

**For Office Use Only:**

File Number	_____	Application Fee	_____
Related File Number	_____	Conservation Authority Fee	_____
Pre-consultation Meeting	_____	Well & Septic Info Provided	_____
Application Submitted	_____	Planner	_____
Complete Application	_____	Public Notice Sign	_____

**Check the type of planning application(s) you are submitting.**

- ☒ Consent/Severance/Boundary Adjustment  
☐ Surplus Farm Dwelling Severance and Zoning By-law Amendment  
☒ Minor Variance  
☐ Easement/Right-of-Way

**Property Assessment Roll Number:** 54202009600

**A. Applicant Information**

**Name of Owner**

Richard  
George Hiebert

It is the responsibility of the owner or applicant to notify the planner of any changes in ownership within 30 days of such a change.

Address 9411 Elgin St.  
Town and Postal Code Stratfordville, ON N0J 1Y0  
Phone Number 519-842-0964  
Cell Number 519-842-0964  
Email nick7hiebert@gmail.com

**Name of Applicant**

George Hiebert  
Address 9411 Elgin St  
Town and Postal Code Stratfordville, ON N0J 1Y0  
Phone Number 519-842-0964  
Cell Number 519-842-0964  
Email nick7hiebert@hotmail.com

Name of Agent

Address

Town and Postal Code

Phone Number

Cell Number

Email

Please specify to whom all communications should be sent. Unless otherwise directed, all correspondence and notices in respect of this application will be forwarded to the owner and agent noted above.

☒ Owner

☐ Agent

☐ Applicant

Names and addresses of any holder of any mortgagees, charges or other encumbrances on the subject lands:

**B. Location, Legal Description and Property Information**

1. Legal Description (include Geographic Township, Concession Number, Lot Number, Block Number and Urban Area or Hamlet):

Lot 13 Concession 14 Township of North Walsingham  
Norfolk County

Municipal Civic Address: 1019 Norfolk County Rd. 21

Present Official Plan Designation(s): \_\_\_\_\_

Present Zoning: Hamlet Residential

2. Is there a special provision or site specific zone on the subject lands?

☐ Yes ☒ No If yes, please specify:

3. Present use of the subject lands:

Vacant land

4. Please describe **all existing** buildings or structures on the subject lands and whether they are to be retained, demolished or removed. If retaining the buildings or structures, please describe the type of buildings or structures, and illustrate the setback, in metric units, from front, rear and side lot lines, ground floor area, gross floor area, lot coverage, number of storeys, width, length, and height on your attached sketch which must be included with your application:

Vacant land

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5. If an addition to an existing building is being proposed, please explain what it will be used for (for example a bedroom, kitchen, or bathroom). If new fixtures are proposed, please describe.

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6. Please describe **all proposed** buildings or structures/additions on the subject lands. Describe the type of buildings or structures/additions, and illustrate the setback, in metric units, from front, rear and side lot lines, ground floor area, gross floor area, lot coverage, number of storeys, width, length, and height on your attached sketch which must be included with your application:

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7. Are any existing buildings on the subject lands designated under the *Ontario Heritage Act* as being architecturally and/or historically significant? Yes ☐ No ☒

If yes, identify and provide details of the building:

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8. If known, the length of time the existing uses have continued on the subject lands:

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9. Existing use of abutting properties:

Residential houses

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10. Are there any easements or restrictive covenants affecting the subject lands?

☐ Yes ☒ No If yes, describe the easement or restrictive covenant and its effect:

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Severed

### C. Purpose of Development Application

Note: Please complete all that apply. Failure to complete this section will result in an incomplete application.

#### 1. Site Information (Please refer to Zoning By-law to confirm permitted dimensions)

	Existing	Permitted	Provision	Proposed	Deficiency
Lot frontage	30.785M	30M			
Lot depth	63.739M				
Lot width	30.785M	30M			
Lot area	1962.465	0.4 Hec.			
Lot coverage					
Front yard					
Rear yard					
Height					
Left Interior side yard					
Right Interior side yard					
Exterior side yard (corner lot)					
Parking Spaces (number)					
Aisle width					
Stall size					
Loading Spaces					
Other					



Retained

### C. Purpose of Development Application

Note: Please complete all that apply. **Failure to complete this section will result in an incomplete application.**

#### 1. Site Information (Please refer to Zoning By-law to confirm permitted dimensions)

	Existing	Permitted	Provision	Proposed	Deficiency
Lot frontage	30.785 M	30 M			
Lot depth	63.734 M				
Lot width	30.785 M	30 M			
Lot area	1961.085	0.4 Hec.			
Lot coverage					
Front yard					
Rear yard					
Height					
Left Interior side yard					
Right Interior side yard					
Exterior side yard (corner lot)					
Parking Spaces (number)					
Aisle width					
Stall size					
Loading Spaces					
Other					

2. Please explain why it is not possible to comply with the provision(s) of the Zoning By-law:

Deficient in Lot Area

3. **Consent/Severance/Boundary Adjustment:** Description of land intended to be severed in metric units:

Frontage: ~~30.661 M~~ 30.785 M

Depth: 63.739 M

Width: 30.785 M

Lot Area: 1962.465 sq/M

Present Use: Vacant Land

Proposed Use: Residential Build

Proposed final lot size (if boundary adjustment): \_\_\_\_\_

If a boundary adjustment, identify the assessment roll number and property owner of the lands to which the parcel will be added: \_\_\_\_\_

Description of land intended to be retained in metric units:

Frontage: 30.785 M

Depth: 63.734 M

Width: 30.785 M

Lot Area: 1961.085 M

Present Use: Vacant Land

Proposed Use: Residential Build

Buildings on retained land: New Construction House currently being built on it

4. **Easement/Right-of-Way:** Description of proposed right-of-way/easement in metric units:

Frontage: \_\_\_\_\_

Depth: \_\_\_\_\_

Width: \_\_\_\_\_  
Area: \_\_\_\_\_  
Proposed Use: \_\_\_\_\_

**5. Surplus Farm Dwelling Severances Only:** List all properties in Norfolk County, which are owned and farmed by the applicant and involved in the farm operation

Owners Name: \_\_\_\_\_  
Roll Number: \_\_\_\_\_  
Total Acreage: \_\_\_\_\_  
Workable Acreage: \_\_\_\_\_  
Existing Farm Type: (for example: corn, orchard, livestock) \_\_\_\_\_  
Dwelling Present?: ☐ Yes ☐ No If yes, year dwelling built \_\_\_\_\_  
Date of Land Purchase: \_\_\_\_\_

Owners Name: \_\_\_\_\_  
Roll Number: \_\_\_\_\_  
Total Acreage: \_\_\_\_\_  
Workable Acreage: \_\_\_\_\_  
Existing Farm Type: (for example: corn, orchard, livestock) \_\_\_\_\_  
Dwelling Present?: ☐ Yes ☐ No If yes, year dwelling built \_\_\_\_\_  
Date of Land Purchase: \_\_\_\_\_

Owners Name: \_\_\_\_\_  
Roll Number: \_\_\_\_\_  
Total Acreage: \_\_\_\_\_  
Workable Acreage: \_\_\_\_\_  
Existing Farm Type: (for example: corn, orchard, livestock) \_\_\_\_\_  
Dwelling Present?: ☐ Yes ☐ No If yes, year dwelling built \_\_\_\_\_  
Date of Land Purchase: \_\_\_\_\_

Owners Name: \_\_\_\_\_  
Roll Number: \_\_\_\_\_  
Total Acreage: \_\_\_\_\_  
Workable Acreage: \_\_\_\_\_  
Existing Farm Type: (for example: corn, orchard, livestock) \_\_\_\_\_  
Dwelling Present?: ☐ Yes ☐ No If yes, year dwelling built \_\_\_\_\_  
Date of Land Purchase: \_\_\_\_\_

Owners Name: \_\_\_\_\_  
Roll Number: \_\_\_\_\_  
Total Acreage: \_\_\_\_\_  
Workable Acreage: \_\_\_\_\_  
Existing Farm Type: (for example: corn, orchard, livestock) \_\_\_\_\_  
Dwelling Present?: ☐ Yes ☐ No If yes, year dwelling built \_\_\_\_\_  
Date of Land Purchase: \_\_\_\_\_

**Note: If additional space is needed please attach a separate sheet.**

**D. All Applications: Previous Use of the Property**

1. Has there been an industrial or commercial use on the subject lands or adjacent lands? ☐ Yes ☒ No ☐ Unknown

If yes, specify the uses (for example: gas station, or petroleum storage):

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

2. Is there reason to believe the subject lands may have been contaminated by former uses on the site or adjacent sites? ☐ Yes ☒ No ☐ Unknown

3. Provide the information you used to determine the answers to the above questions:

*Property owner information*



4. If you answered yes to any of the above questions in Section D, a previous use inventory showing all known former uses of the subject lands, or if appropriate, the adjacent lands, is needed. Is the previous use inventory attached? ☐ Yes ☐ No

**E. All Applications: Provincial Policy**

1. Is the requested amendment consistent with the provincial policy statements issued under subsection 3(1) of the *Planning Act*, R.S.O. 1990, c. P. 13? ☒ Yes ☐ No

If no, please explain:

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2. It is owner's responsibility to be aware of and comply with all relevant federal or provincial legislation, municipal by-laws or other agency approvals, including the Endangered Species Act, 2007. Have the subject lands been screened to ensure that development or site alteration will not have any impact on the habitat for endangered or threatened species further to the provincial policy statement subsection 2.1.7? ☒ Yes ☐ No

If no, please explain:

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3. Have the subject lands been screened to ensure that development or site alteration will not have any impact on source water protection? ☒ Yes ☐ No

If no, please explain:

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Note: If in an area of source water Wellhead Protection Area (WHPA) A, B or C please attach relevant information and approved mitigation measures from the Risk Manager Official.

4. All Applications: Are any of the following uses or features on the subject lands or within 500 metres of the subject lands, unless otherwise specified? Please check boxes, if applicable.

**Livestock facility or stockyard** (submit MDS Calculation with application)

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Wooded area**

☒ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Municipal Landfill**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Sewage treatment plant or waste stabilization plant**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Provincially significant wetland (class 1, 2 or 3) or other environmental feature**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Floodplain**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Rehabilitated mine site**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Non-operating mine site within one kilometre**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Active mine site within one kilometre**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Industrial or commercial use (specify the use(s))**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Active railway line**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Seasonal wetness of lands**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Erosion**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Abandoned gas wells**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

## F. All Applications: Servicing and Access

1. Indicate what services are available or proposed:

### Water Supply

☐ Municipal piped water

☐ Communal wells

☒ Individual wells

☐ Other (describe below)

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### Sewage Treatment

☐ Municipal sewers

☐ Communal system

☒ Septic tank and tile bed in good working order

☐ Other (describe below)

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### Storm Drainage

☐ Storm sewers

☒ Open ditches

☐ Other (describe below)

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2. Existing or proposed access to subject lands:

☒ Municipal road

☐ Provincial highway

☐ Unopened road

☐ Other (describe below)

Name of road/street:

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## G. All Applications: Other Information

1. Does the application involve a local business? ☐ Yes ☒ No

If yes, how many people are employed on the subject lands?

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2. Is there any other information that you think may be useful in the review of this application? If so, explain below or attach on a separate page.

## H. Supporting Material to be submitted by Applicant

In order for your application to be considered complete, folded hard copies (number of paper copies as directed by the planner) and an **electronic version (PDF) of the site plan drawings, additional plans, studies and reports** will be required, including but not limited to the following details:

1. Concept/Layout Plan
2. All measurements in metric
3. Existing and proposed easements and right of ways
4. Parking space totals – required and proposed
5. All dimensions of the subject lands
6. Dimensions and setbacks of all buildings and structures
7. Location and setbacks of septic system and well from all existing and proposed lot lines, and all existing and proposed structures
8. Names of adjacent streets
9. Natural features, watercourses and trees

In addition, the following additional plans, studies and reports, including but not limited to, **may** also be required as part of the complete application submission:

- ☐ On-Site Sewage Disposal System Evaluation Form (to verify location and condition)
- ☐ Environmental Impact Study
- ☒ Geotechnical Study / Hydrogeological Review
- ☐ Minimum Distance Separation Schedule
- ☐ Record of Site Condition

Your development approval might also be dependent on Ministry of Environment Conservation and Parks, Ministry of Transportation or other relevant federal or provincial legislation, municipal by-laws or other agency approvals.

**All final plans must include the owner's signature as well as the engineer's signature and seal.**



## I. Transfers, Easements and Postponement of Interest

The owner acknowledges and agrees that if required it is their solicitor's responsibility on behalf of the owner for the registration of all transfer(s) of land to the County, and/or transfer(s) of easement in favour of the County and/or utilities. Also, the owner further acknowledges and agrees that it is their solicitor's responsibility on behalf of the owner for the registration of postponements of any charges in favour of the County.

### Permission to Enter Subject Lands

Permission is hereby granted to Norfolk County officers, employees or agents, to enter the premises subject to this application for the purposes of making inspections associated with this application, during normal and reasonable working hours.

### Freedom of Information

For the purposes of the *Municipal Freedom of Information and Protection of Privacy Act*, I authorize and consent to the use by or the disclosure to any person or public body any information that is collected under the authority of the *Planning Act*, R.S.O. 1990, c. P. 13 for the purposes of processing this application.

Richard George Hickert

Owner/Applicant/Agent Signature

Sept 11, 2024

Date

## J. Owner's Authorization

If the applicant/agent is not the registered owner of the lands that is the subject of this application, the owner must complete the authorization set out below.

I/We Richard George Hickert am/are the registered owner(s) of the lands that is the subject of this application.

I/We authorize Richard George Hickert to make this application on my/our behalf and to provide any of my/our personal information necessary for the processing of this application. Moreover, this shall be your good and sufficient authorization for so doing.

[Signature]

Owner

Sept 11, 2024

Date

\_\_\_\_\_  
Owner

\_\_\_\_\_  
Date

**\*Note:** If property is owned by an Ontario Ltd. Corporation, Articles of Incorporation are required to be attached to the application.

Girhard Hiebert

**K. Declaration**

I, ~~George Hiebert~~ of Stratfordville

solemnly declare that:

all of the above statements and the statements contained in all of the exhibits transmitted herewith are true and I make this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath and by virtue of *The Canada Evidence Act*.

Declared before me at:

Smncee

AW: [Signature]

Owner/Applicant/Agent Signature

In Norfolk

[Signature]

This 11 day of sept

A.D., 2024

John Andrew Vreelace, a  
Commissioner, etc., Province of Ontario,  
for the Corporation of Norfolk County.  
Expires January 16, 2027.

[Signature]

A Commissioner, etc.

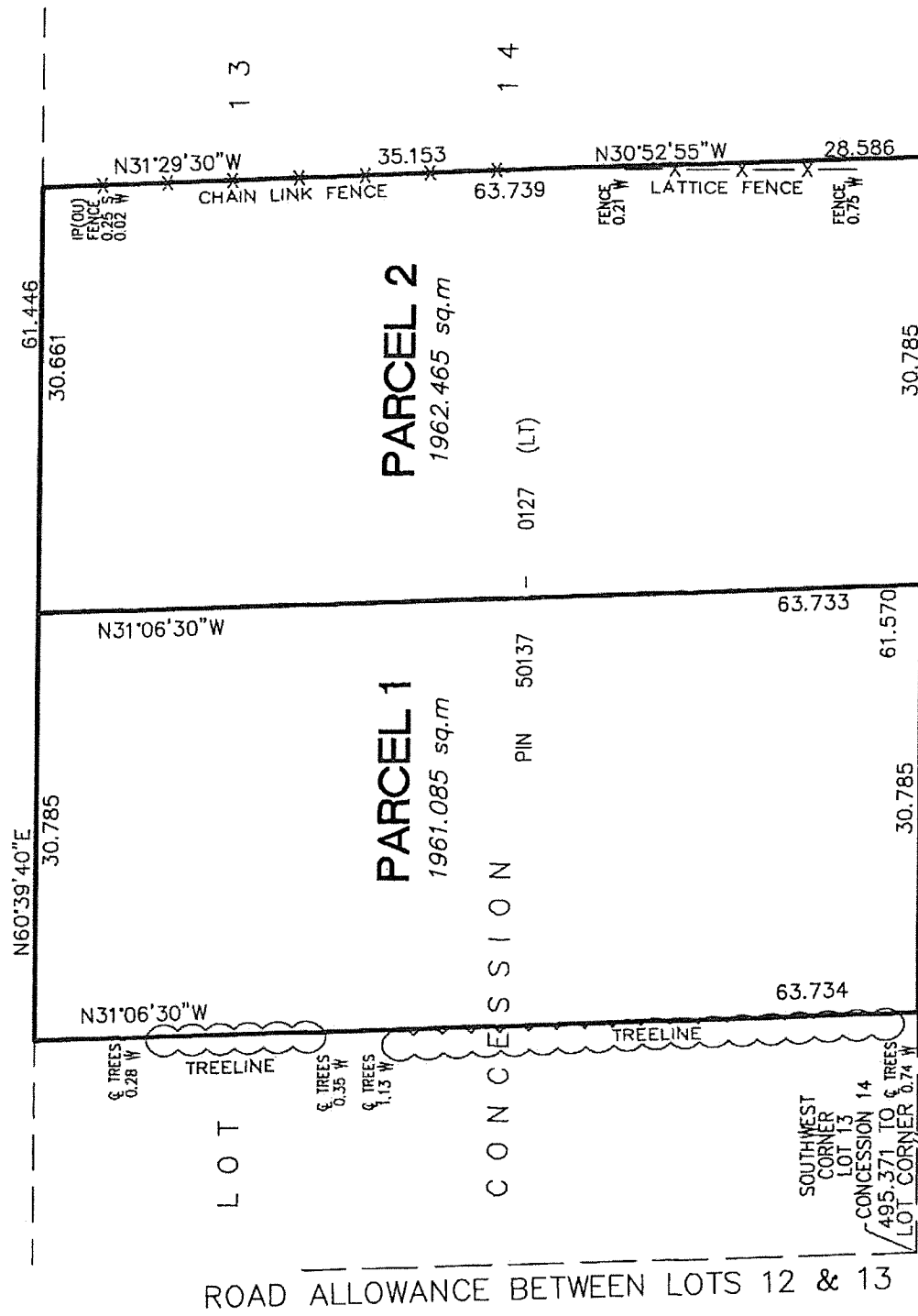
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SKETCH FOR  
SEVERANCE APPLICATION  
OF PART OF  
LOT 13, CONCESSION 14  
IN THE GEOGRAPHIC  
TOWNSHIP OF NORTH WALSHINGHAM  
IN  
NORFOLK COUNTY

SCALE: 1 : 500  
JEWITT AND DIXON LTD.  
MAY 17, 2024



NORFOLK COUNTY ROAD 21  
(20.117m WIDE - ROAD ALLOWANCE BETWEEN CONCESSIONS 13 & 14)

NOTE:

THIS PLAN IS IN METRIC AND CAN BE CONVERTED TO IMPERIAL BY MULTIPLYING BY 3.2808

CAUTION:

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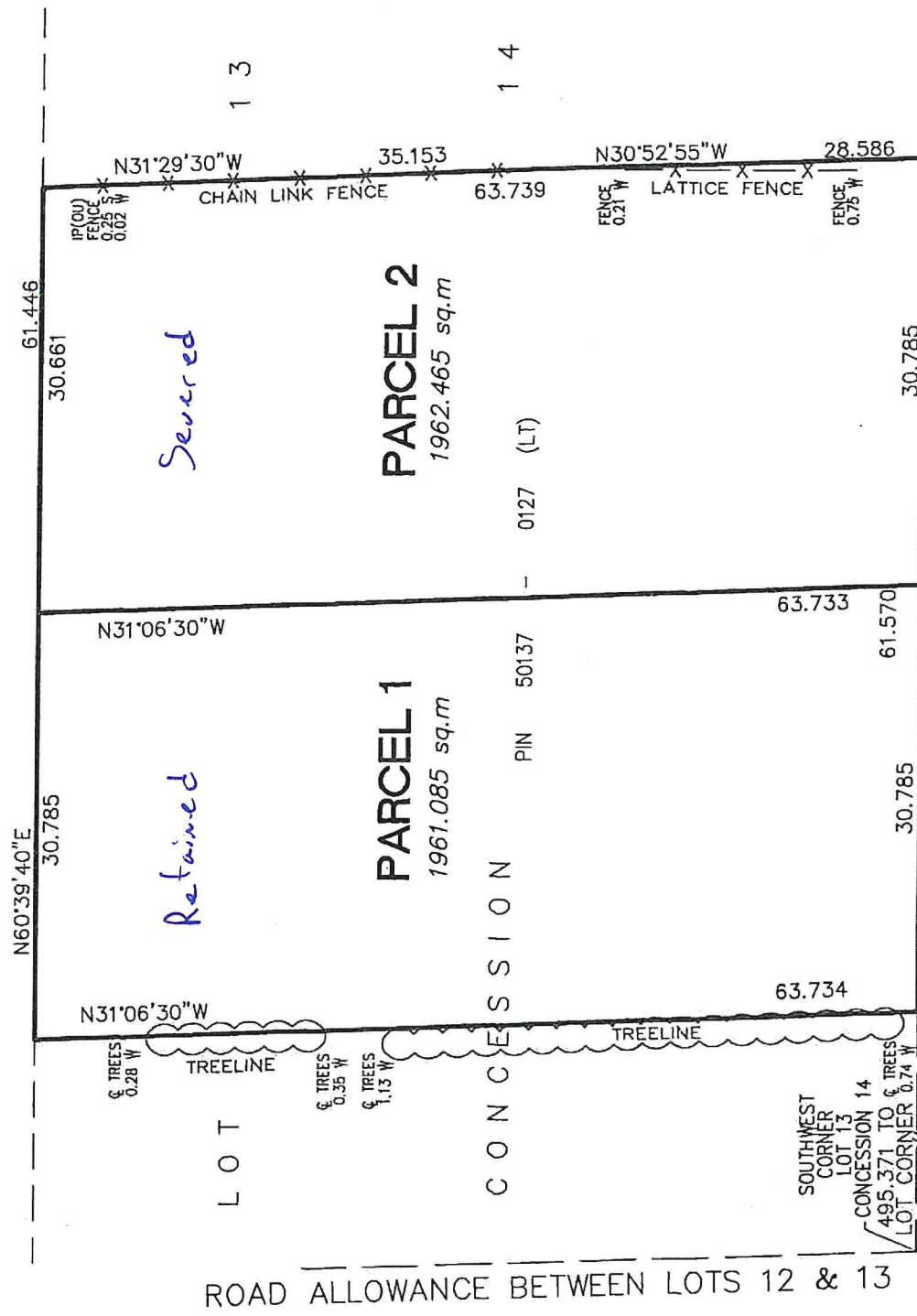
650 IRELAND ROAD, SIMCOE, ONTARIO, N3Y 4K2

PHONE: (519) 426-0842  
E-mail: info@jewittanddixon.com

JOB # 24-4039 CLIENT: HIEBERT

SKETCH FOR  
SEVERANCE APPLICATION  
OF PART OF  
LOT 13, CONCESSION 14  
IN THE GEOGRAPHIC  
TOWNSHIP OF NORTH WALSHINGHAM  
IN  
NORFOLK COUNTY

SCALE: 1 : 500  
JEWITT AND DIXON LTD.  
MAY 17, 2024



NORFOLK COUNTY ROAD 21  
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**ONTARIO LAND SURVEYORS**

650 IRELAND ROAD, SIMCOE, ONTARIO, N3Y 4K2

PHONE: (519) 426-0842  
E-mail: [info@jewittdixon.com](mailto:info@jewittdixon.com)

JOB # 24-4039 CLIENT: HIEBERT



September 10, 2024

**Mr. Nick Hiebert**  
158B concession St West, Tillsonburg

**Subject: Hydrogeological Study for Water Supply Well and Septic System Services**  
Part of Lot 13, Concession 14, Township of North Walsingham, Norfolk County, Ontario  
Englobe reference: 02405890.000

## 1. Introduction

Englobe Corp. (Englobe) was retained by Mr. Nick Hiebert ("the Client") to conduct a hydrogeological study at Part of Lot 13, Concession 14, Township of North Walsingham, Norfolk County, Ontario and municipally addressed 1019 Norfolk County Road 21 (referred to herein-as the "Site"). It is Englobe's understanding that the Site, is currently undeveloped, with no buildings or servicing. Englobe understands that it is the ultimate intention to sever the Site into two separate Parcels, and that each Parcel will be serviced with a water supply well (consisting of a sand-point well) and septic system. The work was carried out in accordance with Englobe's proposal dated June 4<sup>th</sup>, 2024 (Ref.: P2405890.000) and authorized by the Client on July 3<sup>rd</sup>, 2024.

The hydrogeological study was completed following the general approach and methodology provided within the Ontario Ministry of the Environment, Conservation and Parks (MECP) documents D-5-4 *Individual On-Site Sewer Systems: Water Quality Risk Assessment* and D-5-5 *Private Wells: Water Supply Assessment*. Englobe notes however that the above-noted document is applicable to developments with more than five on-site sewage systems, and not all components of this document are intended for single-unit sewage systems.

This letter report has been prepared specifically and solely for the project described herein. It presents the factual results of the field investigation and provides estimates of the observed percolation rates at the tested locations.

### 1.1 Site Description

A summary of the Site details is presented in the following table.

**Table 1-1: Site description**

Site Information	
Existing Site Area	3,924 m <sup>2</sup> in total area: Parcel 1 (approximately 1,961.085 m <sup>2</sup> ), and Parcel 2 (approximately 1,962.465 m <sup>2</sup> ).
Municipal Address	Part of Lot 13, Concession 14, Township of North Walsingham, Norfolk County, Ontario
Geodetic Coordinates to Centroid (approx.)	UTM 533618.52 m E, 4 533618.52 m N 1984 World Geodetic System datum

**Notes:**

UTM - Universal Transverse Mercator

Zoning Map Source: <https://maps.kitchener.ca/OnPointExternal/RMap/Default.aspx#>

The Site is rectangular in shape and approximately 3,924 m<sup>2</sup> in area. The Site is currently undeveloped/vacant. Surrounding land uses consist of the following:

- North: Agricultural properties;
- East: : Residential and agricultural properties;
- South: Norfolk City Road 21 followed by residential and agricultural properties; and
- West: Residential and agricultural properties.

A Site Location Map is provided in **Figure 1** in **Appendix A**.

## 2. Methodology

Englobe completed work at the Site in July 2024 to evaluate whether the severed parcels can be appropriately serviced with a septic systems and potable water wells. The scope of work included collecting soil samples for laboratory analysis of grain size, completing an in-situ percolation tests, and collecting one groundwater sample from a previously installed monitoring well. The following sections further describe the methodologies or procedures applied to carry out these key tasks.

### 2.1 Test Pitting Program

On July 17, 2024, as part of the percolation testing field investigation, the Client provided an excavator to advance three (3) test pits from the existing ground surface to their respective termination depths. The test pits were designated TP24-1, TP24-2 and TP24-3, and were advanced within the contemplated location(s) of septic fields. The test pits were advanced to approximately 3.0 mbgs to view soil stratigraphy and permit percolation rate testing at selected depths below ground.

The approximate locations of the test pits are presented on the attached Test Pit and Potable Water Well Location Plan in **Figure 2** in **Appendix A**. Test pit logs are presented in **Appendix B**.

### 2.2 In-Situ Percolation Rate Testing

On July 17, 2024, Englobe completed *in-situ* percolation rate tests within soils at depths of approximately 1.0 m at the location of TP24-1 and TP24-2. In general, Englobe followed the following procedure during the completion of the percolation test:

- A cylindrical hole was dug at the target depths within the test pit to a depth of approximately 0.3 m and with a diameter of approximately 0.1 m;
- Smeared soils were removed from the walls and floor of the hole;
- A ruler was installed at the bottom of the hole;
- The hole was saturated with water by twice filling the hole with distilled water and allowing a portion of the water to percolate into the soils;
- The hole was refilled with distilled water to a measured depth, then allowed to fully percolate into the soils, while measuring water levels at set time intervals during the test.



## 2.3 Test Well Installation

On July 13, 2024, the Client retained the services of Water Mining Inc., a licensed well contractor, to advance two (2) domestic water supply wells at the Site. For the purposes of the report, the potable water well with well tag number A409223 is designated “PW-1” and the potable water well with well tag number A370019 is designated “PW-2”.

The potable water wells were installed within a water-bearing overburden aquifer consisting primarily of sand, and screened from depths ranging from approximately 6.1 to 8.2 metre below ground surface (mbgs). The well construction information for the potable water wells is included within the Ontario Regulation 903 water well records, included within **Appendix B**.

## 2.4 Aquifer Testing and Groundwater Sampling Program

To assess the quantity and quality of groundwater available from the aquifer intercepting the well screening, the two potable water wells were subjected to a constant rate pumping test for six (6) hours on July 23 and July 24, 2024. The constant rate pumping test was conducted using centrifugal well pumps installed by the licensed well contractor.

The pumping tests were initiated with a static water levels and was performed at a fixed pumping rate. During the pumping test, water well measurements were electronically recovered via pressure transducer installed within the pumping wells to measure drawdown of the water level in the test wells in response to pumping. Immediately following the pumping test, water level recovery was monitoring in the test wells until static water levels were reached.

Groundwater pumped during the tests was discharged to a down-gradient location to ensure that artificial recharge did not occur.

Pumping test details are provided in Table 2-1.

**Table 2-1: Pumping Test Program Details**

Pumping Well	Well Depth (mbgs)	Water Found Depths (mbgs)	Pumping Rate (L/min)	Static Water Level (mbgs)
PW-1 (A409223)	7.6	6.1	30	3.42
PW-2 (A370019)	8.2	6.4	30	3.60

A total of two (2) groundwater samples were collected at 3-hour and 6-hour marks from the end of the discharge hose. The groundwater samples were submitted to ALS Environment (ALS) in Waterloo, Ontario for analysis of general water potability parameters (inorganics, general chemistry, nutrients, metals, and microbiological parameters).

### 3. Results and Discussions

#### 3.1 Soil Stratigraphy and Hydrogeology

At the time of the test pit program, the Site had been cleared and graded in anticipation of construction activities. The soil stratigraphy observed at each test pit location consisted of:

- Coarse brown sand from the ground surface to the final termination depth of the test pits at approximately 3 mbgs.

Based on the MECP well records for the two installed test wells, the soil stratigraphy encountered during the advancements of these wells consisted of:

- Sand from the ground surface to final termination depths of the wells, ranging from 7.6 to 8.2 mbgs. The sand transitioned from brown to grey at approximately 6.1 to 6.4 mbgs, indicating the presence of groundwater.

#### 3.2 Percolation Rate Test and Hydraulic Conductivity Results

A summary of the results of the percolation rate testing completed at the Site are provided in **Table 3-1**.

**Table 3-1 Summary of Percolation Rate Test Results**

Measurements	Start Depth of Water (cm)	End Depth of Water (cm)	Start Time (min)	End Time (min)	Perc test result (min/cm)
1	28	1	0.0	22	1.2
2	26	0	0.0	18.5	1.4

The complete soil percolation test results are provided in **Appendix C**.

#### 3.3 Pumping Test Results

The pumping test program results for PW-1 and PW-2 are summarized in Table 3-2.

**Table 3-2 Pumping Test Program Results**

Pumping Well	Test Date	Target Pumping Rate (L/min)	Pumping Duration (min)	Static Water Level (mbgs)	Available Drawdown (m)	Steady State Drawdown (m)	Steady State Percent Drawdown (%)	Time to 95% Recovery (min)
PW-1 (A409223)	2024-07-23	30	360	3.42	4.18	2.3	55	< 1.5

Pumping Well	Test Date	Target Pumping Rate (L/min)	Pumping Duration (min)	Static Water Level (mbgs)	Available Drawdown (m)	Steady State Drawdown (m)	Steady State Percent Drawdown (%)	Time to 95% Recovery (min)
PW-2 (A370019)	2024-07-24	30	300	3.60	4.6	2.0	43	< 1

Within PW-1, a pseudo-steady state drawdown was achieved after approximately 30 minutes of pumping. Minor variations in the drawdown were encountered until approximately minute 270 of pumping, when a pump failure resulted in the cessation of pumping. Following the pumping failure, water levels recovered to approximately the static water level within approximately 1.5 minutes. Upon repair and restarting of the pump, a similar static water level was reached within approximately 1 minute. At the cessation of all pumping activities, the well recovered to static within approximately 1.5 minutes.

Within PW-2, a pseudo-steady state drawdown was achieved after approximately 50 minutes of pumping. Minor variations in the drawdown were encountered until the cessation of pumping activities at minute 300. The well recovered to static within approximately 1 minute of the cessation of pumping activities.

As part of the Well Yield Testing completed by Water Mining Inc., PW-1 was pumped at a rate of 34 L/min (9 gallons/min) and PW-2 was pumped at a rate of 42 L/min (11 gallons/min), each for a period of 1-hour. A well production rate of 34 L/min and 42 L/min was noted by Water Mining Inc. for PW-1 and PW-2, respectively.

Based on the noted soil stratigraphy and pumping test results, both PW-1 and PW-2 are situated within a highly productive overburden sand aquifer and are capable of sustaining well production rates greater than 30 L/min.

The MECP document D-5-5 *Private Wells: Water Supply Assessment* notes that a minimum of 13.7 L/min well production rate is required for a four bedroom dwelling. PW-1 and PW-2 have demonstrated the capability of well production rates in excess of the required 13.7 L/min.

Based on the above information, there are no apparent issues related to well quantity or interference associated with the proposed severance.

### 3.4 Groundwater Quality

A total of two (2) groundwater samples were collected at 3-hour and approximately 6-hour marks from the end of the discharge hose from each well. The groundwater samples were submitted to ALS Environment (ALS) in Waterloo, Ontario for analysis of general water potability parameters (inorganics, general chemistry, nutrients, metals, and microbiological parameters).

- **DW1-1:** Collected from PW-1 at 3 hours;
- **DW1-2:** Collected from PW-2 prior to cessation of pumping;
- **DW2-1:** Collected from PW-2 at 3 hours; and,

- **DW2-2:** Collected from PW2 prior to cessation of pumping.

Groundwater sampling results were compared to the standards and objectives specified in the Ontario Drinking Water Quality Standards (ODWQS) (MECP, 2006) and the maximum treatability limits included in the MECP Procedure D-5-5. Analytical summary tables for the collected groundwater samples are provided in **Appendix D** and laboratory certificates of analysis are provided in Appendix E.

Based on the laboratory analytical results, the following parameters exceeded the health-based Schedule 1 (Microbial) and/or Schedule 2 (Chemical) standards of the ODWQS:

- **Total Coliforms: ODWQS of non-detectable.**

- **DW1-2:** 1 MPN/100 mL;
- **DW2-1:** 21 MPN/100 mL; and,
- **DW2-2:** 53 MPN/100 mL

Based on the laboratory analytical results, the following parameters exceeded the aesthetic objectives (AO) and/or operational guidelines (OG) within the ODWQS:

- **Chloride: ODWQS of 250 mg/L as an Aesthetic Objective.**

- DW1-1: 440 mg/L;
- DW1-2: 388 mg/L;
- DW2-1: 378 mg/L; and,
- DW2-2: 344 mg/L.

- **Hardness: ODWQS of 80 – 100 mg/L as an Operational Guideline.**

- DW1-1: 287 mg/L;
- DW1-2: 276 mg/L;
- DW2-1: 211 mg/L; and,
- DW2-2: 216 mg/L.

- **Total Dissolved Solids: ODWQS of 500 mg/L as an Aesthetic Objective.**

- DW1-1: 960 mg/L;
- DW1-2: 978 mg/L;
- DW2-1: 945 mg/L; and,
- DW2-2: 873 mg/L.

- **Total Sodium: ODWQS of 200 mg/L as an Aesthetic Objective.**

- DW1-1: 260 mg/L;
- DW1-2: 250 mg/L;
- DW2-1: 289 mg/L; and,
- DW2-2: 266 mg/L.

Discussions on the above-noted results are provided below:

- **Total Coliforms:** It is recommended that resampling of the wells for total coliforms is completed. If the resample results show detectable total coliform values, then the steps outlined within the MECP's information page on bacteria-contaminated wells (<https://www.ontario.ca/page/what-do-if-your-well-contaminated-bacteria>) should be followed. Note that the well is currently a test hole and not an active water supply well.
- **Chloride:** Higher than normal levels of chloride (>250 mg/L) in water would likely cause corrosion and shorten the life of plumbing and piping associated with the treatment system (AWWA, 2010). Chloride concentrations in groundwater ranged from 378 - 440 mg/L. The reported concentration of chloride in groundwater exceeded the objective level and treatability limit of 250 mg/L indicating the potential for corrosion. The most common water treatment systems for reducing the chloride content of drinking water are reverse osmosis, anion exchange, or distillation treatment systems.
- **Hardness (as CaCO<sub>3</sub>):** Hardness in groundwater samples varied from 211 - 287 mg/L. Reported concentrations of hardness exceeded the operational guideline value range of 80 to 100 mg/L. The degree of hardness of water may be classified in terms of its calcium carbonate concentration as follows: soft, 0 to <60 mg/L; medium-hard, 60 to <120 mg/L; hard, 120 to <180 mg/L; and very hard, 180 mg/L and above (AWWA, 2010). Groundwater samples indicate that the water is very hard. When the water with relatively high hardness is heated, excessive scaling of water pipes and valves can result. A water softener treatment may be utilized to lower the level of hardness. It should be noted that a water softener using sodium-based brine could result in elevated levels of sodium in the water supply.
- **Sodium:** Sodium was detected at concentrations varying from 250 - 289 mg/L and above the sodium notification limits and aesthetic objectives. Under the Safe Drinking Water Act, the Ontario Drinking Water Systems Regulation (170/03 as amended) requires that a report be made to the local Medical Officer(s) of Health if a sodium result exceeds 20 mg/L in a sample of drinking water. The MECP guideline D-5-5 requires that warning clauses should be addressed to people on sodium-restricted diets and should be registered on the property title. Also, if water softening is utilized to reduce hardness, a warning should be registered on the title with the recommendation that a separate tap, which bypasses the softener, be installed to supply unsoftened drinking water. Sodium in the groundwater supply can be reduced by employing water treatment systems such as reverse osmosis and ion exchange.
- **Nitrate and Nitrite (as N):** Nitrate was detected in groundwater at concentrations ranging from 1.31 - 2.24 mg/L, while nitrite was measured below the laboratory reportable detection limit (< 0.0050 mg/L). The maximum acceptable concentration of nitrates in drinking water is 10 mg/L as nitrogen. Nitrates are present in water (particularly groundwater) because of the decay of plant or animal material, the use of agricultural contamination, or geological formations containing soluble nitrogen compounds.

## 4. Evaluation of Subsurface Sewage

The two severed lots are anticipated to be serviced by new on-site septic systems.

The MECP Procedure D-5-4 provides an approach for evaluating the potential impact of on-site sewage system on the underlying water supply aquifer through a nitrate attenuation approach. For this approach, the following assumptions and results were utilized:

- It is inferred that the shallow groundwater direction is towards Deer Creek, located south of the Site and the planned septic systems will be located in an area outside of the 100-year flood.
- The highest nitrate concentration measured (2.24 mg/L) was utilized;
- The Site's post-development infiltration rate was estimated to be 276 mm/yr, based on the value for fine sand and urban lawns from Table 3.1 of the Ontario Ministry of the Environment, "Stormwater Management Planning and Design Manual" (2003);
- It was assumed that a total of 2,000 L/day/lot of sewage would be produced, based on a 4 bedroom dwelling as listed within Table 8.2.1.3.A, "Residential Occupancy" of the Ontario Building Code.
- The nitrate input is estimated as  $2.9 \times 10^7$  mg/year (2,000 L/day x 40 mg/L x 365 days/year).
- The area of each lot is approximately 1,962 m<sup>2</sup> based on the Plan of Survey.

Based on the above assumptions and results, the maximum nitrate concentrations are calculated using the following equation:

$$C_{Max,N} = C_{0,N} + \frac{I_N}{IR \times A + V_{SD}}$$

Where,

$C_{Max,N}$  = Maximum Nitrate Concentration (mg/L)

$C_{0,N}$  = Initial Nitrate Concentration (mg/L) = 2.24 mg/L

$I_N$  = Nitrate Input (mg/year) =  $2.9 \times 10^7$  mg/year

$IR$  = Infiltration Rate (m/year) = 0.276 m/year

$A$  = Lot Area (m<sup>2</sup>) = 1,962 m<sup>2</sup>

$V_{SD}$  = Volume of Sewage Dilution = 1,000 L/day = 197 m<sup>3</sup>/year

Based on the above calculation, the maximum nitrate concentration in the aquifer was calculated to be 57.2 mg/L.

The maximum nitrate concentration was calculated to be greater than the maximum acceptable concentration of 10 mg/L of nitrates, and therefore a Class 4 sewage system (i.e. leaching bed system) is not supported for the Site without the inclusion of a treatment unit within the system as specified within the Ontario Building Code to reduce effluent concentrations of nitrates leaving the system.

## 5. Conclusions and Recommendations

Based on the preceding discussion and findings, Englobe offers the following conclusions and recommendations.



