00	5.070	2.720
29	363.00	4.900	2.550
30	364.00	4.750	2.400
31	365.00	4.650	2.300
32	367.00	4.470	2.120
33	370.00	4.300	1.950
34	375.00	4.100	1.750
35	380.00	3.940	1.590
36	390.00	3.700	1.350
37	405.00	3.450	1.100
38	420.00	3.310	0.960
39	435.00	3.070	0.720
40	465.00	2.960	0.610
41	480.00	2.850	0.500
42	900.00	2.350	0.000

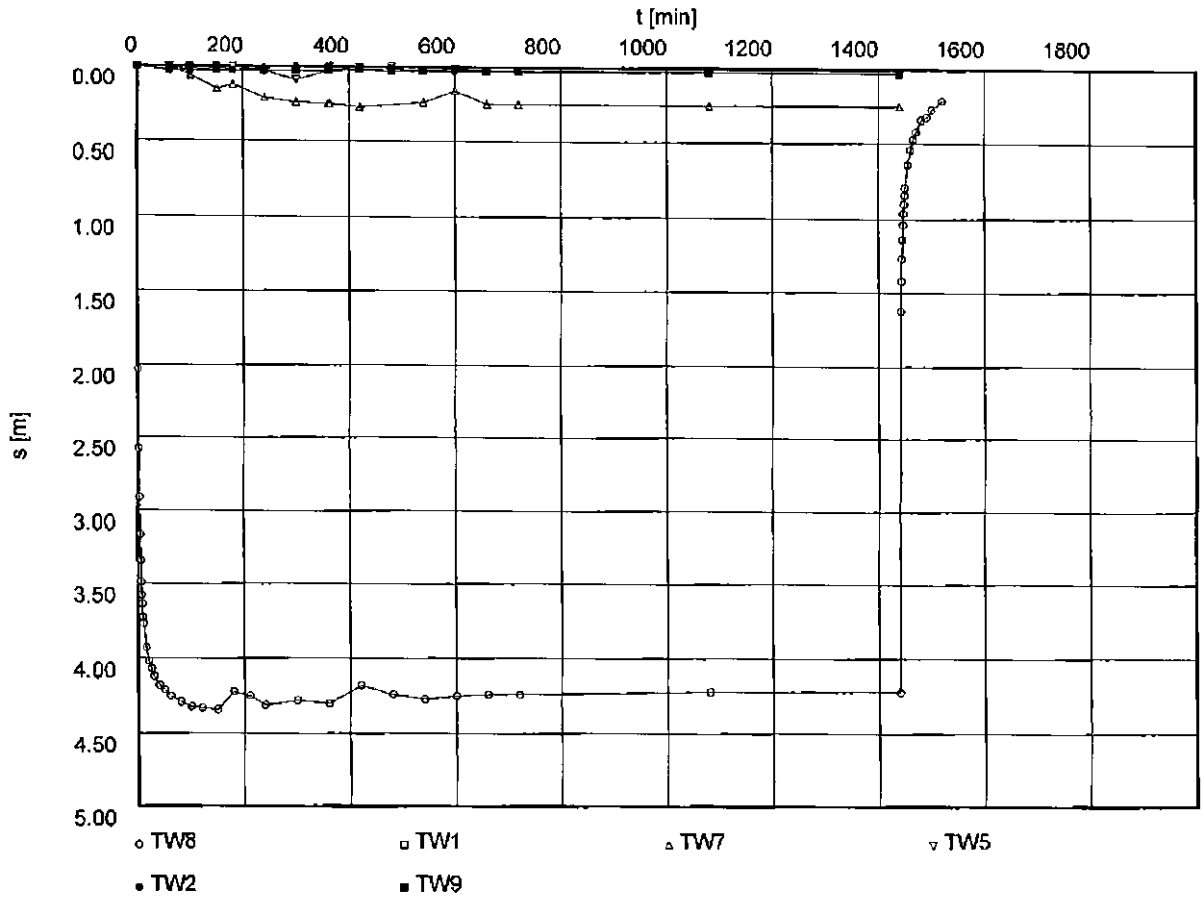
Waterloo Hydrogeologic 180 Columbia St. W. Waterloo, Ontario, Canada ph.(519)746-1798	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date:	none, Page 1
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	
Discharge 0.76 l/s	
	Pumping test duration: 1440.00 min



Transmissivity [m²/min]: 9.26×10^{-3}

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Time-Drawdown plot	Date:	none, Page 1
		Project: PH0482	
		Evaluated by:	
Pumping Test No. 24 hour		Test conducted on:	
TW8			
Discharge 0.76 l/s			



Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Time-Drawdown plot	Date:	none, Page 2
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW8
Discharge 0.76 l/s	

Static water level: 4.830 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
1	0.00	4.830	0.000	
2	1.00	6.860	2.030	
3	2.00	7.410	2.580	
4	3.00	7.740	2.910	
5	4.00	7.990	3.160	
6	5.00	8.170	3.340	
7	6.00	8.320	3.490	
8	7.00	8.410	3.580	
9	8.00	8.470	3.640	
10	9.00	8.560	3.730	
11	10.00	8.600	3.770	
12	15.00	8.760	3.930	
13	20.00	8.850	4.020	
14	25.00	8.900	4.070	
15	30.00	8.950	4.120	
16	40.00	9.010	4.180	
17	50.00	9.040	4.210	
18	60.00	9.080	4.250	
19	80.00	9.120	4.290	
20	100.00	9.150	4.320	
21	120.00	9.160	4.330	
22	150.00	9.170	4.340	
23	180.00	9.050	4.220	
24	210.00	9.080	4.250	
25	240.00	9.140	4.310	
26	300.00	9.110	4.280	
27	360.00	9.130	4.300	
28	420.00	9.010	4.180	
29	480.00	9.070	4.240	
30	540.00	9.100	4.270	
31	600.00	9.080	4.250	
32	660.00	9.070	4.240	
33	720.00	9.070	4.240	
34	1080.00	9.050	4.220	
35	1440.00	9.050	4.220	
36	1442.00	6.450	1.620	
37	1443.00	6.250	1.420	
38	1444.00	6.100	1.270	
39	1445.00	5.970	1.140	
40	1446.00	5.870	1.040	
41	1447.00	5.790	0.960	
42	1448.00	5.730	0.900	
43	1449.00	5.670	0.840	
44	1450.00	5.620	0.790	
45	1455.00	5.470	0.640	
46	1460.00	5.370	0.540	
47	1465.00	5.300	0.470	
48	1470.00	5.250	0.420	
49	1480.00	5.170	0.340	
50	1490.00	5.150	0.320	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Time-Drawdown plot	Date:	none, Page 3
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW8
Discharge 0.76 l/s	

Static water level: 4.830 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
51	1500.00	5.100	0.270	
52	1520.00	5.040	0.210	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Time-Drawdown plot	Date:	none, Page 4
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW6	TW1
Discharge 0.76 l/s	Distance from the pumping well 353.000 m

Static water level: 2.230 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
1	0.00	2.230	0.000
2	60.00	2.230	0.000
3	100.00	2.230	0.000
4	150.00	2.230	0.000
5	180.00	2.200	-0.030
6	240.00	2.190	-0.040
7	300.00	2.190	-0.040
8	360.00	2.190	-0.040
9	363.00	2.200	-0.030
10	420.00	2.190	-0.040
11	540.00	2.190	-0.040
12	600.00	2.190	-0.040
13	660.00	2.190	-0.040
14	720.00	2.160	-0.070
15	1080.00	2.160	-0.070
16	1440.00	2.150	-0.080

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Time-Drawdown plot	Date:	none, Page 5
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW7
Discharge 0.76 l/s	Distance from the pumping well 72.000 m

Static water level: 6.890 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
1	0.00	6.890	0.000
2	60.00	6.890	0.000
3	100.00	6.950	0.060
4	150.00	7.040	0.150
5	180.00	7.010	0.120
6	240.00	7.100	0.210
7	300.00	7.130	0.240
8	360.00	7.140	0.250
9	363.00	7.140	0.250
10	420.00	7.160	0.270
11	540.00	7.130	0.240
12	600.00	7.050	0.160
13	660.00	7.140	0.250
14	720.00	7.140	0.250
15	1080.00	7.140	0.250
16	1440.00	7.140	0.250

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Time-Drawdown plot	Date:	none, Page 6
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW5
Discharge 0.76 l/s	Distance from the pumping well 134.000 m

Static water level: 5.880 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
1	0.00	5.880	0.000
2	60.00	5.880	0.000
3	100.00	5.910	0.030
4	180.00	5.880	0.000
5	240.00	5.910	0.030
6	300.00	5.970	0.090
7	360.00	5.910	0.030
8	363.00	5.880	0.000
9	420.00	5.880	0.000
10	480.00	5.880	0.000
11	540.00	5.860	-0.020
12	600.00	5.850	-0.030
13	660.00	5.850	-0.030
14	720.00	5.850	-0.030
15	1080.00	5.850	-0.030
16	1440.00	5.850	-0.030

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Time-Drawdown plot	Date:	none, Page 7
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW2
Discharge 0.76 l/s	Distance from the pumping well 167.000 m

Static water level: 4.420 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
1	0.00	4.420	0.000
2	60.00	4.420	0.000
3	100.00	4.430	0.010
4	150.00	4.420	0.000
5	180.00	4.450	0.030
6	240.00	4.430	0.010
7	300.00	4.420	0.000
8	360.00	4.420	0.000
9	363.00	4.450	0.030
10	420.00	4.420	0.000
11	480.00	4.430	0.010
12	540.00	4.450	0.030
13	600.00	4.450	0.030
14	660.00	4.450	0.030
15	720.00	4.450	0.030
16	1080.00	4.450	0.030
17	1440.00	4.450	0.030

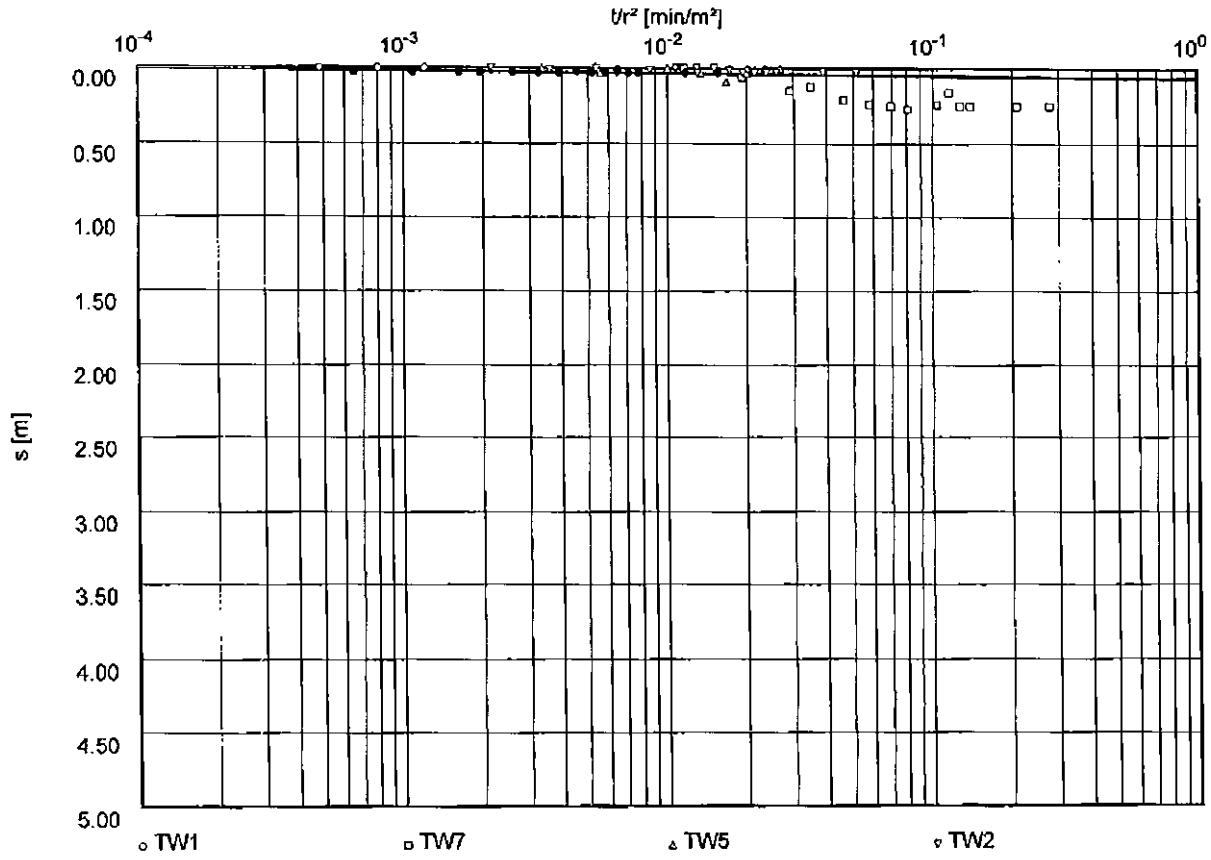
Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Time-Drawdown plot	Date:	none, Page 8
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW9
Discharge 0.76 l/s	Distance from the pumping well 304.000 m

Static water level: 2.930 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
1	0.00	2.930	0.000
2	60.00	2.960	0.030
3	100.00	2.960	0.030
4	150.00	2.960	0.030
5	180.00	2.960	0.030
6	240.00	2.960	0.030
7	300.00	2.960	0.030
8	360.00	2.960	0.030
9	420.00	2.950	0.020
10	480.00	2.960	0.030
11	540.00	2.960	0.030
12	600.00	2.940	0.010
13	660.00	2.960	0.030
14	720.00	2.960	0.030
15	1080.00	2.960	0.030
16	1440.00	2.960	0.030

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Distance-Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date:	none, Page 1
		Project: PH0482	
		Evaluated by:	
Pumping Test No. 24 hour		Test conducted on:	
TW8			
Discharge 0.76 l/s			



Transmissivity [m²/min]: 5.67×10^{-1}

Storativity: 6.15×10^{-5}

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Distance-Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date:	none, Page 2
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW8
Discharge 0.76 l/s	

Static water level: 4.830 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	1.00	6.860	2.030
3	2.00	7.410	2.580
4	3.00	7.740	2.910
5	4.00	7.990	3.160
6	5.00	8.170	3.340
7	6.00	8.320	3.490
8	7.00	8.410	3.580
9	8.00	8.470	3.640
10	9.00	8.560	3.730
11	10.00	8.600	3.770
12	15.00	8.760	3.930
13	20.00	8.850	4.020
14	25.00	8.900	4.070
15	30.00	8.950	4.120
16	40.00	9.010	4.180
17	50.00	9.040	4.210
18	60.00	9.080	4.250
19	80.00	9.120	4.290
20	100.00	9.150	4.320
21	120.00	9.160	4.330
22	150.00	9.170	4.340
23	180.00	9.050	4.220
24	210.00	9.080	4.250
25	240.00	9.140	4.310
26	300.00	9.110	4.280
27	360.00	9.130	4.300
28	420.00	9.010	4.180
29	480.00	9.070	4.240
30	540.00	9.100	4.270
31	600.00	9.080	4.250
32	660.00	9.070	4.240
33	720.00	9.070	4.240
34	1080.00	9.050	4.220
35	1440.00	9.050	4.220
36	1442.00	6.450	1.620
37	1443.00	6.250	1.420
38	1444.00	6.100	1.270
39	1445.00	5.970	1.140
40	1446.00	5.870	1.040
41	1447.00	5.790	0.960
42	1448.00	5.730	0.900
43	1449.00	5.670	0.840
44	1450.00	5.620	0.790
45	1455.00	5.470	0.640
46	1460.00	5.370	0.540
47	1465.00	5.300	0.470
48	1470.00	5.250	0.420
49	1480.00	5.170	0.340
50	1490.00	5.150	0.320

