

Central Almaguin Planning Board
AGENDA
Wednesday, February 4, 2026
At the Village of South River Municipal Office located at
63 Marie Street, South River

Join Zoom Meeting

<https://us02web.zoom.us/j/85027673844?pwd=aqaw6zbfHYplatMM7jblCmWAhsn4CO.1>

Meeting ID: 850 2767 3844

Passcode: 841713

1. Call to order at 5:30 p.m.

2. Approval of Agenda

Recommendation: BE IT RESOLVED THAT this Board does hereby approve the February 7, 2026 agenda as written.

3. Declaration of Pecuniary Interests

4. a) Minutes – January 8, 2026 Meeting

Recommendation: BE IT RESOLVED THAT this Board does hereby adopt the minutes of Wednesday, January 6, 2026; as written

5. Payment of February Accounts:

(Payment method will be Cheque or electronically based on payee)

Recommendation: BE IT RESOLVED THAT this Board does hereby approve payment of the February Accounts:

Village of South River – Rent for February 2026 - \$371.42

Village of South River – Invoice 213426 - \$451.89 (Copies and Printing for 2025)

Christine Hickey – Wages (January 1, 2026 – January 31, 2026 – 27 hours)

Russell Christie – Invoice: 90-145-007 - \$397.04.31

Client First Web Design and Graphics – Invoice 2819 - \$113.00 (updates to website)

Online CRA Payments for January (\$156.02)

Online Visa Payment for January (\$32.77)

6. Public Meetings/Decisions on the following Files - None

7. New/Direction Files

7.1 B002/26 Joly – Lot 4, Concession 11 – Sand Hill/Forest Lake Road

7.2 B003/26 South River – Concession 3, Lot 6 – 6491 Eagle Lake Road

7.3 S001/26 Machar – Concession 11,12, Lot 18,19,20 – Machar – Plan of Subdivision
(Applicant to provide overview of draft Plan)

8. Follow-up/New Items

8.1 Letter to Ministry of Municipal Affairs and Housing – Request Increase to Funding
(to follow)

Recommendation: BE IT RESOLVED THAT the Central Almaguin Planning Board receive the draft letter to the Ministry of Municipal Affairs and Housing regarding increasing Assistance to Planning Boards 2025-2026;

AND THAT the Board direct the Secretary-Treasurer to send the letter to the Ministry.

9. Correspondence/Updates - None

10. By-Laws - None

11. Closed Session - None

12. Adjournment – Next Meeting Date: Wednesday, March 4, 2026 at 5:30 p.m.

Recommendation: BE IT RESOLVED THAT the Central Almaguin Planning Board adjourn at _____ p.m. until Wednesday March 4, 2026 or at the call of the Chair.

Original e-mailed: January 30, 2026 Amended: ____, 2026

Central Almaguin Planning Board
MINUTES
Wednesday, January 7, 2026
At the Village of South River Municipal Office located at
63 Marie Street, South River

Attending:

Chair **Chair** Machar Member Lynda Carleton
 Vice Chair Sundridge Member Fraser Williamson (Electronically)
 Provincial Member John MacLachlan
 Joly Member Chris Nicholson
 Strong Member Tim Bryson (Electronically)

Regrets: South River Member Jim Coleman

Secretary-Treasurer: Christine Hickey

Public: Ted Williams, (Other public members may have been in attendance)

1. Call to order at 5:30 p.m.

The Chair Called the meeting to order at 5:32 p.m.

2. Approval of Agenda

Resolution #1

Moved by: Chris Nicholson

Seconded by: John MacLachlan

BE IT RESOLVED THAT this Board does hereby approve the January 7, 2026 agenda as written. **CARRIED**

3. Declaration of Pecuniary Interests - None
4. a) Minutes – November 5, 2025 Meeting

It was requested that the minutes be modified to read there were holes so big in the application that you could drive Mayor Bryson Log Truck through it.

Resolution #2

Moved by: Fraser Williamson

Seconded by: Tim Bryson

BE IT RESOLVED THAT this Board does hereby adopt the minutes of Wednesday, November 5, 2025 with the requested revision. **CARRIED**

b) Minutes – December 3, 2025 Meeting

Resolution #3

Moved by: Chris Nicholson

Seconded by: John MacLachlan

BE IT RESOLVED THAT this Board does hereby adopt the minutes of Wednesday, December 3, 2025; as written **CARRIED**

5. Payment of January Accounts:

(Payment method will be Cheque or electronically based on payee)

Resolution #4

Moved by: Chris Nicholson

Seconded by: Fraser Williamson

BE IT RESOLVED THAT this Board does hereby approve payment of the January Accounts:

Village of South River – Rent for January 2026 - \$363.78

Christine Hickey – Wages (December 1, 2025 – December 31, 2025 – 17 hours)

Russell Christie – Invoice: 90-145-004 - \$816.31

B008/25 and B009/25 – Refund of Overpayment of Finalization Fee - \$200.00

Online CRA Payments for December (\$100.11)

Online Visa Payment for December (\$32.77)

CARRIED

6. Public Meetings/Decisions on the following Files

6.1 B019/25 Joly – Concession 14, Lot 4 – 916 Sandhill Road

The meeting time for this application was approximately 5:41p.m. to 5:50 p.m.

The Secretary-Treasurer confirmed that the required circulation was completed and there were no written or electronic comments received. The Chair confirmed if there were any questions or comments from those attending electronically or in person, there were no further comments.

Resolution #5

Moved by: Chris Nicholson

Seconded by: John MacLachlan

BE IT RESOLVED THAT this Board does hereby approve File B019/25 Joly;

This approval applies to create one (1) new lot which will have:

70.1m (+/-) Frontage on Sand Hill Road, with a depth of 121.92m (+/-) and an area of 0.809ha (+/-).

Retained Lot will be 3.642ha (+/-).

THE SUBJECT LANDS ARE LOCATED at Concession 14, Lot 4, municipally known as 916 Sandhill Road, Township of Joly, District of Parry Sound.

The Board requires that all conditions of draft approval from the Central Almaguin Planning Board and the Township of Joly be met before the deeds can be stamped and final approval given.

CARRIED

7. New/Direction Files

7.1 B001/26 Strong - Cancellation Certificate – 501 South Lake Bernard Road

Ted Williams, agent for the property owner summarized the request for cancellation and noted that the request is to cancel a consent that was previously issued, the client owns both the properties and would like to 2 properties to merge in order to build a garage.

Resolution #6

Moved by: Fraser Williamson

Seconded by: Tim Bryson

BE IT RESOLVED THAT the Central Almaguin Planning Board authorize the Secretary-Treasurer to work with the applicant on issuing a Cancellation Certificate for Part Lot 13, Concession 2, Township of Strong, municipally known 501 South Lake Bernard Road;

AND THAT a fee of \$500.00 for the requested Cancellation Certificate be paid by the property owner to the Central Almaguin Planning Board;

AND FURTHER THAT the Secretary-Treasurer be authorized to sign necessary documents to complete the Cancellation Certificate process.

CARRIED

8. Follow-up/New Items

8.1 Ministry of Municipal Affairs and Housing - Transfer Payment Agreement
Re: 2025-2026 Annual Assistance to Planning Board Draft Financial Statements

Discussion ensued on the funding amount received; the Committee would like to see an increase to the base amount that we receive due to the increasing costs of the applications and the additional work that is required.

The Committee requested the Secretary-Treasurer to continue to track hours on the work completed in the unorganized areas in order to request additional monies from the Ministry.

Would like to send a letter back with the agreement to request additional funding to cover increased costs.

Resolution #7

Moved by: Jim MacLachlan

Seconded by: Chris Nicholson

BE IT RESOLVED THAT the Central Almaguin Planning Board receive the correspondence from the Ministry of Municipal Affairs and Housing regarding Assistance to Planning Boards 2025-2026;

AND THAT the Board acknowledge the allocation of \$11,935.50 for the delivery of planning services in the unincorporated territory;

AND THAT the Chair and Secretary-Treasurer be authorized to execute the Transfer Payment Agreement.

CARRIED

9. Correspondence/Updates

The Secretary Treasurer provided an update that the Ministry sent a letter to advise that we were unsuccessful in our request for the 2025-2026 Special Case Business Funding.

10. By-Laws - None

11. Closed Session

Resolution #8

Moved by: Chris Nicholson

Seconded by: John MacLachlan

BE IT RESOLVED THAT the Central Almaguin Planning Board hold a Closed Session as provided for by Section 239 (b) of the Municipal Act, 2001, as amended to deal with: Advice that is subject to solicitor-client privilege, including communications necessary for that purpose.

CARRIED

Closed Session meeting started at 6:05 p.m.

Resolution #9

Moved by: Fraser Williamson

Seconded by: Chris Nicholson

BE IT RESOLVED THAT the Central Almaguin Planning Board does hereby return to open session at 6:20 p.m. **CARRIED**

12. Adjournment

Resolution #10

Moved by: John MacLachlan

Seconded by: Fraser Williamson

BE IT RESOLVED THAT the Central Almaguin Planning Board adjourn at 6:22 p.m. until Wednesday February 4, 2026 or at the call of the Chair. **CARRIED**

Lynda Carleton, Chair

Christine Hickey, Secretary-Treasurer

CENTRAL ALMAGUIN PLANNING BOARD

63 Marie Street, P.O. Box 310
South River Ontario P0H 1X0
705-386.2573 Email: admin@centralapb.ca
Website: http://capb.ca

AN APPLICATION FOR CONSENT UNDER SECTION 53 OF THE *PLANNING ACT, R.SO. 1990 c.P.13*

FILE # B 002/26 Joly

PLEASE PRINT OR TYPE AND COMPLETE ALL APPROPRIATE BOXES.

1. APPLICANT INFORMATION

Applicant(s):

Name(s) of Property Owner(s): Andrew Meier

Phone #: Home: _____ Mobile: _____ Business: _____

Mailing Address: _____

Postal Code: _____ Email Address: _____

Agent for the Applicant

The property owner(s) may appoint a person or an agent to act on their behalf for processing this application and attending the meeting at which it will be considered, or a person who is to be contacted about the application for communication. This may be a person or firm acting on behalf of the property owner(s). Owner authorization is required in Section 11 of this form if the applicant is an agent appointed by the owner.

Name of Contact Person/Agent: John Jackson Planner Inc.

Phone #: Home: _____ Mobile: _____ Business: _____

Address: _____

Postal Code: _____ Email Address: _____

2. LOCATION OF THE SUBJECT LAND (District of Parry Sound)

Tax Roll Number: _____

Municipality / Unincorporated Township: Joly

Municipal Address (Civic Address): Sand Hill and Forest Lake Road

Legal Description: Concession: 13 Lot Number: 26 Registered Plan: _____

Lot(s): _____ Reference Plan: _____ Part(s): _____

Parcel Number: _____ PIN: _____

IMPORTANT: If there are **existing easements or restrictive covenants** affecting the subject land, provide the legal description and its effect to the subject land. Attach a copy of relevant documentation.

3. PURPOSE OF THE APPLICATION:

3.1 Type and Purpose of proposed transaction(s) that requires the Consent:

Create a new lot (or re-establish an existing parcel) / Lot Addition / Easement

Other: Charge / Release a Mortgage Lease

3.2 Name of party(s), if known, to whom the land or interest in land is to be transferred, leased or charged:

3.3 If a lot addition, identify the lands to which the parcel will be added _____

3.4 Mortgage, Charges or other Encumbrances: Name _____

Mailing Address _____

4. DESCRIPTION OF SUBJECT LAND AND SERVICING INFORMATION

(Complete each Section in order that your application can be processed. Incomplete applications may be delayed.)

(If 2 new lots are proposed, split the SEVERED section and apply appropriate dimensions and information through Sections 4.1 through

4.1 Description / Size	SEVERED			RETAINED
	Lot 1	Lot 2	Lot 3	
Frontage (m)	120	120	120	700
Depth (m)	380	380	380	±300
Area (ha)	4.1	4.1	4.1	±20.0
4.2 Existing Use of Property:	Vacant	Vacant	Vacant	Vacant
4.3 Existing Building or Structures and date of construction	None	None	None	Vacant

4.4 Proposed Use of the Severed and Retained Parcels	Residential Residential Residential	Vacant
4.5 Road Access: Provincial highway <i>MANDATORY: Provide written comments from MTO North Bay. 705-497-5401</i>		
Municipal road, maintained all year	Sand Hill Rd. Sand Hill Rd Sand Hill Rd	Sand Hill Rd
Municipal Road, seasonally maintained		
Other Public Road (e.g. Local Roads Board)		
Right of Way / Easement* (IF ACCESS TO THE SUBJECT LAND IS BY PRIVATE ROAD OR OTHER PUBLIC ROAD OR RIGHT OF WAY advise the status of the easement (permanent registered or prescriptive), name who owns the land or road, who is responsible for its maintenance and whether it is seasonal or year round.		
MNRF Road Allowance <i>[Written report from the MNRF if an MNRF road allowance is used for access to the subject land. North Bay Office: 705-475-5550]</i>		
4.6 Water Access Lots: Describe the parking and docking facilities to be used and the approximate distance of these facilities for the subject land and the nearest public road.		

4.7 Water Supply	SEVERED	RETAINED
Publicly owned and operated piped water system		
Privately owned and operated individual well	Proposed for 3 lots	Proposed
Privately owned and operated communal well		
Lake or other water body		
Other means		
Does your property abut a lake?	No	No

[Is the lake deemed by the Ministry of the Environment Conservation and Parks (MOECP) to be at capacity for phosphorus load ? **1-800-461-6290 for enquiries]		
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4.8 Sewage Disposal	SEVERED	RETAINED
Publicly owned and operated sanitary sewage system		
Privately owned and operated individual septic tank <i>Attach documentation of the results of the review by the North Bay Mattawa Conservation Authority</i>	Proposed for 3 lots	Proposed
Privately owned and operated communal septic tank		
Privy		
Other Means (e.g. Advanced Treatment System) <i>** (Septic System over 10,000 litres requires Ministry of the Environment Conservation and Parks study and permit. 1-800-461-6290 for enquiries)</i>		

4.9 Other Services (indicate which service(s) are available)	SEVERED	RETAINED
Electricity	Existing	Existing
School Bussing		
Garbage Collection		

4.10 If access to the subject land is by private road or right of way was indicated in section 4.4, indicate who owns the land or the road, who is responsible for its maintenance and whether it is maintained seasonally or all year.

5. LAND USE

5.1 What is the existing Official Plan designation(s)? (Not applicable to lands in unorganized township)

Rural

5.2 What is the Zoning, if any, on the subject land? (Not applicable to lands in unorganized township)

Rural (RU)

If the subject land covered by a Minister's Zoning Order, what is the Plan and registration number?

5.3 Are any of the following uses or features on the subject land or within 500 meters of the subject land, unless otherwise specified? Please check the boxes that apply.

Use or Feature	On the Subject Land	Within 500 meters of subject land, unless otherwise specified by the applicable agency, then indicate approximate distance.
An agricultural operation including livestock facility or stockyard <i>[MANDATORY: Attach MDS work sheets from OMAFRA]</i>		
A landfill		
A sewage treatment plant or waste stabilization plant		
A provincially significant wetland <i>[North Bay Mattawa Conservation Authority or the Ministry of the Environment Conservation and Parks]</i>		
A provincially significant wetland within 120 meters of the subject land <i>[North Bay Mattawa Conservation Authority or the Ministry of the Environment Conservation and Parks]</i>		
Flood Plain		
A rehabilitated mine site		
A non-operating mine site within one kilometer of the subject land		
An active mine site		
An industrial or commercial use, and specify the use (eg gravel pit)		
An active railway line		
Utility corridors (Natural Gas / Hydro)		
A municipal or federal airport		

6. HISTORY OF SUBJECT LAND

6.1 Has the subject land ever been the subject of an application for approval of a Plan of Subdivision or Consent under the Planning Act? NO YES UNKNOWN

If yes, and if known, please provide the application file number and the decision made on the application.

Year the property was created? (if known) _____

6.2 If this application is a re-submission of a previous consent application, what is the original consent application number and how has it been changed from the original application?

7. CURRENT APPLICATION

7.1 Is the subject land currently the subject land of a proposed Official Plan or Official Plan Amendment that has been submitted to the Ministry of Municipal Affairs and Housing for approval?

NO YES UNKNOWN

If yes and if known, specify the file number and status of the application

7.2 Is the subject land the subjection of an application for a Zoning By-law Amendment, Minister’s Zoning Order amendment, Minor Variance, Consent or approval of a Plan of Subdivision?

NO YES UNKNOWN

If yes and if known, specify the file number and status of the application.

8. SKETCH: The application MUST BE ACCOMPANIED BY A *SKETCH / SITE PLAN showing the following:

- a. The boundaries and dimensions of the subject land proposed to be severed as well as the parcel to be retained, including the location of existing structures and driveway(s), other permanent features.
- b. The boundaries and dimensions of any land owned by the owner of the subject land and that abuts the subject land, the distance between the subject land and the nearest township lot line or landmark, such as a railway crossing or bridge
- c. The location of all land previously severed from the parcel originally acquired by the current owner of the subject land
- d. The approximate location of all natural and artificial features on the subject land and adjacent lands that in the opinion of the applicant may affect the application, such as buildings, railways, roads, watercourses, drainage ditches, river or stream banks, wetlands, wooded areas, wells and septic tank.
- f. The location, width and name of any roads within or abutting the subject land, indicating whether it is an unopened road allowance, a public traveled road, a private road or right of way
- g. If access to the subject land is by water only, location of the parking and boat docking facilities to be used
- h. The location and nature of any easement affecting the subject land

9. OTHER INFORMATION: Is there any other information that you think may be useful to the Board or other agencies reviewing the application? If so, explain below or attached on a separate page.

10. AFFIDAVIT OR SWORN DECLARATION (all applicant(s))

I, Andrew Meier OF THE Town of Aurora
IN THE DISTRICT OF Region of York MAKE OATH AND SAY THAT THE INFORMATION
CONTAINED IN THIS APPLICATION IS TRUE AND THAT THE INFORMATION CONTAINED IN THE DOCUMENTS
THAT ACCOMPANY THIS APPLICATION IS TRUE.

SWORN OR DECLARED BEFORE ME

AT THE Town of Parry Sound

IN THE District OF Parry Sound

THIS 18th DAY OF November, 2025





A COMMISSIONER OF OATHS

Applicant

**Patrick James Christie, a Commissioner, etc.,
Province of Ontario, for
Parry Sound Area Property Consulting Inc.
Expires September 4, 2027**

11. AUTHORIZATION OF AGENT (if applicable)

11.1 If the applicant is not the owner of the land subject in this application, written authorization of the property owner authorizing the particular person to act as their agent to make the application and represent them at the meeting when the Board considers this matter, must be submitted with this application form OR the authorization section below be completed.

AUTHORIZATION OF OWNER FOR AGENT TO MAKE THE APPLICATION

I, _____, AM THE OWNER OF THE LAND THAT IS THE SUBJECT OF THIS APPLICATION FOR CONSENT AND HEREBY AUTHORIZE _____

TO MAKE THIS APPLICATION ON MY BEHALF.

DATED: _____ SIGNATURE OF PROPERTY OWNER _____

11.2 If the applicant is not the owner of the land that is the subject of this application, complete the authorization of the owner concerning personal information set out below.

APPOINTMENT AND AUTHORIZATION OF AN AGENT AND CONSENT TO PROVIDE PERSONAL INFORMATION

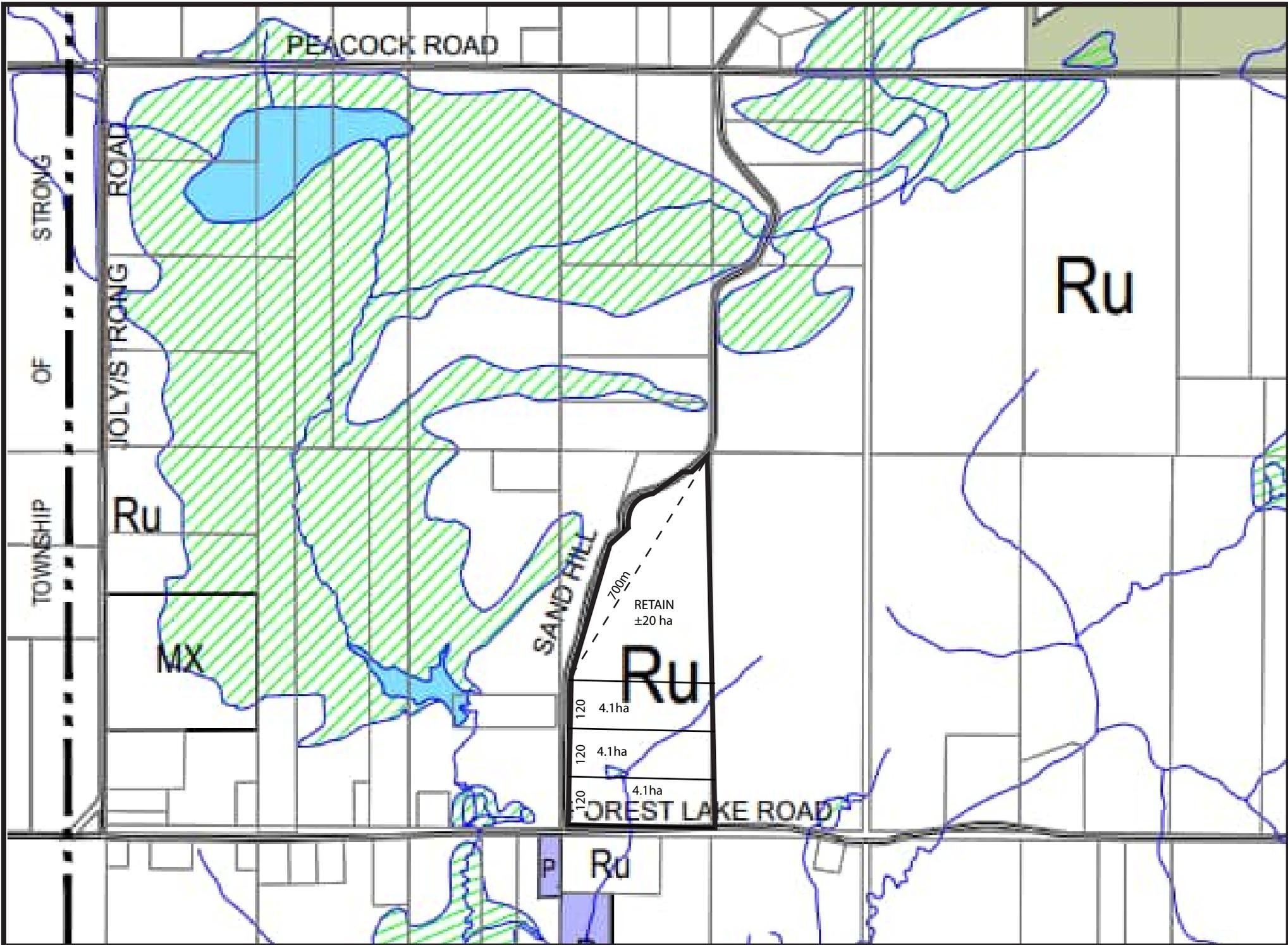
I, _____, AM THE OWNER OF THE LAND THAT IS THE SUBJECT OF THIS APPLICATION FOR CONSENT AND FOR THE PURPOSES OF THE FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY ACT, I AUTHORIZE _____ TO SUBMIT THE INFORMATION REQUIRED FOR THIS PURPOSE.

DATED _____ SIGNATURE OF PROPERTY OWNER _____

12. CONSENT OF OWNER TO THE USE AND DISCLOSURE OF PERSONAL INFORMATION

I/WE Andrew Meier, AM/ARE THE OWNER(S) OF THE LAND THAT IS THE SUBJECT OF THIS CONSENT APPLICATION AND FOR THE PURPOSES OF THE MUNICIPAL FREEDOM OF INFORMATION AND PROTECTION OF PERSONAL PRIVACY ACT, I/WE AUTHORIZE AND CONSENT TO THE USE BY OR THE DISCLOSURE TO ANY PERSON OR PUBLIC BODY OF ANY PERSONAL INFORMATION THAT IS COLLECTED UNDER THE AUTHORITY OF THE PLANNING ACT FOR THE PURPOSES OF PROCESSING THIS APPLICATION.

DATED November 18, 2025 SIGNATURE OF PROPERTY OWNER 



PEACOCK ROAD

STRONG

OF

TOWNSHIP

JOLY'S TRONG ROAD

JOLY'S TRONG ROAD

Ru

MX

SAND HILL

700m

RETAIN ±20 ha

Ru

120

4.1ha

120

4.1ha

120

4.1ha

REST LAKE ROAD

P

Ru

Ru



**871 Forest Lake Road
P.O. Box 519, Sundridge, Ontario P0A 1Z0**

Telephone (705) 384-5428
Municipal.admin@townshipofjoly.com

DATE: December 9, 2025

SUBJECT: Development Application Report
CON 11 PT LOT 4 Sandhill Road

INITIATED BY: Municipal Administrator, Jennifer Martin

STATEMENT ON THE SUBJECT:

The owner at CON 11 PT LOT 4 Sandhill Road has been working with the Joly Planning Department to prepare an application for consent. This application proposes three new lots, being 4.1 hectares and 120' lot frontage along Sandhill Road. Attached is a copy of the sketch provided by the applicants.

This application complies with all required policies of the Township of Joly.

As the proposed development of one new lot complies with Joly policies and procedures, a resolution setting out the conditions required is prepared for Councils consideration. The resolution is a requirement of the consent application process for the Central Almaguin Planning Board.

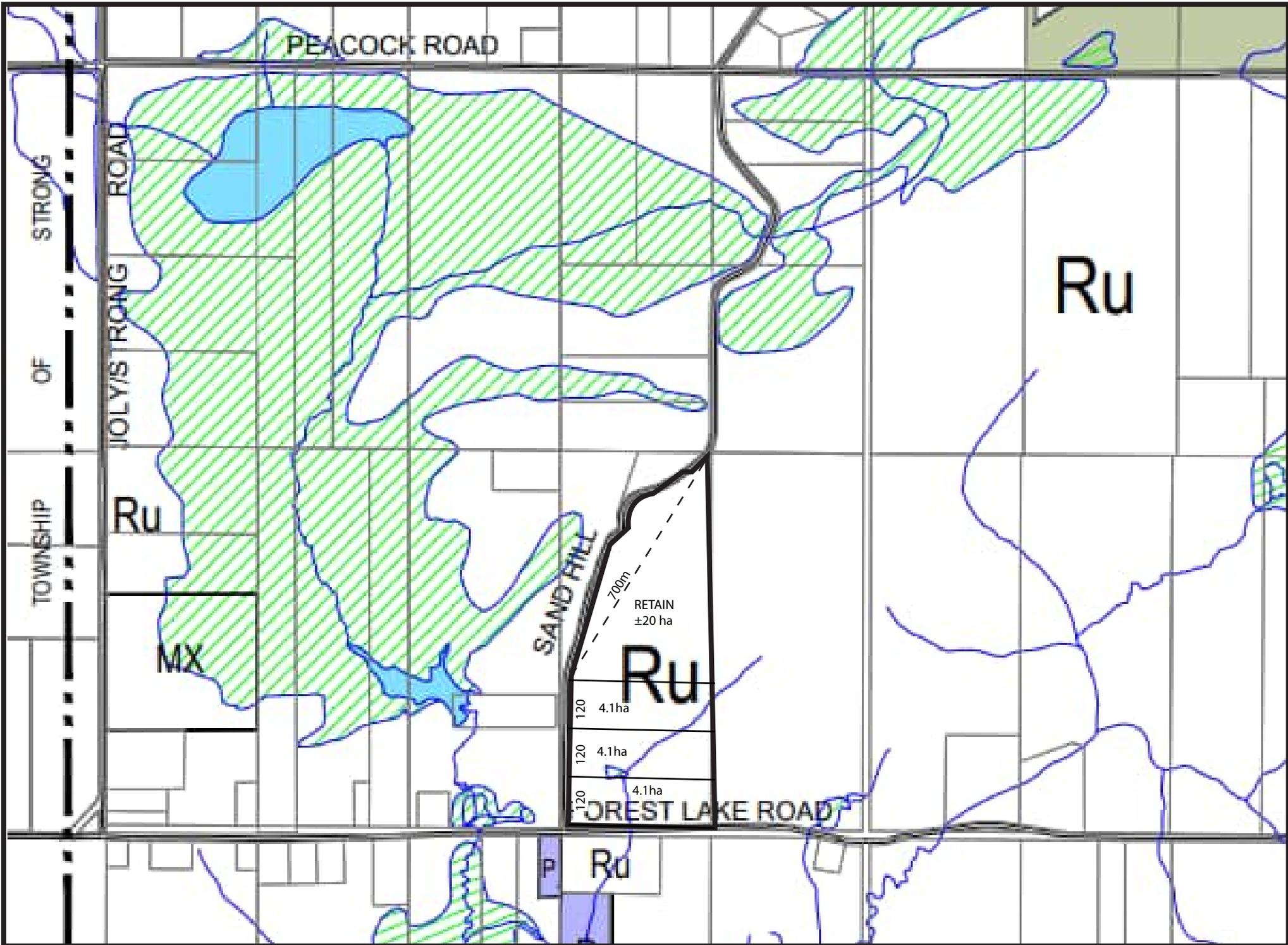
RECOMMENDATIONS:

- 1.) Have the proposed new lot approved by North Bay Mattawa Conservation Authority for on-site sewage system, and the Applicant convey the required cash in lieu of Parkland dedication, and the Township of Joly be provided with a copy of the registered reference plan.
- 2.) Do not approve consent application

Option #1 is recommended.

ATTACHMENTS:

Sketch



PEACOCK ROAD

STRONG

OF

TOWNSHIP

ROAD

JOLY'S TRONG

Ru

MX

SAND HILL

Ru

RETAIN

±20 ha

120

4.1ha

120

4.1ha

120

4.1ha

REST LAKE ROAD

P

Ru

Ru



TOWNSHIP OF JOLY

P.O. Box 519 , Sundridge , Ontario , P0A 1Z0
Tel: 705-384-5428

December 9, 2025

RESOLUTION

Resolution # 2025-00359

Agenda Item # 8.3.1 CON 11 PT LOT 4 Sandhill Rd

Moved By : Tom Bryson

Seconded By : Chris Nicholson

NOW Therefore be it resolved

Council for the Corporation of the Township of Joly hereby have reviewed the Development Application for a consent application to create three new lots fronting Sand Hill Rd on property know as CON 11 PT LOT 4 REM PCL 10316 SS; LOT 1 being 4.1± ha with 120± meters frontage; LOT 2 being 4.1± ha with 120± meters frontage; LOT 3 being 4.1± ha with 120± meters frontage with the retained portion being 20± ha with 700± Metres frontage.

AND this application is accepted with the following conditions:

1. The proposed lots be approved by North Bay Mattawa Conservation Authority for on-Site Sewage system; and
2. The Township of Joly be provided with a copy of the registered reference plan; and
3. The applicant convey to the Township of Joly \$400 cash-in-lieu of Parkland.

Carried

**Original copy signed
Mayor
Township of Joly**

CENTRAL ALMAGUIN PLANNING BOARD

63 Marie Street, P.O. Box 310
South River Ontario P0H 1X0
705-386.2573 Email: admin@centralapb.ca
Website: http://capb.ca

AN APPLICATION FOR CONSENT UNDER SECTION 53 OF THE *PLANNING ACT, R.S.O. 1990 c.P.13*

FILE # B 003 / 26 South River

PLEASE PRINT OR TYPE AND COMPLETE ALL APPROPRIATE BOXES.

1. APPLICANT INFORMATION

Applicant(s):

Name(s) of Property Owner(s): DOUGLAS & DEBBIE PATTERSON

Phone #: Home: _____ Mobile: _____ Business: _____

Mailing Address: _____

Postal Code: _____ Email Address: _____

Agent for the Applicant

The property owner(s) may appoint a person or an agent to act on their behalf for processing this application and attending the meeting at which it will be considered, or a person who is to be contacted about the application for communication. This may be a person or firm acting on behalf of the property owner(s). Owner authorization is required in Section 11 of this form if the applicant is an agent appointed by the owner.

Name of Contact Person/Agent: _____

Phone #: Home: _____ Mobile: _____ Business: _____

Address: _____

Postal Code: _____ Email Address: _____

2. LOCATION OF THE SUBJECT LAND (District of Parry Sound)

Tax Roll Number: 4956 000 001 45450 0000

Municipality / Unincorporated Township: SOUTH RIVER IN THE TOWNSHIP OF MACHAR

Municipal Address (Civic Address): CON 3 PT LOT 6 REM PCL 649/EAGLE LAKE RD WEST SIDE

Legal Description: Concession: 3 Lot Number: 6 Registered Plan: 6491

Lot(s): _____ Reference Plan: _____ Part(s): _____

Parcel Number: _____ PIN: _____

IMPORTANT: If there are **existing easements or restrictive covenants** affecting the subject land, provide the legal description and its effect to the subject land. Attach a copy of relevant documentation.

3. PURPOSE OF THE APPLICATION:

3.1 Type and Purpose of proposed transaction(s) that requires the Consent:

Create a new lot (or re-establish an existing parcel) / Lot Addition / Easement

Other: Charge / Release a Mortgage Lease

3.2 Name of party(s), if known, to whom the land or interest in land is to be transferred, leased or charged:

3.3 If a lot addition, identify the lands to which the parcel will be added _____

3.4 Mortgage, Charges or other Encumbrances: Name _____

Mailing Address _____

4. DESCRIPTION OF SUBJECT LAND AND SERVICING INFORMATION

(Complete each Section in order that your application can be processed. Incomplete applications may be delayed.)

