



# **Terra-Dynamics Consulting Inc.**

**432 Niagara Street, Unit 2 St. Catharines, ON L2M 4W3**

October 20, 2021

Ron Pols  
Pols Ltd.  
52009 Regional Road 24  
Wainfleet, ON L0S 1V0

Re: Hydrogeological Assessment – Draft Plan of Subdivision, 53814 Zion Road, Wainfleet, ON

Dear Mr. Pols,

## **1.0 Introduction, Background Information and Purpose**

Terra-Dynamics Consulting Inc. was retained to complete a Hydrogeological Assessment to assess sewage impacts for six proposed 0.40-0.94 hectare severances (Upper Canada Consultants, 2021, Appendix A) from 53814 Zion Road, located in the Township of Wainfleet (Site, Figure 1). The hydrogeological study is required by the Township of Wainfleet (Township), and Niagara Region, as lots will be proposed that are smaller than 1.0 hectare (Township, 2021a). Relevant municipal zoning by-law and official plan policies to consider include:

1. Township of Wainfleet Zoning By-law, Section 6.2.1 (Township, 2014):

*The minimum lot size shall be 1 hectare unless a hydrogeological study undertaken by an applicant demonstrates that on-site suitable private services can be achieved on a smaller lot with no negative impacts on surface and/or ground water features, in which case the minimum lot size is 4,000 m<sup>2</sup> (1 acre)*

2. Niagara Region Policy 5.C.6.4 (Niagara Region, 2014)

*Proposals for rural residential development in the Rural Area must meet the following criteria, in addition to the other requirements of this Official Plan....*

*d) Soil and drainage conditions are suitable and permit the proper siting of buildings, the supply of potable water and the installation and long-term operation of an adequate means of waste disposal*

*i) ...For residential development consisting of up to three lots the minimum lot size will be 1 hectare unless it is determined through a hydrogeological study that considers potential cumulative impacts that a smaller size lot will adequately accommodate private water and sewage treatment facilities for long term operation.*

The following documents the hydrogeological assessment of the Site.

It is also noted that the Niagara Peninsula Conservation Authority (NPCA) policy 8.2.3.5 (2019) does not allow a septic system within 30 metres of a wetland. Portions of policy 8.2.3.5 are presented below:

*“Proposed New Development within 30 metres of a Wetland*

- a) For new residential development, no new septic systems are permitted within 30m of any wetland.*

It is our understanding that the location of the sewage disposal system at Lot 6 (Appendix A) is to be revised before agency submission to comply with this criterion.

## **2.0 Methodology**

The following methodologies were used to investigate the Site:

- A. Submission of a Hydrogeological Study Terms of Reference to Niagara Region and the Township.
- B. Evaluation of Ministry of Environment, Conservation and Parks (MECP) water well and Ministry of Natural Resources and Forestry (MNRF) well records located within 500 metres of the Site.
- C. A site visit that included inspection for any existing water supply wells, collection of four shallow soil-samples by hand-auger and observations of watercourses on-site.
- D. A water well and septic system survey of properties within a 250 m radius of the Site (Figure 2).
- E. Assessment of geological information using regional mapping of elevation, sediments/overburden, bedrock, geotechnical records and nearby hydrogeological studies.
- F. Preparation of a description of the hydrogeological setting using physical/geological information and water levels.
- G. Assessment of the aquifer vulnerability completed using (a) provincial procedure D-5-4 (MECP, 1996a) and (b) groundwater vulnerability procedures described by the Niagara Peninsula Source Protection Authority (NPSPA) (NPCA, 2013).
- H. A predictive assessment of sewage impacts was completed including a nitrate-nitrogen dilution calculation for the proposed septic systems as per provincial procedure D-5-4 (MECP, 1996a).

Terra-Dynamics Consulting Inc. began the assessment once confirmation of the appropriateness of the Terms of Reference was received from Niagara Region (2021) and the Township of Wainfleet (2021b).

As the new lots will be provided potable water via cisterns, this report does not include a water supply assessment (MECP, 1996b), but it is recommended that a development agreement be implemented that will indicate water supply by cisterns only.

## **3.0 Ministry of Environment, Conservation and Parks (MECP) Water Well Records**

MECP water well records within 500 m of the Site were reviewed and fourteen records identified (Appendix B). None of the Provincial records plot at the Site (Figure 2), and no water wells were identified during our site visit, although historical (1934/1965) aerial photos suggest previous dwellings at the Site. Most (12 of 14) of the wells were constructed between 1959 and 1978.

Nine (9) of the wells were constructed in 1969-1970 to the southeast of the Site, for the Ontario Water Resources Commission (OWRC) as monitoring/observation wells. The OWRC wells were completed to

various depths in the bedrock aquifer, and in close proximity to one another (e.g. four records plot at one location: 6602410, 6602771, 6602772, 6602773), with only one record completed in the deep overburden overlying the bedrock (6602774). The remaining Provincial well records were for domestic water supply. Nine (9) of the fourteen (14) Provincial well records indicate completion in bedrock, with the depth to bedrock between 32.9 and 33 metres below ground surface (m BGS). The remaining four (4) overburden wells were completed in either clay and gravel (6602201), sand and gravel (7103206) or gravel (6603229) overburden potentially overlying bedrock.

Water well contractor water quality observations were generally sulphurous or mineral, with some 'heavy' mineral quality noted, and limited observations of 'fresh' conditions at some deep overburden and upper bedrock locations. Also, one Provincial record was for a well abandonment (7104776) because of poor water quality at location 7103206, and Provincial record 6603229 indicates the constructed well was immediately abandoned because of poor water quality.

Two of the Provincial records (6603229 and 7103206) were completed on the Cemetery Sand Dune (Section 5.1, Figure 2) and recorded surficial brown sand of between 4.9-5.4 metres (16-18 feet) thick. Underlying the sand was clay becoming clay till, 30.8-31.8 metres (101-104 feet) thick. These clay and clay till layers protecting the Salina Formation (Armstrong and Dodge, 2007) bedrock aquifer have been identified as a series of aquitard by the Ontario Geological Survey (Burt, 2020).

#### 4.0 Water Supply and Septic System Survey Results

A water supply and septic system survey (Appendix C) was mailed in June 2021 to the twenty-four (24) parcels within 250 m of the Site (Figure 2). Three survey responses were received (Table 1, Appendix C).

Table 1 – Water Well and Septic Survey Results

Addresses	Survey Details
43775 Highway 3	Cistern
43832 Highway 3	Two shallow large (4 foot) diameter wells
43954 Highway 3	Shallow 'spring fed' well, (3 foot) diameter, 12 feet deep

The two shallow wells at 43832 Highway 3 exert 30 metre set-backs from sewage disposal systems (Sharaf, 2013) which extend onto the Site (Figure 2). However, the proposed sewage disposal systems for the Site (Appendix A) are located further than 140 metres away, and no new sewage disposal systems are proposed topographically upgradient of these shallow wells.

#### 5.0 Physical Setting

The Site is within the Big Forks Creek watershed which eventually outlets to the Welland River (AquaResource Inc. and NPCA, 2009). The ground surface slopes from a topographic high of 179-181 metres above sea level (m ASL) to the northwest and southeast to elevations of 178 and 176 m ASL, respectively (Figure 3). Consequently, NPCA have mapped a subwatershed drainage divide across the Site between Big Forks Creek Catchment W300 to the northwest, and the Ellsworth Drain Catchment W100 to the southeast (Figure 2).

NPCA (2017) have mapped two seasonal waterbodies at the Site (Figure 2). One of these seasonal waterbodies is within the Marshville Station Clay Plain Wetland Complex provincially significant wetland

(MNRF, 2009) (Figure 2). The seasonal waterbody within the PSW can outlet to a constructed open ephemeral watercourse (NPCA, 2017) which could flow to the Ellsworth Drain. The Ellsworth municipal Drain is located immediately to the southeast of the Site (Figure 2) and the Department of Fisheries and Oceans (DFO) have identified it as Class F (intermittent) (OMAFRA, 2021). NPCA has reported the intermittent drain as Type 2 – Important Fish Habitat, which may be an error as Ellsworth Drain is not listed in the fish habitat types (MNRF, 2016). The Ellsworth Drain was observed by Terra-Dynamics as flowing adjacent the Site on July 28<sup>th</sup> with 9.1 mm of precipitation recorded over the previous 7 days (Environment Canada, 2021). Given the size of the upgradient catchment, despite the recent precipitation, this observation 1 day after a rain event may qualify as a baseflow measurement (MacViro, 2009) but the 30 cm depth of surface water was warm at 21°C and no surface water was observed discharging from the constructed open ephemeral watercourse on-site.

The MNRF (2009) have reported the polygon of the Marshville Station Clay Plain Wetland Complex at the Site as a hardwood community swamp, with tall shrubs as the dominant form and also narrow-leaved emergents (e.g sedge, rushes and grasses).

### 5.1 Soils

The very fine sandy loam soils (Figure 3) are mapped as primarily (80%) Walsingham soils, with Flamborough Brown Phase soils (20%) limited to the southeast corner (Kingston and Presant, 1989). The soils are described as:

- a) Walsingham: developed on eolian deposits (i.e. fine sand parent materials) with imperfect drainage due to “*fluctuating water tables within the B and C horizons*”, at least 1 m thick and hydrological soil group A, and
- b) Flamborough: developed on loamy fine sand parent materials, moderately to rapidly permeable, and hydrologic soil group 70% C / 30% B. The soils are tile-drained for agriculture south of Highway 3 across from the Site but not at the Site (Figure 3, OMAFRA, 2021).

Soil-samples were collected by hand-auger from four locations to confirm local soil conditions (Figure 3) and the results summarize below:

1. HA-1, 0.5 m deep, at Lot 6, 20 cm of silty sand topsoil overlying clay, non-calcareous
2. HA-2, 1 m deep, at Lot 2, silty sand topsoil to 35 cm becoming very fine silty sand, non-calcareous to 60 cm at a 5 cm clay layer)
3. HA-3, 1 m deep, at Lot 4, very fine silty sand, non-calcareous to 80 cm
4. HA-4, 0.9 m deep, at Lot 4, silty sand topsoil to 36 cm becoming very fine silty sand to 74 cm overlying clay, non-calcareous

### 5.2 Overburden Geology

The Site is located on the Dunnville Sand Plain (Chapman and Putnam, 1984). A northeast-southwest trending aeolian sand dune (Feenstra, 1984) covers approximately 2/3 of the Site (Figure 2). This 3 km long dune has been named the Cemetery Dune by Pastirik (1985) as there are two cemeteries located on the dune immediately northeast of the Site. Glaciolacustrine nearshore and deltaic silty sand is mapped on the northwest and southeast flanks of the Cemetery Dune at the Site (Figure 2) which was laid down over the glaciolacustrine clay and silt (Pastirik, 1985). The thickness of the dune sand is estimated as 5 metres based upon nearby water well records (Section 3), topographic contours, surficial

geological mapping, and the hand-auger soil sampling and is underlain by a silty clay to clay aquitard as summarized in a Hydrogeologic Schematic (Figure 4).

## 5.4 Hydrogeologic Setting

### 5.4.1 Overburden Aquifer

The sand at the Site has been identified as a regressive overburden aquifer by the Ontario Geological Survey (Burt, 2020). The water table in the dune is expected to be fairly flat and not mounded due to expected high hydraulic conductivities for recharge (Haitjema and Mitchell-Bruker, 2005, MECP, 2006). However, the depth to the water table was not able to be determined as it has not been reported by the MECP, encountered during hand-augering or during observations of surface water courses.

Water balance modelling completed for the Niagara Peninsula Conservation Authority (NPCA) estimated the average annual infiltration rates for the proposed lots (Appendix A) as ranging from 135 to 188 mm/year (AquaResource Inc. and NPCA, 2009). These infiltration rates are reasonable (Table 1) for the physical setting as the MECP (1995) reports the range for silty sand to sandy silt as 150-200 mm/year.

**Table 1 - Lot Average Annual Infiltration Rates (mm/year)**

Lot	1	2	3	4	5	6
Infiltration Rate	188	181	179	177	169	135

### 5.4.2 Unconfined Aquifer Conceptual Model

The information for the Site is summarized in the schematic below, as a conceptual model for the assessment of potential sewage system impacts to groundwater and private wells (Figure 5).

### 5.4.3 Aquifer Vulnerability

The Site has been mapped as on a Highly Vulnerable Aquifer (HVA) by the Niagara Peninsula Source Protection Authority (NPSA, 2013). This HVA designated was because of the potential for the Dunnville Sand Plain to be used as a source of potable supply. Although no water well records were identified located showing water takings from the surficial sand aquifer, the water well survey responses for 43832 and 43954 Highway 3 (Section #) show the aquifer is a local source of supply.

Consequently, as a result of the at-surface aquifer being highly vulnerable to at-surface activities (MECP, 1996a) as per Step 2 shown below, a contaminant assessment was completed to see if lot sizes are appropriate, as per Step 3 (Figure 6).

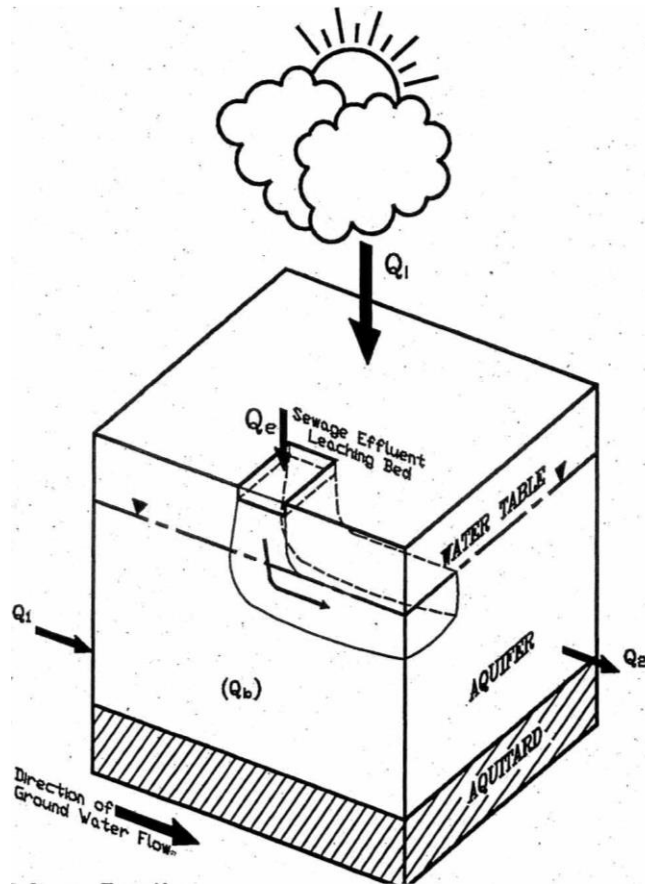


Figure 5 - Unconfined Aquifer Impact Assessment Subsurface Sewage System (MECP, 1995)

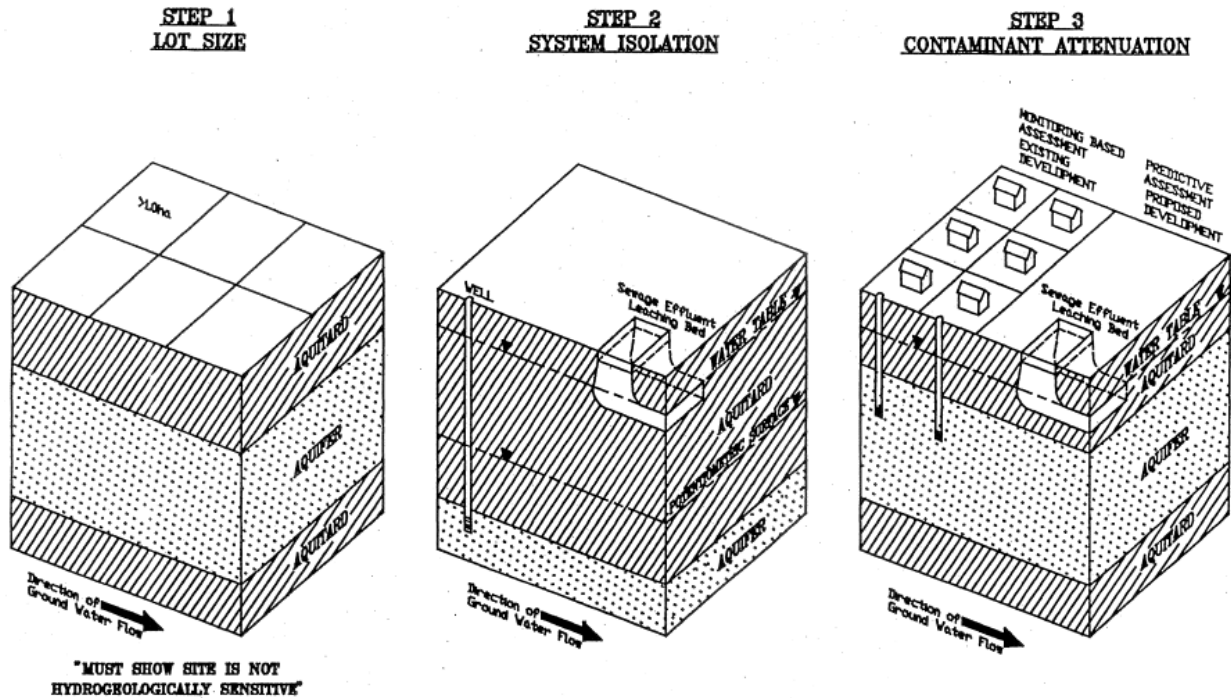


Figure 6 – Three Step Water Quality Assessment Process (MECP, 1995)

## 6.0 Prediction of Contaminant Attenuation

### 6.1 Off-Site Nitrate-Nitrogen Assessment

Using Provincial Procedure D-5-4 (MECP, 1996a), an assessment was completed to calculate the per lot property boundary nitrate-nitrogen (NO<sub>3</sub>-N) groundwater concentrations. The calculations are presented in Appendix D and summarized herein:

1. For the purposes of predicting the potential for groundwater impacts a concentration of 40 mg/L nitrate-nitrogen is used for sewage effluent for a Class IV system, i.e. without Level IV (or tertiary treatment) nitrogen reduction (MECP, 1996a).
2. Average, not peak, sewage loading rates are used, which is 1,000 Litres/day for a three-bedroom homes, and for four- and five-bedroom homes average rates of 1,200 and 1,400 Litres/day, respectively (City of Hamilton, 2013).
3. Each entire lot was considered for dilution of the sewage effluent to calculate if 40 mg/L of nitrate-nitrogen (NO<sub>3</sub>-N) is diluted below the drinking water standard of 10 mg/L (i.e. Safe Drinking Water Act, 2002).
4. Infiltration rates were extracted from NPCA water balance modelling (Section 5.4.1, Table 1).

