Stantec Consulting Ltd.
300W-675 Cochrane Drive, Markham ON L3R 0B8

June 20, 2018
File: 160622612

Attention: Mr. Paul Justice
Justice Construction
PO Box 210
Greely, Ontario K4P 1N5

Dear Mr. Justice,

Reference: Hydrogeological Desktop Study
2164 Old Prescott Road, Ottawa, Ontario

Stantec Consulting Ltd. (Stantec) has been retained by Justice Construction to conduct a hydrogeological desktop study investigation in support of a Zoning By-law Amendment application for their property at 2164 Old Prescott Road. The owner is proposing to construct a detached dwelling and ancillary building, both on private services, on the property. The purpose of this desktop study is to demonstrate that the proposed development can be serviced with private well and septic systems.

1 SITE LOCATION AND SURROUNDING USES

The property is located south of the community of Greely at the northeast corner of Stagecoach Road and Old Prescott Road (Figure 1 in Attachment A). The property is municipally known as 2164 Old Prescott Road and legally described as Part of Lot 15, Concession 4, Geographic Township of Gloucester, part of Part 1 on Plan 5R-684 save and except Parts 1 to 10 on 4R-18771, City of Ottawa. The property has an area of approximately 9.2 hectares (22.8 acres) with 203 metres of frontage on Stagecoach Road and 478 metres of frontage on Old Prescott Road.

The property is part of a former sand and gravel pit and is partially covered by a large, excavated pond. The aggregate licence (Aggregate Resource Act Licence no.: 4047) was surrendered on December 10, 2012. Justice Construction has severed three lots from the original pit and constructed three detached dwellings on the respective lots. The remainder of the property is covered by mowed grass and regenerating trees. The property slopes southward from Old Prescott Road to the excavated pond.

The property and surrounding lands are designated as Sand and Gravel Resource Area on Schedule A of the Official Plan and zoned ME2- Mineral Extraction. The following uses surround the property:

North: Osgoode Sand and Gravel Ltd. operates a Class A sand and gravel pit north of the property at 2094 Old Prescott Road.

East: Three detached dwellings on private services, constructed by the client, are located to the east of the property at 2162, 2160 and 2158 Old Prescott Road. As mentioned above, the three lots were severed from the original pit. The lots are designated Sand and Gravel Resource Area and zoned RU[193r]- Rural.

South: Old Prescott Road, a collector, bounds the property to the south. Meadowlands Village, a mobile home park, is located at 2183 Old Prescott Road and surrounds 2191 Old Prescott Road, a detached dwelling on private services opposite the property.

West: Stagecoach Road, an arterial, bounds the property to the west. A detached dwelling and paving company are located at 2136 Stagecoach Road.

2 DEVELOPMENT PROPOSAL

The owner is proposing to construct a detached dwelling with a secondary dwelling unit and an ancillary building which would accommodate the owner's growing construction and renovation business. Both buildings would be on private services.

An amendment to the Zoning By-law is required to permit the proposed development. The intent of the ME2- Mineral Extraction zone is to recognize lands with aggregate resource potential and limit land uses which would preclude extraction of these resources. The property is an exhausted sand and gravel pit, and all aggregate resources on the property have been exhausted. The current zoning would be amended to a RU- Rural special exception zone. The special exception zone is required to allow a habitable dwelling within 5 metres of the excavated pond and permit an ancillary office, vehicle and equipment storage use.

3 HYDROGEOLOGICAL CONDITIONS

Hydrogeological assessments in accordance with Provincial Guideline D-5 (Planning for Sewage and Water Services) are typically undertaken for land development sites with five or more structures / septic services. Due to the low density of the proposed development (two structures on private services), a maximum of two groundwater supply wells and septic systems will be required for Site servicing. Therefore this desktop study provided herein discusses the water supply and septic service potential in proximity to the Site.

The Site is located within the physiographic region defined as the Russell Prescott sand plain. This physiographic region extends from near Ottawa, across the northern portion of eastern Ontario to the Quebec border. The sand plains were laid down as deltaic deposits of the Ottawa River and its tributaries (Chapman and Putnam, 1984: 209)[1]. As shown on Figure 2 in Attachment A, near surface soils in proximity to the Site have been mapped as sands by the Ontario Geological Survey (2003)[2].