(If 2 new lots are proposed, split the SEVERED section and apply appropriate dimensions and information through Sections 4.1 through

4.1 Description / Size	SEVERED #1 / #2	RETAINED
Frontage (m)	68.25m / 74.18m	
Depth (m)	53.4m / 49.26	
Area (ha)	0.364 HA / 0.365 HA	
4.2 Existing Use of Property:	RI / RI RES.	RI RES.
4.3 Existing Building or Structures and date of construction	NONE / NONE	NONE

4.4 Proposed Use of the Severed and Retained Parcels	RES / RES	RESIDENTIAL
4.5 Road Access: Provincial highway MANDATORY: Provide written comments from MTO North Bay. 705-497-5401	/	/
Municipal road, maintained all year	POPLAR ST / POPLAR ST	POPLAR ST.
Municipal Road, seasonally maintained	/	/
Other Public Road (e.g. Local Roads Board)	/	/
Right of Way / Easement* (IF ACCESS TO THE SUBJECT LAND IS BY PRIVATE ROAD OR OTHER PUBLIC ROAD OR RIGHT OF WAY advise the status of the easement (permanent registered or prescriptive), name who owns the land or road, who is responsible for its maintenance and whether it is seasonal or year round.	/	/
MNRF Road Allowance [Written report from the MNRF if an MNRF road allowance is used for access to the subject land. North Bay Office: 705-475-5550]	/	/
4.6 Water Access Lots: Describe the parking and docking facilities to be used and the approximate distance of these facilities for the subject land and the nearest public road.		
/		

4.7 Water Supply	SEVERED	RETAINED
Publicly owned and operated piped water system	✓ / ✓	✓
Privately owned and operated individual well	/	/
Privately owned and operated communal well	/	/
Lake or other water body	/	/
Other means	/	/
Does your property abut a lake?	NO	NO

[Is the lake deemed by the Ministry of the Environment Conservation and Parks (MOECP) to be at capacity for phosphorus load ? **1-800-461-6290 for enquiries]	/	/
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4.8 Sewage Disposal	SEVERED	RETAINED
Publicly owned and operated sanitary sewage system	/	/
Privately owned and operated individual septic tank <i>Attach documentation of the results of the review by the North Bay Mattawa Conservation Authority</i>	/	/
Privately owned and operated communal septic tank	/	/
Privy	/	/
Other Means (e.g. Advanced Treatment System) ** (Septic System over 10,000 litres requires Ministry of the Environment Conservation and Parks study and permit. 1-800-461-6290 for enquiries)	/	/

4.9 Other Services (indicate which service(s) are available)	SEVERED	RETAINED
Electricity	/	/
School Bussing	/	/
Garbage Collection	/	/

4.10 If access to the subject land is by private road or right of way was indicated in section 4.4, indicate who owns the land or the road, who is responsible for its maintenance and whether it is maintained seasonally or all year.

/

5. LAND USE

5.1 What is the existing Official Plan designation(s)? (Not applicable to lands in unorganized township)

RURAL RESIDENTIAL.

5.2 What is the Zoning, if any, on the subject land? (Not applicable to lands in unorganized township)

RI

If the subject land covered by a Minister's Zoning Order, what is the Plan and registration number?

5.3 Are any of the following uses or features on the subject land or within 500 meters of the subject land, unless otherwise specified? Please check the boxes that apply.

Use or Feature	On the Subject Land	Within 500 meters of subject land, unless otherwise specified by the applicable agency, then indicate approximate distance.
An agricultural operation including livestock facility or stockyard <i>[MANDATORY: Attach MDS work sheets from OMAFRA]</i>		
A landfill		
A sewage treatment plant or waste stabilization plant		
A provincially significant wetland <i>[North Bay Mattawa Conservation Authority or the Ministry of the Environment Conservation and Parks]</i>		
A provincially significant wetland within 120 meters of the subject land <i>[North Bay Mattawa Conservation Authority or the Ministry of the Environment Conservation and Parks]</i>		
Flood Plain		
A rehabilitated mine site		
A non-operating mine site within one kilometer of the subject land		
An active mine site		
An industrial or commercial use, and specify the use (eg gravel pit)		
An active railway line		
Utility corridors (Natural Gas / Hydro)		
A municipal or federal airport		

6. HISTORY OF SUBJECT LAND

6.1 Has the subject land ever been the subject of an application for approval of a Plan of Subdivision or Consent under the Planning Act? NO YES UNKNOWN

If yes, and if known, please provide the application file number and the decision made on the application.

Year the property was created? (if known) _____

6.2 If this application is a re-submission of a previous consent application, what is the original consent application number and how has it been changed from the original application?

7. CURRENT APPLICATION

7.1 Is the subject land currently the subject land of a proposed Official Plan or Official Plan Amendment that has been submitted to the Ministry of Municipal Affairs and Housing for approval?

NO YES UNKNOWN

If yes and if known, specify the file number and status of the application

7.2 Is the subject land the subject of an application for a Zoning By-law Amendment, Minister's Zoning Order amendment, Minor Variance, Consent or approval of a Plan of Subdivision?

NO YES UNKNOWN

If yes and if known, specify the file number and status of the application.

8. SKETCH: The application MUST BE ACCOMPANIED BY A *SKETCH / SITE PLAN showing the following:

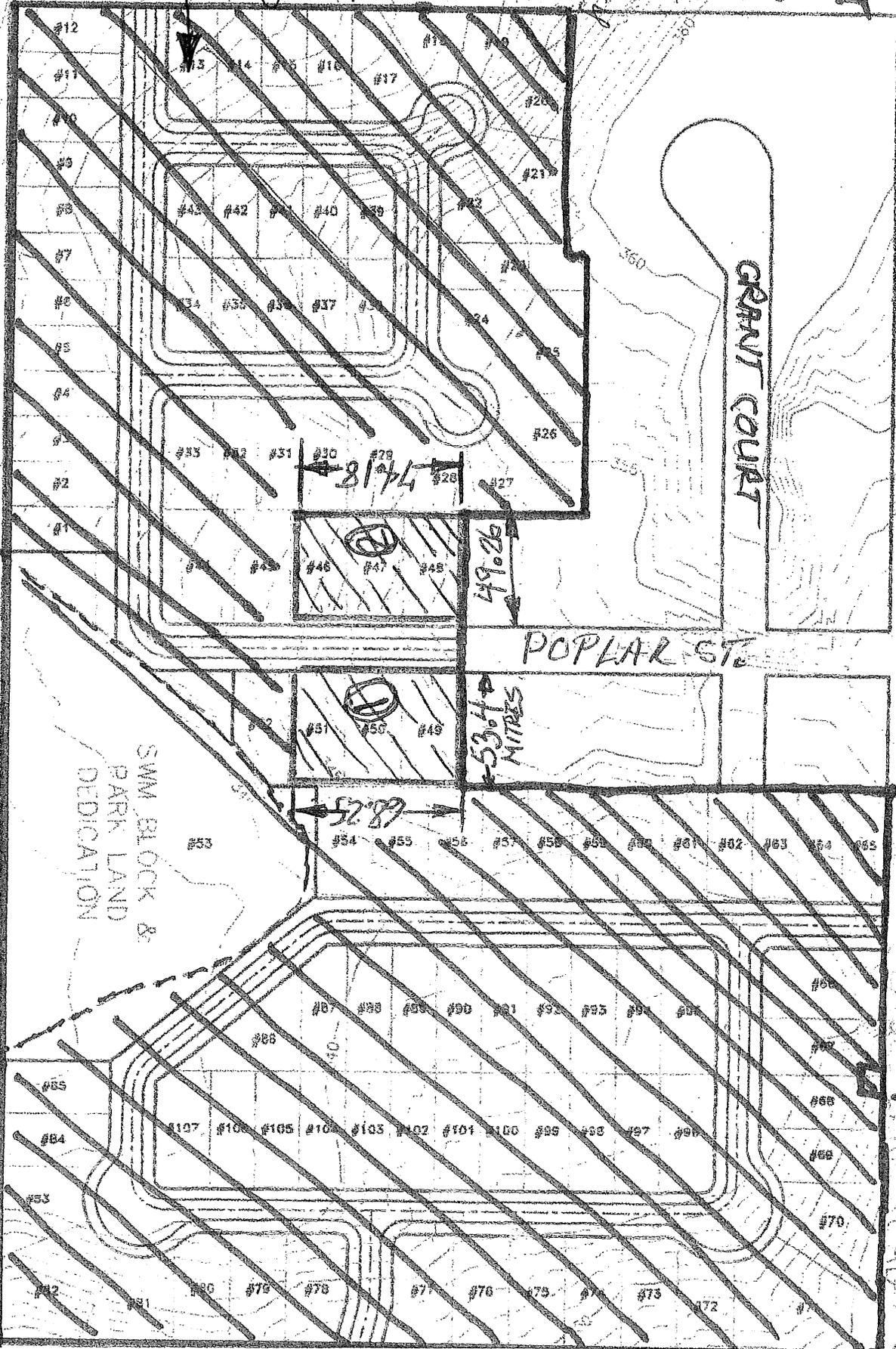
- a. The boundaries and dimensions of the subject land proposed to be severed as well as the parcel to be retained, including the location of existing structures and driveway(s), other permanent features.
- b. The boundaries and dimensions of any land owned by the owner of the subject land and that abuts the subject land, the distance between the subject land and the nearest township lot line or landmark, such as a railway crossing or bridge
- c. The location of all land previously severed from the parcel originally acquired by the current owner of the subject land
- d. The approximate location of all natural and artificial features on the subject land and adjacent lands that in the opinion of the applicant may affect the application, such as buildings, railways, roads, watercourses, drainage ditches, river or stream banks, wetlands, wooded areas, wells and septic tank.
- f. The location, width and name of any roads within or abutting the subject land, indicating whether it is an unopened road allowance, a public traveled road, a private road or right of way
- g. If access to the subject land is by water only, location of the parking and boat docking facilities to be used
- h. The location and nature of any easement affecting the subject land

9. OTHER INFORMATION: Is there any other information that you think may be useful to the Board or other agencies reviewing the application? If so, explain below or attached on a separate page.

SEE ATTACHED SHEET

SUBJECT LAND

SUBJECT WOOD CURRENTLY COVERED TREES HATCHED AREA AROUND LOTS TO BE SEVERED IS RETAINED PARTIALLY WITH EP AREA NOT HATCHED



EP BOUNDARY

EP

SWM BLOCK & PARK LAND DEDICATION

GRANT COURT

POPLAR ST

EAGLE LAKE RD.

JOHN

CUMMEL

81.44

49.26

53.64

52.89

10. AFFIDAVIT OR SWORN DECLARATION (all applicant(s))

I, DOUGLAS PATTERSON OF THE TOWNSHIP OF LOWT
IN THE DISTRICT OF PARRY SOUND MAKE OATH AND SAY THAT THE INFORMATION
CONTAINED IN THIS APPLICATION IS TRUE AND THAT THE INFORMATION CONTAINED IN THE DOCUMENTS
THAT ACCOMPANY THIS APPLICATION IS TRUE.

SWORN OR DECLARED BEFORE ME

AT THE Village of South River

IN THE District OF Parry Sound

THIS 28 DAY OF Jan, 2026

C Robertson

[Signature]

A COMMISSIONER OF OATHS

Applicant

Candice Elizabeth Robertson,
a Commissioner, etc., Province of Ontario for
the Corporation the Village of South River.
Expires December 6, 2027

11. AUTHORIZATION OF AGENT (if applicable)

11.1 If the applicant is not the owner of the land subject in this application, written authorization of the property owner authorizing the particular person to act as their agent to make the application and represent them at the meeting when the Board considers this matter, must be submitted with this application form OR the authorization section below be completed.

AUTHORIZATION OF OWNER FOR AGENT TO MAKE THE APPLICATION

I, DOUGLAS & DEBBIE PATTERSON, AM THE OWNER OF THE LAND THAT IS THE SUBJECT OF THIS APPLICATION FOR CONSENT AND HEREBY AUTHORIZE CHRISTINE HICKEY

TO MAKE THIS APPLICATION ON MY BEHALF.

DATED: Jan 28/2026 SIGNATURE OF PROPERTY OWNER 
Debbie Patterson

11.2 If the applicant is not the owner of the land that is the subject of this application, complete the authorization of the owner concerning personal information set out below.

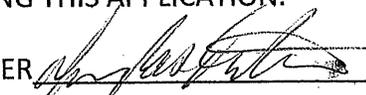
APPOINTMENT AND AUTHORIZATION OF AN AGENT AND CONSENT TO PROVIDE PERSONAL INFORMATION

I, _____, AM THE OWNER OF THE LAND THAT IS THE SUBJECT OF THIS APPLICATION FOR CONSENT AND FOR THE PURPOSES OF THE FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY ACT, I AUTHORIZE _____ TO SUBMIT THE INFORMATION REQUIRED FOR THIS PURPOSE.

DATED _____ SIGNATURE OF PROPERTY OWNER _____

12. CONSENT OF OWNER TO THE USE AND DISCLOSURE OF PERSONAL INFORMATION

I/WE DOUGLAS & DEBBIE PATTERSON, AM/ARE THE OWNER(S) OF THE LAND THAT IS THE SUBJECT OF THIS CONSENT APPLICATION AND FOR THE PURPOSES OF THE MUNICIPAL FREEDOM OF INFORMATION AND PROTECTION OF PERSONAL PRIVACY ACT, I/WE AUTHORIZE AND CONSENT TO THE USE BY OR THE DISCLOSURE TO ANY PERSON OR PUBLIC BODY OF ANY PERSONAL INFORMATION THAT IS COLLECTED UNDER THE AUTHORITY OF THE PLANNING ACT FOR THE PURPOSES OF PROCESSING THIS APPLICATION.

DATED Jan 28/2026 SIGNATURE OF PROPERTY OWNER 
Debbie Patterson



**Village of South River
D and D Patterson Severance**

Date: October 14, 2025

Motion:

Moved By: Dei Brandt

Seconded By: Ben Hallan

BE IT RESOLVED THAT the Council of the Village of South River does hereby support in principal the severance of CON 3 PT LOT 6 REM PCL 6491 EAGLE LAKE RD W SIDE into two one-acre parcels and the remainder as forty-five acres. The new lots would require rezoning, servicing, and the extension of Poplar St before building permits could be issued. The proponent would be responsible for all costs associated with development.

Carried By: Dei Brandt

Lost By: _____

Name of Council Member	Yeas	Nays	Abstention	Pecuniary Interest	Recorded Vote
Mayor Coleman					
Councillor Brandt					
Councillor Brooks					
Councillor O'Hallarn					
Councillor Scott					

**THE CORPORATION OF
THE VILLAGE OF SOUTH RIVER**

By-law 48-2025

Being a By-law to Amend Zoning By-law #17-95

WHEREAS the Council of the Corporation of the Village of South River deems it advisable to amend By-law No. 17-95 (the Comprehensive Zoning By-law of the Village of South River);

NOW THEREFORE the Council of the Corporation of the Village of South River ENACTS in accordance with Section 34 of the Planning Act, R.S.O. 1990, as amended, the following:

- 1.** That Schedule "A", Zone Map, attached hereto and forming part of By-law No. 17-95, as amended, is hereby further amended from the existing zoning of Rural Residential (RU1) to First Density Residential (R1) for the lands municipally known CON 3 PT LOT 6 REM PCL 6491 at Eagle Lake Rd, as shown in hatched lines on Schedule "A".
- 2.** Schedule "A", attached hereto, is hereby made part of this by-law.
- 3.** THIS BY-LAW SHALL COME into force on the date of passage and take effect the day after the last date for filing of appeals where no appeals are received, or, where appeals are received, upon the approval of the Ontario Municipal Board.

READ a first time this 9th day of December, 2025.

Mayor (Jim Coleman)

Clerk-Administrator (Don McArthur)

READ a second and third time and finally PASSED this 9th day of December, 2025.

Mayor (Jim Coleman)

Clerk-Administrator (Don McArthur)

Schedule A By-law 48-2025



Fields marked with an asterisk (*) are required under Ontario Regulation 544/06.

1. Application Information

1.1 Name of owner(s). An owner's authorization is required in Section 17.1, if applicant is not the owner.

Name of owner(s)

First Name*

Franco Polsinelli & Nghi Nguyer

Last Name*

Middle Initial

Home Telephone Number*

Business Telephone Number

Email Address

Address

Unit Number

c/o Tom Harsanyi

Street Number*

Street Name*

PO Box

City/Town*

Province*

Postal Code*

1.2 Agent/applicant: Name of the person who is to be contacted about the application, if different than the owner.
(This may be a person or firm acting on behalf of the owner.)

Contact Name

First Name

John

Last Name

Gallagher

Middle Initial

P

Home Telephone Number

Business Telephone Number

Fax Number

Address

Unit Number

Street Number

Street Name

PO Box

City/Town

Province
ON

Postal Code

1.3 Name of owner(s) of the sub-surface rights if different from the surface rights owner(s)

2. Description/Location of the Subject Land (complete applicable boxes in section 2.1)

2.1 Upper-Tier/District

District of Parry Sound

Municipality

Machar

Former Municipality

Machar

Geographic Township

Machar

Geographic Township in Territory without Municipal Organization

Section or Mining Location No.

Concession Number(s)

11, 12

Lot Number(s)

18,19,20

Registered Plan Number

Lot(s)/Block(s)

Reference Plan No.

Part Number(s)

Parcel Number(s)

Name of Street/Road

Street Number

2.2 Are there any easements or restrictive covenants affecting the subject land?*

 Yes No

If yes, describe each easement or covenant and its effect. Use a separate page, if necessary.

3. Designation of Lands/Current and Proposed Land Use

3.1 Name of the official plan
Township of Machar Official Plan

3.2 The current designation(s) of the subject land in the applicable official plan(s)*

Lower-tier Rural & Shoreline, Natural Protection

Upper-tier

Single-tier

Planning board

3.3 What is the present zoning, if any, of the subject land?

RU, SR, EP

3.4 If the land is covered by a Minister's Zoning Order (MZO), what is the regulation number?

3.5 If the land is covered by a MZO, what uses are permitted by the order?

3.6 What is the current use of the subject land?

Residential

3.7 What are the surrounding land uses?

East Shoreline residential on east side of lake

West Rural lands

North Rural lands

South Rural and Rural Residential

3.8 Check whether this application is for approval of:* Condominium Description Plan of Subdivision

Indicate below the type of condominium proposed.

Standard Amalgamations Vacant Land Phased Common Elements Leasehold

3.9. Table A

Table A - Proposed Land Use

Proposed Land Use		Number of Units or Dwellings	Number of Lots and/or Blocks on the Draft Plan	Area (ha.)	Density (Units/Dwellings per ha.)	Number of Parking Spaces
Residential	Detached	20	20			(1) 20
	Semi detached					(1)
	Multiple attached					
	Apartment					
	Seasonal					
	Mobile home					
	Other (specify)					
Commercial						
Industrial						
Park, open space		nil			nil	nil
Institutional (specify) ▶						
Roads		nil			nil	nil
Other (specify) ▶						
Totals		23				

(1) Complete only if for approval of condominium description

Previous/Former Uses of Site and Adjacent Land (History)

3.10 Has there been an industrial or commercial use, or an orchard, on the subject land or adjacent land?

Yes No Unknown

If yes, specify the uses.

3.11 Has the grading of the subject land been changed by adding earth or other material(s)?

Yes No Unknown

3.12 Has a gas station been located on the subject land or adjacent land at any time?

Yes No Unknown

3.13 Has there been petroleum or other fuel stored on the subject land or adjacent land?

Yes No Unknown

3.14 Is there reason to believe the subject land may have been contaminated by former uses on the site or adjacent site?

Yes No Unknown

3.15 What information did you use to determine the answers to the above questions on former uses?

3.16 If yes to any of (3.9), (3.10), (3.11), (3.12), or (3.13), an inventory of previous uses of the subject land or, if appropriate, of the adjacent land(s), is needed.

Is the inventory of previous uses attached?

Yes No

If the inventory is not attached, why not?

3.17 If yes to (3.9), (3.10), (3.11), (3.12), (3.13) or (3.14), was an Environmental Site Assessment (ESA) conducted under the *Environmental Assessment Act* or has a Record of Site Condition (RSC) been filed? Refer to Appendix 2.

Yes No

If no, why not? Explain on a separate page, if necessary.

4. Consultation with the Planning Approval Authority/Municipality/Planning Board

4.1. Has there been consultation with the Ministry of Municipal Affairs (MMA) prior to submitting this application?

Yes No

If yes, and if known, indicate the file number

4.2. Have you consulted with the municipality/planning board on the application's conformity to the official plan?

Yes No

If yes, attach a letter/documentation from the municipality/planning board on the proposal's conformity to the official plan.
(If an official plan amendment is needed, it should be submitted prior to or concurrently with this application.)

Attached

4.3. Have you discussed with the municipality/planning board the official plan 'submission requirements for a plan of subdivision/condominium'?

Yes No

4.4. Have you provided with this application a list, together with the related materials, of the submission requirements identified in the official plan?

(All materials required in the official plan for complete application must be provided when submitting an application.)

Yes No Attached

If no, why not? Please explain.

5. Additional Information for Condominium Applications Only

A. General information for all types of condominium

5.1 Has a site plan for the proposed condominium been approved?*

Yes No

5.2 Has a site plan agreement been entered into?*

Yes No

5.3 Has a building permit for the proposed condominium been issued?*

Yes No

5.4 Has construction of the development started?*

Yes No

5.5 If construction is completed, indicate the date of completion (yyyy/mm/dd)

5.6 Is the building currently occupied?*

Yes No

5.7 Is this a conversion of a building containing rental residential units?*

Yes No If yes, indicate the number of units to be converted, _____ units.

5.8 Has the municipality approved the conversion?

Yes No If yes, attach a council resolution to this effect from the municipality Attached

B. Information specific to each type of condominium apart from the standard condominium

5.9 **Amalgamations** (where two or more corporations may amalgamate.)

Include the following with your application: a plan showing the relationship of the condominiums to be amalgamated; the ministry file numbers; the approval dates; and any other relevant information.

5.10 **Vacant Land** (condominium in which each owner may decide what type of structure, if any, will be built on his or her lot.)

This kind of development may, for example, be suitable for a mobile home development. Include information on the proposed servicing and the status of required permits, etc.

5.11 **Phased** (condominium development which will allow a single condominium to be built in phases.)

Include a summary outline of the number of units and common elements to be developed in each specific phase and any common elements that would be available in subsequent phases.

5.12 **Common Elements** (condominium with the following features: the common elements are defined; the land is not divided into units; the homes could be freehold; facilities such as a recreational centre or roads and sewers could be common elements.)

Include a map showing the freehold properties outside the specific condominium site. Identify common elements and property ownerships.

5.13 **Leasehold** (condominium where the initial term of the lease of the land must be from 40-99 years and the leasehold unit owner could sell the unit without the consent of the landlord.)

On a separate page, provide information on what happens at the end of the lease period. Include dates.

6. Provincial Plans

6.1. Is the subject land for the proposed development located within an area of land designated in any provincial plan (Example: Oak Ridges Moraine Conservation Plan, the Greenbelt Plan, the Growth Plan for the Greater Golden Horseshoe, the Parkway Belt West Plan, the Niagara Escarpment Plan, or the Central Pickering Development Plan)?*

Yes No

6.2 If yes, identify which provincial plans(s) and explain the current designations(s) of the subject land(s).

6.3 If yes, does the proposal conform/not conflict with the policies contained in the provincial plan(s)?*

Yes No

If yes, please explain. Attach a separate page, if necessary. Submit a copy of a planning report, if applicable.

6.4 Is the subject land the subject of a proposed amendment to a provincial plan?

Yes No

If yes, what is the applicable provincial plan? Specify the file number and status of the application.

7. Status of Current and Other Applications under the *Planning Act*

7.1 Has the subject land ever been the subject of a planning application, including applications before the Ontario Municipal Board (OMB), for approval of either:

Amendment to the Official Plan*

Yes No If yes and if known, indicate i) file number and ii) status of the application

i) File Number

ii) Status

Plan of Subdivision*

Yes No If yes and if known, indicate i) file number and ii) status of the application

i) File Number

ii) Status

Consent*

B/019/2022/Machar approved and finalized

Yes No If yes and if known, indicate i) file number and ii) status of the application

i) File Number

ii) Status

Site Plan*

Yes No If yes and if known, indicate i) file number and ii) status of the application

i) File Number

ii) Status

Zoning By-law Amendment*

Yes No If yes and if known, indicate i) file number and ii) status of the application

i) File Number

ii) Status

Minor Variance*

Yes No If yes and if known, indicate i) file number and ii) status of the application

i) File Number

ii) Status

Minister's Zoning Order Amendment*

Yes No If yes and if known, indicate i) file number and ii) status of the application and the Ontario Regulation number.

i) File Number

ii) Status

Ontario Regulation number

Note: Please provide list(s) of the relevant applications on a separate page and attach to this form. For those applications before the OMB, provide the OMB file number and the status of appeal.

8. Provincial Policy

- 8.1 Is the proposed development consistent with the Provincial Policy Statement (PPS) issued under subsection 3(1) of the *Planning Act*?*
 Yes No (See Appendix 2 for more information on the PPS.)
- 8.2 Explain how the application is consistent with the PPS. Attach a separate page if necessary.

- 8.3 Has a site assessment been carried out by a qualified person to determine if natural heritage features exist on or within 120 metres of the subject property?
 Yes No
- 8.4 Have any studies been completed to assess the impacts of the proposed development on any existing natural heritage features and adjacent lands?
 Yes No
- 8.5 **Table B** is a checklist (not a substitute for the PPS) to assist in identifying areas of provincial interest that may apply to your application. Please check the appropriate boxes in **Table B** in **Appendix 1**.
The last column is **additional information** associated with each feature or development circumstance that may be needed to process an application. Applicants are encouraged to submit supporting documentation with the application.

9. Housing Affordability N/A

- 9.1 For applications that include permanent housing, complete **Table C - Housing Affordability**.
For each type of housing and unit size, complete the rest of the row. If lots are to be sold as vacant lots, indicate the lot frontage. Information should be based on the best information available at the time of application. If additional space is needed, attach a separate page.

Table C - Housing Affordability

For example: semi-detached - 10 units; 1000 sq. ft./5.5 metres, \$140,000

Housing Type	Number of Units	Unit Size and/or Lot Frontage	Estimated Selling Price/ Rent	Canada Mortgage and Housing Corporation (CMHC) Average Price / Rent for Current Year
Semi-detached				
Link/Semi-detached				
Row or townhouse				
Apartment block				
Other types or multiples				

- 9.2 What is the municipality/planning board's minimum target, or provincial target established in a provincial plan, for the provision of housing which is affordable to low and moderate income households?

9.3 What is the municipality/planning board's development standards for residential intensification, redevelopment and new residential development?

9.4 Explain how the proposed development would assist in:

i) achieving the municipality/planning board's targets for residential intensification and redevelopment; and

ii) implementing the municipality/planning board's development standards and policies for residential intensification and redevelopment. Attach a separate page if necessary.

9.5 Is there any other information that may relate to the affordability of the proposed housing or the type of housing needs served by the proposal?

Yes No If yes, please explain in Section 15.1 or attach a separate page, if necessary.

10. Archaeology

10.1 Does the subject land contain any known archaeological resources or areas of archaeological potential?*

Yes No **Report from Earthworks Archaeological Services**

If yes, does the plan propose to develop lands within the subject lands that contain:

- known archaeological resources¹? Yes No
- areas of archaeological potential²? Yes No

10.2 If yes to 10.1, the following reports must be prepared:

- a) an archaeological assessment that is prepared by a person who holds a licence that is effective with respect to the subject land and issued under Part 6 (Conservation of Resources of Archaeological Value) of the *Ontario Heritage Act*; and
- b) a conservation plan for any archaeological resources identified in the assessment.

Titles of reports

10.3 Are the reports attached?

Yes No If no, discuss the reasons with the regional MSO.

Notes:

1. Archaeological resources include artifacts, archaeological sites and marine archaeological site. Refer to the PPS for the definition.
2. Areas of archaeological potential means areas with the likelihood to contain archaeological resources. Refer to the PPS for the definition.

11. Servicing

11.1 Indicate in a) and b) below the proposed type of servicing for the subject land. Select from **Table D** the appropriate type of servicing. Provide/attach a separate page with the names of the relevant servicing information and/or reports indicated in **Table D** and as requested in c) below.

a) In **Table D**, select the relevant boxes in the right column.

Indicate the proposed type of sewage disposal system – whether sewage disposal will be provided to the subject land by a publicly owned and operated sanitary sewage system, a privately owned and operated individual or communal septic system, or other means?*

b) In **Table D**, select the relevant boxes in the right column

Indicate the proposed type of water supply system - whether water will be provided to the subject land by a publicly owned and operated piped water system, a privately owned and operated individual or communal well, a lake or other water body or other means?*

c. Provide a list of available servicing reports/information Attached

d. Have these reports been submitted with your application?

Yes No

Indicate on the list the reports that are included with the application.

Tulloch Preliminary SWM and Private Sewage Disposal Assessment

11.2 Hauled Sewage

If development is proposed on a privately owned and operated individual or communal septic system, provide confirmation that there is adequate reserve sewage treatment capacity for hauled sewage resulting from the proposed development. Refer to Table D below.

11.3 Is there municipal support for the allocation of uncommitted reserve servicing capacity to the subject application?

Sewage Yes No Water Yes No

Table D - Sewage Disposal and Water Supply

Type of Servicing	Reports/Information Required [select appropriate boxes where applicable]	
Sewage Disposal	a) Publicly owned and operated sanitary sewage system	<input type="checkbox"/> Applicants must provide evidence in their application that there is municipal confirmation of sufficient uncommitted reserve sewage system capacity to service the development at the time of draft approval. The reserve sewage system capacity shall also include treatment capacity for hauled sewage from individual on-site sewage systems.
	b) Public communal septic	<input type="checkbox"/> Development of five or more lots/units would require a servicing options report ¹ and a hydrogeological report ² . <input type="checkbox"/> Development of less than five lots/units and generating effluent of more than 4,500 litres per day would require a servicing options ¹ and hydrogeological report ² .
	c) Privately owned and operated individual septic system	<input type="checkbox"/> Development of five or more lots/units would require a servicing options report ¹ and a hydrogeological report ² . <input type="checkbox"/> Development of less than five lots/units and generating effluent of more than 4,500 litres per day would require a servicing options ¹ and hydrogeological report ² .
	d) Privately owned and operated communal septic system	<input type="checkbox"/> Development of less than five lots/units and generating effluent of 4,500 litres or less per day would require a hydrogeological report ² .
	e) Other	To be described by applicant.
Hauled Sewage	<input type="checkbox"/> If development is proposed on privately owned and operated individual or communal septic systems, applicant must provide evidence in the application showing either: <input type="checkbox"/> i) Municipal confirmation of sufficient uncommitted reserve sewage system capacity, at the time of draft approval, for treatment of septage resulting from the proposed development, Or <input type="checkbox"/> ii) Confirmation (i.e., letter) from a commercial enterprise (private provider) for hauled sewage (septage) indicating that capacity is available, at the time of draft approval, to accommodate the specific proposal.	
Water Supply	a) Publicly owned and operated piped water system	<input type="checkbox"/> Applicants must provide evidence in their application that there is municipal confirmation of sufficient reserve water system capacity to service the development at the time of draft approval.
	b) Privately owned and operated individual well(s)	<input type="checkbox"/> A communal or individual well system for the development of more than five lots/units would require a servicing options report ¹ and a hydrogeological report ² .
	c) Privately owned and operated communal well(s)	<input type="checkbox"/> Communal well systems for non-residential development may need a hydrogeological report ² .
	d) Lake or other water body	A Permit to Take Water may be required. Contact your regional Municipal Services Office for guidance.
	f) Other	To be described by applicant.

Notes:

1. To facilitate review of the application - submit a letter from the municipality to show concurrence (or not) with the recommendations in the servicing options report.
2. Before undertaking a hydrogeological report, consult with MMA about the assessment required given the nature and location of the proposal.
 Where communal services are proposed (water and/or sewage), ownership of these services must be assumed by the municipality or a public body through a signed letter of acceptance.

Other notes: See attached Appendix 2 for more information.

- To facilitate review of the application, submit a letter from the local health unit indicating that the site is developable and could accommodate the proposal.
- A Building Permit is required for septic systems under *Part 8 of the Building Code*.
- A certificate of approval is required from the Ministry of the Environment and Climate Change (MOECC) for sewage systems generating more than 10,000 litres of effluent per day.
- Permit to Take Water is required for water taking of more than 50,000 litres of surface and/or ground water per day.
- Servicing projects that require a Class EA under the *Environmental Assessment Act* should be discussed early with your regional MSO and the MOECC office.
- Satisfying policy requirements comes first; technical studies and any other requirements are to assist in meeting the policy.

12. Access

12.1 Indicate below in **a)** and **b)** the proposed **access** to the subject land.

Note the information that may be required, as indicated in **Table E** below.

a. The proposed road access would be by:

- Provincial highway
 Municipal road maintained all year
 Municipal road maintained seasonally
 Other public road
 Right of way
 No road access
 Other

b. Is water access proposed?

- Yes No

If yes, on a separate page, describe the parking and docking facilities to be used, the approximate distance of these facilities from the subject land and the nearest public road access.

- Attached

13. Stormwater Management/Drainage

13.1 Indicate in **a)** below the proposed type of **stormwater management** for the subject land.

Provide/attach the servicing reports/information as indicated in **Table E** and required in b) below.

a. The proposed stormwater management would be by:

- Sewers
 Ditches
 Swales
 Other

b. Is the stormwater management report attached?

- Yes No

If not attached as a separate report, in what report can it be found?

14. Garbage Disposal

14.1 Describe the available or proposed garbage disposal for the proposed development.

Table E – Road/Water Access and Stormwater Management

Services	Reports /Information Required	
Storm Drainage	a) Sewers	i) A stormwater management plan is recommended, and should be prepared concurrently with any hydro-geological report for submission with the application. ii) A stormwater management plan may be needed prior to final approval of a plan of subdivision or prior to site plan approval.
	b) Ditches c) Swales d) Other	A stormwater management plan may be needed.
Road Access	a) Provincial highway	Application to MTO for an Access Permit should be made prior to submitting this application (See Appendix 2). An Access Permit is required from MTO prior to commencing development.
	b) Municipal or other public road maintained all year	Detailed road alignment and access will be confirmed when the development application is made.
	c) Municipal road maintained seasonally	Subdivision or condominium development is not usually permitted on seasonally maintained roads.
	d) Right of way	Access by right of ways and private roads are not usually permitted, except as part of a condominium.
Water Access	A letter is required from the owner(s) of a commercially operated parking and docking facility indicating that capacity is available to accommodate the specific proposal.	

15. Consultation Strategy

15.1 Please describe in detail your proposed strategy for consulting with the public with respect to this requested amendment. Please explain below or attach on a separate page.

The Owner will place a sign on the lot informing of the upcoming meeting.

16. Other Information

16.1 Is there any other information that may be useful to the ministry in reviewing this development proposal (e.g., information relating to housing affordability, requirements and policies in the municipal official plan, or efforts made to resolve outstanding objections or concerns by area resident(s), the municipality, other)?

If so, explain below or attach a separate page with this information.

16.2 The original or certified copy of any other information and materials, as required by the official plan of the municipality/planning board, must be provided with this application.

16.3 Where applicable and relevant information is available in a planning report submitted to council, or in a technical study/report(s) prepared for the proposal, please provide the name, section and page number if you have referenced the study/report(s) in any of the questions above.

17. Affidavit or Sworn Declaration

I, F. Polsinelli & N. Nguyen of the City of Vaughan
Last Name, First Name* Municipality*
in the province of* Ontario, make oath and say (or solemnly declare)

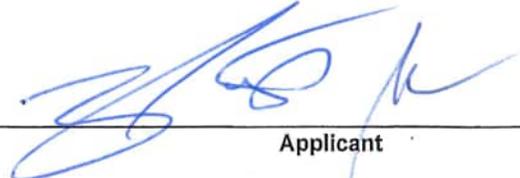
that the information required under Schedule 1 to Ontario Regulation 544/06 and provided by the applicant in this application is accurate, and that the information contained in the documents that accompany this application is accurate.

