

STUART CADE

SEP 08 2026

Scoped Hydrogeological Study
389 Quaker Road
Prince Edward, Ontario

Prepared for:

Suzanne Wright
389 Quaker Road
Prince Edward County, ON
K0K 2T0

Submitted by:

The Greer Galloway Group
a division of Jp2g Consultants Inc
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K8N 4Z5

September 4, 2026

Jp2g Project 26-6083A





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Attachments

Sketch for Severance Application – Watson Land Surveyors

Laboratory Certificate of Analysis



1 Introduction

Greer Galloway, a division of JP2G Consultants Inc., was retained by the property owner, Suzanne Wright to conduct a Scoped Hydrogeological Study for a proposed severed lot at 389 Quaker Road in Prince Edward County, Ontario. The client is proposing to sever a 1.6-hectares (ha) residential lot containing the existing dwelling and barn located at 389 Quaker Road. The retained farmland of approximately 38.7 ha would be consolidated with the farm operation on the adjacent property to the east, municipally addressed as 128 Quaker Road.

The purpose of the investigation was to assess the potential risk of nitrate contamination to neighbouring properties resulting from on-site disposal of sewage effluent. Nitrate attenuation was evaluated in accordance with rationale outlined in MECP Guideline D-5-4.

2 Investigation Methods

The investigation included a review of available mapping including Prince Edward County GIS and Watson Land Surveyor maps, available geologic and hydrogeologic information for the area, and an analysis of sewage servicing options in general accordance with Ministry of the Environment Conservation and Parks (MECP) Guideline D-5-4 (Individual On-Site Sewage Systems).

2.1 Water Quality Assessment:

On August 18th, 2026, Danielle Davidson visited 389 Quaker Road. A groundwater sample was obtained from the existing well on the proposed severance which services the existing dwelling on the proposed severance. The sample was collected using a bailer and placed into laboratory-prepared sample containers that were placed into a cooler with ice packs to maintain a temperature of approximately 4°C, and transported to Caduceon Laboratories in Kingston, Ontario under chain of custody.

The sample was analysed for a variety of parameters including Nitrite and Nitrate which will be used to establish Background Nitrate Calculations. (Laboratory Certificate of Analysis appended).

3 Findings

3.1 Site Description:

The subject property at 389 Quaker Road in Prince Edward County, Ontario, is approximately 40.1 ha in area and is located at the end of Quaker Road, approximately 1.16 km north of its intersection with Prince Edward County Road 1. Prince Edward County Road 4 borders the north edge of the property. The subject lands are currently used for agricultural and residential purposes. The property is largely zoned Agricultural (AG), with a 1.89 ha portion in the southeast corner designated as Environmental Protection (EP).

The client is proposing to sever a 1.6 ha lot containing the existing dwelling, private water supply well, and private septic system. The water supply consists of a dug well constructed with a cement tile casing having an interior diameter of 0.90 m. The well is 6.60 m deep below ground surface and extends approximately 0.45 m above grade.

3.2 Climate and Water Balance:

The area is characterized by mild winters and relatively cool humid summers. Snow typically occurs during 5 months of the year from December to April. Precipitation is approximately 911 mm/a (Environment Canada, 2020) with an average annual evapotranspiration (ET) of roughly 500 mm/a based on the site location (Statistics Canada, 2017)

Mapping shows primarily thin surficial soils classified as thin soils over Paleozoic bedrock in the Surficial Geology of Southern Ontario (OGS, 2011). The infiltration factors for the area were calculated as per the Ontario Ministry of the Environment 1995 Hydrogeological Technical Information Requirements for Land Development Applications.

It is based on three sub-factors which are:

- Topography sub-factor;



- Soil sub-factor; and,
- Cover sub-factor.

The following table presents infiltration factors based on the details of the ground cover factors for the area under current conditions:

Table 1: Estimated Infiltration Factors

Site Characteristic	Infiltration Factor
<u>Topography</u>	
Flat Land	0.3
Rolling Land	0.2
Hilly Land	0.1
<u>Soils</u>	
Tight impervious clay	0.1
Medium combinations of clay and loam	0.2
Open Sandy loam	0.4
<u>Cover</u>	
Cultivated Land	0.1
Woodland	0.2
Sum of Infiltration Factors	0.6

Given an average annual moisture surplus (P-ET) of approximately 410 mm, and an infiltration factor of 0.6, we estimate an average annual infiltration of about 246 mm/a, or roughly 6,740 L/day per hectare.

3.3 Geology:

The site is part of the Prince Edward Peninsula (Chapman and Putnam 1984). This region is separated from the mainland by the Bay of Quinte and is characterized by low relief and shallow soils. The geology consists of upper Middle Ordovician rocks that unconformably overlie Precambrian basement rocks of the Grenville Province. Overburden thickness is variable but generally thin and large portions of the County have less than 1 m of overburden.