## 5.1 Conclusions

- Test pit investigations indicate that the soils at the Site generally consist of sands.
- Percolation rates at the Site were measured ranging from 1.2 to 1.4 min/cm, indicating relatively fast percolating soils;
- Well yield testing indicated that each installed pumping well is capable of sustaining well production rates greater than 30 L/min, which indicates a suitable available groundwater quantity for the proposed severance;
- Total coliforms were identified at each pump well location;
- The maximum nitrate concentration within the underlying aquifer was calculated to be 57.2 mg/L, which is greater than the acceptable concentration of 10 mg/L of nitrates, and therefore a Class 4 sewage system (i.e. leaching bed system) is not supported for the Site without the inclusion of a treatment unit within the system as specified within the Ontario Building Code to reduce effluent concentrations of nitrates leaving the system..

## 5.2 Recommendations

- It is recommended that resampling of the wells for total coliforms is completed. If the resample results show detectable total coliform values, then the steps outlined within the MECP's information page on bacteria-contaminated wells (<https://www.ontario.ca/page/what-do-if-your-well-contaminated-bacteria>) should be followed. Note that the well is currently a test hole and not an active water supply well.

## 6. Closure

We trust the above letter meets your current needs. Should you have any further questions, please do not hesitate to contact the undersigned.

For **Englobe Corp.**

**DRAFT**

**DRAFT**

**Pegah Vatani, M.A.Sc.,**  
*Environmental Professional - SWO*

**Kevin Bailey, M.A.Sc., P. Eng.**  
*Team Lead - Environmental - SWO*

### Enclosures

Appendix A - Figures  
Appendix B - MECP Well Records  
Appendix C - Percolation Test Results  
Appendix D - Laboratory Summary Tables  
Appendix E - Laboratory Certificates of Analysis  
Appendix F - Statement of Limitations

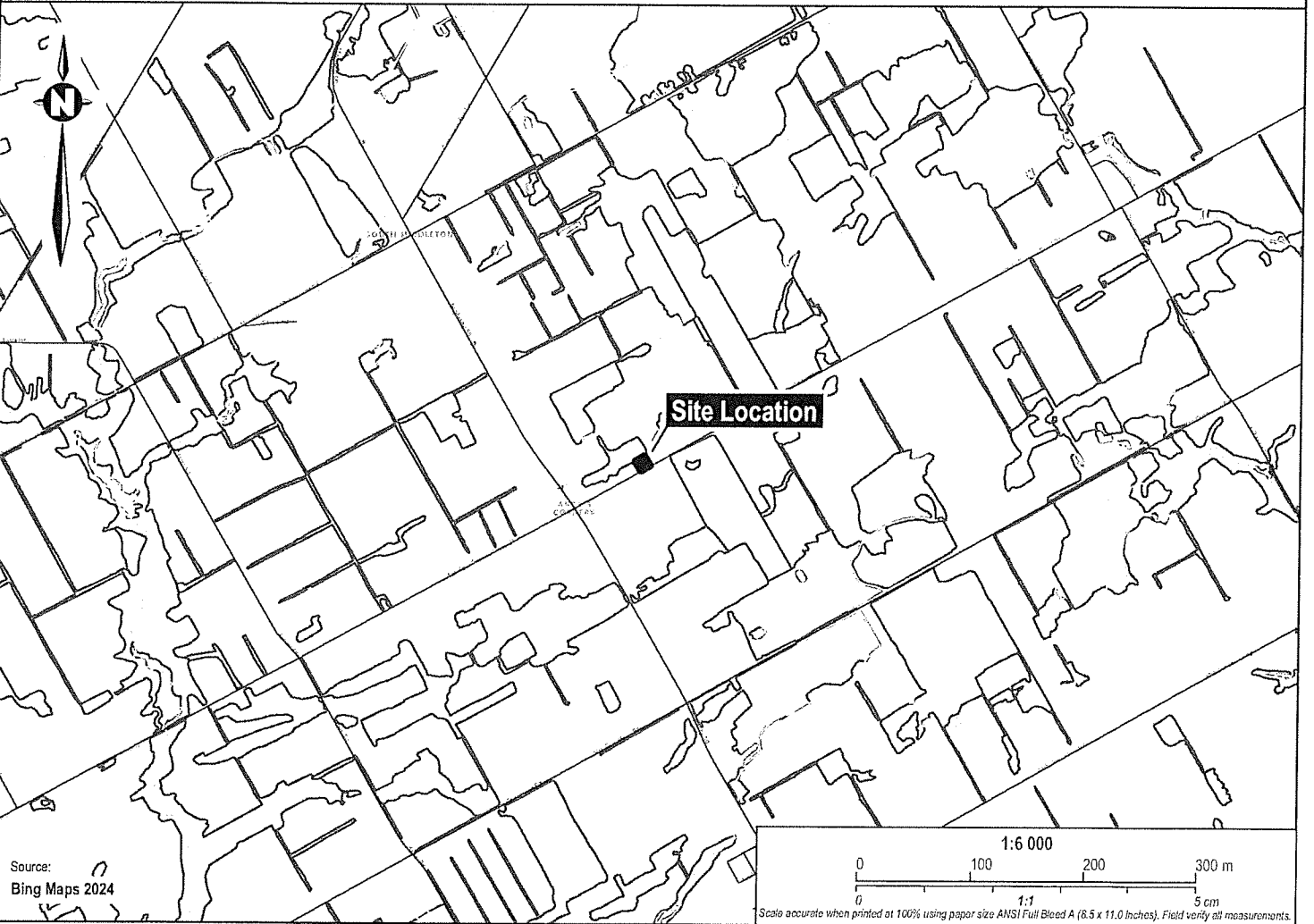
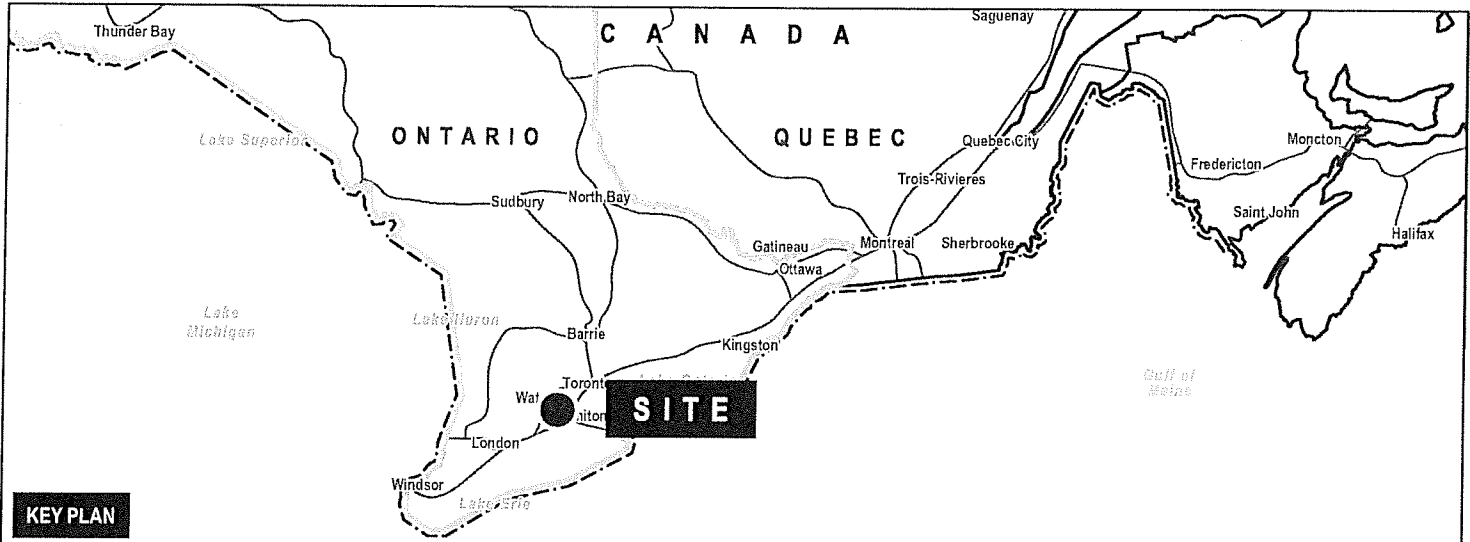
## 7. References

- American Water Works Association (AWWA). 2004. A guide for design and installation of steel pipes.
- Government of Ontario. 2017. Section 8 - Building Code, Ontario Regulation 332/12 with amendments up to Ontario Regulation 191/14, under the Building Code Act, 1992.
- Ministry of Environment Conservation and Parks. 2021. D-5-4 Individual On-Site Sewage Systems: Water Quality Impact Risk Assessment, 2016.
- Ministry of Environment Conservation and Parks. 2021. D-5-5 Private Wells: Water Supply Assessment, 2016.
- Ontario Ministry of the Environment and Climate Change, as amended January 2014. Ontario Resources Act R.R.O. 1990, Regulation 903 - Wells
- Ontario Ministry of the Environment (MOE), 2003. Stormwater Planning and Design Manual. March 2003.

# Appendix A

## Figures






**Note**

1. This drawing shall be read in conjunction with the associated technical report.

A	8/29/2024	Final	XX
Revision	Date	Issue	Approval

Client Nick Hiebert		Site 1019 Norfolk County Road 21, Courtland, ON	
	Report Title Hydrogeological Study	Designed By K.B	Date August 2024
	Drawing Title Site Location Map	Drawn By D.R	Project No. 02405890.000
		Approved By K.B	Figure No. 1
		Scale As Shown	

# **Appendix B**

## **MECP Well Records**



# **Appendix C**

## **Percolation Test Results**



**eNGLOBE**



Location:		Parcel 1 Lot 13, Concession 14, Township of North Walsingham, Ontario														
Date:		July 17 2024														
Weather:		24 degrees Cel. And Sunny														
Analyst:		Thomas Langille														
Borehole radius (cm):		7.62														
Soil class:		Weak capillarity														
Measurement	Start depth of water (cm)	End depth of water (cm)	Start time (*decimal min)	End time (*decimal min)	time (min)	in head (cm)	Perc test result (min/cm)	Perc test (hr/min)	mean head (m)	H/a (unitless)	2H+2 (m2)	2H/* (unitless)	C (unitless)	Ca2 (m2)	Denom	Ks (mm/hr)
1	27.94	24.13	0.5	1.0	0.50	3.8	0.1	0.0002	0.260	3.417	0.136	0.014	1.3085	0.00760	3.44764E-05	220.4
2	21.34	19.81	2.0	2.5	0.5	1.5	0.3	0.0005	0.206	2.700	0.085	0.011	1.1193	0.00650	5.58802E-05	116.3
3	18.8	17.78	3.0	3.5	0.5	1.0	0.5	0.0008	0.183	2.400	0.067	0.010	1.0336	0.00600	6.78657E-05	88.4
4	17.27	16.51	4.0	4.5	0.5	0.8	0.7	0.0011	0.169	2.217	0.057	0.009	0.9789	0.00568	7.90808E-05	71.9
5	15.75	15.24	5.0	5.5	0.5	0.5	1.0	0.0016	0.155	2.033	0.048	0.009	0.9225	0.00536	0.000101281	52.9
6	14.99	14.9	6.0	6.5	0.5	0.1	5.6	0.0093	0.149	1.961	0.045	0.008	0.8997	0.00522	0.000538865	9.7
7	14.73	13.97	7.0	7.5	0.5	0.8	0.7	0.0011	0.144	1.883	0.041	0.008	0.8747	0.00508	5.94688E-05	85.4
8	13.72	12.7	8.0	8.5	0.5	1.0	0.5	0.0008	0.132	1.734	0.035	0.007	0.8256	0.00479	3.84261E-05	124.8
9	12.45	12.19	9.0	9.5	0.5	0.3	1.9	0.0032	0.123	1.617	0.030	0.007	0.7862	0.00457	0.000133865	34.1
10	11.68	11.43	10.0	10.5	0.5	0.3	2.0	0.0033	0.116	1.516	0.027	0.006	0.7515	0.00436	0.000124955	34.9
11	11.18	10.92	11.0	11.5	0.5	0.3	1.9	0.0032	0.111	1.450	0.024	0.006	0.7281	0.00423	0.000111497	37.9
12	10.41	10.16	12.0	12.5	0.5	0.3	2.0	0.0033	0.103	1.350	0.021	0.006	0.6920	0.00402	0.00010296	39.0
13	9.91	9.4	13.0	13.5	0.5	0.5	1.0	0.0016	0.097	1.267	0.019	0.005	0.6615	0.00384	4.55045E-05	84.4
14	9.14	8.89	14.0	14.5	0.5	0.3	2.0	0.0033	0.090	1.183	0.016	0.005	0.6299	0.00366	8.30656E-05	44.0
15	8.64	8.53	15.0	15.5	0.5	0.1	4.5	0.0076	0.086	1.127	0.015	0.005	0.6082	0.00353	0.000174555	20.2
16	8.38	8.13	16.0	16.5	0.5	0.3	2.0	0.0033	0.083	1.083	0.014	0.005	0.5913	0.00343	7.21614E-05	47.6
17	7.87	7.62	17.0	17.5	0.5	0.3	2.0	0.0033	0.077	1.016	0.012	0.004	0.5648	0.00328	6.52633E-05	50.2
18	7.37	7.11	18.0	18.5	0.5	0.3	1.9	0.0032	0.072	0.950	0.010	0.004	0.5379	0.00312	5.65035E-05	55.3
19	7.11	6.86	19.0	19.5	0.5	0.3	2.0	0.0033	0.070	0.917	0.010	0.004	0.5241	0.00304	5.56065E-05	54.7
20	6.35	5.8	20.0	20.5	0.5	0.6	0.9	0.0015	0.061	0.797	0.007	0.003	0.4736	0.00275	2.04638E-05	134.4
21	5.08	4.83	21.0	21.5	0.5	0.3	2.0	0.0033	0.050	0.650	0.005	0.003	0.4081	0.00237	3.34429E-05	70.9
22	4.06	1.27	22.0	22.5	0.5	2.8	0.2	0.0003	0.027	0.350	0.001	0.001	0.2582	0.00150	1.31434E-06	1140.8

Location:	Parcel 2 Lot 13, Concession 14, Township of North Walsingham, Ontario															
Date:	July 17 2024															
Weather:	24 degrees Cel. And Sunny															
Analyst:	Thomas Langille															
Borehole radius (cm): 7.62																
Soil class: Weak capillarity																
Measurement	Start depth of water (cm)	End depth of water (cm)	Start time (*decimal min)	End time (*decimal min)	time (min)	in head (cm)	Perc test result (min/cm)	Perc test (hr/min)	mean head (m)	H/a (unitless)	2H <sup>v</sup> (m <sup>2</sup> )	2H/* (unitless)	C (unitless)	Ca2 (m <sup>2</sup> )	Denom	K <sub>s</sub> (mm/hr)
1	26	22.75	0.5	1.0	0.50	3.3	0.2	0.0003	0.244	3.199	0.119	0.014	1.2531	0.00728	3.58067E-05	203.2
2	21	19.5	2.0	2.5	0.5	1.5	0.3	0.0006	0.203	2.657	0.082	0.011	1.1074	0.00643	5.53848E-05	116.1
3	16.75	16	3.0	3.5	0.5	0.8	0.7	0.0011	0.164	2.149	0.054	0.009	0.9583	0.00556	7.58774E-05	73.3
4	14.8	13.9	4.0	4.5	0.5	0.9	0.6	0.0009	0.144	1.883	0.041	0.008	0.8747	0.00508	5.02181E-05	101.1
5	13	12.5	5.0	5.5	0.5	0.5	1.0	0.0017	0.128	1.673	0.033	0.007	0.8054	0.00468	7.3787E-05	63.4
6	11.6	11	6.0	6.5	0.5	0.6	0.8	0.0014	0.113	1.483	0.026	0.006	0.7397	0.00430	5.01541E-05	85.6
7	10.5	9.8	7.0	7.5	0.5	0.7	0.7	0.0012	0.102	1.332	0.021	0.006	0.6855	0.00398	3.59806E-05	110.6
8	9.8	9.5	8.0	8.5	0.5	0.3	1.7	0.0028	0.097	1.266	0.019	0.005	0.6613	0.00384	7.72923E-05	49.7
9	9	8.6	9.0	9.5	0.5	0.4	1.3	0.0021	0.088	1.155	0.015	0.005	0.6191	0.00359	4.99406E-05	72.0
10	8	7.4	10.0	10.5	0.5	0.6	0.8	0.0014	0.077	1.010	0.012	0.004	0.5624	0.00327	2.69462E-05	121.2
11	7.2	6.9	11.0	11.5	0.5	0.3	1.7	0.0028	0.071	0.925	0.010	0.004	0.5277	0.00306	4.70028E-05	65.2
12	6.25	6	12.0	12.5	0.5	0.3	2.0	0.0033	0.061	0.804	0.008	0.003	0.4764	0.00277	4.55746E-05	60.7
13	5.75	5.28	13.0	13.5	0.5	0.5	1.1	0.0018	0.055	0.724	0.006	0.003	0.4414	0.00256	2.07619E-05	123.4
14	5	4.46	14.0	14.5	0.5	0.5	0.9	0.0015	0.047	0.621	0.004	0.003	0.3944	0.00229	1.44949E-05	158.0
15	4	3.44	15.0	15.5	0.5	0.6	0.9	0.0015	0.037	0.488	0.003	0.002	0.3305	0.00192	1.00501E-05	191.0
16	2.5	1.95	16.0	16.5	0.5	0.6	0.9	0.0015	0.022	0.292	0.001	0.001	0.2258	0.00131	5.35975E-06	244.6
17	1.5	1.1	17.0	17.5	0.5	0.4	1.3	0.0021	0.013	0.171	0.000	0.001	0.1512	0.00088	4.03782E-06	217.4
18	0.5	0.2	18.0	18.5	0.5	0.3	1.7	0.0028	0.004	0.046	0.000	0.000	0.0565	0.00033	1.51871E-06	215.8