Sworn (or declared) before me at the City of Vaughan in the Regional Municipality of York
(lower-tier municipality)* (upper-tier municipality)*

on this* 27th day of* November, *20 25
day month



Commissioner of Oaths



Applicant

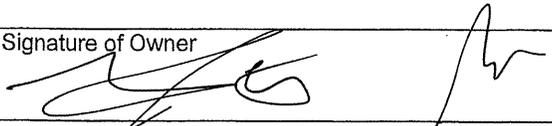
18. Authorizations

18.1 If the applicant is not the owner of the land that is the subject of this application, the written authorization of the owner that the applicant is authorized to make the application must be included with this form or the authorization set out below must be completed.

Authorization of Owner for Agent to Make the Application

I, F. Polsinelli & N. Nguyen am the owner of the land that is the subject of this application for approval of a plan of subdivision (or condominium description) and I authorize John P Gallagher to make this application on my behalf.

Signature of Owner



Date (yyyy/mm/dd)

18.2 If the applicant is not the owner of the land that is the subject of this application, complete the authorization of the owner concerning personal information set out below.

Authorization of Owner for Agent to Provide Personal Information

I, F. Polsinelli & N. Nguyen, am the owner of the land that is the subject of this application for approval of a plan of subdivision (or condominium description) and for the purposes of the **Freedom of Information and Protection of Privacy Act**.

I, authorize John P Gallagher, as my agent for this application, to provide any of my personal information that will be included in this application or collected during the processing of the application.

Signature of Owner



Date (yyyy/mm/dd)

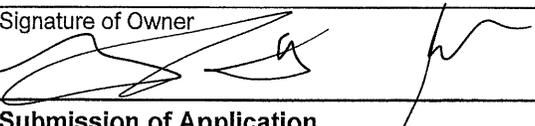
19. Consent of the Owner

Complete 'the consent of the owner' concerning personal information set out below.

Consent of the Owner to the Use and Disclosure of Personal Information

I, F. Polsinelli & N. Nguyen am the owner of the land that is the subject of this application for approval of a plan of subdivision (or condominium description) and for the purposes of the **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 of any personal information that is collected under the authority of the *Planning Act* for the purposes of processing this application.

Signature of Owner



Date (yyyy/mm/dd)

20. Submission of Application

Date of application to Ministry of Municipal Affairs (yyyy/mm/dd)*

21. Applicant's Checklist

- i) Have you remembered to attach the following:
 - Eight copies of the completed application form (ensure you have a copy for yourself)
 - Twelve copies, at a minimum, of the draft plan
 - Twelve copies of the draft plan on 8½" x 11" paper
 - Eight copies each of the reports as indicated in the application form
 - The required fee, either a certified cheque or money order, payable to the Minister of Finance
- ii) Check that the application form is signed and dated by the owner/agent

Note: Submission of digital report(s)/electronic copies is encouraged but this does not replace the ministry's requirement for hard copies.

Forward Complete Application to:

- Municipal Services Office (MSO) of the Ministry of Municipal Affairs
- Please see the attached map for geographic areas of coverage for each MSO. Refer to Page 1 for the address of each MSO.

Appendix 1

Table B below is a checklist (not a substitute for the PPS) to assist in identifying areas of provincial interest that may apply to your application. Please check the appropriate boxes in **Table B**.

The last column is **additional information** associated with each feature or development circumstance which may be needed to process an application.

Applicants are encouraged to submit supporting documentation with the application.

Table B - Significant Features Checklist

Development Circumstances Or Features of Interest to the Province	(a) If a feature/land use, is it on site or within 500 m Or (b) If a development circumstance, does it apply?	If a feature/land use, specify distance from site (in meters)	Additional information that may be required
Class 1 industry ¹	<input type="checkbox"/>		If sensitive land use is proposed within 70 m from the boundary lines, a noise/odour/particulate study may be needed.
Class 2 industry ²	<input type="checkbox"/>		If sensitive land use is proposed within 300 m from the boundary lines, a noise/odour/particulate study or other studies may be needed.
Class 3 industry ³	<input type="checkbox"/>		If sensitive land use is proposed within 1000 m from the boundary lines, an assessment of the full range of impacts and mitigation measures may be needed.
Landfill site(s): closed/active landfill	<input type="checkbox"/>		<p>If sensitive land use is proposed, and if within 500 m of the perimeter of the fill area, studies including leachate and groundwater impacts, noise, methane gas control, odour, vermin and other impacts may be needed.</p> <p>The proponent may also be requested to provide other information such as age and size of landfill site; type of waste disposed on site; projected life of site; size of buffer area; amount of truck traffic per day, etc.</p> <p>If proposal is on a closed landfill that is 25 years old or less, approval under Section 46 of the <i>Environmental Protection Act</i> is required and should be obtained prior to any <i>Planning Act</i> approval.</p>
Sewage treatment plant and waste stabilization pond	<input type="checkbox"/>		<p>Need for a feasibility study if the proposal is for a sensitive land use and the property line is within:</p> <ul style="list-style-type: none"> • 100 m from the periphery of the noise/ odour-producing source structure of a sewage treatment plant (STP) producing less than 500 cubic metres of effluent per day; or • 150 m from the periphery of the noise/ odour-producing source structure of a STP producing greater than 25,000 cubic metres of effluent per day; or • 400 m from the boundary line of a waste stabilization pond.

Development Circumstances Or Features of Interest to the Province	(a) If a feature/land use, is it on site or within 500 m Or (b) If a development circumstance, does it apply?	If a feature/land use, specify distance from site (in meters)	Additional information that may be required
Provincial highway	<input type="checkbox"/>		<p>Consult with the Ministry of Transportation in order to assess whether direct access to the provincial highway will be permitted. If so, permits will be required for all proposed buildings/land use and entrances within the permit control area in accordance with the Public Transportation and <i>Highway Improvement Act</i>.</p> <p>If the proposal is located in proximity to a provincial highway, a traffic impact study and a stormwater management report would be required by the Ministry of Transportation, be required by the Ministry of Transportation.</p>
Airports where Noise Exposure Forecast (NEF) or Noise Exposure Projection (NEP) greater than 30	<input type="checkbox"/>		<p>If the proposal is to redevelop existing residential uses and other sensitive land uses, or infill of residential and other sensitive land uses in areas above 30 NEF/NEP, assess feasibility of proposal by demonstrating no negative impacts on the long-term function of the airport.</p>
Active railway line and major highways	<input type="checkbox"/>		<p>A noise feasibility study may be needed to determine possible noise impacts and appropriate mitigation measures if sensitive land use is proposed within:</p> <ul style="list-style-type: none"> • 500 m of a main railway line or of any provincial highway; • 250 m of a secondary railway line; • 100 m of other railways or a freeway right of way; and • 50 m of a provincial highway right-of-way.
Electricity generating station, hydro transformers, railway yards, etc.	<input type="checkbox"/>		<p>If sensitive land use is proposed, and if within 1000 metres, a noise study may be needed to determine possible noise impacts and appropriate mitigation measures.</p>
High voltage electric transmission line	<input type="checkbox"/>		<p>Consult the appropriate electric power service/utility for required buffer/separation distance.</p>
Transportation, other infrastructure, utility and hydro corridors	<input type="checkbox"/>		<p>For all corridors, demonstrate that the proposed development in planned corridors would not preclude or negatively affect the use of the corridor for the purpose(s) for which it was identified.</p>
Agricultural operations	<input type="checkbox"/>		<p>If development is proposed outside of a settlement area, it must comply with the Minimum Distance Separation Formulae.</p>

Development Circumstances Or Features of Interest to the Province	(a) If a feature/land use, is it on site or within 500 m Or (b) If a development circumstance, does it apply?	If a feature/land use, specify distance from site (in meters)	Additional information that may be required
Mineral mining operations and petroleum resource operations and known petroleum resources	<input type="checkbox"/>		<p>If within 1000 m, demonstrate that development and activities would:</p> <ul style="list-style-type: none"> • not preclude or hinder the expansion of existing operations, or their continued use, or establishment of new resource operations, or access to the resources; • not be incompatible for reasons of public health, public safety or environmental impacts; <p style="text-align: center;">Or</p> <ul style="list-style-type: none"> • serve a greater long-term public interest if the resource use is not feasible, and • address issues of public health, public safety and environmental impacts.
Mineral aggregate operations, and known deposits of mineral aggregate resources	<input type="checkbox"/>		<p>If a sensitive land use is proposed, a feasibility study is needed to determine noise, dust/particulate and hydrogeology if within:</p> <ul style="list-style-type: none"> • 1000 m of the property boundary line (or licensed area) of any land designated for or an existing pit, or • 1000 m of the property boundary line (or licensed area) of any land designated for or an existing quarry. <p>If within 1000 m of a known deposit of sand and gravel or a bedrock resource, the applicant needs to demonstrate that development and activities would:</p> <ul style="list-style-type: none"> • not preclude or hinder the expansion of existing operations, or their continued use, or establishment of new resource operations or access to the resources; • not be incompatible for reasons of public health, public safety or environmental impacts; or • serve a greater long-term public interest if the resource use is not feasible, and • address issues of public health, public safety and environmental impacts.
<p>Significant wetlands in Ecoregions 5E, 6E and 7E;</p> <p>Significant coastal wetlands;</p> <p>Significant habitat of endangered species and threatened species</p>	<input type="checkbox"/>		<p>Development and site alteration are not permitted in the features.</p> <p>Are any significant wetlands, significant coastal wetlands or unevaluated wetlands present on the subject lands or within 120 m?</p> <p>Are any known significant habitats present on the subject lands or within 50 m?</p> <p>Has there been preliminary site assessment to identify whether potentially significant habitats are present?</p>

Development Circumstances Or Features of Interest to the Province	(a) If a feature/land use, is it on site or within 500 m Or (b) If a development circumstance, does it apply?	If a feature/land use, specify distance from site (in meters)	Additional information that may be required
Significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E	<input type="checkbox"/>		Development and site alterations are not permitted in the feature, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. Are any significant wetlands, significant coastal wetlands or unevaluated wetlands present on the subject lands or within 120 m?
Significant woodlands and valleylands south and east of the Canadian Shield; Significant wildlife habitat; Significant Areas of Natural and Scientific Interest	<input type="checkbox"/>		Development and site alteration are not permitted in the feature unless no negative impacts on the natural features or their ecological functions have been demonstrated. Are any significant woodlands, significant valleylands, significant wildlife habitat, and Areas of Natural and Scientific Interest (ANSIs) on the subject lands or within 50 m? If yes to the above, an environmental impact study may be needed. Consult with the regional Municipal Services Office.
Fish habitat	<input type="checkbox"/>		Development and site alteration are not permitted in fish habitat except in accordance with provincial and federal requirements. Is any fish habitat on the subject lands or within 15 m? Is any lake trout lake on the subject lands or within 30 m? If yes to the above, an environmental impact study may be needed. Consult with Ministry of Municipal Affairs early in the planning proposal stage.
Adjacent lands to natural heritage features and areas	<input type="checkbox"/>		Development and site alteration are not permitted on adjacent lands to natural heritage features unless: <ul style="list-style-type: none"> • the ecological function of the adjacent lands has been evaluated; and it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.
Sensitive surface water features and sensitive groundwater features	<input type="checkbox"/>		Development and site alteration are restricted in or near sensitive surface water features and sensitive groundwater features. Demonstrate suitable mitigation measures and/or alternative development approaches to protect, improve or restore sensitive surface water features, sensitive groundwater features and their hydrologic functions.

Development Circumstances Or Features of Interest to the Province	(a) If a feature/land use, is it on site or within 500 m Or (b) If a development circumstance, does it apply?	If a feature/land use, specify distance from site (in meters)	Additional information that may be required
Water quality and quantity	<input type="checkbox"/>		<p>For all plans of subdivision/condominium proposals, a stormwater management plan or an assessment is generally required to determine potential impacts on water quality and quantity.</p> <ul style="list-style-type: none"> If the proposal is adjacent to a water body such as a lake or stream, wetland, spring, or ground water recharge area, an impact assessment on the water body may be needed. <p>Development adjacent to a lake trout lake must address other requirements. Consult with the Ministry of Municipal Affairs early in the planning stage. The province has particular interests in lake trout lakes.</p>
Cultural heritage and archaeology	<input type="checkbox"/>		<p>Significant built heritage resources and significant cultural heritage landscapes shall be conserved; adverse impacts on these resources are to be mitigated.</p> <p>Development and site alteration shall only be permitted on lands containing archaeological resources or areas of archaeological potential if significant archaeological resources have been conserved by removal and documentation, or by preservation on site.</p> <p>Where significant archaeological resources must be preserved on site, only development and site alteration which maintain the heritage integrity of the site may be permitted.</p> <p>Development and site alteration may be permitted on adjacent lands to protected heritage property if it has been demonstrated that the heritage attributes of the protected heritage property will be conserved.</p> <p>Mitigation measures and/or alternative development approaches may be required in order to conserve the heritage attributes of the protected heritage property affected by proposed adjacent development or site alteration.</p>
Human-made hazards ⁴ including mine hazards and high forest fire hazards	<input type="checkbox"/>		<p>Development proposed on abutting or adjacent to lands affected by mine hazards, oil, gas and salt hazards, or former mineral mining operations, mineral aggregate operations, or petroleum resource operations may be permitted only if rehabilitation measures to address and mitigate known or suspected hazards are under-way or have been completed.</p> <p>Are the subject lands on or within 75 m of existing un-decommissioned oil and gas works?</p> <p>Are the subject lands on or within 1000 m of a salt solution mining well?</p> <p>Demonstrate how the hazard(s) will be addressed.</p>

Development Circumstances Or Features of Interest to the Province	(a) If a feature/land use, is it on site or within 500 m Or (b) If a development circumstance, does it apply?	If a feature/land use, specify distance from site (in meters)	Additional information that may be required
Mine hazards, former mining operations, or rehabilitated and abandoned mine sites	<input type="checkbox"/>		If proposal is on, adjacent to, or within 1000 m of mine hazards, former mining operations, rehabilitated mine sites, abandoned mine sites, or AMIS identified sites, progressive and final rehabilitation will be required to accommodate subsequent land uses. All work must be completed to the satisfaction of the province.
Non-operating mine site within 1000 metres	<input type="checkbox"/>		Was the mine rehabilitated? Have potential impacts been addressed? If within 1000 m, demonstrate to the satisfaction of the Ministry of Northern Development and Mines that the mine has been rehabilitated or all potential impacts have been investigated and mitigated.
Rehabilitated and abandoned mine sites	<input type="checkbox"/>		If proposal is on, adjacent to, or within 1000 m, consult with the Ministry of Northern Development and Mines. Progressive and final rehabilitation will be required to accommodate subsequent land uses.

Development Circumstances Or Features of Interest to the Province	(a) If a feature/land use, is it on site or within 500 m Or (b) If a development circumstance, does it apply?	If a feature/land use, specify distance from site (in meters)	Additional information that may be required
Natural hazards	<input type="checkbox"/>		<p>Development should generally be directed to areas outside of hazardous lands and hazardous sites.</p> <p>Is your development proposal within:</p> <ul style="list-style-type: none"> • a dynamic beach hazard? • the defined portions of the one hundred year flood level along the connecting channels of the Great Lakes? • areas that would be inaccessible as a result of flooding, erosion or dynamic beach hazards and a floodway? <p>Is your proposal subject to limited exceptions such as:</p> <ul style="list-style-type: none"> • safe access appropriate for the nature of the development and the natural hazard? • Special Policy Area? • uses which by their nature must locate in the floodway? <p>Where development is permitted in portions of hazardous lands and hazardous sites not subject to the above prohibitions, flood-proofing, protection works standards and access standards must be adhered to. In addition, vehicles and people need to have a way to safely enter and exit the area, hazards cannot be created or aggravated and there can be no adverse environmental impacts.</p> <p>Are the subject lands within or partially within:</p> <ol style="list-style-type: none"> i) hazardous lands adjacent to the shorelines of the Great-Lakes - St. Lawrence River System and large inland lakes (includes flooding, erosion and dynamic beach hazards)? ii) hazardous lands adjacent to river, stream and small inland lake systems (includes flooding and erosion hazards)? iii) hazardous sites (includes unstable soils and unstable bedrock)? iv) a special policy area shown in an approved official plan? v) the food fringe in an area subject to the two zone concept of floodplain management? <p>If the proposal is in a hazardous area, demonstrate how the hazards will be avoided, or where appropriate, addressed through standards and procedures such as flood-proofing and protection works.</p>

Development Circumstances Or Features of Interest to the Province	(a) If a feature/land use, is it on site or within 500 m Or (b) If a development circumstance, does it apply?	If a feature/land use, specify distance from site (in meters)	Additional information that may be required
Contaminated sites	<input type="checkbox"/>		<p>To determine potential soil contamination, there is a need for a Phase 1 Environmental Site Assessment (ESA) as per applicable regulation of the Ministry of the Environment and Climate Change (MOECC). A Phase 2 Environmental Site Assessment is needed if the site has potential for soil contamination.</p> <p>Remediation of contaminated sites shall be undertaken, as necessary, prior to any activity on the site(s) associated with any proposed new sensitive use such that there will be no adverse effects. A Record of Site Condition (RSC) is required where a more sensitive use is proposed.</p> <p>Refer to Appendix 2 for more information. Consult with the Ministry of Municipal Affairs on your specific proposal.</p>
Crown lands ⁵	<input type="checkbox"/>		<p>Consult your local regional Municipal Services Office as the first point of contact for assistance in dealing with planning issues relating to proposals requiring the acquisition or use of Crown lands.</p> <p>Contact the Ministry of Natural Resources and Forestry (MNRF) District Office regarding the actual acquisition or use of Crown lands.</p>

Notes:

1. Class 1 Industry - small scale, self-contained plant, no outside storage, low probability of fugitive emissions and daytime operations only.
2. Class 2 Industry - medium scale processing and manufacturing with outdoor storage, periodic output of emissions, shift operations and daytime truck traffic.
3. Class 3 Industry - indicate if within 1000 metres; processing and manufacturing with frequent and intense off-site impacts and a high probability of fugitive emissions.
4. Hazardous Sites - property or lands that could be unsafe for development or alteration due to a naturally occurring hazard(s). These hazards may include unstable soils (sensitive marine clays - Leda, organic soils) or unstable bedrock (Karst topography).
5. Certain areas of Crown Lands are identified by MNRF as being of special interests, such as lake access points. Distances quoted in Table A are approximate and are intended for your guidance in assessing your application.

OTHER INFORMATION

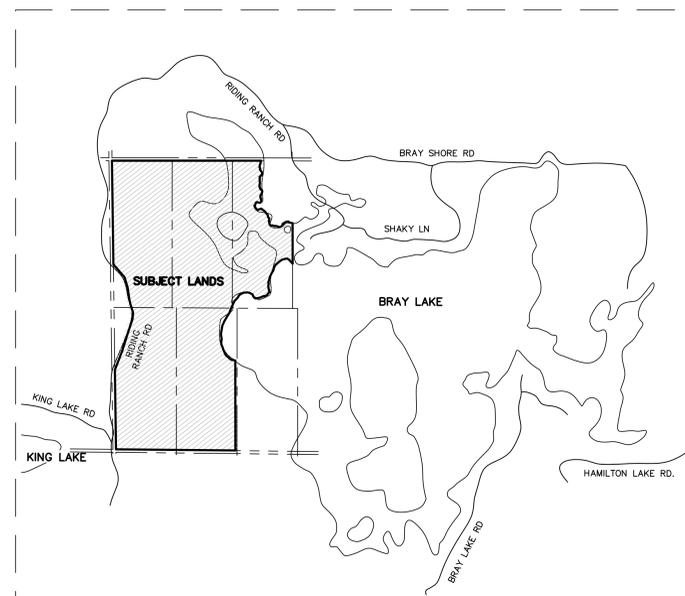
- 1) ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT:
 - A. LAND BOUNDARIES ARE AS SHOWN ON DRAFT PLAN
 - B. ROADWAYS ARE AS SHOWN ON DRAFT PLAN AND KEY PLAN
 - C. KEY PLAN IS AS SHOWN ON DRAFT PLAN
 - D. PROPOSED LOTS ARE FOR RURAL, NATURAL HERITAGE PROTECTION/ENVIRONMENTAL PROTECTION, AND SHORELINE USE, AS SHOWN ON PLAN
 - E. ADJACENT USES: CROWN, RURAL, NATURAL HERITAGE PROTECTION/ENVIRONMENTAL PROTECTION, AND SHORELINE, AS SHOWN ON PLAN
 - F. LOT DIMENSIONS ARE APPROXIMATE ONLY
 - G. TOPOGRAPHIC FEATURES ARE AS SHOWN, DERIVED FROM ORTHO PHOTOGRAPHIC IMAGERY FROM FIRST BASE SOLUTIONS DATED JULY 29, 2020
 - H. WATER SUPPLY IS TO BE PROVIDED AND OPERATED BY INDIVIDUAL LAND OWNERS
 - I. GEOTECHNICAL INVESTIGATION WILL BE REQUIRED TO CONFIRM SOIL AND GROUND COMPOSITION
 - J. 1m CONTOURS ARE AS SHOWN ON DRAFT PLAN
 - K. SEPTIC SERVICES ARE TO BE PROVIDED AND OPERATED BY INDIVIDUAL LAND OWNERS
 - L. PROPOSED LOTS CONTAIN AREAS IDENTIFIED AS A WATERCOURSE, MOOSE AQUATIC FEEDING AREA, OTHER WETLANDS AND FLOODPLAIN AS SUCH WILL HAVE RESTRICTIONS AFFECTING THE SUBDIVISION LANDS



LEGEND:

- EP DENOTES ENVIRONMENTAL PROTECTION (NATURAL HERITAGE PROTECTION) ZONING AREA
- FP DENOTES FLOOD PLAIN ZONING AREA
- SR DENOTES SHORELINE ZONING AREA
- RU DENOTES RURAL ZONING AREA
- FN DENOTES FENCE
- T DENOTES TREE
- DENOTES 15m VEGETATED NATURAL SHORELINE BUFFER
- DENOTES 23m BUILDING SETBACK FROM SHORELINE
- DENOTES 30m WETLAND / WATER COURSE SETBACK
- DENOTES TYPE 1 FISH HABITAT
- DENOTES TYPE 2 FISH HABITAT

KEY PLAN



OWNER'S CERTIFICATE

THIS IS TO CERTIFY THAT:
POLMI HOLDINGS INC. BEING THE REGISTERED OWNERS OF THE SUBJECT LANDS,
HEREBY SUBMITS A DRAFT PLAN OF SUBDIVISION FOR APPROVAL.

TOM HARSANYI DATE _____
AUTHORIZED AGENT FOR POLMI HOLDINGS INC.
"I HAVE THE AUTHORITY TO BIND THE CORPORATION"

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:
THE BOUNDARIES, DIMENSIONS AND AREAS SHOWN AND THEIR RELATIONSHIP TO
THE ADJACENT AND SURROUNDING LANDS ARE CORRECTLY SHOWN ON THIS PLAN

KEVIN KUJALA HUNTSVILLE, ONTARIO
ONTARIO LAND SURVEYOR

DRAFT

TOWNSHIP OF MACHAR

Resolution Number: 135-25

Moved by: Ron McLaren Blair Flowers Pearl Ivens Neil Scarlett
Seconded by: Ron McLaren Blair Flowers Pearl Ivens Neil Scarlett

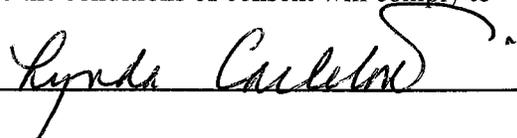
Nov 10, 2025

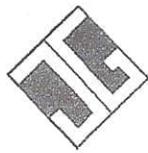
THAT we receive Planning Report dated November 10, 2025 regarding the proposed Plan of Subdivision application for the subject lands owned by Polsinelli/Nguyer and located on Part Lots 18, 19, 20, Concession 11 and 12 Bray Lake, and that Council recommends the following to the Central Almaguin Planning Board (CAPB):

- 1) That this conditional approval applies to the Draft Plan of Subdivision prepared by KPK Surveying, Job Number 202405 as shown in the Staff Report's Attachment #1, which shows 20 single detached residential lots and 15-metre wide right-of-way;
- 2) That the proposed Subdivision be conditionally approved based on the recommended Conditions of Draft Plan Approval that have been provided in Attachment #2 of the Staff Report, including but not limited to:
 - a) That the ability of the lots to accommodate a septic be confirmed by the North Bay Mattawa Conservation Authority,
 - b) Confirmation from a licenced Sewage Disposal Business that they have the ability to accommodate hauled sewage from the 20 proposed lots,
 - c) The standard conditions of provisional Consent be included in the decision as follows: the Township requires a copy of the decision, 2 copies of the registered survey, and a Cash-in-Lieu of Parkland payment in the amount of \$2,500 + HST per lot created = \$56,500,
- 3) That the CAPB work with the Township prior to finalizing the Conditions of Draft Plan Approval and during the preparation of the Subdivision Agreement to ensure that all the Township's interest are addressed,

THAT based on the recommended Conditions of Draft Approval that have been drafted, a review of the PPS, the Official Plan and the Zoning By-Law, the proposed Plan of Subdivision is consistent with the PPS, conforms to the Official Plan and subject to the conditions of consent will comply to the Zoning By-Law (following a future amendment).

Carried by: _____





JOHN P. GALLAGHER & ASSOCIATES
PLANNING, DEVELOPMENT & DESIGN CONSULTANTS

Planning Report
Pt. Lots 18, 19, 20, Concessions 11 & 12,
Geographic Township of Machar
Township of Machar
Polsinelli/Nguyer

Prepared by John P Gallagher & Associates

May 2023

TELEPHONE/FACSIMILE (705) 789-5900
EMAIL: jgpplan@surenet.net
www.planningconsultant.net

Planning Report
Pt. Lots 18, 19, 20, Concessions 11 & 12,
Geographic Township of Machar
Township of Machar
Polsinelli/Nguyer

1.0 Introduction

This planning report has been prepared by John P. Gallagher & Associates in support of applications for plan of subdivision and zoning amendment. The subject applications are submitted in tandem with this report together with the appropriate fees and supporting reports. The legal description is Part of Lots 18, 19, 20, Concessions 11 & 12, Machar.

The subject property has approximately 3,154 metres frontage on the west side of Bray Lake, approximately 1,000 metres on Riding Ranch Road. The large lot comprises approximately 151.5 ha lot area. The property has a seasonal dwellings and accessory structures located on it. This is in the area of Proposed Lot 10. The land is well treed with wetlands along the western boundary. The topography of the site generally grades down from the road to the water. All access driveways have been reviewed by the Engineer.

The land has a varied terrain. There are flat sections and hills on the lands. The area of the building sites have less than 30% grades across the envelopes. This building envelope identification has been done as part of the design process, to ensure areas of steep slopes are avoided and designed around, so as to minimize landscape alteration.

2.0 Proposed Development

The Owners, propose to obtain Draft Plan of Subdivision approval for the 20 lots. The proposal includes sixteen waterfront lots, with lot sizes ranging from 1 ha to 68 ha. All the lots would meet the 60 metre frontage requirement. There are also four rural lots proposed, with road frontages of 150m and lot sizes

ranging from 12.2 ha to 23.7 2ha. Prior commencing on the project, a preconsultation (April 27, 2020) was undertaken with the Township of Machar Planner, (MHBC). A significant number of supporting studies were required for the development. Given the workload of consultants over the last couple of years, it has taken this long to redesign the current plan to incorporate the findings of the studies, prior to submission. We had originally proposed 31 lots, which has now been reduced significantly by 11 lots. There was a single lot severance of the land on the north west side of the Bray Lake.

A single detached dwelling and associated accessory structures are proposed for each of the lots. All the building sites will be located a minimum of 23 metres setback from the water and well above the flood elevation for Bray Lake. The location of the building sites have been determined through detailed mapping, engineering and site visits using G.P.S. This was undertaken to determine the best location for building envelopes and access points in accordance with the approved policies of the Official Plan. As this is in the waterfront and rural areas, lake or well water and septic systems are proposed for each of the lots.

The surrounding area is comprised of single family dwellings on the eastern waterfront lots across the lake. The land to the north, south and west is generally rural lands with limited development.

A number of studies have been submitted with the application. These reports are to be read in conjunction with the Planning review, application and plans.

3.0 Machar Official Plan

The subject lands are designated as Rural, Shoreline and Natural Heritage Protection on Schedule A-Land Use of the Machar Official Plan. Below are Official Plan policies (*italicized*) with commentary on each policy.

B4.3 PERMITTED USES

Permitted uses in areas designated Shoreline on Schedule A shall include single dwellings, tourist commercial uses, marinas and recreational uses which existed on the date of approval of this Plan.

B4.4 GENERAL DEVELOPMENT POLICIES

All development on lands designated Shoreline and within 300 metres of the high water mark of the lake shall be deemed to have an impact on the lake unless it can be demonstrated otherwise.

Development may be subject to a Tree Cutting By-law passed by Council in accordance with Section 4 of the Trees Act. Council may also require that an Environmental Impact Report be prepared in accordance with Section B5.14.

The lands and waters have been evaluated by Riverstone Environmental and appropriate recommendations for the environmental features have been suggested. The EIS report recommendations can be incorporated into a 51-26 Agreement, registered on title to the lands and by

the site specific zoning bylaw. This will include requirements for vegetation retention, especially in the near shore area.

B4.4.1 Preservation of Vegetation

New development in the shoreline shall be sensitive to the preservation of tree cover and vegetation wherever possible so as to prevent erosion, siltation and possible nutrient migration and help maintain wildlife habitat. Development shall be set back a minimum of 23 metres from the high water mark. A greater setback may be required where necessary to address water quality, wetland, fish habitat or similar issues.

Natural features shall dominate the shoreline, with the Township generally requiring that up to 90 percent of the front 15 metres of a lot be maintained in a natural vegetative buffer. Site alteration and disturbance of vegetation within 15 metres of the shoreline shall be limited to minor alterations to accommodate access trails, docks, water pumping equipment or restoration work. Performance standards respecting the protection of the vegetative buffer and the amount and type of development permitted to encroach within the buffer shall be set out in the implementing Zoning By-law and through Site Plan Control. Approvals for new development or re-development will include requirements for landscape naturalization, improved on-site retention and treatment of wastewater and stormwater and improved compatibility with the natural environment.

The proposed plan incorporates the retention of vegetation on the site to create a low impact design. Building placement on the lot respects the 23 metre setback. Docking locations in Type 2 habitats (where docking structures are permitted) have been shown on the plan.

B4.4.4 Sewage Systems

New sewage systems are encouraged to be located as far back from the shoreline as possible, and shall be located a minimum of 30 metres from the shoreline, unless it is not physically possible (due to terrain features or lot depth) to locate the sewage system at such a distance, in which case the system shall be located as far back as possible and in accordance with current legislated minimum setback requirements.

Where sewage systems cannot be set back 30 metres from the shoreline tertiary treatment systems shall be utilized. Tertiary treatment systems shall not be used as a means through which to permit new development on any at-capacity lake.

All septic systems will be located a minimum 30 metres from the present high water mark. The Tulloch report identifies the locations proposed for the septic and buildings.

B4.7 SHORELINE RESIDENTIAL DEVELOPMENT POLICIES

B4.7.1

New lots shall have a minimum frontage of 60 metres (200 feet) and generally be 1.0 ha (2.47 acres) unless a smaller lot size can otherwise be supported by technical information pertaining to the physical

characteristics and hydrogeology of the site in accordance with the MOE D-Series guidelines or their successor documents.

New lots should be created only when it can be shown to the satisfaction of the approval authority that soil and drainage conditions are suitable to permit the proper siting of buildings, to obtain a sufficient and potable water supply and to permit the installation of an adequate means of sewage disposal. Consideration should be given to the adequacy of water supply and sewage disposal for both the severed and retained portions of the subject property and to impacts to neighbouring properties, and to the cumulative impacts of development on the sustainability of water resources.

All the lots would meet or exceed the requirements of the Machar Official Plan. Tulloch Engineering has reviewed the proposed septic system location for each lot and ensuring that both building and septic system can be placed on the lots.

B4.7.4 Private Roads

New recreational residential development may be permitted on roads which are not maintained year round by the Township provided that an agreement is registered on title acknowledging municipal services such as snowplowing, road maintenance, emergency services, garbage pick-up and school bussing may not be provided by the municipality. The conversion of an existing recreational residence on such roads into a permanent residence or the construction of a residence which will be used year round, will require Council to pass a By-law in accordance with Section D1.1.2 of this Plan.

Private rights of way are proposed for the lots within plan of subdivision. The existing driveway coming into the site will continue to be the main entrance. Tulloch has reviewed the access driveways throughout the land and provided direction for the location and construction of such driveways. This has been incorporated into the plan.

C1.2.2 Fish Habitat

Fish habitat means spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes. New development may be permitted within fish habitat if it can be demonstrated through an EIS that such development will have no negative impact on the feature and the Department of Fisheries has authorized such development or works in accordance with the Fisheries Act. Type 1 Fish Habitat is identified on the Schedules to this Official Plan, areas that are not identified as Type 1 fish habitat are of "unknown" significance; therefore applicants must consult with the appropriate authority (the Federal Department of Fisheries and Oceans) when proposing any development on lands adjacent to water. For the purpose of this section, lands adjacent to fish habitat are defined, as being within 150 metres of a fish habitat area. "Type 1" fish habitat, unless a study shows that they would be located in Type 2 habitat.

Riverstone Environmental has reviewed the shoreline fish habitat and carrying capacity of the lake. The lots have Type 1 and Type 2 Fish Habitat shown, so that dock placement can occur in the appropriate area. Some of the lots had been reconfigured and lost, due to the presence of Class 1 Fish Habitat.

C1.5 FLOOD PLAINS AND EROSION HAZARDS

Development and site alteration within a floodplain is prohibited, except for that development and site alteration which, by its very nature, must be located within a floodplain. A floodplain consists of those areas, usually low lands adjoining watercourses, which have been or may be subject to flooding hazards. Schedule B to this Plan identifies flood plain areas that were identified based on interpretation of aerial photographs, and represent the best information available at the time that this Plan was prepared.

Where development and site alteration is proposed in the vicinity of flooding hazards, a detailed engineering study will first confirm the actual extent of the flooding hazard. Development and site alteration will only proceed if it has been demonstrated to the satisfaction of the approval authority that it can occur safely on the subject lands outside of the flooding hazard, and not upon lands which are high points surrounded by the flooding hazard. Lands impacted by flooding hazards will be zoned appropriately to prohibit development and site alteration, except for that development and site alteration which must, by its very nature, be located within a floodplain.