Nitrate-nitrogen concentrations for standard Class 4 septic systems generally exceeded the 10 mg/L criterion except at Lot 6 for a 3-bedroom home (Table 2).

**Table 2 – Nitrogen Dilution Loading Calculations (mg/L)**

Lot	1	2	3	4	5	6
<b>3-bedroom (1,000 L/day sewage loading)</b>						
Class 4	10.9	11.2	11.6	11.4	9.9	8.9
50% Nitrogen Reduction (N-I)	5.4	5.6	5.8	5.7	4.9	4.5
<b>4-bedroom (1,200 L/day sewage loading)</b>						
Class 4	12.4	12.7	13.2	12.9	11.3	10.3
50% Nitrogen Reduction (N-I)	6.2	6.4	6.6	6.5	5.6	5.1
<b>5-bedroom (1,400 L/day sewage loading)</b>						
Class 4	13.7	14.1	14.5	14.3	12.6	11.5
50% Nitrogen Reduction (N-I)	6.9	7	7.3	7.1	6.3	5.7

However, with nitrogen effluent reduction treatment of 50% which corresponds with a sewage effluent nitrogen concentration of 20 mg/L or less, all proposed lots provided sufficient dilution for 3-, 4- or 5-bedroom homes. The 50% nitrogen effluent reduction criterion corresponds with the CAN-BNQ 3680-600 standard of N-I (50%) total nitrogen reduction (Ministry of Municipal Affairs and Housing, 2011).

### 6.2 Off-Site Phosphorus Considerations

The proposed locations, and the physical setting of the sewage disposal systems should be sufficient to attenuate sewage effluent phosphorus before any discharge at the Zion Road ditch, the closest surface downgradient water body. This conclusion is based upon: (i) the sewage disposal systems being

between 15-45 m from the Zion Road ditch, (ii) on non-calcareous soils, (iii) and (iv) sufficient iron and aluminum in the sands (Pastirik, 1985). As stated by Roberston et al (1998) in their review of phosphate mobility and persistence in 10 Septic System Plumes “....smaller scale phosphate plumes (<3 m in length) are present at the acidic sites on noncalcareous sands and on silt- and clay-rich sediments”.

### **6.3 Effluent Treatment**

The Township of Wainfleet is the local approval authority for Part 8 Ontario Building Code septic system permits and allows the use of Level IV/Tertiary treatment to improve septic effluent quality (De Guire, 2019).

In Ontario, certification of systems for nitrogen removal had begun through the application of the CAN-BNQ 3680-600 standard (Ministry of Municipal Affairs and Housing, 2011). The available systems with certified 50% (or referred to as N-I) nitrogen removal are listed on the Ontario On-site Wastewater Association (<https://www.oowa.org/consumer-information/options-onsite-residential-wastewater-treatment-technologies/>). There is currently one treatment provider with these specifications, Norweco Inc. (<https://www.norweco.com/>). However, there are also other systems which have test data showing system performance of reducing effluent nitrogen to greater than 75% nitrate-nitrogen such as Bionest with a DE-OX unit has a reported total nitrogen effluent quality of 6 mg/L (Gauthier, 2019) , or a Waterloo Biofilter Unit with WaterNOx™ (an advanced nitrogen removal filter) is expected to be less than 5 mg/L total nitrogen (<https://waterloo-biofilter.com/products/nutrient-removal/nitrogen-removal-products/waternox/>).

### **6.4 Other Considerations**

Development agreements should be completed that cisterns will be used for water supplies on the severances.

Future sewage system effluent disposal locations (e.g. raised leaching or filter bed) are constrained by the Part 8 Ontario Building Code set-back of 15 metres from a cistern (referred to as a reservoir in the code).

Recommend sewage disposal bed mantles should be sloped to the west.

### **7.0 Summary of Recommendations**

The proposed lots (Appendix A), can be safely serviced by private sewage systems with the implementation of the following recommendations:

1. All lots be equipped with sewage systems that provide at least 50% nitrogen reduction of septic sewage effluent Level IV/tertiary treatment;
2. Future sewage disposal systems observe the required Ontario Building Code set-backs from water supplies and surface water;
3. A development agreement should be completed with the Township indicating water supply will be by cistern(s); and

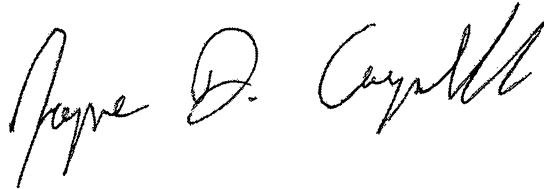


4. Recommend sewage disposal bed mantles should be sloped to the west.

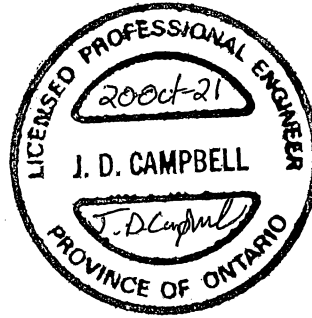
We trust this information is sufficient to your present needs. Please do not hesitate to contact the undersigned if you have any questions.

Yours truly,

TERRA-DYNAMICS CONSULTING INC.



Jayme D. Campbell, P.Eng.  
Senior Water Resource Engineer



cc. William Heikoop, Upper Canada Planning & Engineering Ltd.

#### Attachments

- Figure 1 - Location of Site
- Figure 2 – Site Details
- Figure 3 – Soils
- Figure 4 – Hydrogeologic Cross-Section
- Appendix A – Draft Plan of Subdivision
- Appendix B – MECP Water Well Logs
- Appendix C - Water Use and Septic System Surveys
- Appendix D – Nitrogen Dilution Calculations

#### **8.0 References**

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<https://www.gisapplication.lrc.gov.on.ca/AIA/index.html?viewer=AIA.AIA&locale=en-US>

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Robertson, W.D., Schiff, S.L. and Ptacek, C.J., 1998. Review of Phosphate Mobility and Persistence in 10 Septic System Plumes. GROUND WATER, Vol.36, No. 6, November – December 1998.

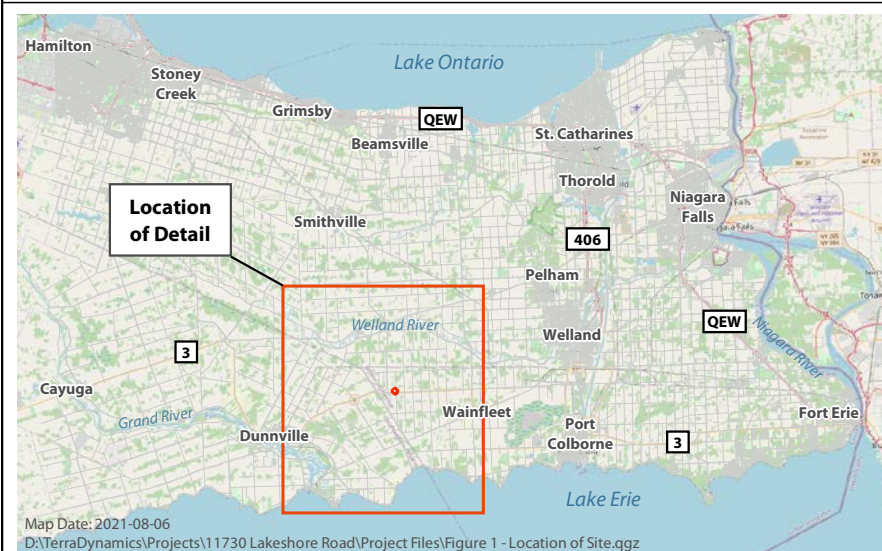
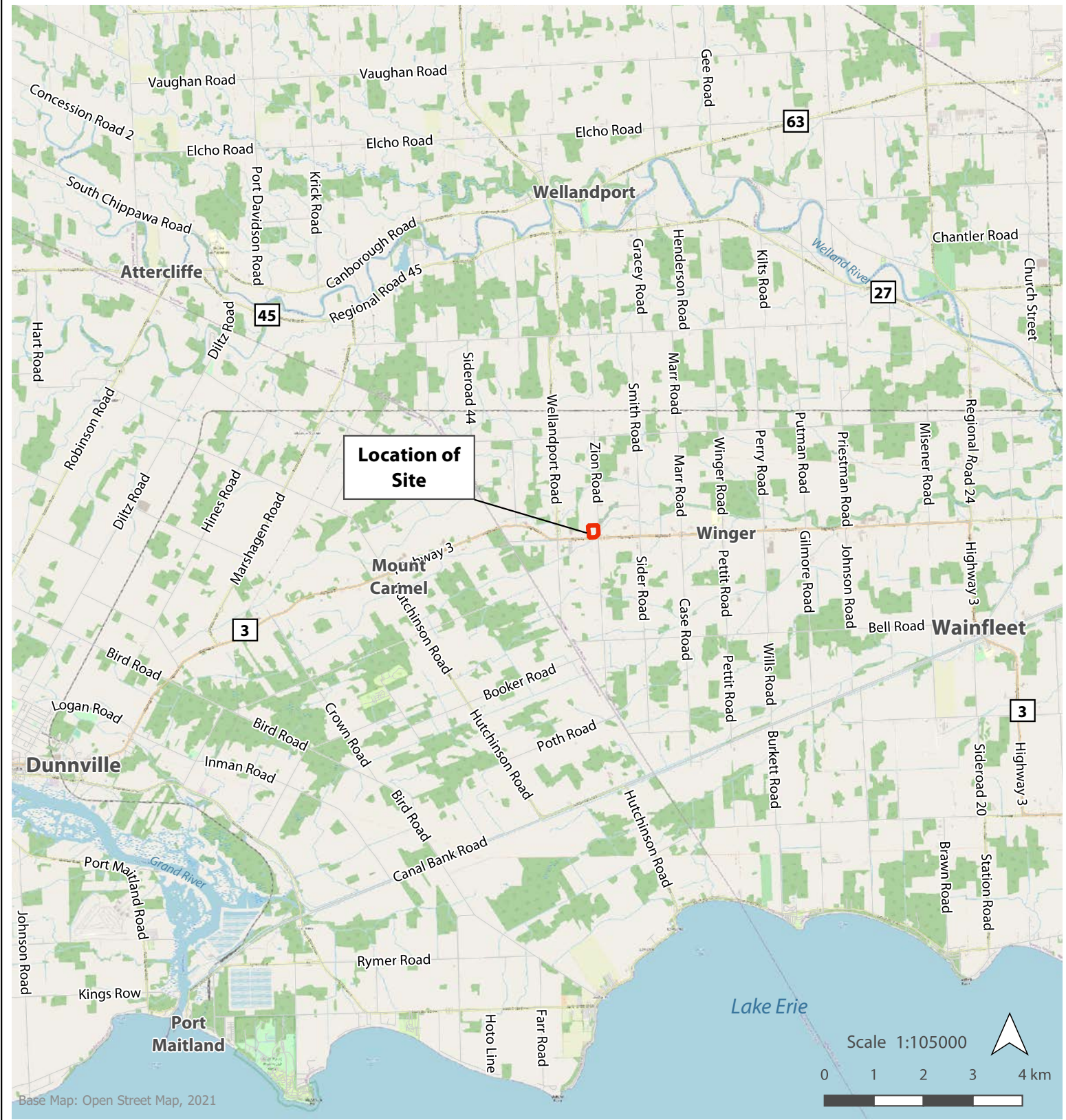
Sharaf, A., 2013. On-site Sewage Systems, Code Reference Series, contains Building Code Act, 1992 and relevant portions of O.Reg.332/12.


Township of Wainfleet (Township), 2021a. Record of Pre-Consultation, 53814 Zio Road, Roll Number 271400001210100, Con 5 Pt Lot 38. Meeting date Thursday, May 27, 2021.

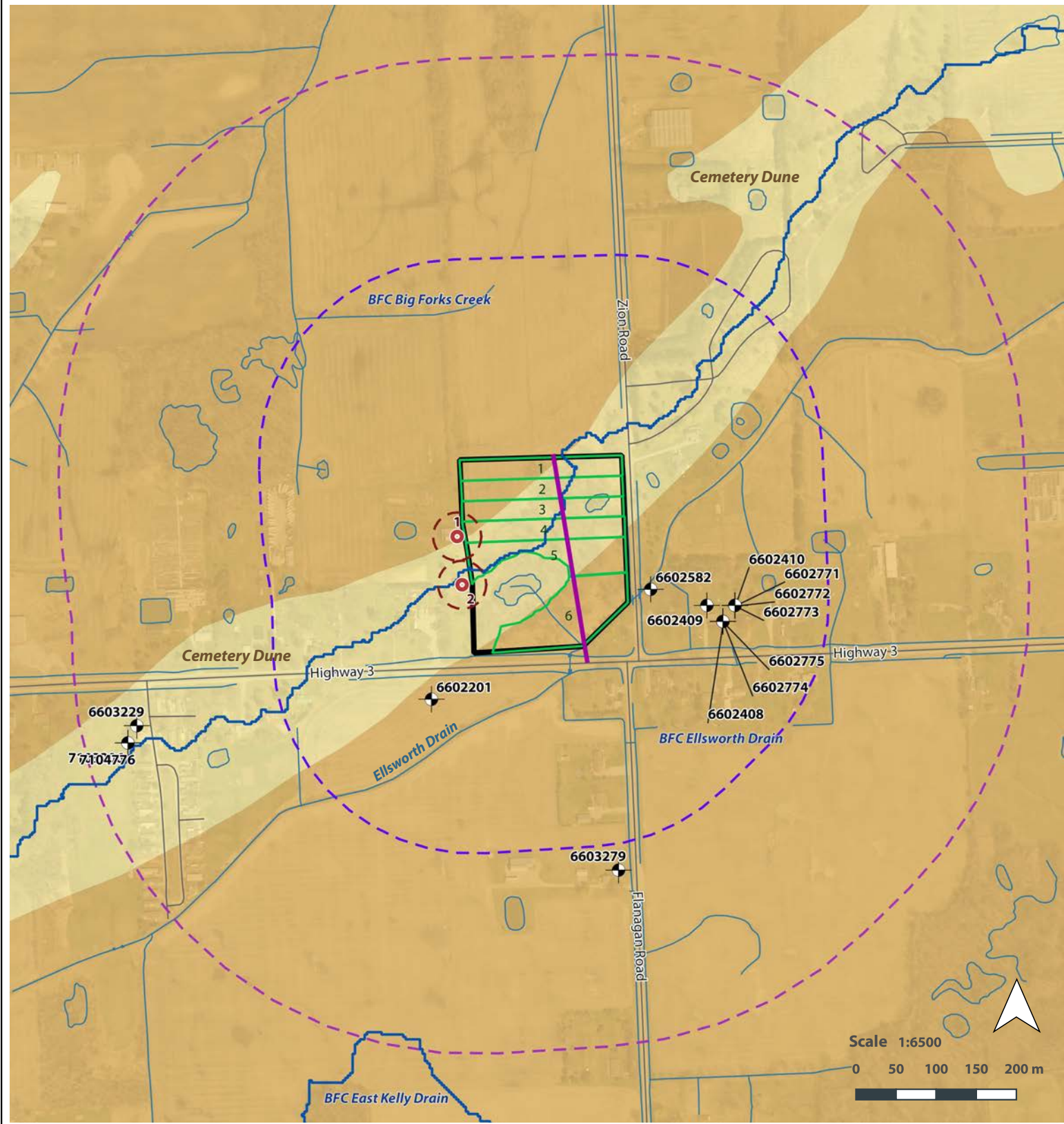
Township of Wainfleet, 2021b. Email from S. Ivins, Planner, Assistance Secretary-Treasurer Committee of Adjustment.

Township of Wainfleet, 2016. Township of Wainfleet Official Plan, prepared by Sorensen Gravely Lowes Planning Associates Inc., AgPlan Ltd., Cumming + Company and North-South Environmental Inc.

Township of Wainfleet, 2014. Township of Wainfleet Zoning By-law, prepared by Sorensen Gravely Lowes Planning Associates Inc.