Waterloo Hydrogeologic 160 Columbia St. W. Waterloo,Ontario,Canada ph (519)746-1798	Pumping test analysis Distance-Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date:	none, Page 3
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW8
Discharge 0.76 l/s	

Static water level: 4.830 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
51	1500.00	5.100	0.270
52	1520.00	5.040	0.210

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Distance-Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date:	none, Page 4
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW1
Discharge 0.76 l/s	Distance from the pumping well 353.000 m

Static water level: 2.230 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	60.00	2.230	0.000	
3	100.00	2.230	0.000	
4	150.00	2.230	0.000	
5	180.00	2.200	-0.030	
6	240.00	2.190	-0.040	
7	300.00	2.190	-0.040	
8	360.00	2.190	-0.040	
9	363.00	2.200	-0.030	
10	420.00	2.190	-0.040	
11	540.00	2.190	-0.040	
12	600.00	2.190	-0.040	
13	660.00	2.190	-0.040	
14	720.00	2.160	-0.070	
15	1080.00	2.160	-0.070	
16	1440.00	2.150	-0.080	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Distance-Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date:	none, Page 5
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW7
Discharge 0.76 l/s	Distance from the pumping well 72.000 m

Static water level: 6.890 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	60.00	6.890	0.000
3	100.00	6.950	0.060
4	150.00	7.040	0.150
5	180.00	7.010	0.120
6	240.00	7.100	0.210
7	300.00	7.130	0.240
8	360.00	7.140	0.250
9	363.00	7.140	0.250
10	420.00	7.160	0.270
11	540.00	7.130	0.240
12	600.00	7.050	0.160
13	660.00	7.140	0.250
14	720.00	7.140	0.250
15	1080.00	7.140	0.250
16	1440.00	7.140	0.250

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Distance-Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date:	none, Page 6
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW5
Discharge 0.76 l/s	Distance from the pumping well 134.000 m

Static water level: 5.880 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	60.00	5.880	0.000
3	100.00	5.910	0.030
4	180.00	5.880	0.000
5	240.00	5.910	0.030
6	300.00	5.970	0.090
7	360.00	5.910	0.030
8	363.00	5.880	0.000
9	420.00	5.880	0.000
10	480.00	5.880	0.000
11	540.00	5.860	-0.020
12	600.00	5.850	-0.030
13	660.00	5.850	-0.030
14	720.00	5.850	-0.030
15	1080.00	5.850	-0.030
16	1440.00	5.850	-0.030

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Distance-Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date:	none, Page 7
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW2
Discharge 0.76 l/s	Distance from the pumping well 167.000 m

Static water level: 4.420 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	60.00	4.420	0.000	
3	100.00	4.430	0.010	
4	150.00	4.420	0.000	
5	180.00	4.450	0.030	
6	240.00	4.430	0.010	
7	300.00	4.420	0.000	
8	360.00	4.420	0.000	
9	363.00	4.450	0.030	
10	420.00	4.420	0.000	
11	480.00	4.430	0.010	
12	540.00	4.450	0.030	
13	600.00	4.450	0.030	
14	660.00	4.450	0.030	
15	720.00	4.450	0.030	
16	1080.00	4.450	0.030	
17	1440.00	4.450	0.030	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Distance-Time-Drawdown-method after COOPER & JACOB Confined aquifer	Dale:	none, Page 8
		Project: PH0482	
		Evaluated by:	

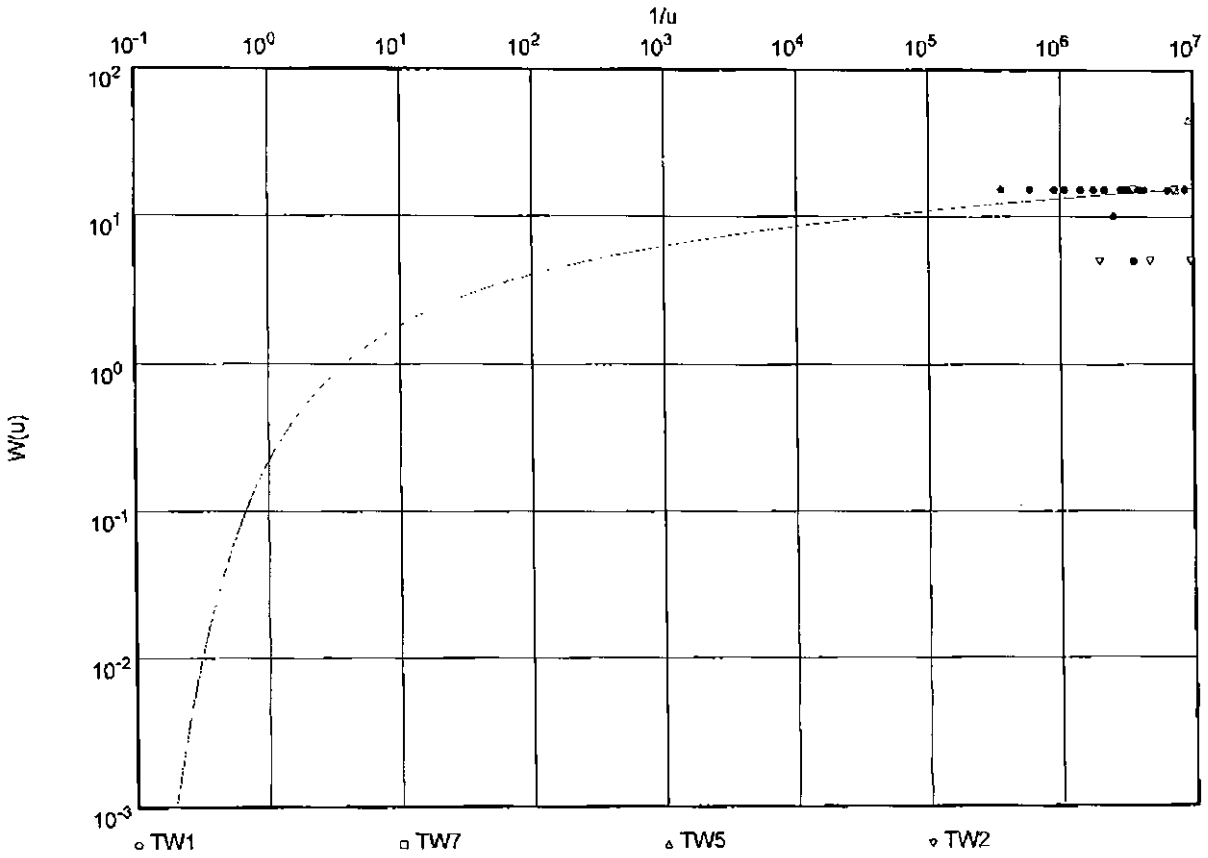
Pumping Test No. 24 hour	Test conducted on:
TW8	TW9
Discharge 0.76 l/s	Distance from the pumping well 304.000 m

Static water level: 2.930 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	60.00	2.960	0.030
3	100.00	2.960	0.030
4	150.00	2.960	0.030
5	180.00	2.960	0.030
6	240.00	2.960	0.030
7	300.00	2.960	0.030
8	360.00	2.960	0.030
9	420.00	2.950	0.020
10	480.00	2.960	0.030
11	540.00	2.960	0.030
12	600.00	2.940	0.010
13	660.00	2.960	0.030
14	720.00	2.960	0.030
15	1080.00	2.960	0.030
16	1440.00	2.960	0.030

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 1
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	
Discharge 0.76 l/s	



Transmissivity [m²/min]: 1.82×10^{0}

Storativity: 1.32×10^{-6}

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph (519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 2
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW8
Discharge 0.76 l/s	

Static water level: 4.830 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	1.00	6.860	2.030
3	2.00	7.410	2.580
4	3.00	7.740	2.910
5	4.00	7.990	3.160
6	5.00	8.170	3.340
7	6.00	8.320	3.490
8	7.00	8.410	3.580
9	8.00	8.470	3.640
10	9.00	8.560	3.730
11	10.00	8.600	3.770
12	15.00	8.760	3.930
13	20.00	8.850	4.020
14	25.00	8.900	4.070
15	30.00	8.950	4.120
16	40.00	9.010	4.180
17	50.00	9.040	4.210
18	60.00	9.080	4.250
19	80.00	9.120	4.290
20	100.00	9.150	4.320
21	120.00	9.160	4.330
22	150.00	9.170	4.340
23	180.00	9.050	4.220
24	210.00	9.080	4.250
25	240.00	9.140	4.310
26	300.00	9.110	4.280
27	360.00	9.130	4.300
28	420.00	9.010	4.180
29	480.00	9.070	4.240
30	540.00	9.100	4.270
31	600.00	9.080	4.250
32	660.00	9.070	4.240
33	720.00	9.070	4.240
34	1080.00	9.050	4.220
35	1440.00	9.050	4.220
36	1442.00	6.450	1.620
37	1443.00	6.250	1.420
38	1444.00	6.100	1.270
39	1445.00	5.970	1.140
40	1446.00	5.870	1.040
41	1447.00	5.790	0.960
42	1448.00	5.730	0.900
43	1449.00	5.670	0.840
44	1450.00	5.620	0.790
45	1455.00	5.470	0.640
46	1460.00	5.370	0.540
47	1465.00	5.300	0.470
48	1470.00	5.250	0.420
49	1480.00	5.170	0.340
50	1490.00	5.150	0.320

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 3
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW8
Discharge 0.76 l/s	

Static water level: 4.830 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
51	1500.00	5.100	0.270	
52	1520.00	5.040	0.210	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 4
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW1
Discharge 0.76 l/s	Distance from the pumping well 353.000 m

Static water level: 2.230 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	60.00	2.230	0.000
3	100.00	2.230	0.000
4	150.00	2.230	0.000
5	180.00	2.200	-0.030
6	240.00	2.190	-0.040
7	300.00	2.190	-0.040
8	360.00	2.190	-0.040
9	363.00	2.200	-0.030
10	420.00	2.190	-0.040
11	540.00	2.190	-0.040
12	600.00	2.190	-0.040
13	660.00	2.190	-0.040
14	720.00	2.160	-0.070
15	1080.00	2.160	-0.070
16	1440.00	2.150	-0.080

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 5
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW7
Discharge 0.76 l/s	Distance from the pumping well 72.000 m

Static water level: 6.890 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	60.00	6.890	0.000
3	100.00	6.950	0.060
4	150.00	7.040	0.150
5	180.00	7.010	0.120
6	240.00	7.100	0.210
7	300.00	7.130	0.240
8	360.00	7.140	0.250
9	363.00	7.140	0.250
10	420.00	7.160	0.270
11	540.00	7.130	0.240
12	600.00	7.050	0.160
13	660.00	7.140	0.250
14	720.00	7.140	0.250
15	1080.00	7.140	0.250
16	1440.00	7.140	0.250

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 6
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW5
Discharge 0.76 l/s	Distance from the pumping well 134.000 m

Static water level: 5.880 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	60.00	5.880	0.000
3	100.00	5.910	0.030
4	180.00	5.880	0.000
5	240.00	5.910	0.030
6	300.00	5.970	0.090
7	360.00	5.910	0.030
8	363.00	5.880	0.000
9	420.00	5.880	0.000
10	480.00	5.880	0.000
11	540.00	5.860	-0.020
12	600.00	5.850	-0.030
13	660.00	5.850	-0.030
14	720.00	5.850	-0.030
15	1080.00	5.850	-0.030
16	1440.00	5.850	-0.030

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 7
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW2
Discharge 0.76 l/s	Distance from the pumping well 167.000 m

Static water level: 4.420 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	60.00	4.420	0.000
3	100.00	4.430	0.010
4	150.00	4.420	0.000
5	180.00	4.450	0.030
6	240.00	4.430	0.010
7	300.00	4.420	0.000
8	360.00	4.420	0.000
9	363.00	4.450	0.030
10	420.00	4.420	0.000
11	480.00	4.430	0.010
12	540.00	4.450	0.030
13	600.00	4.450	0.030
14	660.00	4.450	0.030
15	720.00	4.450	0.030
16	1080.00	4.450	0.030
17	1440.00	4.450	0.030

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 8
		Project: PH0482	
		Evaluated by:	

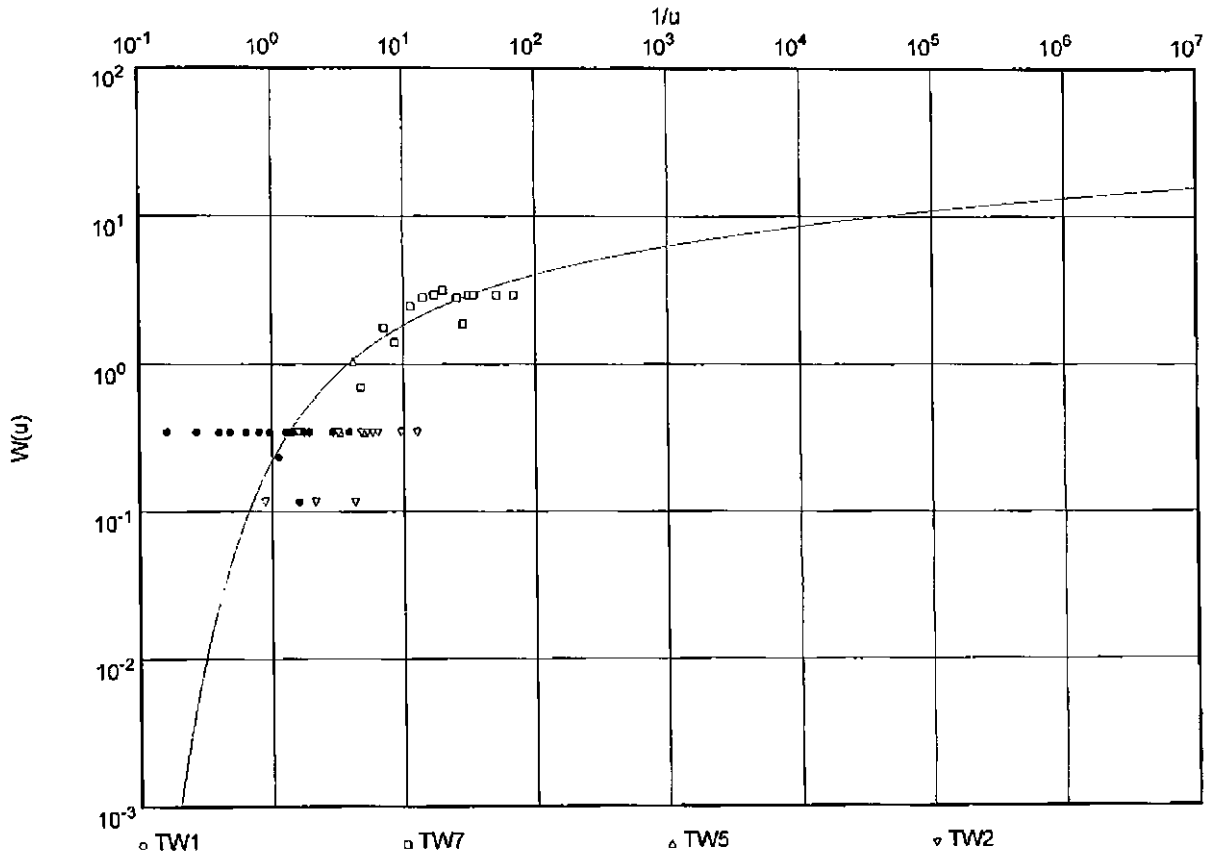
Pumping Test No. 24 hour	Test conducted on:
TW8	TW9
Discharge 0.76 l/s	Distance from the pumping well 304.000 m

Static water level: 2.930 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	60.00	2.960	0.030	
3	100.00	2.960	0.030	
4	150.00	2.960	0.030	
5	180.00	2.960	0.030	
6	240.00	2.960	0.030	
7	300.00	2.960	0.030	
8	360.00	2.960	0.030	
9	420.00	2.950	0.020	
10	480.00	2.960	0.030	
11	540.00	2.960	0.030	
12	600.00	2.940	0.010	
13	660.00	2.960	0.030	
14	720.00	2.960	0.030	
15	1080.00	2.960	0.030	
16	1440.00	2.960	0.030	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 1
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	
Discharge 0.76 l/s	