[1] Chapman, L.J. and D.F. Putnam. 1984. The Physiography of Southern Ontario, 3rd Edition. Ontario Geological Survey, Special Volume 2

[2] Ontario Geological Survey 2003. Surficial geology of Southern Ontario; MRD 128.

3.1 GROUNDWATER SUPPLY POTENTIAL

Figure 1 shows the locations of Ontario Ministry of Environment and Climate Change (MOECC) water well records. The logs of these records indicate overburden soils in proximity to the Site reflect sand soils and extend to a depth of approximately 20 m below grade. Sand soils are underlain by limestone bedrock. MOECC water well records No. 1527636 and A095929 are located within 200 m of the proposed development Site servicing locations. Groundwater supply potential from these nearby wells are described below. A copy of these MOECC Water well records are provided in Attachment B.

Well No. A095929 reflects a private well, completed within the limestone bedrock and services the residence at 2162 Old Prescott Road. Steady state groundwater pumping at 82 m^3/day effected less than 1 m of water table drawdown.

Well No. 1527636 is a communal well, completed with a 2.5 m long stainless steel wire wound screen at the base of the overburden aquifer. The well record indicates the well is capable of sustaining a pumping rate up to 654 m^3/day. At this pumping rate, 3.5 m of water level drawdown was observed within the pumping well.

Collectively, the nearby water well records indicate that both overburden and bedrock formations reflect water bearing zones that are highly transmissive. These results indicate that ground conditions at 2164 Old Prescott Road are capable of sustaining a yield that is sufficient for servicing the proposed development at 2164 Old Prescott Road.

The water demand for the proposed development will be less than 10 m^3/day. As such, operation of groundwater supply wells at 2164 Old Prescott Road should not adversely affect the operation of nearby groundwater production wells.

There are no known reports of impacted groundwater quality at nearby groundwater supply well locations. Testing of groundwater quality can be confirmed following the well installation at 2164 Old Prescott Road.

3.2 DISPOSAL OF SEPTIC SYSTEM EFFLUENT

Attenuative processes within a one hectare lot are generally sufficient to reduce the nitrate-nitrogen to an acceptable concentration in groundwater below adjacent properties[3]. As per provincial guideline D-5-4 developments consisting of lots which average 1 hectare (with no lot being smaller than 0.8 ha) do not require a detailed hydrogeological assessment. As discussed within the hydrogeological section above, overburden and bedrock formations have a high transmissivity, allowing for rapid infiltration and broad distribution of septic effluent plumes. It is noted that the proposed lot sizes are much greater than 1 ha. and are therefore exempt from a nitrate impact evaluation.

[3] Suitability of the lot for a sewage disposal system is also dependent on approval from the Director under Part VIII of the Environmental Protection Act. See the MOEE "Manual of Policy, Procedures and Guidelines for On-site Sewage Systems."

3.3 AGGREGATE IMPACT ASSESSMENT

As discussed above, the property currently forms part of a rehabilitated sand and gravel pit, where the economic aggregate has been exhausted and the aggregate licence has been surrendered. Development of this Site is not adversely affecting potential aggregate extraction of future resources.

4 CLOSURE

We trust this desktop hydrogeological study at 2164 Old Prescott Road in Ottawa, Ontario is sufficient for your planning purposes. Should you have any questions, or require further information, please do not hesitate to contact the undersigned.

5 LIMITATIONS

This letter regarding “Hydrogeological Desktop Study 2164 Old Prescott Road, Ottawa, Ontario” was prepared by Stantec Consulting Ltd. (“Stantec”) for the account of Justice Construction (the “Client”). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Regards,

Stantec Consulting Ltd.