<h2>Location of Site</h2>	
<h3>53814 Zion Road, Wainfleet, Hydrogeological Assessment</h3>	
 <b>TDC Terra-Dynamics Consulting Inc.</b>	
<b>Prepared for: Pols Ltd.</b>	<b>Figure 1</b>



- Proposed Subdivision (Site)
- Lots
- 250m Buffer of Site
- 500m Buffer of Site
- Subwatershed Boundary
- Surficial Geology
- Sand
- Sand and silt
- +

 MECP Water Well Record Within 500m of Site
- Shallow Bored Well
- 30m Setback of Shallow Bored Wells
- Hydrogeologic Schematic
- Watercourse (NPCA, 2017)

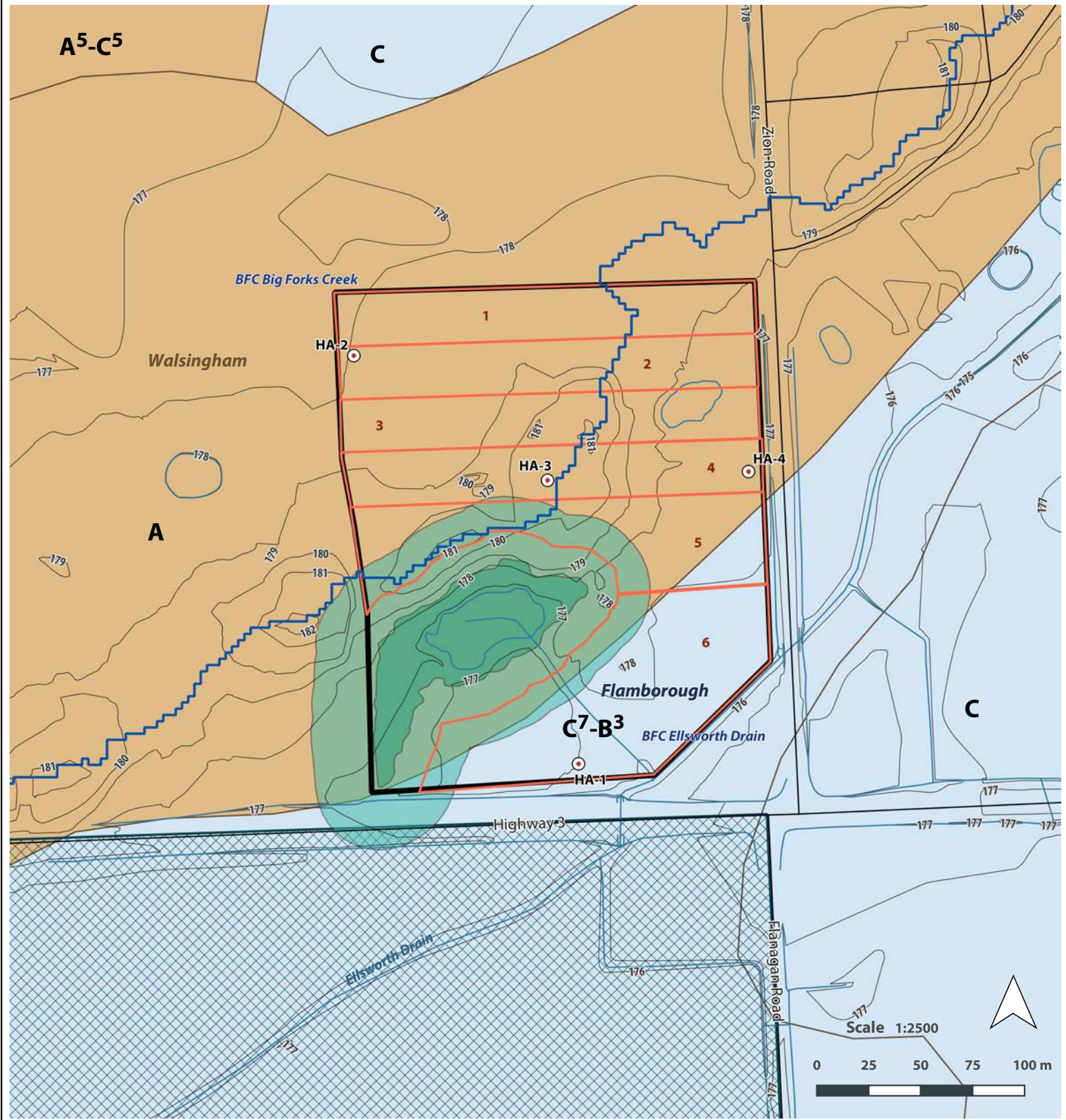
## Site Setting

# 53814 Zion Road, Wainfleet, Hydrogeological Assessment

References: Ministry of Environment, Conservation and Parks: Drilled Water Wells, 2021. Ontario Geological Survey: Surficial Geology, Niagara Region: Orthoimagery, 2015. Niagara Peninsula Conservation Authority: Watercourse 2017 1:2000, Subwatershed 1:2000, Contours (1m) 2010.  
Map Date: 2021-08-08 D:\TerraDynamics\Projects\53814 Zion Road\Project Files\Figure 2 - Site Setting.qgz

**Prepared for:**  
**Pols Ltd.**

**Figure 2**



- ⊙ Hand Auger Locations
- ▭ Proposed Subdivision (Site)
- ▭ Lots
- ▨ Tile Drain Area
- Marshville Station Clay Plain Wetland Complex
- 30m Buffer of Wetland Complex
- Ground Surface Contour (1m)
- Watercourse (NPCA, 2017)
- ▭ Subwatershed Boundary
- BFC Ellsworth Drain* } Subwatershed labels
- BFC Big Forks Creek* }
- Hydrogeologic Soil Groups
- A
- C
- Walsingham* } Soil Names
- Flamborough* }

### Soils

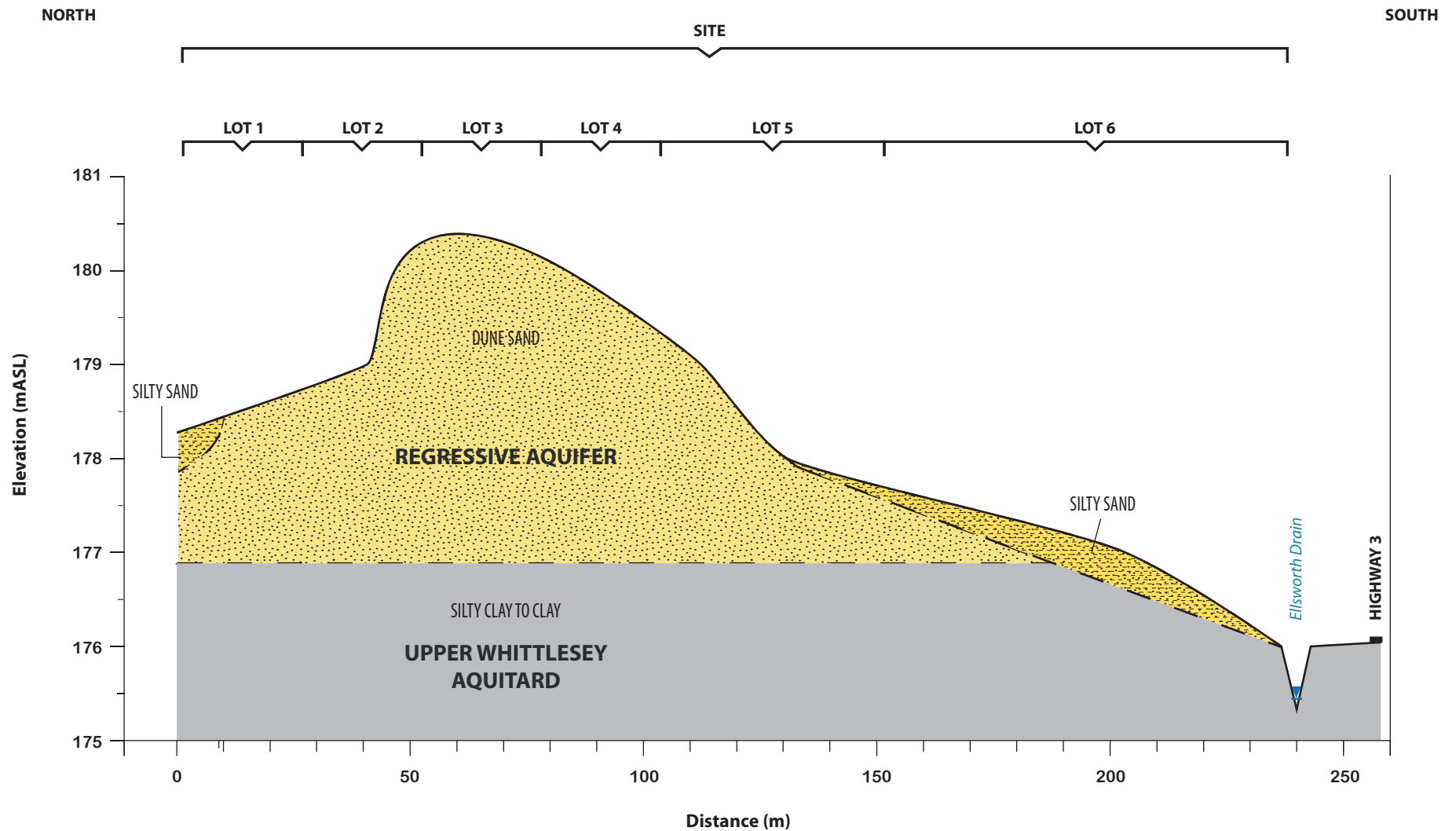
## 53814 Zion Road, Wainfleet, Hydrogeological Assessment



Prepared for:  
Pols Ltd.

Figure 3

References: Ontario Ministry of Agriculture, Food and Rural Affairs: Soils, Tile Drain Areas. Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry: Wetlands. Niagara Peninsula Conservation Authority: Watercourse 2017 1:2000, Subwatershed 1:2000, Contours (1m) 2010.  
Map Date: 2021-08-09 D:\TerraDynamics\Projects\53814 Zion Road\Project Files\Figure 3 - Soils.qgz



Surface Water Level

See Figure 2 for line of hydrogeologic schematic

<b>Hydrogeologic Schematic</b>	
<b>53814 Zion Road, Wainfleet, Hydrogeological Assessment</b>	
<b>Terra-Dynamics Consulting Inc.</b>	
Prepared For: <b>Pols Ltd.</b>	<b>Figure 4</b>

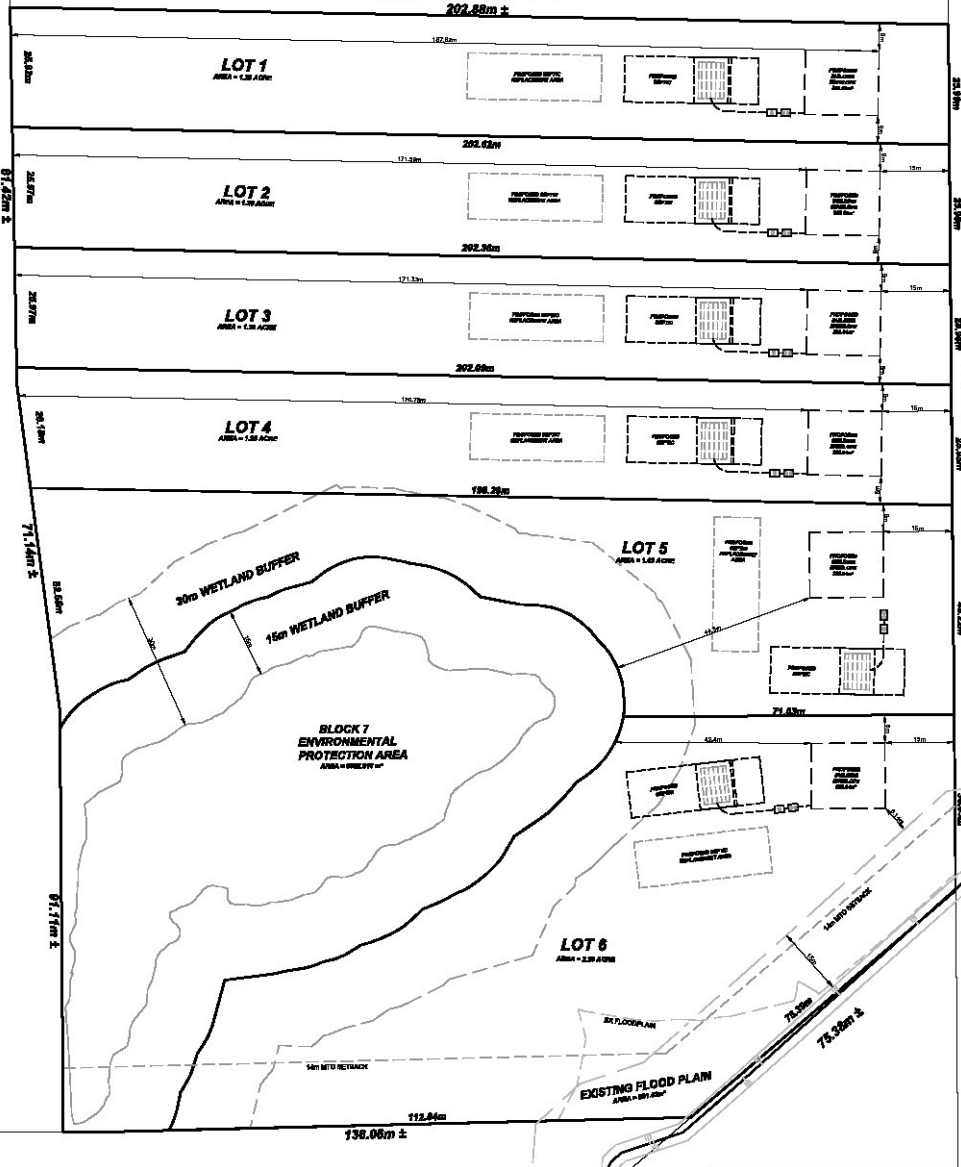
## **Appendix A**

### **MECP Water well records**

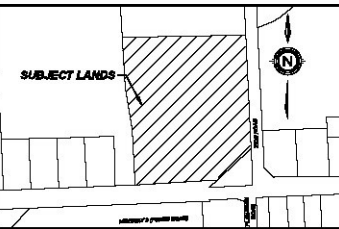


# 53814 ZION ROAD WAINFLEET

202.88m ±



ZION ROAD



SUBJECT LANDS  
**KEY PLAN**  
N.T.S.

**DRAFT PLAN OF SUBDIVISION**

**LEGAL DESCRIPTION**

**OWNER'S CERTIFICATE**

BEING THE REGISTERED OWNER, I HEREBY AUTHORIZE UPPER CANADA CONSULTANTS TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE SURVEYOR FOR APPROVAL.

OWNER'S NAME \_\_\_\_\_ DATE \_\_\_\_\_

**SURVEYOR'S CERTIFICATE**

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED ARE CORRECTLY SHOWN.

SURVEYOR'S NAME \_\_\_\_\_ DATE \_\_\_\_\_

**REQUIREMENTS OF SECTION 8(1)(7) OF THE PLANNING ACT**

- a) SEE PLAN
- b) SEE PLAN
- c) SEE PLAN
- d) SEE PLAN
- e) SEE PLAN
- f) SEE PLAN
- g) SEE PLAN
- h) MUNICIPAL WATER
- i) SILTY SAND
- j) SEE PLAN
- k) FULL SERVICE
- l) SEE PLAN

ZONING MATRIX		
PROVISION	ZONING (R#)	PROVIDED
MINIMUM LOT AREA	4000m <sup>2</sup>	4000m <sup>2</sup>
MINIMUM LOT COVERAGE	25%	3.00%
MINIMUM LOT FRONT SETBACK	4m	3.00m
MINIMUM FRONT YARD SETBACK	15m	15m
MINIMUM SIDE YARD SETBACK	15m	N/A
MINIMUM REAR YARD SETBACK	3m	8.0m
MINIMUM FRONT YARD SETBACK	15m	15.0m
MINIMUM REAR SETBACK	N/A	8m

**LAND USE SCHEDULE**

LAND USE	LOT/BLOCK	# OF UNITS	AREA(m <sup>2</sup> )	AREA(ac)
SINGLE DWELLING RESIDENTIAL	LOT 1-6	6	2,3881	5.96
ENVIRONMENTAL PROTECTION	BLOCK 7		6,8882	17.08
<b>TOTAL</b>		<b>6</b>	<b>4,5863</b>	<b>11.04</b>

DEVELOPABLE AREA = 3,9681ha  
DEVELOPABLE DENSITY = 1.52 units/ha

DATE	2021-06-18
REVISION	DATE



DRAWING TITLE	DRAFTING	AV
<b>DRAFT PLAN OF SUBDIVISION</b>	DATE	JUNE 18, 2021
	PRINTED	JUNE 18, 2021
	SCALE	1:500
	DWG No.	2125_CP
REV		0

## HIGHWAY 3 (FORKS ROAD)

UPPER CANADA CONSULTANTS ENGINEERS/PLANNERS 1111 BAYVIEW AVE. SUITE 1000 SCARBOROUGH, ONTARIO M1B 2Y7

## **Appendix B**

### **MECP Water well records**



306/14e

J.B.

6602408

117 2 62 4 8 17 10  
4 R 4 7 5 5 4 1 10

4 R 0 5 8 2

The Ontario Water Resources Commission Act

2 4

# WATER WELL RECORD

County or District Welland Township, Village, Town or City York Ward

Con. 5 Lot SW P-37 Date completed 3 ~~19~~ 69  
(day) month year

Owner Cwrc (print in block letters) Address 801 Bay St. Toronto

### Casing and Screen Record

### Pumping Test

Inside diameter of casing 7" O.D.  
Total length of casing 107' 8"  
Type of screen  
Length of screen  
Depth to top of screen  
Diameter of finished hole 7" O.D.

Static level 71.94  
Test-pumping rate 10 G.P.M.  
Pumping level Baling - 100'  
Duration of test pumping 1/2 hour  
Water clear or cloudy at end of test Clear  
Recommended pumping rate 10 G.P.M.  
with pump setting of 90 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)
0	9		
9	68		
68	110	109'	Mineral
110	186	↔	Heavy Mineral

Yellow clay  
Blue clay  
Blue clay + gravel show  
Salina Lewiston

Wt. Pyrometer set at 174'  
No-2 Pyrometer set at 110'

For what purpose(s) is the water to be used? observation well  
TH-20/2/7508T

Is well on upland, in valley, or on hillside? upland  
Drilling or Boring Firm E. Stewart

Address Jarvis Dist. R-3

Licence Number 3289

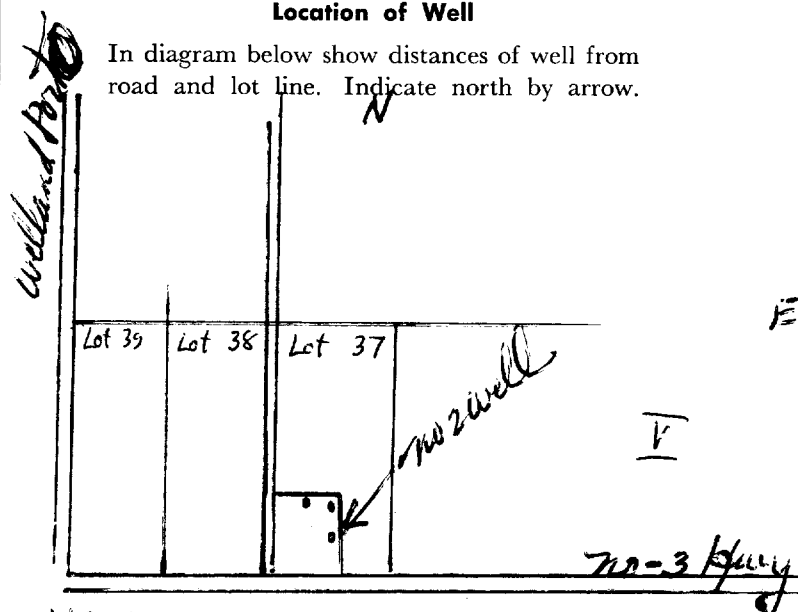
Name of Driller or Borer E. Stewart + Son

Address Same

Date Jan 31 - 69  
Edwin Stewart  
(Signature of Licensed Drilling or Boring Contractor)

### Location of Well

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



110 ft N of road  
337 ft E of road  
W.M.