# Appendix D

## Laboratory Summary Tables



		Guidelines							
		Ontario Drinking Water Regulation (IAN, 2020)		Ontario Drinking Water Regulation (IAN, 2020)					
		Aesthetic Objective/Operational Guideline (2006)		Table 1 (Microbiological) and 2 (Chemical) Standards (IAN)					
		ONDWS		ONDWS					
		Pass Limits		Pass Limits					
		Lower	Upper	Lower	Upper	WT2421115-001 (1)	WT2421115-002 (1)	WT2421115-003 (1)	WT2421115-004 (1)
Sample									
Sample Type Name						Water/Water	Water/Water	Water/Water	Water/Water
Name						DW1-1	DW1-2	DW2-1	DW2-2
Sampling Date						23-07-2024	23-07-2024	24-07-2024	24-07-2024
ALS ID						WT2421115-001	WT2421115-002	WT2421115-003	WT2421115-004
Test	Unit	LOR							
Anions and Nutrients									
Ammonia, total (as N)	mg/L	0.005				0.0066	0.0171	0.0054	<0.0050
Bromide	mg/L	0.5				<0.50	<0.50	<0.50	<0.50
Chloride	mg/L		<=250			340	348	378	344
Fluoride	mg/L	0.1		<=1.5		<0.100	<0.100	<0.100	<0.100
Nitrate (as N)	mg/L			<=10		2.24	2.05	1.37	1.31
Nitrate + Nitrite (as N)	mg/L			<=10		2.24	2.05	1.37	1.31
Nitrite (as N)	mg/L	0.05		<=1		<0.050	<0.050	<0.050	<0.050
Phosphate, ortho-, dissolved (as P)	mg/L	0.001				<0.0010	0.0049	<0.0010	0.0010
Sulfate (as SO4)	mg/L		<=500			25.8	22.1	22.8	22.6
Ion Balance									
Anion sum	meq/L					17.8	16.3	16.8	15.8
Cation sum (total)	meq/L					17.1	16.4	16.8	16.0
Ion balance (APHA)	%					-2.00	0.306	0.0	0.629
Ion balance (cations/anions)	%					96.1	101	100	101
Metals									
Sodium adsorption ratio (SAR)						6.68	6.55	8.66	7.86
Microbiological Tests									
Coliforms, Escherichia coli (E. coli)	MPN/100mL	1		<1		<1	<1	<1	<1
Coliforms, total	MPN/100mL	1		<1		<1	1	21	52
Physical Tests									
Alkalinity, bicarbonate (as HCO3)	mg/L					284	293	343	340
Alkalinity, carbonate (as CO3)	mg/L	1		<1.0		<1.0	<1.0	<1.0	<1.0
Alkalinity, hydroxide (as OH)	mg/L	1		<1.0		<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	mg/L		>=30	<=500		233	240	281	278
Colour, apparent	CU	2		<=5		3.7	2.0	2.0	<1.0
Conductivity	µS/cm					1780	1760	1710	1610
Hardness (as CaCO3), from total Ca/Mg	mg/L		>=80	<=100		287	276	213	216
Langlier index (@ 20°C)	-					0.881	0.852	0.830	0.844
Langlier index (@ 4°C)	-					0.618	0.608	0.586	0.600
pH	pH units		>=6.5	<=8.5		8.11	8.09	8.11	8.11
pH, saturation (@ 20°C)	pH units					7.23	7.24	7.28	7.27
pH, saturation (@ 4°C)	pH units					7.47	7.48	7.52	7.51
Solids, total dissolved (TDS)	mg/L			<=500		366	378	345	372
Solids, total dissolved (TDS), calculated	mg/L					1160	1140	1120	1050
Solids, total suspended (TSS)	mg/L	3		<=5		<3.0	<3.0	<3.0	<3.0
Turbidity	NTU					0.19	0.26	0.17	0.10
Total Metals									
Aluminum, total	mg/L		<=0.1			0.0177	0.0145	0.0086	0.0094
Antimony, total	mg/L	0.0001		<=0.005		<0.00010	<0.00010	<0.00010	<0.00010
Arsenic, total	mg/L			<=0.01		0.00012	0.00013	0.00014	0.00013
Barium, total	mg/L			<=1		0.0452	0.0451	0.0372	0.0377
Beryllium, total	mg/L	0.00002				<0.000010	<0.000010	<0.000010	<0.000010
Bismuth, total	mg/L	0.00005				<0.000050	<0.000050	<0.000050	<0.000050
Boron, total	mg/L			<=5		0.020	0.020	0.024	0.025
Cadmium, total	mg/L	0.000005		<=0.005		0.0000055	<0.0000050	<0.0000050	<0.0000050
Calcium, total	mg/L					90.4	86.3	66.3	67.6
Cesium, total	mg/L	0.00001				<0.000010	<0.000010	<0.000010	<0.000010
Chromium, total	mg/L			<=0.05		0.00119	0.00120	0.00175	0.00155
Cobalt, total	mg/L	0.0001				<0.00010	<0.00010	<0.00010	<0.00010
Copper, total	mg/L		<=1			0.00056	0.00054	0.00073	0.00072
Iron, total	mg/L		<=0.3			0.073	0.078	0.040	0.030
Lead, total	mg/L	0.00005		<=0.01		<0.000050	<0.000050	<0.000050	<0.000050
Lithium, total	mg/L	0.001				0.0011	<0.0010	<0.0010	<0.0010
Magnesium, total	mg/L					14.8	14.6	11.0	11.6
Manganese, total	mg/L		<=0.05			0.00069	0.00083	0.00143	0.00100
Molybdenum, total	mg/L					0.000051	0.000055	0.000118	0.000121
Nickel, total	mg/L	0.0005				<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus, total	mg/L	0.05				1.02	1.01	1.33	2.25
Potassium, total	mg/L					0.00012	0.00011	0.00026	0.00017
Rubidium, total	mg/L			<=0.05		0.000927	0.000862	0.00105	0.000589
Selenium, total	mg/L					11.4	11.2	11.4	11.5
Silicon (as SiO2), total	mg/L					5.33	5.25	5.35	5.38
Silver, total	mg/L					0.000017	0.000013	0.000017	0.000011
Sodium, total	mg/L		<=200			260	250	289	266
Strontium, total	mg/L					0.262	0.257	0.209	0.212
Sulfur, total	mg/L					9.04	9.41	8.74	8.79
Tellurium, total	mg/L	0.0002				<0.00020	<0.00020	<0.00020	<0.00020
Thallium, total	mg/L	0.00001				<0.000010	<0.000010	<0.000010	<0.000010
Thorium, total	mg/L	0.0001				<0.00010	<0.00010	<0.00010	<0.00010
Tin, total	mg/L	0.0001				<0.00010	<0.00010	<0.00010	<0.00010
Titanium, total	mg/L	0.0003				<0.00030	<0.00030	<0.00030	<0.00030
Tungsten, total	mg/L			<=0.02		0.00055	0.00048	0.00082	0.00061
Uranium, total	mg/L					0.000159	0.000161	0.000184	0.000179
Vanadium, total	mg/L	0.0005				<0.00050	<0.00050	<0.00050	<0.00050
Zinc, total	mg/L	0.003	<=5			<0.0030	<0.0030	<0.0030	<0.0030
Zirconium, total	mg/L	0.0002				<0.00020	<0.00020	<0.00020	<0.00020

#### Evaluations

Pending	Pending
No Spec	No Spec
Within Limit	Within Limit
Within Warning Limit	Within Warning Limit
Exceeds Limit	Exceeds Limit
Result LOR > Limit	Result LOR > Limit
Result LOR < Limit	Result LOR < Limit

#### Disclaimer

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

# **Appendix E**

## **Laboratory Certificate of Analysis**



**eNGLOBE**

CERTIFICATE OF ANALYSIS

Work Order : WT2421115

Client : Englobe Corp.

Contact : Kevin Bailey

Address : 353 Bridge Street East  
Kitchener ON Canada N2K 2Y5

Telephone : -----

Project : 02405890

PO : -----

C-O-C number : 23-1097696

Sampler : Ross I

Site : -----

Quote number : KITCHENER/LONDON GW SOA

No. of samples received : 4

No. of samples analysed : 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Amanda Ganour-Lumsden	Department Manager - Microbiology and Prep	Microbiology, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Inorganics, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Metals, Waterloo, Ontario
Jing Liu	Laboratory Analyst	Inorganics, Edmonton, Alberta
Jon Fisher	Production Manager, Environmental	Inorganics, Waterloo, Ontario
Nik Perko	Senior Analyst	Inorganics, Waterloo, Ontario
Ruby Sujeepan	Analyst	Microbiology, Waterloo, Ontario
Zeba Patel	Analyst	Microbiology, Waterloo, Ontario





### General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances  
 LOR: Limit of Reporting (detection limit).

Unit	Description
-	no units
%	percent
µS/cm	microsiemens per centimetre
CFU/100mL	colony forming units per hundred millilitres
CU	colour units (1 cu = 1 mg/l pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
MPN/100mL	most probable number per hundred millilitres
NTU	nephelometric turbidity units
pH units	pH units

<: less than.  
 >: greater than.  
 Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.  
 UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

### Qualifiers

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).



Analytical Results

Sub-Matrix: Water  
(Matrix: Water)

Client sample ID				Client sample ID			
DW1-1				DW1-2			
DW2-1				DW2-2			
Client sampling date / time				Client sampling date / time			
23-Jul-2024 13:10				23-Jul-2024 16:10			
24-Jul-2024 11:25				24-Jul-2024 14:25			
WT2421115-001				WT2421115-002			
WT2421115-003				WT2421115-004			
Analyte	CAS Number	Method/Lab	LOR	Unit	Result	Result	Result
Physical Tests							
Alkalinity, bicarbonate (as HCO <sub>3</sub> )	71-52-3	E290/WT	1.0	mg/L	284	293	343
Alkalinity, carbonate (as CO <sub>3</sub> )	3812-32-6	E290/WT	1.0	mg/L	<1.0	<1.0	<1.0
Alkalinity, hydroxide (as OH)	14280-30-9	E290/WT	1.0	mg/L	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO <sub>3</sub> )		E290/WT	1.0	mg/L	233	240	281
Colour, apparent		E330/WT	2.0	CU	3.7	<2.0	<2.0
Conductivity		E100/WT	1.0	µS/cm	1780	1760	1720
Hardness (as CaCO <sub>3</sub> ), from total Ca/Mg		EC100A/WT	0.50	mg/L	287	276	211
pH		E108/WT	0.10	pH units	8.11	8.09	8.11
Solids, total dissolved [TDS]		E162/WT	10	mg/L	960 <small>DLOS</small>	978 <small>DLOS</small>	945 <small>DLOS</small>
Solids, total dissolved [TDS], calculated		EC103A/WT	1.0	mg/L	1160	1140	1120
Solids, total suspended [TSS]		E160/WT	3.0	mg/L	<3.0	<3.0	<3.0
Turbidity		E121/WT	0.10	NTU	0.19	0.26	0.17
Langelier index (@ 20°C)		EC105A/WT	0.010	-	0.881	0.852	0.830
Langelier index (@ 4°C)		EC105A/WT	0.010	-	0.638	0.608	0.586
pH, saturation (@ 20°C)		EC105A/WT	0.010	pH units	7.23	7.24	7.28
pH, saturation (@ 4°C)		EC105A/WT	0.010	pH units	7.47	7.48	7.52
Anions and Nutrients							
Ammonia, total (as N)	7664-41-7	E298/EO	0.0050	mg/L	0.0066	0.0171	0.0054
Bromide	24959-67-9	E235.Br/WT	0.10	mg/L	<0.50 <small>DLOS</small>	<0.50 <small>DLOS</small>	<0.0050 <small>DLOS</small>
Chloride	16887-00-6	E235.Cl/WT	0.50	mg/L	440 <small>DLOS</small>	388 <small>DLOS</small>	<0.50 <small>DLOS</small>
Fluoride	18984-48-8	E235.F/WT	0.020	mg/L	<0.100 <small>DLOS</small>	<0.100 <small>DLOS</small>	<0.100 <small>DLOS</small>
Nitrate (as N)	14797-55-8	E235.NO3/WT	0.020	mg/L	2.24 <small>DLOS</small>	2.05 <small>DLOS</small>	<0.100 <small>DLOS</small>
Nitrate + Nitrite (as N)		EC235.N+N/WT	0.0032	mg/L	2.24	2.05	1.37
Nitrite (as N)		T		mg/L	2.24	2.05	1.37
Phosphate, ortho-, dissolved (as P)	14797-65-0	E235.NO2/WT	0.010	mg/L	<0.050 <small>DLOS</small>	<0.050 <small>DLOS</small>	<0.050 <small>DLOS</small>
Sulfate (as SO <sub>4</sub> )	14265-44-2	E378.U/WT	0.0010	mg/L	<0.0010	0.0049	<0.0010
	14808-79-8	E235.SO4/WT	0.30	mg/L	25.8 <small>DLOS</small>	22.1 <small>DLOS</small>	<0.0010 <small>DLOS</small>
Microbiological Tests							
Coliforms, Escherichia coli [E. coli]		E012A.EC/WT	1	CFU/100mL	NR	NR	NR
Coliforms, total		E012.TCM/WT	1	CFU/100mL	NR	NR	NR



## Analytical Results

Client sample ID				DW1-1	DW1-2	DW2-1	DW2-2	
Sub-Matrix: Water (Matrix: Water)								
Client sampling date / time				23-Jul-2024 13:10	23-Jul-2024 16:10	24-Jul-2024 11:25	24-Jul-2024 14:25	
Analyte	CAS Number	Method/Lab	LOR	Unit	Result	Result	Result	Result
Microbiological Tests								
Coliforms, total	---	E010/WT	1	MPN/100mL	Not Detected	1	21	53
coliforms, total background	---	E012 BG, TC/ WT	1	CFU/100mL	NR	NR	NR	NR
Coliforms, Escherichia coli [E. coli]	---	E010/WT	1	MPN/100mL	Not Detected	Not Detected	Not Detected	Not Detected
Metals								
Sodium adsorption ratio [SAR]	---	EC102/WT	0.10	-	6.68	6.55	8.66	7.86
Ion Balance								
Anion sum	---	EC101A/WT	0.10	meq/L	17.8	16.3	16.8	15.8
Cation sum (total)	---	EC101A/WT	0.10	meq/L	17.1	16.4	16.8	16.0
Ion balance (APHA)	---	EC101A/WT	0.010	%	-2.00	0.306	0.0	0.629
Ion balance (cations/anions)	---	EC101A/WT	0.01	%	96.1	101	100	101
Total Metals								
Aluminum, total	7429-90-5	E420/WT	0.0030	mg/L	0.0177	0.0145	0.0086	0.0094
Antimony, total	7440-36-0	E420/WT	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic, total	7440-38-2	E420/WT	0.00010	mg/L	0.00012	0.00013	0.00014	0.00013
Barium, total	7440-39-3	E420/WT	0.00010	mg/L	0.0452	0.0451	0.0372	0.0372
Beryllium, total	7440-41-7	E420/WT	0.000020	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth, total	7440-69-9	E420/WT	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050
Boron, total	7440-42-8	E420/WT	0.010	mg/L	0.020	0.020	0.024	0.025
Cadmium, total	7440-43-9	E420/WT	0.0000050	mg/L	0.000055	<0.000050	<0.000050	<0.000050
Calcium, total	7440-70-2	E420/WT	0.050	mg/L	90.4	86.3	66.3	67.6
Cesium, total	7440-46-2	E420/WT	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010
Chromium, total	7440-47-3	E420/WT	0.00050	mg/L	0.00119	0.00120	0.00175	0.00155
Cobalt, total	7440-48-4	E420/WT	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010
Copper, total	7440-50-8	E420/WT	0.00050	mg/L	0.00056	0.00054	0.00073	0.00072
Iron, total	7439-89-6	E420/WT	0.010	mg/L	0.073	0.078	0.040	0.030
Lead, total	7439-92-1	E420/WT	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050
Lithium, total	7439-93-2	E420/WT	0.0010	mg/L	0.0011	<0.0010	<0.0010	<0.0010
Magnesium, total	7439-95-4	E420/WT	0.0050	mg/L	14.8	14.6	11.0	11.6
Manganese, total	7439-96-5	E420/WT	0.00010	mg/L	0.00069	0.00083	0.00143	0.00100
Molybdenum, total	7439-98-7	E420/WT	0.000050	mg/L	0.000051	0.000055	0.000118	0.000121



## Analytical Results

Sub-Matrix: Water  
(Matrix: Water)

		Client sample ID		DW1-1	DW1-2	DW2-1	DW2-2		
Analyte	CAS Number	Method/Lab	Client sampling date / time	LOF	Unit	WT2421115-001	WT2421115-002	WT2421115-003	WT2421115-004
Total Metals									
Nickel, total	7440-02-0	E420MT	0.00050		mg/L	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus, total	7723-14-0	E420MT	0.050		mg/L	<0.050	<0.050	<0.050	<0.050
Potassium, total	7440-09-7	E420MT	0.050		mg/L	1.02	1.01	1.33	2.25
Rubidium, total	7440-17-7	E420MT	0.00020		mg/L	0.00032	0.00031	0.00026	0.00027
Selenium, total	7782-49-2	E420MT	0.000050		mg/L	0.000927	0.000862	0.00105	0.000589
Silicon, total	7440-21-3	E420MT	0.10		mg/L	5.33	5.25	5.35	5.38
Silver, total	7440-22-4	E420MT	0.000010		mg/L	0.000027	0.000023	0.000017	0.000011
Sodium, total	7440-23-5	E420MT	0.050		mg/L	260 DUC	250 DUC	289 DUC	266 DUC
Strontium, total	7440-24-6	E420MT	0.00020		mg/L	0.262	0.257	0.209	0.212
Sulfur, total	7704-34-9	E420MT	0.50		mg/L	9.04	9.41	8.74	8.79
Tellurium, total	13494-80-9	E420MT	0.00020		mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Thallium, total	7440-28-0	E420MT	0.000010		mg/L	<0.000010	<0.000010	<0.000010	<0.000010
Thorium, total	7440-29-1	E420MT	0.00010		mg/L	<0.00010	<0.00010	<0.00010	<0.00010
Tin, total	7440-31-5	E420MT	0.00010		mg/L	<0.00010	<0.00010	<0.00010	<0.00010
Titanium, total	7440-32-6	E420MT	0.00030		mg/L	<0.00030	<0.00030	<0.00030	<0.00030
Tungsten, total	7440-33-7	E420MT	0.00010		mg/L	0.00055	0.00048	0.00082	0.00061
Uranium, total	7440-61-1	E420MT	0.000010		mg/L	0.000159	0.000161	0.000184	0.000179
Vanadium, total	7440-62-2	E420MT	0.00050		mg/L	<0.00050	<0.00050	<0.00050	<0.00050
Zinc, total	7440-66-6	E420MT	0.0030		mg/L	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium, total	7440-67-7	E420MT	0.00020		mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (as SiO2), total	7631-86-9	EC420.SiO2/WT	0.25		mg/L	11.4	11.2	11.4	11.5

Please refer to the General Comments section for an explanation of any result qualifiers detected.  
Please refer to the Accreditation section for an explanation of analyte accreditations.



## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: WT2421115	Page	: 1 of 18
Client	: Englobe Corp.	Laboratory	: ALS Environmental - Waterloo
Contact	: Kevin Bailey	Account Manager	: Gayle Braun
Address	: 353 Bridge Street East Kitchener ON Canada N2K 2Y5	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: -----	Telephone	: +1 519 886 6910
Project	: 02405890	Date Samples Received	: 24-Jul-2024 17:40
PO	: -----	Issue Date	: 01-Aug-2024 18:59
C-O-C number	: 23-1097696		
Sampler	: Ross I		
Site	: -----		
Quote number	: KITCHENER/LONDON GW SOA		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

### Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQC: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

### Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

### Summary of Outliers

#### Outliers : Quality Control Samples

- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Method Blank value outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

#### Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

**Outliers : Analysis Holding Time Compliance (Breaches)**

- No Analysis Holding Time Outliers exist.

**Outliers : Frequency of Quality Control Samples**

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.



### Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: Water

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
<b>Method Blank (MB) Values</b>								
Anions and Nutrients	QC-1564710-001	----	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0016 <sup>B</sup> mg/L	0.001 mg/L	Blank result exceeds permitted value

### Result Qualifiers

Qualifier

Description

B

Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.





## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and for federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: Water

Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method										
Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
Rec	Actual	Rec		Actual						
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECPI]										
DW2-1	E298	24-Jul-2024	01-Aug-2024	28 days	8 days	✓	01-Aug-2024	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECPI]										
DW2-2	E298	24-Jul-2024	01-Aug-2024	28 days	8 days	✓	01-Aug-2024	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECPI]										
DW1-1	E298	23-Jul-2024	01-Aug-2024	28 days	9 days	✓	01-Aug-2024	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECPI]										
DW1-2	E298	23-Jul-2024	01-Aug-2024	28 days	9 days	✓	01-Aug-2024	28 days	9 days	✓
Anions and Nutrients : Bromide in Water by IC										
HDPE [ON MECPI]										
DW2-1	E235 Br	24-Jul-2024	26-Jul-2024	28 days	2 days	✓	29-Jul-2024	28 days	5 days	✓
Anions and Nutrients : Bromide in Water by IC										
HDPE [ON MECPI]										
DW2-2	E235 Br	24-Jul-2024	26-Jul-2024	28 days	2 days	✓	29-Jul-2024	28 days	5 days	✓
Anions and Nutrients : Bromide in Water by IC										
HDPE [ON MECPI]										
DW1-1	E235 Br	23-Jul-2024	25-Jul-2024	28 days	2 days	✓	29-Jul-2024	28 days	6 days	✓



Matrix: Water

Analyse Group : Analytical Method

Evaluation: x = Holding time exceedance ; ✓ = Within Holding Time

Analyse Group : Analytical Method										
Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
Rec	Actual	Rec		Actual						
Anions and Nutrients : Bromide in Water by /C										
HDPE [ON MECP]										
DW1-2	E235.Br	23-Jul-2024	26-Jul-2024	28 days	3 days	✓	29-Jul-2024	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by /C										
HDPE [ON MECP]										
DW2-1	E235.Cl	24-Jul-2024	26-Jul-2024	28 days	2 days	✓	29-Jul-2024	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by /C										
HDPE [ON MECP]										
DW2-2	E235.Cl	24-Jul-2024	26-Jul-2024	28 days	2 days	✓	29-Jul-2024	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by /C										
HDPE [ON MECP]										
DW1-1	E235.Cl	23-Jul-2024	25-Jul-2024	28 days	2 days	✓	29-Jul-2024	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by /C										
HDPE [ON MECP]										
DW1-2	E235.Cl	23-Jul-2024	26-Jul-2024	28 days	3 days	✓	29-Jul-2024	28 days	6 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE [ON MECP]										
DW1-1	E378-U	23-Jul-2024	25-Jul-2024	7 days	2 days	✓	26-Jul-2024	7 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE [ON MECP]										
DW1-2	E378-U	23-Jul-2024	27-Jul-2024	7 days	4 days	✓	30-Jul-2024	7 days	7 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE [ON MECP]										
DW2-1	E378-U	24-Jul-2024	30-Jul-2024	7 days	6 days	✓	31-Jul-2024	7 days	7 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE [ON MECP]										
DW2-2	E378-U	24-Jul-2024	30-Jul-2024	7 days	6 days	✓	31-Jul-2024	7 days	7 days	✓