The bedrock consists of limestones and shales laid down over older Precambrian-age rock beginning in the middle Ordovician (approximately 460 million years ago) as part of a continent-wide marine transgression. This transgression (a period of increasing sea levels) deposited, in order, the Shadow Lake, Gull River, Bobcaygeon, Verulam and Lindsay Formations (Armstrong and Carter, 2010). The lower member of the Lindsay Formation is the uppermost bedrock unit beneath the property. The lower member of the Lindsay Formation consists mainly of medium grey and blueish grey, finely to medium crystalline limestone, uniformly bedded with subequal thickness of and separated by thin shaley seams (Experimental Farms Service, 1947). These strata dip shallowly to the west.

The overburden geology is composed of unconsolidated deposits resulting primarily from glacial activity. The Soils Map of Prince Edward County, Ontario, Report No. 10, indicates that Elmbrook Clay is the dominant soil type on the property. The Elmbrook series typically occurs within one metre of underlying bedrock and is noted as being imperfectly drained and stone free.



3.4 Water Quality:

A summary of the analytical results from the groundwater sample from the existing supply well (no tag number) is shown below:

Table 2: Summary of Analytical Results

Parameter	Units	RL	Well (Aug 18, 2026)	MECP D-5-5 Limit
Nitrite (N)	mg/L	0.1	<0.05	1
Nitrate (N)	mg/L	0.1	0.16	10

4 Nitrate Attenuation

4.1 MECP Guideline D-5-4:

The site has no significantly elevated background nitrate and is not a “sensitive setting” in the local context. As per Ministry of the Environment, Conservation and Parks Guideline D-5-4 Individual On-Site Systems:

“It is assumed that attenuative processes within a one-hectare lot will be sufficient to reduce the nitrate-nitrogen to an acceptable concentration in groundwater below adjacent properties. It should be noted that sufficient attenuative processes may not be present in hydrogeologically sensitive environments, or where there is little water surplus available.”

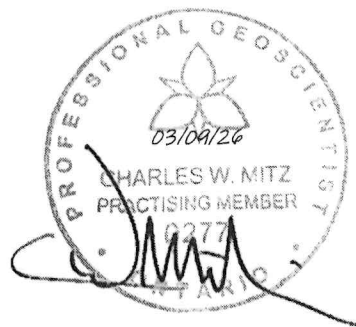
As the proposed severed parcel is greater than 1 ha in area (1.6 ha), and the background concentration of nitrite is negligible at 0.16 mg/L nutrient attenuation calculations and assessment are omitted under D-5-4 Guidelines.

5 Summary:

The purpose of the investigation was to assess the potential risk of nitrate contamination to neighbouring properties resulting from on-site sewage effluent. Our assessment found the following:

1. The severed lot is large enough to meet reasonable use criteria with respect to nitrate in groundwater leaving the property.
2. Due to the nature of a shallow dug well treatment equivalent to that required for a surface water source is recommended and this requirement should be placed on title.

Sincerely,



Charles Mitz, M.Eng., Ph.D., P.Geo
Senior Project Manager

Danielle Davidson
Environmental Technologist



6 References:

Armstrong, D.K. and Carter, T.R. 2006. An updated guide to the subsurface Paleozoic stratigraphy of southern Ontario; Ontario Geological Survey, Open File Report 6191, 214p

Chapman, L.J. and Putnam, D.F. 1984. The Physiography of Southern Ontario. Third Edition. Ontario Geological Survey, Map 2556, scale 1:1 000 000.

Environment Canada, 2020

https://climate.weather.gc.ca/climate_normals/results_1981_2010_e.html?stnID=4859&autofwd=1

Experimental Farms Service, 1947: Soil Map of Prince Edward County, Ontario. Soil Survey Report No. 10, Scale 1:63 360.

MECP (Ministry of Environment Conservation and Parks) 1996: D-5-4 Individual On-Site Sewage Systems: Water Quality Impact Risk Assessment, updated April 14, 2016.

Ontario Geological Survey 2011. Surficial geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 128-REV