No development/site alteration is permitted within the flooding hazard limit, as defined by the 100 year flood, Regional Flood, or within the 100 year Erosion Hazard limit, as defined by a qualified person and sealed /stamped by a professional engineer in accordance with the provincial guidelines outlined in the Ministry of Natural Resources Guide to Understanding Natural Hazards (2001). The top of bank shall be determined by an Engineer and/or Surveyor

The location of the proposed dwellings and associated access is above the flood elevation for Bray Lake. The lake level for Bray Lake is controlled by a dam on the south end of the lake. The contours on the draft plan identify the flood elevation.

C2.17.3 Subdivision/Condominium Development Policies

This section is intended to contain general Plan of Subdivision/ Plan of Condominium policies that are to be considered with every application for Plan of Subdivision / Plan of Condominium. Each Plan of Subdivision / Plan of Condominium shall comply with the specific policies dealing with lot creation in each land use designation.

Prior to the consideration of an application for Plan of Subdivision /Plan of Condominium, Council shall be satisfied that:

- a) the approval of the development is not premature and is in the public interest;*
- b) the lands will be appropriately serviced with infrastructure, schools, parkland and open space, community facilities and other amenities;*
- c) there is sufficient reserve sewage system capacity, including treatment capacity of disposal capacity for hauled sewage from private communal systems and individual on-site sewage services;*
- d) the density of the development is appropriate for the area;*

- e) the subdivision/condominium, when developed, will be integrated with other development in the area;
- f) the subdivision/condominium conforms with the environmental protection and management policies of this Plan;
- g) the proposal conforms to Section 51 (24) of the Planning Act, as amended; and,
- h) where new waterfront development is proposed by Plan of Subdivision or Condominium, the lands must be designated Shoreline. Prior to the registration of any Plan of Subdivision, a Subdivision Agreement between the landowner and the Township will be required.

The residential plan of subdivision is not premature. There is a housing crisis occurring in Ontario and the creation of lots, supports people in need of housing. The economic policies of the Official Plan support tourism and recreational opportunities. The scale of the project is low with only 20 lots on 375 acres of land, so the density is quite insignificant. It would take a few years for the homes to be built on the lands. The subject lands benefit from the existing services provided by the Township. Additional tax revenue would be generated for the municipality. Ample room exists in sanitary treatment facilities for disposal of hauled sewage. The draft plan is in accordance with the recommendations from the EIS respecting the Environmental policies of the Official Plan. The recommendations will be implemented through a zoning amendment and a 51-26 agreement registered on title to the lands.

4.0 Provincial Policy Statement 2020

In the context of the PPS, the lands would be considered Rural Lands. The permitted uses include limited residential development and resource based recreational uses.

1.1.5.2 On rural lands located in municipalities, permitted uses are:

- a) the management or use of resources;
- b) resource-based recreational uses (including recreational dwellings);
- c) residential development, including lot creation, that is locally appropriate;
- d) agricultural uses, agriculture-related uses, on-farm diversified uses and normal farm practices, in accordance with provincial standards;
- e) home occupations and home industries;
- f) cemeteries; and
- g) other rural land uses.

1.1.5.3 Recreational, tourism and other economic opportunities should be promoted.

1.1.5.4 Development that is compatible with the rural landscape and can be sustained by rural service levels should be promoted.

1.1.5.5 Development shall be appropriate to the infrastructure which is planned or available, and avoid the need for the unjustified and/or uneconomical expansion of this infrastructure

The permitted uses in the rural lands support both limited residential development and recreational dwellings. The Municipality has provided policy supporting the creation of the waterfront and rural lots. Within the plan, there are only four rural lots. These lots have been created with extensive frontage and lot area with lots ranging from 12 ha to 23.7 ha. The Official Plan supports economic growth and tourism and the benefits of allowing same. The creation of the rural lots provides additional tax revenue to the municipality, without having to extend services.

1.6.6.4 Where municipal sewage services and municipal water services or private communal sewage services and private communal water services are not available, planned or feasible, individual on-site sewage services and individual on-site water services may be used provided that site conditions are suitable for the long-term provision of such services with no negative impacts. In settlement areas, individual on-site sewage services and individual on-site water services may be used for infilling and minor rounding out of existing development.

A Functional Servicing Report has been submitted together with the application. Private services are the preferred type of servicing in this area. Each of the lots have ample room for the placement of a dwelling, well and septic system.

The applications are consistent with the Provincial Policy Statements, 2020 by allowing proper use of the existing infrastructure, providing employment opportunities and housing, while meeting the servicing policies of the statements. Implementation of the recommendations of the Riverstone Environmental Impact Study and FSR will ensure protection of the environment. The Environmental Impact Study has identified environmental constraints onsite and provided buffers to address same. The plan has shown the flood elevation and the building envelopes and access will be above that elevation.

An Archaeological Assessment has been submitted to address PPS 2.6. No items of archaeological potential were encountered.

The new dwellings proposed on each of the lots will meet the current Ontario Building Code and Fire Code in their construction. This approach supports impacts of Climate Change.

5.0 Zoning

In reviewing the zoning on the subject lands, the property is currently zoned Rural (RU), Shoreline (SR) and Environmental Protection (EP). It is proposed to rezone the waterfront lots Shoreline (SR) with exceptions to identify docking facilities, vegetation retention, setbacks. The wetlands and associated buffers will be rezoned to Environmental Protection (EP).

The rural lots/back lots will be zoned Rural One (RU1). The wetlands and buffers on these lands will be zoned Natural Resource (NR).

The background report recommendations and studies will be incorporated in to the Site Specific Zoning Bylaw for the lands, as well the 51-26 Agreement.

6.0 Conclusion

It is my professional opinion the proposed draft plan of subdivision and zoning application are consistent with the Provincial Policy Statement 2020, conforms to the Machar Official Plan and will meet the requirements of the Machar Zoning Bylaw. The applications as submitted are appropriate and represent good planning.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read 'John P. Gallagher', written in a cursive style.

John P. Gallagher, CPT, MCIP, RPP

Professional Planning Consultant

STAFF REPORT

TO: Angela Loney,
Clerk Administrator, Township of Machar

FROM: Jamie Robinson, BES, MCIP, RPP
Patrick Townes, BA, BEd
MHBC Planning Limited

DATE: November 10, 2025

SUBJECT: Draft Plan of Subdivision – Polsinelli/Nguyer
Part Lots 18, 19, 20, Concession 11 and 12, Township of Machar
Bray Lake Subdivision

Recommendation

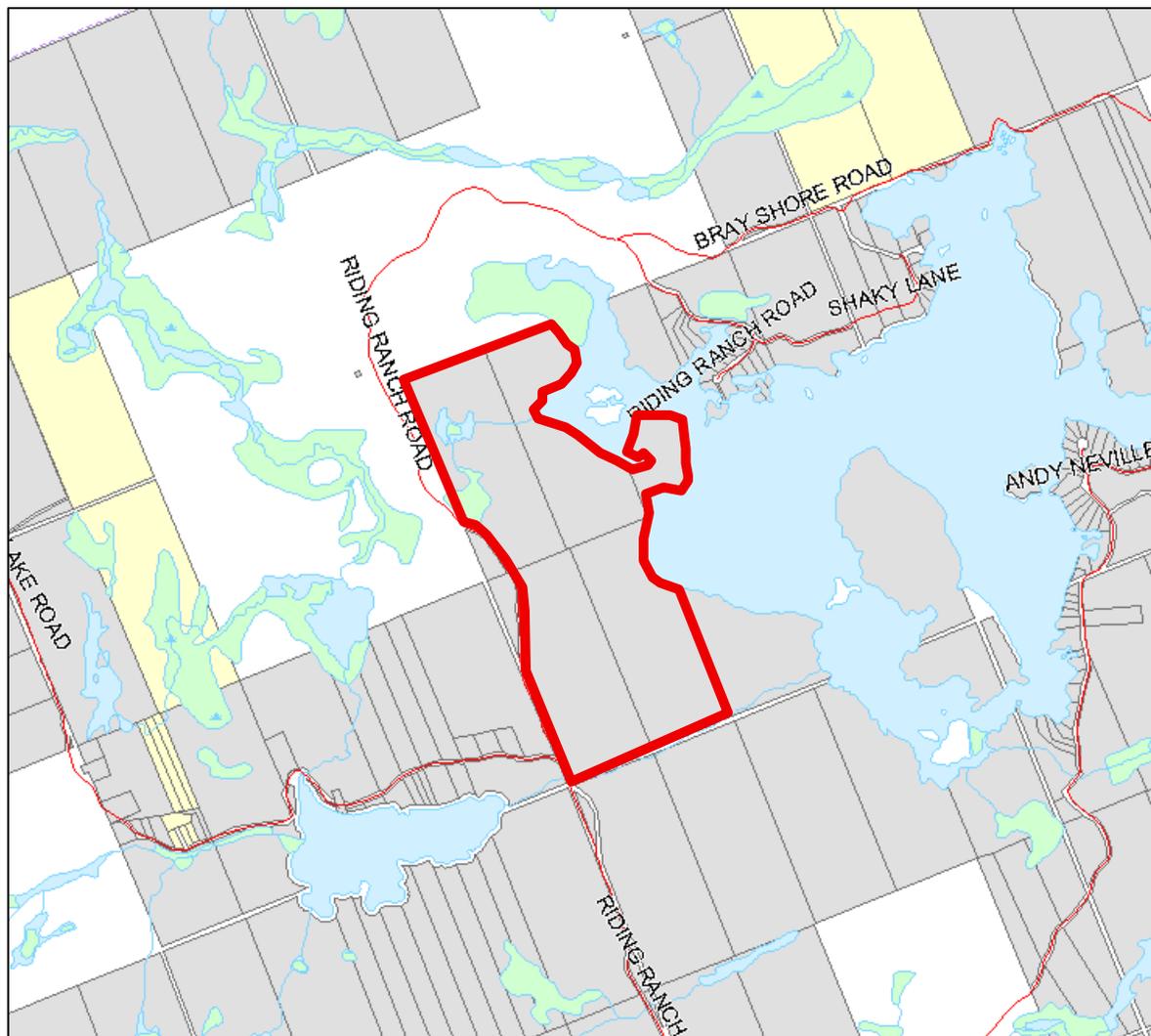
That the Council for the Township of Machar provide the recommended Conditions of Draft Plan Approval to the Central Almaguin Planning Board in regard to the proposed Plan of Subdivision application for the lands owned by Polsinelli/Nguyer and located on Part Lots 18, 19, 20, Concession 11 and 12, Bray Lake, by recommending that the Plan of Subdivision application to create 20 new lots be approved, subject to the conditions provided.

Proposal / Background

The owners of the subject lands have submitted an application associated with a Plan of Subdivision application, located on Part of Lots 18, 19, 20 and Concession 11 and 12, generally located in the northern part of the Township on Bray Lake. The owners of the subject lands are Franco Polsinelli and Nghi Nguyer and the applications have been filed by John P. Gallagher & Associates. The Township of Machar is not the approval authority for a Plan of Subdivision application, however does provide a recommendation/comments to the Central Almaguin Planning Board in regard to the application and the conditions of Draft Plan approval. Changes to the *Planning Act* no longer require a Statutory Public Meeting for Plan of Subdivision applications.

The location and boundary of the subject lands are shown on Figure 1. Based on the proposed Draft Plan that has been submitted with the application, the subject lands are also inclusive of flooded lands to the north-east of the boundary that is shown in Figure 1.

Figure 1: Subject Lands



The subject lands are comprised of approximately 150 hectares (370.7 acres) and have varying lot frontages on Bray Lake and Riding Ranch Road. The subject lands appear to be comprised currently of five separate lots of record. There are seasonal detached dwellings and an accessory building existing on a portion of the subject lands.

The development proposal includes the creation of 20 new residential lots, varying in lot area and lot frontage on the subject lands. The original proposal was to create 31 new lots however this original proposal has been scaled back. The proposed new lots range in lot area from approximately 1 hectare to 69 hectares. The proposed lots, including the lot area and lot frontages are summarized on Table 1.

Table 1: Proposed Lot Statistics

Lot No.	Lot Area (ha)	Lot Frontage (m)
1	12.1	150
2	12.2	150
3	12.2	150
4	23.7	147.3
5	26.2	261.4
6	69.7	526.7
7	1.0	60.0
8	1.0	60.0
9	1.6	91.8
10	1.4	86.9
11	1.0	60
12	1.0	60
13	1.0	60
14	1.9	73.4
15	1.3	109
16	1.1	122.7
17	1.2	125.7
18	1.6	91.9
19	2.3	78.2
20	2.6	234.4

Four of the proposed lots (Lots 1-4) have lot frontage on Riding Ranch Road and do not have lot frontage on Bray Lake. Two of the proposed lots (Lot 5 and 6) have frontage on Riding Ranch Road and lot frontage on Bray Lake. And the remaining proposed lots (Lots 7-20) have lot frontage on Bray Lake and are proposed to be accessed by new 15 metre right-of-way.

The proposed Draft Plan is included as Attachment #1 to this Report. The proposed Draft Plan shows the subject lands and the proposed lots, including the proposed lot areas and lot frontages. The proposed new 15 metre right-of-way is also shown on the proposed Draft Plan.

The owner and the agent have submitted the following reports/technical studies with the proposed Plan of Subdivision application:

- Planning Justification Report
- Archaeological Assessment
- Environmental Impact Study and Lake Capacity Assessment
- Septic Pump Out Letter
- Stormwater Management Report and Sewage System Assessment
- Traffic Brief
- Wildland Fire Risk Assessment

A summary of each report/technical study has been provided in this Report.

The Environmental Impact Study and Lake Capacity Assessment was peer reviewed by a consultant on behalf of the Township, Hutchinson Environmental Sciences Limited.

A copy of the Township's recommended Conditions of Draft Plan Approval have been prepared for consideration of the approval authority. These are the conditions that the Township is recommending to be included as part of the approval process at the Central Almaguin Planning Board. The Conditions of Draft Plan Approval have been included as Attachment #2.

Area Context

As indicated in the agent's Planning Justification Report, the subject lands have a varying terrain and generally slope towards Bray Lake. There are seasonal dwellings and an accessory building located on the subject lands in the area of proposed Lot 10. The subject lands appear to be primarily forested, and the surrounding land uses include rural and shoreline residential properties and Crown Land. Overall, there is limited development within this area of the Township. Riding Ranch Road is classified as a year-round maintained road.

The subject lands are designated as Rural, Shoreline and Natural Heritage Protection on Schedule A of the Official Plan. The subject lands contain areas identified as a watercourse, moose aquatic feeding area, other wetlands and floodplain on Schedule B of the Official Plan. Bray Lake is identified as a cold water lake. The subject lands are located within the Rural (RU) Zone, the Shoreline Residential (SR) Zone and the Environmental Protection (EP) Zone.

Policy Analysis

In regard to the proposed Plan of Subdivision application, the following is a summary and review of the relevant land use policies that are applicable to the proposed development.

Planning Act

Section 51(24) of the *Planning Act* provides criteria which must be considered when assessing any new Plan of Subdivision. These criteria (in italics) and comments are provided below.

(a) *The effect of the development of the proposed subdivision on matters of provincial interest as referred to in Section 2;*

(b)

The *Planning Act* promotes the efficient use of land within rural areas. The proposed Plan of Subdivision is located within a rural area and each of the new residential lots will be serviced with private water and sewer services (i.e. well and septic).

The *Planning Act* also speaks to the adequate range and distribution of residential housing types. In this case, the proposed develop includes lots to accommodated future single detached dwellings.

Resource-based residential uses and residential development, including lot creation, where site conditions are suitable for the provision of appropriate sewage and water services are permitted in rural areas in accordance with the Provincial Policy Statement. The application includes information to demonstrate that the proposed lots can be appropriately serviced with individual on-site sewage services (septic systems) and individual on-site water services (wells).

(c) *Whether the proposed subdivision is premature or in the public interest;*

Resource-based residential uses and residential development, including lot creation, where site conditions are suitable for the provision of appropriate sewage and water services are permitted in rural areas in accordance with the Provincial Policy Statement. Additional housing stock is to be provided in the Township as a result of the proposed development and does not appear to be premature, and is in the public interest.

- (d) *Whether the plan conforms to the official plan and adjacent plans of subdivision, if any;*

The majority of the proposed residential lots are located along the shoreline of Bray Lake and within the Shoreline designation of the Official Plan. The Township's Official Plan limits lot creation in the Rural designation to eight (8) per year, however the majority of the residential lots are located within the Shoreline designation and therefore are considered resource-based residential uses and are not intended to be limited in the same manner as the Rural designation. Following a review of the proposed Plan of Subdivision application, the reports/technical studies that have been submitted, and the recommended Conditions of Draft Plan Approval, the proposed application conforms to the Township's Official Plan.

- (e) *The suitability of the land for the purposes for which it is to be subdivided;*

Based on the reports/technical studies that have been submitted with the application, it appears that the subject lands are suitable for the proposed Plan of Subdivision and future residential lots.

If any affordable housing units are being proposed, the suitability of the proposed units for affordable housing;

Based on the application and the proposed lots, no affordable housing units are proposed.

- (f) *The number, width, location and proposed grades and elevations of highways, and the adequacy of them, and the highways linking highways in the proposed subdivision with the established highway system in the vicinity and the adequacy of them;*

Access to the proposed lots is provided via Riding Ranch Road, which is an existing municipally maintained road. Information has been submitted with the application to demonstrate that no additional upgrades are required to Riding Ranch Road as a result of the proposed development. A new private right-of-way with a width of 15 metres is proposed to provide access to the shoreline lots. This will be a private road and the Township will not provide services on this road. It is recommended that the owner apply for a Plan of Condominium or a Private Road Agreement to administer the use of the road and make it clear what the responsibilities are for future owners.

- (g) *The dimensions and shapes of the proposed lots;*

The proposed lots vary in lot area and lot frontage. The proposed lots are to meet the minimum lot area and lot frontage requirements in the Township's Zoning By-law. Information has been submitted with the application to demonstrate that each of the lots have a future building envelope for a single detached dwelling and a septic system.

- (h) *The restrictions or proposed restrictions, if any, on the land proposed to be subdivided or the buildings and structures proposed to be erected on it and the restrictions, if any, on adjoining land;*

Recommendations contained within the information submitted with the application includes a minimum 15 metre vegetation buffer from the shoreline. This will be implemented in a future Zoning By-law Amendment. Further areas that are identified as wetlands and watercourses have also been established with associated setback areas to prohibit development in the future to protect these areas from a natural heritage perspective.

(i) *Conservation of natural resources and flood control;*

Future development on the proposed shoreline lots are to respect the minimum setback from the shoreline of 23 metres which is the minimum setback requirement for all shoreline lots in the Zoning By-law.

(j) *The adequacy of utilities and municipal services;*

Access to the proposed lots is provided via Riding Ranch Road, which is an existing municipally maintained road. Information has been submitted with the application to demonstrate that no additional upgrades are required to Riding Ranch Road as a result of the proposed development.

Owners will be responsible for obtaining approvals from the North Bay-Mattawa Conservation Authority for future septic systems.

(k) *The adequacy of school sites;*

The local school boards will be circulated during the formal application process at the Central Almaguin Planning Board.

(l) *The area of land, if any, within the proposed subdivision that, exclusive of highways, is to be conveyed or dedicated for public purposes;*

Based on the submitted materials, no blocks of land are proposed to be conveyed to the Township.

(m) *The extent to which the plan's design optimizes the available supply, means of supplying, efficient use and conservation of energy; and,*

Access to the proposed shoreline lots will connect to the existing road network and private servicing will be provided in an efficient manner.

(n) *The interrelationship between the design of the proposed plan of subdivision and site plan control matters relating to any development on the land, if the land is also located within a site plan control area designated under subsection 41(2) of this Act or subsections 114(2) of the City of Toronto Act, 2006.*

Not applicable.

In consideration of the above, the proposed Plan of Subdivision, along with the applicable Conditions of Draft Plan Approval, would generally have regard for matters of Provincial Interest and the criteria of Section 51(24) of the *Planning Act*.

Provincial Planning Statement

The Provincial Policy Statement (PPS) is a document that provides policy direction on matters of Provincial interest concerning land use planning. Ontario has a policy led planning system and the PPS sets the foundation for regulating the development and use of land in the Province. Policies are set out to provide for appropriate development while also protecting resources of provincial interest, public health and safety, and the quality of the natural and built environment. When making land use planning decisions, Planning Authorities must ensure that decisions are consistent with the PPS.

All applications made under the *Planning Act*, must be consistent with the PPS. The subject lands are considered as Rural Lands in the context of the PPS. Section 2.6 establishes permitted uses for Rural Lands within municipalities. In addition to permissions for resource-based recreational uses, Section 2.6.1 c) identifies residential development, including lot creation where site conditions are suitable for the provision of appropriate sewage and water services. Lot creation for the purposes of residential uses is a permitted use on the subject lands. The owner has submitted a Private Sewage System Assessment to demonstrate that the proposed lots are suitable for a septic system following a review of the soils and the topography of the subject lands.

Section 4.1 of the PPS provides for the long-term protection of Ontario's natural heritage features and areas. Natural heritage features are identified on the subject lands in the Township's Official Plan, and therefore an Environmental Impact Study was required to evaluate these features. Recommendations are summarized in this Report however there are wetland areas and watercourses that are to be protected along with associated setback areas. A minimum vegetation buffer of 15 metres is also recommended along the shoreline.

Policies regarding water are included in Section 4.2 of the PPS. The policies of the Township's Official Plan require that the lake capacity of Bray Lake be evaluated prior to development. The owner has submitted a Lake Capacity Study that was peer reviewed by the Township's consultant. The conclusions of this work has demonstrated that the proposed development can proceed on the basis that it meets Provincial policies and documents (Lakeshore Capacity Assessment Handbook) related to water quality and lake capacity.

Section 4.6 of the PPS includes policies regarding cultural heritage and archaeology. The owner has submitted an Archaeological Assessment in accordance with Provincial standards to conclude that no artifacts have been located on the subject lands.

Section 3 of the PPS provides for the protection of public health and safety, including flooding. The minimum setback from the shoreline of 23 metres in the Zoning By-law is to be respected for the proposed shoreline lots. A Wildland Fire Risk Assessment has also been submitted.

Based on a review of the relevant policies and considering the recommended Conditions of Draft Plan Approval, the proposed Plan of Subdivision is consistent with the PPS.

Township of Machar Official Plan

The subject lands are designated as Rural, Shoreline and Natural Heritage Protection on Schedule A of the Official Plan. The subject lands contain areas identified as a watercourse, moose aquatic feeding area, other wetlands and floodplain on Schedule B of the Official Plan. Bray Lake is identified as a cold water lake.

Residential dwellings are permitted within the Rural and Shoreline designations in the Official Plan. The Natural Heritage Protection designation encompasses a number of natural heritage features and is identified to maintain and enhance the ecological integrity of the natural heritage system. Permitted uses are limited to conservation and passive recreational uses that do not require development or site alteration. These areas are to be protected on the subject lands, including the applicable adjacent lands for each of the features.

Section B1.5.10 of the Township Official Plan states that the approximate number of new lots permitted within the Rural Area per year will be eight (8). The majority of the proposed residential lots are located along the shoreline of Bray Lake and within the Shoreline designation of the Official Plan. The Township's Official Plan limits lot creation in the Rural designation to

eight (8) per year, however the majority of the residential lots are located within the Shoreline designation and therefore are considered resource-based residential uses and are not intended to be limited in the same manner as the Rural designation.

Applications for subdivision of land shall be subject to the policies of Section C2.17. A Plan of Subdivision is required in this case because there are more than three new lots being created. Section C2.17.3 of the Official Plan includes policies regarding subdivisions. Prior to the consideration of an application for Plan of Subdivision /Plan of Condominium, Council shall be satisfied that:

a) the approval of the development is not premature and is in the public interest;

Resource-based residential uses and residential development, including lot creation, where site conditions are suitable for the provision of appropriate sewage and water services are permitted in rural areas in accordance with the Provincial Policy Statement. Additional housing stock is to be provided in the Township as a result of the proposed development and does not appear to be premature, and is in the public interest.

b) the lands will be appropriately serviced with infrastructure, schools, parkland and open space, community facilities and other amenities;

Due to the location of the subject lands, cash in lieu of parkland is recommended and not physical open spaces or parkland.

c) there is sufficient reserve sewage system capacity, including treatment capacity of disposal capacity for hauled sewage from private communal systems and individual on-site sewage services;

The owner has submitted a letter confirming there is disposal capacity for hauled sewage from the proposed septic systems.

d) the density of the development is appropriate for the area;

The proposed lot sizes are representative of rural and shoreline development.

e) the subdivision/condominium, when developed, will be integrated with other development in the area; f) the subdivision/condominium conforms with the environmental protection and management policies of this Plan;

The owner has submitted an Environmental Impact Study to evaluate the natural heritage features on the subject lands. Recommendations and mitigation measures have been provided to protect these features.

g) the proposal conforms to Section 51 (24) of the Planning Act, as amended; and,

Refer to the previous section of this Report.

h) where new waterfront development is proposed by Plan of Subdivision or Condominium, the lands must be designated Shoreline.

The subject lands are located in the shoreline area of the Township, and are designated Shoreline where the majority of the lots are proposed. Three new lots are proposed within the Rural designation and do not have lot frontage on Bray Lake, however three new lots would be permitted through the Consent process.

Policies related to the Shoreline designation are included in Section B4 of the Township Official Plan. Section B4.4 of the Township Official Plan states that all development on lands designated Shoreline and within 300 metres of the high water mark of a lake shall be deemed to have an impact on the lake, unless it can be demonstrated otherwise. The owner has submitted an Environmental Impact Study and Lake Capacity Study to demonstrate the proposed development can proceed with no negative impacts to these features and areas.

Preservation of vegetation is referenced under Section B4.4.1 of the Township Official Plan, as new development in the shoreline shall be sensitive to the preservation of tree cover and vegetation wherever possible so as to prevent erosion, siltation and possible nutrient migration and help maintain wildlife habitat. Development shall be set back a minimum of 23 metres from the high water mark. A greater setback may be required where necessary to address water quality, wetland, fish habitat or similar issues. In general, 90% of the front 15 metres of a lot is to be maintained in a natural state. It is recommended that each lot be subject to Site Plan Control, and measures be included in the implementing Zoning By-law Amendment to ensure the shoreline area is protected, and vegetation/buffer areas are established adjacent Bray Lake. A minimum vegetative buffer of 15 metres is proposed on the shoreline lots.

Section B4.4.4 notes that new sewage systems are encouraged to be located as far back from the shoreline as possible, and shall be located a minimum of 30 metres from the shoreline. This is a requirement in the Zoning By-law.

New lots in the Shoreline designation shall have a minimum lot frontage of 60 metres and generally be a minimum of 1 hectare. Smaller lots may be supported if appropriate technical information is provided. The owner has revised the original proposal and now is proposing 20 new lots that meet the required lot frontage and lot area.

Section B4.7.4 of the Township Official Plan states that new recreational residential development may be permitted on roads which are not maintained year round by the Township provided that an agreement is registered on title acknowledging municipal services such as snowplowing, road maintenance, emergency services, garbage pick-up and school bussing may not be provided by the municipality. The owner has submitted a Traffic Report to demonstrate that the proposed new lots can be accommodated. It is recommended that the owners apply for a Plan of Condominium or a Private Road Agreement for the road that is proposed off of Riding Ranch Road.

Bray Lake is considered to have unique characteristics and limited carrying capacities with respect to the amount of shoreline development they can accommodate. For Bray Lake, in addition to the requirement that new development shall not raise the phosphorus levels by greater than 50% above its natural level, development shall not cause the level of phosphorus in any of the lakes to exceed 20mg/L over the lifetime of this plan, even if such a level would be less than a 50% increase to the natural level of the lake. Section B4.11 of the Township Official Plan includes specific policies for Bray Lake. Section B4.11.1 states:

In order to limit the lake's further water quality deterioration, new development shall not raise the phosphorus level on Bray Lake over the life of this Plan by more than 50% above its natural level. The creation of new lots shall be supported by lake capacity modeling in accordance with the guidelines of the Ministry of the Environment.

The owner has submitted a Lake Capacity Study that has been peer reviewed by a professional firm hired by the Township. It has been demonstrated that the proposed development meets the necessary requirements and a summary of the Study is included in this Report.

Portions of the shoreline are identified as a floodplain area. Section C1.5 of the Township Official Plan states:

Where development and site alteration is proposed in the vicinity of flooding hazards, a detailed engineering study will first confirm the actual extent of the flooding hazard. Development and site alteration will only proceed if it has been demonstrated to the satisfaction of the approval authority that it can occur safely on the subject lands outside of the flooding hazard, and not upon lands which are high points surrounded by the flooding hazard. Lands impacted by flooding hazards will be zoned appropriately to prohibit development and site alteration, except for that development and site alteration which must, by its very nature, be located within a floodplain.

Watercourses and wetland areas have been identified in the Environmental Impact Study. These areas are to be restrictively zoned along with their respected recommended minimum setbacks for future development. Further, new dwellings are to be located a minimum of 23 metres from the shoreline which is the requirement for all shoreline lots in the Township in the Zoning By-law.

Section C2.19 of the Township Official Plan states that Council will accept cash in lieu of parkland where appropriate. This will be a requirement for the proposed development.

Based on a review of the relevant policies and considering the recommended Conditions of Draft Plan Approval, the proposed Plan of Subdivision conforms to the Official Plan.

Township of Machar Zoning By-law

The subject lands are located within the Rural (RU) Zone, the Shoreline (SR) and Environmental Protection (EP) Zone. A Zoning By-law Amendment application will be required to establish zone boundaries on the subject lands for the proposed lots, and also to administer any required minimum setbacks from Bray Lake or identified environmental features. The requirement for the owner to apply for and obtain approval of a Zoning By-law Amendment will be included in the Conditions of Draft Plan Approval.

The proposed lot areas and lot frontages meet the minimum requirements of both the Rural (RU) Zone and the Shoreline Residential (SR) Zone. Other zoning provisions will be recommended to include the following:

- Rezone wetland areas and watercourse and their associated minimum setback areas to the Environmental Protection (EP) Zone.
- Establish a minimum vegetation buffer of 15 metres along the shoreline of Bray Lake.

Summary of Recommendations of Technical Studies

Environmental Impact Study – prepared by RiverStone

RiverStone conducted an Environmental Impact Study on the subject lands. The purpose of the Study was to address Provincial and municipal requirements pertaining to the protection of significant natural features (wetlands, watercourses, species at risk, and fish habitat). The report provided the following recommendations:

- design of the septic system shall include pump-dosing or equivalent technology to uniformly distribute septic effluent over the tile bed;
- provision of a 30m minimum undisturbed shoreline buffer and soil mantle, with the exception of a pervious pathway;
- phosphorus attenuation measures such as directing runoff and overland drainage from driveways, parking areas, other hard surfaces to soak away pits, infiltration facilities should be included in the lot design;
- all imported soils used for leaching bed construction should be silt free, fine to medium grained non-calcareous soils, having the presence of iron and aluminum. Native soils removed for the placement of a dwelling may also be used should they meet all criteria noted above and those for septic use as noted in the Ontario Building Code;
- development of the primary dwelling for each of the proposed lots be setback a minimum of 23m and 30m for the septic systems from the shoreline of Bray Lake;
- development of the primary dwellings and septic systems for each of the proposed lots be a minimum of 30m from identified wetlands and watercourses;
- no additional vegetation clearing outside of the identified development envelopes is to occur within 30m of the shoreline of Bray Lake;
- When the native soil is exposed, sediment and erosion control works, in the form of heavy-duty sediment fencing, be positioned along the downgradient edge of any construction envelopes adjacent to water bodies, wetlands, or watercourses;
- temporary storage locations of aggregate material be located no less than 30m from the shoreline of Bray Lake in areas of low slopes. This material is to be contained by heavy-duty sediment fencing;
- the sediment fencing must be constructed of heavy material and solid posts to ensure its integrity and be properly installed (trenched in) to maintain its integrity during inclement weather events;
- additional sediment fencing and appropriate control measures (e.g., straw bales) be stockpiled on site so that any breach can be immediately repaired through construction of check dams;
- regular inspection and monitoring will be necessary to ensure that the structural integrity and continued functioning of the sediment control measures is maintained (i.e., property installation is not the only action necessary to satisfy the mitigation requirements)
- inspections of sediment and erosion control measures be completed within 24 hours of the onset of a storm event;
- sediment control measures be maintained in good working order until vegetation has been established on the exposed soils;
- offloading of construction materials and aggregate should be completed during fair weather;
- vegetation is not to be removed within 30m of the wetlands unless it is a safety hazard, and debris from clearing or materials to be used in construction are not to be placed within this area;
- where stormwater management is applied, Lot Impact Development (LID) techniques should be implemented, that promote infiltration and use of vegetated swales to take-up overland runoff, before entering watercourses;

- aggregate storage, particularly sand, is a suitable nesting substrate for Hog-nosed snakes. Should sand be stored on the property between June 1 and August 31, the stockpile should be surrounded by exclusion fencing to prevent access;
- tree clearing for the purposes of development on each proposed lot only occur in the fall, winter and early spring (from October 15 to April 15). This timeframe is outside of the maternal roosting period;
- in the event that tree clearing must occur between April 15 and October 15, additional studies will need to be completed to confirm the presence or absence of SAR bats. These studies will include snag tree surveys and acoustic monitoring of the area where trees will be removed, by a qualified professional. Should SAR bats be detected, the MECP should be contacted to determine if a permit would be required to proceed; and
- vegetation removal should be restricted during the migratory bird nesting season, May 1 to August 15 each year. This timeframe falls entirely within the restricted timing window for removal of trees as it relates to roosting bats and noted above. In the event that tree clearing must occur between May 1 and August 15, a qualified professional should complete a nest survey for the area where tree clearing is proposed. If nesting birds are found, tree clearing should wait until the birds have fledged.

Wildland Fire Risk Assessment – prepared by RiverStone

RiverStone conducted a Wildland Fire Risk Assessment on the subject property. The assessment provided three recommendations for future development and how it should proceed on the proposed lots:

1. Building Envelope Siting – where possible future development should be situated in the lowest hazardous forest types.
2. Vegetation Management – the subject lands contain extreme/high risk forest types, that with vegetation management can reduce the risk.
3. Building Design – incorporating fire resistant construction materials as part of building design.

The Wildland Fire Assessment concluded that the identified wildland fire risks associated with the proposed application can be mitigated to an acceptable level according to Provincial Guidelines. It is also advised that the recommendations be incorporated into any relevant development agreement or conditions of development approval.

Stage 1 & 2 Archaeological Assessment – prepared by Earthworks Archaeological Services Inc.

Earthworks Archaeological Services Inc. conducted an Archaeological Assessment for the subject property. A comprehensive Stage 1 Archaeological Assessment of the subject property, including a background study and property inspection, was completed where the property was evaluated as containing evidence of archaeological potential based on the small lakes and wetlands within and along the edge of the study area. This illustrates potential for locating Pre-Contact Aboriginal archaeological material.