Matrix: Water

Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)		Method	Sampling Date	Extraction / Preparation				Analysis			
				Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
					Rec	Actual			Rec	Actual	
Anions and Nutrients : Fluoride in Water by IC											
HDPE [ON MECPI] DW2-1		E235.F	24-Jul-2024	26-Jul-2024	28 days	2 days	✓	29-Jul-2024	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC											
HDPE [ON MECPI] DW2-2		E235.F	24-Jul-2024	26-Jul-2024	28 days	2 days	✓	29-Jul-2024	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC											
HDPE [ON MECPI] DW1-1		E235.F	23-Jul-2024	25-Jul-2024	28 days	2 days	✓	29-Jul-2024	28 days	6 days	✓
Anions and Nutrients : Fluoride in Water by IC											
HDPE [ON MECPI] DW1-2		E235.F	23-Jul-2024	26-Jul-2024	28 days	3 days	✓	29-Jul-2024	28 days	6 days	✓
Anions and Nutrients : Nitrate in Water by IC											
HDPE [ON MECPI] DW2-1		E235.NO3	24-Jul-2024	26-Jul-2024	7 days	2 days	✓	29-Jul-2024	7 days	5 days	✓
Anions and Nutrients : Nitrate in Water by IC											
HDPE [ON MECPI] DW1-1		E235.NO3	23-Jul-2024	25-Jul-2024	7 days	2 days	✓	29-Jul-2024	7 days	6 days	✓
Anions and Nutrients : Nitrate in Water by IC											
HDPE [ON MECPI] DW1-2		E235.NO3	23-Jul-2024	26-Jul-2024	7 days	3 days	✓	29-Jul-2024	7 days	6 days	✓
Anions and Nutrients : Nitrite in Water by IC											
HDPE [ON MECPI] DW2-1		E235.NO2	24-Jul-2024	26-Jul-2024	7 days	2 days	✓	29-Jul-2024	7 days	5 days	✓



Matrix: Water

Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyze Group : Analytical Method Container / Client Sample ID(s)		Method	Sampling Date	Extraction / Preparation				Analysis			
				Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
					Rec	Actual			Rec	Actual	
Anions and Nutrients : Nitrite in Water by IC											
HDPE [ON MECP] DW2-2		E235.NO2	24-Jul-2024	26-Jul-2024	7 days	2 days	✓	29-Jul-2024	7 days	5 days	✓
Anions and Nutrients : Nitrite in Water by IC											
HDPE [ON MECP] DW1-1		E235.NO2	23-Jul-2024	25-Jul-2024	7 days	2 days	✓	29-Jul-2024	7 days	6 days	✓
Anions and Nutrients : Nitrite in Water by IC											
HDPE [ON MECP] DW1-2		E235.NO2	23-Jul-2024	26-Jul-2024	7 days	3 days	✓	29-Jul-2024	7 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC											
HDPE [ON MECP] DW2-1		E235.SO4	24-Jul-2024	26-Jul-2024	28 days	2 days	✓	29-Jul-2024	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC											
HDPE [ON MECP] DW1-1		E235.SO4	23-Jul-2024	25-Jul-2024	28 days	2 days	✓	29-Jul-2024	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC											
HDPE [ON MECP] DW1-2		E235.SO4	23-Jul-2024	26-Jul-2024	28 days	3 days	✓	29-Jul-2024	28 days	6 days	✓
Microbiological Tests : E. coli (MF-mFC-BGIG)											
Sterile HDPE (Sodium thiosulphate) [ON MECP] DW2-2		E012A.EC	24-Jul-2024	-----	-----	-----		25-Jul-2024	48 hrs	22 hrs	✓
Microbiological Tests : E. coli (MF-mFC-BGIG)											
Sterile HDPE (Sodium thiosulphate) [ON MECP] DW2-1		E012A.EC	24-Jul-2024	-----	-----	-----		25-Jul-2024	48 hrs	25 hrs	✓



Matrix: Water

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method		Method	Sampling Date	Extraction / Preparation				Analysis			
				Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
Rec	Actual	Rec	Actual								
Microbiological Tests : E. coli (MF-mFC-BCIG)											
Sterile HDPE (Sodium thiosulphate) [ON MECP]											
DW1-2		E012A.EC	23-Jul-2024	----	----	----		25-Jul-2024	48 hrs	44 hrs	✓
Microbiological Tests : E. coli (MF-mFC-BCIG)											
Sterile HDPE (Sodium thiosulphate) [ON MECP]											
DW1-1		E012A.EC	23-Jul-2024	----	----	----		25-Jul-2024	48 hrs	47 hrs	✓
Microbiological Tests : Total Coliforms (MF-mEndo)											
Sterile HDPE (Sodium thiosulphate) [ON MECP]											
DW2-2		E012.TC	24-Jul-2024	----	----	----		25-Jul-2024	48 hrs	22 hrs	✓
Microbiological Tests : Total Coliforms (MF-mEndo)											
Sterile HDPE (Sodium thiosulphate) [ON MECP]											
DW2-1		E012.TC	24-Jul-2024	----	----	----		25-Jul-2024	48 hrs	25 hrs	✓
Microbiological Tests : Total Coliforms (MF-mEndo)											
Sterile HDPE (Sodium thiosulphate) [ON MECP]											
DW1-2		E012.TC	23-Jul-2024	----	----	----		25-Jul-2024	48 hrs	44 hrs	✓
Microbiological Tests : Total Coliforms (MF-mEndo)											
Sterile HDPE (Sodium thiosulphate) [ON MECP]											
DW1-1		E012.TC	23-Jul-2024	----	----	----		25-Jul-2024	48 hrs	47 hrs	✓
Microbiological Tests : Total Coliforms and E. coli (Enzyme Substrate)											
Sterile HDPE (Sodium thiosulphate) [ON MECP]											
DW2-2		E010	24-Jul-2024	----	----	----		25-Jul-2024	48 hrs	21 hrs	✓
Microbiological Tests : Total Coliforms and E. coli (Enzyme Substrate)											
Sterile HDPE (Sodium thiosulphate) [ON MECP]											
DW2-1		E010	24-Jul-2024	----	----	----		25-Jul-2024	48 hrs	24 hrs	✓
Microbiological Tests : Total Coliforms and E. coli (Enzyme Substrate)											
Sterile HDPE (Sodium thiosulphate) [ON MECP]											
DW1-2		E010	23-Jul-2024	----	----	----		25-Jul-2024	48 hrs	44 hrs	✓



Matrix: Water

Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method		Method	Sampling Date	Extraction / Preparation				Analysis			
				Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
Rec	Actual	Rec	Actual								
Microbiological Tests : Total Coliforms and E. coli (Enzyme Substrate)											
Sterile HDPE (Sodium thiosulphate) [ON MECP]											
DW1-1		E010	23-Jul-2024	-----	-----	-----		25-Jul-2024	48 hrs	47 hrs	✓
Microbiological Tests : Total Coliforms Background (MF-mEndo)											
Sterile HDPE (Sodium thiosulphate) [ON MECP]											
DW2-2		E012.BG.TC	24-Jul-2024	-----	-----	-----		25-Jul-2024	48 hrs	22 hrs	✓
Microbiological Tests : Total Coliforms Background (MF-mEndo)											
Sterile HDPE (Sodium thiosulphate) [ON MECP]											
DW2-1		E012.BG.TC	24-Jul-2024	-----	-----	-----		25-Jul-2024	48 hrs	25 hrs	✓
Microbiological Tests : Total Coliforms Background (MF-mEndo)											
Sterile HDPE (Sodium thiosulphate) [ON MECP]											
DW1-2		E012.BG.TC	23-Jul-2024	-----	-----	-----		25-Jul-2024	48 hrs	44 hrs	✓
Microbiological Tests : Total Coliforms Background (MF-mEndo)											
Sterile HDPE (Sodium thiosulphate) [ON MECP]											
DW1-1		E012.BG.TC	23-Jul-2024	-----	-----	-----		25-Jul-2024	48 hrs	47 hrs	✓
Physical Tests : Alkalinity Species by Titration											
HDPE [ON MECP]											
DW1-1		E290	23-Jul-2024	25-Jul-2024	14 days	2 days	✓	26-Jul-2024	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration											
HDPE [ON MECP]											
DW2-1		E290	24-Jul-2024	26-Jul-2024	14 days	2 days	✓	27-Jul-2024	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration											
HDPE [ON MECP]											
DW2-2		E290	24-Jul-2024	26-Jul-2024	14 days	2 days	✓	27-Jul-2024	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration											
HDPE [ON MECP]											
DW1-2		E290	23-Jul-2024	26-Jul-2024	14 days	3 days	✓	27-Jul-2024	14 days	4 days	✓





Matrix: Water

Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method		Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)	Preparation Date			Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Colour (Apparent) by Spectrometer											
HDPE [ON MECP]											
DW2-2		E330	24-Jul-2024	-----	-----		25-Jul-2024	48 hrs	22 hrs	✓	
Physical Tests : Colour (Apparent) by Spectrometer											
HDPE [ON MECP]											
DW2-1		E330	24-Jul-2024	-----	-----		25-Jul-2024	48 hrs	25 hrs	✓	
Physical Tests : Colour (Apparent) by Spectrometer											
HDPE [ON MECP]											
DW1-2		E330	23-Jul-2024	-----	-----		25-Jul-2024	48 hrs	45 hrs	✓	
Physical Tests : Colour (Apparent) by Spectrometer											
HDPE [ON MECP]											
DW1-1		E330	23-Jul-2024	-----	-----		25-Jul-2024	48 hrs	48 hrs	✓	
Physical Tests : Conductivity in Water											
HDPE [ON MECP]											
DW1-1		E100	23-Jul-2024	25-Jul-2024	28 days	2 days	✓	26-Jul-2024	28 days	3 days	✓
Physical Tests : Conductivity in Water											
HDPE [ON MECP]											
DW2-1		E100	24-Jul-2024	26-Jul-2024	28 days	2 days	✓	27-Jul-2024	28 days	3 days	✓
Physical Tests : Conductivity in Water											
HDPE [ON MECP]											
DW2-2		E100	24-Jul-2024	26-Jul-2024	28 days	2 days	✓	27-Jul-2024	28 days	3 days	✓
Physical Tests : Conductivity in Water											
HDPE [ON MECP]											
DW1-2		E100	23-Jul-2024	26-Jul-2024	28 days	3 days	✓	27-Jul-2024	28 days	4 days	✓
Physical Tests : pH by Meter											
HDPE [ON MECP]											
DW1-1		E108	23-Jul-2024	25-Jul-2024	14 days	2 days	✓	26-Jul-2024	14 days	3 days	✓



Matrix: Water

Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)		Method	Sampling Date	Extraction / Preparation				Analysis			
				Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
					Rec	Actual			Rec	Actual	
Physical Tests : pH by Meter											
HDPE [ON MECP] DW2-1		E108	24-Jul-2024	26-Jul-2024	14 days	2 days	✓	27-Jul-2024	14 days	3 days	✓
Physical Tests : pH by Meter											
HDPE [ON MECP] DW2-2		E108	24-Jul-2024	26-Jul-2024	14 days	2 days	✓	27-Jul-2024	14 days	3 days	✓
Physical Tests : pH by Meter											
HDPE [ON MECP] DW1-2		E108	23-Jul-2024	26-Jul-2024	14 days	3 days	✓	27-Jul-2024	14 days	4 days	✓
Physical Tests : TDS by Gravimetry											
HDPE [ON MECP] DW2-1		E162	24-Jul-2024	---	---	---		26-Jul-2024	7 days	2 days	✓
Physical Tests : TDS by Gravimetry											
HDPE [ON MECP] DW2-2		E162	24-Jul-2024	---	---	---		26-Jul-2024	7 days	2 days	✓
Physical Tests : TDS by Gravimetry											
HDPE [ON MECP] DW1-1		E162	23-Jul-2024	---	---	---		26-Jul-2024	7 days	3 days	✓
Physical Tests : TDS by Gravimetry											
HDPE [ON MECP] DW1-2		E162	23-Jul-2024	---	---	---		26-Jul-2024	7 days	3 days	✓
Physical Tests : TSS by Gravimetry											
HDPE [ON MECP] DW2-1		E160	24-Jul-2024	---	---	---		26-Jul-2024	7 days	2 days	✓
Physical Tests : TSS by Gravimetry											
HDPE [ON MECP] DW2-2		E160	24-Jul-2024	---	---	---		26-Jul-2024	7 days	2 days	✓





Matrix: Water

Evaluation: ✕ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)		Method	Sampling Date	Extraction / Preparation				Analysis			
				Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
					Rec	Actual			Rec	Actual	
Physical Tests : TSS by Gravimetry											
HDPE [ON MECF]											
DW1-1		E160	23-Jul-2024	----	----			26-Jul-2024	7 days	3 days	✓
Physical Tests : TSS by Gravimetry											
HDPE [ON MECF]											
DW1-2		E160	23-Jul-2024	----	----			26-Jul-2024	7 days	3 days	✓
Physical Tests : Turbidity by Nephelometry											
HDPE [ON MECF]											
DW2-2		E121	24-Jul-2024	----	----			25-Jul-2024	48 hrs	20 hrs	✓
Physical Tests : Turbidity by Nephelometry											
HDPE [ON MECF]											
DW2-1		E121	24-Jul-2024	----	----			25-Jul-2024	48 hrs	23 hrs	✓
Physical Tests : Turbidity by Nephelometry											
HDPE [ON MECF]											
DW1-2		E121	23-Jul-2024	----	----			25-Jul-2024	48 hrs	42 hrs	✓
Physical Tests : Turbidity by Nephelometry											
HDPE [ON MECF]											
DW1-1		E121	23-Jul-2024	----	----			25-Jul-2024	48 hrs	45 hrs	✓
Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid)											
DW2-1		E420	24-Jul-2024	25-Jul-2024	180 days	1 days	✓	25-Jul-2024	180 days	1 days	✓
Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid)											
DW2-2		E420	24-Jul-2024	25-Jul-2024	180 days	1 days	✓	25-Jul-2024	180 days	1 days	✓
Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid)											
DW1-1		E420	23-Jul-2024	25-Jul-2024	180 days	2 days	✓	25-Jul-2024	180 days	2 days	✓



Matrix: Water

Analyte Group : Analytical Method

Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte group - Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Total Metals - Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) DW1-2	E420	23-Jul-2024	25-Jul-2024	180 days	2 days	✓	25-Jul-2024	180 days	2 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



## Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: Water

Quality Control Sample Type		Evaluation: * = QC frequency outside specification, ✓ = QC frequency within specification.									
Analytical Methods	Method	QC Lot #	Count		Frequency (%)			Evaluation			
			QC	Regular	Actual	Expected					
Laboratory Duplicates (DUP)											
Alkalinity Species by Titration											
Ammonia by Fluorescence	E290	1564701	2	25	8.0	5.0	✓				
Bromide in Water by IC	E298	1575545	1	20	5.0	5.0	✓				
Chloride in Water by IC	E235.Br	1564708	2	13	15.3	5.0	✓				
Colour (Apparent) by Spectrometer	E235.Cl	1564704	2	29	6.9	5.0	✓				
Conductivity in Water	E330	1564067	1	16	6.2	5.0	✓				
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E100	1564702	2	16	12.5	5.0	✓				
Fluoride in Water by IC	E378-U	1564710	3	52	5.7	5.0	✓				
Nitrate in Water by IC	E235.F	1564705	2	17	11.7	5.0	✓				
Nitrite in Water by IC	E235.NO3	1564706	2	28	7.1	5.0	✓				
pH by Meter	E235.NO2	1564707	2	27	7.4	5.0	✓				
Sulfate in Water by IC	E108	1564700	2	36	5.5	5.0	✓				
TDS by Gravimetry	E235.SO4	1564703	2	29	6.9	5.0	✓				
Total Metals in Water by CRC ICPMS	E162	1566392	1	20	5.0	5.0	✓				
TSS by Gravimetry	E420	1562886	1	20	5.0	5.0	✓				
Turbidity by Nephelometry	E160	1563337	2	39	5.1	4.7	✓				
	E121	1563499	1	20	5.0	5.0	✓				
Laboratory Control Samples (LCS)											
Alkalinity Species by Titration											
Ammonia by Fluorescence	E290	1564701	2	25	8.0	5.0	✓				
Bromide in Water by IC	E298	1575545	1	20	5.0	5.0	✓				
Chloride in Water by IC	E235.Br	1564708	2	13	15.3	5.0	✓				
Colour (Apparent) by Spectrometer	E235.Cl	1564704	2	29	6.9	5.0	✓				
Conductivity in Water	E330	1564067	1	16	6.2	5.0	✓				
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E100	1564702	2	16	12.5	5.0	✓				
Fluoride in Water by IC	E378-U	1564710	3	52	5.7	5.0	✓				
Nitrate in Water by IC	E235.F	1564705	2	17	11.7	5.0	✓				
Nitrite in Water by IC	E235.NO3	1564706	2	28	7.1	5.0	✓				
pH by Meter	E235.NO2	1564707	2	27	7.4	5.0	✓				
Sulfate in Water by IC	E108	1564700	2	36	5.5	5.0	✓				
TDS by Gravimetry	E235.SO4	1564703	2	29	6.9	5.0	✓				
Total Metals in Water by CRC ICPMS	E162	1566392	1	20	5.0	5.0	✓				
TSS by Gravimetry	E420	1562886	1	20	5.0	5.0	✗				
Turbidity by Nephelometry	E160	1563337	2	39	5.1	4.7	✓				
	E121	1563499	1	20	5.0	5.0	✓				



Matrix: Water

Quality Control Sample Type

Evaluation: \* = QC frequency outside specification, ✓ = QC frequency within specification.

Analytical Methods	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Laboratory Control Samples (LCS) - Continued							
Turbidity by Nephelometry	E121	1563499	1	20	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration							
Ammonia by Fluorescence	E290	1564701	2	25	8.0	5.0	✓
Bromide in Water by IC	E298	1575545	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Br	1564708	2	13	15.3	5.0	✓
Colour (Apparent) by Spectrometer	E235.Cl	1564704	2	29	6.9	5.0	✓
Conductivity in Water	E330	1564067	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E100	1564702	2	16	12.5	5.0	✓
E. coli (MF-mFC-BCIG)	E378-U	1564710	3	52	5.7	5.0	✓
Fluoride in Water by IC	E012A.EC	1564208	1	5	20.0	5.0	✓
Nitrate in Water by IC	E235.F	1564705	2	17	11.7	5.0	✓
Nitrite in Water by IC	E235.NO3	1564706	2	28	7.1	5.0	✓
Sulfate in Water by IC	E235.NO2	1564707	2	27	7.4	5.0	✓
TDS by Gravimetry	E235.SO4	1564703	2	29	6.9	5.0	✓
Total Coliforms (MF-mEndo)	E162	1566392	1	20	5.0	5.0	✓
Total Coliforms and E. coli (Enzyme Substrate)	E012.TC	1564215	2	25	8.0	5.0	✓
Total Coliforms Background (MF-mEndo)	E010	1564008	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E012.BG.TC	1564216	1	20	5.0	5.0	✓
TSS by Gravimetry	E420	1562886	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E160	1563337	2	39	5.1	4.7	✓
	E121	1563499	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence							
Bromide in Water by IC	E298	1575545	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Br	1564708	2	13	15.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E235.Cl	1564704	2	29	6.9	5.0	✓
Fluoride in Water by IC	E378-U	1564710	3	52	5.7	5.0	✓
Nitrate in Water by IC	E235.F	1564705	2	17	11.7	5.0	✓
Nitrite in Water by IC	E235.NO3	1564706	2	28	7.1	5.0	✓
Sulfate in Water by IC	E235.NO2	1564707	2	27	7.4	5.0	✓
Total Metals in Water by CRC ICPMS	E235.SO4	1564703	2	29	6.9	5.0	✓
	E420	1562886	1	20	5.0	5.0	✓



## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Description
Total Coliforms and E. coli (Enzyme Substrate)	E010	Water	APHA 9223 (mod)	The enzyme substrate test simultaneously detects Total Coliforms and E. coli in a 100 mL sample after incubation at 35.0 ±0.5°C for either 18 or 24 hours (dependent on reagent used).
	ALS Environmental - Waterloo			
Total Coliforms Background (MF-mEndo)	E012.BG.TC	Water	APHA 9222B (mod)	Noncoliform bacteria observed on Total Coliform plates are enumerated.
	ALS Environmental - Waterloo			
Total Coliforms (MF-mEndo)	E012.TC	Water	APHA 9222B (mod)	Following filtration (0.45 µm), and incubation at 35.0 ±0.5°C for 24 hours, colonies exhibiting characteristic morphology of the target organism are enumerated and confirmed.
	ALS Environmental - Waterloo			
E. coli (MF-mFC-BCIG)	E012A.EC	Water	APHA 9222D (mod)	Following filtration (0.45 µm), and incubation at 44.5±0.2°C for 24 hours, colonies exhibiting characteristic morphology of the target organism are enumerated.
	ALS Environmental - Waterloo			
Conductivity in Water	E 100	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
	ALS Environmental - Waterloo			
pH by Meter	E 108	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
	ALS Environmental - Waterloo			
Turbidity by Nephelometry	E 121	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
	ALS Environmental - Waterloo			
TSS by Gravimetry	E 160	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
	ALS Environmental - Waterloo			
TDS by Gravimetry	E 162	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
	ALS Environmental - Waterloo			



Analytical Methods	Method / Lab	Matrix	Method / Reference	Method Description
Bromide in Water by IC	E235, Br ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235, Cl ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235, F ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235, NO2 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235, NO3 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235, SO4 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 ALS Environmental - Waterloo	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 ALS Environmental - Edmonton	Water	Method Flatlab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Colour (Apparent) by Spectrometer	E330 ALS Environmental - Waterloo	Water	APHA 2120 C (mod)	Colour (Apparent) is measured in an unfiltered sample spectrophotometrically using the single wavelength method. The colour contribution of settleable solids are not included in the result. This method is intended for potable waters.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Waterloo	Water	APHA 4500-P F (mod)	Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.