Stephen Di Biase P.Geo.
Senior Hydrogeologist

Phone: (905) 415-6330
Fax: (905) 474-9889
Email: Stephen.DiBiase@stantec.com

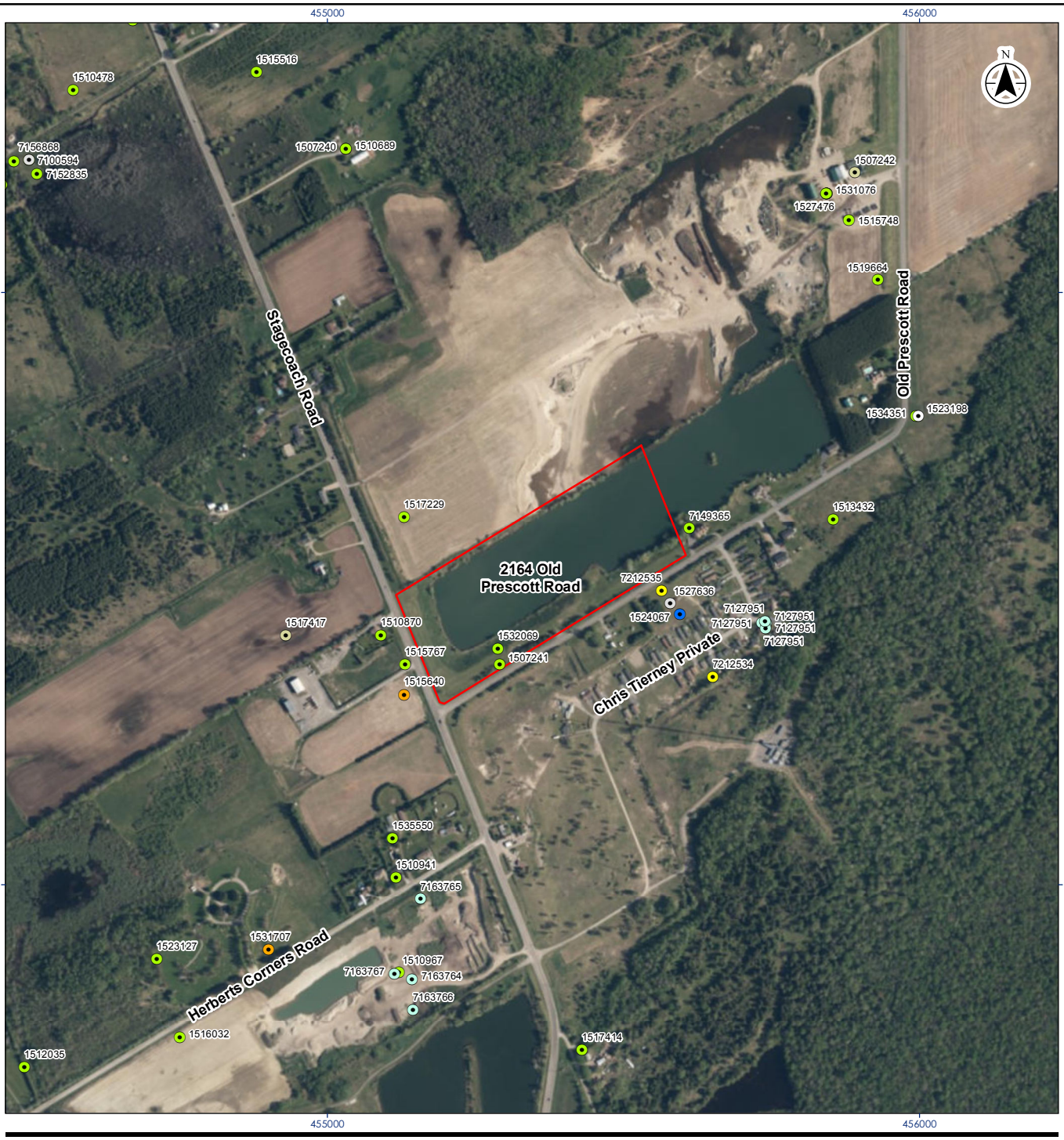
Reference: **Hydrogeological Desktop Study**
2164 Old Prescott Road, Ottawa, Ontario

Attachment: A – Figures/Plans
- Figure 1. Site Location
- Figure 2. Surficial Geology

B – MOE Water Well Records
- Well Record A095929
- Well Record 1527636

c. Eric Bays (Stantec Consulting Ltd.)

APPENDIX A
Figures/Plans



Legend

- Phase One Study Area
- Approximate Site Property
- Monitoring and Test Hole
- Public

MOE Water Well Record

- Not Defined
- Commerical
- Domestic
- Irrigation
- Livestock
- Monitoring

0 200 400 metres

1:10,000 (at original document size of 8.5x11)

Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.
3. Orthoimagery © City of Ottawa, 2018. Imagery Date, 2017.
4. MOECC Water well locations are approximate and have been positioned based on published UTM coordinates © Queen's Printer for Ontario, 2018.