Transmissivity [m²/min]: 4.21×10^{-2}

Storativity: 6.82×10^{-4}

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 2
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW8
Discharge 0.76 l/s	

Static water level: 4.830 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	1.00	6.860	2.030	
3	2.00	7.410	2.580	
4	3.00	7.740	2.910	
5	4.00	7.990	3.160	
6	5.00	8.170	3.340	
7	6.00	8.320	3.490	
8	7.00	8.410	3.580	
9	8.00	8.470	3.640	
10	9.00	8.560	3.730	
11	10.00	8.600	3.770	
12	15.00	8.760	3.930	
13	20.00	8.850	4.020	
14	25.00	8.900	4.070	
15	30.00	8.950	4.120	
16	40.00	9.010	4.180	
17	50.00	9.040	4.210	
18	60.00	9.080	4.250	
19	80.00	9.120	4.290	
20	100.00	9.150	4.320	
21	120.00	9.160	4.330	
22	150.00	9.170	4.340	
23	180.00	9.050	4.220	
24	210.00	9.080	4.250	
25	240.00	9.140	4.310	
26	300.00	9.110	4.280	
27	360.00	9.130	4.300	
28	420.00	9.010	4.180	
29	480.00	9.070	4.240	
30	540.00	9.100	4.270	
31	600.00	9.080	4.250	
32	660.00	9.070	4.240	
33	720.00	9.070	4.240	
34	1080.00	9.050	4.220	
35	1440.00	9.050	4.220	
36	1442.00	6.450	1.620	
37	1443.00	6.250	1.420	
38	1444.00	6.100	1.270	
39	1445.00	5.970	1.140	
40	1446.00	5.870	1.040	
41	1447.00	5.790	0.960	
42	1448.00	5.730	0.900	
43	1449.00	5.670	0.840	
44	1450.00	5.620	0.790	
45	1455.00	5.470	0.640	
46	1460.00	5.370	0.540	
47	1465.00	5.300	0.470	
48	1470.00	5.250	0.420	
49	1480.00	5.170	0.340	
50	1490.00	5.150	0.320	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 3
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW8
Discharge 0.76 l/s	

Static water level: 4.830 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
51	1500.00	5.100	0.270	
52	1520.00	5.040	0.210	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 4
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW1
Discharge 0.76 l/s	Distance from the pumping well 353.000 m

Static water level: 2.230 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	60.00	2.230	0.000	
3	100.00	2.230	0.000	
4	150.00	2.230	0.000	
5	180.00	2.200	-0.030	
6	240.00	2.190	-0.040	
7	300.00	2.190	-0.040	
8	360.00	2.190	-0.040	
9	363.00	2.200	-0.030	
10	420.00	2.190	-0.040	
11	540.00	2.190	-0.040	
12	600.00	2.190	-0.040	
13	660.00	2.190	-0.040	
14	720.00	2.160	-0.070	
15	1080.00	2.160	-0.070	
16	1440.00	2.150	-0.080	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 5
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW7
Discharge 0.76 l/s	Distance from the pumping well 72.000 m

Static water level: 6.890 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	60.00	6.890	0.000
3	100.00	6.950	0.060
4	150.00	7.040	0.150
5	180.00	7.010	0.120
6	240.00	7.100	0.210
7	300.00	7.130	0.240
8	360.00	7.140	0.250
9	363.00	7.140	0.250
10	420.00	7.160	0.270
11	540.00	7.130	0.240
12	600.00	7.050	0.160
13	660.00	7.140	0.250
14	720.00	7.140	0.250
15	1080.00	7.140	0.250
16	1440.00	7.140	0.250

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph (519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 6
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW5
Discharge 0.76 l/s	Distance from the pumping well 134.000 m

Static water level: 5.880 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	60.00	5.880	0.000
3	100.00	5.910	0.030
4	180.00	5.880	0.000
5	240.00	5.910	0.030
6	300.00	5.970	0.090
7	360.00	5.910	0.030
8	363.00	5.880	0.000
9	420.00	5.880	0.000
10	480.00	5.880	0.000
11	540.00	5.860	-0.020
12	600.00	5.850	-0.030
13	660.00	5.850	-0.030
14	720.00	5.850	-0.030
15	1080.00	5.850	-0.030
16	1440.00	5.850	-0.030

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo, Ontario, Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 7
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW2
Discharge 0.76 l/s	Distance from the pumping well 167.000 m

Static water level: 4.420 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	60.00	4.420	0.000	
3	100.00	4.430	0.010	
4	150.00	4.420	0.000	
5	180.00	4.450	0.030	
6	240.00	4.430	0.010	
7	300.00	4.420	0.000	
8	360.00	4.420	0.000	
9	363.00	4.450	0.030	
10	420.00	4.420	0.000	
11	480.00	4.430	0.010	
12	540.00	4.450	0.030	
13	600.00	4.450	0.030	
14	660.00	4.450	0.030	
15	720.00	4.450	0.030	
16	1080.00	4.450	0.030	
17	1440.00	4.450	0.030	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 8
		Project: PH0482	
		Evaluated by:	

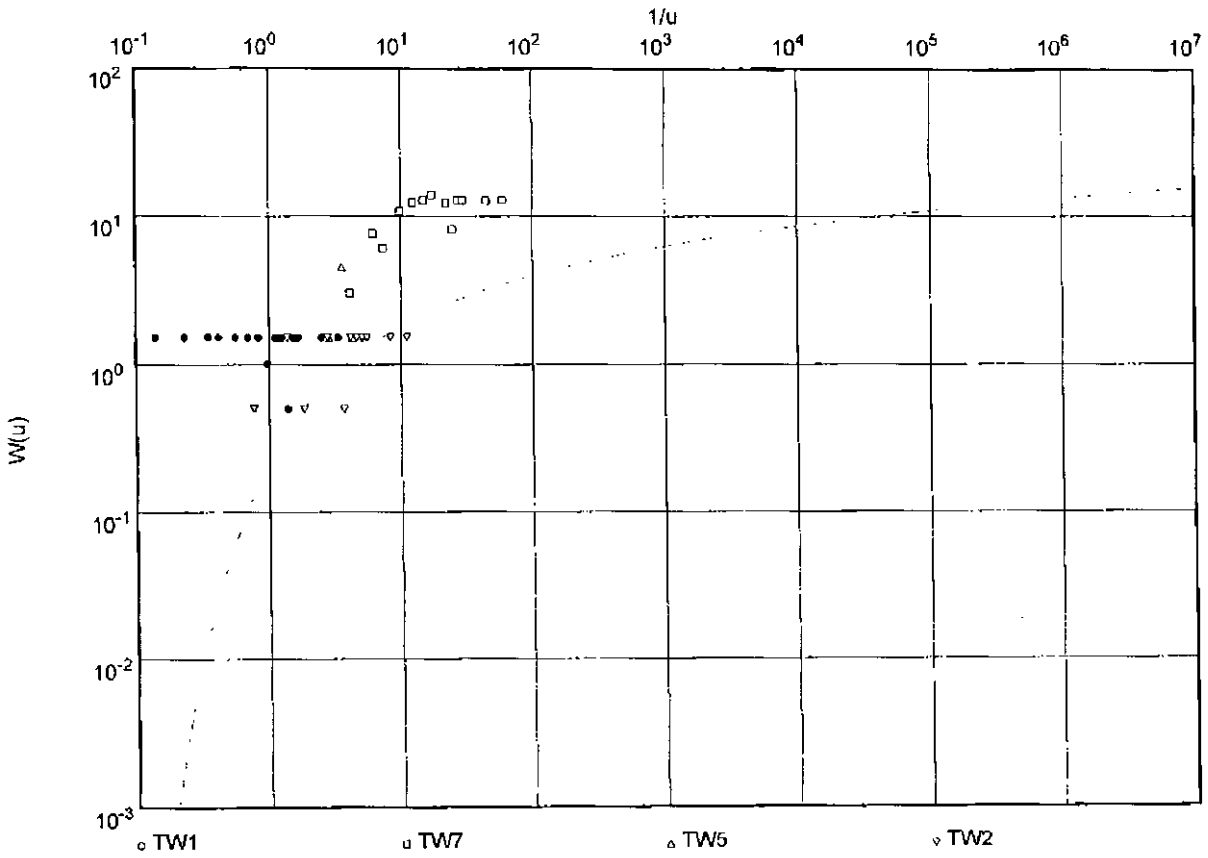
Pumping Test No. 24 hour	Test conducted on:
TW8	TW9
Discharge 0.76 l/s	Distance from the pumping well 304.000 m

Static water level: 2.930 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	60.00	2.960	0.030	
3	100.00	2.960	0.030	
4	150.00	2.960	0.030	
5	180.00	2.960	0.030	
6	240.00	2.960	0.030	
7	300.00	2.960	0.030	
8	360.00	2.960	0.030	
9	420.00	2.950	0.020	
10	480.00	2.960	0.030	
11	540.00	2.960	0.030	
12	600.00	2.940	0.010	
13	660.00	2.960	0.030	
14	720.00	2.960	0.030	
15	1080.00	2.960	0.030	
16	1440.00	2.960	0.030	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph (519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 1
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	
Discharge 0.76 l/s	



Transmissivity [m²/min]: 1.84×10^{-1}

Storativity: 3.46×10^{-3}

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 2
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW8
Discharge 0.76 l/s	

Static water level: 4.830 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	1.00	6.860	2.030	
3	2.00	7.410	2.580	
4	3.00	7.740	2.910	
5	4.00	7.990	3.160	
6	5.00	8.170	3.340	
7	6.00	8.320	3.490	
8	7.00	8.410	3.580	
9	8.00	8.470	3.640	
10	9.00	8.560	3.730	
11	10.00	8.600	3.770	
12	15.00	8.760	3.930	
13	20.00	8.850	4.020	
14	25.00	8.900	4.070	
15	30.00	8.950	4.120	
16	40.00	9.010	4.180	
17	50.00	9.040	4.210	
18	60.00	9.080	4.250	
19	80.00	9.120	4.290	
20	100.00	9.150	4.320	
21	120.00	9.160	4.330	
22	150.00	9.170	4.340	
23	180.00	9.050	4.220	
24	210.00	9.080	4.250	
25	240.00	9.140	4.310	
26	300.00	9.110	4.280	
27	360.00	9.130	4.300	
28	420.00	9.010	4.180	
29	480.00	9.070	4.240	
30	540.00	9.100	4.270	
31	600.00	9.080	4.250	
32	660.00	9.070	4.240	
33	720.00	9.070	4.240	
34	1080.00	9.050	4.220	
35	1440.00	9.050	4.220	
36	1442.00	6.450	1.620	
37	1443.00	6.250	1.420	
38	1444.00	6.100	1.270	
39	1445.00	5.970	1.140	
40	1446.00	5.870	1.040	
41	1447.00	5.790	0.960	
42	1448.00	5.730	0.900	
43	1449.00	5.670	0.840	
44	1450.00	5.620	0.790	
45	1455.00	5.470	0.640	
46	1460.00	5.370	0.540	
47	1465.00	5.300	0.470	
48	1470.00	5.250	0.420	
49	1480.00	5.170	0.340	
50	1490.00	5.150	0.320	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 3
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW8
Discharge 0.76 l/s	

Static water level: 4.830 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
51	1500.00	5.100	0.270
52	1520.00	5.040	0.210

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo, Ontario, Canada ph (519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 4
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW1
Discharge 0.76 l/s	Distance from the pumping well 353.000 m

Static water level: 2.230 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	60.00	2.230	0.000
3	100.00	2.230	0.000
4	150.00	2.230	0.000
5	180.00	2.200	-0.030
6	240.00	2.190	-0.040
7	300.00	2.190	-0.040
8	360.00	2.190	-0.040
9	363.00	2.200	-0.030
10	420.00	2.190	-0.040
11	540.00	2.190	-0.040
12	600.00	2.190	-0.040
13	660.00	2.190	-0.040
14	720.00	2.160	-0.070
15	1080.00	2.160	-0.070
16	1440.00	2.150	-0.080

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 5
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW7
Discharge 0.76 l/s	Distance from the pumping well 72.000 m

Static water level: 6.890 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	60.00	6.890	0.000	
3	100.00	6.950	0.060	
4	150.00	7.040	0.150	
5	180.00	7.010	0.120	
6	240.00	7.100	0.210	
7	300.00	7.130	0.240	
8	360.00	7.140	0.250	
9	363.00	7.140	0.250	
10	420.00	7.160	0.270	
11	540.00	7.130	0.240	
12	600.00	7.050	0.160	
13	660.00	7.140	0.250	
14	720.00	7.140	0.250	
15	1080.00	7.140	0.250	
16	1440.00	7.140	0.250	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 6
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW5
Discharge 0.76 l/s	Distance from the pumping well 134.000 m

Static water level: 5.880 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	60.00	5.880	0.000
3	100.00	5.910	0.030
4	180.00	5.880	0.000
5	240.00	5.910	0.030
6	300.00	5.970	0.090
7	360.00	5.910	0.030
8	363.00	5.880	0.000
9	420.00	5.880	0.000
10	480.00	5.880	0.000
11	540.00	5.860	-0.020
12	600.00	5.850	-0.030
13	660.00	5.850	-0.030
14	720.00	5.850	-0.030
15	1080.00	5.850	-0.030
16	1440.00	5.850	-0.030

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 7
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 24 hour	Test conducted on:
TW8	TW2
Discharge 0.76 l/s	Distance from the pumping well 167.000 m

Static water level: 4.420 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	60.00	4.420	0.000
3	100.00	4.430	0.010
4	150.00	4.420	0.000
5	180.00	4.450	0.030
6	240.00	4.430	0.010
7	300.00	4.420	0.000
8	360.00	4.420	0.000
9	363.00	4.450	0.030
10	420.00	4.420	0.000
11	480.00	4.430	0.010
12	540.00	4.450	0.030
13	600.00	4.450	0.030
14	660.00	4.450	0.030
15	720.00	4.450	0.030
16	1080.00	4.450	0.030
17	1440.00	4.450	0.030

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 8
		Project: PH0482	
		Evaluated by:	