A Stage 2 archaeological assessment was required in order to identify and document any archaeological material that may be present. Test pit surveys were conducted between August 25 and September 1, 2020. The Stage 2 archaeological survey did not yield any evidence of archaeological material.

Traffic Brief – prepared by JD Northcote Engineering Inc.

JD Northcote Engineering Inc. conducted a traffic brief for the subject property. The brief concluded that no additional infrastructure improvements are recommended within the study area as a result of the proposed development. The traffic generation from the subject property will not cause any operational or traffic safety issues.

Preliminary Stormwater Management Plan and Private Sewage System Assessment – prepared by Tulloch

Tulloch Engineering prepared a preliminary stormwater management plan and private sewage system assessment for the subject property. The report concluded that it is not anticipated that flooding of adjacent lands will result due to increases in run-off rates from the development. Suitable drainage facilities can be installed to convey drainage to the lake and protect against surface erosion and quality impairment of runoff. During construction a suitable mitigation plan can be implemented for the site to protect Bray Lake and adjacent lands from sediment migration.

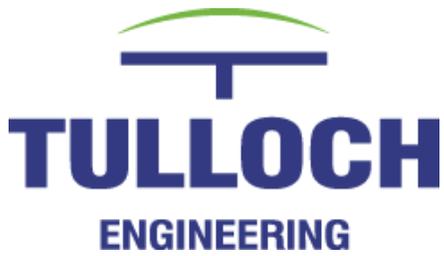
Further, the report recommends that the conveyance systems, construction mitigation measures specified in this report be implemented. The report also recommends that the Township require a detailed grading and construction mitigation plan be submitted in support of each building permit application.

Summary

Following a review of the information provided in the application for Plan of Subdivision, it is recommended that Council recommend to the Central Almaguin Planning Board that the proposed Subdivision be conditionally approved based on the recommended Conditions of Draft Plan Approval that have been provided in Attachment #2 of this Report. These conditions are to be included in addition to those imposed by the Planning Board.

It is also recommended that the Central Almaguin Planning Board work with the Township prior to finalizing the Conditions of Draft Plan Approval and during the preparation of the Subdivision Agreement to ensure that all the Township's interests are addressed.

Based on the recommended Conditions of Draft Plan Approval that have been drafted, a review of the PPS, the Official Plan and the Zoning By-law, the proposed Plan of Subdivision is consistent with the PPS, conforms to the Official Plan and subject to the conditions of consent will comply to the Zoning By-law (following a future amendment).



PRELIMINARY STORMWATER MANAGEMENT PLAN AND PRIVATE SEWAGE SYSTEM ASSESSMENT

Bray Lake Subdivision

August 2022

Project # 211851



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APPENDIX B – Design Drawings

APPENDIX C – Hydraulic Calculations

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DISCLAIMER

This Report has been prepared by TULLOCH Engineering Inc. ('TULLOCH') for the sole and exclusive use of Polni Holdings ('Client') to support preliminary recommendations for the development on Bray Lake (the 'Development') in Machar, Ontario (the 'Site'). The Report shall not be used for any other purpose, or provided to, relied upon or used by any third party without the express written consent of TULLOCH.

A limited number of visits to the Site were completed along with an existing condition topographic survey; and as such, the information collected and presented herein applies to the time of the visits only.

This Report contains design opinions, conclusions and recommendations made by TULLOCH using professional judgment and reasonable care for the purpose of stormwater management and site servicing design.

Use of or reliance on this report by the Client is subject to the following conditions:

- a) the report being read in the context of and subject to the terms of the Engineering Services Agreement for the Work, including any methodologies, procedures, techniques, assumptions and other relevant terms or conditions specified or agreed therein;
- b) the report being read in its entirety. TULLOCH is not responsible for the use of portions of the report without reference to the entire report;
- c) the conditions of the site may change over time or may have already changed due to natural forces or human intervention, and TULLOCH takes no responsibility for the impact that such changes may have on the accuracy or validity of the observations, conclusions and recommendations set out in this report; and,
- d) the report is based on information made available to TULLOCH by the Client or by certain third parties; and unless stated otherwise in the Agreement, TULLOCH has not verified the accuracy, completeness or validity of such information, makes no representation regarding its accuracy and hereby disclaims any liability in connection therewith.

This report has been prepared with the degree of care, skill and diligence normally provided by engineers in the performance of comparable services for projects of similar nature. The scope of this report includes engineering design of site servicing and stormwater management to support approval of the development by the Municipality and governing authorities.

REVISION LOG

2022/08/31	0	Issued for Approval	B. Belfry	T. Maurer	C. Stilwell
Date (Y/M/D)	Rev.	Status	Prepared By	Checked By	Approved By
TULLOCH ENGINEERING INC.					

REPORT PREPARATION & REVIEW

<p>Prepared by:</p>  <hr/> <p>Ben Belfry, E.I.T.</p>	<p>Reviewed by:</p>  <hr/> <p>Ted Maurer, C.E.T.</p>
<p>Approved by:</p>  <hr/> <p>Chris Stilwell, P. Eng.</p>	

1. INTRODUCTION

1.1 General

Bray Lake Subdivision is proposing to develop a 20-lot subdivision along the west shore of Bray Lake. The total site development area is approximately 150 hectares. The lots will front the west bay of Bray Lake and the east limit of Riding Ranch Road. Six (6) of the lots could be accessed via private entrances from Riding Ranch Road and the other fourteen (14) lots via one (1) new 15 m wide private right-of-way from Riding Ranch Road that branches into three (3) new 15 m wide private rights-of-ways.

The site lies approximately 16 km west of the Town of South River, in Geographic Township of Machar, District of Parry Sound. The site is bounded by Bray Lake and vacant land to the northeast, existing vacant land to the northwest, Riding Ranch Road, and vacant land to the southwest and southeast.

TULLOCH Engineering Inc. has been retained by the property owner, to prepare a Preliminary Stormwater Management and Construction Mitigation Plan in support of an anticipated application for draft plan approval. The application for draft plan of subdivision approval will be submitted under separate cover by others. TULLOCH Engineering Inc. has not been retained by the property owner for the design for roads. Private access roadway design is not in the scope and is designed by others.

1.2 Purpose and Scope

The main purpose of this report is to outline a preferred stormwater management and construction mitigation strategy for the proposed subdivision to be implemented as the site is developed. However, preliminary assessments for private sewage system suitability and soils conditions have been included in support of the draft plan of subdivision as incorporated in SWM report Appendix E.

The recommendations and construction details outlined in this report can be used as a reference for the municipality as they review individual development plans for the 20 lots.

The following objectives have been identified in the preparation of this report:

- Assess impact on surface water quantity and quality as a result of the development and review potential impact on receiving water bodies.
- Determine if reduction of peak runoff flows through structural controls are required to control potential flooding downstream from the development.
- If required, identify suitable structural methods to reduce peak runoff flows and volumes from the site and incorporate these methods into the final engineering design drawings.
- Identify methods to control sedimentation and erosion during construction and in the long term.

- Identify required drainage systems to be implemented during construction to safely convey runoff to Bray Lake.

1.3 Reference Reports

The following Provincial guidelines and stormwater management practices have been used for reference in the preparation of this Preliminary Stormwater Management Plan:

- i) Stormwater Management Planning and Design Manual, March 2003 - Ministry of the Environment. Conservation and Parks.
- ii) Ministry of Transportation Highway Drainage Design Standards, January 2008.
- iii) Ministry of Transportation Drainage Management Manual, 1997.
- iv) CVC, LSRCA, and TRCA partnered Sustainable Technologies Evaluation Program, Low Impact Development Stormwater Management Planning and Design Manual, March 2022.
- v) Ministry of Northern Development, Mines, Natural Resources and Forestry Buffer Zone Guidelines, 1987.
- vi) Guidelines on Erosion and Sediment Control for Urban Drainage, RTAC, MTO, 1992.
- vii) Bray Lake Subdivision Draft Plan of Subdivision, KPK Surveying Inc., July 22, 2022.

2. EXISTING SITE CONDITIONS

2.1 Topography / Drainage

The topography of the site is hilly, with site elevations ranging between 404.5 m ASL in the central east portion of the site and 349.2 m ASL (Maximum) at the water's edge. The Maximum High-Water Mark is in accordance with the Ontario Power Generation, OPG, water management plan upper limit. The OPG Bray Lake water elevation observations and water management plan limits are shown in Appendix D. The field measured High-Water Mark is to be verified with final approval.

The site is heavily vegetated predominantly by deciduous forest in the highland areas, with areas of mixed forested growth on slopes and coniferous forest around the lower elevations and adjacent to wetlands.

The site has four elevation peaks that result in surface runoff on the property draining in all geographic directions with land slopes averaging 1.4%-15%. Ultimately, all surface runoff from the site is routed east, to Bray Lake via naturally occurring intermittent watercourses.

There is an existing well-defined intermittent watercourse within proposed Lot 5 and 6 in a southwest to east direction. This watercourse has been labelled *Watercourse 'A'*. A small wetland, labelled as *Wetland 'A'*, exists within proposed Lot 6. Wetland 'A' drains south to north through Watercourse 'A' to *Wetland 'B'*. Wetland 'B' drains west to east via Watercourse 'A' to flooded

lands of Bray Lake. These flooded lands are located northeast of the proposed subject lands and are the most northwest limit of Bray Lake.

There is an intermittent watercourse, labelled as *Watercourse 'B'*, draining part of proposed Lots 3, 4, 5, 9, 10, and 11 west to east towards Bray Lake. A small wetland, labelled as *Wetland 'E'* exists within proposed Lots 3 and 4. Wetland 'E' drains to Watercourse 'B' and discharges to Bray Lake.

There is an intermittent watercourse, labelled as *Watercourse 'C'*, draining part of proposed Lots 1, 2, 3, and 4 west to east towards abutting vacant land. A small wetland, labelled as *Wetland 'F'* exists within proposed Lot 2. Wetland 'F' drains to Watercourse 'C'. Runoff beyond the east property boundary will travel approximately 140 m down gradient, east, before reaching Bray Lake.

There is an intermittent watercourse just beyond the south subject property boundary labelled as *Watercourse 'D'*. Watercourse 'D' collects runoff from parts of proposed lots 1, 2, 3, and 4. A small wetland, labelled *Wetland 'G'*, drains north to south into another small wetland, labelled as *Wetland 'H'*. Wetland 'H' is considered part of Watercourse 'D' and drains west to east along Watercourse 'D' to a small wetland, labelled as *Wetland 'I'*. Wetland 'I' drains west to east across the south and east subject property boundaries. Runoff beyond the south and east property boundaries will travel approximately 450 m west to east through vacant land, down gradient along Watercourse 'D', prior to reaching Bray Lake.

There is a small wetland within proposed Lot 6, labelled as *Wetland 'D'*. Wetland 'D' has no defined watercourse draining the wetland. However, contours indicate that Wetland 'D' drains northwest to southeast to flooded lands of Bray Lake. These flooded lands are located northeast of the proposed subject lands and are the most northwest limit of Bray Lake.

Various other small wetlands exist throughout the subject lands. These small wetlands were considered in the hydrologic evaluation, however, were not labelled. These small wetlands exist within proposed Lots 2, 3, 4, 13, 14, 16, and 17.

Site topography and the location of noted watercourses and wetlands as identified above are illustrated on drawing SWM-1, found in Appendix B.

2.2 Site Geology

Based on a review of available soils mapping taken from the Ministry of Northern Development, Mines, Natural Resources and Forestry Surficial Geology of Southern Ontario Data mapping for the Bray Lake Area; the site location is identified as follows:

- The north, west, and east portion of the subject property is Type 2a, bedrock drift complex in Precambrian terrain, primarily till cover.
- The central portion of the subject property is Type 5a, silty sand to sand-textured till on Precambrian terrain.

- The southwest portion of the subject property is Type 9, coarse-textured glaciolacustrine deposits consisting of sand, gravel, minor silt and clay.

The hydrologic soil group, *HSG*, for the site was determined to be class B for all surficial geology types within the site. The HSG was determined using design chart 1.08 in the Ministry of Transportation, *MTO*, Drainage Management Manual Part 4, 1997. Design chart 1.08 classifies a B soil as shallow overlying sand, gravel, and loam. The Ministry of Agriculture, Foods, and Rural Affairs, *OMAFRA*, online interactive AgMaps was utilized to confirm a HSG of B. A copy of the surficial geology map soil information, *OMAFRA* AgMap, and Geotechnical Investigation Plan G-01 has been included in Appendix D of the report.

Invasive soil investigations were also carried out at the site to verify soils conditions and general depth of overburden. Soils conditions identified within the three test pits advanced were, sandy topsoil at ground surface for approximately 0.25 m depth. A well graded brown sand to silty sand with some gravel was observed below the topsoil. Cobble and boulders were observed in test pits. Shallow bedrock was encountered in the three test pits from 0.9 m to 1.2 m below ground surface. Soils were noted to be saturated. However, significant recharge of groundwater in the test pits was not observed; representing the absence of groundwater table. A visual inspection of the site verified shallow well-draining sand with some gravel over bedrock as the predominant condition. A hydrogeological assessment was completed for the site by others. However, a hydrogeological assessment is not part of this report.

For the purposes of the rational method peak runoff rate calculations to follow, an open sand loam was selected when determining rural land use runoff coefficients in design chart 1.07 of the *MTO* Drainage Management Manual, 1997 and weighted runoff coefficients, *C*, were calculated for the site development. Pre-development and post-development runoff coefficients were also weighed to consider the presence of woodlot, wetland, gravel roads, asphalt road, buildings, lawns, building envelopes, and septic filter bed envelopes. Tulloch soils investigation memo has been included in Appendix D.

2.3 Fish Habitat

Shoreline areas throughout the site and at the outfall of Watercourse 'A' and 'B' have been identified as Type 1, or sensitive spawning habitat. Fish habitat delineations were determined by Riverstone Environmental, as shown on the Draft Plan, appended.

Notwithstanding the identification of fish habitat in this area as "Type 1", it has generally good engineering practice to treat lakes and rivers as a sensitive receiving water body when selecting the appropriate quality control criteria for new development. Accordingly, an "Enhanced" level of protection is appropriate, and the quality control techniques selected as part of the overall SWM plan should reflect this.

3. HYDROLOGY

3.1 Rational Method Calculations

The Rational Method was used to estimate the peak runoff rates for the 5, 25, and 100-year return period storm events, as presented in Table 3 and 4 below. Rational Method calculations are appended with pre-development and post-development drainage areas demonstrated on Drawings No. D1 and D2 included in Appendix B.

3.2 Design Storms

As per section 3.5.1 recommendations of The Ministry of Environment, Conservation, and Parks, *MECP*, Stormwater Management Planning and Design Manual, 2003, post-development flows shall be attenuated to pre-development rates for storm events up to and including the 100-year storm event. In best practice, the 100-year flood is to be safely conveyed offsite with non-erosive properties. The online MTO Ontario IDF Lookup Tool was used to obtain rainfall data for all storm events up to and including the 100-year in proximity to the site.

The following design storms were selected as part of the evaluation:

- 5-year design storm
- 25-year design storm
- 100-year design storm

The selected stormwater management criteria are discussed further in Section 5.2 of this report.

3.3 Drainage Catchments

Six catchments have been delineated to calculate pre-development and post-development runoff rates leaving the site. The catchments generally represent their individual downstream outlets. The north portion of the property flows north toward Watercourse 'A'. The northeast portion of the property drains south and east to Bray Lake and north to abutting vacant land. Runoff across the north abutting vacant land drains down gradient approximately 120 m before reaching the flooded lands of Bray Lake. The three catchments throughout the central and east portion of the subject property flow east to Bray Lake either directly or via Watercourse 'B' or 'C'. The south portion of the property flows south to the abutting vacant land consisting of Watercourse 'D', ultimately draining east to vacant land and Bray Lake.

The main impact of the proposed development on local surface drainage patterns will be the introduction of impervious and near impervious areas (house roofs, driveways and gravel roadways generally) to an otherwise undisturbed site.

Catchment parameters are listed in Table 1 and 2. The catchment locations are identified on Drawing Sheets D1 and D2.

The hydrologic model parameters for the post-development condition have been selected to represent the maximum allowable development scope. The watershed characteristics such as slope, HSG, and runoff coefficients have been selected to provide a conservative estimate of peak runoff rates. The watershed characteristics utilized are found in the appended rational method design sheets. The entirety of all building envelope areas was modelled with a rural residential C value to account for maximum development within each lot. The maximum runoff coefficient of 0.6 from the MTO published range, 0.4-0.6, for proposed gravel roads and shoulders was used. Septic filter bed areas were considered an average to flat sloped lawn in sandy soils. All woodlot was modelled to be hilly in an open sand loam.

Table 1: Pre-Development Catchment Parameters

Pre-Development	Catchment Area (ha)	Runoff Coefficient (C)
101	55.18	0.18
102	11.85	0.17
103	26.94	0.18
104	28.92	0.16
105	15.48	0.18
106	23.11	0.17

Table 2: Post-Development Catchment Parameters

Post-development	Catchment Area (ha)	Runoff Coefficient (C)
201	55.18	0.18
202	11.85	0.17
203	26.79	0.20
204	29.16	0.17
205	15.40	0.20
206	23.12	0.17

4. PROPOSED DEVELOPMENT

4.1 General

The subject land lot configuration consists of six (6) larger back lots and fourteen (14) smaller waterfront lots. Smaller waterfront lot areas range between approximately 1.0 ha and 1.9 ha. The larger lot areas range between approximately 12 ha and 47 ha.

It is estimated that less than 10% of the overall area will be disturbed to facilitate the construction of hard surface areas such as building envelopes, driveways, and access roads and private sewage systems. All septic envelopes are subject to final approval with building permits and will require additional evaluation during the development of each individual lot.

It is expected that the proposed residential building envelopes will be constructed to fit into the natural topography of the land, and that minimal lot grading and tree removal will be required, except as part of the building envelope, septic envelope, and driveway areas. The hydrologic model for post-development conditions is based on rural residential building envelopes between 0.4 ha and 1.0 ha for the smaller waterfront lots, and 0.4 ha for the larger back lots. Although alternative filter bed locations are presented in Drawing SWM-1, a maximum of one private sewage filter bed per lot was considered in the post-development hydrologic analysis.

The proposed development layout and existing topography are identified on Drawing SWM-1 as appended.

4.2 Design Run-Off Peak Flow Rates

The results of the Rational Method peak runoff flow rate calculations for the pre and post-development conditions are presented in Table 3 and 4 below. Rational Method calculations are presented in Appendix A with pre and post-development drainage areas shown on Drawings No. D1 and D2 in Appendix B.

Table 3: Pre-Development Peak Flow Rate Over Property Boundaries (m³/s)

Drainage Area	Catchment Area (ha)	Return Period Storm (Years)	Pre-Development Flows
101	55.18	5	0.55 m ³ /s
		25	0.87 m ³ /s
		100	1.21 m ³ /s
102	11.85	5	0.34 m ³ /s
		25	0.52 m ³ /s
		100	0.71 m ³ /s
103	26.94	5	0.77 m ³ /s
		25	1.23 m ³ /s
		100	1.71 m ³ /s
104	28.92	5	0.36 m ³ /s
		25	0.54 m ³ /s
		100	0.75 m ³ /s

105	15.48	5	0.31 m ³ /s
		25	0.46 m ³ /s
		100	0.67 m ³ /s
106	23.11	5	0.36 m ³ /s
		25	0.58 m ³ /s
		100	0.80 m ³ /s

Table 4: Post-Development Peak Flow Rate Over Property Boundaries (m³/s)

Drainage Area	Catchment Area (ha)	Return Period Storm (Years)	Post-Development Flows	Diff. Pre/Post Flows	% Increase
201	55.18	5	0.55 m ³ /s	0.00 m ³ /s	0.00 %
		25	0.88 m ³ /s	0.01 m ³ /s	1.15 %
		100	1.22 m ³ /s	0.01 m ³ /s	0.83 %
202	11.85	5	0.34 m ³ /s	0.00 m ³ /s	0.00 %
		25	0.52 m ³ /s	0.00 m ³ /s	0.00 %
		100	0.71 m ³ /s	0.00 m ³ /s	0.00 %
203	26.79	5	0.86 m ³ /s	0.09 m ³ /s	16.88 %
		25	1.30 m ³ /s	0.07 m ³ /s	11.38 %
		100	1.90 m ³ /s	0.19 m ³ /s	11.11 %
204	29.16	5	0.38 m ³ /s	0.02 m ³ /s	5.55 %
		25	0.58 m ³ /s	0.04 m ³ /s	7.41 %
		100	0.80 m ³ /s	0.05 m ³ /s	6.67 %
205	15.37	5	0.34 m ³ /s	0.03 m ³ /s	9.68 %
		25	0.54 m ³ /s	0.08 m ³ /s	17.39 %
		100	0.74 m ³ /s	0.07 m ³ /s	10.45 %
206	23.11	5	0.37 m ³ /s	0.01 m ³ /s	2.78 %
		25	0.59 m ³ /s	0.01 m ³ /s	1.72 %
		100	0.81 m ³ /s	0.01 m ³ /s	1.25 %

Catchments 202 shows a 0.0% change in peak runoff from pre to post-development conditions. No changes are expected for Catchment 202, with land use remaining unchanged between pre and post-development.

Peak runoff rates from Catchments 201, 204 and 206 increase ≤ 10% from pre to post-development conditions. Catchments 201, 204, and 206 peak runoff rates increase by 0.0% -

1.15%, 5.55% - 7.41%, and 1.25% - 2.78% respectively from pre to post-development. Catchment 201 contains the largest catchment area. Catchment 201 encompasses part of Lots 5 and 6, part of the access road, and external lands to the southwest containing Riding Ranch Road. Catchment 201 conveys runoff along the Riding Ranch Road, however, ultimately discharges to Bray Lake via Watercourse 'A'. The alteration of land use within catchment 201 is minimal compared to the catchment size. Catchment 204 conveys part of the catchment runoff along Riding Ranch Road, however, ultimately discharges to Bray Lake via Watercourse 'B'. Catchment 206 drains the upper limit of the catchment along Riding Ranch Road. Ultimately discharging runoff to vacant lands beyond the northeast and southeast property boundaries via Watercourse 'D'. Although catchment 201, 204, and 206 convey runoff along Riding Ranch Road, the public right-of-way is located in the upper most limit of all three catchments. Aside from access roadway intersection and private entrances, no post-development alteration is anticipated to increase peak runoff within the right-of-way corridor. Peak runoff rate increases of $\leq 10.0\%$ from pre to post-development can be considered negligible. No flooding of adjacent Bray Lake, Watercourse 'D', and abutting northeast and southeast vacant lands under post-development conditions is anticipated.

Catchment 203 and 205 increase by 11.11% - 16.88% and 9.68% - 17.39% respectively from pre to post-development. Catchment 203 discharges to Bray Lake and flooded lands of Bray Lake between Watercourse 'A' and 'B'. Catchment 203 shows a increase in peak runoff rates due to approximately 22% of the catchment being developed. Catchment 205 discharges to Bray Lake and adjacent northeast vacant lands via Watercourse 'C'. The greatest increase from pre to post-development runoff in Catchment 203 is approximately 0.19 m³/s. The greatest increase from pre to post-development runoff in Catchment 205 is approximately 0.07 m³/s. Almost all the altered land in Catchment 205 will drain directly to Bray Lake from Lots 7, 8, and part of 9. The remainder of Catchment 205 will likely remain unchanged as drainage continues to Watercourse 'C'. Watercourse 'C' drains across northeast abutting vacant land, before reaching Bray Lake. It is not anticipated that the increase in peak runoff within Catchment 203 or 205 will flood adjacent lands or increase the Bray Lake water level significantly.

The total development site results in peak runoff rate increases of 5.7%, 4.7%, and 5.7% for the 5, 25, and 100- year storm events respectively. A total increase of $<10\%$ can be considered negligible. It is not anticipated that peak flow rate increases will impact the Bray Lake water level significantly or cause flooding on adjacent lands. All storm water runoff ultimately discharges to Bray Lake from the subject land boundaries within a maximum runoff route distance of 450m.

5. Preliminary Stormwater Management Plan

5.1 Objectives

The intent of Stormwater Management is to reduce the risk of impact from stormwater runoff on neighboring properties caused by the change in land use conditions. These specifically include

the risk of damage to property due to erosion, flooding and the possibility of impairing surface water quality as a result of construction, or by creating a more impervious watershed.

5.2 Design Criteria

The design criteria considered for the site has been derived from the following resources:

- Buffer Zone Guidelines, MNDMNR, 1987.
- Stormwater Management Planning and Design Manual, MECP, March 2003.
- Guidelines on Erosion and Sediment Control for Urban Drainage, RTAC, MTO., 1992.
- Highway Drainage Design Standards, MTO, January 2008.
- Drainage Management Manual, MTO, 1997.
- CVC, LSRCA, and TRCA partnered Sustainable Technologies Evaluation Program, Low Impact Development Stormwater Management Planning and Design Manual, March 2022.

A. Quantity Controls

- Minor system entrance culvert designs to accommodate 5-year return interval storm.
- Rural road cross-culverts to accommodate 25-year return interval storm.
- Major system ditch and easement swale design to accommodate all runoff with consideration of flooding.
- Attenuation of post-development peak flows to pre-development levels for all storm events including the 100-year return storm where warranted.
- Evaluation of peak run-off rates for post-development flows compared to pre-development flows for the 2 to 100-year return period storm events using Ontario IDF Curve Lookup for rainfall data.
- Roadside ditches designed to convey the 100-year major storm event.
- Scour protection for up to the 100-year storm event runoff velocities.

B. Quality Controls

- The Buffer Zone guidelines, MNDMNR, 1987 requires rural developments such as this to provide 30m natural buffer for quality concerns.
- 23 m building setback from shoreline and 15 m vegetated natural shoreline buffer determined by Riverstone Environmental, as shown on the Draft Plan, 2022.
- Minimum stormwater quality measures are to be in accordance with the MECP SWM Planning and Design Manual, 2003. Permanent system design should address control parameters as outlined in Table 3.2, Water Quality Storage Requirements based on Receiving Waters. The ultimate receiving outlet of site drainage is Bray Lake, at least 30 m down gradient of proposed altered land. Accordingly, the receiving watercourse should be considered "sensitive", and an enhanced level of quality control, 80% long-term suspended solids removal, should be applied.
- A quality control solution should be designed considering both construction mitigation measures and permanent system design.

5.3 Roadworks and Ditching

Private roadway access will be provided via one (1) new proposed 15 m wide private right-of-way from Riding Ranch Road that branches into three (3) new 15 m wide private rights-of-way. The private roadways are proposed with a 6.0 m minimum travelled width with 1.0 m shoulders. The road will be surfaced with gravel, although it is recommended that in areas where gradients exceed 5.0%, a double high float surface treatment or asphalt be placed to prevent erosion. A typical cross section is shown on Drawing Sheet SWM-2.

Conveyance structures including culverts and drainage ditches will need to be provided to intercept overland flow along the private access roads and direct drainage to existing watercourses. The private road surfaces will be constructed with a crown to direct drainage to sideline ditches.

In order to size the culverts and ditches along the access roads, the largest contributing drainage area (internal and external) was delineated using available contour mapping. The drainage areas are illustrated on Drawing D2. Post-development 200-series catchment peak flow rates were used in culvert and ditch sizing. 100-year design flows were used to size the roadside ditches. 25-year design flows were used to size cross culverts beneath the private roadways. 5-year design flows were considered for entrance culvert capacity.

Where grades are 5% or less, the ditch surface should be stabilized with a vegetation cover. Where grades exceed 5%, ditches will require a rip-rap lining consisting of 150 mm diameter stone with geotextile beneath. The rip-rap should extend a minimum 300 mm above the ditch invert along the side slope. Typical details for the erosion and sediment control measures required at the outfall of the roadside ditches to existing watercourses are included on Drawing SWM-1 and SWM-2 included in Appendix B.

Grading of the individual lots should not block existing overland flow paths to Bray Lake. 600 mm and 450 mm diameter cross culverts have been sized to convey runoff collected by the access road ditches. The proposed 600 mm diameter cross culvert at the intersections of the proposed private access roadway and Riding Ranch Road is to be installed with a minimum gradient of 2.0%. The remaining proposed 600 mm and 450 mm diameter cross culverts within the access roadways are to be installed with a minimum gradient of 4.0%. Entrance culverts to Lots 7, 16, and 19 are to be 450 mm diameter with minimum gradient of 0.5%. Entrance culverts within Catchments 201 and 203 are to have minimum gradients of 3.5% and 4.0% respectively. Entrance culverts within Catchments 204, 205, and 206 are to have minimum gradients of 2.0%.

A Preliminary Culvert Design Sheet of all crossing and entrance culverts is provided in Appendix C.

5.4 Vegetative Buffers

The shoreline along Bray Lake is characterized by sensitive shoreline, with mixed forest backlot. As a condition of development, the integrity of the shoreline vegetation units should be required to be maintained. According to the Ministry of Environment Storm Water Management Planning and Design Manual, 2003, wetland type vegetation enhances water quality by filtering stormwater and binding soils to prevent erosion.

The designation of a thirty (30) m natural “buffer zone” between the moose aquatic feeding area, wetlands, and watercourses and proposed disturbed areas is recommended. The designation of a fifteen (15) m natural vegetated buffer and twenty-three (23) m building setback from shoreline is also recommended. Setbacks from aquatic features and shoreline were determined by Riverstone Environmental as shown on the Draft Plan. The establishment of a designated buffer zone would not preclude allowing minor incursion for the establishment of water access and construction of docks. The proponents of individual building permit applications should be required to delineate the extent of vegetation removal proposed, and any remedial measures required, as part of the application.

5.5 Stormwater Quantity

As outlined in section 3.5.1 the MECP Stormwater Management Practices Planning and Design Manual, 2003, limiting post-development peak runoff flow rates to pre-development rates is generally accepted criteria where stormwater runoff may adversely affect adjacent property's. However, since the proposed development discharges runoff to Bray Lake it is not anticipated that the runoff flow rate increases assessed for this development will have any significant or measurable impact on the subject property's Internal wetlands or the corresponding Bray Lake water level that may otherwise cause flooding to adjacent property's.

Under post-development conditions drainage patterns within Catchments 203, and part of 202 and 205, will continue to sheet drain to the Bray Lake shoreline as in pre-development conditions. Part of post-development catchments 202 and 205 will sheet drain to the abutting north and east vacant land properties, respectively. Post-development Catchment 201, 204, 206, and part of 205 will continue to channel flow to the Bray Lake Shoreline as in pre-development conditions. Under post-development conditions the drainage patterns will be partially altered in Catchments 201, 203, 204, and 205 with the introduction of roadway ditches. However, the overall topography within the drainage area and drainage outlet will remain unchanged to that of pre-development. It is also expected that the existing drainage course crossings proposed at Lots 4 and 10 will remain unaltered under post-development conditions.

In reviewing the potential for flooding on the proposed lots, it has been resolved that internal flooding should not be a concern. Proposed building envelopes as demonstrated on Drawing SWM 1 having frontage on Bray Lake will have a natural land slope to the shoreline varying in relief from 1.5 m to 10.9 m of elevation above the noted high-water elevation. Building envelopes

of the larger Lots 1-6 were assumed to be 0.4 ha and having more than 1.5m of relief above the wetland water levels.

Runoff from the house roof drains are to outlet to grade at the building corners with drainage directed away from the building.

All driveways will require pipe culverts within the ditch line, with a minimum diameter of 450 mm, as per Tulloch's culvert sizing review included in Appendix C.

Based on peak runoff flow calculations for development of the proposed subdivision, increases in runoff rates will be experienced in all cases. However, it is not expected that the runoff rate increases will cause flooding or adversely impact adjacent lands, watercourses or the receiving water body with proper attention given to erosion protection. Attenuation of post-development peak flows to pre-development levels have been considered unwarranted for the proposed development for the following reasons:

- Provided the maximum building coverage allowed by the residential zoning, the low density of the proposed development results in marginal runoff flow increases in all storm event cases. The runoff increase can be considered marginal given that flooding of adjacent residential properties within the affected Bray Lake drainage catchments is not anticipated. The storage capacity of Bray Lake and the Bray Lake OPG outlet control dam will result in insignificant downstream runoff increase. Natural attenuation of runoff within the site, such as through wetlands, has not been modelled. Coupling the Bray Lake storage capacity, outlet dam control, and on-site natural attenuation, downstream post-development peak runoff rates are expected to be less than has been modelled with this review.
- Due in part to the considerable change in topographic relief above lake level along the Bray Lake shoreline that provides well defined watercourses routing the overland flows to the lake. This, coupled with the natural attenuation expected to occur within the localized perched wetland areas that have not been modelled with this peak flow review.
- The proposed lot configuration is such that drainage from the building envelopes demonstrated on each lot will maintain existing drainage patterns introducing lot line drainage swales where necessary to direct runoff away from adjacent lot's building envelope and towards the proposed 15 m vegetated natural shoreline buffer or 30 m vegetated buffer from wetlands and watercourses.
- Naturally occurring site vegetation and localized surface depressions or undulations in the terrain will provide partial conveyance control of peak run-off flows in addition to filtering runoff before it reaches the local watercourse and/or lake shoreline. These naturally occurring conveyance controls are not reflected in the peak flow rate calculations that will act to further reduce flow rates.
- Through the introduction of roadside ditch outlets that will safely convey surface runoff from the proposed private roadway rights-of-way to the site's natural drainage courses. It is proposed to provide the necessary erosion protection within the ditches using rip-rap lining where grades are greater than 5% and rock flow check dams that will slow run-off and help to maintain existing flow patterns.

- Infiltration of surface water should be encouraged within the proposed development through the use of pervious landscaping within the building envelope and by leaving as much as possible of the existing lands undisturbed.

The proposed storm water management plan for this development therefore includes the following components:

- Maintaining existing natural drainage paths.
- Placement of proposed development building envelopes outside of the natural drainage paths.
- The installation of appropriate drainage ditching and conveyance structures (culverts) in the development areas to safely convey drainage through the site to the lake.
- Protecting the roadway surface from erosion where surface slopes exceed 5%.
- Maintaining existing vegetated buffers between the proposed development area and the water body.
- Ensure the protection of existing watercourses through the implementation of proper erosion and sediment control techniques at the roadway culverts and ditch outfalls.
- Protection against erosion as a result of site development.
- Installation of appropriate construction mitigation measures to protect against erosion and sediment migration during the construction period.

5.6 Stormwater Quality

Shoreline areas throughout the site and at the outfall of Watercourse 'A' and 'B' have been identified as Type 1, or sensitive spawning habitat.

Existing Watercourse 'A' crossing the proposed Lots 5 and 6 is seasonally intermittent and has not been identified as being sensitive in nature, such as being a creek with base flow.

The Ministry of Natural Resources and Forestry have not identified the existing wetlands 'A' through 'I' as being provincially significant.

An "enhanced" level of protection has been considered as appropriate for the receiving waters of Bray Lake and the quality control practices selected as part of the overall SWM plan are to reflect this.