Analytical Methods		Method / Lab	Matrix	Method Reference	Method Description
Total Metals in Water by CRC ICPMS		E420	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.
Hardness (Calculated) from Total Ca/Mg	ALS Environmental - Waterloo				Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
	EC100A	Water	APHA 2340B	"Hardness (as CaCO <sub>3</sub> ) from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO <sub>3</sub> equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.	
Ion Balance using Total Metals	EC101A	Water	APHA 1030E	Cation Sum (using total metals), Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).	
Sodium Adsorption Ratio [SAR] from Total Metals	ALS Environmental - Waterloo	Water	CCME Sodium Adsorption Ratio (SAR)	The Sodium Adsorption Ratio (SAR) for a water sample is calculated from the Sodium, Calcium, and Magnesium concentrations of the water, using the same calculations as would be used for a sediment paste extract.	
TDS calculated from conductivity	EC103A	Water	APHA 1030 E	Total dissolved solids (as mg/L) can be estimated by multiplying electrical conductance (in umhos/cm) by 0.65.	
Saturation Index using Laboratory pH (Ca-T)	ALS Environmental - Waterloo	Water	APHA 2330B	Langelier Index provides an indication of scale formation potential at a given pH and temperature, and is calculated as per APHA 2330B Saturation Index. Positive values indicate oversaturation with respect to CaCO <sub>3</sub> . Negative values indicate undersaturation of CaCO <sub>3</sub> . This calculation uses laboratory pH measurements and provides estimates of Langelier Index at temperatures of 4, 15, 20, 25, 66, and 77°C. Ryznar Stability Index is an alternative index used for scale formation and corrosion potential.	
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).	
Total Silicon as Silica (Calculation)	ALS Environmental - Waterloo				Total Silicon (as SiO <sub>2</sub> ) is a calculated parameter. Total Silicon (as SiO <sub>2</sub> mg/L) = 2.139 x Total Silicon (mg/L).
	EC420.SiO2	Water	N/A		
Preparation Methods					
Method / Lab		Matrix	Method Reference		Method Description
Preparation for Ammonia	EP298	Water			Sample preparation for Preserved Nutrients Water Quality Analysis.
	ALS Environmental - Edmonton				

## QUALITY CONTROL REPORT

Work Order	: WT2421115	Page	: 1 of 16
Client	: Englobe Corp.	Laboratory	: ALS Environmental - Waterloo
Contact	: Kevin Bailey	Account Manager	: Gayle Braun
Address	: 353 Bridge Street East Kitchener ON Canada N2K 2Y5	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: -----	Telephone	: +1 519 886 6910
Project	: 02405890	Date Samples Received	: 24-Jul-2024 17:40
PO	: -----	Date Analysis Commenced	: 25-Jul-2024
C-O-C number	: 23-1097696	Issue Date	: 01-Aug-2024 18:59
Sampler	: Ross I		
Site	: -----		
Quote number	: KITCHENER/LONDON GW SOA		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.  
This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report: Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report: Recovery and Data Quality Objectives
- Method Blank (MB) Report: Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report: Recovery and Data Quality Objectives

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Amanda Ganour-Lumsden	Department Manager - Microbiology and Prep	Waterloo Microbiology, Waterloo, Ontario
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Greg Pokocky	Manager - Inorganics	Waterloo Metals, Waterloo, Ontario
Jing Liu	Laboratory Analyst	Edmonton Inorganics, Edmonton, Alberta
Jon Fisher	Production Manager, Environmental	Waterloo Inorganics, Waterloo, Ontario
Nik Perkió	Senior Analyst	Waterloo Inorganics, Waterloo, Ontario
Ruby Sujeepan	Analyst	Waterloo Microbiology, Waterloo, Ontario
Zeba Patel	Analyst	Waterloo Microbiology, Waterloo, Ontario





## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

- Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO = Data Quality Objective.
- LOR = Limit of Reporting (detection limit).
- RPD = Relative Percent Difference
- # = Indicates a QC result that did not meet the ALS DQO.

## Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



### Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DAOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 1563337)											
WT2420817-002	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	3.9	3.5	0.4	Diff <2x LOR	----
Physical Tests (QC Lot: 1563499)											
WT2421000-001	Anonymous	Turbidity	----	E121	0.10	NTU	2.16	2.38	9.25%	15%	----
Physical Tests (QC Lot: 1564067)											
WT2421033-001	Anonymous	Colour, apparent	----	E330	2.0	CU	2.5	2.7	0.2	Diff <2x LOR	----
Physical Tests (QC Lot: 1564700)											
WT2421000-001	Anonymous	pH	----	E108	0.10	pH units	8.00	8.01	0.125%	4%	----
Physical Tests (QC Lot: 1564701)											
WT2421000-001	Anonymous	Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	259	261	0.738%	20%	----
Physical Tests (QC Lot: 1564702)											
WT2421000-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	662	659	0.454%	10%	----
Physical Tests (QC Lot: 1565826)											
WT2421115-002	DWI-2	pH	----	E108	0.10	pH units	8.09	8.11	0.247%	4%	----
Physical Tests (QC Lot: 1565827)											
WT2421115-002	DWI-2	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	240	240	0.0333%	20%	----
Physical Tests (QC Lot: 1565828)											
WT2421115-002	DWI-2	Conductivity	----	E100	1.0	µS/cm	1760	1750	0.285%	10%	----
Physical Tests (QC Lot: 1566392)											
WT2420995-006	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	134	136	2	Diff <2x LOR	----
Physical Tests (QC Lot: 1566399)											
WT2421019-013	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	4.1	3.5	0.6	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1564703)											
WT2421033-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	1030	1030	0.322%	20%	----
Anions and Nutrients (QC Lot: 1564704)											
WT2421033-001	Anonymous	Chloride	16887-00-6	E235.Cl	2.50	mg/L	3.63	3.56	0.07	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1564705)											
WT2421033-001	Anonymous	Fluoride	16984-48-8	E235.F	0.100	mg/L	0.874	0.879	0.005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1564706)											
WT2421033-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	0.100	mg/L	0.245	0.230	0.016	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1564707)											



Sub-Matrix: Water

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Anions and Nutrients (QC Lot: 1564707) - continued											
WT2421033-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	---
Anions and Nutrients (QC Lot: 1564708)											
WT2421033-001	Anonymous	Bromide	24959-67-9	E235.Br	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	---
Anions and Nutrients (QC Lot: 1564710)											
HA2401656-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0096	0.0099	0.0003	Diff <2x LOR	---
Anions and Nutrients (QC Lot: 1565820)											
WT2421155-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	15.6	15.7	0.0921%	20%	---
Anions and Nutrients (QC Lot: 1565821)											
WT2421155-001	Anonymous	Chloride	16887-00-6	E235.Cl	0.50	mg/L	16.6	16.5	0.817%	20%	---
Anions and Nutrients (QC Lot: 1565822)											
WT2421155-001	Anonymous	Bromide	24959-67-9	E235.Br	0.10	mg/L	<0.10	<0.10	0	Diff <2x LOR	---
Anions and Nutrients (QC Lot: 1565823)											
WT2421155-001	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.565	0.572	1.14%	20%	---
Anions and Nutrients (QC Lot: 1565824)											
WT2421155-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.296	0.303	2.26%	20%	---
Anions and Nutrients (QC Lot: 1565825)											
WT2421155-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	---
Anions and Nutrients (QC Lot: 1567874)											
HA2401745-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	---
Anions and Nutrients (QC Lot: 1570752)											
WT2421115-003	DW2-1	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	---
Anions and Nutrients (QC Lot: 1575545)											
HA2401739-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	---
Microbiological Tests (QC Lot: 1564008)											
WT2421115-001	DW1-1	Coliforms, Escherichia coli [E. coli]	---	E010	1	MPN/100mL	<1	<1	0	Diff <2x LOR	---
		Coliforms, total	---	E010	1	MPN/100mL	<1	<1	0	Diff <2x LOR	---
Microbiological Tests (QC Lot: 1564215)											
WT2421155-002	Anonymous	Coliforms, total	---	E012.TC	1	CFU/100mL	<1	<1	0	Diff <2x LOR	---
Total Metals (QC Lot: 1562886)											
HA2401721-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0059	0.0061	0.0002	Diff <2x LOR	---
		Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	---
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00026	0.00025	0.000007	Diff <2x LOR	---
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.00696	0.00688	1.05%	20%	---



Sub-Matrix: Water

Laboratory Duplicate (DUP) Report											
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 1562886) - continued											
HA2401721-001	Anonymous	Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000068	0.0000061	0.0000007	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	13.6	14.0	3.18%	20%	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	0.0311	0.0309	0.571%	20%	----
		Iron, total	7439-89-6	E420	0.010	mg/L	0.062	0.061	0.0008	Diff <2x LOR	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	0.000349	0.000347	0.000001	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	1.77	1.77	0.292%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.00213	0.00217	1.69%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000131	0.000144	0.000013	Diff <2x LOR	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Phosphorus, total	7723-14-0	E420	0.050	mg/L	0.637	0.671	5.13%	20%	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	0.539	0.536	0.418%	20%	----
		Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00060	0.00067	0.00007	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	1.88	1.89	0.0682%	20%	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	25.1	24.9	0.840%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	0.0949	0.0938	1.24%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	14.1	14.0	1.39%	20%	----
		Tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, total	7440-29-1	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
Tungsten, total	7440-33-7	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----		
Uranium, total	7440-61-1	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----		
Vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----		
Zinc, total	7440-66-6	E420	0.0030	mg/L	0.247	0.247	0.0606%	20%	----		



Sub-Matrix: Water

Sub-Matrix: Water				Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 1562886) - continued											
HA2401721-001	Anonymous	Zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	---



## Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Physical Tests (QCLOt: 1563337)</b>						
Solids, total suspended (TSS)	---	E160	3	mg/L	<3.0	---
<b>Physical Tests (QCLOt: 1563499)</b>						
Turbidity	---	E121	0.1	NTU	<0.10	---
<b>Physical Tests (QCLOt: 1564067)</b>						
Colour, apparent	---	E330	2	CU	<2.0	---
<b>Physical Tests (QCLOt: 1564701)</b>						
Alkalinity, total (as CaCO3)	---	E290	1	mg/L	<1.0	---
<b>Physical Tests (QCLOt: 1564702)</b>						
Conductivity	---	E100	1	µS/cm	<1.0	---
<b>Physical Tests (QCLOt: 1565827)</b>						
Alkalinity, total (as CaCO3)	---	E290	1	mg/L	<1.0	---
<b>Physical Tests (QCLOt: 1565828)</b>						
Conductivity	---	E100	1	µS/cm	<1.0	---
<b>Physical Tests (QCLOt: 1566392)</b>						
Solids, total dissolved (TDS)	---	E162	10	mg/L	<10	---
<b>Physical Tests (QCLOt: 1566399)</b>						
Solids, total suspended (TSS)	---	E160	3	mg/L	<3.0	---
<b>Anions and Nutrients (QCLOt: 1564703)</b>						
Sulfate (as SO4)	14808-79-8	E235 SO4	0.3	mg/L	<0.30	---
<b>Anions and Nutrients (QCLOt: 1564704)</b>						
Chloride	16887-00-6	E235 Cl	0.5	mg/L	<0.50	---
<b>Anions and Nutrients (QCLOt: 1564705)</b>						
Fluoride	16984-48-8	E235 F	0.02	mg/L	<0.020	---
<b>Anions and Nutrients (QCLOt: 1564706)</b>						
Nitrate (as N)	14797-55-8	E235 NO3	0.02	mg/L	<0.020	---
<b>Anions and Nutrients (QCLOt: 1564707)</b>						
Nitrite (as N)	14797-55-0	E235 NO2	0.01	mg/L	<0.010	---
<b>Anions and Nutrients (QCLOt: 1564708)</b>						
Bromide	24959-67-9	E235 Br	0.1	mg/L	<0.10	---
<b>Anions and Nutrients (QCLOt: 1564710)</b>						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	# 0.0016	B
<b>Anions and Nutrients (QCLOt: 1565820)</b>						



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Anions and Nutrients (QCLot: 1565820) -continued</b>						
Sulfate (as SO <sub>4</sub> )	14808-79-8	E235.SO4	0.3	mg/L	<0.30	---
<b>Anions and Nutrients (QCLot: 1565821)</b>						
Chloride	16987-00-6	E235.Cl	0.5	mg/L	<0.50	---
<b>Anions and Nutrients (QCLot: 1565822)</b>						
Bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	---
<b>Anions and Nutrients (QCLot: 1565823)</b>						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	---
<b>Anions and Nutrients (QCLot: 1565824)</b>						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	---
<b>Anions and Nutrients (QCLot: 1565825)</b>						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	---
<b>Anions and Nutrients (QCLot: 1567874)</b>						
Phosphate, ortho-, dissolved (as P)	14285-44-2	E378-U	0.001	mg/L	<0.0010	---
<b>Anions and Nutrients (QCLot: 1570752)</b>						
Phosphate, ortho-, dissolved (as P)	14285-44-2	E378-U	0.001	mg/L	<0.0010	---
<b>Anions and Nutrients (QCLot: 1575545)</b>						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
<b>Microbiological Tests (QCLot: 1564008)</b>						
Coliforms, Escherichia coli [E. coli]	---	E010	1	MPN/100mL	<1	---
Coliforms, total	---	E010	1	MPN/100mL	<1	---
<b>Microbiological Tests (QCLot: 1564208)</b>						
Coliforms, Escherichia coli [E. coli]	---	E012A.EC	1	CFU/100mL	<1	---
<b>Microbiological Tests (QCLot: 1564215)</b>						
Coliforms, total	---	E012.TC	1	CFU/100mL	<1	---
<b>Microbiological Tests (QCLot: 1564216)</b>						
coliforms, total background	---	E012.BG.TC	1	CFU/100mL	<1	---
<b>Microbiological Tests (QCLot: 1564217)</b>						
Coliforms, total	---	E012.TC	1	CFU/100mL	<1	---
<b>Total Metals (QCLot: 1562886)</b>						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	---
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	---
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	---
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	---
Bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	---



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Total Metals (GCLOT: 1562886) - continued</b>						
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	-----
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	-----
Cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	-----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	-----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	-----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	-----
Iron, total	7439-99-6	E420	0.01	mg/L	<0.010	-----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	-----
Lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	-----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	-----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	-----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	-----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	-----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	-----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	-----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	-----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	-----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	-----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	-----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	-----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	-----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	-----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	-----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	-----
Thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	-----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	-----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	-----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	-----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	-----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	-----
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	-----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	-----





Qualifiers

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report					
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier	
					Target Concentration	LCS	Low	High		
Physical Tests (QCLot: 1563337)										
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	104	85.0	115	----	
Physical Tests (QCLot: 1563499)										
Turbidity	----	E121	0.1	NTU	200 NTU	89.5	85.0	115	----	
Physical Tests (QCLot: 1564067)										
Colour, apparent	----	E330	2	CU	25 CU	98.4	70.0	130	----	
Physical Tests (QCLot: 1564700)										
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----	
Physical Tests (QCLot: 1564701)										
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	150 mg/L	98.7	85.0	115	----	
Physical Tests (QCLot: 1564702)										
Conductivity	----	E100	1	µS/cm	1410 µS/cm	101	90.0	110	----	
Physical Tests (QCLot: 1565826)										
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----	
Physical Tests (QCLot: 1565827)										
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	150 mg/L	100	85.0	115	----	
Physical Tests (QCLot: 1565828)										
Conductivity	----	E100	1	µS/cm	1410 µS/cm	100	90.0	110	----	
Physical Tests (QCLot: 1566392)										
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	101	85.0	115	----	
Physical Tests (QCLot: 1566399)										
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	86.8	85.0	115	----	
Anions and Nutrients (QCLot: 1564703)										
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----	
Anions and Nutrients (QCLot: 1564704)										
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.2	90.0	110	----	
Anions and Nutrients (QCLot: 1564705)										
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.0	90.0	110	----	
Anions and Nutrients (QCLot: 1564706)										
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	99.1	90.0	110	----	
Anions and Nutrients (QCLot: 1564707)										
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	99.7	90.0	110	----	



Sub-Matrix: Water

Sub-Matrix: Water		Laboratory Control Sample (LCS) Report									
		Spike		Recovery (%)				Qualifier			
				Recovery Limits (%)							
				Target Concentration	LCS	Low	High				
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier		
Anions and Nutrients (QCLot: 1564708)											
Bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	103	85.0	115	-----		
Anions and Nutrients (QCLot: 1564710)											
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.05 mg/L	100	80.0	120	-----		
Anions and Nutrients (QCLot: 1565820)											
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	-----		
Anions and Nutrients (QCLot: 1565821)											
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	-----		
Anions and Nutrients (QCLot: 1565822)											
Bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	103	85.0	115	-----		
Anions and Nutrients (QCLot: 1565823)											
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.8	90.0	110	-----		
Anions and Nutrients (QCLot: 1565824)											
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	100	90.0	110	-----		
Anions and Nutrients (QCLot: 1565825)											
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	100	90.0	110	-----		
Anions and Nutrients (QCLot: 1567874)											
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.05 mg/L	98.7	80.0	120	-----		
Anions and Nutrients (QCLot: 1570752)											
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.05 mg/L	98.4	80.0	120	-----		
Anions and Nutrients (QCLot: 1575545)											
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	107	85.0	115	-----		
Total Metals (QCLot: 1562886)											
Aluminum, total	7429-90-5	E420	0.003	mg/L	0.1 mg/L	102	80.0	120	-----		
Antimony, total	7440-36-0	E420	0.0001	mg/L	0.05 mg/L	103	80.0	120	-----		
Arsenic, total	7440-38-2	E420	0.0001	mg/L	0.05 mg/L	108	80.0	120	-----		
Barium, total	7440-39-3	E420	0.0001	mg/L	0.012 mg/L	100	80.0	120	-----		
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.005 mg/L	94.0	80.0	120	-----		
Bismuth, total	7440-69-9	E420	0.00005	mg/L	0.05 mg/L	104	80.0	120	-----		
Boron, total	7440-42-8	E420	0.01	mg/L	0.05 mg/L	97.3	80.0	120	-----		
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.005 mg/L	99.0	80.0	120	-----		
Calcium, total	7440-70-2	E420	0.05	mg/L	2.5 mg/L	99.4	80.0	120	-----		
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.002 mg/L	101	80.0	120	-----		
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.012 mg/L	104	80.0	120	-----		
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.012 mg/L	102	80.0	120	-----		
Copper, total	7440-50-8	E420	0.0005	mg/L	0.012 mg/L	102	80.0	120	-----		



Sub-Matrix: Water

Sub-Matrix: Water	Laboratory Control Sample (LCS) Report									
	Spike		Recovery (%)		Recovery Limits (%)		Qualifier			
	Target Concentration	LCS	Low	High						
	Total Metals (QCLot: 1562886) - continued									
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier	
Iron, total	7439-89-6	E420	0.01	mg/L	0.05 mg/L	99.7	80.0	120	----	
Lead, total	7439-92-1	E420	0.00005	mg/L	0.025 mg/L	98.6	80.0	120	----	
Lithium, total	7439-93-2	E420	0.001	mg/L	0.012 mg/L	89.4	80.0	120	----	
Magnesium, total	7439-95-4	E420	0.005	mg/L	2.5 mg/L	112	80.0	120	----	
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.012 mg/L	103	80.0	120	----	
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.012 mg/L	103	80.0	120	----	
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.025 mg/L	101	80.0	120	----	
Phosphorus, total	7723-14-0	E420	0.05	mg/L	0.5 mg/L	102	80.0	120	----	
Potassium, total	7440-09-7	E420	0.05	mg/L	2.5 mg/L	97.6	80.0	120	----	
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.005 mg/L	103	80.0	120	----	
Selenium, total	7782-49-2	E420	0.00005	mg/L	0.05 mg/L	106	80.0	120	----	
Silicon, total	7440-21-3	E420	0.1	mg/L	0.5 mg/L	104	80.0	120	----	
Silver, total	7440-22-4	E420	0.00001	mg/L	0.005 mg/L	92.0	80.0	120	----	
Sodium, total	7440-23-5	E420	0.05	mg/L	2.5 mg/L	108	80.0	120	----	
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.012 mg/L	101	80.0	120	----	
Sulfur, total	7704-34-9	E420	0.5	mg/L	2.5 mg/L	109	80.0	120	----	
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.005 mg/L	103	80.0	120	----	
Thallium, total	7440-28-0	E420	0.00001	mg/L	0.05 mg/L	102	80.0	120	----	
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.005 mg/L	94.1	80.0	120	----	
Tin, total	7440-31-5	E420	0.0001	mg/L	0.025 mg/L	102	80.0	120	----	
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.012 mg/L	102	80.0	120	----	
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.005 mg/L	96.6	80.0	120	----	
Uranium, total	7440-61-1	E420	0.00001	mg/L	0 mg/L	99.9	80.0	120	----	
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.025 mg/L	103	80.0	120	----	
Zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	99.4	80.0	120	----	
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.005 mg/L	95.8	80.0	120	----	



## Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level  $\geq 1 \times$  spike level.