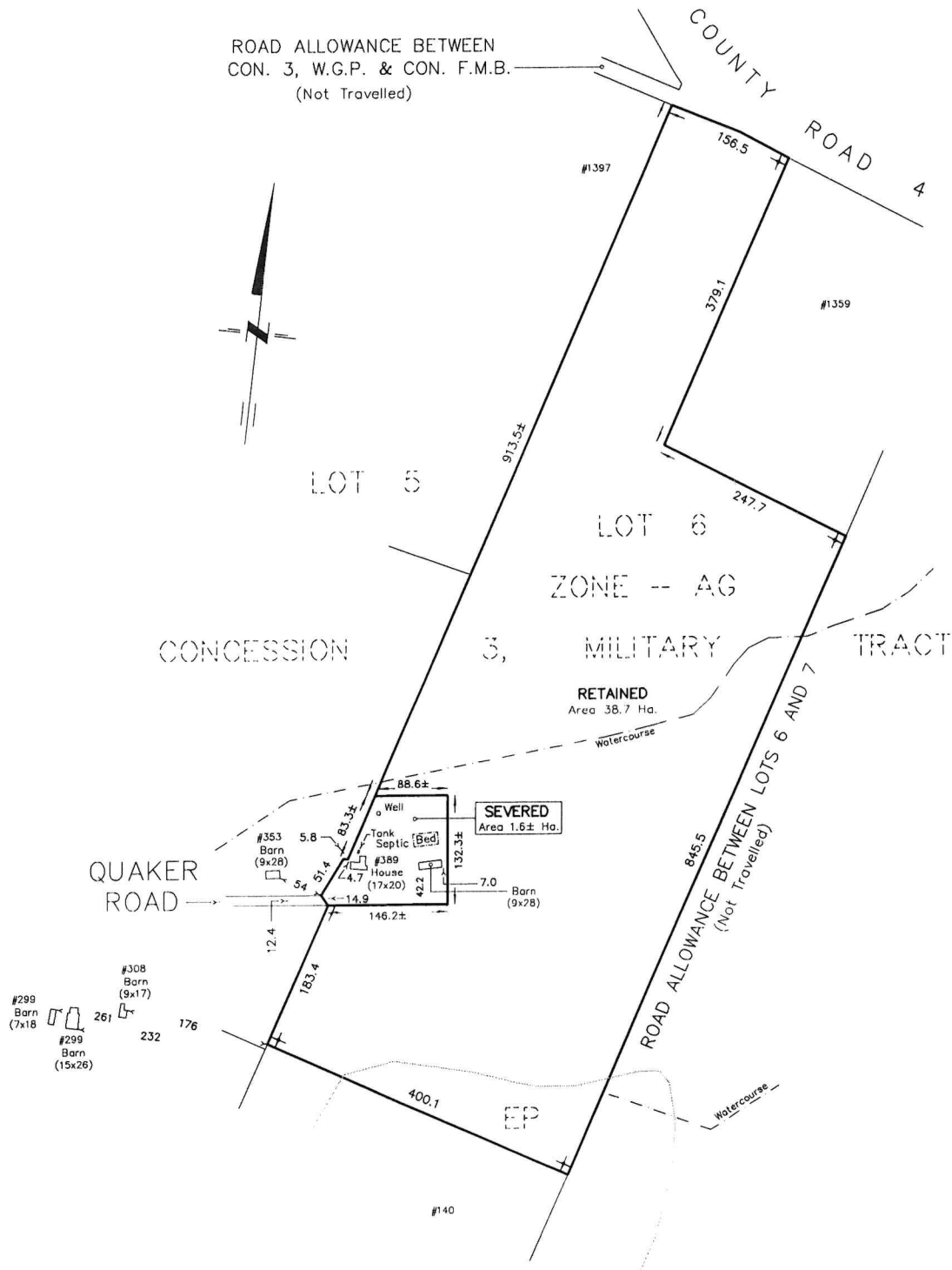
Quinte Conservation 2006, Conceptual Water Budget Quinte Region, 93p.

http://quintesourcewater.ca/site/images/stories/pdfs/waterbudget/waterbudgetfinalreportdec19th2006_nofigures.pdf

Stats Canada, 2017 <https://www150.statcan.gc.ca/n1/pub/16-201-x/2017000/sec-2/m-c/m-c-2.5-eng.htm>

SKETCH for SEVERANCE APPLICATION

METRIC SCALE 1 : 5000



NOTES :

389 QUAKER ROAD

PART OF LOT 6
CONCESSION 3, MILITARY TRACT
TOWNSHIP OF HALLOWELL.
NOW IN THE MUNICIPALITY OF THE
COUNTY OF PRINCE EDWARD

DIMENSIONS AND INFORMATION SHOWN ARE DERIVED
FROM PLAN 47R-7352 AND MUNICIPAL RESOURCES.

DISTANCES SHOWN ON THIS PLAN ARE IN METRES
AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

UNDERGROUND SERVICES SHOWN ON THIS SKETCH WERE
PROVIDED BY THE CLIENT AND HAVE NOT BEEN VERIFIED.

JULY 06, 2026

CAUTION

THIS IS NOT A PLAN OF SURVEY AND SHALL NOT BE USED
EXCEPT FOR THE PURPOSE INDICATED IN THE TITLE BLOCK

218 CHURCH STREET
BELLEVILLE, ONTARIO

WATSON
LAND SURVEYORS Ltd.

K8N - 3C3
(613) 962 - 9521

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PROJECT N^o 16392-W-26

C.O.C.: G389 Quaker

REPORT No: 26-026113 - Rev. 1

Report To:

Greer Galloway, a division of Jp2g Consultants Inc.
1620 Wallbridge-Loyalist Road, RR #5
Belleville, ON K8N 4Z5

CADUCEON Environmental Laboratories

285 Dalton Ave
Kingston, ON K7K 6Z1

Attention: Danielle Davidson

DATE RECEIVED: 2026-Aug-19
DATE REPORTED: 2026-Sep-04
SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: 389 Quaker Road
P.O. NUMBER: 25-6087A

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	1	OTTAWA	LMACGREGOR	2026-Aug-20	A-IC-01	SM 4110B

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *

		Client I.D.	Well
		Sample I.D.	26-026113-1
		Date Collected	2026-08-18
Parameter	Units	R.L.	
Nitrate (N)	mg/L	0.05	0.16
Nitrite (N)	mg/L	0.05	<0.05

26-026113Rev1 replaces 26-026113 – Revised to change client project ID



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.