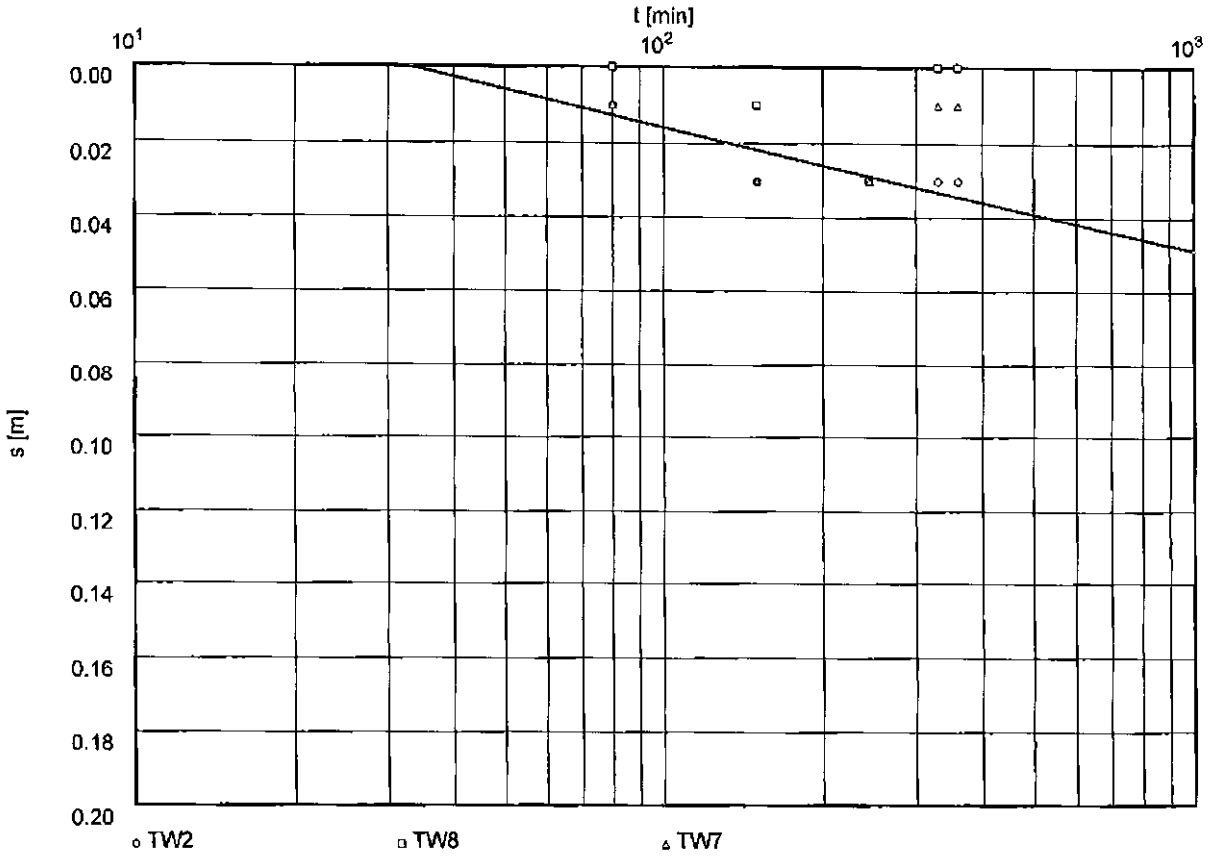
Pumping Test No. 24 hour	Test conducted on:
TW8	TW9
Discharge 0.76 l/s	Distance from the pumping well 304.000 m

Static water level: 2.930 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	60.00	2.960	0.030	
3	100.00	2.960	0.030	
4	150.00	2.960	0.030	
5	180.00	2.960	0.030	
6	240.00	2.960	0.030	
7	300.00	2.960	0.030	
8	360.00	2.960	0.030	
9	420.00	2.950	0.020	
10	480.00	2.960	0.030	
11	540.00	2.960	0.030	
12	600.00	2.940	0.010	
13	660.00	2.960	0.030	
14	720.00	2.960	0.030	
15	1080.00	2.960	0.030	
16	1440.00	2.960	0.030	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date:	none, Page 1
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 1	Test conducted on:
TW9	
Discharge 1.26 l/s	



Transmissivity [m²/min]: 4.19×10^{-1}

Storativity: 4.07×10^{-4}

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date:	none, Page 2
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 1	Test conducted on:
TW9	TW9
Discharge 1.26 l/s	

Static water level: 2.930 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	1.00	3.010	0.080	
3	2.00	3.030	0.100	
4	3.00	3.030	0.100	
5	4.00	3.030	0.100	
6	5.00	3.030	0.100	
7	6.00	3.030	0.100	
8	7.00	3.030	0.100	
9	8.00	3.030	0.100	
10	9.00	3.030	0.100	
11	10.00	3.030	0.100	
12	15.00	3.030	0.100	
13	20.00	3.040	0.110	
14	25.00	3.040	0.110	
15	30.00	3.040	0.110	
16	40.00	3.040	0.110	
17	50.00	3.040	0.110	
18	60.00	3.040	0.110	
19	80.00	3.050	0.120	
20	120.00	3.050	0.120	
21	150.00	3.060	0.130	
22	180.00	3.060	0.130	
23	210.00	3.060	0.130	
24	240.00	3.070	0.140	
25	300.00	3.070	0.140	
26	360.00	3.070	0.140	
27	361.00	2.990	0.060	
28	362.00	2.980	0.050	
29	363.00	2.970	0.040	
30	364.00	2.970	0.040	
31	365.00	2.970	0.040	
32	366.00	2.970	0.040	
33	367.00	2.960	0.030	
34	368.00	2.960	0.030	
35	369.00	2.960	0.030	
36	370.00	2.960	0.030	
37	375.00	2.950	0.020	
38	380.00	2.940	0.010	
39	385.00	2.930	0.000	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date:	none, Page 3
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 1	Test conducted on:
TW9	TW2
Discharge 1.26 l/s	Distance from the pumping well 277.000 m

Static water level: 4.390 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	80.00	4.400	0.010	
3	150.00	4.420	0.030	
4	245.00	4.420	0.030	
5	330.00	4.420	0.030	
6	360.00	4.420	0.030	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph (519)746-1798	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date:	none, Page 4
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 1	Test conducted on:
TW9	TW8
Discharge 1.26 l/s	Distance from the pumping well 304.000 m

Static water level: 4.880 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	80.00	4.880	0.000
3	150.00	4.890	0.010
4	245.00	4.910	0.030
5	330.00	4.880	0.000
6	360.00	4.880	0.000

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date:	none, Page 5
		Project: PH0482	
		Evaluated by:	

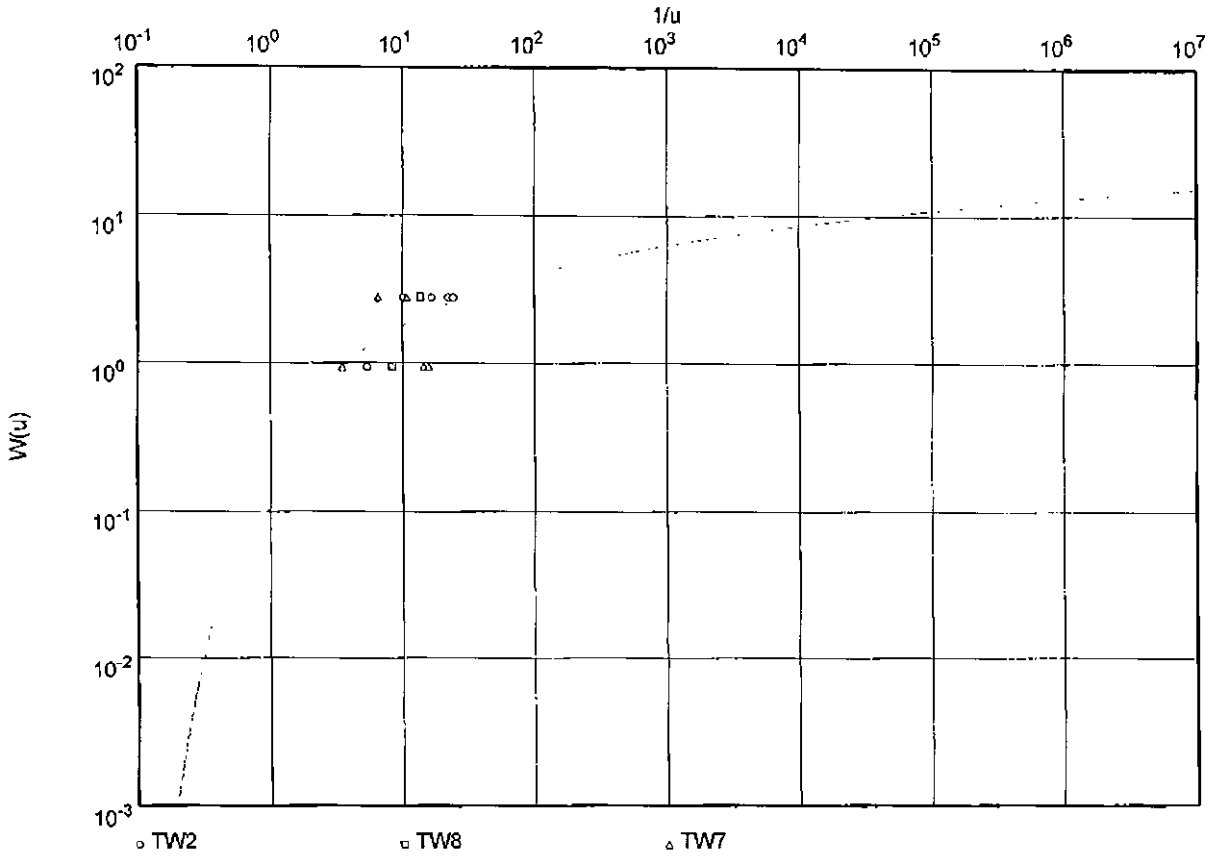
Pumping Test No. 1	Test conducted on:
TW9	TW7
Discharge 1.26 l/s	Distance from the pumping well 344.000 m

Static water level: 5.230 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	80.00	5.240	0.010	
3	150.00	5.260	0.030	
4	245.00	5.260	0.030	
5	330.00	5.240	0.010	
6	360.00	5.240	0.010	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph (519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 1
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 1	Test conducted on:
TW9	
Discharge 1.26 l/s	



Transmissivity [m²/min]: 5.65×10^{-1}

Storativity: 4.38×10^{-4}

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 2
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 1	Test conducted on:
TW9	TW9
Discharge 1.26 l/s	

Static water level: 2.930 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	1.00	3.010	0.080	
3	2.00	3.030	0.100	
4	3.00	3.030	0.100	
5	4.00	3.030	0.100	
6	5.00	3.030	0.100	
7	6.00	3.030	0.100	
8	7.00	3.030	0.100	
9	8.00	3.030	0.100	
10	9.00	3.030	0.100	
11	10.00	3.030	0.100	
12	15.00	3.030	0.100	
13	20.00	3.040	0.110	
14	25.00	3.040	0.110	
15	30.00	3.040	0.110	
16	40.00	3.040	0.110	
17	50.00	3.040	0.110	
18	60.00	3.040	0.110	
19	80.00	3.050	0.120	
20	120.00	3.050	0.120	
21	150.00	3.060	0.130	
22	180.00	3.060	0.130	
23	210.00	3.060	0.130	
24	240.00	3.070	0.140	
25	300.00	3.070	0.140	
26	360.00	3.070	0.140	
27	361.00	2.990	0.060	
28	362.00	2.980	0.050	
29	363.00	2.970	0.040	
30	364.00	2.970	0.040	
31	365.00	2.970	0.040	
32	366.00	2.970	0.040	
33	367.00	2.960	0.030	
34	368.00	2.960	0.030	
35	369.00	2.960	0.030	
36	370.00	2.960	0.030	
37	375.00	2.950	0.020	
38	380.00	2.940	0.010	
39	385.00	2.930	0.000	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph (519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 3
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 1	Test conducted on:
TW9	TW2
Discharge 1.26 l/s	Distance from the pumping well 277.000 m

Static water level: 4.390 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
2	80.00	4.400	0.010
3	150.00	4.420	0.030
4	245.00	4.420	0.030
5	330.00	4.420	0.030
6	360.00	4.420	0.030

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 4
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 1	Test conducted on:
TW9	TW8
Discharge 1.26 l/s	Distance from the pumping well 304.000 m

Static water level: 4.880 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	80.00	4.880	0.000	
3	150.00	4.890	0.010	
4	245.00	4.910	0.030	
5	330.00	4.880	0.000	
6	360.00	4.880	0.000	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo, Ontario, Canada ph.(519)746-1798	Pumping test analysis Theis analysis method Confined aquifer	Date:	none, Page 5
		Project: PH0482	
		Evaluated by:	

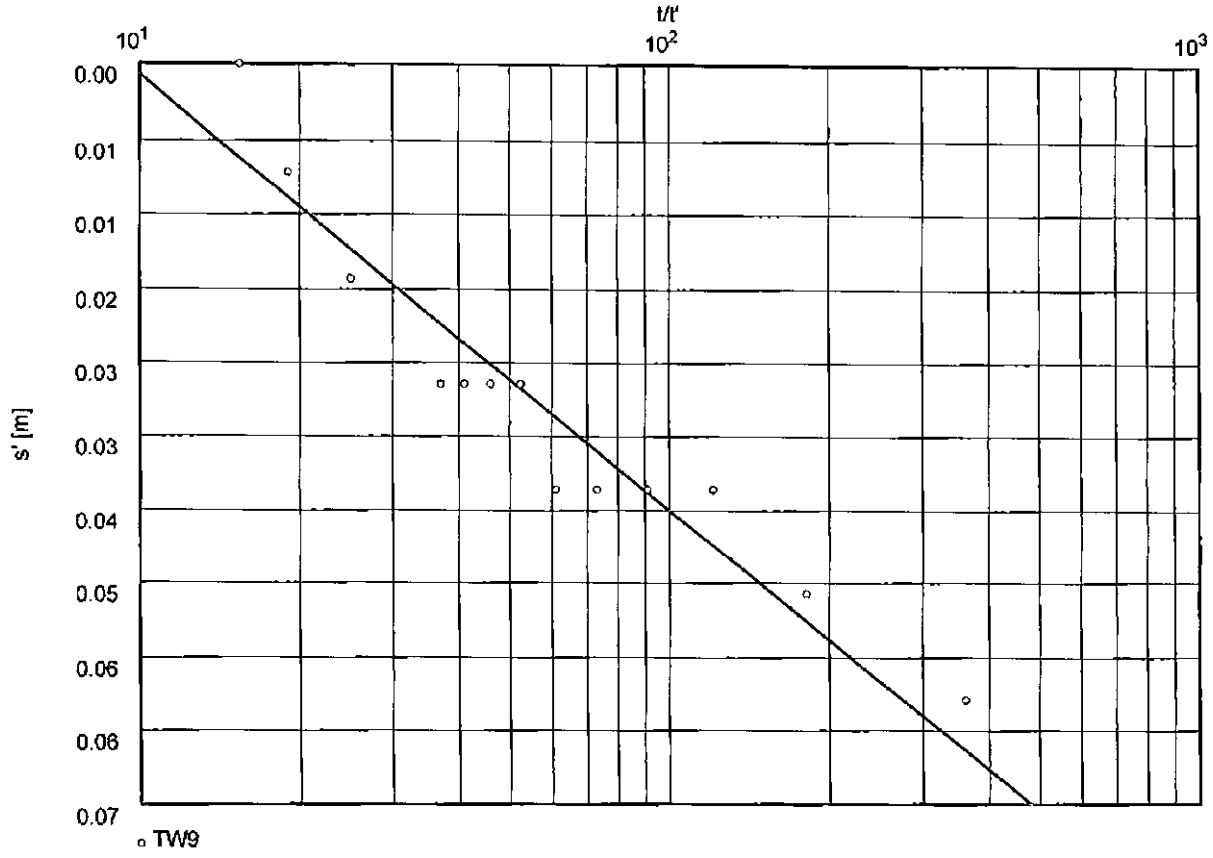
Pumping Test No. 1	Test conducted on:
TW9	TW7
Discharge 1.26 l/s	Distance from the pumping well 344.000 m

Static water level: 5.230 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
2	80.00	5.240	0.010	
3	150.00	5.260	0.030	
4	245.00	5.260	0.030	
5	330.00	5.240	0.010	
6	360.00	5.240	0.010	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date:	none, Page 1
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 1	Test conducted on:
TW9	
Discharge 1.26 l/s	
	Pumping test duration: 360.00 min



Transmissivity [m²/min]: 3.37×10^{-1}

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph (519)746-1798	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date:	none, Page 2
		Project: PH0482	
		Evaluated by:	