Sub-Matrix: Water

Sub-Matrix: Water		Laboratory sample ID		Client sample ID		Analyte		CAS Number		Method		Matrix Spike (MS) Report							
												Spike		Recovery Limits (%)			Qualifier		
													Concentration	Target	Recovery (%)	MS		Low	High
Anions and Nutrients (QCLOt: 1564703)																			
WT2421033-001	Anonymous			Sulfate (as SO4)	14808-79-8	E235 SO4		ND mg/L	----	ND		75.0	125	-----					
Anions and Nutrients (QCLOt: 1564704)																			
WT2421033-001	Anonymous			Chloride	16887-00-6	E235 Cl		513 mg/L	500 mg/L	102		75.0	125	-----					
Anions and Nutrients (QCLOt: 1564705)																			
WT2421033-001	Anonymous			Fluoride	16984-48-8	E235 F		5.14 mg/L	5 mg/L	103		75.0	125	-----					
Anions and Nutrients (QCLOt: 1564706)																			
WT2421033-001	Anonymous			Nitrate (as N)	14797-55-8	E235 NO3		12.6 mg/L	12.5 mg/L	101		75.0	125	-----					
Anions and Nutrients (QCLOt: 1564707)																			
WT2421033-001	Anonymous			Nitrite (as N)	14797-65-0	E235 NO2		2.53 mg/L	2.5 mg/L	101		75.0	125	-----					
Anions and Nutrients (QCLOt: 1564708)																			
WT2421033-001	Anonymous			Bromide	24959-67-9	E235 Br		2.49 mg/L	2.5 mg/L	99.6		75.0	125	-----					
Anions and Nutrients (QCLOt: 1564710)																			
HA2401666-001	Anonymous			Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U		0.0199 mg/L	0.02 mg/L	102		70.0	130	-----					
Anions and Nutrients (QCLOt: 1565820)																			
WT2421155-001	Anonymous			Sulfate (as SO4)	14808-79-8	E235 SO4		103 mg/L	100 mg/L	103		75.0	125	-----					
Anions and Nutrients (QCLOt: 1565821)																			
WT2421155-001	Anonymous			Chloride	16887-00-6	E235 Cl		102 mg/L	100 mg/L	102		75.0	125	-----					
Anions and Nutrients (QCLOt: 1565822)																			
WT2421155-001	Anonymous			Bromide	24959-67-9	E235 Br		0.50 mg/L	0.5 mg/L	99.6		75.0	125	-----					
Anions and Nutrients (QCLOt: 1565823)																			
WT2421155-001	Anonymous			Fluoride	16984-48-8	E235 F		1.03 mg/L	1 mg/L	103		75.0	125	-----					
Anions and Nutrients (QCLOt: 1565824)																			
WT2421155-001	Anonymous			Nitrate (as N)	14797-55-8	E235 NO3		2.65 mg/L	2.5 mg/L	106		75.0	125	-----					
Anions and Nutrients (QCLOt: 1565825)																			
WT2421155-001	Anonymous			Nitrite (as N)	14797-65-0	E235 NO2		0.434 mg/L	0.5 mg/L	86.8		75.0	125	-----					
Anions and Nutrients (QCLOt: 1567874)																			
HA2401745-001	Anonymous			Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U		0.0171 mg/L	0.02 mg/L	87.1		70.0	130	-----					
Anions and Nutrients (QCLOt: 1570752)																			
WT2421115-003	DW2-1			Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U		0.0195 mg/L	0.02 mg/L	99.5		70.0	130	-----					
Anions and Nutrients (QCLOt: 1575545)																			



Sub-Matrix: Water

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
					Concentration	Target		MS	Low	High
Anions and Nutrients (QCLot: 1575545) - continued										
HA2401739-002	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.109 mg/L	0.1 mg/L	109	75.0	125	---
Total Metals (QCLot: 1562886)										
HA2401721-002	Anonymous	Aluminum, total	7429-90-5	E420	0.0970 mg/L	0.1 mg/L	97.0	70.0	130	---
		Antimony, total	7440-36-0	E420	0.0521 mg/L	0.05 mg/L	104	70.0	130	---
		Arsenic, total	7440-38-2	E420	0.0530 mg/L	0.05 mg/L	106	70.0	130	---
		Barium, total	7440-39-3	E420	0.0114 mg/L	0.012 mg/L	91.2	70.0	130	---
		Beryllium, total	7440-41-7	E420	0.00446 mg/L	0.005 mg/L	89.1	70.0	130	---
		Bismuth, total	7440-69-9	E420	0.0485 mg/L	0.05 mg/L	97.1	70.0	130	---
		Boron, total	7440-42-8	E420	0.048 mg/L	0.05 mg/L	95.1	70.0	130	---
		Cadmium, total	7440-43-9	E420	0.00488 mg/L	0.005 mg/L	97.7	70.0	130	---
		Calcium, total	7440-70-2	E420	ND mg/L	---	ND	70.0	130	---
		Cesium, total	7440-46-2	E420	0.00253 mg/L	0.002 mg/L	101	70.0	130	---
		Chromium, total	7440-47-3	E420	0.0125 mg/L	0.012 mg/L	100	70.0	130	---
		Cobalt, total	7440-48-4	E420	0.0124 mg/L	0.012 mg/L	99.1	70.0	130	---
		Copper, total	7440-50-8	E420	ND mg/L	---	ND	70.0	130	---
		Iron, total	7439-89-6	E420	ND mg/L	---	ND	70.0	130	---
		Lead, total	7439-92-1	E420	0.0239 mg/L	0.025 mg/L	95.7	70.0	130	---
		Lithium, total	7439-93-2	E420	0.0109 mg/L	0.012 mg/L	87.4	70.0	130	---
		Magnesium, total	7439-95-4	E420	2.74 mg/L	2.5 mg/L	109	70.0	130	---
		Manganese, total	7439-96-5	E420	0.0124 mg/L	0.012 mg/L	99.1	70.0	130	---
		Molybdenum, total	7439-98-7	E420	0.0128 mg/L	0.012 mg/L	102	70.0	130	---
		Nickel, total	7440-02-0	E420	0.0246 mg/L	0.025 mg/L	98.4	70.0	130	---
		Phosphorus, total	7723-14-0	E420	ND mg/L	---	ND	70.0	130	---
		Potassium, total	7440-09-7	E420	2.32 mg/L	2.5 mg/L	92.9	70.0	130	---
		Rubidium, total	7440-17-7	E420	0.00493 mg/L	0.005 mg/L	98.7	70.0	130	---
		Selenium, total	7782-49-2	E420	0.0527 mg/L	0.05 mg/L	105	70.0	130	---
		Silicon, total	7440-21-3	E420	ND mg/L	---	ND	70.0	130	---
		Silver, total	7440-22-4	E420	0.00441 mg/L	0.005 mg/L	88.2	70.0	130	---
		Sodium, total	7440-23-5	E420	ND mg/L	---	ND	70.0	130	---
		Strontium, total	7440-24-6	E420	ND mg/L	---	ND	70.0	130	---
		Sulfur, total	7704-34-9	E420	ND mg/L	---	ND	70.0	130	---
		Tellurium, total	13494-80-9	E420	0.00495 mg/L	0.005 mg/L	99.1	70.0	130	---
		Thallium, total	7440-28-0	E420	0.0486 mg/L	0.05 mg/L	97.2	70.0	130	---
		Thorium, total	7440-29-1	E420	0.00482 mg/L	0.005 mg/L	96.5	70.0	130	---
		Tin, total	7440-31-5	E420	0.0252 mg/L	0.025 mg/L	101	70.0	130	---
		Titanium, total	7440-32-6	E420	0.0122 mg/L	0.012 mg/L	97.5	70.0	130	---
		Tungsten, total	7440-33-7	E420	0.00484 mg/L	0.005 mg/L	96.7	70.0	130	---
		Uranium, total	7440-61-1	E420	0.000255 mg/L	0 mg/L	102	70.0	130	---
		Vanadium, total	7440-62-2	E420	0.0251 mg/L	0.025 mg/L	100	70.0	130	---
		Zinc, total	7440-66-6	E420	ND mg/L	---	ND	70.0	130	---
		Zirconium, total	7440-67-7	E420	0.00476 mg/L	0.005 mg/L	95.2	70.0	130	---





Chain of Custody (COC) / Analytical Request Form

COC Number: 23 - 1097696

Page 1 of 1

Canada Toll Free: 1 800 668 9878

Environmental Division  
Waterloo

Work Order Reference  
WT2421115



Telephone : - 1 519 886 6910

Contact and company name below will appear on the final report		Reports / Recipients		Turnaround Time (TAT) Requested	
To:	ALS	Select Report Format:	<input checked="" type="checkbox"/> PDF <input type="checkbox"/> EXCEL <input type="checkbox"/> EDO (DIGITAL)	<input checked="" type="checkbox"/> Routine (R) if received by 3pm M-F - no surcharges apply	
From:	KEVIN BAILEY	Merge CO/OCI Reports with COA	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	<input type="checkbox"/> 4 day (P4) if received by 3pm M-F - 20% rush surcharge minimum	
City:		Compare Results to Criteria on Report - provide details below if box checked		<input type="checkbox"/> 3 day (P3) if received by 3pm M-F - 25% rush surcharge minimum	
State:		Select Distribution:	<input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	<input type="checkbox"/> 2 day (P2) if received by 3pm M-F - 50% rush surcharge minimum	
Country:		Email 1 or Fax	KEVIN BAILEY@ENVIRONMENTAL.AT	<input type="checkbox"/> 1 day (P1) if received by 3pm M-F - 100% rush surcharge minimum	
Province:		Email 2	RUSSELL.ROBERTS@ENVIRONMENTAL.AT	<input type="checkbox"/> Same day (E) if received by 10am M-F - 200% rush surcharge	
Postal Code:		Email 3		Additional fees may apply to rush requests on weekends	
Copy of Invoice with Report		Invoice Recipients		Date and Time Required for all E&P TATs:	
<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		For all tests with rush TATs requested, please call	
Copy of Invoice with Report		Email 1 or Fax		Analysis Required	
AP-ONT@ENVIRONMENTAL.AT		AP-ONT@ENVIRONMENTAL.AT		Indicate Method (F), Preserved (P) or Filtered and Preserved (FP) below	
Project Information		Oil and Gas Required Fields (client use)		NUMBER OF CONTAINERS	
Client Code / QUOTE #:		AFECost Center:		SUSPECTED HAZARD (see notes)	
Project #:		Major/Minor Code:		EXTENDED STORAGE REQUIRED	
AFE:		Routing Code:		SAMPLES ON HOLD	
Location:		ALS Contact: GAYLE B			
Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mm-yy)		Time (hh:mm)	
DW1-1		23/07/24		13:10	
DW1-2		"		16:10	
DW2-1		24/07/24		11:25	
DW2-2		"		14:25	
Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)		Sample Type		Cooling Method: <input type="checkbox"/> NONE <input checked="" type="checkbox"/> ICE <input type="checkbox"/> ICE PACKS <input type="checkbox"/> FROZEN	
PLEASE TEST FOR POTABILITY		SAMPLES ON HOLD		Cooler Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	
(METALS & VOLUME) (PACKAGING (THANKS))		Time		Cooler Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	
SHIPMENT RELEASE (client use)		Date		INITIAL COOLER TEMPERATURES °C	
Date: 24/24/24 5:30		Received by:		FINAL COOLER TEMPERATURES °C	
Time: 5:30		Date:		7.1 2.2	
SHIPPING RELEASE (client use)		Date:		FINAL SHIPMENT RECEPTION (ALS use only)	
Date: 24/24/24 5:30		Received by:		Date: 24-July-27	
Time: 5:30		Date:		Time: 19:40	
Drinking Water (DW) Samples (client use)		Date:		Time:	
Samples taken from a Regulated DW System?		Received by:		Time:	
<input type="checkbox"/> YES <input type="checkbox"/> NO		Date:		Time:	
Samples for human consumption use?		Date:		Time:	
<input type="checkbox"/> YES <input type="checkbox"/> NO		Date:		Time:	
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.		Date:		Time:	
TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION		Date:		Time:	
To complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.		Date:		Time:	
water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.		Date:		Time:	



# **Appendix F**

## **Statement of Limitations**



**eNGLOBE**

## STATEMENT OF LIMITATIONS

This report (hereinafter, the “**Report**”) was prepared by Englobe Corp. (hereinafter the “**Company**”) and is provided for the sole and exclusive use and benefit of Nick Hiebert (the “**Client**”). Ownership in and copyright for the contents of the Report belong to the Company.

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This Report should be considered in its entirety; selecting specific portions of the Report may result in the misinterpretation of the content.

The work performed by the Company was carried out in accordance with the terms and conditions specified in the *Professional Services Agreement* between the Company and the Client, in accordance with currently accepted engineering standards and practices and in a manner consistent with the level of skill, care and competence ordinarily exercised by members of the same profession currently practicing under similar conditions and like circumstances in the same jurisdiction in which the services were provided. Standards, guidelines and practices may change over time; those which were applied to produce this Report may be obsolete or unacceptable at a later date.

The findings, recommendations, suggestions, or opinions expressed in this Report reflect the Company's best professional judgment based on observations and/or information reasonably available at the time the work was performed, as appropriate for the scope, work schedule and budgetary constraints established by the Client. No other warranty or representation, expressed or implied, is included in this Report including, but not limited to, that the Report deals with all issues potentially applicable to the site and/or that the Report deals with any and all of the important features of the site, except as expressly provided in the scope of work.

This Report has been prepared for the specific site, development, building, design or building assessment objectives and/or purposes that were described to the Company by the Client. The applicability and reliability of the content of this Report, subject to the limitations provided herein, are only valid to the extent that there has been no material alteration or variation thereto, and the Company expressly disclaims any obligation to update the Report. However, the Company reserves the right to amend or supplement this Report based on additional information, documentation or evidence made available to it.

*The Company makes no representation concerning the legal significance of its findings, nor as to the present or future value of the property, or its fitness for a particular purpose and hereby disclaims any responsibility or liability for consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.*

Since the passage of time, natural occurrences, and direct or indirect human intervention may affect the views, conclusions and recommendations (if any) provided in this Report, it is intended for immediate use.

This Statement of Limitations forms an integral part of the Report.

In preparing this Report, the Company has relied in good faith on information provided by others and has assumed that such information is factual, accurate and complete. The Company accepts no responsibility or liability for any deficiency, misstatement or inaccuracy in this Report resulting from the information provided, concealed or not fully disclosed by those individuals.

Any description of the site and its physical setting documented in this Report is presented for informational purposes only, to provide the reader a better understanding of the site and scope of work. Any topographic benchmarks and elevations are primarily to establish relative elevation differences between sampling locations and should not be used for other purposes such as grading, excavation, planning, development, or similar purposes.

Any results from laboratory or other subcontractors reported herein have been carried out by others, and the Company cannot warrant their accuracy.





PLAN OF PART  
OF PART  
LOT 13  
CONCESSION 14  
IN THE GEOGRAPHIC  
TOWNSHIP OF NORTH WALSHINGHAM  
IN  
NORFOLK COUNTY  
SCALE: 1 : 250  
JEWITT AND DIXON LTD.  
METRIC NOTE:  
DISTANCES AND COORDINATES ARE  
BE CONVERTED TO IMPERIAL BY

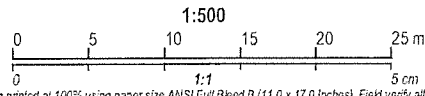


Legend

- Site Boundary
- Water Wells
- Test Pits

Note

- This drawing shall be read in conjunction with the associated technical report.
- Drawing scale may be distorted. Measurements/locations taken from the drawing must be verified in the field.



Scale accurate when printed at 100% using paper size ANSI Full Bleed D (11.0 x 17.0 inches). Field verify all measurements.