CSS.58

ITM. 1172 624850  
 110-3 4R 4755430  
 ev. 4R 0582  
 asin 24



30L/14e  
 6602409  
 3 9

The Ontario Water Resources Commission Act

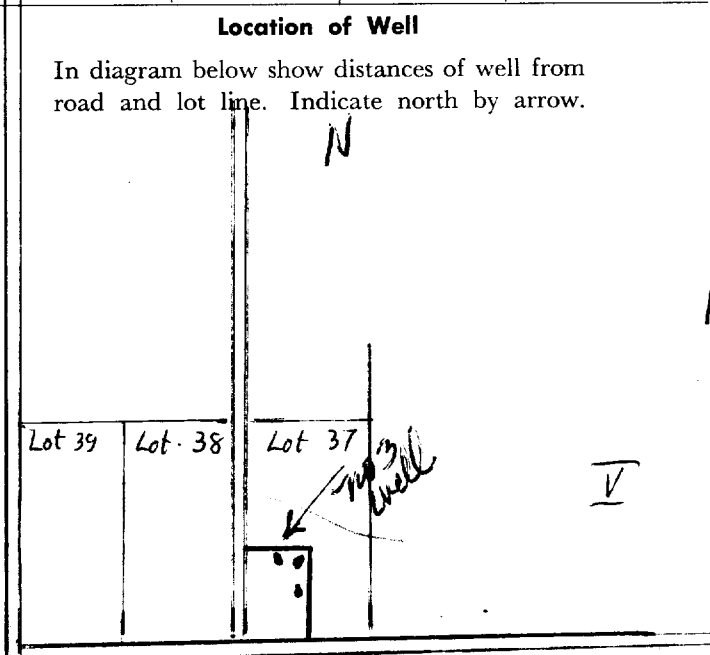
# WATER WELL RECORD

County or District Welland Township, Village, Town or City Wainfleet  
 Con. 5 Lot SWP-37 Date completed 13th January 1969  
 (day month year)  
 Owner G W R. C. Address 801 Bay St. Toronto  
 (print in block letters)

Casing and Screen Record	Pumping Test
Inside diameter of casing <u>5"</u>	Static level <u>8.9</u>
Total length of casing <u>108'7"</u>	Test-pumping rate <u>Below 20</u> G.P.M.
Type of screen	Pumping level <u>40'</u>
Length of screen	Duration of test pumping <u>3 hours</u>
Depth to top of screen	Water clear or cloudy at end of test <u>Clear</u>
Diameter of finished hole <u>5"</u>	Recommended pumping rate <u>20</u> G.P.M.
	with pump setting of <u>50</u> 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)
<u>Brown Clay</u>	<u>0</u>	<u>5</u>		
<u>Blue clay</u>	<u>5</u>	<u>48</u>		
<u>Reddish clay</u>	<u>48</u>	<u>70</u>		
<u>Clay + gravel</u>	<u>70</u>	<u>100</u>	<u>109-110</u>	<u>Mineral</u>
<u>Sandstone</u>	<u>110</u>	<u>175</u>		

For what purpose(s) is the water to be used? Observation  
 Is well on upland, in valley, or on hillside? upland  
 Drilling or Boring Firm Elyon Stewart  
 Address James Ont. R. 3  
 Licence Number 3289  
 Name of Driller or Borer E Stewart & Son  
 Address Same  
 Date Jan. 31/69  
Elyon Stewart  
 (Signature of Licensed Drilling or Boring Contractor)



194 ft N of road  
 297 ft E of road  
 CSS.S3 IV



6602410-

303/14e

17172 624885

4R 4757430

4R 0582

The Ontario Water Resources Commission Act

# WATER WELL RECORD

County or District Welland Township, Village, Town or City Wainfleet

Con. 5 Lot SWP 37 Date completed 28 Jan 1969  
(day month year)

Owner OWRC (print in block letters) Address 801 Bay St. Toronto

### Casing and Screen Record

### Pumping Test

Inside diameter of casing 8"  
Total length of casing 110' 116' in second drive  
Type of screen Johnston 30 gauge  
Length of screen 6 feet  
Depth to top of screen 106' casing pulled 2' to 108'  
Diameter of finished hole 6 1/2" O.

Static level upper water 8.24  
Test-pumping rate 14 G.P.M.  
Pumping level 60'  
Duration of test pumping 4 1/2 hours  
Water clear or cloudy at end of test Clear  
Recommended pumping rate 10 G.P.M.  
with pump setting of 60 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)
<u>yellow clay</u>	<u>0</u>	<u>5</u>		
<u>Blue clay</u>	<u>5</u>	<u>55</u>		
<u>yellow clay + gravel</u>	<u>55</u>	<u>110</u>	<u>109</u>	<u>fresh</u>
<u>Sabina Lower tone</u>	<u>110</u>	<u>245</u>		
<u>Show Niagara dolomite</u>	<u>245</u>	<u>250</u>	<u>116-271</u>	<u>Heavy mineral</u>
<u>Niagara " limestone</u>	<u>250</u>	<u>271</u>	<u>80.2 ft m at</u>	<u>100' draw down</u>
<u>No 1 Piezometer set at 265 feet</u>				
<u>No 2 " " " - 232 feet</u>				
<u>No 3 " 8" casing set at 116' to 135'</u>				

For what purpose(s) is the water to be used observation well

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

Drilling or Boring Firm Edwin Stewart

Address Jama Ont. R. 3

Licence Number 3289

Name of Driller or Borer E. Stewart & Son

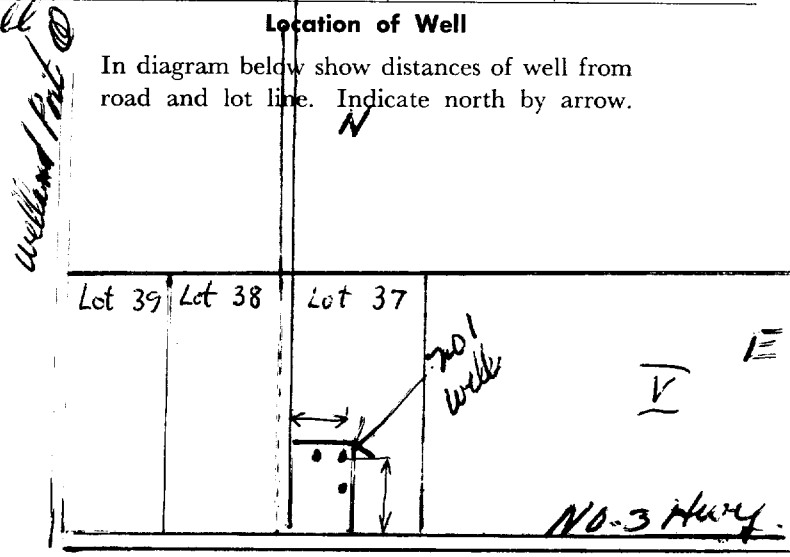
Address Same

Date Jan. 31/69

Edwin Stewart  
(Signature of Licensed Drilling or Boring Contractor)

### Location of Well

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



339 ft E of road  
19 1/4 ft N of road  
RAM

CSS.88 IV

# WATER WELL RECORD

302/16 W  
(304/14e)

Observation point # 2740  
(Location site # 2740)

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

11 | 6602582 | 10 | 14 | 15 | 22 | 23 | 24 | 25 | 27

DISTRICT: **Wainfleet** TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: **Con V** CON., BLOCK, TRACT, SURVEY, ETC.: **037** LOT: **037**

SURNAME FIRST: **O.W.R.C.** ADDRESS: **135 St. Clair Ave. W.** DATE COMPLETED: **05 70**  
DAY: **13** MO: **May** YR: **1970**

ZONE: **1.7** EASTING: **6248** NORTHING: **4755430** RC: **4** ELEVATION: **90** BASIN CODE: **24**

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)				
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	DEPTH - FEET	
			FROM	TO
	Topsoil		0	1
Brownish	clay		1	54
Reddish	Clay		54	60
Reddish	Clay	Fine gravel (till)	60	96
Reddish	Clay	Boulders	96	97
Reddish	Clay	Gravel	97	97.5
	Boulders		97.5	98
Reddish	Clay		98	107.3
Greyish	Sand, Gravel		107.3	108.5
Grey	Rock	(hard cap bedrock)	108.5	108.8
Grey	Shale		108.8	109.4

31 | 000102 | 005405 | 0060705 | 0096705/11 | 0097705/13 | 0098705/11/13 | 11

32 | 0107705 | 0108209/11 | 0109220 | 0110217 | 0111205 | 0112205 | 0113205 | 0114205 | 0115205 | 0116205 | 0117205 | 0118205 | 0119205 | 0120205 | 0121205 | 0122205 | 0123205 | 0124205 | 0125205 | 0126205 | 0127205 | 0128205 | 0129205 | 0130205

**41 WATER RECORD**

WATER FOUND AT - FEET	KIND OF WATER
0107-10-13	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERAL
107-108	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERAL
15-18	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERAL

**51 CASING & OPEN HOLE RECORD**

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
02	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE		FROM	TO
			0	65
				100.4

**SCREEN**

SIZE(S) OF OPENING (SLOT NO.): **1/8 inch**

DIAMETER: **1 1/8** INCHES

LENGTH: **03** FEET

MATERIAL AND TYPE: **Steel**

DEPTH TO TOP OF SCREEN: **106.4** FEET

**61 PLUGGING & SEALING RECORD**

DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
10-13	14-17
18-21	22-25
26-29	30-33

**71 PUMPING TEST**

PUMPING TEST METHOD:  PUMP 2  BAILER

PUMPING RATE: **0006** GPM. DURATION OF PUMPING: **02** HOURS **00** MINS.

STATIC LEVEL: **008** FEET. WATER LEVEL END OF PUMPING: **015** FEET.

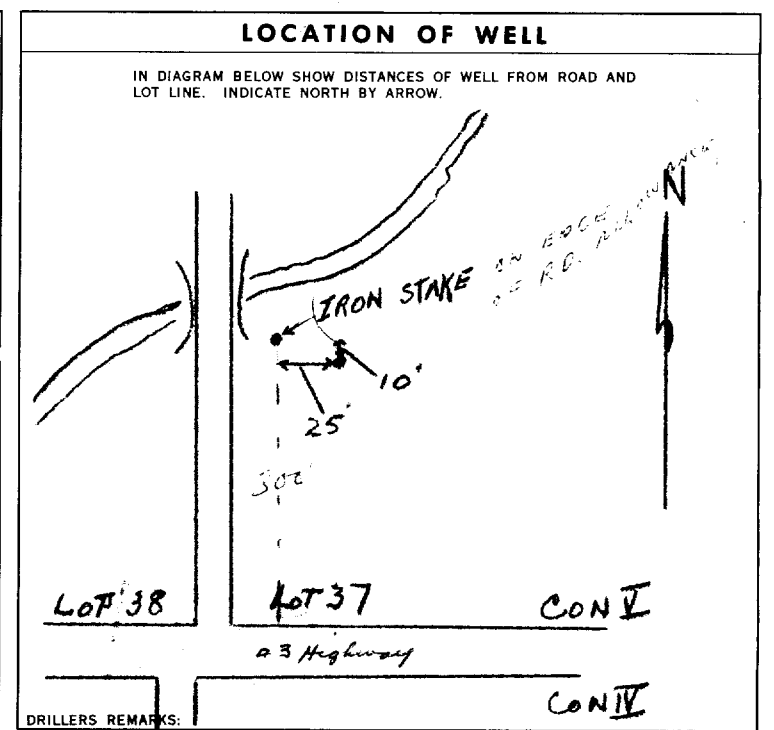
WATER LEVELS DURING:

15 MINUTES 26-28	30 MINUTES 29-31	45 MINUTES 32-34	60 MINUTES 35-37
<b>015</b>	<b>015</b>	<b>015</b>	<b>015</b>

PUMP INTAKE SET AT: **16** FEET. WATER AT END OF TEST: **015** FEET.

RECOMMENDED PUMP TYPE:  SHALLOW  DEEP. RECOMMENDED PUMP SETTING: **16** FEET. RECOMMENDED PUMPING RATE: **0006** GPM.

50-53 **000.8** GPM./FT. SPECIFIC CAPACITY



**FINAL STATUS OF WELL**

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

**WATER USE** **09**

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

**METHOD OF DRILLING**

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

**CONTRACTOR**

NAME OF WELL CONTRACTOR: **O.W.R.C.** LICENCE NUMBER: **4823**

ADDRESS: **135 St. Clair Ave. W. Toronto**

NAME OF DRILLER OR BORER: **Charles Snider** LICENCE NUMBER: **4823**

SIGNATURE OF CONTRACTOR: *Charles Snider* SUBMISSION DATE: \_\_\_\_\_

**OFFICE USE ONLY**

DATA SOURCE: **1** CONTRACTOR: **4823** DATE RECEIVED: **020371**

DATE OF INSPECTION: \_\_\_\_\_ INSPECTOR: \_\_\_\_\_

REMARKS: \_\_\_\_\_

CSS:SS

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

11 6602771

MUNICIP. \_\_\_\_\_ CON. \_\_\_\_\_

COUNTY OR DISTRICT: **Welland** TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: **Wainfleet** CON., BLOCK, TRACT, SURVEY, ETC. **V** LOT 25-27: **37**

OWNER (SURNAME FIRST): **O.W.R.C.** ADDRESS: **135 St Clair ave W. Toronto** DATE COMPLETED: DAY **28** MO **1** YR **69**

21 ZONE: **1.7** EASTING: **624885** NORTHING: **4755430** RC: **4** ELEVATION: **0582** RC: **4** BASIN CODE: **24**

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
<i>yellow clay</i>				0	5
<i>blue clay</i>				5	55
<i>yellow clay and gravel</i>				55	110
<i>Salina rock</i>			<i>LIMESTONE</i>	110	135

31 \_\_\_\_\_ 32 \_\_\_\_\_

**41 WATER RECORD**

WATER FOUND AT - FEET	KIND OF WATER
10-13 <b>109</b>	1 <input type="checkbox"/> FRESH 3 <input checked="" type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
15-18	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

**51 CASING & OPEN HOLE RECORD**

INS. DE DIA. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11 <b>8</b>	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input checked="" type="checkbox"/> OPEN HOLE		0	116
17-18	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE		116	135
24-25	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE			

**SCREEN**

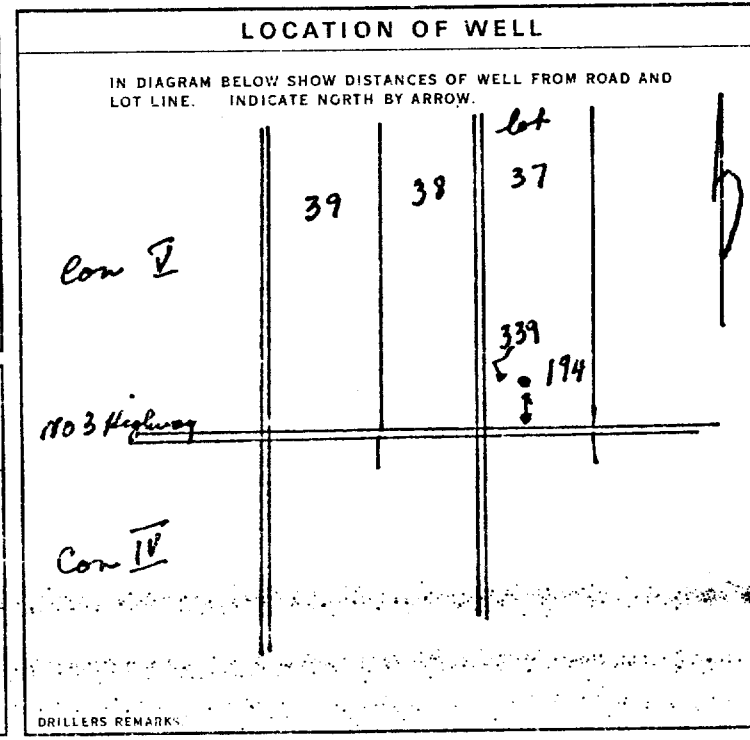
SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
	INCHES	FEET
	DEPTH TO TOP OF SCREEN	

**61 PLUGGING & SEALING RECORD**

DEPTH SET AT - FEET	MATERIAL AND TYPE
10-13	14-17
18-21	22-25
28-29	30-33

**71 PUMPING TEST**

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER	GPM	15-16 HOURS 17-18 MINS
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
19-21 <b>7.88</b>	22-24	1 <input type="checkbox"/> PUMPING 2 <input type="checkbox"/> RECOVERY
IF FLOWING GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	FEET	1 <input type="checkbox"/> CLEAR 2 <input type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
<input type="checkbox"/> SHALLOW <input type="checkbox"/> DEEP	FEET	GPM



**FINAL STATUS OF WELL**

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

**WATER USE**

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

**METHOD OF DRILLING**

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

**CONTRACTOR**

NAME OF WELL CONTRACTOR: **Elgin Stewart** LICENCE NUMBER: **3289**

NAME OF DRILLER OR BORER: **Garvis Ont** LICENCE NUMBER: **as above**

SIGNATURE OF CONTRACTOR: \_\_\_\_\_ SUBMISSION DATE: DAY **31** MO **1** YR **69**

**OFFICE USE ONLY**

DATA SOURCE: \_\_\_\_\_ CONTRACTOR: \_\_\_\_\_ DATE RECEIVED: \_\_\_\_\_

DATE OF INSPECTION: \_\_\_\_\_ INSPECTOR: \_\_\_\_\_

REMARKS: \_\_\_\_\_

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WI



# WATER WELL RECORD

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

11

6602772

MUNICIP.

CON.