A natural vegetated buffer of 15 m in width has been proposed along the Bray Lake shoreline for quality protection, determined by Riverstone Environmental as shown on the Draft Plan. A 30 m vegetated buffer has been proposed along specified wetlands, moose aquatic feeding areas, and watercourses within the site, in keeping with the Ministry of Natural Resources Buffer Zone guidelines, 1987. House construction will be limited to having a minimum shoreline setback of 23 m, determined by Riverstone Environmental as shown on the Draft Plan.

In as much as the proposed development is rural in nature, maintaining large, vegetated buffers between the more impervious houses, laneways and roadway will provide permanent runoff

quality control. 86% of the site's drainage flows toward Bray Lake, catchment areas 201, 202, 203, 204, and 205. The remainder of the site drains south and east to the existing Watercourse 'D' within the south and east abutting vacant land property. The naturally occurring vegetated buffers and wetlands will serve to filter stormwater runoff, controlling sediment migration on a permanent basis. Internal roadside ditches are to be grass lined with gradients of less than 5% and rip-rap lined with gradients of more than 5% to provide permanent erosion and sediment control. Enhanced grass swales where possible within building envelope areas will provide water quality treatment through conveyance control.

Additionally, sediment control and erosion protection can be provided for roadside ditch flows within the private roadway ditches by attenuating peak ditch flows during the 2-year, common erosion event, and greater. The physical constraints for enhanced infiltration-based quality control grass swales and ditches according to Table 4.1 in The MECP Stormwater Management Planning and Design Manual, 2003, are as follows:

- Topography slope must be less than 5%.
- Catchment area requiring treatment must be less than 2 ha.

Rock flow check dams are to be installed at the down gradient limit of each proposed roadside ditch to provide runoff attenuation, improved infiltration and suspended solids settling. Rock flow check dam calculations are provided in Appendix C assessing the required storage volumes. Table 5 shows all catchment areas requiring treatment are less than 2 ha. The rock flow check dams are to be constructed in a 0.7 m depth ditch with 1 m flat bottom width. The specified flat bottom ditch with 2:1 (H:V) side slopes are to continue at least 20 m upstream of all rock flow check dams at less than 1%. Locations of rock flow check dams are shown on the Preliminary Stormwater Management, Private Sewage Assessment, and Construction Mitigation Plan – SWM-1. Detail cross sections of the proposed 1.0 bottom width infiltration ditch and rock flow check dams are shown on Notes and Details Drawing – SWM-2. The flat bottom ditch allows for greater runoff storage, attenuating peak flows, and improved infiltration. Ditches and rock flow check dams can provide the required storage volume for quality treatment of sediment. Rock flow check dams within the proposed quality control ditch lengths identified on SWM-1 have been designed with a 0.20 m ponding depth. Rock flow check dams are to be installed in accordance with Ontario Provincial Standard Drawing 219.211.

Table 3.2 in the MECP Stormwater Management Planning and Design Manual, 2003, requires a water quality storage volume, *WQV*, of 30.7 m³/ha for *enhanced* 80% long-term suspended solids removal of a 57% impervious catchment. Table 5 outlines the required *WQV* for each treated catchment. Most catchments require one (1) to three (3) rock flow check dams located within the specified ditch length to provide the required *WQV*. All catchments requiring sediment treatment are designed with a minimum of two (2) infiltration based quality control ditches per catchment, one (1) per each roadside ditch, exceeding the required *WQV*. All catchments have been designed with quality control ditches that exceed the required *WQV*. Infiltration based quality control ditch (Enhanced Swale) calculations have been included in Appendix C.

Delineated catchments requiring treatment can be found on drawing D2 in Appendix B.

Table 5: Water Quality Storage Requirement Based on Receiving Waters (m³)

Catchment ID	Area, Ha	Required Water Quality Storage Volume (WQV), m ³	0.2 m Depth Storage Volume at One (1) Rock Flow Check Dam with Upstream Slope of 1%, m ³	Number of Check Dams Required	Number of Check Dams Designed	Total Volume of Designed Number of Check Dams, m ³
301	0.31	9.51	2.842	4	4	11.37
302	0.25	7.67	2.842	3	4	11.37
303	0.10	3.07	2.842	2	2	5.68
304	0.15	4.60	2.842	2	2	5.68
305	0.06	1.84	2.842	1	2	5.68
306	0.10	3.07	2.842	2	2	5.68
307	0.40	12.27	2.842	5	6	17.05
308	0.28	8.59	2.842	4	4	11.37
309	0.05	1.53	2.842	1	2	5.68
310	0.05	1.53	2.842	1	2	5.68
311	0.19	5.83	2.842	3	4	11.37
312	0.77	23.62	2.842	9	10	28.42
313	0.25	7.67	2.842	3	4	11.37

6. SEDIMENT CONTROL AND CONSTRUCTION MITIGATION

6.1 General

In order to protect the downstream water body from sediment carried by storm runoff during construction, it is recommended that silt fence as per Ontario Provincial Standard Drawing 219.130 and straw bale check dams as per Ontario Provincial Standard Drawing 219.180 should be employed, at a minimum in the locations shown on the Preliminary Stormwater Management, Private Sewage System Assessment and Construction Mitigation Plan – SWM-1 in Appendix B. Such measures should be in place prior to the commencement of construction and be maintained until all open soils are stabilized. In order to assure proper operation of the silt fence and straw bale check dams during construction it is suggested that regular maintenance be carried for the duration of construction until the site is stabilized on completion of construction.

The storm drainage areas are heavily wooded throughout. The subdivision development will have little effect on the present drainage characteristics of the area. Migration of sediments due to the development of the site is expected to be minimal.

Generally, silt fence should be installed at the toe of all fill slopes and along the roadside / driveway ditches. Staked straw bales should be provided along the length of roadside and driveway ditches at intervals of no more than 50 m.

Rip-rap end treatments in accordance with OPSD 810.010 are recommended at the inlet and outlet of roadside culverts to prevent erosion and the “stirring” of particulate matter in these locations.

Where the roadside ditches discharge to existing watercourses, settling areas should be constructed in addition to straw bale flow checks being placed.

Stripped or stockpiled earth material should be located a minimum of 30 m away from natural drainage paths and always be placed up-gradient of the siltation controls. In addition, the stockpiles should be located a minimum of 30 m away from the top of any existing embankment.

It is recommended that as a condition of building permit issuance, the Township require proponents to provide individual lot grading and construction mitigation plans suited to the proposed lot development plan.

The location of areas deemed to be susceptible to erosion, as well as recommended erosion protection measures are shown on Drawing SWM-1 in Appendix B.

6.2 Monitoring and Maintenance

It is the responsibility of the contractor and owner to maintain construction mitigation / siltation control devices until suitable vegetation cover has been established and / or the site has been stabilized from erosion.

A regular review of the facilities by the contractor and/or owner shall be carried out during the construction period to ensure that the facilities are being properly maintained, and if necessary, replaced.

The construction mitigation / siltation devices should be inspected immediately after each significant rainfall event. Damaged devices should be repaired immediately, and additional devices installed, if necessary, in order to maintain affective mitigation controls.

Silt should be removed from the fencing and straw bale dams when deposits reach approximately 250 mm above original ground.

In the event that the proposed works cannot be completed within one construction season or adequate vegetation has not been established prior to winter freeze up, a review of the site by

the engineer and contractor should be carried out as part of the owner's responsibility to assess potential problem erosion areas that might occur during the spring thaw or at times of heavy surface run-off.

6.3 Contingency Plan

Should the erosion control measures fail, and sediment migrate beyond the limits of the control works, the following tasks should be carried out.

- The Township of Machar should be notified of the event. The area will be assessed and cleaned up to the satisfaction of the Township.
- Additional sedimentation facilities should be installed in the area of the migration and down gradient to contain the sediment.
- The Department of Fisheries and Oceans should be contacted in the event that sediment reaches the receiving lake or any fish habitat in the lower reaches of the on-site watercourses.

7. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions are based on the information and analysis presented in this report:

- The comparison of pre-development and post-development flows indicate marginal increases in peak flow rates as a result of the proposed development.
- It is not anticipated that flooding of adjacent lands will result due to increases in run-off rates from this development.
- A 15 m vegetated natural buffer and 23 m building setback be established to ensure the integrity of the existing Bray Lake shoreline, which will serve to naturally attenuate and filter storm runoff and reduce the potential of shoreline erosion.
- Stormwater management requirements for the site can be addressed by safely conveying drainage from the development area through the property to the natural waterbodies.
- Suitable drainage facilities can be installed to convey drainage to the lake and protect against surface erosion and quality impairment of runoff.
- A suitable construction mitigation plan can be implemented for the site to protect Bray Lake and adjacent lands from sediment migration.

It is recommended that:

- This report and drawings be submitted to the Township of Machar for review and approval.
- The conveyance systems specified in this report be implemented in order to ensure that post-development drainage is directed to Bray Lake without impact.
- The construction mitigation measures outlined in this report be implemented and a monitoring program be conducted until such time as the site development is complete.
- The Township require a detailed grading and construction mitigation plan be submitted in support of each building permit application. These plans should identify and provide



sizing for conveyance structures (culverts) on private property, demonstrate that the proposed lot development does not impact overland drainage routes, and illustrate the site-specific erosion and sediment control measures to be implemented.

All of which is respectfully submitted,

TULLOCH Engineering Inc.



APPENDIX A

MTO Intensity-Duration-Frequency Data Rational Method Calculations

Active coordinate

45° 54' 15" N, 79° 29' 45" W (45.904167,-79.495833)

Retrieved: Wed, 19 Jan 2022 02:42:35 GMT



Location summary

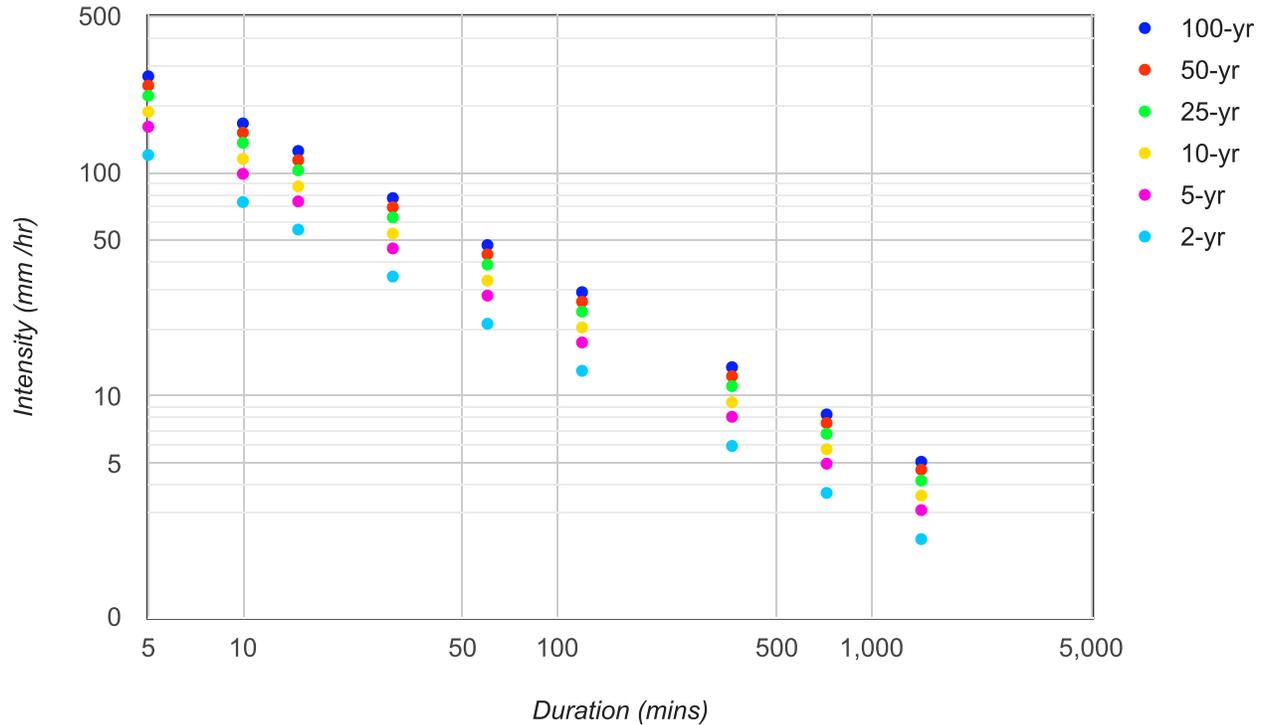
These are the locations in the selection.

IDF Curve: 45° 54' 15" N, 79° 29' 45" W (45.904167,-79.495833)

Results

An IDF curve was found.

Coordinate: 45.904167, -79.495833
IDF curve year: 2010



Coefficient summary

IDF Curve: 45° 54' 15" N, 79° 29' 45" W (45.904167,-79.495833)

Retrieved: Wed, 19 Jan 2022 02:42:35 GMT

Data year: 2010

IDF curve year: 2010

Return period	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
A	21.1	28.2	32.9	38.8	43.1	47.4
B	-0.699	-0.699	-0.699	-0.699	-0.699	-0.699

Statistics**Rainfall intensity (mm hr⁻¹)**

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	119.8	73.8	55.6	34.3	21.1	13.0	6.0	3.7	2.3
5-yr	160.2	98.7	74.3	45.8	28.2	17.4	8.1	5.0	3.1
10-yr	186.9	115.1	86.7	53.4	32.9	20.3	9.4	5.8	3.6
25-yr	220.4	135.8	102.3	63.0	38.8	23.9	11.1	6.8	4.2
50-yr	244.8	150.8	113.6	70.0	43.1	26.5	12.3	7.6	4.7
100-yr	269.2	165.8	124.9	76.9	47.4	29.2	13.5	8.3	5.1

Rainfall depth (mm)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	10.0	12.3	13.9	17.1	21.1	26.0	36.2	44.6	54.9
5-yr	13.3	16.4	18.6	22.9	28.2	34.7	48.4	59.6	73.4
10-yr	15.6	19.2	21.7	26.7	32.9	40.5	56.4	69.5	85.6
25-yr	18.4	22.6	25.6	31.5	38.8	47.8	66.5	82.0	101.0
50-yr	20.4	25.1	28.4	35.0	43.1	53.1	73.9	91.1	112.2
100-yr	22.4	27.6	31.2	38.5	47.4	58.4	81.3	100.1	123.4

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Last Modified: September 2016



Project: Bray Lake Subdivision SWM
File No: 21-1851
Subject: Catchment 101

Date: 04-Aug-22
Designed: BB
Checked: TM/CS

Rational Method for Calculating Peak Flows

<u>Airport Formula</u>	<u>Bransby-Williams Formula</u>	<u>Peak Flow Calculation</u>
$t_c = \frac{3.26 * (1.1 - C) * L^{0.5}}{S_w^{0.33}}$ <p>where: t_c = time of concentration C = runoff coefficient L = watershed length (m) S_w = watershed slope (%)</p> <p>source: MTO Drainage Manual 8.16</p>	$t_c = \frac{0.057 * L}{S_w^{0.2} * A^{0.1}}$ <p>where: t_c = time of concentration L = watershed length (m) S_w = watershed slope (%) A = watershed area (ha)</p> <p>source: MTO Drainage Manual 8.15</p>	$Q = 0.00278 * C * i * A$ <p>where: Q = peak flow (m³/s) C = runoff coefficient i = rainfall intensity (mm/h) A = watershed area (ha)</p> <p>source: MTO Drainage Manual 8.19</p>

Watershed Characteristics

Watershed Length, L (m) = 1683.00 Watershed Fall (m) = 17.94 Watershed Slope, S_w = 1.42%

<u>Area Number</u>	<u>Area (ha)</u>	<u>Runoff Coefficient</u>	<u>Description</u>
1	44.54	0.18	Woodland Hilly (Sandy Loam)
2	8.79	0.05	Lakes/Wetlands
3	0.12	0.60	Gravel Roadway
4	1.73	0.88	Impervious Roadway
from ACAD Drawing		Design Chart 1.07	Design Chart 1.07

Watershed Calculations

<u>Total Area</u>	<u>Weighted Runoff Coefficient</u>	<u>Time of Concentration Formula</u>
$A_{total} = A_1 + A_2 + A_3$ <p>= 55.18</p>	$C_w = \frac{A_1 * C_1 + A_2 * C_2 + A_3 * C_3}{A_{total}}$ <p>= 0.18</p>	<p>If $C_w < 0.4$ - use Airport Formula If $C_w \geq 0.4$ - use Bransby-Williams Formula</p>
source: MTO Drainage Manual		source: MTO Drainage Manual

Design Chart 1.06

Peak Flow Calculations

<u>Storm Frequency</u>	<u>Adjusted Runoff Coefficient</u>	<u>T_c Formula</u>	<u>T_c (min)</u>	<u>i, Intensity (mm/h)</u>	<u>Q, Peak Flow</u>
2	0.18	Airport	109.33	14.62	0.41 m ³ /s
5	0.18	Airport	109.33	19.56	0.55 m ³ /s
10	0.18	Airport	109.33	22.82	0.64 m ³ /s
25	0.20	Airport	107.16	28.37	0.87 m ³ /s
50	0.22	Airport	104.99	31.48	1.05 m ³ /s
100	0.23	Airport	103.91	34.66	1.21 m ³ /s



Project: Bray Lake Subdivision SWM
File No: 21-1851
Subject: Catchment 102

Date: 04-Aug-22
Designed: BB
Checked: TM/CS

Rational Method for Calculating Peak Flows

<u>Airport Formula</u>	<u>Bransby-Williams Formula</u>	<u>Peak Flow Calculation</u>
$t_c = \frac{3.26 * (1.1 - C) * L^{0.5}}{S_w^{0.33}}$ <p>where: t_c = time of concentration C = runoff coefficient L = watershed length (m) S_w = watershed slope (%)</p> <p>source: MTO Drainage Manual 8.16</p>	$t_c = \frac{0.057 * L}{S_w^{0.2} * A^{0.1}}$ <p>where: t_c = time of concentration L = watershed length (m) S_w = watershed slope (%) A = watershed area (ha)</p> <p>source: MTO Drainage Manual 8.15</p>	$Q = 0.00278 * C * i * A$ <p>where: Q = peak flow (m^3/s) C = runoff coefficient i = rainfall intensity (mm/h) A = watershed area (ha)</p> <p>source: MTO Drainage Manual 8.19</p>

Watershed Characteristics

Watershed Length, L (m) = 365.00 Watershed Fall (m) = 40.61 Watershed Slope, S_w = 14.83%

<u>Area Number</u>	<u>Area (ha)</u>	<u>Runoff Coefficient</u>	<u>Description</u>
1	11.12	0.18	Woodland Hilly (Sandy Loam)
2	0.73	0.05	Lakes/Wetlands
	from ACAD Drawing	Design Chart 1.07	Design Chart 1.07

Watershed Calculations

<u>Total Area</u>	<u>Weighted Runoff Coefficient</u>	<u>Time of Concentration Formula</u>
$A_{total} = A_1 + A_2 + A_3$ $= 11.85$	$C_w = \frac{A_1 * C_1 + A_2 * C_2 + A_3 * C_3}{A_{total}}$ $= 0.17$	<p>If $C_w < 0.4$ - use Airport Formula If $C_w \geq 0.4$ - use Bransby-Williams Formula</p> <p>source: MTO Drainage Manual</p>

Peak Flow Calculations

<u>Storm Frequency</u>	<u>Adjusted Runoff Coefficient</u>	<u>T_c Formula</u>	<u>T_c (min)</u>	<u>i, Intensity (mm/h)</u>	<u>Q, Peak Flow</u>
2	0.17	Airport	23.74	44.95	0.25 m^3/s
5	0.17	Airport	23.74	60.05	0.34 m^3/s
10	0.17	Airport	23.74	70.05	0.40 m^3/s
25	0.19	Airport	23.30	82.65	0.52 m^3/s
50	0.21	Airport	22.86	91.80	0.62 m^3/s
100	0.21	Airport	22.64	100.90	0.71 m^3/s



Project: Bray Lake Subdivision SWM
File No: 21-1851
Subject: Catchment 103

Date: 04-Aug-22
Designed: BB
Checked: TM/CS

Rational Method for Calculating Peak Flows

<u>Airport Formula</u>	<u>Bransby-Williams Formula</u>	<u>Peak Flow Calculation</u>
$t_c = \frac{3.26 * (1.1 - C) * L^{0.5}}{S_w^{0.33}}$ <p>where: t_c = time of concentration C = runoff coefficient L = watershed length (m) S_w = watershed slope (%)</p> <p>source: MTO Drainage Manual 8.16</p>	$t_c = \frac{0.057 * L}{S_w^{0.2} * A^{0.1}}$ <p>where: t_c = time of concentration L = watershed length (m) S_w = watershed slope (%) A = watershed area (ha)</p> <p>source: MTO Drainage Manual 8.15</p>	$Q = 0.00278 * C * i * A$ <p>where: Q = peak flow (m^3/s) C = runoff coefficient i = rainfall intensity (mm/h) A = watershed area (ha)</p> <p>source: MTO Drainage Manual 8.19</p>

Watershed Characteristics

Watershed Length, L (m) = 389.00 Watershed Fall (m) = 42.96 Watershed Slope, S_w = 14.72%

<u>Area Number</u>	<u>Area (ha)</u>	<u>Runoff Coefficient</u>	<u>Description</u>
1	26.53	0.18	Woodland Hilly (Sandy Loam)
2	0.18	0.05	Lakes/Wetlands
3	0.05	0.83	Building/Roof
4	0.15	0.18	Steep Lawn (Sandy Loam)
5	0.03	0.60	Gravel Roadway
	from ACAD Drawing	Design Chart 1.07	Design Chart 1.07

Watershed Calculations

<u>Total Area</u>	<u>Weighted Runoff Coefficient</u>	<u>Time of Concentration Formula</u>
$A_{total} = A_1 + A_2 + A_3$ <p>= 26.94</p>	$C_w = \frac{A_1 * C_1 + A_2 * C_2 + A_3 * C_3}{A_{total}}$ <p>= 0.18</p>	<p>If $C_w < 0.4$ - use Airport Formula If $C_w \geq 0.4$ - use Bransby-Williams Formula</p>
	source: MTO Drainage Manual	source: MTO Drainage Manual

Peak Flow Calculations

<u>Storm Frequency</u>	<u>Adjusted Runoff Coefficient</u>	<u>T_c Formula</u>	<u>T_c (min)</u>	<u>i, Intensity (mm/h)</u>	<u>Q, Peak Flow</u>
2	0.18	Airport	24.33	42.82	0.58 m^3/s
5	0.18	Airport	24.33	57.20	0.77 m^3/s
10	0.18	Airport	24.33	66.72	0.90 m^3/s
25	0.20	Airport	23.85	82.65	1.23 m^3/s
50	0.22	Airport	23.37	91.80	1.49 m^3/s
100	0.23	Airport	23.13	100.90	1.71 m^3/s



Project: Bray Lake Subdivision SWM
File No: 21-1851
Subject: Catchment 104

Date: 04-Aug-22
Designed: BB
Checked: TM/CS

Rational Method for Calculating Peak Flows

Airport Formula

$$t_c = \frac{3.26 * (1.1 - C) * L^{0.5}}{S_w^{0.33}}$$

where: t_c = time of concentration
 C = runoff coefficient
 L = watershed length (m)
 S_w = watershed slope (%)

source: MTO Drainage Manual 8.16

Bransby-Williams Formula

$$t_c = \frac{0.057 * L}{S_w^{0.2} * A^{0.1}}$$

where: t_c = time of concentration
 L = watershed length (m)
 S_w = watershed slope (%)
 A = watershed area (ha)

source: MTO Drainage Manual 8.15

Peak Flow Calculation

$$Q = 0.00278 * C * i * A$$

where: Q = peak flow (m³/s)
 C = runoff coefficient
 i = rainfall intensity (mm/h)
 A = watershed area (ha)

source: MTO Drainage Manual 8.19

Watershed Characteristics

Watershed Length, L (m) = 1090.00 Watershed Fall (m) = 22.71 Watershed Slope, S_w = 2.78%

Area Number	Area (ha)	Runoff Coefficient	Description
1	23.14	0.18	Woodland Hilly (Sandy Loam)
2	5.24	0.05	Lakes/Wetlands
3	0.09	0.18	Steep Lawn (Sandy Loam)
4	0.16	0.88	Asphalt Roadway
5	0.29	0.60	Gravel Roadway
from ACAD Drawing		Design Chart 1.07	Design Chart 1.07

Watershed Calculations

Total Area	Weighted Runoff Coefficient	Time of Concentration Formula
$A_{total} = A_1 + A_2 + A_3$	$C_w = \frac{A_1 * C_1 + A_2 * C_2 + A_3 * C_3}{A_{total}}$	If $C_w < 0.4$ - use Airport Formula If $C_w \geq 0.4$ - use Bransby-Williams Formula
= 28.92	= 0.16	
source: MTO Drainage Manual		source: MTO Drainage Manual

Peak Flow Calculations

Storm Frequency	Adjusted Runoff Coefficient	T_c Formula	T_c (min)	i , Intensity (mm/h)	Q , Peak Flow
2	0.16	Airport	71.87	20.29	0.27 m ³ /s
5	0.16	Airport	71.87	27.12	0.36 m ³ /s
10	0.16	Airport	71.87	31.64	0.42 m ³ /s
25	0.18	Airport	70.61	37.31	0.54 m ³ /s
50	0.20	Airport	69.34	41.44	0.66 m ³ /s
100	0.21	Airport	68.71	45.58	0.75 m ³ /s



Project: Bray Lake Subdivision SWM
File No: 21-1851
Subject: Catchment 105

Date: 04-Aug-22
Designed: BB
Checked: TM/CS

Rational Method for Calculating Peak Flows

Airport Formula

$$t_c = \frac{3.26 * (1.1 - C) * L^{0.5}}{S_w^{0.33}}$$

where: t_c = time of concentration
 C = runoff coefficient
 L = watershed length (m)
 S_w = watershed slope (%)

source: MTO Drainage Manual 8.16

Bransby-Williams Formula

$$t_c = \frac{0.057 * L}{S_w^{0.2} * A^{0.1}}$$

where: t_c = time of concentration
 L = watershed length (m)
 S_w = watershed slope (%)
 A = watershed area (ha)

source: MTO Drainage Manual 8.15

Peak Flow Calculation

$$Q = 0.00278 * C * i * A$$

where: Q = peak flow (m^3/s)
 C = runoff coefficient
 i = rainfall intensity (mm/h)
 A = watershed area (ha)

source: MTO Drainage Manual 8.19

Watershed Characteristics

Watershed Length, L (m) = 516.00 Watershed Fall (m) = 19.36 Watershed Slope, S_w = 5.00%

<u>Area Number</u>	<u>Area (ha)</u>	<u>Runoff Coefficient</u>	<u>Description</u>
1	14.99	0.18	Woodland Hilly (Sandy Loam)
2	0.49	0.05	Lakes/Wetlands
	from ACAD Drawing	Design Chart 1.07	Design Chart 1.07

Watershed Calculations

<u>Total Area</u>	<u>Weighted Runoff Coefficient</u>	<u>Time of Concentration Formula</u>
$A_{total} = A_1 + A_2 + A_3$ = 15.48	$C_w = \frac{A_1 * C_1 + A_2 * C_2 + A_3 * C_3}{A_{total}}$ = 0.18	If $C_w < 0.4$ - use Airport Formula If $C_w \geq 0.4$ - use Bransby-Williams Formula
	source: MTO Drainage Manual	source: MTO Drainage Manual

Peak Flow Calculations

<u>Storm Frequency</u>	<u>Adjusted Runoff Coefficient</u>	<u>T_c Formula</u>	<u>T_c (min)</u>	<u>i, Intensity (mm/h)</u>	<u>Q, Peak Flow</u>
2	0.18	Airport	40.23	30.34	0.23 m^3/s
5	0.18	Airport	40.23	40.52	0.31 m^3/s
10	0.18	Airport	40.23	47.25	0.36 m^3/s
25	0.19	Airport	39.46	55.74	0.46 m^3/s
50	0.21	Airport	38.70	64.62	0.59 m^3/s
100	0.22	Airport	38.31	71.00	0.67 m^3/s



Project: Bray Lake Subdivision SWM
File No: 21-1851
Subject: Catchment 106

Date: 04-Aug-22
Designed: BB
Checked: TM/CS

Rational Method for Calculating Peak Flows

Airport Formula

$$t_c = \frac{3.26 * (1.1 - C) * L^{0.5}}{S_w^{0.33}}$$

where: t_c = time of concentration
 C = runoff coefficient
 L = watershed length (m)
 S_w = watershed slope (%)

source: MTO Drainage Manual 8.16

Bransby-Williams Formula

$$t_c = \frac{0.057 * L}{S_w^{0.2} * A^{0.1}}$$

where: t_c = time of concentration
 L = watershed length (m)
 S_w = watershed slope (%)
 A = watershed area (ha)

source: MTO Drainage Manual 8.15

Peak Flow Calculation

$$Q = 0.00278 * C * i * A$$

where: Q = peak flow (m^3/s)
 C = runoff coefficient
 i = rainfall intensity (mm/h)
 A = watershed area (ha)

source: MTO Drainage Manual 8.19

Watershed Characteristics

Watershed Length, L (m) = 695.00 Watershed Fall (m) = 19.99 Watershed Slope, S_w = 3.84%

Area Number	Area (ha)	Runoff Coefficient	Description
1	20.23	0.18	Woodland Hilly (Sandy Loam)
2	2.76	0.05	Lakes/Wetlands
3	0.12	0.88	Asphalt Roadway
from ACAD Drawing		Design Chart 1.07	Design Chart 1.07

Watershed Calculations

Total Area	Weighted Runoff Coefficient	Time of Concentration Formula
$A_{total} = A_1 + A_2 + A_3$ = 23.11	$C_w = \frac{A_1 * C_1 + A_2 * C_2 + A_3 * C_3}{A_{total}}$ = 0.17	If $C_w < 0.4$ - use Airport Formula If $C_w \geq 0.4$ - use Bransby-Williams Formula
source: MTO Drainage Manual		source: MTO Drainage Manual

Peak Flow Calculations

Storm Frequency	Adjusted Runoff Coefficient	T_c Formula	T_c (min)	i , Intensity (mm/h)	Q , Peak Flow
2	0.17	Airport	51.40	25.06	0.27 m^3/s
5	0.17	Airport	51.40	33.48	0.36 m^3/s
10	0.17	Airport	51.40	39.05	0.42 m^3/s
25	0.18	Airport	50.47	48.48	0.58 m^3/s
50	0.20	Airport	49.54	53.86	0.70 m^3/s
100	0.21	Airport	49.08	59.20	0.80 m^3/s



Project: Bray Lake Subdivision SWM
File No: 21-1851
Subject: Catchment 201

Date: 04-Aug-22
Designed: BB
Checked: TM/CS

Rational Method for Calculating Peak Flows

<u>Airport Formula</u>	<u>Bransby-Williams Formula</u>	<u>Peak Flow Calculation</u>
$t_c = \frac{3.26 * (1.1 - C) * L^{0.5}}{S_w^{0.33}}$ <p>where: t_c = time of concentration C = runoff coefficient L = watershed length (m) S_w = watershed slope (%)</p> <p>source: MTO Drainage Manual 8.16</p>	$t_c = \frac{0.057 * L}{S_w^{0.2} * A^{0.1}}$ <p>where: t_c = time of concentration L = watershed length (m) S_w = watershed slope (%) A = watershed area (ha)</p> <p>source: MTO Drainage Manual 8.15</p>	$Q = 0.00278 * C * i * A$ <p>where: Q = peak flow (m³/s) C = runoff coefficient i = rainfall intensity (mm/h) A = watershed area (ha)</p> <p>source: MTO Drainage Manual 8.19</p>

Watershed Characteristics

Watershed Length, L (m) = 1683.00 Watershed Fall (m) = 17.94 Watershed Slope, S_w = 1.42%

<u>Area Number</u>	<u>Area (ha)</u>	<u>Runoff Coefficient</u>	<u>Description</u>
1	43.63	0.18	Woodland Hilly (Sandy Loam)
2	8.79	0.05	Lakes/Wetlands
3	0.17	0.60	Gravel Roadway
4	1.73	0.88	Asphalt Roadway
5	0.80	0.30	Rural Residential
6	0.06	0.10	Landscaped Area (Septic Filter Bed)
	from ACAD Drawing	Design Chart 1.07	Design Chart 1.07

Watershed Calculations

<u>Total Area</u>	<u>Weighted Runoff Coefficient</u>	<u>Time of Concentration Formula</u>
$A_{total} = A_1 + A_2 + A_3$ $= 55.18$	$C_w = \frac{A_1 * C_1 + A_2 * C_2 + A_3 * C_3}{A_{total}}$ $= 0.18$	<p>If $C_w < 0.4$ - use Airport Formula If $C_w \geq 0.4$ - use Bransby-Williams Formula</p>
	source: MTO Drainage Manual	source: MTO Drainage Manual

Design Chart 1.06

Peak Flow Calculations

<u>Storm Frequency</u>	<u>Adjusted Runoff Coefficient</u>	<u>T_c Formula</u>	<u>T_c (min)</u>	<u>i, Intensity (mm/h)</u>	<u>Q, Peak Flow</u>
2	0.18	Airport	109.08	14.62	0.41 m ³ /s
5	0.18	Airport	109.08	19.56	0.55 m ³ /s
10	0.18	Airport	109.08	22.82	0.64 m ³ /s
25	0.20	Airport	106.89	28.37	0.88 m ³ /s
50	0.22	Airport	104.70	31.48	1.07 m ³ /s
100	0.23	Airport	103.60	34.66	1.22 m ³ /s



Project: Bray Lake Subdivision SWM
File No: 21-1851
Subject: Catchment 202

Date: 04-Aug-22
Designed: BB
Checked: TM/CS

Rational Method for Calculating Peak Flows

<u>Airport Formula</u>	<u>Bransby-Williams Formula</u>	<u>Peak Flow Calculation</u>
$t_c = \frac{3.26 * (1.1 - C) * L^{0.5}}{S_w^{0.33}}$ <p>where: t_c = time of concentration C = runoff coefficient L = watershed length (m) S_w = watershed slope (%)</p> <p>source: MTO Drainage Manual 8.16</p>	$t_c = \frac{0.057 * L}{S_w^{0.2} * A^{0.1}}$ <p>where: t_c = time of concentration L = watershed length (m) S_w = watershed slope (%) A = watershed area (ha)</p> <p>source: MTO Drainage Manual 8.15</p>	$Q = 0.00278 * C * i * A$ <p>where: Q = peak flow (m^3/s) C = runoff coefficient i = rainfall intensity (mm/h) A = watershed area (ha)</p> <p>source: MTO Drainage Manual 8.19</p>

Watershed Characteristics

Watershed Length, L (m) = 365.00 Watershed Fall (m) = 40.61 Watershed Slope, S_w = 14.83%