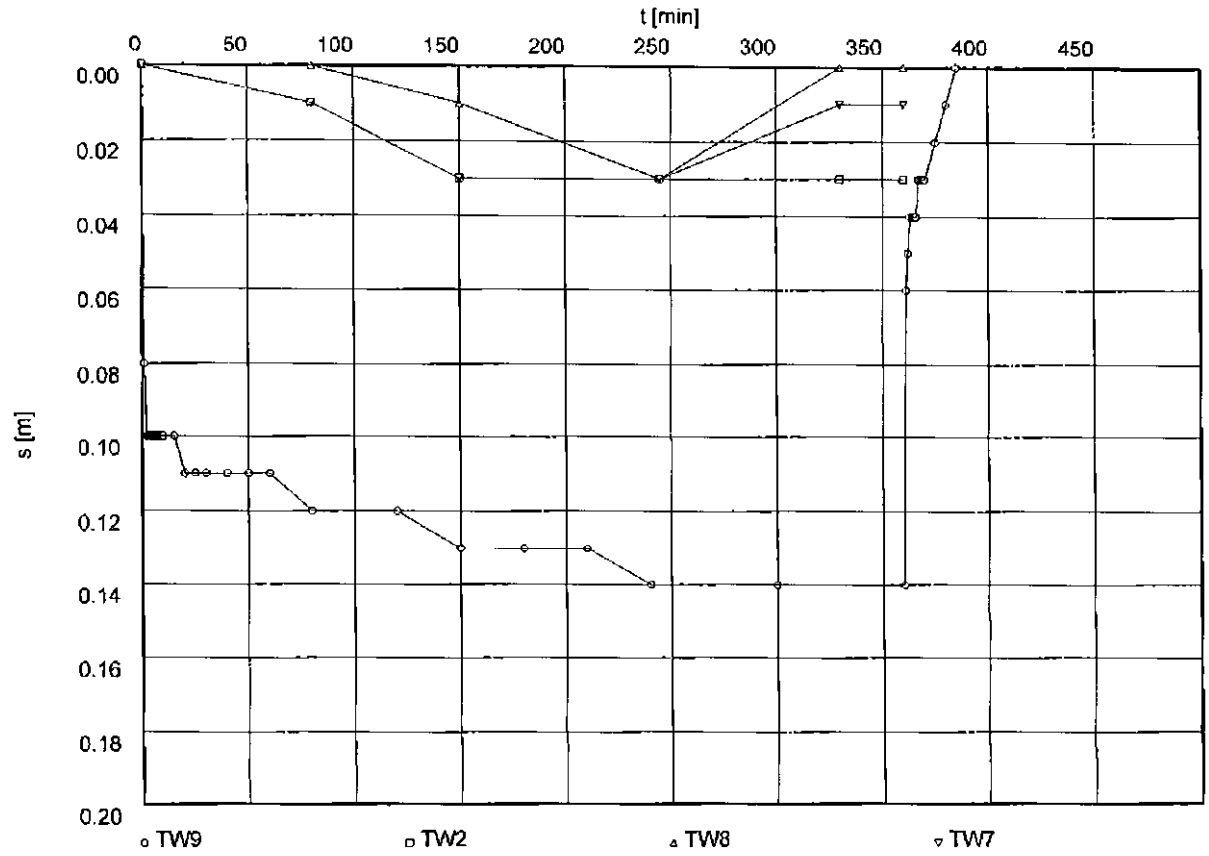
Pumping Test No. 1	Test conducted on:
TW9	TW9
Discharge 1.26 l/s	

Static water level: 2.930 m below datum — Pumping test duration: 360.00 min

	Time from end of pumping [min]	Water level [m]	Residual drawdown [m]
1	1.00	2.990	0.060
2	2.00	2.980	0.050
3	3.00	2.970	0.040
4	4.00	2.970	0.040
5	5.00	2.970	0.040
6	6.00	2.970	0.040
7	7.00	2.960	0.030
8	8.00	2.960	0.030
9	9.00	2.960	0.030
10	10.00	2.960	0.030
11	15.00	2.950	0.020
12	20.00	2.940	0.010
13	25.00	2.930	0.000

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1799	Pumping test analysis Time-Drawdown plot	Date:	none, Page 1
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 1	Test conducted on:
TW9	
Discharge 1.26 l/s	



Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph (519)746-1798	Pumping test analysis Time-Drawdown plot	Date:	none, Page 2
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 1	Test conducted on:
TW9	TW9
Discharge 1.26 l/s	

Static water level: 2.930 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]
1	0.00	2.930	0.000
2	1.00	3.010	0.080
3	2.00	3.030	0.100
4	3.00	3.030	0.100
5	4.00	3.030	0.100
6	5.00	3.030	0.100
7	6.00	3.030	0.100
8	7.00	3.030	0.100
9	8.00	3.030	0.100
10	9.00	3.030	0.100
11	10.00	3.030	0.100
12	15.00	3.030	0.100
13	20.00	3.040	0.110
14	25.00	3.040	0.110
15	30.00	3.040	0.110
16	40.00	3.040	0.110
17	50.00	3.040	0.110
18	60.00	3.040	0.110
19	80.00	3.050	0.120
20	120.00	3.050	0.120
21	150.00	3.060	0.130
22	180.00	3.060	0.130
23	210.00	3.060	0.130
24	240.00	3.070	0.140
25	300.00	3.070	0.140
26	360.00	3.070	0.140
27	361.00	2.990	0.060
28	362.00	2.980	0.050
29	363.00	2.970	0.040
30	364.00	2.970	0.040
31	365.00	2.970	0.040
32	366.00	2.970	0.040
33	367.00	2.960	0.030
34	368.00	2.960	0.030
35	369.00	2.960	0.030
36	370.00	2.960	0.030
37	375.00	2.950	0.020
38	380.00	2.940	0.010
39	385.00	2.930	0.000

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Time-Drawdown plot	Date:	none, Page 3
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 1	Test conducted on:
TW9	TW2
Discharge 1.26 l/s	Distance from the pumping well 277.000 m

Static water level: 4.390 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
1	0.00	4.390	0.000	
2	80.00	4.400	0.010	
3	150.00	4.420	0.030	
4	245.00	4.420	0.030	
5	330.00	4.420	0.030	
6	360.00	4.420	0.030	

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Time-Drawdown plot	Date:	none, Page 4
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 1	Test conducted on:
TW9	TW8
Discharge 1.26 l/s	Distance from the pumping well 304.000 m

Static water level: 4.880 m below datum

	Pumping test duration [min]	Water level [m]	Drawdown [m]	
1	0.00	4.880	0.000	
2	80.00	4.880	0.000	
3	150.00	4.890	0.010	
4	245.00	4.910	0.030	
5	330.00	4.880	0.000	
6	360.00	4.880	0.000	

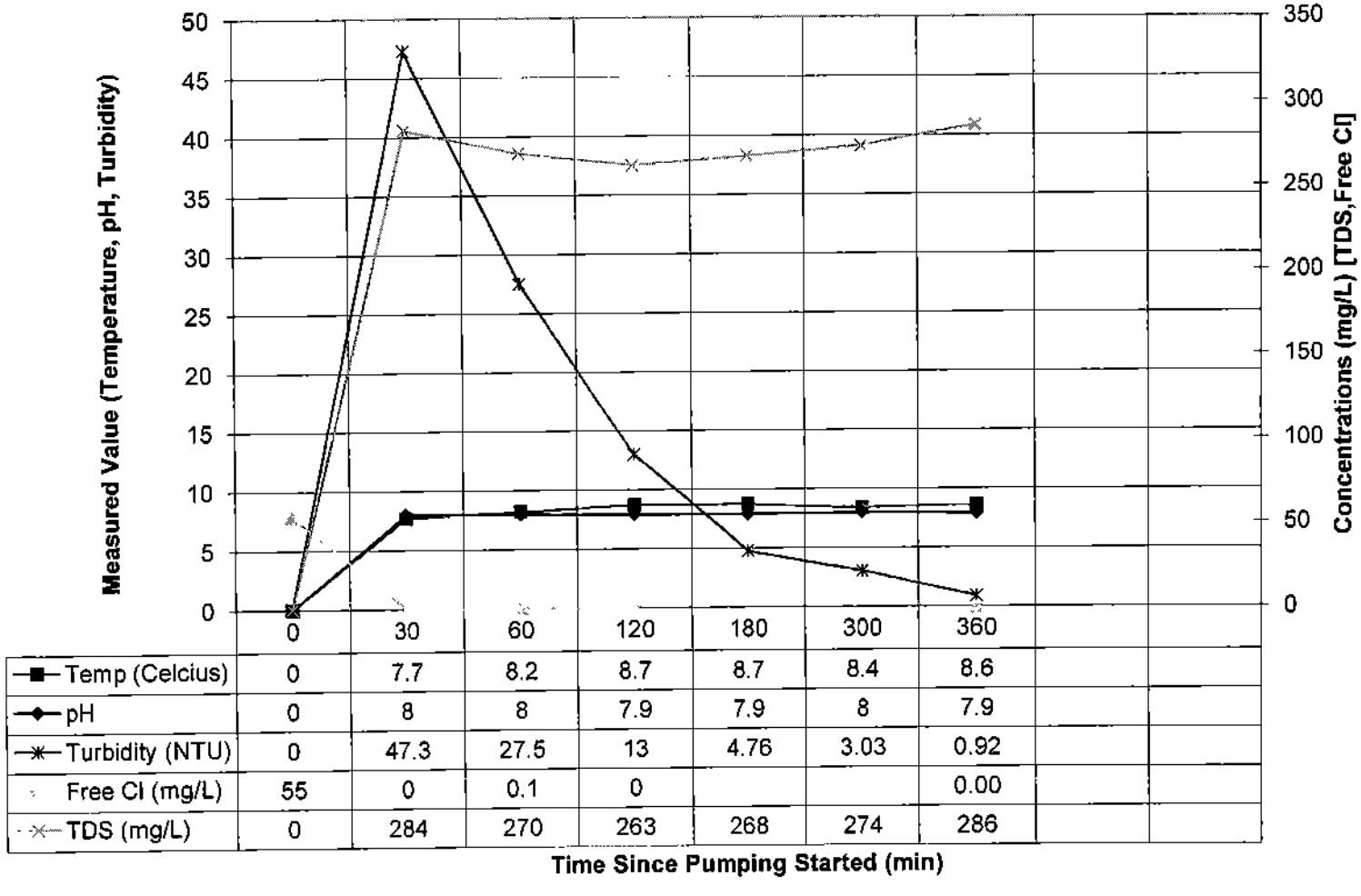
Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	Pumping test analysis Time-Drawdown plot	Date:	none, Page 5
		Project: PH0482	
		Evaluated by:	

Pumping Test No. 1	Test conducted on:
TW9	TW7
Discharge 1.26 l/s	Distance from the pumping well 344.000 m

Static water level: 5.230 m below datum

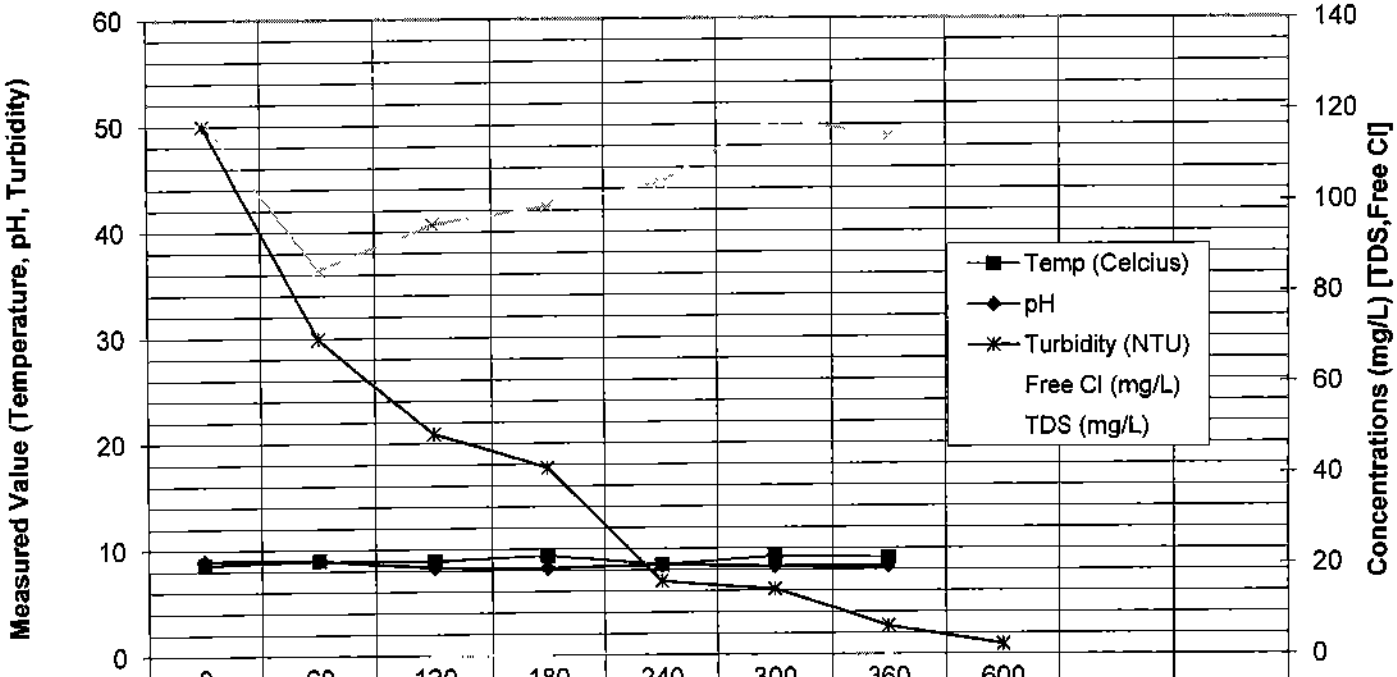
	Pumping test duration [min]	Water level [m]	Drawdown [m]
1	0.00	5.230	0.000
2	80.00	5.240	0.010
3	150.00	5.260	0.030
4	245.00	5.260	0.030
5	330.00	5.240	0.010
6	360.00	5.240	0.010

Field Measurements During Pumping of TW1

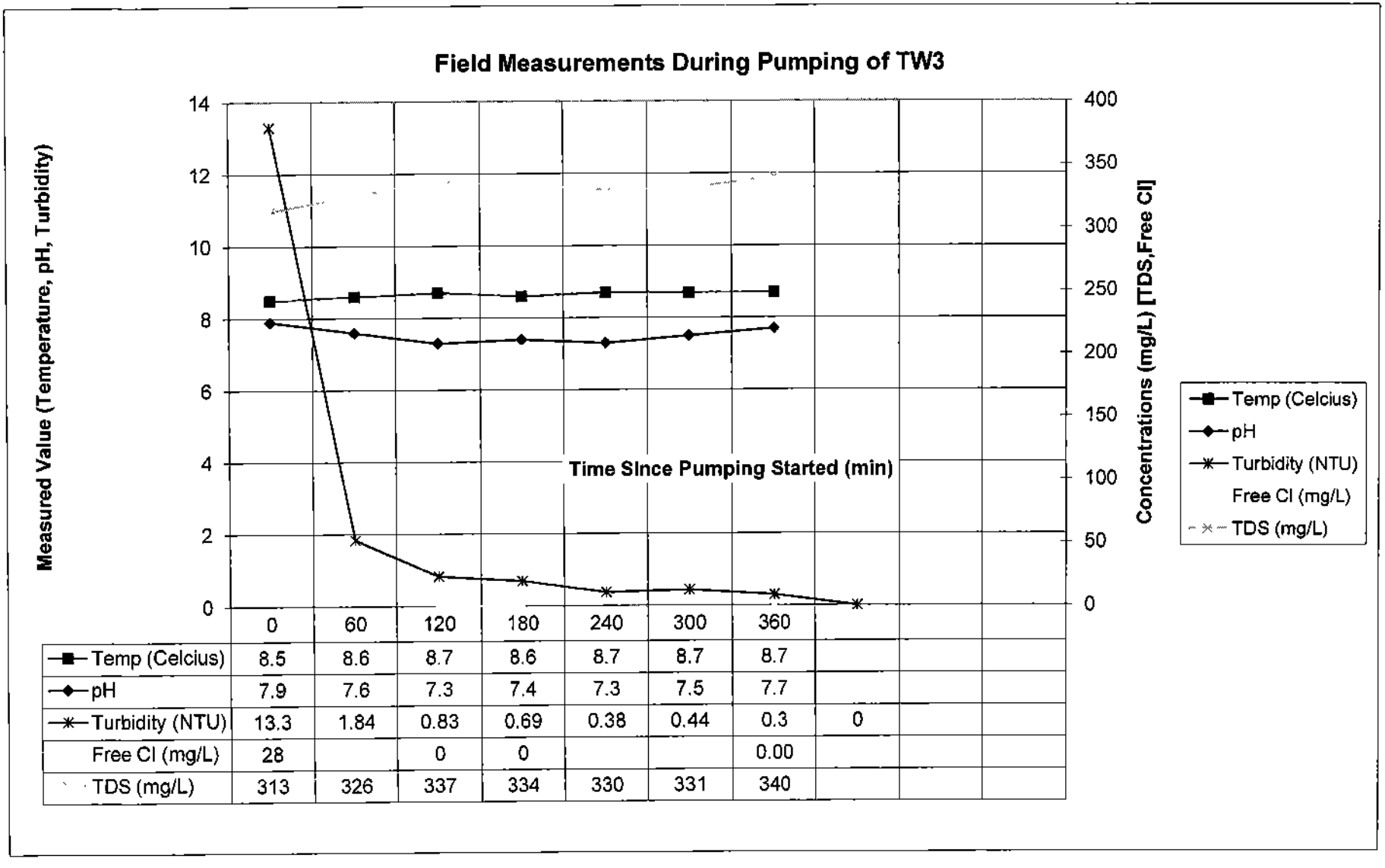


	0	30	60	120	180	300	360
Temp (Celcius)	0	7.7	8.2	8.7	8.7	8.4	8.6
pH	0	8	8	7.9	7.9	8	7.9
Turbidity (NTU)	0	47.3	27.5	13	4.76	3.03	0.92
Free Cl (mg/L)	55	0	0.1	0			0.00
TDS (mg/L)	0	284	270	263	268	274	286