Stantec

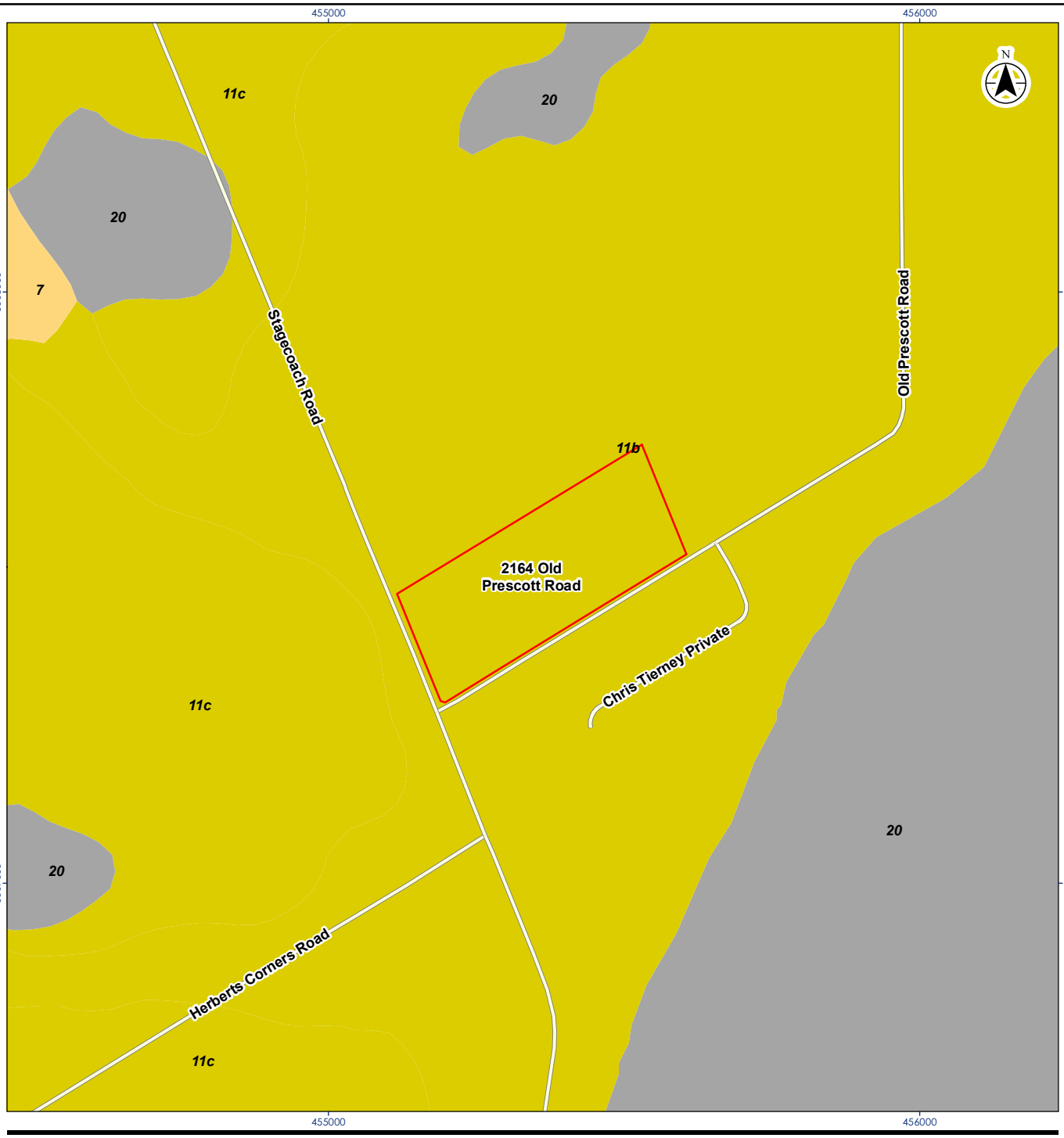
Project Location
Greely, ON

160410204 REVB
Prepared by CL on 2018-06-13
Technical Review by BC on 2018-06-13
Independent Review by SB on 2018-06-13

Client/Project
JUSTICE CONSTRUCTION
HYDROGEOLOGICAL DESKTOP STUDY
2164 OLD PRESCOTT ROAD, GREELY, ONTARIO

Figure No.
1

Title
MOE Water Well Records



Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.
3. Surficial geology produced by the Ontario Geological Survey 2003. Surficial geology of Southern Ontario: Ontario Geological Survey, MRD 128.