COUNTY OR DISTRICT: Welland TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Waukegan CON., BLOCK, TRACT, SURVEY, ETC.: V LOT: 37

OWNER (SURNAME FIRST): O. W. R. C. ADDRESS: 135 St Clair ave W. Toronto DATE COMPLETED: DAY 28 MO. 1 YR. 69

ZONE: 17 EASTING: 624885 NORTHING: 4755430 RC: 4 ELEVATION: 0582 RC: 4 BASIN CODE: 24

### LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
<u>Yellow clay</u>				<u>0</u>	<u>5</u>
<u>Blue clay</u>				<u>5</u>	<u>55</u>
<u>yellow clay and gravel</u>				<u>55</u>	<u>110</u>
<u>Salina rock</u>			<u>LIMESTONE</u>	<u>110</u>	<u>225</u>

31

32

#### 41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
<u>116-225</u>	1 <input type="checkbox"/> FRESH 3 <input checked="" type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

#### 51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
<u>2</u>	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE		<u>0</u>	<u>222</u>
	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE			
	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE			

#### SCREEN

SIZE(S) OF OPENING (SLOT NO.): 125 DIAMETER: 2 INCHES LENGTH: 3 FEET

MATERIAL AND TYPE: slotted pipe DEPTH TO TOP OF SCREEN: 222 FEET

#### 61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE	(CEMENT GROUT LEAD PACKER, ETC.)
FROM: <u>10-13</u> TO: <u>14-17</u>		
FROM: <u>18-21</u> TO: <u>22-25</u>		
FROM: <u>26-29</u> TO: <u>30-33</u>		

#### 71 PUMPING TEST

PUMPING TEST METHOD: 1  PUMP 2  BAILER

STATIC LEVEL: 8.03 FEET

WATER LEVEL END OF PUMPING: 22-24 FEET

WATER LEVELS DURING:

15 MINUTES: <u>26-28</u> FEET	30 MINUTES: <u>29-31</u> FEET	45 MINUTES: <u>32-34</u> FEET	60 MINUTES: <u>35-37</u> FEET
-------------------------------	-------------------------------	-------------------------------	-------------------------------

IF FLOWING, GIVE RATE: 38-41 GPM

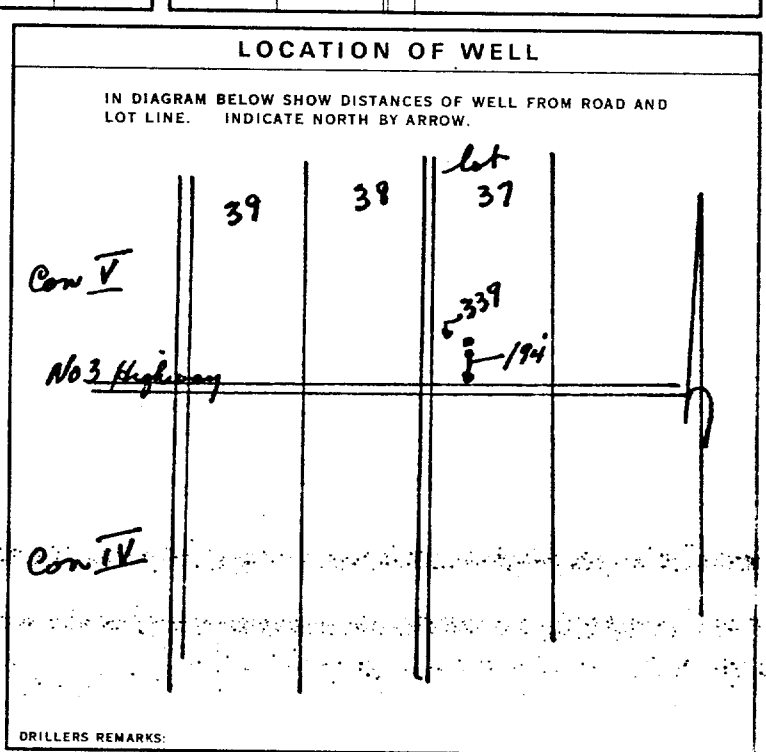
PUMP INTAKE SET AT: 43-45 FEET

WATER AT END OF TEST: 46-49 FEET

RECOMMENDED PUMP TYPE:  SHALLOW  DEEP

RECOMMENDED PUMP SETTING: 43-45 FEET

RECOMMENDED PUMPING RATE: 46-49 GPM



#### FINAL STATUS OF WELL

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

#### WATER USE

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

#### METHOD OF DRILLING

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

#### CONTRACTOR

NAME OF WELL CONTRACTOR: Elgin Stewart LICENCE NUMBER: 3289

ADDRESS: Jarvis - Ont

NAME OF DRILLER OR BORER: as above LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: [Signature] SUBMISSION DATE: DAY 31 MO. 1 YR. 69

#### OFFICE USE ONLY

DATA SOURCE: 58 CONTRACTOR: 59-62 DATE RECEIVED: 63-66 80

DATE OF INSPECTION: \_\_\_\_\_ INSPECTOR: \_\_\_\_\_

REMARKS: \_\_\_\_\_

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ONTARIO

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6602773

MUNICIP. \_\_\_\_\_ CON. \_\_\_\_\_

COUNTY OR DISTRICT: Welland TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Wainfleet CON., BLOCK, TRACT, SURVEY, ETC.: V LOT 25-27: 37  
 OWNER (SURNAME FIRST): D.W.R.C. ADDRESS: 135 St. Clair ave, W. Toronto DATE COMPLETED: DAY 28 MO. 1 YR 69

21 ZONE: 17 EASTING: 624885 NORTHING: 4755430 RC: 4 ELEVATION: 0582 RC: 4 BASIN CODE: 24

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
<u>yellow</u>	<u>clay</u>			<u>0</u>	<u>5</u>
<u>blue</u>	<u>clay</u>			<u>5</u>	<u>55</u>
<u>yellow</u>	<u>clay and gravel</u>			<u>55</u>	<u>110</u>
	<u>Solenia rock</u>		<u>LIMESTONE</u>	<u>110</u>	<u>245</u>
	<u>Showing of Niagara</u>		<u>LIMESTONE</u>	<u>245</u>	<u>250</u>
	<u>Niagara</u>			<u>250</u>	<u>265</u>

31 \_\_\_\_\_ 32 \_\_\_\_\_

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
10-13	1 <input type="checkbox"/> FRESH	3 <input checked="" type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	
116-271	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		
15-18	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	
20-23	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	
30-33	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE		<u>0</u>	<u>262</u>
17-18	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE			
24-25	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE			

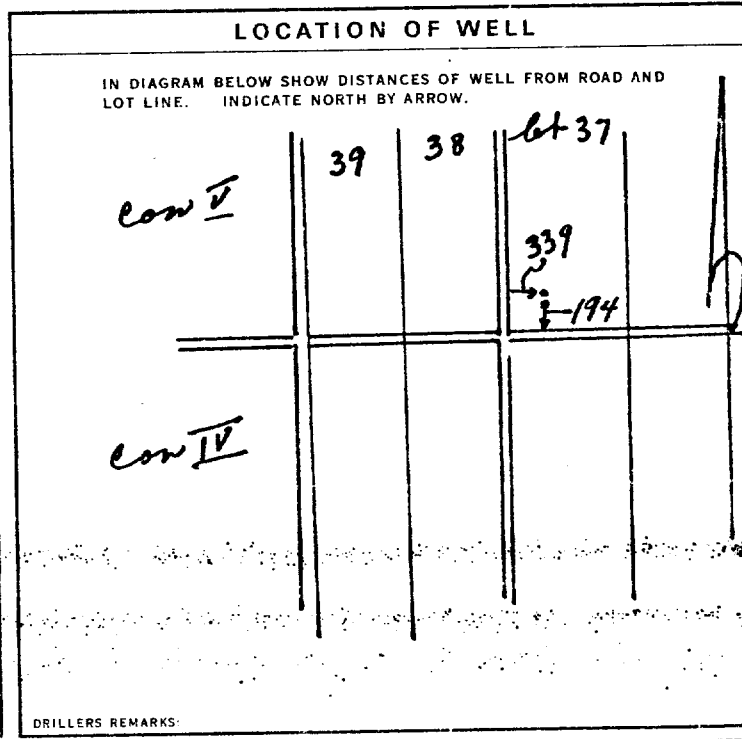
SCREEN SIZE(S) OF OPENING (SLOT NO.): 125 DIAMETER: 2 INCHES LENGTH: 3 FEET  
 MATERIAL AND TYPE: slotted pipe DEPTH TO TOP OF SCREEN: 262 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE	(CEMENT GROUT LEAD PACKER, ETC.)
10-13		
18-21		
26-29		

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER	GPM	15-16 HOURS 17-18 MINS.
STATIC LEVEL: <u>8.61</u> FEET	WATER LEVEL END OF PUMPING: _____ FEET	WATER LEVELS DURING:
		15 MINUTES: <u>26-28</u> FEET 30 MINUTES: _____ FEET 45 MINUTES: _____ FEET 60 MINUTES: _____ FEET
IF FLOWING GIVE RATE: _____ GPM	PUMP INTAKE SET AT: _____ FEET	WATER AT END OF TEST: _____ FEET
RECOMMENDED PUMP TYPE: <input type="checkbox"/> SHALLOW <input type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING: _____ FEET	RECOMMENDED PUMPING RATE: _____ 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

WATER USE: 1  DOMESTIC 2  STOCK 3  IRRIGATION 4  INDUSTRIAL 5  OTHER 6  COMMERCIAL 7  MUNICIPAL 8  PUBLIC SUPPLY 9  COOLING OR AIR CONDITIONING 10  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: Belgin Stewart LICENCE NUMBER: 3289  
 ADDRESS: Garvis - Ont.  
 NAME OF DRILLER OR BORER: as above LICENCE NUMBER: \_\_\_\_\_  
 SIGNATURE OF CONTRACTOR: \_\_\_\_\_ SUBMISSION DATE: DAY 31 MO. 1 YR 69

OFFICE USE ONLY: DATA SOURCE: \_\_\_\_\_ CONTRACTOR: \_\_\_\_\_ DATE RECEIVED: \_\_\_\_\_  
 DATE OF INSPECTION: \_\_\_\_\_ INSPECTOR: \_\_\_\_\_  
 REMARKS: \_\_\_\_\_  
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11 6602775

MUNICIP. CON. 10 14 15 22 23 24

COUNTY OR DISTRICT: Welland TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Marinefleet CON., BLOCK, TRACT, SURVEY, ETC.: E LOT: 37  
 OWNER (SURNAME FIRST): O.W.P.C ADDRESS: 135 St Clair ave w. Toronto. DATE COMPLETED: 3 DAY 1 MO. 69 YR.

21 ZONE EASTING NORTHING RC. ELEVATION RC. BASIN CODE II III IV  
 1 2 10 12 17 18 24 25 26 30 31 47  
 1 17 624820 4755410 4 0582 4 24

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
<u>yellow</u>	<u>clay</u>			<u>0</u>	<u>9</u>
<u>blue</u>	<u>clay</u>			<u>9</u>	<u>68</u>
<u>blue</u>	<u>clay and gravel</u>			<u>68</u>	<u>110</u>
	<u>Salina rock formation</u>		<u>LIMESTONE</u>	<u>110</u>	<u>175</u>

31 32 10 14 15 21 32 43 54 65 75 80

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
10-13	1 <input type="checkbox"/> FRESH	3 <input checked="" type="checkbox"/> SULPHUR		
15-18	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		
172	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR		
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11	1 <input checked="" type="checkbox"/> STEEL		0	172
2	2 <input type="checkbox"/> GALVANIZED			
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			

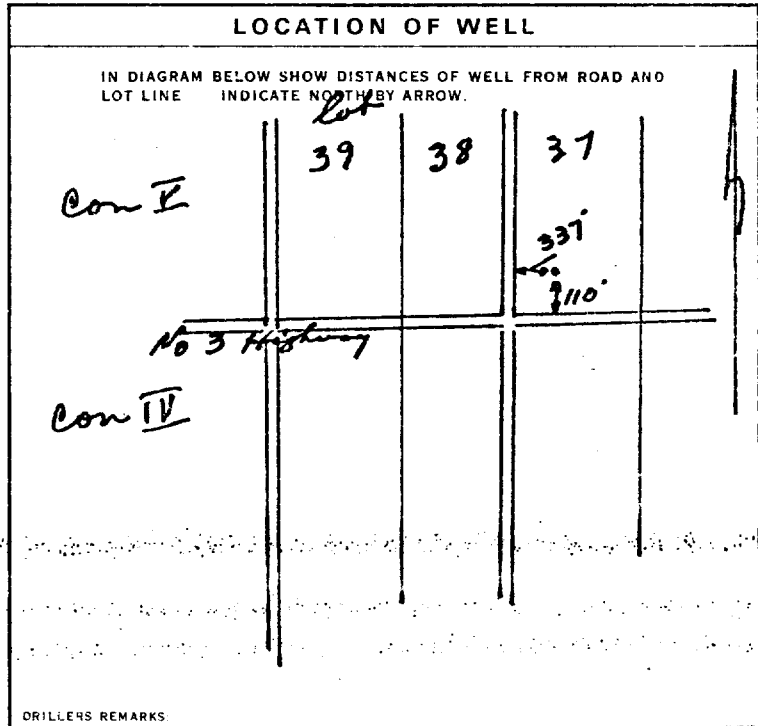
SCREEN SIZE(S) OF OPENING (LOT NO.): 125 DIAMETER: 2 INCHES LENGTH: 3 FEET  
 MATERIAL AND TYPE: slotted pipe DEPTH TO TOP OF SCREEN: 172 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
10-13	14-17
18-21	22-25
26-29	30-33

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER	GPM	15-16 HOURS 17-18 MINS
STATIC LEVEL: <u>7.38</u> FEET	WATER LEVELS DURING	
	15 MINUTES	30 MINUTES
	45 MINUTES	60 MINUTES



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: 1  DOMESTIC 2  STOCK 3  IRRIGATION 4  INDUSTRIAL 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: Elgin Stewart LICENCE NUMBER: 3289  
 ADDRESS: Jarvis - Ontario.  
 NAME OF DRILLER OR BOPER: as above LICENCE NUMBER:  
 SIGNATURE OF CONTRACTOR: [Signature] SUBMISSION DATE: 31 DAY 1 MO. 69 YR.

OFFICE USE ONLY: DATA SOURCE: 58 CONTRACTOR: 59-62 DATE RECEIVED: 63-68 90  
 DATE OF INSPECTION: INSPECTOR:  
 REMARKS: 08888 P  
 WI



Ontario

304/14e

# WATER WELL RECORD

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

11 6603229 66007 CAN 04

COUNTY OR DISTRICT: NIAGARA  
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: WAINFLEET  
CON. BLOCK, TRACT, SURVEY, ETC: #  
LOT: 039  
OWNER (SURNAME FIRST): WELAND  
ADDRESS: MILBROOK-PARK, INC. 110 ST CLAIR AVE. EAST TORONTO  
DATE COMPLETED: DAY 26 MO 5 YR 77  
ZONE: 17 EASTING: 624140 NORTHING: 4755280 ELEVATION: 4 0590 RC: 4 24

### LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
BROWN	SAND			0	16
	CLAY LOAM			16	26
BLUE	CLAY			26	36
BROWN	CLAY			36	86
	CLAY LOAM & GRAVEL			86	96
	CLAY SAND & GRAVEL			96	117
	LOAM SAND & GRAVEL			117	120
	GRAVEL			120	130

31  
32

#### 41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERAL
130	2 <input type="checkbox"/> SALTY 4 <input checked="" type="checkbox"/> MINERAL
15-18	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERAL

#### 51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
64	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE	188	130	16
17-18	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE		20-23	
24-25	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE		27-30	

#### SCREEN

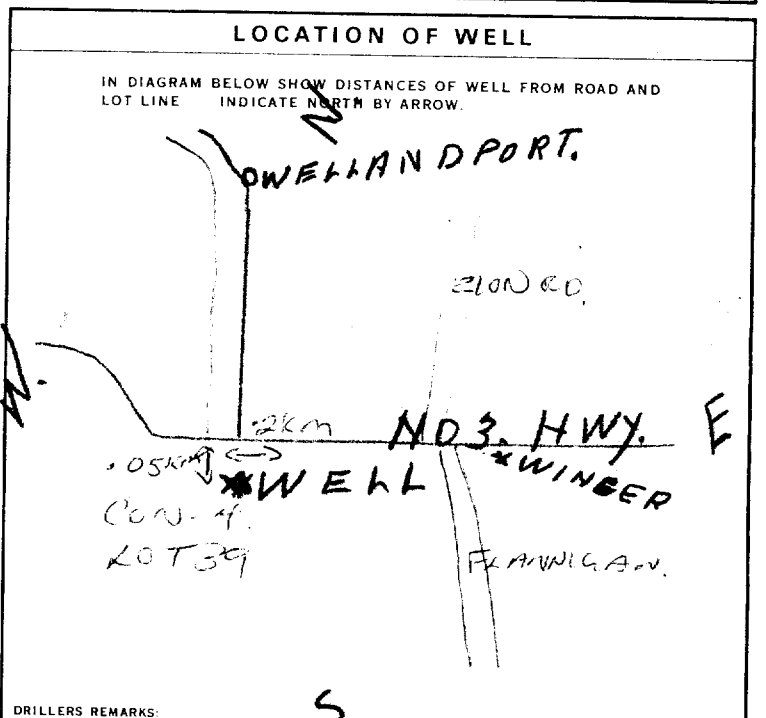
SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
	31-33	34-38
MATERIAL AND TYPE		DEPTH TO TOP OF SCREEN 41-44

#### 61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
10-13	14-17
18-21	22-25
26-29	30-33 80

#### 71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input type="checkbox"/> PUMP 2 <input checked="" type="checkbox"/> BAILER	20 GPM	5 HOURS 17-18 MINS
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
19-21	22-24	15 MINUTES 26-28 30 MINUTES 29-31 45 MINUTES 32-34 60 MINUTES 35-37
17 FEET	35 FEET	
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
		1 <input type="checkbox"/> CLEAR 2 <input type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
<input type="checkbox"/> SHALLOW <input type="checkbox"/> DEEP		



#### FINAL STATUS OF WELL

1 <input type="checkbox"/> WATER SUPPLY	5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
2 <input type="checkbox"/> OBSERVATION WELL	6 <input checked="" type="checkbox"/> ABANDONED, POOR QUALITY
3 <input type="checkbox"/> TEST HOLE	7 <input type="checkbox"/> UNFINISHED
4 <input type="checkbox"/> RECHARGE WELL	

#### WATER USE

1 <input type="checkbox"/> DOMESTIC	5 <input type="checkbox"/> COMMERCIAL
2 <input type="checkbox"/> STOCK	6 <input type="checkbox"/> MUNICIPAL
3 <input type="checkbox"/> IRRIGATION	7 <input type="checkbox"/> PUBLIC SUPPLY
4 <input type="checkbox"/> INDUSTRIAL	8 <input type="checkbox"/> COOLING OR AIR CONDITIONING
<input type="checkbox"/> OTHER	9 <input type="checkbox"/> NOT USED

#### METHOD OF DRILLING

1 <input checked="" type="checkbox"/> CABLE TOOL	6 <input type="checkbox"/> BORING
2 <input type="checkbox"/> ROTARY (CONVENTIONAL)	7 <input type="checkbox"/> DIAMOND
3 <input type="checkbox"/> ROTARY (REVERSE)	8 <input type="checkbox"/> JETTING
4 <input type="checkbox"/> ROTARY (AIR)	9 <input type="checkbox"/> DRIVING
5 <input type="checkbox"/> AIR PERCUSSION	

#### CONTRACTOR

NAME OF WELL CONTRACTOR: W.R. FIELD	LICENCE NUMBER: 2123
ADDRESS: RR1 VINELAND	
NAME OF DRILLER OR BORER: MARSHALL FIELD	LICENCE NUMBER: 2124
SIGNATURE OF CONTRACTOR: W.R. Field	SUBMISSION DATE: DAY MO. YR.