A	8/29/2024	Final	X.X
Revision	Date	Issue	Approval

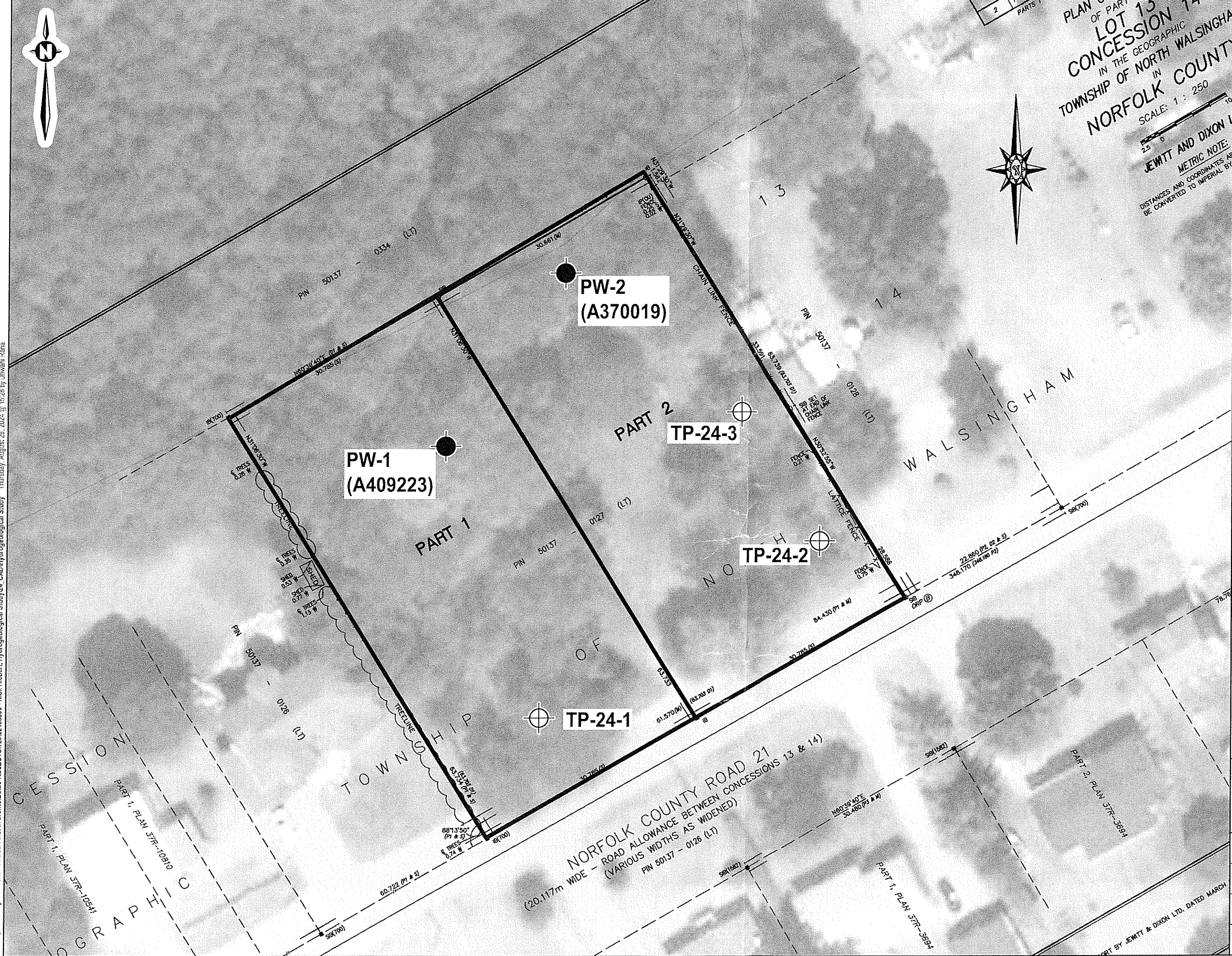
Client  
**Nick Hiebert**

Site  
**1019 Norfolk County Road 21, Courtland, ON**

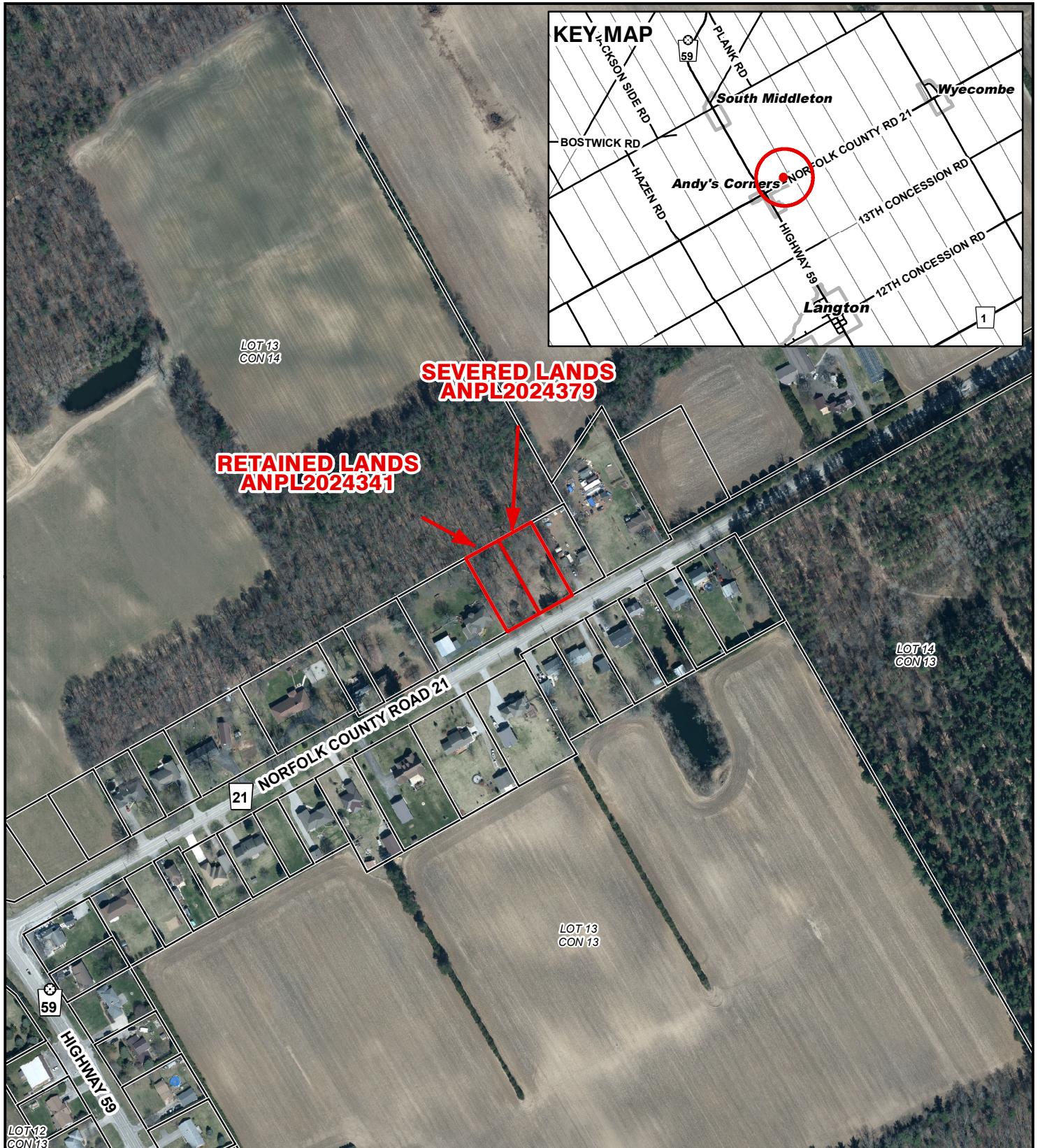
Report Title  
**Hydrogeological Study**

Drawing Title  
**Water Well and Test Pit Location Map**


Designed By	K.B	Scale	As Shown
Drawn By	D.R	Date	August 2024
Approved By	K.B	Project No.	02405890.000
Figure No.	2		



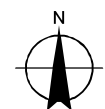




**Legend**

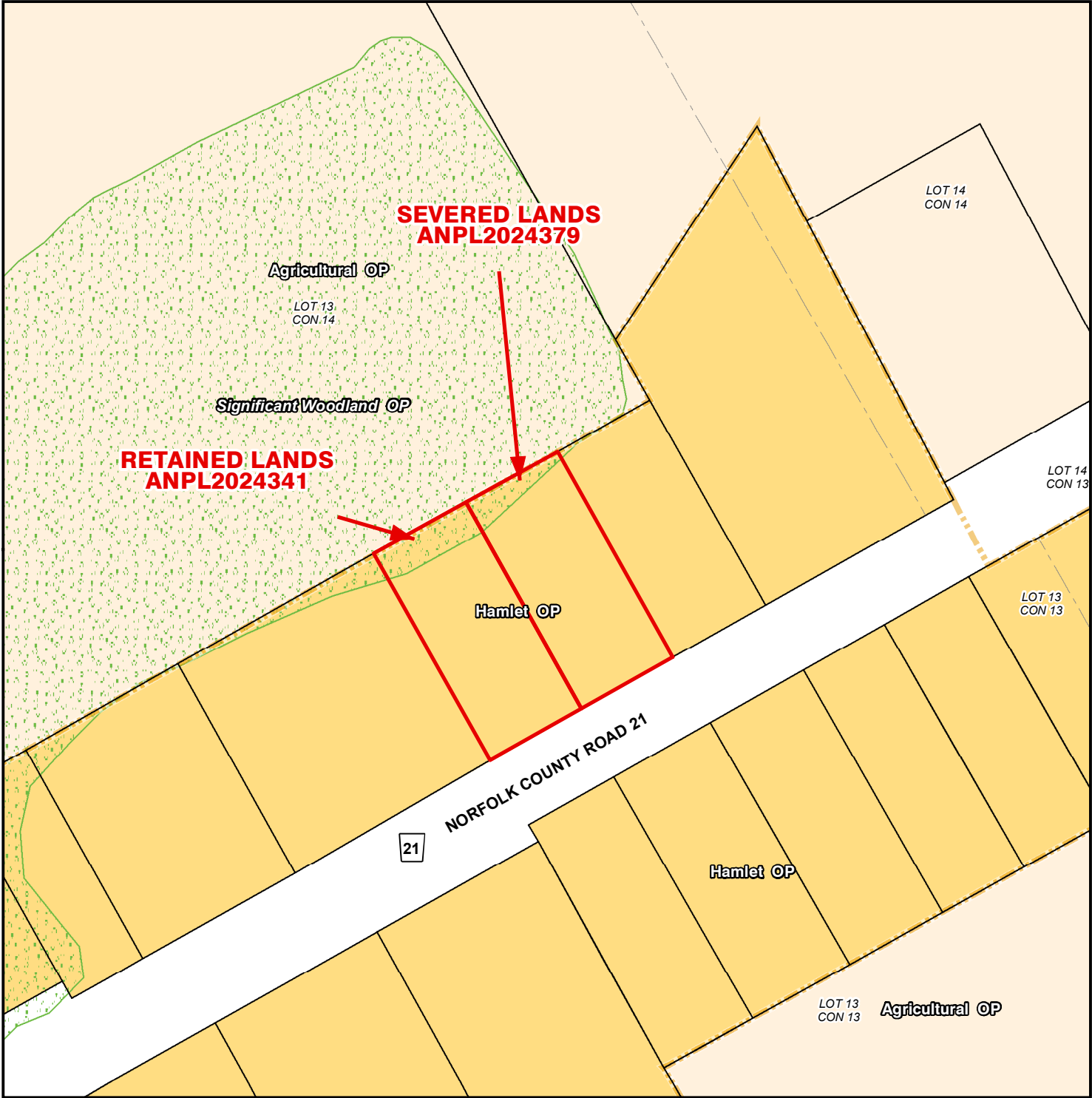
 Subject Lands

2020 Air Photo



30 15 0 30 60 90 120  
Meters





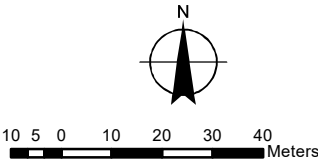
**Legend**

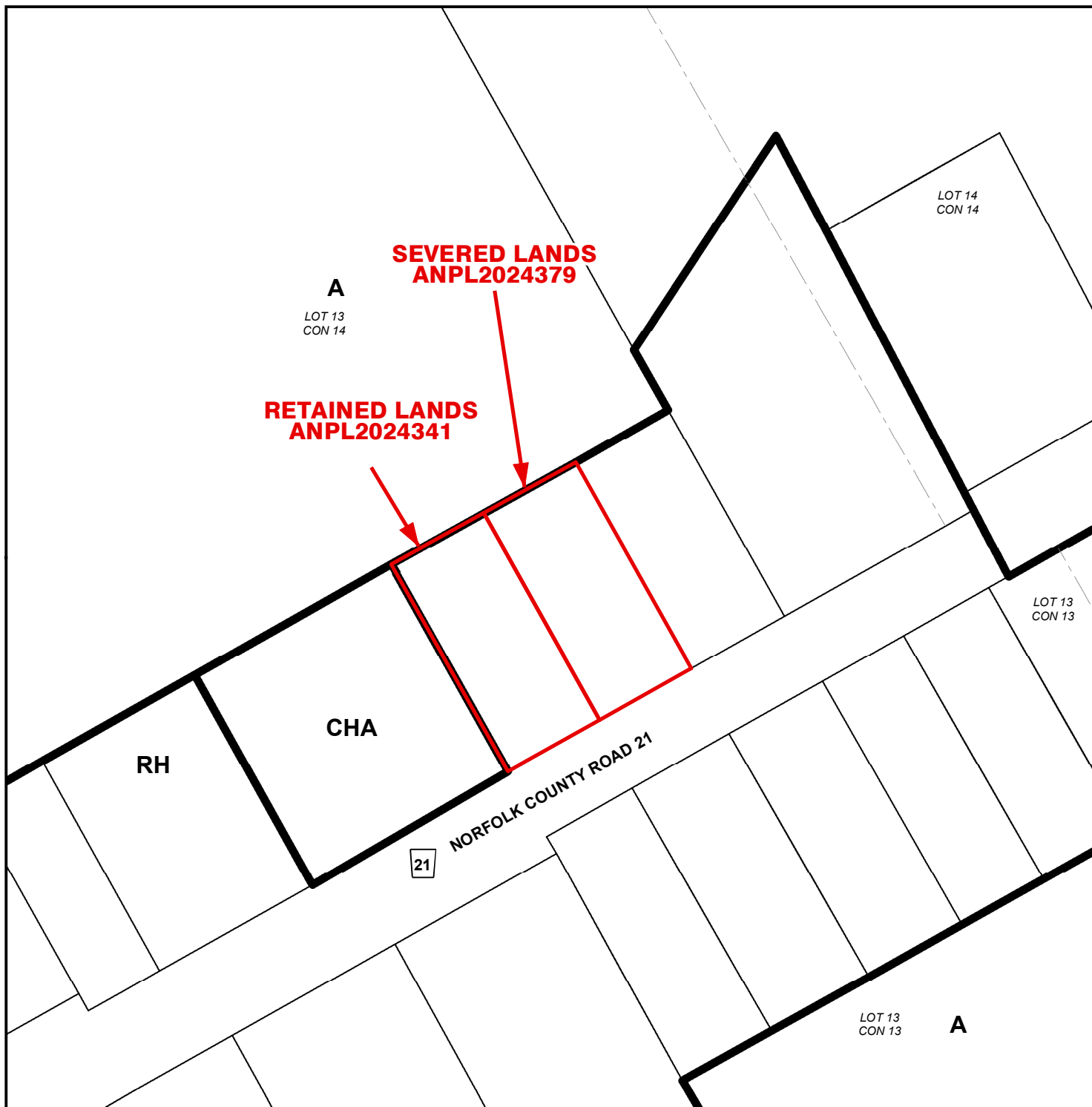
 Subject Lands

**Official Plan Designations**

-  Agricultural
-  Hamlet
-  Hamlet Area Boundary
-  Significant Woodland

10/28/2024





**LEGEND**

 Subject Lands

ZONING BY-LAW 1-Z-2014

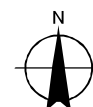
10/28/2024

(H) - Holding

A - Agricultural Zone

CHA - Hamlet Commercial Zone

RH - Hamlet Residential Zone



10 5 0 10 20 30 40 Meters

# MAP D

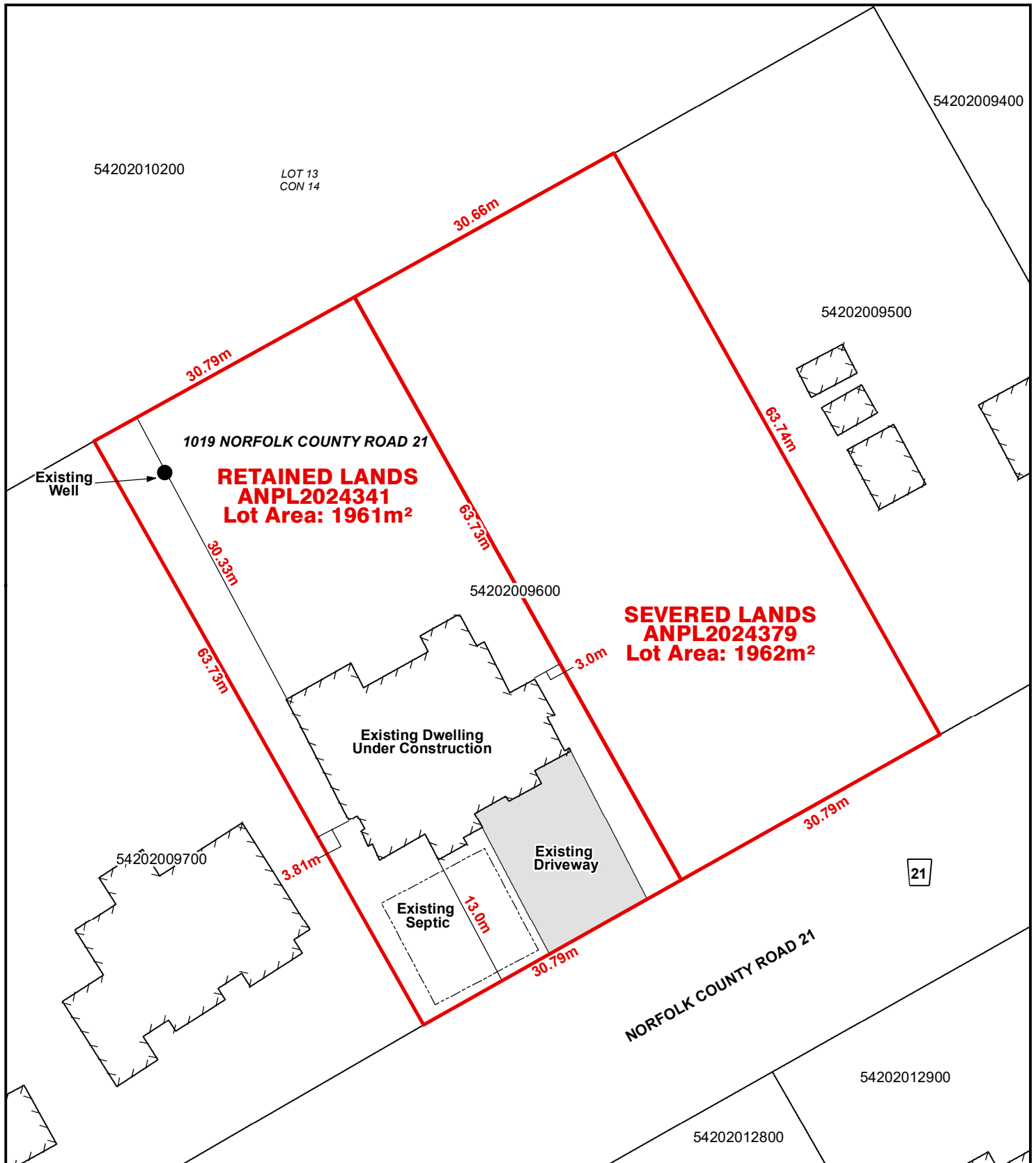
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Geographic Township of NORTH WALSINGHAM

BNPL2024340

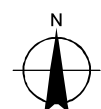
ANPL2024341

ANPL2024379



### Legend

Subject Lands



10/28/2024

4 2 0 4 8 12 16 Meters



# LOCATION OF LANDS AFFECTED

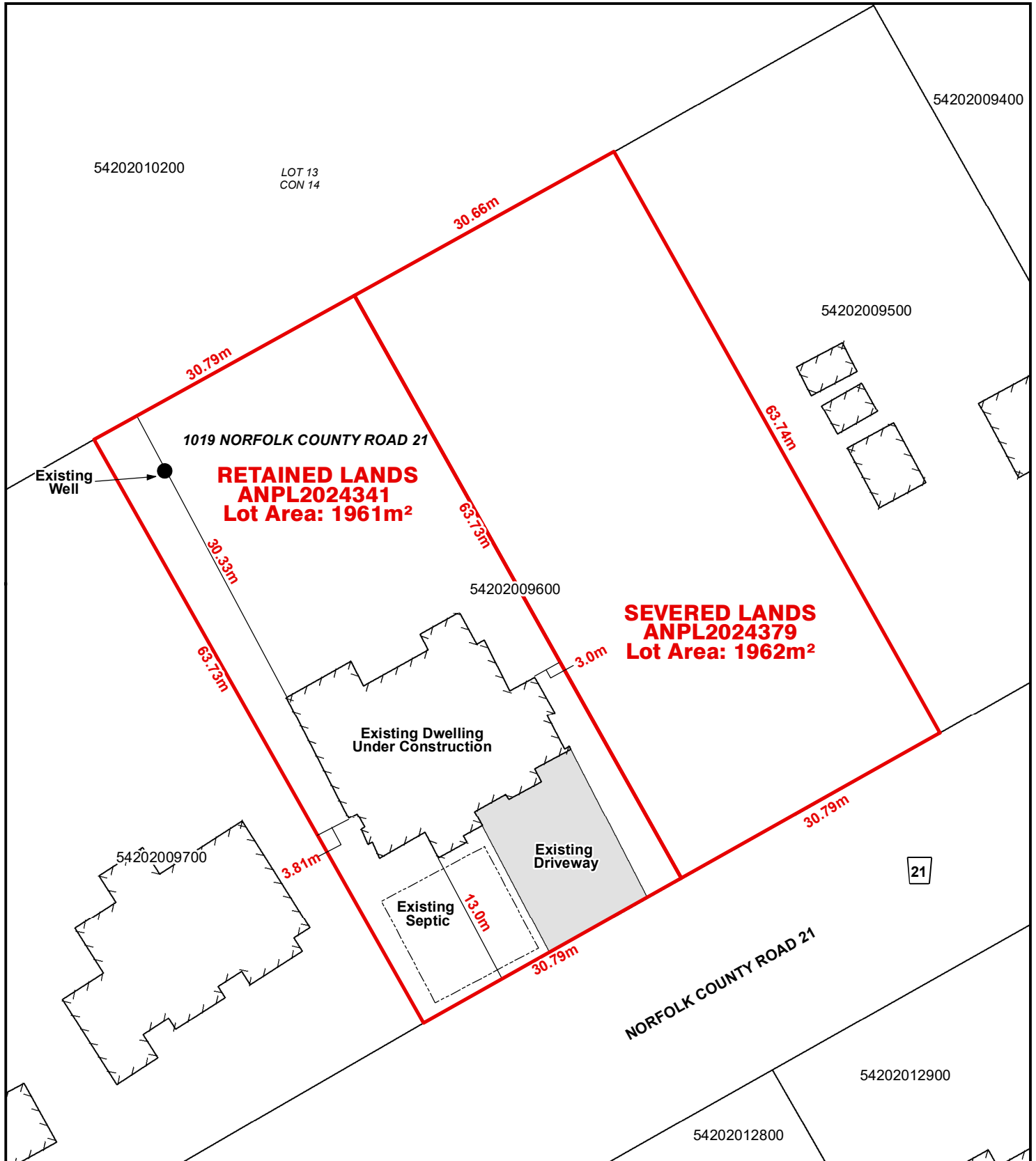
## CONCEPTUAL PLAN

Geographic Township of NORTH WALSINGHAM

BNPL2024340

ANPL2024341

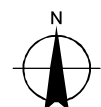
ANPL2024379



### Legend

Subject Lands

10/28/2024



4 2 0 4 8 12 16 Meters