Legend

- Approximate Site Property
- Road

Surficial Geology

- 20: Organic deposits
- 11b: Coarse-textured glaciomarine deposits (Littoral-foreshore deposits)
- 11c: Coarse-textured glaciomarine deposits (Foreshore-basinal deposits)
- 7: Glaciofluvial deposits

0 200 400 metres

1:10,000 (at original document size of 8.5x11)

Stantec

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Greely, ON

160410204 REVB
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Client/Project
JUSTICE CONSTRUCTION
HYDROGEOLOGICAL DESKTOP STUDY
2164 OLD PRESCOTT ROAD, GREELY, ONTARIO

Figure No.
2

Title
Surficial Geology

APPENDIX B
MOE Water Well Records

Ontario — Ministry of the Environment

Measurements recorded in: ☐ Metric ☐ Imperial

Well T[illegible] **A 095929** [illegible]Below)

A095929

Well Record

Regulation 903 Ontario Water Resources Act

Page _____ of _____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
2162 Old Prescott Rd	Osgoode	Pt 15	4

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

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Subdivision Number	Other
NAD 83	18	455611	5007602	4R-18771 5L,2,3-4	

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
	Sand & Boulders			0'	52'
	Grey Limestone			52'	115'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
58'	48'	Neat Cement Slurry	7.8
48'	0'	Neat Bentonite Slurry	29.4

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	Depth (m/ft) To
6"	Steel	.188	+2'	58'
6'18	Open Hole		58'	115'

Construction Record - Screen

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

Water Details

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

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	58	6"
58'	115'	6'18"

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, specify Not tested

If pumping discontinued, give reason: X

Pump intake set at (m/ft) 100'

Pumping rate (l/min / GPM) 15

Duration of pumping 1 hrs + 0 min

Final water level end of pumping (m/ft) 14' 1"

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

Recommended pump depth (m/ft) 100'

Recommended pump rate (l/min / GPM) 15

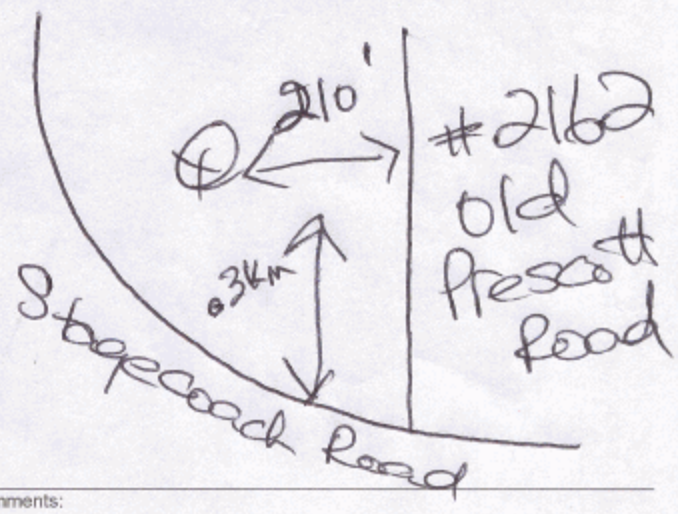
Well production (l/min / GPM) 15

Disinfected? ☒ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	13' 2"		14' 1"	
1	14' 1"	1	13' 2"	
2	14' 1"	2	13' 2"	
3	14'	3	13' 2"	
4	14'	4	13' 2"	
5	14'	5	13' 2"	
10	14' 1"	10	13' 2"	
15	14' 1"	15	13' 2"	
20	14' 1"	20	13' 2"	
25	14' 1"	25	13' 2"	
30	14' 1"	30	13' 2"	
40	14' 1"	40	13' 2"	
50	14' 1"	50	13' 2"	
60	14' 1"	60	13' 2"	

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.
Air Rock Drilling Co Ltd	1119