<u>Area Number</u>	<u>Area (ha)</u>	<u>Runoff Coefficient</u>	<u>Description</u>
1	11.12	0.18	Woodland Hilly (Sandy Loam)
2	0.73	0.05	Lakes/Wetlands
	from ACAD Drawing	Design Chart 1.07	Design Chart 1.07

Watershed Calculations

<u>Total Area</u>	<u>Weighted Runoff Coefficient</u>	<u>Time of Concentration Formula</u>
$A_{total} = A_1 + A_2 + A_3$ <p>= 11.85</p>	$C_w = \frac{A_1 * C_1 + A_2 * C_2 + A_3 * C_3}{A_{total}}$ <p>= 0.17</p>	<p>If $C_w < 0.4$ - use Airport Formula If $C_w \geq 0.4$ - use Bransby-Williams Formula</p> <p>source: MTO Drainage Manual</p>

Peak Flow Calculations

<u>Storm Frequency</u>	<u>Adjusted Runoff Coefficient</u>	<u>T_c Formula</u>	<u>T_c (min)</u>	<u>i, Intensity (mm/h)</u>	<u>Q, Peak Flow</u>
2	0.17	Airport	23.74	44.95	0.25 m^3/s
5	0.17	Airport	23.74	60.05	0.34 m^3/s
10	0.17	Airport	23.74	70.05	0.40 m^3/s
25	0.19	Airport	23.30	82.65	0.52 m^3/s
50	0.21	Airport	22.86	91.80	0.62 m^3/s
100	0.21	Airport	22.64	100.90	0.71 m^3/s



Project: Bray Lake Subdivision SWM
File No: 21-1851
Subject: Catchment 203

Date: 04-Aug-22
Designed: BB
Checked: TM/CS

Rational Method for Calculating Peak Flows

Airport Formula

$$t_c = \frac{3.26 * (1.1 - C) * L^{0.5}}{S_w^{0.33}}$$

where: t_c = time of concentration
 C = runoff coefficient
 L = watershed length (m)
 S_w = watershed slope (%)

source: MTO Drainage Manual 8.16

Bransby-Williams Formula

$$t_c = \frac{0.057 * L}{S_w^{0.2} * A^{0.1}}$$

where: t_c = time of concentration
 L = watershed length (m)
 S_w = watershed slope (%)
 A = watershed area (ha)

source: MTO Drainage Manual 8.15

Peak Flow Calculation

$$Q = 0.00278 * C * i * A$$

where: Q = peak flow (m^3/s)
 C = runoff coefficient
 i = rainfall intensity (mm/h)
 A = watershed area (ha)

source: MTO Drainage Manual 8.19

Watershed Characteristics

Watershed Length, L (m) = 413.00 Watershed Fall (m) = 44.50 Watershed Slope, S_w = 14.37%

<u>Area Number</u>	<u>Area (ha)</u>	<u>Runoff Coefficient</u>	<u>Description</u>
1	19.16	0.18	Woodland Hilly (Sandy Loam)
2	1.73	0.05	Lakes/Wetlands
3	5.05	0.30	Rural Residential
4	0.30	0.10	Landscaped Area (Septic Filter Bed)
5	0.55	0.60	Gravel Roadway
	from ACAD Drawing	Design Chart 1.07	Design Chart 1.07

Watershed Calculations

<u>Total Area</u>	<u>Weighted Runoff Coefficient</u>	<u>Time of Concentration Formula</u>
$A_{total} = A_1 + A_2 + A_3$	$C_w = \frac{A_1 * C_1 + A_2 * C_2 + A_3 * C_3}{A_{total}}$	If $C_w < 0.4$ - use Airport Formula If $C_w \geq 0.4$ - use Bransby-Williams Formula
= 26.79	= 0.20	
	source: MTO Drainage Manual	source: MTO Drainage Manual

Peak Flow Calculations

<u>Storm Frequency</u>	<u>Adjusted Runoff Coefficient</u>	<u>T_c Formula</u>	<u>T_c (min)</u>	<u>i, Intensity (mm/h)</u>	<u>Q, Peak Flow</u>
2	0.20	Airport	24.69	42.82	0.64 m^3/s
5	0.20	Airport	24.69	57.20	0.86 m^3/s
10	0.20	Airport	24.69	66.72	1.00 m^3/s
25	0.22	Airport	24.14	78.72	1.30 m^3/s
50	0.24	Airport	23.58	91.80	1.66 m^3/s
100	0.25	Airport	23.31	100.90	1.90 m^3/s



Project: Bray Lake Subdivision SWM
File No: 21-1851
Subject: Catchment 204

Date: 04-Aug-22
Designed: BB
Checked: TM/CS

Rational Method for Calculating Peak Flows

Airport Formula

$$t_c = \frac{3.26 * (1.1 - C) * L^{0.5}}{S_w^{0.33}}$$

where: t_c = time of concentration
 C = runoff coefficient
 L = watershed length (m)
 S_w = watershed slope (%)

source: MTO Drainage Manual 8.16

Bransby-Williams Formula

$$t_c = \frac{0.057 * L}{S_w^{0.2} * A^{0.1}}$$

where: t_c = time of concentration
 L = watershed length (m)
 S_w = watershed slope (%)
 A = watershed area (ha)

source: MTO Drainage Manual 8.15

Peak Flow Calculation

$$Q = 0.00278 * C * i * A$$

where: Q = peak flow (m^3/s)
 C = runoff coefficient
 i = rainfall intensity (mm/h)
 A = watershed area (ha)

source: MTO Drainage Manual 8.19

Watershed Characteristics

Watershed Length, L (m) = 1090.00 Watershed Fall (m) = 22.71 Watershed Slope, S_w = 2.78%

<u>Area Number</u>	<u>Area (ha)</u>	<u>Runoff Coefficient</u>	<u>Description</u>
1	22.05	0.18	Woodland Hilly (Sandy Loam)
2	5.24	0.05	Lakes/Wetlands
3	0.16	0.88	Asphalt Roadway
4	0.57	0.60	Gravel Roadway
5	1.08	0.30	Rural Residential
6	0.06	0.10	Landscaped Area(Septic Filter Bed)
	from ACAD Drawing	Design Chart 1.07	Design Chart 1.07

Watershed Calculations

<u>Total Area</u>	<u>Weighted Runoff Coefficient</u>	<u>Time of Concentration Formula</u>
$A_{total} = A_1 + A_2 + A_3$	$C_w = \frac{A_1 * C_1 + A_2 * C_2 + A_3 * C_3}{A_{total}}$	If $C_w < 0.4$ - use Airport Formula If $C_w \geq 0.4$ - use Bransby-Williams Formula
= 29.16	= 0.17	
	source: MTO Drainage Manual	source: MTO Drainage Manual

Peak Flow Calculations

<u>Storm Frequency</u>	<u>Adjusted Runoff Coefficient</u>	<u>T_c Formula</u>	<u>T_c (min)</u>	<u>i, Intensity (mm/h)</u>	<u>Q, Peak Flow</u>
2	0.17	Airport	71.22	20.29	0.28 m^3/s
5	0.17	Airport	71.22	27.12	0.38 m^3/s
10	0.17	Airport	71.22	31.64	0.44 m^3/s
25	0.19	Airport	69.89	37.31	0.58 m^3/s
50	0.21	Airport	68.56	41.44	0.70 m^3/s
100	0.22	Airport	67.90	45.58	0.80 m^3/s



Project: Bray Lake Subdivision SWM
File No: 21-1851
Subject: Catchment 205

Date: 04-Aug-22
Designed: BB
Checked: TM/CS

Rational Method for Calculating Peak Flows

Airport Formula

$$t_c = \frac{3.26 * (1.1 - C) * L^{0.5}}{S_w^{0.33}}$$

where: t_c = time of concentration
 C = runoff coefficient
 L = watershed length (m)
 S_w = watershed slope (%)

source: MTO Drainage Manual 8.16

Bransby-Williams Formula

$$t_c = \frac{0.057 * L}{S_w^{0.2} * A^{0.1}}$$

where: t_c = time of concentration
 L = watershed length (m)
 S_w = watershed slope (%)
 A = watershed area (ha)

source: MTO Drainage Manual 8.15

Peak Flow Calculation

$$Q = 0.00278 * C * i * A$$

where: Q = peak flow (m³/s)
 C = runoff coefficient
 i = rainfall intensity (mm/h)
 A = watershed area (ha)

source: MTO Drainage Manual 8.19

Watershed Characteristics

Watershed Length, L (m) = 516.00 Watershed Fall (m) = 19.36 Watershed Slope, S_w = 5.00%

Area Number	Area (ha)	Runoff Coefficient	Description
1	12.61	0.18	Woodland Hilly (Sandy Loam)
2	0.49	0.05	Lakes/Wetlands
3	0.21	0.60	Gravel Roadway
4	1.94	0.30	Rural Residential
5	0.15	0.10	Landscaped Area (Septic Filter Bed)
from ACAD Drawing		Design Chart 1.07	Design Chart 1.07

Watershed Calculations

Total Area	Weighted Runoff Coefficient	Time of Concentration Formula
$A_{total} = A_1 + A_2 + A_3$	$C_w = \frac{A_1 * C_1 + A_2 * C_2 + A_3 * C_3}{A_{total}}$	If $C_w < 0.4$ - use Airport Formula If $C_w \geq 0.4$ - use Bransby-Williams Formula
= 15.40	= 0.20	
source: MTO Drainage Manual		source: MTO Drainage Manual

Peak Flow Calculations

Storm Frequency	Adjusted Runoff Coefficient	T_c Formula	T_c (min)	i, Intensity (mm/h)	Q, Peak Flow
2	0.20	Airport	39.36	30.34	0.25 m ³ /s
5	0.20	Airport	39.36	40.52	0.34 m ³ /s
10	0.20	Airport	39.36	47.25	0.40 m ³ /s
25	0.22	Airport	38.50	58.16	0.54 m ³ /s
50	0.24	Airport	37.65	64.62	0.65 m ³ /s
100	0.24	Airport	37.22	71.00	0.74 m ³ /s



Project: Bray Lake Subdivision SWM
File No: 21-1851
Subject: Catchment 206

Date: 04-Aug-22
Designed: BB
Checked: TM/CS

Rational Method for Calculating Peak Flows

Airport Formula

$$t_c = \frac{3.26 * (1.1 - C) * L^{0.5}}{S_w^{0.33}}$$

where: t_c = time of concentration
 C = runoff coefficient
 L = watershed length (m)
 S_w = watershed slope (%)

source: MTO Drainage Manual 8.16

Bransby-Williams Formula

$$t_c = \frac{0.057 * L}{S_w^{0.2} * A^{0.1}}$$

where: t_c = time of concentration
 L = watershed length (m)
 S_w = watershed slope (%)
 A = watershed area (ha)

source: MTO Drainage Manual 8.15

Peak Flow Calculation

$$Q = 0.00278 * C * i * A$$

where: Q = peak flow (m^3/s)
 C = runoff coefficient
 i = rainfall intensity (mm/h)
 A = watershed area (ha)

source: MTO Drainage Manual 8.19

Watershed Characteristics

Watershed Length, L (m) = 695.00 Watershed Fall (m) = 19.99 Watershed Slope, S_w = 3.84%

Area Number	Area (ha)	Runoff Coefficient	Description
1	19.78	0.18	Woodland Hilly (Sandy Loam)
2	2.79	0.05	Lakes/Wetlands
3	0.12	0.88	Asphalt Roadway
4	0.40	0.30	Rural Residential
5	0.03	0.10	Landscaped Area (Septic Filter Bed)
from ACAD Drawing		Design Chart 1.07	Design Chart 1.07

Watershed Calculations

Total Area	Weighted Runoff Coefficient	Time of Concentration Formula
$A_{total} = A_1 + A_2 + A_3$	$C_w = \frac{A_1 * C_1 + A_2 * C_2 + A_3 * C_3}{A_{total}}$	If $C_w < 0.4$ - use Airport Formula If $C_w \geq 0.4$ - use Bransby-Williams Formula
= 23.12	= 0.17	
source: MTO Drainage Manual		source: MTO Drainage Manual

Peak Flow Calculations

Storm Frequency	Adjusted Runoff Coefficient	T_c Formula	T_c (min)	i , Intensity (mm/h)	Q , Peak Flow
2	0.17	Airport	51.30	25.06	0.27 m^3/s
5	0.17	Airport	51.30	33.48	0.37 m^3/s
10	0.17	Airport	51.30	39.05	0.43 m^3/s
25	0.19	Airport	50.36	48.48	0.59 m^3/s
50	0.20	Airport	49.42	53.86	0.71 m^3/s
100	0.21	Airport	48.96	59.20	0.81 m^3/s

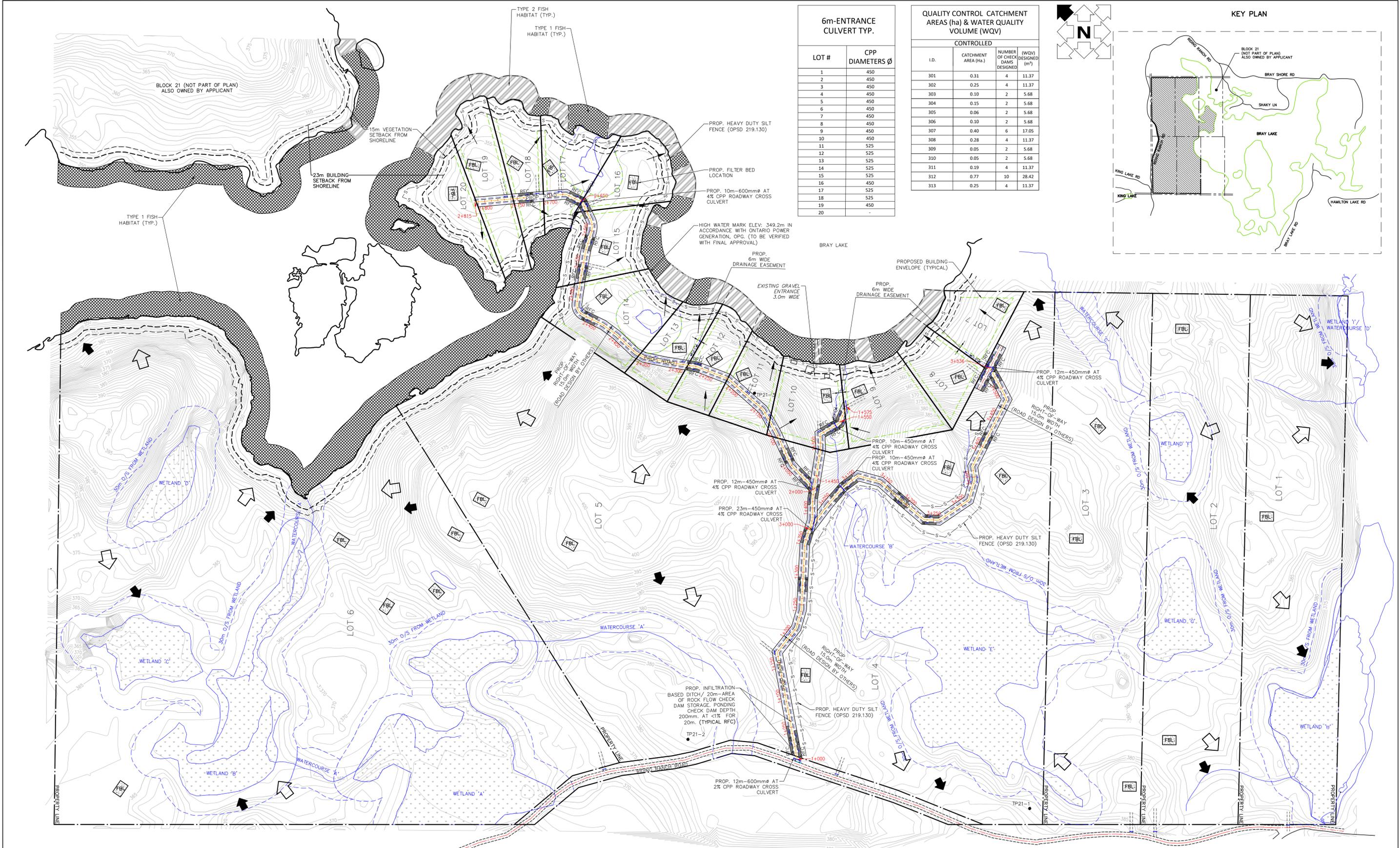


APPENDIX B

**Preliminary Stormwater Management, Private Sewage System
Assessment and Construction Mitigation Plan – SWM-1 & SWM-2**

**Pre-Development and Post-Development Drainage Areas Plan -
D1 & D2**

BRAY LAKE SUBDIVISION DRAFT PLAN - COPY

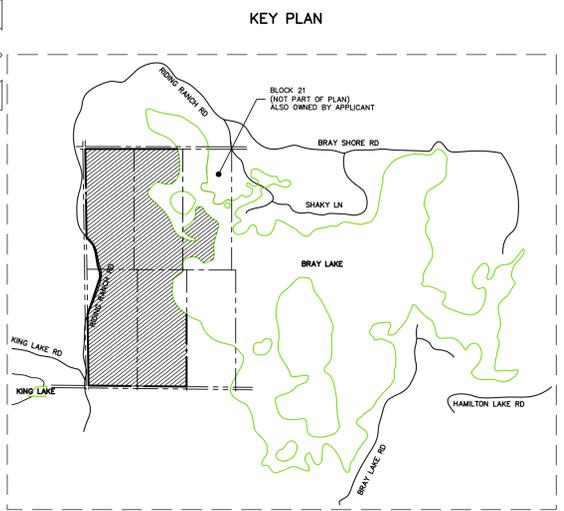
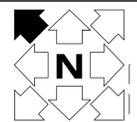


6m-ENTRANCE CULVERT TYP.

LOT #	CPP DIAMETERS Ø
1	450
2	450
3	450
4	450
5	450
6	450
7	450
8	450
9	450
10	450
11	525
12	525
13	525
14	525
15	525
16	450
17	525
18	525
19	450
20	-

QUALITY CONTROL CATCHMENT AREAS (ha) & WATER QUALITY VOLUME (WQV)

CONTROLLED			
I.D.	CATCHMENT AREA (ha)	NUMBER OF CHECK DAMS DESIGNED	(WQV) DESIGNED (m³)
301	0.31	4	11.37
302	0.25	4	11.37
303	0.10	2	5.68
304	0.15	2	5.68
305	0.06	2	5.68
306	0.10	2	5.68
307	0.40	6	17.05
308	0.28	4	11.37
309	0.05	2	5.68
310	0.05	2	5.68
311	0.19	4	11.37
312	0.77	10	28.42
313	0.25	4	11.37



LEGEND

PROPERTY LINE	—	(PROPOSED) BUILDING ENVELOPE	[Hatched]
EXISTING CONTOURS	—192	(PROPOSED) FILTER BED LOCATION	[FBL]
(PROPOSED) EDGE OF ASPHALT	- - -	(EXISTING) OVERLAND FLOW	[Arrow]
30m SETBACK	- - -	(PROPOSED) OVERLAND FLOW	[Arrow]
WETLAND	[Dotted]	100YR. SHEET FLOW	[Arrow]
(PROPOSED) DOCK LOCATION	[Symbol]		
(PROPOSED) DRIVEWAY	[Symbol]		

(PROPOSED) SILT FENCE (OPSD 219.130)	—S—S—	DENOTES TYPE 1 FISH HABITAT	[Symbol]
ROCK FLOW CHECK DAM	[Symbol]	DENOTES TYPE 2 FISH HABITAT	[Symbol]
STRAW BALE CHECK DAM	[Symbol]		
AREA OF INFILTRATION BASED STORAGE	[Symbol]		
(PROPOSED) DITCH	- - -		

REVISION:

No.	DATE	BY
1	AUGUST 31, 2022	C.S.

No.	DATE	BY
1	AUGUST 31, 2022	C.S.



**BRAY LAKE SUBDIVISION
BRAY LAKE, MACHAR, ON**

**PRELIMINARY STORMWATER MANAGEMENT,
PRIVATE SEWAGE SYSTEM ASSESSMENT &
CONSTRUCTION MITIGATION PLAN**



SCALE 1:2500

DRAWN E.V.

CHECKED C.S./M.B.B.

DATE AUGUST 31, 2022

PROJECT No. 21-1851

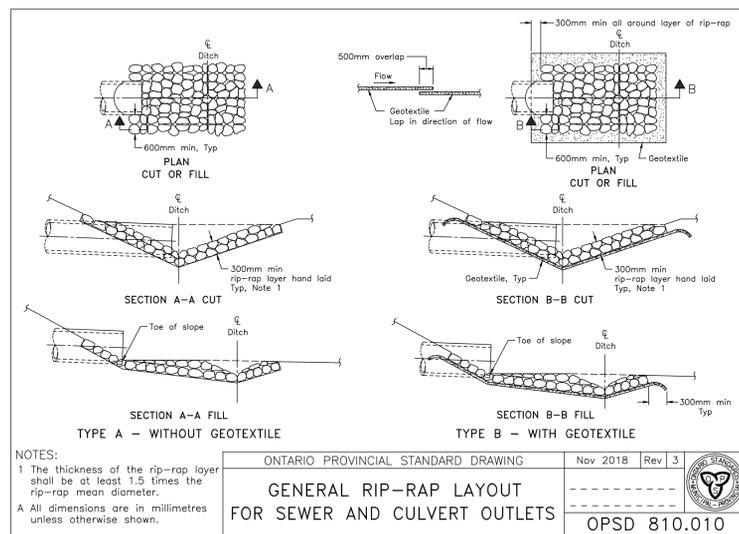
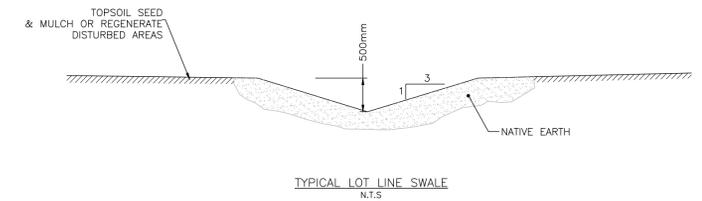
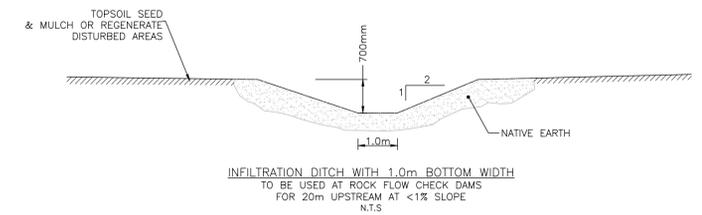
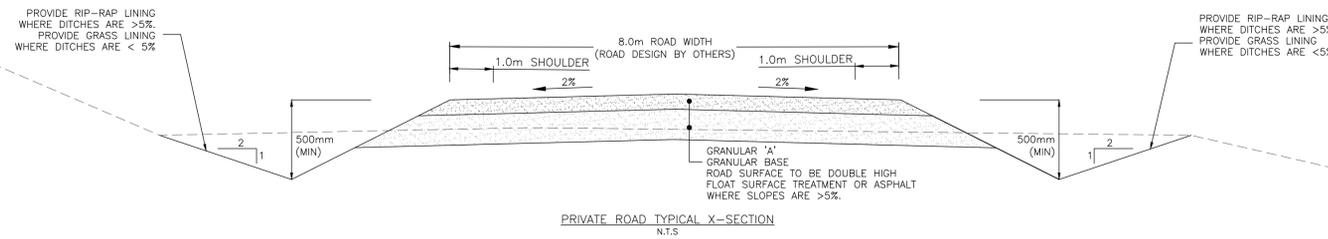
SHEET SWM 1

GENERAL NOTES:

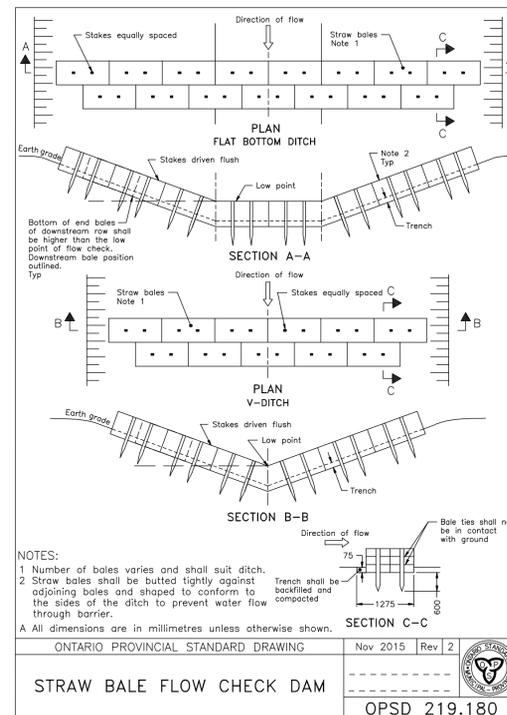
- DO NOT SCALE DRAWINGS.
- ALL STANDARDS ARE TO BE IN ACCORDANCE WITH CURRENT ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS) UNLESS OTHERWISE NOTED.
- THE LOCATION OF UTILITIES AND SERVICES SHOWN ON DRAWINGS IS APPROXIMATE AND MAY BE INCOMPLETE. CONFIRM EXACT LOCATION OF UTILITIES WITH MUNICIPALITY OR UTILITIES. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE LOCATIONS OF ALL UTILITIES PRIOR TO CONSTRUCTION AND WILL BE RESPONSIBLE FOR PROTECTING AGAINST DAMAGE. THE CONTRACTOR ASSUMES ALL LIABILITY FOR DAMAGE TO UTILITY AND ROAD WORKS.
- ALL DIMENSIONS ARE IN METERS, EXCEPT PIPE DIAMETERS, WHICH ARE IN MILLIMETERS, UNLESS SPECIFIED OTHERWISE.
- LATEST APPROVED DRAWINGS TO BE USED FOR CONSTRUCTION AND ALL DISCREPANCIES REPORTED TO THE ENGINEER.
- DOMESTIC WATER SUPPLIES SHALL BE LOCATED UPGRADIENT OF FILTER BED LOCATIONS BY MINIMUM 15m FOR DRILLED WELLS WITH CASINGS AND 30m FOR DUG WELLS.
- ALL ROADWAYS TO BE DESIGNED BY OTHERS.
- ANY DISCREPANCY FROM THE DRAWINGS SHALL BE REPORTED TO THE ENGINEER PRIOR TO PROCEEDING.
- ALL CULVERTS SHALL BE COMPLETED WITH RIP RAP END TREATMENT IN ACCORDANCE WITH OPSD 810.010.

CONSTRUCTION MITIGATION:
FINAL MEASURES TO INCLUDE THE FOLLOWING:

- ALL SEDIMENT CONTROL FENCING IS TO BE INSTALLED PRIOR TO ANY GRADING OR EXCAVATION.
- EROSION CONTROL FENCING TO BE INSTALLED AROUND THE BASE OF ALL STOCKPILES.
- ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED AS SITE DEVELOPMENT PROGRESSES. CONTRACTOR TO PROVIDE ALL ADDITIONAL EROSION CONTROL STRUCTURES, AS NEEDED, TO THE SATISFACTION OF THE APPROPRIATE APPROVAL AUTHORITY I.e. MNR, MECP, HONI, ENGINEER
- THE CONSTRUCTOR TO MONITOR EROSION CONTROL STRUCTURES TO ENSURE FENCING IS INSTALLED AND MAINTENANCE IS PERFORMED TO TOWN REQUIREMENTS. THE SATISFACTION OF THE APPROPRIATE APPROVAL AUTHORITY I.e. MNR, MECP, HONI, MUNICIPALITY.
- EROSION CONTROL STRUCTURES ARE TO BE MONITORED REGULARLY AND ANY DAMAGE REPAIRED IMMEDIATELY. SEDIMENT IS TO BE REMOVED WHEN ACCUMULATIONS BUILD UP INSIDE THE CONTROL FENCE.
- ALL EROSION CONTROL STRUCTURES ARE TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND HAS BEEN RESTABILIZED EITHER BY GRAVEL OR RESTORATION OF VEGETATIVE GROUND COVER.
- NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THE ENGINEER AND/OR THE DEPARTMENT OF APPROPRIATE APPROVAL AUTHORITY SUCH AS I.e. MNR, MECP, HONI, MUNICIPALITY ETC.
- THE CONTRACTOR IS RESPONSIBLE TO REMOVE ANY SEDIMENT THAT HAS TRACKED OFF SITE ONTO ADJACENT PROPERTY OWNED BY OTHERS DAILY. RESTORATION AND/OR MAINTENANCE TO ADJACENT PROPERTY MUST BE COMPLETED TO EQUAL OR BETTER CONDITION.
- THE CONTRACTOR IS RESPONSIBLE FOR MUNICIPAL ROADWAY TO ENSURE ROADS ARE CLEARED OF ALL SEDIMENT TRACKED BY VEHICLES AT THE END OF EACH DAY.
- INFILTRATION BASED DITCH SHALL PROVIDE CHECK DAM PONDING DEPTH OF 200mm AT <1% FOR 20m LENGTH OF INFILTRATION DITCH WITH 1m BOTTOM WIDTH.



NOTES:	ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 3	
1 The thickness of the rip-rap layer shall be at least 1.5 times the rip-rap mean diameter.	GENERAL RIP-RAP LAYOUT FOR SEWER AND CULVERT OUTLETS			
A All dimensions are in millimetres unless otherwise shown.				
				OPSD 810.010

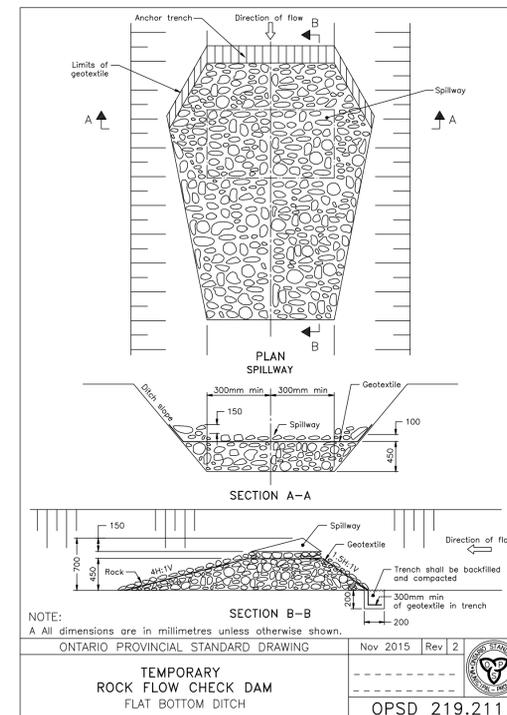


NOTES:

- Number of bales varies and shall suit ditch.
- Straw bales shall be butted tightly against adjoining bales and shaped to conform to the sides of the ditch to prevent water flow through barrier.

A All dimensions are in millimetres unless otherwise shown.

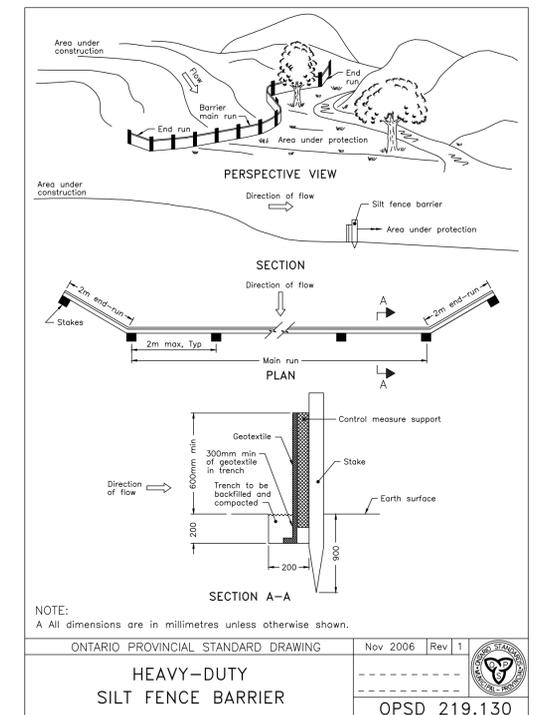
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2	
STRAW BALE FLOW CHECK DAM			
			OPSD 219.180



NOTE:

A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2	
TEMPORARY ROCK FLOW CHECK DAM FLAT BOTTOM DITCH			
			OPSD 219.211



NOTE:

A All dimensions are in millimetres unless otherwise shown.

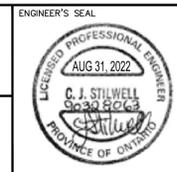
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2006	Rev 1	
HEAVY-DUTY SILT FENCE BARRIER			
			OPSD 219.130

REVISION:	No.	DATE	BY
ISSUED FOR APPROVAL	1	AUG 31, 2022	C.S.