#### OFFICE USE ONLY

DATA SOURCE	CONTRACTOR	DATE RECEIVED
		190977
DATE OF INSPECTION	INSPECTOR	
REMARKS		



Ontario

# WATER WELL RECORD

306/14e

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

(11)

6603279

MUNICIPALITY 66007

CON. C6N

04

COUNTY, OR DISTRICT: *Windsor-Essex* TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: *Windsor* CON., BLOCK, TRACT, SURVEY, ETC.: *4*

DATE COMPLETED: *09 July 78*

PLACING: *55100* ELEVATION: *40590* BASIN CODE: *424*

### LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
<i>gray</i>	<i>Clay</i>			<i>0</i>	<i>68</i>
<i>Red</i>	<i>Clay</i>			<i>68</i>	<i>90</i>
	<i>Clay &amp; gravel</i>			<i>90</i>	<i>110</i>
	<i>Rock</i>				<i>110</i>

31: *0068205* *0090705* *0110 0511* *0110 20*

**41 WATER RECORD**

WATER FOUND AT - FEET	KIND OF WATER			
<i>0110</i>	<input checked="" type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL
	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR	<input type="checkbox"/> MINERAL

**51 CASING & OPEN HOLE RECORD**

INSIDE DIAMETER INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
<i>18 1/2</i>	<input checked="" type="checkbox"/> STEEL	<i>18 1/2</i>	<i>0 0111</i>
	<input type="checkbox"/> GALVANIZED		
	<input type="checkbox"/> CONCRETE		
	<input type="checkbox"/> OPEN HOLE		

**61 PLUGGING & SEALING RECORD**

DEPTH SET AT - FEET	MATERIAL AND TYPE
<i>10-13</i>	<i>14-17</i>
<i>18-21</i>	<i>22-25</i>
<i>26-29</i>	<i>30-33</i>

**71 PUMPING TEST**

PUMPING TEST METHOD:  PUMP  BAILER

PUMPING RATE: *0003* GPM

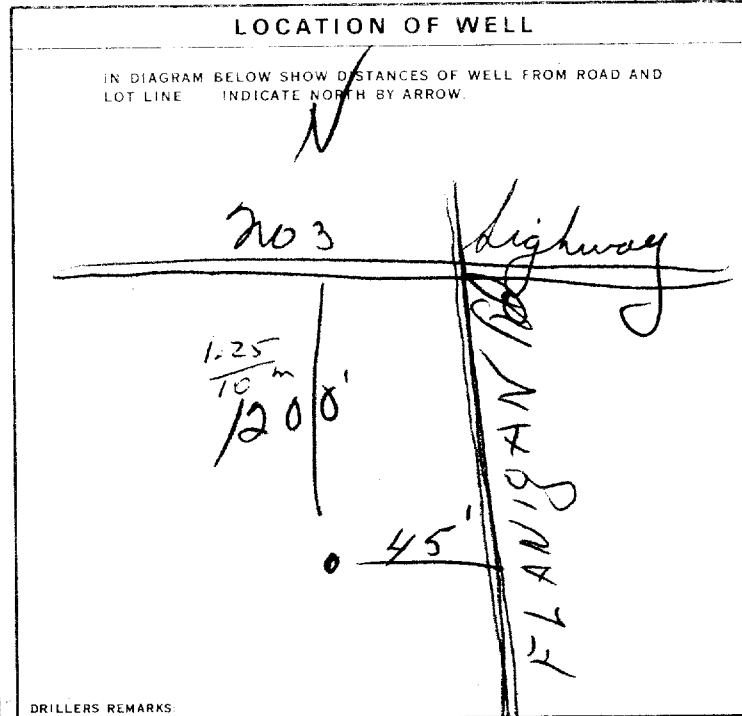
DURATION OF PUMPING: *02* HOURS *00* MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING			
<i>110</i>	<i>110</i>	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
<i>331</i>	<i>331</i>	<i>26-28</i>	<i>29-31</i>	<i>32-34</i>	<i>35-37</i>

RECOMMENDED PUMP TYPE:  SHALLOW  DEEP

RECOMMENDED PUMP SETTING: *100* FEET

RECOMMENDED PUMPING RATE: *0003* GPM



**FINAL STATUS OF WELL**

WATER SUPPLY  OBSERVATION WELL  TEST HOLE  RECHARGE WELL

ABANDONED, INSUFFICIENT SUPPLY  ABANDONED, POOR QUALITY  UNFINISHED

**WATER USE**

DOMESTIC  STOCK  IRRIGATION  INDUSTRIAL  OTHER

COMMERCIAL  MUNICIPAL  PUBLIC SUPPLY  COOLING OR AIR CONDITIONING  NOT USED

**METHOD OF DRILLING**

CABLE TOOL  ROTARY (CONVENTIONAL)  ROTARY (REVERSE)  ROTARY (AIR)  AIR PERCUSSION

BORING  DIAMOND  JETTING  DRIVING

**CONTRACTOR**

NAME OF WELL CONTRACTOR: *S.W. Merritt* LICENCE NUMBER: *3609*

ADDRESS: *R.R. 1 Smithville*

NAME OF DRILLER OR BOKER: *S.W. Merritt* LICENCE NUMBER: *3609*

SIGNATURE OF CONTRACTOR: *John Merritt* SUBMISSION DATE: *9 Sep 78*

**OFFICE USE ONLY**

DATA SOURCE: *1* CONTRACTOR: *3609* DATE RECEIVED: *180978*

DATE OF INSPECTION: *May 17/79* INSPECTOR: *ES*

REMARKS: *CSS-58*

A070998

**Well Owner's Information**

First Name: 1372686 ONTARIO INC. Last Name: E-mail Address:  Well Constructed by Well Owner

Mailing Address (Street Number/Name, RR): 5125 Trafalger Rd Municipality: Hornsby Province: Ont Postal Code: L4R 1E0 Telephone No. (inc. area code): 416 580 8938

**Part A Construction and/or Major Alteration of a Well**

Address of Well Location (Street Number/Name, RR): 39 Highway #3 Township: Wainfleet Lot: 39 Concession: 4  
 County/District/Municipality: Niagara City/Town/Village: Wainfleet Province: Ontario Postal Code: \_\_\_\_\_  
 UTM Coordinates: NAD 83 Zone: 17 Easting: 413 Northing: 4755260 GPS Unit Make: Magellan Model: Blazer Mode of Operation:  Undifferentiated  Averaged  Differentiated, specify \_\_\_\_\_

**Overburden and Bedrock Materials** (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (Metres) From	Depth (Metres) To
Brown	Topsoil			0	0.3
Brown	Sand			0.3	5.4
Grey	Clay (Hard)			5.4	6.4
Grey	Clay (Soft)			6.4	21.33
Brown	Clay	stones		21.33	37.18
Brown	Gravel	Sand		37.18	39.62

**Annular Space/Abandonment Sealing Record**

Depth Set at (Metres) From	Depth Set at (Metres) To	Type of Sealant Used (Material and Type)	Volume Placed (Cubic Metres)
0	6	Be-to-bite Slurry	132.4L
		20% Quick Grown mixture	.132m <sup>3</sup>

**Results of Well Yield Testing**

Time (Min)	Draw Down		Recovery	
	Water Level (Metres)	Time (Min)	Water Level (Metres)	Time (Min)
Static Level	5.94	Static Level		
1	6.21	1	6.0	
2	6.21	2	6.0	
3	6.21	3	6.0	
4	6.21	4	6.0	
5	6.21	5	5.97	
10	6.21	10	5.97	
15	6.24	15	5.97	
20	6.24	20	5.97	
25	6.24	25	5.97	
30	6.24	30	5.94	
40	6.24	40	5.94	
50	6.27	50	5.94	
60	6.24	60	5.94	

Check box if after test of well yield, water was:  
 Clear and sand free  
 Cannot develop to sand-free state  
 If pumping discontinued, give reason: \_\_\_\_\_  
 Pumping test method: Submersible  
 Pump intake set at (Metres): 37m  
 Pumping rate (Litres/min): 75.7  
 Duration of pumping: 4 hrs + min  
 Final water level end of pumping (Metres): 6.27  
 Recommended pump type:  Shallow  Deep  
 Recommended pump depth: 37 Metres  
 Recommended pump rate (Litres/min): 75.7  
 If flowing give rate (Litres/min): \_\_\_\_\_

**Method of Construction**

Cable Tool  Diamond  Public  Commercial  Not used  
 Rotary (Conventional)  Jetting  Domestic  Municipal  Dewatering  
 Rotary (Reverse)  Driving  Livestock  Test Hole  Monitoring  
 Rotary (Air)  Digging  Irrigation  Cooling & Air Conditioning  
 Air percussion  Boring  Industrial  
 Other, specify \_\_\_\_\_

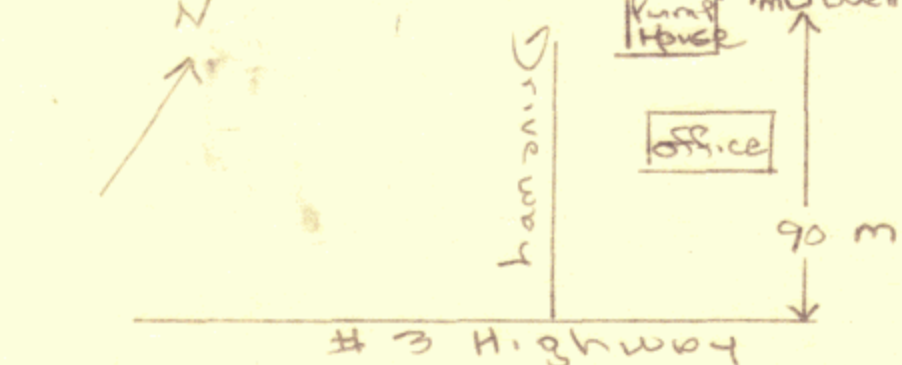
**Water Use**

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

**Status of Well**

**Location of Well**

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



Date Well Completed (yyyy/mm/dd): 08/02/22 Was the well owner's information package delivered?  Yes  No Date the Well Record and Package Delivered to Well Owner (yyyy/mm/dd): 08/03/07

**Well Contractor and Well Technician Information**

Business Name of Well Contractor: Circle Eddy's Drilling Well Contractor's Licence No.: 7121914  
 Business Address (Street No./Name, number, RR): 108 Queen St South, Thornhill, Ont. Municipality: Niagara  
 Province: Ont Postal Code: M1V 3M9 Business E-mail Address: C.Dupuis@seinc.ca  
 Bus. Telephone No. (inc. area code): 905-882-4444 Name of Well Technician (Last Name, First Name): Gladney Edward  
 Well Technician's Licence No.: T+20999 Signature of Technician: Ed Gladney Date Submitted (yyyy/mm/dd): 08/03/11

**Water Details**

Water found at Depth	Kind of Water
39 Metres <input type="checkbox"/> Gas <input checked="" type="checkbox"/> Fresh <input type="checkbox"/> Salty <input type="checkbox"/> Sulphur <input type="checkbox"/> Minerals	
Metres <input type="checkbox"/> Gas <input type="checkbox"/> Fresh <input type="checkbox"/> Salty <input type="checkbox"/> Sulphur <input type="checkbox"/> Minerals	
Metres <input type="checkbox"/> Gas <input type="checkbox"/> Fresh <input type="checkbox"/> Salty <input type="checkbox"/> Sulphur <input type="checkbox"/> Minerals	

**Casing Used**  Galvanized  Steel  Fibreglass  Plastic  Concrete

**Screen Used**  Galvanized  Steel  Fibreglass  Plastic  Concrete

**Casing and Well Details**

Diameter of the Hole (Centimetres): 15cm  
 Depth of the Hole (Metres): 39.62  
 Wall Thickness (Metres): .188  
 Inside Diameter of the Casing (Metres): .15  
 Depth of the Casing (Metres): 39.62

**No Casing and Screen Used**  Open Hole

Disinfected?  Yes  No

**Ministry Use Only**

Audit No.: 275212 Well Contractor No.: \_\_\_\_\_  
 Date Received (yyyy/mm/dd): MAR 18 2008 Date of Inspection (yyyy/mm/dd): \_\_\_\_\_  
 Remarks: \_\_\_\_\_

**Well Owner's Information**

First Name 1372686	Last Name Ontario INC	E-mail Address	<input type="checkbox"/> Well Constructed by Well Owner
Mailing Address (Street Number/Name, RR) 5185 Trafalgar Rd	Municipality Hornby	Province Ont	Postal Code 401 1E0V16
Telephone No. (inc. area code) 803939			

**Part A Construction and/or Major Alteration of a Well**

Address of Well Location (Street Number/Name, RR) 39 H69 Highway #3	Township Wainfleet	Lot 39	Concession 4
County/District/Municipality Niagara	City/Town/Village Wainfleet	Province Ontario	Postal Code
UTM Coordinates NAD 83	Zone Easting 1762413	Northing 31475260	GPS Unit Make Maggala
Model Blazer	Mode of Operation: <input type="checkbox"/> Undifferentiated <input checked="" type="checkbox"/> Averaged	<input type="checkbox"/> Differentiated, specify	

**Overburden and Bedrock Materials** (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (Metres) From	Depth (Metres) To
	Wall Abandonment		2m casing removed		
			soil		
			Holeplug		
			20% QuickBort mixture		

**Annular Space/Abandonment Sealing Record**

Depth Set at (Metres) From	Depth Set at (Metres) To	Type of Sealant Used (Material and Type)	Volume Placed (Cubic Metres)
.9	39.62	20% Quick Bort mixture	946.351
.3	.9	4 Bags Holeplug	946m <sup>3</sup>
0	.3	soil	

**Results of Well Yield Testing**

Check box if after test of well yield, water was: <input type="checkbox"/> Clear and sand free <input type="checkbox"/> Cannot develop to sand-free state	Draw Down		Recovery	
	Time (Min)	Water Level (Metres)	Time (Min)	Water Level (Metres)
If pumping discontinued, give reason:	Static Level		Static Level	
	1		1	
Pumping test method	2		2	
	3		3	
Pump intake set at (Metres)	4		4	
	5		5	
Pumping rate (Litres/min)	10		10	
	15		15	
Duration of pumping hrs + min	20		20	
	25		25	
Final water level end of pumping (Metres)	30		30	
	40		40	
Recommended pump type <input type="checkbox"/> Shallow <input type="checkbox"/> Deep	50		50	
	60		60	
Recommended pump depth Metres				
Recommended pump rate (Litres/min)				
If flowing give rate (Litres/min)				

**Method of Construction**

- Cable Tool
- Rotary (Conventional)
- Rotary (Reverse)
- Rotary (Air)
- Air percussion
- Other, specify

**Water Use**

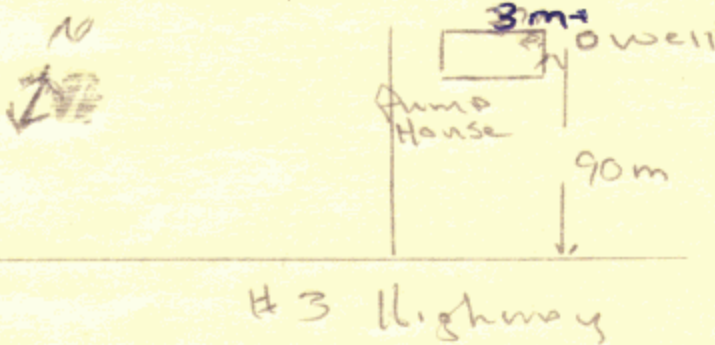
- Public
- Commercial
- Not used
- Domestic
- Municipal
- Dewatering
- Livestock
- Test Hole
- Monitoring
- Irrigation
- Cooling & Air Conditioning
- Industrial
- Other, specify

**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

**Location of Well**

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 Metres	Kind of Water <input type="checkbox"/> Gas <input type="checkbox"/> Fresh <input type="checkbox"/> Salty <input type="checkbox"/> Sulphur <input type="checkbox"/> Minerals
Water found at Depth Metres	Kind of Water <input type="checkbox"/> Gas <input type="checkbox"/> Fresh <input type="checkbox"/> Salty <input type="checkbox"/> Sulphur <input type="checkbox"/> Minerals
Water found at Depth Metres	Kind of Water <input type="checkbox"/> Gas <input type="checkbox"/> Fresh <input type="checkbox"/> Salty <input type="checkbox"/> Sulphur <input type="checkbox"/> Minerals

**Casing Used**

- Galvanized
- Steel
- Fibreglass
- Plastic
- Concrete

**Screen Used**

- Galvanized
- Steel
- Fibreglass
- Plastic
- Concrete

**Casing and Well Details**

Diameter of the Hole (Centimetres) 15
Depth of the Hole (Metres) 39.62
Wall Thickness (Metres) .188
Inside Diameter of the Casing (Metres)
Depth of the Casing (Metres) 39.62

**No Casing and Screen Used**

- Open Hole
- Disinfected?  
 Yes  No

**Ministry Use Only**

Audit No. 275215	Well Contractor No.
Date Received (yyyy/mm/dd) MAY 01 2008	Date of Inspection (yyyy/mm/dd)
Remarks	

Date Well Completed (yyyy/mm/dd) 080410	Was the well owner's information package delivered? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Date the Well Record and Package Delivered to Well Owner (yyyy/mm/dd) 080422
--	--	---

**Well Contractor and Well Technician Information**

Business Name of Well Contractor Circle Eddy's Drilling	Well Contractor's Licence No. 721914
Business Address (Street No./Name, number, RR) 108 Queen St South	Municipality Thorold
Province Ont	Postal Code N7V 4N9
Business E-mail Address	
Bus. Telephone No. (inc. area code) 9052275472	Name of Well Technician (Last Name, First Name) Blodley Edward
Well Technician's Licence No. T120919	Signature of Technician Ed Blodley
Date Submitted (yyyy/mm/dd) 080423	





## **Appendix C**

### **Water well and septic system survey**



## **Terra-Dynamics Consulting Inc.**

**432 Niagara Street, Unit 2 St. Catharines, ON L2M 4W3**

June, 2021

Dear Resident:

On behalf of Mr. Ron Pols, Terra-Dynamics Consulting Inc. is completing a water well and septic system survey. This is a survey of properties in the vicinity of 53814 Zion Road, as shown on the attached map (Site). Mr. Pols is making application to create six lots on the property. This well and septic system survey is a recommended part of a hydrogeologic, or groundwater, study of the subject lands. This is a standard questionnaire for properties on private services.

The purpose of this survey is to collect information on private or residential water wells, cisterns and septic systems within approximately 250 metres of the property (as shown by the outline on the attached map). **Participation is voluntary.** Participation involves completing the attached questionnaire on well and/or cistern use, groundwater quantity, quality and your septic system. Please complete it as best as you can. Please fill out the questionnaire and mail it back to Terra-Dynamics Consulting Inc. in the self-addressed and stamped envelope. The information you provide will be summarized in our report to Niagara Region and the Township of Wainfleet and personal information (e.g. name, address, etc.) will be kept confidential and will not be included in our report.

If you have any questions about the questionnaire, please contact Jayme Campbell at 289-407-0915 or via email at [jcampbell@terra-dynamics.com](mailto:jcampbell@terra-dynamics.com).