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

Province	Postal Code	Business E-mail Address
ON	K0A 2Z0	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6138382170	HOGAN DAN

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
30758		2010/07/19

Well owner's information package delivered	Date Package Delivered	Date Work Completed
X ☐ Yes ☐ No	2010/07/05	2010/06/29

Ministry Use Only

Audit No. z110708

Received AUG 05 2010

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

Ministry's Copy

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 | 1527636 | MUNICIP. 150009 | CON. CON. | 04

COUNTY OR DISTRICT: OTTAWA CARLETON
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: TOWNSHIP OF OSGOODE
CON. BLOCK, TRACT, SURVEY, ETC: CONCESSION 4
LOT: 15
[redacted] #2, Greely, Ontario. K0A 1Z0.
DATE COMPLETED: DAY 20 MO 07 YR 93.
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		MED - COARSE	0	22
GREY	SAND GRAVEL		MED - COARSE	22	50
GREY	LIMESTONE		SEAMY, BROKEN.	50	53.

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
44-52	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	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	DEPTH - FEET TO
15"	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		0	25
10 3/4"	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.250"	+2	44
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.): SLOT #60
DIAMETER: 8 5/8 INCHES
LENGTH: 8 FEET
MATERIAL AND TYPE: Stainless, telescope
DEPTH TO TOP OF SCREEN: 44 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER ETC.)
6	25	Cement grout (Pressure grouted).

71 PUMPING TEST

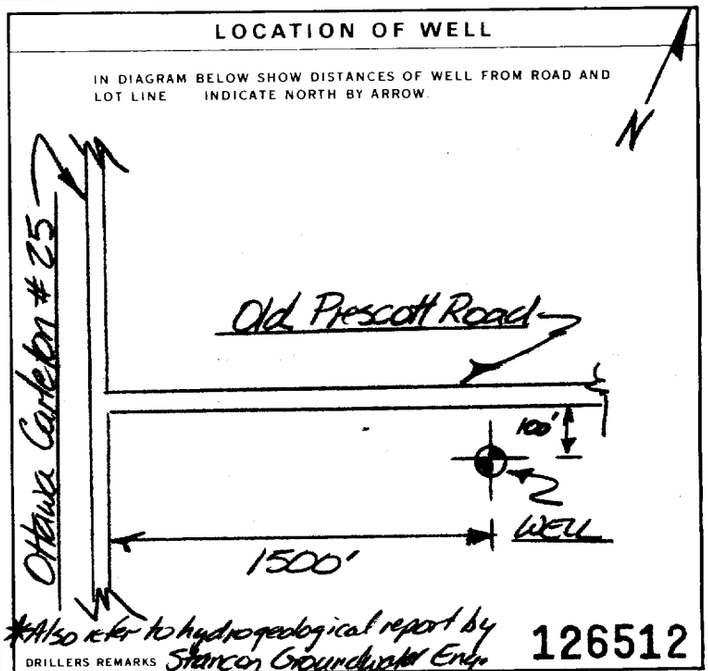
PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER
PUMPING RATE: 120 GPM
DURATION OF PUMPING: 24 HOURS 0 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
17.74 FEET	29.28 FEET		28.66 FEET	28.69 FEET	28.75 FEET	28.79 FEET

IF FLOWING, GIVE RATE: ____ GPM
PUMP INTAKE SET AT: 40 FEET
WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING: 40 FEET
RECOMMENDED PUMPING RATE: to 120 GPM

LOCATION OF WELL

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



*Also refer to hydrogeological report by Stanton Groundwater Eng.

DRILLERS REMARKS: 126512

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: STANTON DRILLING INC.
WELL CONTRACTOR'S LICENCE NUMBER: 4875
ADDRESS: Box 219, Pakenham, Ont. K0A 2X0
NAME OF WELL TECHNICIAN: Peter J.A. Stanton, P. Eng.
WELL TECHNICIAN'S LICENCE NUMBER: T0086.
SIGNATURE OF TECHNICIAN/CONTRACTOR:
SUBMISSION DATE: DAY 20 MO 08 YR 93.

OFFICE USE ONLY

DATA SOURCE
CONTRACTOR: 4875
DATE RECEIVED: JAN 06 1994
DATE OF INSPECTION
INSPECTOR
REMARKS: CSS.RS

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9