Field Measurements During Pumping of TW2

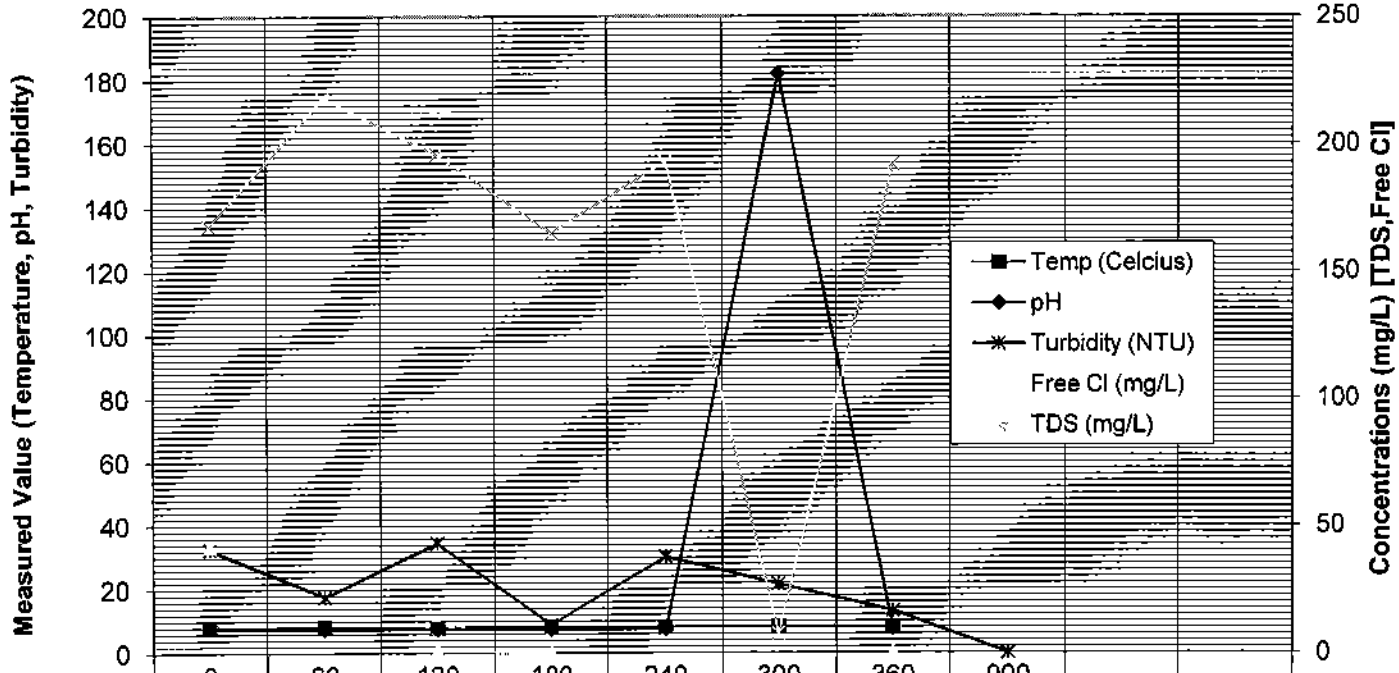


	0	60	120	180	240	300	360	600
Temp (Celcius)	8.6	9	8.9	9.4	8.5	9.3	9.1	
pH	9.0	9	8.3	8.2	8.5	8.3	8.3	
Turbidity (NTU)	50	29.9	20.9	17.7	6.93	6.16	2.69	0.94
Free Cl (mg/L)	35		0.25	0			0.00	
TDS (mg/L)	118	85	95	99	104	118	114	



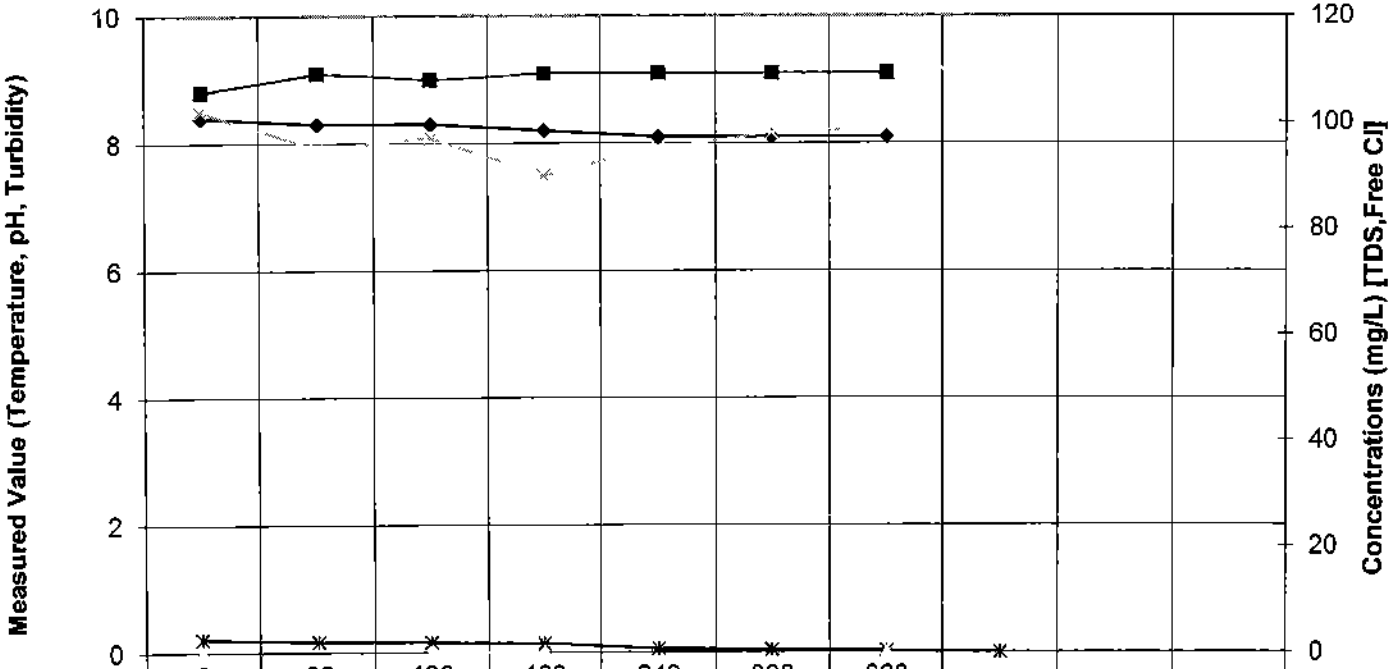
	0	60	120	180	240	300	360	
Temp (Celcius)	8.5	8.6	8.7	8.6	8.7	8.7	8.7	
pH	7.9	7.6	7.3	7.4	7.3	7.5	7.7	
Turbidity (NTU)	13.3	1.84	0.83	0.69	0.38	0.44	0.3	0
Free Cl (mg/L)	28		0	0			0.00	
TDS (mg/L)	313	326	337	334	330	331	340	

Field Measurements During Pumping of TW4



	0	60	120	180	240	300	360	900
Temp (Celcius)	8.1	8.3	8	8.3	8.2	8.2	8.2	
pH	7.9	7.6	7.5	7.5	7.5	182	7.7	
Turbidity (NTU)	32.6	17.6	34.5	8.87	30.2	21.6	13.2	0.02
Free Cl (mg/L)	42		1	0			0.00	
TDS (mg/L)	168	218	196	165	193	7.7	192	

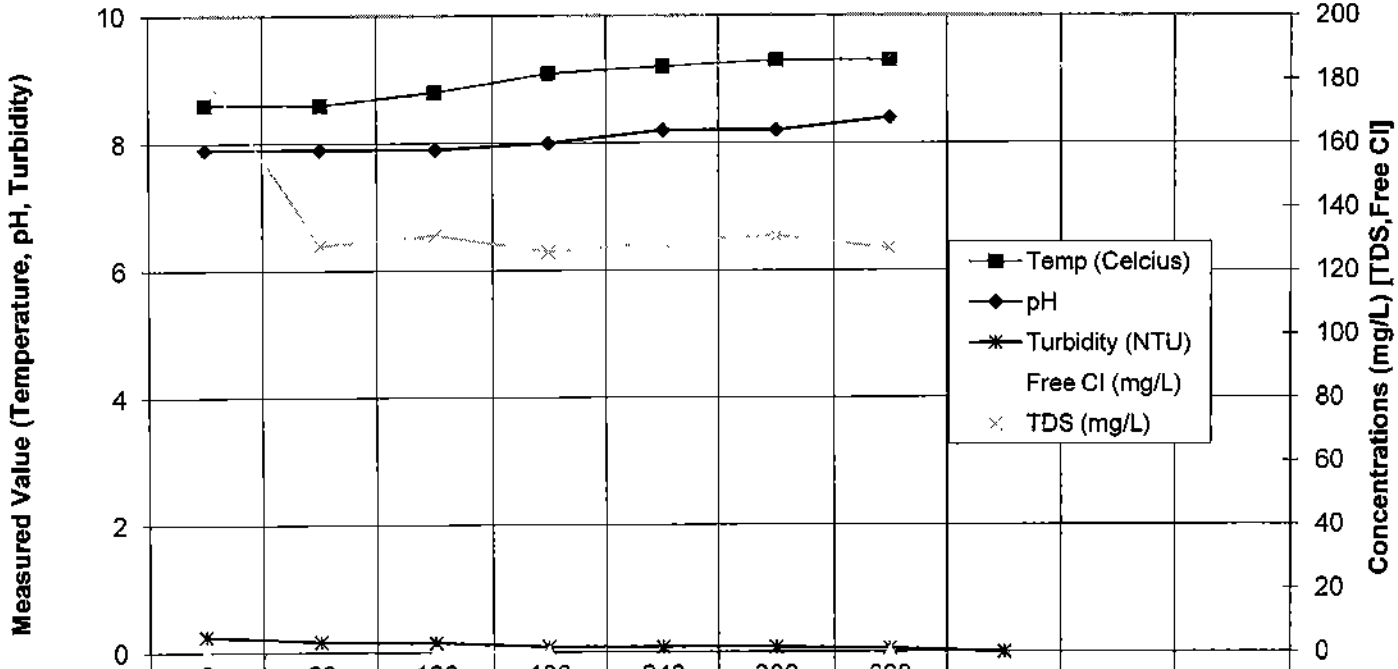
Field Measurements During Pumping of TW5



	0	60	120	180	240	300	360			
Temp (Celcius)	8.8	9.1	9	9.1	9.1	9.1	9.1			
pH	8.4	8.3	8.3	8.2	8.1	8.1	8.1			
Turbidity (NTU)	0.21	0.17	0.16	0.14	0.06	0.04	0.02	0		
Free Cl (mg/L)	0		0	0			0.00			
TDS (mg/L)	102	95	97	90	95	98	99			

Time Since Pumping Started (min)

Field Measurements During Pumping of TW6



	0	60	120	180	240	300	360			
Temp (Celcius)	8.6	8.6	8.8	9.1	9.2	9.3	9.3			
pH	7.9	7.9	7.9	8	8.2	8.2	8.4			
Turbidity (NTU)	0.25	0.17	0.15	0.09	0.08	0.08	0.06	0		
Free Cl (mg/L)	0		0	0			0.00			
TDS (mg/L)	182	128	131	126	129	131	127			

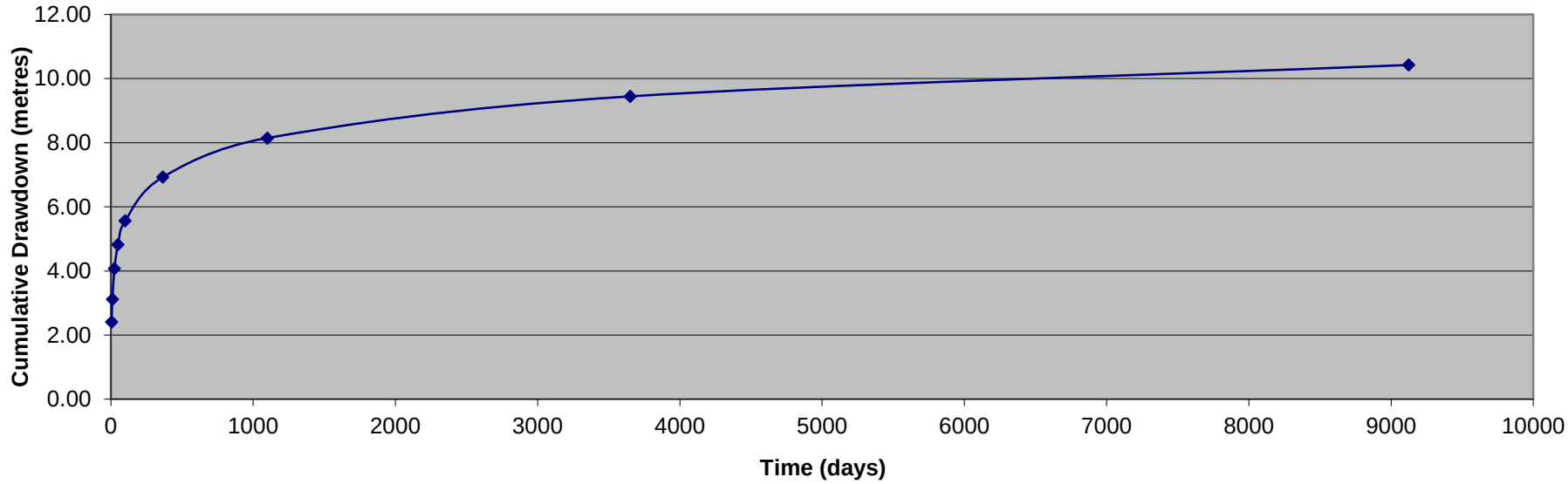
Model No. 1: Determination of Potential Well Interference- 20 Year Cumulative Impact

Pumping Rate (Q) m3/day	3		Average anticipated well depth:	48	m
Transmissivity (T) m2/day	13.3		% drawdown under worst case scenario:	22%	
Average Well Spacing (m) r	100				
Coefficient of Storage S	0.00068				