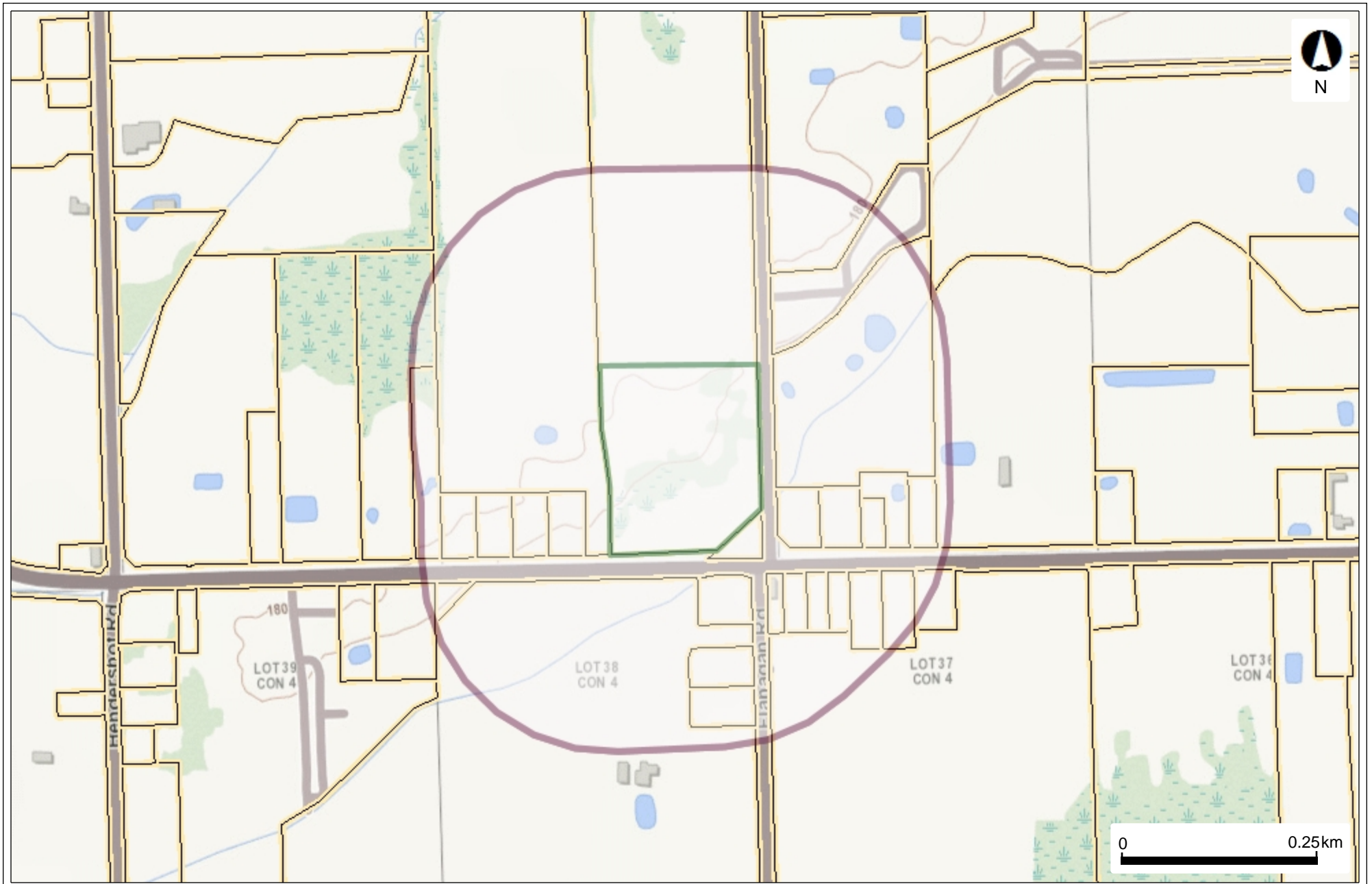
Thank you in advance for your assistance.

Yours truly,

TERRA-DYNAMICS CONSULTING INC.

Jayme D. Campbell, P.Eng.  
Senior Water Resource Engineer

# Water Well Survey



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# Terra-Dynamics Consulting Inc.

432 Niagara Street, Unit 2 St. Catharines, ON L2M 4W3

## WATER WELL SURVEY FORM

Date: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Property Address: \_\_\_\_\_

Telephone: \_\_\_\_\_

Email (if further information requested): \_\_\_\_\_

### 1.0 GENERAL QUESTIONS

Do you know your drinking water source? Please circle one or more of the following three options:

1. Well (20+ feet casing)    2. Shallow Well (less than 20 feet of casing)  
3. Cistern    4. Municipal

Further comments:

\_\_\_\_\_  
\_\_\_\_\_

Use page 3 or a separate sheet of paper for additional comments.

If your water supply is from a cistern, the rest of the questions do not apply. If you have both a cistern and a well, please complete the well questionnaire (Section 2.0 or 3.0). Please let us know where your place is located either on the supplied map or the area for a sketch on the second last page of this form. Please mail the completed form back to Terra-Dynamics in the provided envelope. Thank you for your assistance.

- If you have a drilled deep well (20+ feet of casing) please complete Sections 2 & 4
- If you have a shallow well (less than 20 feet of casing), please complete Sections 3&4

### 2.0 DRILLED WELL (greater than 20 feet of casing)

How deep is your well? \_\_\_\_\_

Is your well drilled into rock? \_\_\_\_\_ What is the well casing diameter? \_\_\_\_\_

Do you know when your well was drilled? \_\_\_\_\_

Do you know the name of the well driller? \_\_\_\_\_

Do you have a well log? (i.e. a description of the geology encountered when drilling your well and if yes, can you supply a copy or write down the information in the Comments Section).

---

What is the use of your well water? (i.e. drinking water for house, garden irrigation, etc.)

---

Has your well ever run dry? \_\_\_\_\_

Do you experience problems with taste, colour or odour? (if yes, please explain).

---

Do you have any water purification systems for your well water? (i.e. water softeners, UV Light for bacteria, Sulphur/Iron Filter for odour or staining, etc.).

---

Do you perform regular maintenance on your well? (i.e. pump service, silt removal, etc.)

---

### **3.0 SHALLOW WELL (less than 20 feet of casing)**

What is the well casing material and diameter? \_\_\_\_\_

What is the expected age of the well? \_\_\_\_\_

How deep is the well? \_\_\_\_\_

Does you utilize a jet pump or a submersible pump? \_\_\_\_\_

Is there problems with water quality (colour, odour, etc.)? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, please explain \_\_\_\_\_

Do you have any water purification systems for your dug well water? (i.e. water softeners, UV Light for bacteria, Sulphur/Iron Filter for odour or staining, etc.).

---

Have you ever experienced freeze-up during the winter? \_\_\_\_\_

What is the use of your shallow dug well water? (i.e. drinking water for house, irrigation, etc.)

---

Has your dug well ever run dry?

---

Do you perform regular maintenance on your pump? (i.e. pump service, silt removal)

---

Additional comments: \_\_\_\_\_

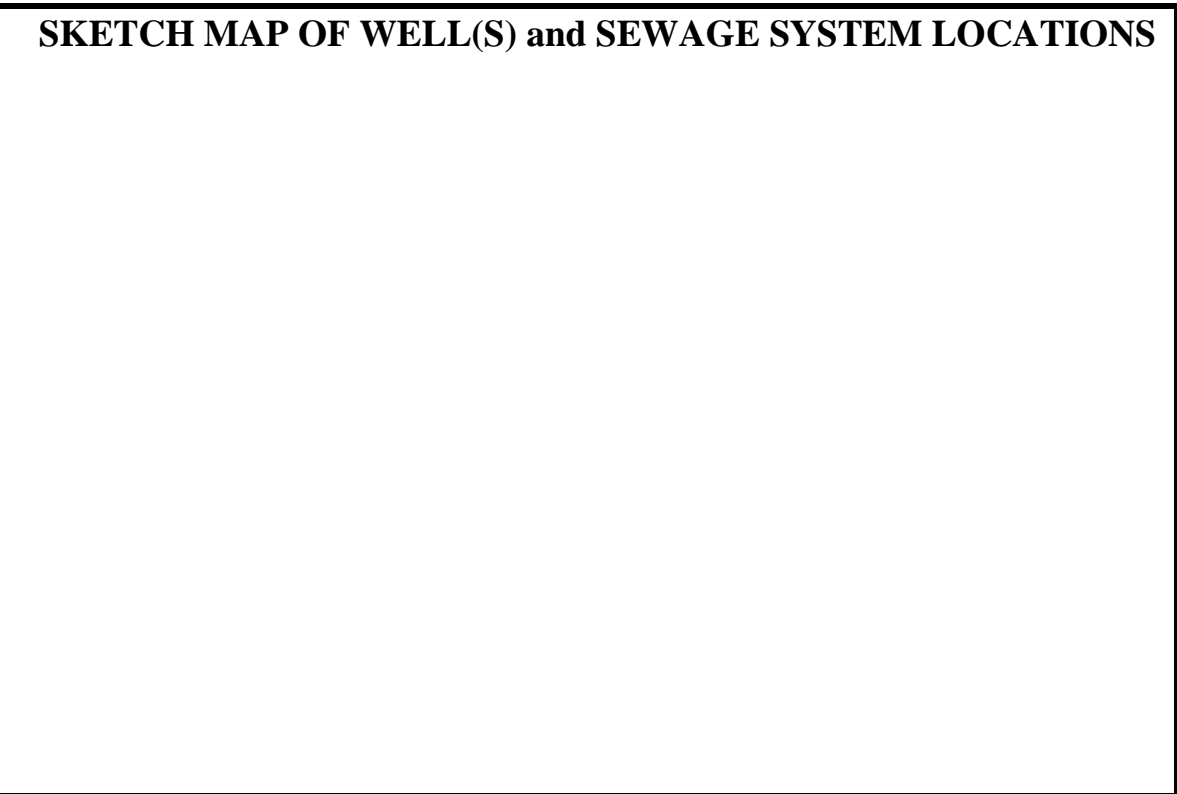
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#### **4.0 LOCATION MAP**

Can you please draw a sketch map of the location of your well(s), septic tank and sewage bed on your property (please show the location relative to buildings and roads).

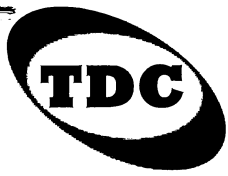
#### **SKETCH MAP OF WELL(S) and SEWAGE SYSTEM LOCATIONS**



Other Comments: (Use a separate sheet, if required)

Please mail the completed form back to Terra-Dynamics in the provided envelope.  
Thank you for your help.

Jayme Campbell, P. Eng., Senior Water Resource Engineer  
432 Niagara Street, Unit 2, St. Catharines, ON L2M 4W3  
289-407-0915



# Terra-Dynamics Consulting Inc.

432 Niagara Street, Unit 2 St. Catharines, ON L2M 4W3

## WATER WELL SURVEY FORM

Date: July 2, 2021

Contact Person: [Redacted]

Property Address: 43775 Hwy 3

Telephone: [Redacted]

Email (if further information requested): [Redacted]

### 1.0 GENERAL QUESTIONS

Do you know your drinking water source? Please circle one or more of the following three options:

- 1. Well (20+ feet casing)
- 2. Shallow Well (less than 20 feet of casing)
- 3. Cistern
- 4. Municipal

Further comments:

\_\_\_\_\_  
\_\_\_\_\_

Use page 3 or a separate sheet of paper for additional comments.

If your water supply is from a cistern, the rest of the questions do not apply. If you have both a cistern and a well, please complete the well questionnaire (Section 2.0 or 3.0). Please let us know where your place is located either on the supplied map or the area for a sketch on the second last page of this form. Please mail the completed form back to Terra-Dynamics in the provided envelope. Thank you for your assistance.

- If you have a drilled deep well (20+ feet of casing) please complete Sections 2 & 4
- If you have a shallow well (less than 20 feet of casing), please complete Sections 3&4

### 2.0 DRILLED WELL (greater than 20 feet of casing)

How deep is your well? \_\_\_\_\_

Is your well drilled into rock? \_\_\_\_\_ What is the well casing diameter? \_\_\_\_\_

Do you know when your well was drilled? \_\_\_\_\_

Do you know the name of the well driller? \_\_\_\_\_



# Terra-Dynamics Consulting Inc.

432 Niagara Street, Unit 2 St. Catharines, ON L2M 4W3

## WATER WELL SURVEY FORM

Date: July 13/21

Contact Person: [Redacted]

Property Address: 43832 Highway #3 Wainfleet ON

Telephone: [Redacted]

Email (if further information requested): \_\_\_\_\_

### 1.0 GENERAL QUESTIONS

Do you know your drinking water source? Please circle one or more of the following three options:

- 1. Well (20+ feet casing)
- 2. Shallow Well (less than 20 feet of casing)
- 3. Cistern
- 4. Municipal

Further comments: Both wells.

Use page 3 or a separate sheet of paper for additional comments.

If your water supply is from a cistern, the rest of the questions do not apply. If you have both a cistern and a well, please complete the well questionnaire (Section 2.0 or 3.0). Please let us know where your place is located either on the supplied map or the area for a sketch on the second last page of this form. Please mail the completed form back to Terra-Dynamics in the provided envelope. Thank you for your assistance.

- If you have a drilled deep well (20+ feet of casing) please complete Sections 2 & 4
- If you have a shallow well (less than 20 feet of casing), please complete Sections 3&4

### 2.0 DRILLED WELL (greater than 20 feet of casing)

How deep is your well? \_\_\_\_\_

Is your well drilled into rock? \_\_\_\_\_ What is the well casing diameter? \_\_\_\_\_

Do you know when your well was drilled? \_\_\_\_\_

Do you know the name of the well driller? \_\_\_\_\_



Do you have a well log? (i.e. a description of the geology encountered when drilling your well and if yes, can you supply a copy or write down the information in the Comments Section).

What is the use of your well water? (i.e. drinking water for house, garden irrigation, etc.)

Has your well ever run dry? \_\_\_\_\_

Do you experience problems with taste, colour or odour? (if yes, please explain).

~~Do you have any water purification systems for your well water? (i.e. water softeners, UV Light for bacteria, Sulphur/Iron Filter for odour or staining, etc.).~~

Do you perform regular maintenance on your well? (i.e. pump service, silt removal, etc.)

### 3.0 SHALLOW WELL (less than 20 feet of casing)

What is the well casing material and diameter? Cement 4ft

What is the expected age of the well? Dont know

How deep is the well? Dont know

Does you utilize a jet pump or a submersible pump? jet pump

~~Is there problems with water quality (colour, odour, etc.)? Yes \_\_\_\_\_ No~~

If yes, please explain \_\_\_\_\_

Do you have any water purification systems for your dug well water? (i.e. water softeners, UV Light for bacteria, Sulphur/Iron Filter for odour or staining, etc.).

No

Have you ever experienced freeze-up during the winter? No

What is the use of your shallow dug well water? (i.e. drinking water for house, irrigation, etc.)

drinking water / irrigation.

Has your dug well ever run dry?

No

Do you perform regular maintenance on your pump? (i.e. pump service, silt removal)

No

Additional comments:

---

---

#### 4.0 LOCATION MAP

Can you please draw a sketch map of the location of your well(s), septic tank and sewage bed on your property (please show the location relative to buildings and roads).

#### SKETCH MAP OF WELL(S) and SEWAGE SYSTEM LOCATIONS

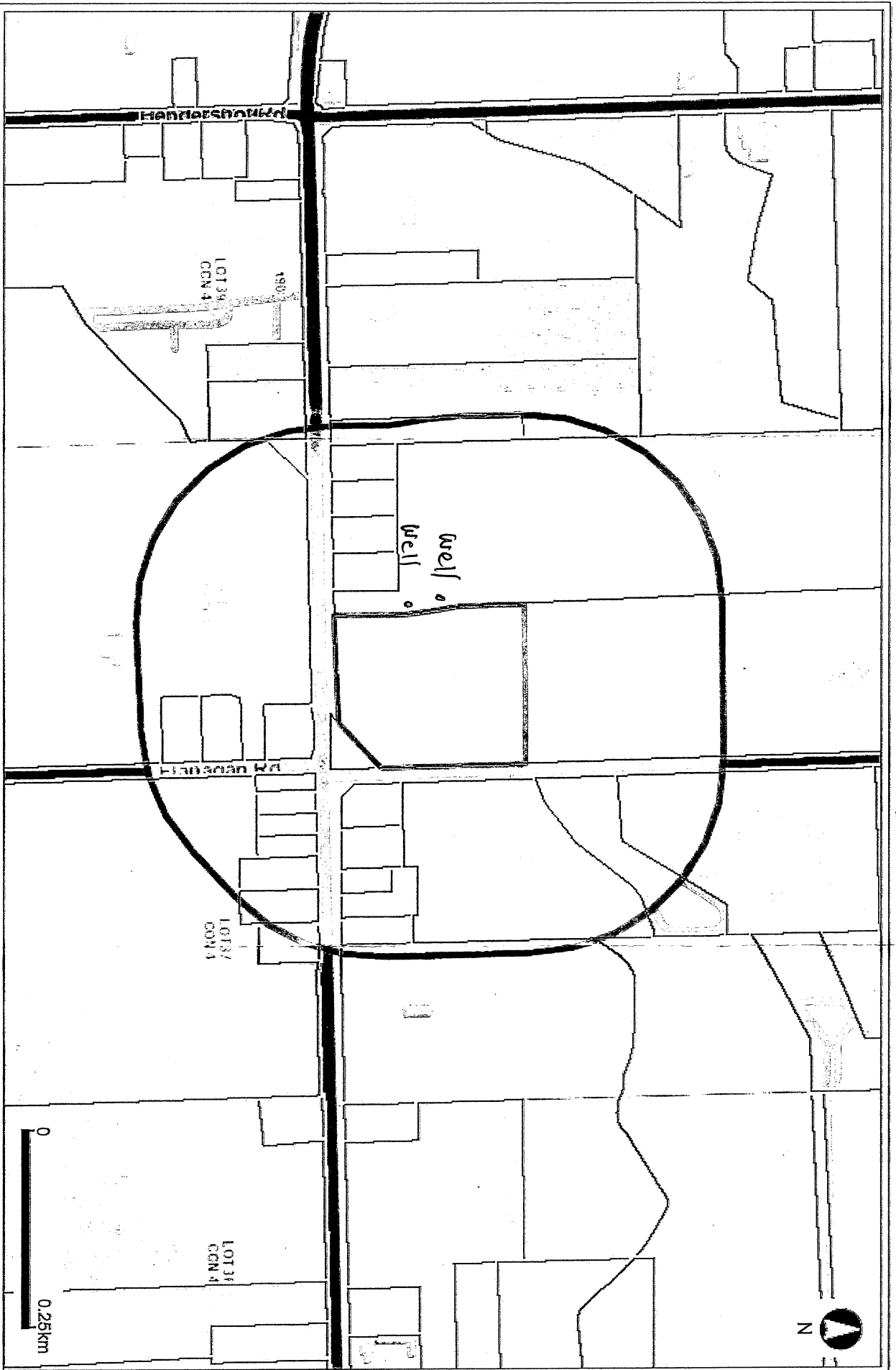
See attached map

Other Comments: (Use a separate sheet, if required)

Please mail the completed form back to Terra-Dynamics in the provided envelope.  
Thank you for your help.

Jayne Campbell, P. Eng., Senior Water Resource Engineer  
432 Niagara Street, Unit 2, St. Catharines, ON L2M 4W3  
289-407-0915

# Water Well Survey



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Barn well 30 ft from property line

House well 40ft from property line

Teranet Inc., Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

Legend

● Override 1 ★ Immunization Sites

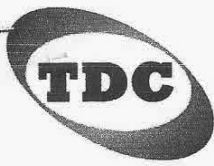
□ Assessment Parcels

0 0.02 0.04 0.07 0.11 0.14

Niagara Region



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# Terra-Dynamics Consulting Inc.

432 Niagara Street, Unit 2 St. Catharines, ON L2M 4W3

## WATER WELL SURVEY FORM

Date: July 6 2021

Contact Person: [Redacted]

Property Address: 43954 Hwy #3 RR#1 WAINFLEET ONT.

Telephone: [Redacted]

Email (if further information requested): \_\_\_\_\_

### 1.0 GENERAL QUESTIONS

Do you know your drinking water source? Please circle one or more of the following three options:

- 1. Well (20+ feet casing)
- 2. Shallow Well (less than 20 feet of casing)
- 3. Cistern
- 4. Municipal

Further comments:

WILL RUN OUT OF WATER IF DRY SUMMER DOING SPRING FEED WELL

SUPPER DISHES THEN USUALLY WILL HAVE WATER IN MORNING  
& THEN SAME AGAIN AT NIGHT HAVE TO BE CAREFULL

Use page 3 or a separate sheet of paper for additional comments.

If your water supply is from a cistern, the rest of the questions do not apply. If you have both a cistern and a well, please complete the well questionnaire (Section 2.0 or 3.0). Please let us know where your place is located either on the supplied map or the area for a sketch on the second last page of this form. Please mail the completed form back to Terra-Dynamics in the provided envelope. Thank you for your assistance.

- If you have a drilled deep well (20+ feet of casing) please complete Sections 2 & 4
- If you have a shallow well (less than 20 feet of casing), please complete Sections 3&4

### 2.0 DRILLED WELL (greater than 20 feet of casing)

How deep is your well? \_\_\_\_\_

Is your well drilled into rock? \_\_\_\_\_ What is the well casing diameter? \_\_\_\_\_

Do you know when your well was drilled? \_\_\_\_\_

Do you know the name of the well driller? \_\_\_\_\_

Do you have a well log? (i.e. a description of the geology encountered when drilling your well and if yes, can you supply a copy or write down the information in the Comments Section).

What is the use of your well water? (i.e. drinking water for house, garden irrigation, etc.)

ALL THE ABOVE (SPRING FEED)

Has your well ever run dry? IF DRY SUMMER

Do you experience problems with taste, colour or odour? (if yes, please explain).

NO

Do you have any water purification systems for your well water? (i.e. water softeners, UV Light for bacteria, Sulphur/Iron Filter for odour or staining, etc.).

GOES THROUGH MICRON 30 FILTER CARTRIDGE

Do you perform regular maintenance on your well? (i.e. pump service, silt removal, etc.)

REGULAR CLEANING OF WELL

### 3.0 SHALLOW WELL (less than 20 feet of casing)

What is the well casing material and diameter? 3' ROUND 12' DEEP CEMENT TILE

What is the expected age of the well? 30 YEARS OLD

How deep is the well? 12'

Does you utilize a jet pump or a submersible pump?

Is there problems with water quality (colour, odour, etc.)? Yes \_\_\_\_\_ No X

If yes, please explain \_\_\_\_\_

Do you have any water purification systems for your dug well water? (i.e. water softeners, UV Light for bacteria, Sulphur/Iron Filter for odour or staining, etc.).

Have you ever experienced freeze-up during the winter? NO

What is the use of your shallow dug well water? (i.e. drinking water for house, irrigation, etc.)

SPRING FEED WELL ALL THE ABOVE

Has your dug well ever run dry?

YES

Do you perform regular maintenance on your pump? (i.e. pump service, silt removal)

YES

Additional comments: \_\_\_\_\_

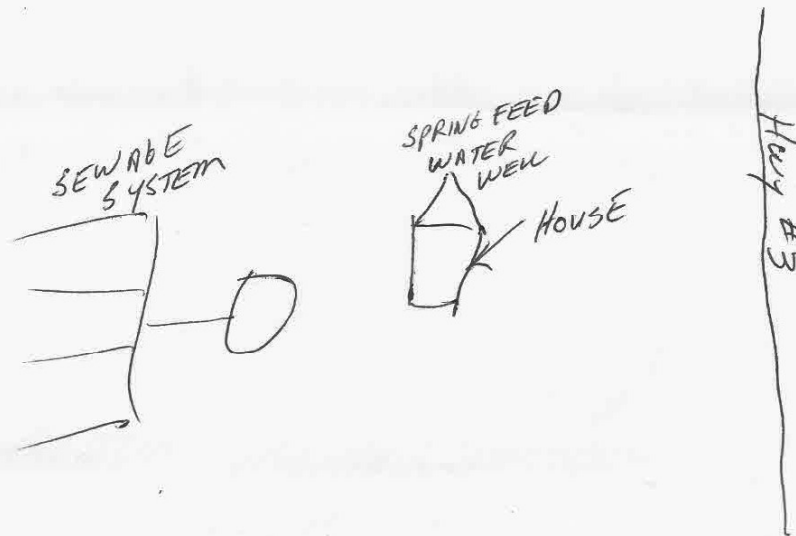
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#### 4.0 LOCATION MAP

Can you please draw a sketch map of the location of your well(s), septic tank and sewage bed on your property (please show the location relative to buildings and roads).

#### SKETCH MAP OF WELL(S) and SEWAGE SYSTEM LOCATIONS

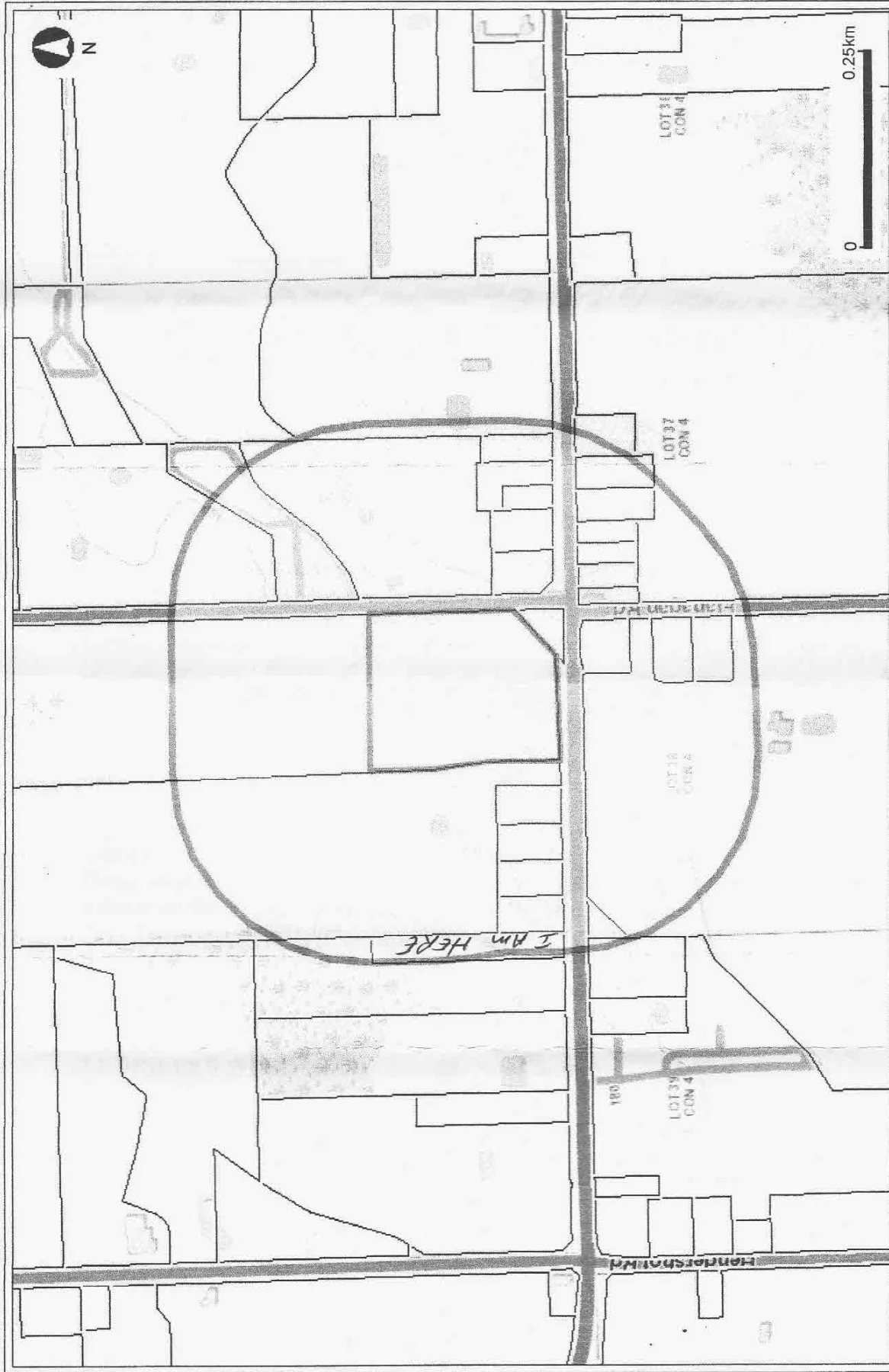


Other Comments: (Use a separate sheet, if required)

Please mail the completed form back to Terra-Dynamics in the provided envelope.  
Thank you for your help.

Jayne Campbell, P. Eng., Senior Water Resource Engineer  
432 Niagara Street, Unit 2, St. Catharines, ON L2M 4W3  
289-407-0915

# Water Well Survey



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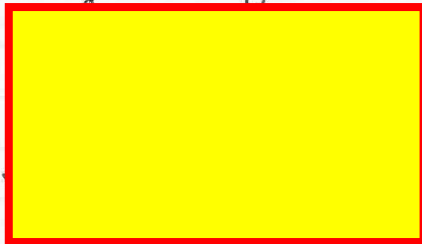
Map Created: 6/18/2021  
Map Center: 42.94405 N, -79.4719 W



THIS IS MY ONLY SOURCE OF WATER

I AM CONCERNED ABOUT THE POSSIBLE DEPLETION ON MY WATER SOURCE WITH MORE PROPOSED WELLS ALSO THE AQUIFER HERE IS CONTAMINATION AS A RESULT OF THE ISSUES WITH SOUTHLAND TRAILOR PARK THAT THE NEIGHBOURS ACROSS THE HWY ARE DEALING WITH THAT IS CURRENTLY UNDER INVESTIGATION FROM THE MINISTRY OF ENVIRONMENT

AND ALSO WITH THE SWAMP THAT IS AT THE CORNER OF ZION ROAD & HWY #3 I AM CONCERNED ABOUT SEWAGE LEAKING FROM THESE NEW SEPTIC SYSTEMS INTO THIS PROTECTED WET LANDS . 0



## **Appendix D**

### **Nitrate-Nitrogen Calculations**

**MECP D-5-4 (1996a) Nitrate-nitrogen concentration calculation**

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 1	0.52	10.0	10.9

Sewage flow 1000 L/day per lot 3-Bedroom  
 Infiltration rate 0.188 m/year  
 Nitrate effluent load 40 mg/L Class 4 Sewage System

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 1	0.52	10.0	12.4

Sewage flow 1200 L/day per lot 4-Bedroom  
 Nitrate effluent load 40 mg/L Class 4 Sewage System

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 1	0.52	10.0	13.7

Sewage flow 1400 L/day per lot 5-Bedroom  
 Nitrate effluent load 40 mg/L Class 4 Sewage System

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 1	0.52	10.0	5.4

Sewage flow 1000 L/day per lot 3-Bedroom  
 Nitrate effluent load 20 mg/L 50% Nitrogen Removal System N-I

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 1	0.52	10.0	6.2

Sewage flow 1200 L/day per lot 4-Bedroom  
 Nitrate effluent load 20 mg/L 50% Nitrogen Removal System N-I

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 1	0.52	10.0	6.9

Sewage flow 1400 L/day per lot 5-Bedroom  
 Nitrate effluent load 20 mg/L 50% Nitrogen Removal System N-I

**MECP D-5-4 (1996a) Nitrate-nitrogen concentration calculation**

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 2	0.52	10.0	11.2

Sewage flow 1000 L/day per lot 3-Bedroom  
 Infiltration rate 0.181 m/year  
 Nitrate effluent load 40 mg/L Class 4 Sewage System

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 2	0.52	10.0	12.7

Sewage flow 1200 L/day per lot 4-Bedroom  
 Nitrate effluent load 40 mg/L Class 4 Sewage System

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 2	0.52	10.0	14.1

Sewage flow 1400 L/day per lot 5-Bedroom  
 Nitrate effluent load 40 mg/L Class 4 Sewage System

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 2	0.52	10.0	5.6

Sewage flow 1000 L/day per lot 3-Bedroom  
 Nitrate effluent load 20 mg/L 50% Nitrogen Removal System N-I

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 2	0.52	10.0	6.4

Sewage flow 1200 L/day per lot 4-Bedroom  
 Nitrate effluent load 20 mg/L 50% Nitrogen Removal System N-I

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 2	0.52	10.0	7.0

Sewage flow 1400 L/day per lot 5-Bedroom  
 Nitrate effluent load 20 mg/L 50% Nitrogen Removal System N-I

**MECP D-5-4 (1996a) Nitrate-nitrogen concentration calculation**

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 3	0.50	10.0	11.6

Sewage flow 1000 L/day per lot 3-Bedroom  
 Infiltration rate 0.179 m/year  
 Nitrate effluent load 40 mg/L Class 4 Sewage System

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 3	0.50	10.0	13.1

Sewage flow 1200 L/day per lot 4-Bedroom  
 Nitrate effluent load 40 mg/L Class 4 Sewage System

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 3	0.50	10.0	14.5

Sewage flow 1400 L/day per lot 5-Bedroom  
 Nitrate effluent load 40 mg/L Class 4 Sewage System

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 3	0.50	10.0	5.8

Sewage flow 1000 L/day per lot 3-Bedroom  
 Nitrate effluent load 20 mg/L 50% Nitrogen Removal System N-I

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 3	0.50	10.0	6.6

Sewage flow 1200 L/day per lot 4-Bedroom  
 Nitrate effluent load 20 mg/L 50% Nitrogen Removal System N-I

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 3	0.50	10.0	7.3

Sewage flow 1400 L/day per lot 5-Bedroom  
 Nitrate effluent load 20 mg/L 50% Nitrogen Removal System N-I

**MECP D-5-4 (1996a) Nitrate-nitrogen concentration calculation**

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 4	0.52	10.0	11.4

Sewage flow 1000 L/day per lot 3-Bedroom  
 Infiltration rate 0.177 m/year  
 Nitrate effluent load 40 mg/L Class 4 Sewage System

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 4	0.52	10.0	12.9

Sewage flow 1200 L/day per lot 4-Bedroom  
 Nitrate effluent load 40 mg/L Class 4 Sewage System

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 4	0.52	10.0	14.3

Sewage flow 1400 L/day per lot 5-Bedroom  
 Nitrate effluent load 40 mg/L Class 4 Sewage System

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 4	0.52	10.0	5.7

Sewage flow 1000 L/day per lot 3-Bedroom  
 Nitrate effluent load 20 mg/L 50% Nitrogen Removal System N-I

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 4	0.52	10.0	6.5

Sewage flow 1200 L/day per lot 4-Bedroom  
 Nitrate effluent load 20 mg/L 50% Nitrogen Removal System N-I

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 4	0.52	10.0	7.1

Sewage flow 1400 L/day per lot 5-Bedroom  
 Nitrate effluent load 20 mg/L 50% Nitrogen Removal System N-I

**MECP D-5-4 (1996a) Nitrate-nitrogen concentration calculation**

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 5	0.66	10.0	9.9

Sewage flow **1000** L/day per lot 3-Bedroom  
 Infiltration rate **0.169** m/year  
 Nitrate effluent load **40** mg/L Class 4 Sewage System

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 5	0.66	10.0	11.3

Sewage flow **1200** L/day per lot 4-Bedroom  
 Nitrate effluent load **40** mg/L Class 4 Sewage System

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 5	0.66	10.0	12.6

Sewage flow **1400** L/day per lot 5-Bedroom  
 Nitrate effluent load **40** mg/L Class 4 Sewage System

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 5	0.66	10.0	4.9

Sewage flow **1000** L/day per lot 3-Bedroom  
 Nitrate effluent load **20** mg/L 50% Nitrogen Removal System N-I

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 5	0.66	10.0	5.6

Sewage flow **1200** L/day per lot 4-Bedroom  
 Nitrate effluent load **20** mg/L 50% Nitrogen Removal System N-I

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 5	0.66	10.0	6.3

Sewage flow **1400** L/day per lot 5-Bedroom  
 Nitrate effluent load **20** mg/L 50% Nitrogen Removal System N-I

**MECP D-5-4 (1996a) Nitrate-nitrogen concentration calculation**

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 6	0.94	10.0	8.9

Sewage flow 1000 L/day per lot 3-Bedroom  
 Infiltration rate 0.135 m/year  
 Nitrate effluent load 40 mg/L Class 4 Sewage System

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 6	0.94	10.0	10.3

Sewage flow 1200 L/day per lot 4-Bedroom  
 Nitrate effluent load 40 mg/L Class 4 Sewage System

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 6	0.94	10.0	11.5

Sewage flow 1400 L/day per lot 5-Bedroom  
 Nitrate effluent load 40 mg/L Class 4 Sewage System

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 6	0.94	10.0	4.5

Sewage flow 1000 L/day per lot 3-Bedroom  
 Nitrate effluent load 20 mg/L 50% Nitrogen Removal System N-I

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 6	0.94	10.0	5.1

Sewage flow 1200 L/day per lot 4-Bedroom  
 Nitrate effluent load 20 mg/L 50% Nitrogen Removal System N-I

Site	Dilution Area (ha)	Max Allowable Nitrate-N Criterion (mg/L)	Downgradient Nitrate-N Concentration (mg/L)
Lot 6	0.94	10.0	5.7

Sewage flow 1400 L/day per lot 5-Bedroom  
 Nitrate effluent load 20 mg/L 50% Nitrogen Removal System N-I