Notes: Analysis Assumes Continuous Pumping of 61 to 70 Wells

	1st Well Grouping		2nd Well Grouping		3rd Well Grouping		4th Well Grouping		
Time (days)	u	W(u)	u	W(u)	u	W(u)	u	W(u)	Drawdown
5	1.3E-02	3.7785	3.8E-02	2.7306	6.4E-02	2.2346	8.9E-02	1.9290	2.41
10	6.4E-03	4.4806	1.9E-02	3.4050	3.2E-02	2.8965	4.5E-02	2.5684	3.12
25	2.6E-03	5.3776	7.7E-03	4.2970	1.3E-02	3.7785	1.8E-02	3.4581	4.07
50	1.3E-03	6.0695	3.8E-03	4.9993	6.4E-03	4.4806	8.9E-03	4.1534	4.83
100	6.4E-04	6.7775	1.9E-03	5.6906	3.2E-03	5.1706	4.5E-03	4.8310	5.56
365	1.8E-04	8.0455	5.3E-04	6.6959	8.8E-04	6.4592	1.2E-03	6.1494	6.93
1100	5.8E-05	9.1779	1.7E-04	8.1027	2.9E-04	7.5687	4.1E-04	7.2240	8.15
3650	1.8E-05	10.3479	5.3E-05	9.2681	8.8E-05	8.7610	1.2E-04	8.4509	9.44
9125	7.0E-06	11.2924	2.1E-05	10.1938	3.5E-05	9.6830	4.9E-05	9.3465	10.42

Figure A4-1: Graph of Drawdown vs. Time



Model No. 2: Determination of Potential Well Interference- Individual Well Pumping at 50,000L/day

File No. PH3745

Pumping Rate (Q) m3/day	50
Transmissivity (T) m2/day	13.3
Radius of impact (m)	100
Coefficient of Storage S	0.00068

Notes: Continuous Pumping of 1 well

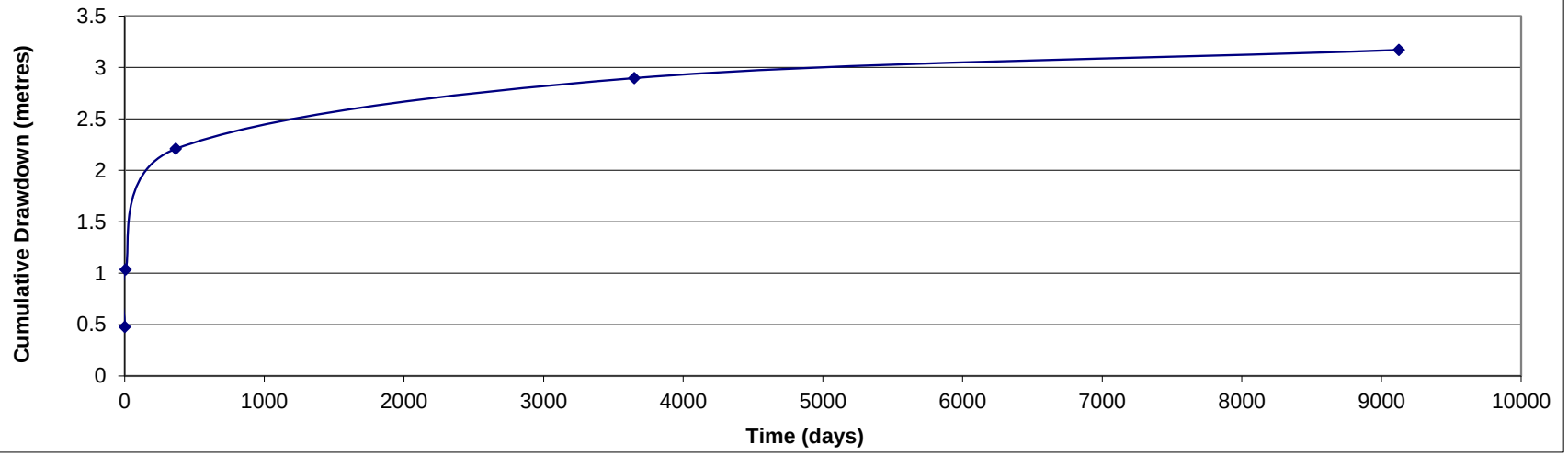
Time (days)	u	W(u)	drawdown
1	1.3E-01	1.5889000	0.48
7	1.8E-02	3.4581000	1.03
365	3.5E-04	7.3807000	2.21
3650	3.5E-05	9.6830000	2.90
9125	1.4E-05	10.5993000	3.17

Average anticipated well depth: 48.00 m

% drawdown under worst case scenario 7%

As such, at maximum rate allowed by the Ontario Water Resources Act , only 7% of the available drawdown is anticipated to be removed from the well during pumping. Given recovery data provided, well is expected to recover with interim potential well interference.

Figure A4-2:
Drawdown Versus Time at a Distance of 100 m at a Pumping Rate of 50,000 L/day



Ottawa Intl A WATER BUDGET MEANS FOR THE PERIOD 1939-2019 DC20492

LAT.... 45.32 WATER HOLDING CAPACITY...100 MM HEAT INDEX... 36.68
LONG... 75.67 LOWER ZONE..... 60 MM A..... 1.079

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	-10.7	62	11	14	0	0	0	24	84	98	295
28- 2	-9.0	56	11	16	1	1	0	26	113	98	350
31- 3	-2.9	65	31	77	5	5	0	101	70	100	416
30- 4	5.7	73	68	75	31	31	0	112	0	100	490
31- 5	13.1	76	76	0	80	80	0	14	0	81	566
30- 6	18.3	85	85	0	116	112	-4	5	0	49	651
31- 7	20.9	88	88	0	136	114	-22	3	0	20	739
31- 8	19.6	84	84	0	118	87	-31	1	0	16	823
30- 9	14.8	82	82	0	75	65	-10	3	0	30	905
31-10	8.3	77	77	0	37	36	-1	9	0	63	77
30-11	1.2	76	59	8	10	10	0	31	9	89	154
31-12	-6.9	79	26	14	1	1	0	32	48	97	233
AVE	6.0 TTL	904	698	204	610	542	-68	361			

Ottawa Intl A STANDARD DEVIATIONS FOR THE PERIOD 1939-2019 DC20492

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	2.9	25	15	18	1	1	0	28	44	8	59
28- 2	2.6	27	14	26	1	1	0	35	59	7	63
31- 3	2.6	28	22	49	5	5	0	55	87	0	71
30- 4	1.8	32	33	88	9	9	0	89	3	2	80
31- 5	1.8	34	34	3	12	12	0	25	0	22	94
30- 6	1.2	38	38	0	8	12	10	16	0	36	105
31- 7	1.1	45	45	0	8	28	29	17	0	30	118
31- 8	1.3	37	37	0	8	28	30	4	0	29	127
30- 9	1.5	39	39	0	8	16	16	13	0	35	133
31-10	1.5	37	37	1	7	7	2	19	0	35	37
30-11	1.8	27	27	8	4	4	0	32	13	20	45
31-12	3.0	30	22	14	1	1	0	30	34	9	55

patersongroup

1934 Stagecoach Road, Ottawa

PREDICTIVE NITRATE IMPACT ASSESSEMENT

Infiltration Factors		
Topography	0.15	
Soil	0.20	
Cover	0.10	
Total	**0.45**	
Site Characteristics		
Area of Site :	625720	m^2
Total of roof areas:	24420	m^2
Total area of paved driveway areas:	31101	m^2
Roof + paved driveway areas	55521	m^2
Impervious Area	55521	m^2
Percent Impervious Area =	9	%
Impervious Area according to SWMDB completed by JFSA	125144	m^2
Percent Impervious Area according to SWMDB completed by JFSA	20%	%
Infiltration Area =	500576	m^2
Septic Effluent		
Concentration of Effluent (Cs) =	40	mg/L
Daily Sewage Flow (Qs)=	66	m^3
See Notes below.		
Infiltration Calculation		
Nitrate concentration in precipitation (C_i) =	0	mg/L
Surplus Water (Environment Canada)	361	mm/yr
Factored Water Surplus =	162	mm/yr
Infiltration % due to stormwater management measures	-	%
Infiltration rate from stormwater management measures =	0	mm/yr
Infiltration Flow Entering the System (Q_i) =	223	m^3/day
Mass Balance Model (MOEE, 1995)		
$C_T = (Q_bC_b+Q_eC_e+Q_iC_i)/(Q_b+Q_e+Q_i)$ = Cumulative Nitrate Concentration		
Q_b = flow entering the system across the upgradient area	0	m^3/day
C_b = background nitrate concentration	0.16	mg/L
Q_e = flow entering the system from the septic drainfield	66	m^3/day
C_e = concentration of nitrates in the septic effluent	40	mg/L
Q_i = flow entering the system from infiltration	223	m^3/day
C_i = Concentration of nitrates in the infiltrate	0	mg/L
C_T =	**9.14**	**mg/L**
Estimate Number of Lots	**66**	**lots**

Notes: Although impervious area calculations result in an area of 9% (based on a 300 m2 home, including a garage of 70 m2, a driveway area of 140 m2 and a subdivision road length of 22,000 m2) the Stormwater Managements Design Brief completed by JFSA with Project Ref # P584-06 dated May 11, 2022 notes a impervious area of 20%. The impervious area of 20% was used to demonstrate that the NIA calculation would work for the subdivision using a conservative approach

APPENDIX 5

PH4734 – 1 – Site Plan

PH4734 – 2 - MECP Water Well Location Plan

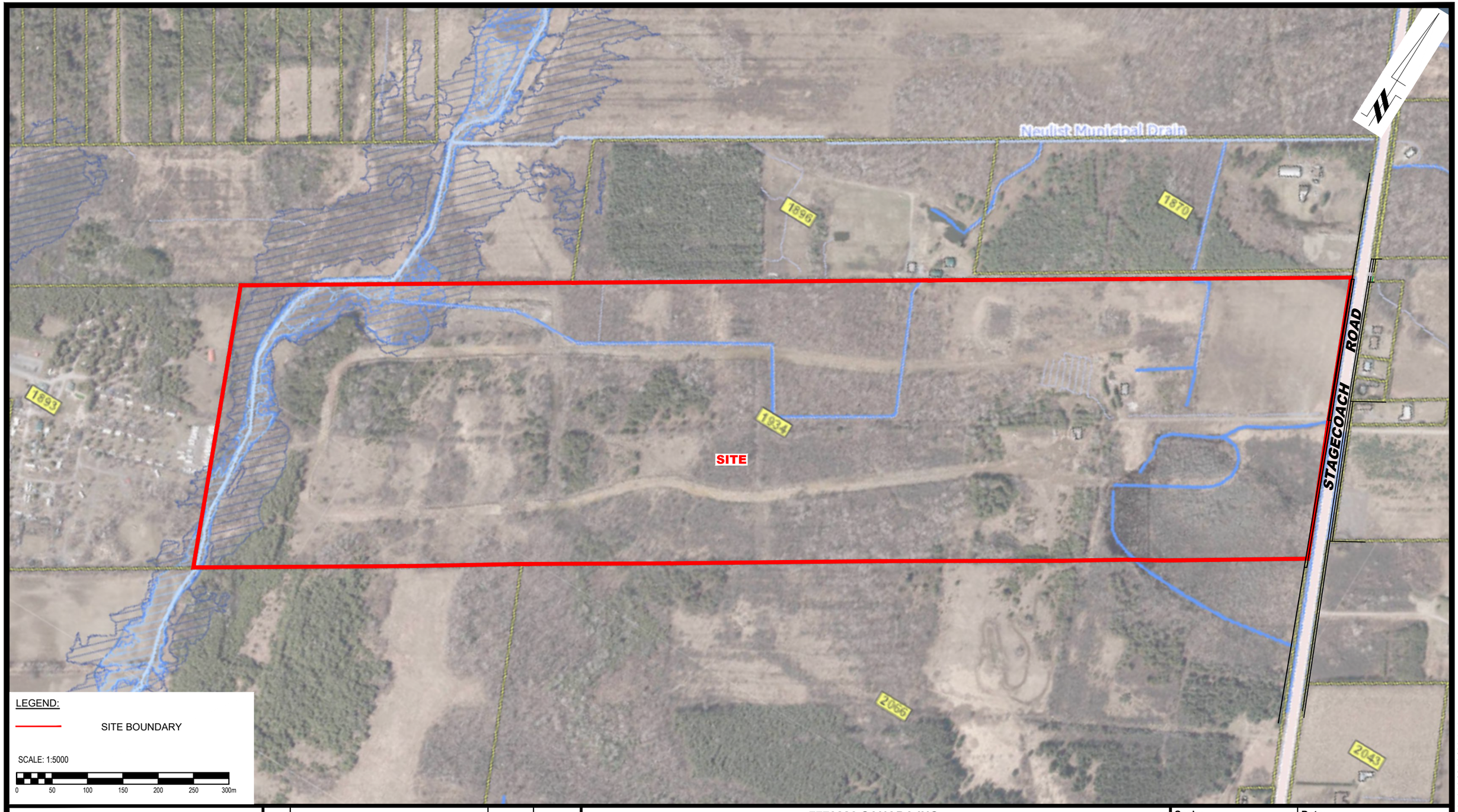
PH4734 – 3 - Surficial Geology Plan

PH4734 – 4 - Bedrock Geology Plan

PH4734 – 5 - Bedrock Aquifer Plan

PH0482 – 4 – Generalized Hydrogeological Cross Section

PH0482 – 7 – Lot Development Plan



PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

7773226 CANADA INC.

WATER BUDGET ASSESSMENT
PROPOSED RESIDENTIAL SUBDIVISION
1934 STAGECOACH ROAD

OTTAWA, ONTARIO

Title:

SITE PLAN

Scale: 1:5000	Date: 04/2023
Drawn by: YA	Report No.: PH4734-REP.01
Checked by: OB	Dwg. No.: PH4734-1
Approved by: ML	Revision No.:

11x17

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PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

7773226 CANADA INC.

WATER BUDGET ASSESSMENT
PROPOSED RESIDENTIAL SUBDIVISION
1934 STAGECOACH ROAD

OTTAWA, ONTARIO

Title:

MECP WATER WELL LOCATION PLAN

Scale: 1:10,000	Date: 04/2023
Drawn by: YA	Report No.: PH4734-REP.01
Checked by: OB	Dwg. No.: PH4734-2
Approved by: ML	Revision No.:

11x17

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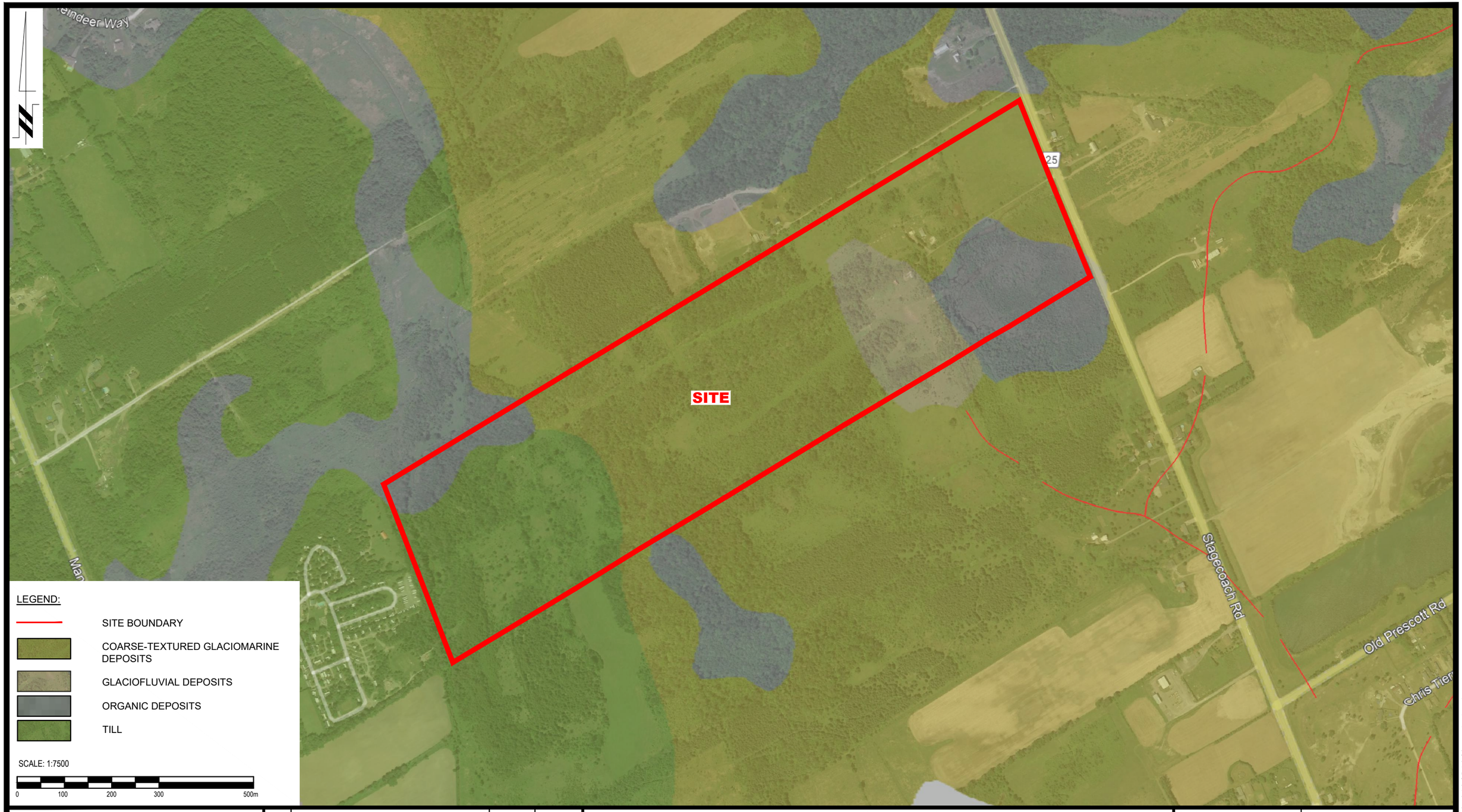

LEGEND:

- SITE BOUNDARY
- COARSE-TEXTURED GLACIOMARINE DEPOSITS
- GLACIOFLUVIAL DEPOSITS
- ORGANIC DEPOSITS
- TILL

SCALE: 1:7500

0 100 200 300 500m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

7773226 CANADA INC.

WATER BUDGET ASSESSMENT
PROPOSED RESIDENTIAL SUBDIVISION
1934 STAGECOACH ROAD

OTTAWA, ONTARIO

Title:

SURFICIAL GEOLOGY PLAN

Scale: 1:7500	Date: 04/2023
Drawn by: YA	Report No.: PH4734-REP.01
Checked by: OB	Dwg. No.: PH4734-3
Approved by: ML	Revision No.:

11x17

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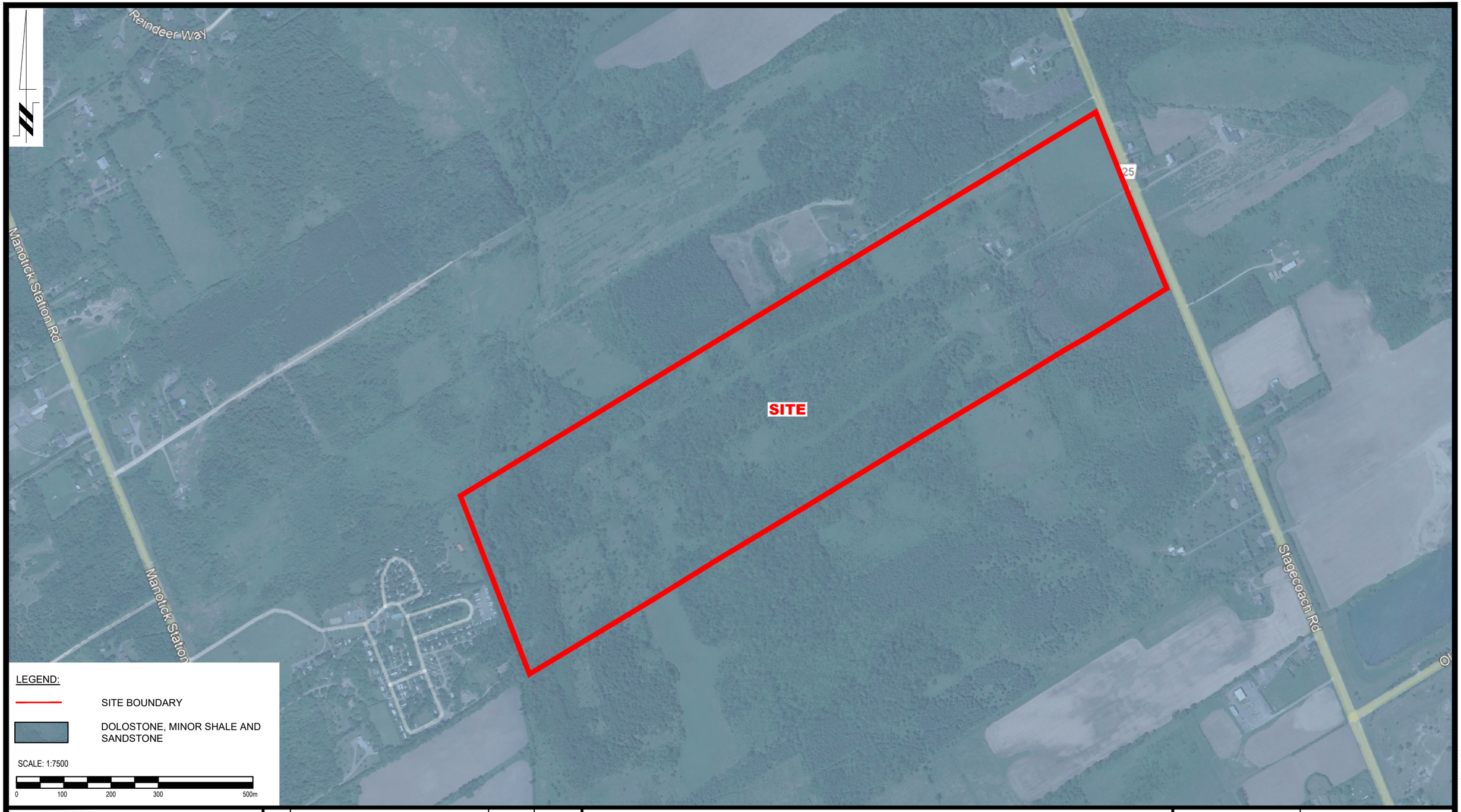

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

7773226 CANADA INC.

WATER BUDGET ASSESSMENT
PROPOSED RESIDENTIAL SUBDIVISION
1934 STAGECOACH ROAD

OTTAWA, ONTARIO

Title:

BEDROCK GEOLOGY PLAN

Scale: 1:7500	Date: 04/2023
Drawn by: YA	Report No.: PH4734-REP.01
Checked by: OB	Dwg. No.: PH4734-4
Approved by: ML	Revision No.:

11x17

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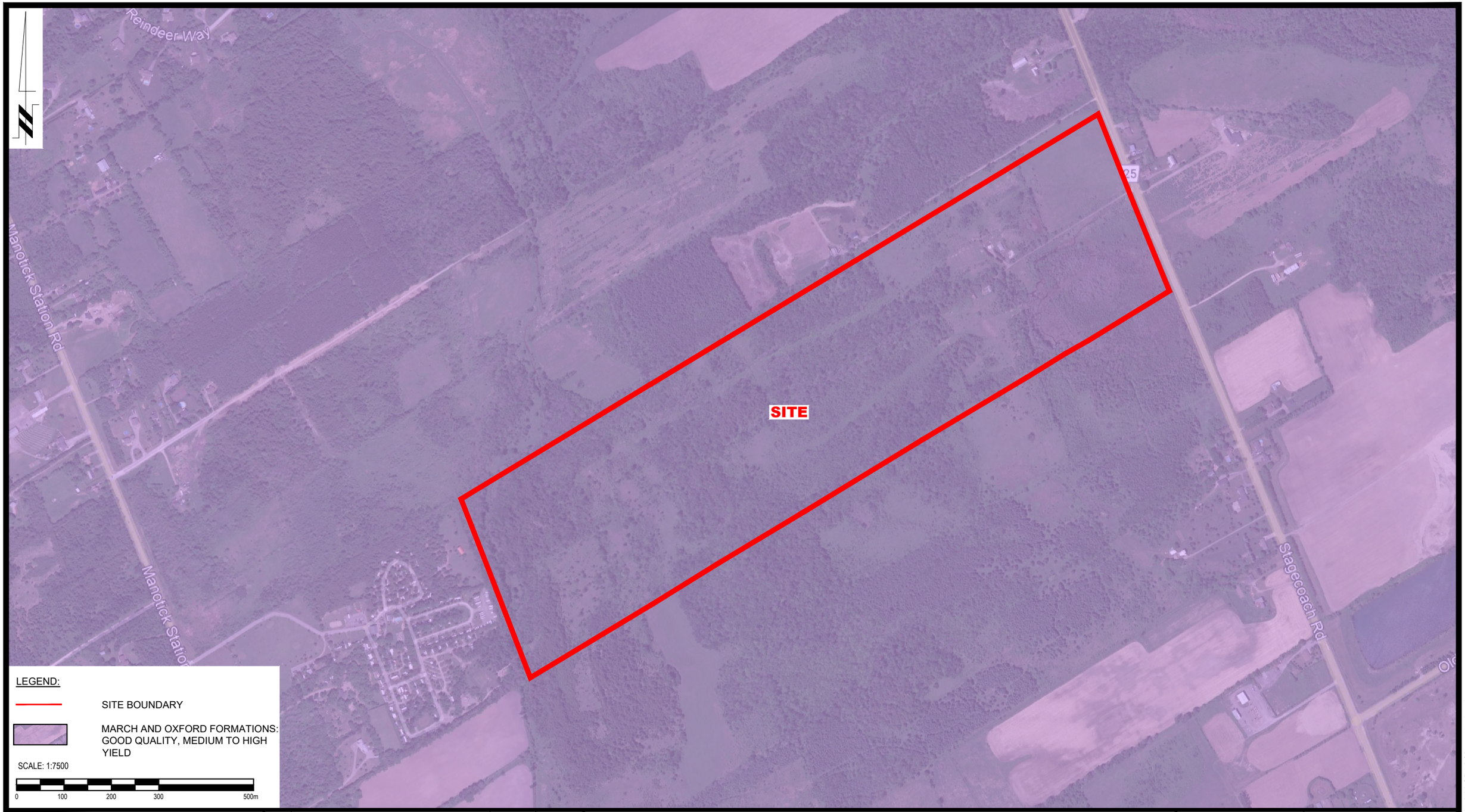

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

7773226 CANADA INC.

WATER BUDGET ASSESSMENT
PROPOSED RESIDENTIAL SUBDIVISION
1934 STAGECOACH ROAD

OTTAWA, ONTARIO

Title:

BEDROCK AQUIFER PLAN

Scale: 1:7500	Date: 04/2023
Drawn by: YA	Report No.: PH4734-REP.01
Checked by: OB	Dwg. No.: PH4734-5
Approved by: ML	Revision No.:

11x17

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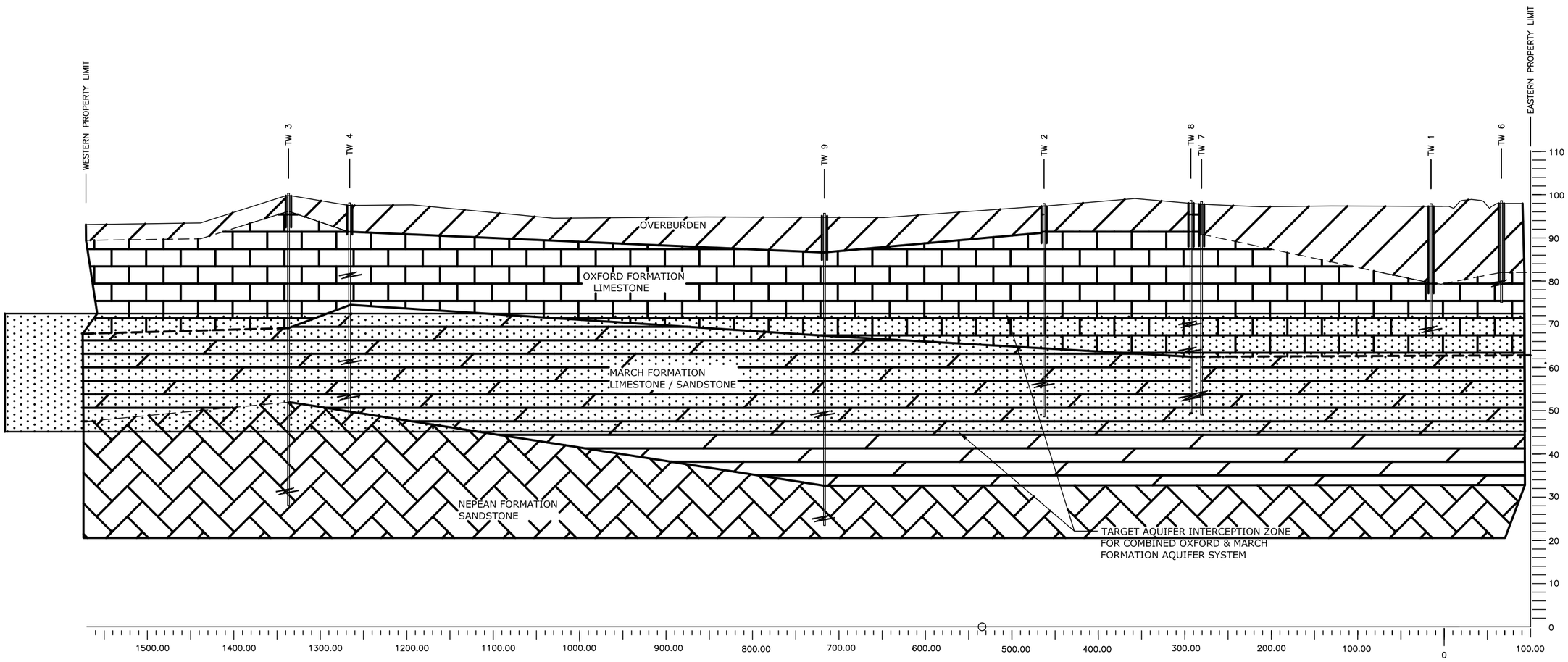

paterson group
consulting engineers
28 Concourse Gate, Unit 1, Ottawa, Ontario K2E 7T7

Scale:	H 1:5000 V: 1:500
Des.:	RAP
Dwn:	RAP
Chkd:	RAP

VELIKA REALTY CORPORATION
HYDROGEOLOGICAL STUDY
1934 STAGECOACH ROAD
OTTAWA, (GREELY) ONTARIO

GENERALIZED SITE CROSS SECTION

Dwg. No. PH0482-4
Report No.: PH0482-REP.02
Date: 11/2010

SCALE: 1:5000

0 50 100 150 200 250 300m

LEGEND:

	APPROXIMATE TEST PIT LOCATION
	APPROXIMATE TEST WELL LOCATION
97.15	GROUND SURFACE ELEVATION (m)
(09/02/2007)	DATE OF TEST WELL CONSTRUCTION

Date	Description	Rev.

Client:

7773226 CANADA INC.

Consultant:

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

Project:

PROPOSED RESIDENTIAL DEVELOPMENT

1934 STAGECOACH ROAD
OTTAWA (OSGOODE), ONTARIO

Drawing:

LOT DEVELOPMENT PLAN

Date: 06/2023	
Drawn by: YA	File: PH0482
Checked by: EA	Scale: 1:10
Approved by: MK	Date: 06/2023

Drawing No.:

PH0482-7

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