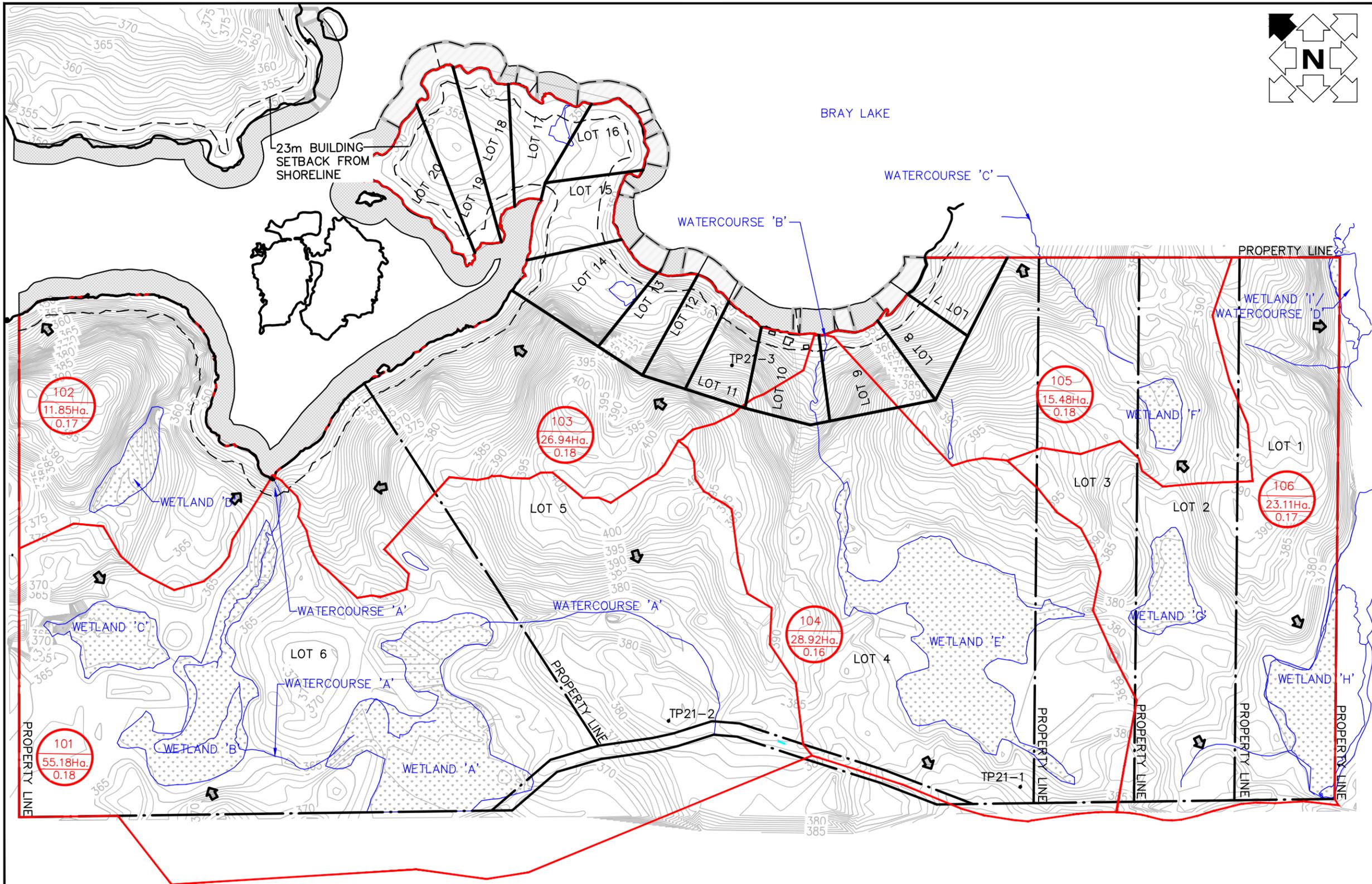


**BRAY LAKE SUBDIVISION
BRAY LAKE, MACHAR, ON**

NOTES & DETAILS



SCALE	1:2500
DRAWN	E.V.
CHECKED	C.S./T.M.B.B.
DATE	AUG 31, 2022
PROJECT No.	21-1851
SHEET	SWM 2



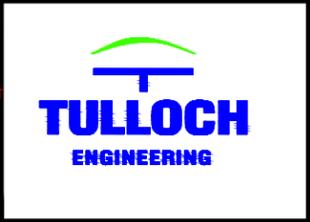
PRE-DEVELOPMENT STORM WATER CATCHMENT AREAS (ha)	
I.D.	CATCHMENT AREA (Ha.)
101	55.18
102	11.85
103	26.94
104	28.92
105	15.48
106	23.11



No.	DATE	BY	ISSUES / REVISIONS
1	AUG 31, 2022	C.S	ISSUED FOR APPROVAL

LEGEND

- CATCHMENT AREA (ha) 101
55.18Ha.
0.18
- PROPERTY LINE
- EXISTING CONTOURS
- WETLAND (EXISTING) FLOOD SPILLWAY
- CATCHMENT AREA RUNOFF COEFFICIENT 101
3.99Ha.
0.18



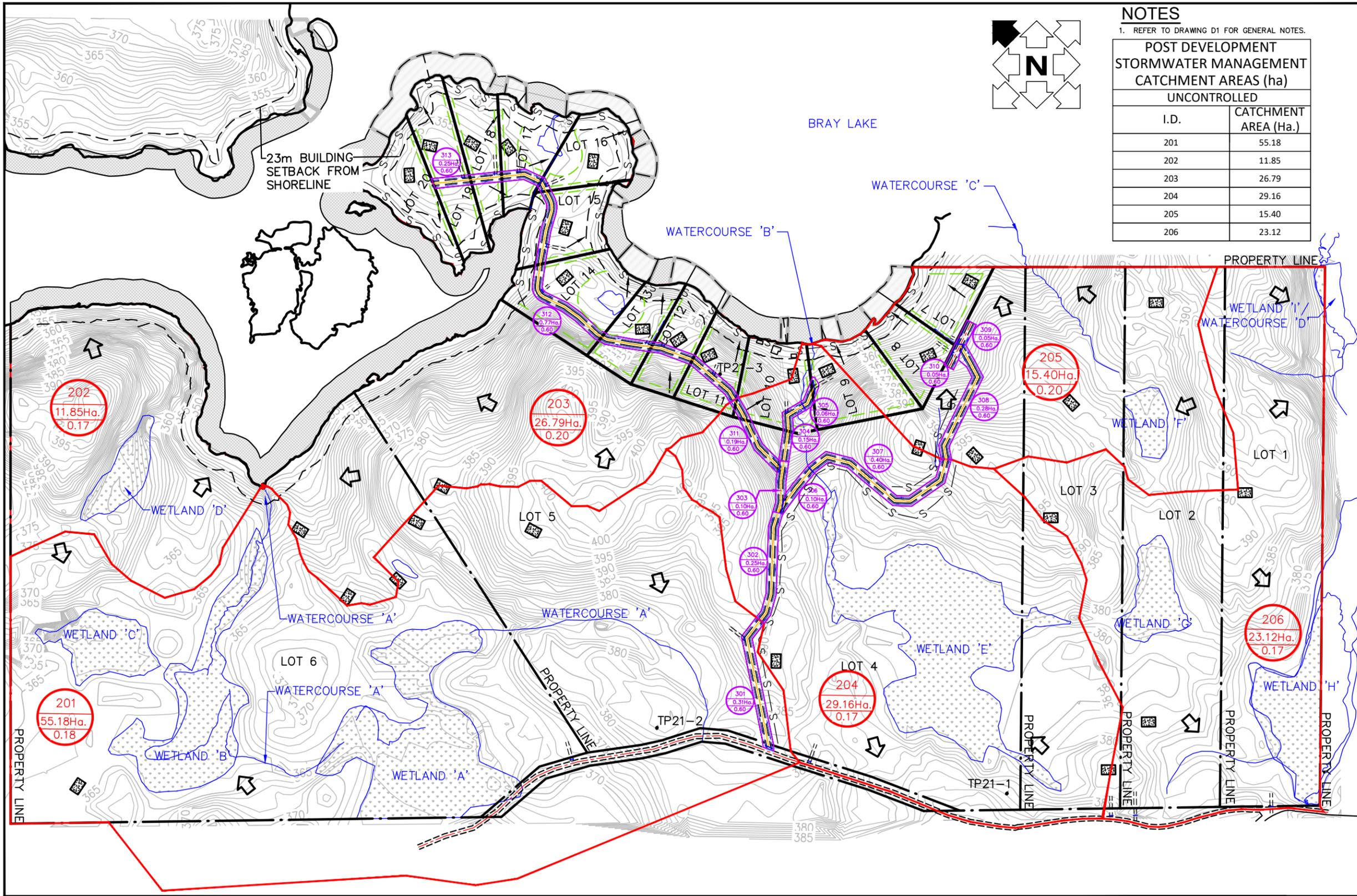
DRAWING: **BRAY LAKE SUBDIVISION**

PROJECT: **STORMWATER PRE-DEVELOPMENT DRAINAGE AREAS**

DRAWN BY: E.V
 DESIGNED BY: T.M/B.B
 SCALE: 1:6000

CHECKED BY: T.M/B.B
 APPROVED BY: C.S
 DATE: AUG 31, 2022

PROJECT No.: 21-1851
 DRAWING No. **D1**
 REVISION No. **1**



NOTES

1. REFER TO DRAWING D1 FOR GENERAL NOTES.

POST DEVELOPMENT STORMWATER MANAGEMENT CATCHMENT AREAS (ha)	
UNCONTROLLED	
I.D.	CATCHMENT AREA (Ha.)
201	55.18
202	11.85
203	26.79
204	29.16
205	15.40
206	23.12

QUALITY CONTROL CATCHMENT AREAS (ha) & WATER QUALITY VOLUME (WQV)

CONTROLLED			
I.D.	CATCHMENT AREA (Ha.)	(WQV) REQUIRED (m³)	(WQV) DESIGNED (m³)
301	0.31	9.51	11.37
302	0.25	7.67	11.37
303	0.10	3.07	5.68
304	0.15	4.60	5.68
305	0.06	1.84	5.68
306	0.10	3.07	5.68
307	0.40	12.27	17.05
308	0.28	8.59	11.37
309	0.05	1.53	5.68
310	0.05	1.53	5.68
311	0.19	5.83	11.37
312	0.77	23.62	28.42
313	0.25	7.67	11.37

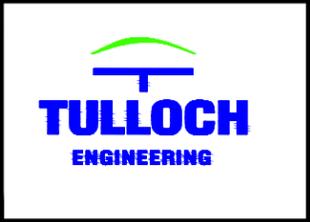
NOTE: FOR SWMP TYPES AND DESCRIPTIONS SEE PRELIMINARY STORMWATER MANAGEMENT REPORT SECTION 5.6.



No.	DATE	BY	ISSUES / REVISIONS
1	AUG 31, 2022	C.S	ISSUED FOR APPROVAL

LEGEND

- CATCHMENT AREA (I.D. 200, 3.99Ha, 0.18)
- AREA (ha) (I.D. 305, 0.044Ha, 0.60)
- RUNOFF COEFFICIENT (C) (I.D. 305, 0.044Ha, 0.60)
- CATCHMENT AREA
- PROPERTY LINE
- EXISTING CONTOURS
- WETLAND
- FLOOD



DRAWING: **BRAY LAKE SUBDIVISION**

PROJECT: **STORMWATER POST-DEVELOPMENT DRAINAGE AREAS**

DRAWN BY: E.V
 CHECKED BY: T.M/B.B
 DESIGNED BY: T.M/B.B
 APPROVED BY: C.S
 SCALE: 1:6000
 DATE: AUG 31, 2022

PROJECT No.: 21-1851
 DRAWING No. **D2**
 REVISION No. **1**

PIN 52053-0306

ORIGINAL ROAD ALLOWANCE BETWEEN CONCESSIONS 12 AND 13

BRAY LAKE SUBDIVISION DRAFT PLAN OF SUBDIVISION

PART OF LOTS 18, 19 AND 20, CONCESSION 12
AND PART OF LOTS 19 AND 20, CONCESSION 11
TOWNSHIP OF MACHAR
DISTRICT MUNICIPALITY OF PARRY SOUND
SCALE 1:2500

25m 0 25 125m
KPK SURVEYING INC., O.L.S.
2022

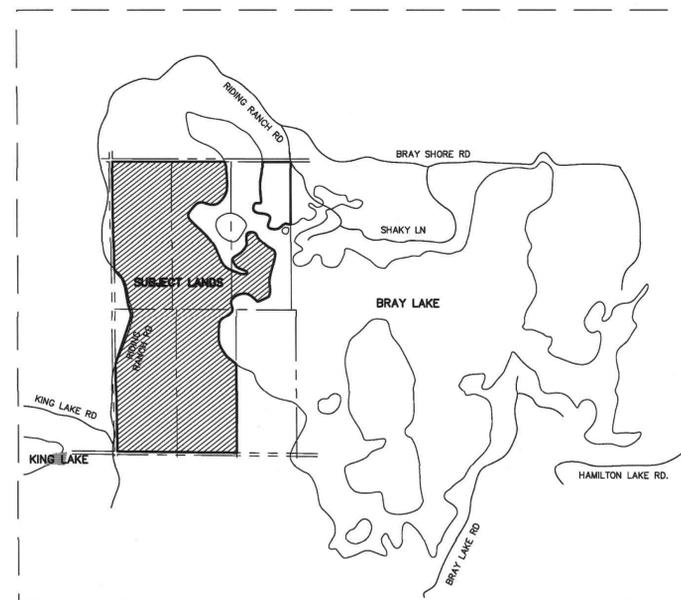
OTHER INFORMATION

- 1) ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT:
 - A. LAND BOUNDARIES ARE AS SHOWN ON DRAFT PLAN
 - B. ROADWAYS ARE AS SHOWN ON DRAFT PLAN AND KEY PLAN
 - C. KEY PLAN IS AS SHOWN ON DRAFT PLAN
 - D. PROPOSED LOTS ARE FOR RURAL, NATURAL HERITAGE PROTECTION/ENVIRONMENTAL PROTECTION, AND SHORELINE USE, AS SHOWN ON PLAN
 - E. ADJACENT USES: CROWN, RURAL, NATURAL HERITAGE PROTECTION/ENVIRONMENTAL PROTECTION, AND SHORELINE, AS SHOWN ON PLAN
 - F. LOT DIMENSIONS ARE APPROXIMATE ONLY
 - G. TOPOGRAPHIC FEATURES ARE AS SHOWN, DERIVED FROM ORTHO PHOTOGRAPHIC IMAGERY FROM FIRST BASE SOLUTIONS DATED JULY 29, 2020
 - H. WATER SUPPLY IS TO BE PROVIDED AND OPERATED BY INDIVIDUAL LAND OWNERS
 - I. GEOTECHNICAL INVESTIGATION WILL BE REQUIRED TO CONFIRM SOIL AND GROUND COMPOSITION
 - J. 1m CONTOURS ARE AS SHOWN ON DRAFT PLAN
 - K. SEPTIC SERVICES ARE TO BE PROVIDED AND OPERATED BY INDIVIDUAL LAND OWNERS
 - L. PROPOSED LOTS CONTAIN AREAS IDENTIFIED AS A WATERCOURSE, MOOSE AQUATIC FEEDING AREA, OTHER WETLANDS AND FLOODPLAIN AS SUCH WILL HAVE RESTRICTIONS AFFECTING THE SUBDIVISION LANDS

LEGEND:

- EP DENOTES ENVIRONMENTAL PROTECTION (NATURAL HERITAGE PROTECTION) ZONING AREA
- FP DENOTES FLOOD PLAIN ZONING AREA
- SR DENOTES SHORELINE ZONING AREA
- RU DENOTES RURAL ZONING AREA
- FN DENOTES FENCE
- DN DENOTES TREE
- DENOTES 15m VEGETATED NATURAL SHORELINE BUFFER
- DENOTES 23m BUILDING SETBACK FROM SHORELINE
- DENOTES 30m WETLAND / WATER COURSE SETBACK
- DENOTES TYPE 1 FISH HABITAT
- DENOTES TYPE 2 FISH HABITAT

KEY PLAN



OWNER'S CERTIFICATE

THIS IS TO CERTIFY THAT:
POLMI HOLDINGS INC. BEING THE REGISTERED OWNERS OF THE SUBJECT LANDS,
HEREBY SUBMITS A DRAFT PLAN OF SUBDIVISION FOR APPROVAL.

[Signature] 07/22/22
TOM VASZANYI, DATE
AUTHORIZED AGENT FOR POLMI HOLDINGS INC.

"I HAVE THE AUTHORITY TO BIND THE CORPORATION"

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:
THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO
THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN ON THIS PLAN

[Signature] 07/22/22
KEVIN KUHALA, HUNTSVILLE, ONTARIO
ONTARIO LAND SURVEYOR

KPK
SURVEYING

KPK SURVEYING INC.
HUNTSVILLE, ON
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APPENDIX C

Infiltration Based Storage/Rock Flow Check Dam Calculations Culvert Sizing Calculations



Project:	Bray Lake Subdivision SWM	Date:	04-Aug-22
File No:	21-1851	Designed:	BB
Subject:	Rock Flow Check Dam Sizing	Checked:	TM/CS
Infiltration Ditch / Rock Flow Check Dam Sizing			

Ditch Characteristics

<u>Channel Depth</u>	<u>Channel Type</u>	<u>Base Width</u>	<u>Side Slopes</u>	<u>Max. Slope</u>
0.70 m	Grass lined	1.00 m	2H : 1V	1.00%

Depth, m	Slope, %	Cross Sectional Area, m ³	Length of Spacing Between Consecutive Check Dams, m	Storage Volume Per Check Dam, m ³
0.55	1.0%	1.16	55	32.38
0.45	1.0%	0.855	45	19.53
0.3	1.0%	0.48	30	7.308
0.2	1.0%	0.28	20	2.842

Water Quality Storage Requirement based on Receiving Waters.

Catchment ID	Area, Ha	% Imperviousness	Storage Volume for Impervious Level for Infiltration Based Storage(m ³ /Ha)	Required Water Quality Storage Volume (WQV), m ³
301	0.31	57%	30.67	9.51
302	0.25	57%	30.67	7.67
303	0.10	57%	30.67	3.07
304	0.15	57%	30.67	4.60
305	0.06	57%	30.67	1.84
306	0.10	57%	30.67	3.07
307	0.40	57%	30.67	12.27
308	0.28	57%	30.67	8.59
309	0.05	57%	30.67	1.53
310	0.05	57%	30.67	1.53
311	0.19	57%	30.67	5.83
312	0.77	57%	30.67	23.62
313	0.25	57%	30.67	7.67

Note: Storage Volume for Impervious Level (m³/ha) was interpolated from Table 3.2 in the MECP Stormwater Management % Imperviousness was determined from %_{imp}=(C-0.2)/0.7 found in Section 7.2 of the City of Barrie Storm Drainage and Stormwater Management Policies and Design Guidelines, 2020.

Catchment ID	Area, Ha	Required Water Quality Storage Volume (WQV), m ³	0.2 m Depth Storage Volume at One (1) Rock Flow Check Dam with Upstream Slope of 1%, m ³	Number of Check Dams Required	Number of Check Dams Designed	Total Volume of Designed Number of Check Dams, m ³
301	0.31	9.51	2.842	4	4	11.37
302	0.25	7.67	2.842	3	4	11.37
303	0.10	3.07	2.842	2	2	5.68
304	0.15	4.60	2.842	2	2	5.68
305	0.06	1.84	2.842	1	2	5.68
306	0.10	3.07	2.842	2	2	5.68
307	0.40	12.27	2.842	5	6	17.05
308	0.28	8.59	2.842	4	4	11.37
309	0.05	1.53	2.842	1	2	5.68
310	0.05	1.53	2.842	1	2	5.68
311	0.19	5.83	2.842	3	4	11.37
312	0.77	23.62	2.842	9	10	28.42
313	0.25	7.67	2.842	3	4	11.37

Note: Rock Flow Check Dams to be installed in accordance with OPSD 219.211.



SHEET
1

TULLOCH ENGINEERING
Bray Lake Subdivision SWM - 21-1851
Culvert Design Sheet - 25 Year Cross Culverts - 5 Year Entrance Culverts

DATE: 04-Aug-22
DESIGN/CHECK: BB/TM
PROJECT NO: 21-1851

Equations and Constants

<p>Peak Flow</p> $Q = 0.00278 \cdot A \cdot i \cdot C$ <p>where: A = catchment area (ha) i = 100 yr rainfall intensity (mm/h) C = weighted runoff coefficient</p> <p>Source: MTO DMM Equation 8.19</p>	<p>Hydraulic Radius</p> $R = \frac{D}{4}$ <p>where: D = Pipe diameter</p> <p>Source: MTO DMM Design Chart 2.29</p>	<p>Full Pipe Velocity</p> $V = \frac{R^{0.667} S^{0.5}}{n}$ <p>where: R = Hydraulic Radius S = Pipe Slope n = Manning's n</p> <p>Source: MTO DMM Design Chart 2.29</p>	<p>Pipe Capacity</p> $Q_{full} = V \cdot \text{area}$ <p>where: V = Velocity area = πr^2</p> <p>Source: MTO DMM Design Chart 2.29</p>	<p>Bransby-Williams Formula</p> $T_c = \frac{0.057 \cdot L}{S_w^{0.2} \cdot A^{0.1}}$ <p>where: L = Watershed length S_w = Watershed slope A = Watershed area</p> <p>Source: MTO DMM Design Equation 8.15</p>	<p>Airport Formula</p> $T_c = \frac{3.26(1.1-C) \cdot L^{0.5}}{S_w^{0.33}}$ <p>where: L = Watershed length S_w = Watershed slope C = Runoff coefficient</p> <p>Source: MTO DMM Design Equation 8.16</p>
<p>Manning's n</p> <p>Smooth-walled HDPE = 0.012</p> <p>Source: MTO GPD Guidelines Appendix C</p>	<p>Runoff Constants</p> <p>Woodland Hilly (Sandy Loam) = 0.25 Lake/Wetlands = 0.05 Gravel Roadway = 0.60 Landscaped Areas (Septic Filter Bed) = 0.10 Rural Residential = 0.30 Asphalt Roadway = 0.88</p> <p>Source: MTO DMM Design Chart 1.07</p>	<p>Weighted Runoff Constant</p> $C_w = \frac{(C_1 A_1) + (C_2 A_2) + \dots}{A_{total}}$ <p>where: 1, 2, ... = Drainage sub-areas</p> <p>Source: MTO DMM Design Equation 8.10</p>	<p>Rainfall Intensity (i)</p> <p>Interpolated values from MTO IDF Curve Lookup Tool for Huntsville</p> <p>Source: http://www.mto.gov.on.ca/IDF_Curves</p>		

Catchment Area	LOCATION	DRAINAGE AREA			RUNOFF					Pipe Length (m)	PIPE SELECTION						
		Area (A) (ha)	Cum. Area (A) (ha)	Weighted Runoff C (const.)	A*C (ha)	T _c (min)	i (mm/h)	Q _{catchment} (m ³ /s)	Q _{total} (m ³ /s)		Pipe Slope (m/m)	Pipe Diameter (m)	Hydraulic Radius (m)	Full Pipe Velocity (m/s)	Pipe Capacity (m ³ /s)	% Capacity	Actual Velocity (m/s)
201	Pvt. Rd. Culvert Between Lot 4/5 at Riding Ridge Road Intersection.	55.18	55.18	0.20	11.04	106.89	28.37	0.87	0.87	12.0	0.020	0.600	0.150	3.32	0.94	0.93	3.82
203	Pvt. Rd. Culvert, Between Lot 16/17 at Station 2+648.	26.79	26.79	0.22	5.89	24.14	78.72	1.29	1.29	10.0	0.040	0.600	0.150	4.70	1.33	0.97	5.45
204	Pvt. Rd. Culvert, Between Lot 4/5 at Station 1+377.	29.16	29.16	0.19	5.54	69.89	37.31	0.57	0.57	23.0	0.040	0.450	0.113	3.88	0.62	0.93	4.46
204	Pvt. Rd. Culvert, Between Lot 4/5 at Station 1+433.	29.16	29.16	0.19	5.54	69.89	37.31	0.57	0.57	12.0	0.040	0.450	0.113	3.88	0.62	0.93	4.46
204	Pvt. Rd. Culvert Between Lot 9/10 at Station 1+541.	29.16	29.16	0.19	5.54	69.89	37.31	0.57	0.57	10.0	0.040	0.450	0.113	3.88	0.62	0.93	4.46
204	Pvt. Rd. Culvert Within Lot 4 at Station 3+081.	29.16	29.16	0.19	5.54	69.89	37.31	0.57	0.57	10.0	0.040	0.450	0.113	3.88	0.62	0.93	4.46
205	Pvt. Rd. Culvert Within Lot 4 at Station 3+529.	15.40	15.40	0.22	3.39	38.50	58.16	0.55	0.55	12.0	0.040	0.450	0.113	3.88	0.62	0.89	4.42
205	Pvt. Rd. Culvert Between Lot 4/7 at Station 3+535.	15.40	15.40	0.22	3.39	38.50	58.16	0.55	0.55	12.0	0.040	0.450	0.113	3.88	0.62	0.89	4.42
201	All Entrance Culverts in Catchment 201.	55.18	55.18	0.18	9.93	109.08	19.56	0.54	0.54	6.0	0.035	0.450	0.113	3.63	0.58	0.94	4.18
203	All Entrance Culverts in Catchment 203.	26.79	26.79	0.20	5.36	23.90	60.05	0.89	0.89	6.0	0.040	0.525	0.131	4.30	0.93	0.96	4.99
	Lot 16 Entrance Culvert	0.77	0.77	0.60	0.46	30.24	45.80	0.06	0.06	6.0	0.005	0.450	0.113	1.37	0.22	0.27	1.13
	Lot 19 Entrance Culvert	0.25	0.25	0.60	0.15	8.59	117.59	0.05	0.05	6.0	0.005	0.450	0.113	1.37	0.22	0.22	1.07
204	All Entrance Culverts in Catchment 204.	29.16	29.16	0.17	4.96	71.22	27.12	0.37	0.37	6.0	0.020	0.450	0.113	2.74	0.44	0.86	3.10
	Lot 7 Entrance Culvert	0.05	0.05	0.6	0.03	3.41	160.20	0.01	0.01	6.0	0.005	0.450	0.113	1.37	0.22	0.06	0.71
205	All Entrance Culverts in Catchment 205.	15.40	15.40	0.2	3.08	39.36	40.52	0.35	0.35	6.0	0.020	0.450	0.113	2.74	0.44	0.79	3.06
206	All Entrance Culverts in Catchment 206.	23.12	23.12	0.17	3.93	51.30	33.48	0.37	0.37	6.0	0.020	0.450	0.113	2.74	0.44	0.84	3.09

Notes: Cross culvert flows are based on a 25-year storm event.
Entrance culvert flows are based on a 5-year storm event.
DMM- Drainage Management Manual, GPDG- Gravity Pipe Design Guidelines
Total post-development 200-series catchment flows were used for preliminary culvert sizing calculation to determine acceptability of minimum 450 mm culvert diameters.

APPENDIX D

**Tulloch Private Sewage System Assessment and Geotechnical Soils
Assessment with Preliminary Recommendations**

**Ministry of Northern Development, Mines, Natural Resources, and
Forestry – Surficial Geology Map and Legend**

**Ministry of Agriculture, Food, and Rural Affairs – Hydrologic Soil
Group Map**

**Ontario Power Generation – Bray Lake Water Elevation
Observations and Water Management Plan Limits**



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Polni Holdings
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On L7B 1A9

August 31, 2022

C/O: JPG Planning, Mr. John Gallagher, RPP.

**Re: Preliminary Review for Private Sewage Disposal Assessment
Bray Lake Subdivision Development
Machar, Ontario**

Further to your request, Tulloch Engineering has reviewed the draft subdivision lands and offers the following opinion regarding use of private sewage systems on the proposed lots as demonstrated on Tulloch's Preliminary Stormwater Management, Private Sewage Disposal Assessment and Construction Mitigation Plan – SWM1, dated August 31, 2022.

Tulloch visited the development site in January 2022 and reviewed the proposed building envelopes on each of the twenty-three proposed lots to determine suitability for private sewage system construction. It was noted that much of the terrain is rocky and hilly terrain with shallow soils over bedrock. A desk top review of available online soils mapping information in the area indicates the following conditions:

The Ministry of Northern Development, Mines, Natural Resources, and Forestry Ontario Geological Survey Surficial Geology Map for the Bray Lake Area shows local surficial geology along the Bray Lake west shoreline and surrounding area as follows:

- The north, west, and east portion of the subject property is Type 2a, bedrock drift complex in Precambrian terrain, primarily till cover.
- The central portion of the subject property is Type 5a, silty sand to sand-textured till on Precambrian terrain.
- The southwest portion of the subject property is Type 9, coarse-textured glaciolacustrine deposits consisting of sand, gravel, minor silt and clay.

Utilizing Design Chart 1.08 in the Ministry of Transportation Drainage Management Manual, 1997, all subject site soils were determined to be a hydrologic soil group, HSG, 'B'. The Ontario Ministry of Agriculture, Foods, and Rural Affairs online tool AgMaps confirmed a HSG of 'B'. A surficial geology map of the site from the Ontario Geological Survey information, and a HSG map of the site from the OMAFRA AgMaps tool has been attached.

August 31, 2022

Preliminary Review for Private Sewage Disposal Assessment

Bray Lake Subdivision Development

Machar, Ontario

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Tulloch also completed an in-situ soil investigation to verify soil conditions. The sand-gravel till soils type generally identified with soil depths varying from 0.55 m to 1.3 m over bedrock. A visual inspection of the site verified shallow sand and till overlying bedrock. A geotechnical soils assessment memo has been attached for reference to the findings.

Tulloch's assessment of the proposed lot layout for the suitability of private sewage systems is as follows:

- With proposed lot sizing ranging between approximately 1.0 ha to 1.9 ha for the smaller waterfront lots, and 12 ha - 47 ha for the larger lots there is sufficient lot area on each lot to accommodate a private sewage system while adhering to required setbacks;
- The private sewage systems will need to comply with Part 8 of the Ontario Building code, being designed and installed by a licensed sewage system installer under OBC requirements;
- Domestic water supplies shall be located up gradient of sewage system locations by a minimum 15 m distance for drilled wells with casings and 30 m for dug wells as indicated by the OBC.
- Where bedrock outcrops and ecologically sensitive areas occur within the lots, the private sewage system may require a tertiary treatment system solution to minimize footprint and impact of the system. A tertiary treatment solution can be achieved within the OBC Part 8 criteria;
- Preliminary filter bed envelopes have been indicated on each of the proposed lots that meets the requirements for a Class 4F raised filter bed. Due to the nature of shallow overburden soils over bedrock, it is expected that a private sewage system solution will include a raised filter bed, sewage pump chamber and septic tank treatment unit as a minimum. Typical 50 square metre filter bed envelopes have been identified on each lot as shown on the Preliminary Stormwater Management Plan – SWM1 as attached. Alternative filter bed envelopes have also been provided on the larger Lots 1-6. Final design will need to be completed at the building permit stage for the appropriate sizing of each private sewage system.

We trust this will assist you with your current draft plan approvals. Please contact the undersigned if you require further information or clarification in the above regard.

August 31, 2022

**Preliminary Review for Private Sewage Disposal Assessment
Bray Lake Subdivision Development
Machar, Ontario**

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Respectfully Submitted:

TULLOCH ENGINEERING INC

Prepared by:



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Reviewed by:



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Approved by:



Chris Stilwell, P. Eng.
Principal and Senior Project Manager
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Attached:

- Preliminary Stormwater Management, Private Sewage Disposal Assessment and Construction Mitigation Plan – SWM1, dated August 31, 2022.
- Geotechnical Soils Assessment and Preliminary Recommendations for the Proposed Bray Lake Subdivision in Machar, Ontario, dated August 30, 2022.
- Ministry of Northern Development, Mines, Natural Resources, and Forestry – Surficial Geology Map and Legend.
- Ministry of Agriculture, Food, and Rural Affairs – Hydrologic Soil Group Map.
- Ontario Power Generation – Bray Lake Water Elevation Observations and Water Management Plan Limits.

MEMORANDUM

Date: Tuesday, August 30, 2022

To: Mr. Tom Harsanyi
Polni Holdings
P.O. Box 910
King City, Ontario
L7B 1A9

From: Erik Giles, P.Eng.

CC: Ted Maurer, C.E.T.

RE: **Geotechnical Soils Assessment and Preliminary Recommendations for the Proposed Bray Lake Subdivision in Machar, Ontario**

Dear Mr. Harsanyi,

This memorandum documents TULLOCH's findings from the preliminary geotechnical site investigation conducted on November 22nd, 2021, for the proposed Bray Lake Subdivision development located in Machar, Ontario. This memorandum details the findings of the geotechnical investigation, supplemental laboratory testing of select soil samples and provides preliminary recommendations as it pertains to geotechnical foundation design and construction considerations. Recommendations are based on the findings of the investigation in conjunction with visual assessment of soils observed during the investigation and on inference between test pits. A plot summarizing the Dynamic Cone Penetrometer (DCP) results as well as the results of the laboratory testing and a site photo log are attached to the memorandum.

1. SUBSURFACE CONDITIONS ON SITE CONDITIONS

A series of four shallow test pits referenced as TP21-01 to TP21-04 were excavated to help support a hydrogeological investigation across the property. TP21-01 to TP21-03 were left open for investigation and soils examination by TULLOCH. Table 1-1 shown below contains the approximate coordinates of the three test pit locations. Coordinates were taken by a handheld GPS with an accuracy of ± 3 m. A site plan indicating the Test Pit Locations is attached to this memorandum.

Table 1-1: Test Pit Summary

Test Pit No.	Test Pit Location		Refusal Depth (mbgs) ¹
	Northing (m)	Easting (m)	
TP21-01	5083288	616580	1.2
TP21-02	5083814	616479	1.2
TP21-03	5083929	617008	0.9

Note(s):¹mbgs = meters below ground surface

Samples were also collected by the hydrogeological investigation in-situ and were provided for index testing by TULLOCH to help categorize the soils within the test pit. Dynamic Cone Penetrometer tests were conducted where possible from ground surface beside each test pit to help understand the compactness of the surficial soils for foundation recommendations. DCP testing could not be completed in TP21-03 due to shallow refusal on inferred bedrock. DCP testing results are attached to this memorandum.

Test pits were excavated to refusal at each location ranging from 0.9 m below ground surface (mbgs) in TP21-03 and to approximately 1.2 mbgs in TP21-01 and TP21-02. A hard bottom was encountered at all test pits with both the DCP and hand probe meeting refusal on a hard surface. Refusal of this nature infers a shallow bedrock although it could not be confirmed due to the standing water and lack of bedrock coring. Subsurface soils were relatively uniform across the test pits typically consisted of a sandy topsoil with organics at ground surface ranging in thickness from 0.2 m to 0.3 m. Below the topsoil a well graded sand to silty sand with some gravel was encountered, the material was brown in colour, non-cohesive and generally moist. This material extended the depth of all test pits that were examined on site. Beneath the topsoil in TP21-04 a sandy silt with trace clay was found, this material was found to also be non-cohesive and was wet with free standing water observed in the sample bag. This material was examined from the retrieved sample taken during the hydrogeological investigation, TP21-04 was backfilled prior to TULLOCH's arrival on site and further examination was not possible. It should be noted that throughout all test pits a significant fraction of cobbles and boulders was observed throughout the soil stratum. Visible bedrock knobs were observed on both sides of the access road in the areas of high relief. A wet creek area was also observed south of the existing access road and was observed to run down towards Bray Lake, from visual examination surficial soils appeared to contain organics and were soft underfoot.

Representative laboratory testing was conducted on select samples obtained from TP21-02 through TP21-04. Moisture content testing was conducted on the sand to silty sand samples in TP21-02 and TP21-03 and ranged from 17% to 23.9%. The elevated water contents are likely due to the saturated nature of the soils from the open test pits at the time of TULLOCH's arrival. The sandy silt material in TP21-04 yielded a moisture content of 42.6%. Particle size distribution testing was conducted on the silty sand to sand material in TP21-02 and TP21-03 which yielded a particle size distribution ranging from 6.3% to 24.4% gravel, 46.3% to 67.7% sand and 29.3% to 26% fines.

Particle size distribution for the sandy silt encountered at TP21-04 yielded a particle size distribution of 0% gravel, 32.6% sand, 63.9% silt and 3.5% clay.

Atterberg limits testing was conducted on the recovered silt sample from TP21-04, upon examination for the test the material was found to be non-plastic.

Based on the DCP test results conducted on the native sand to silty sand soils exposed below the topsoil, the in-situ density of the sandy soils were generally found to be compact and often met with early refusal on likely cobbles and boulders and/or shallow bedrock.

With respect to ground water all test pits were found to have standing water within each excavation. The water was bailed, and generally significant seepage was not observed however soil conditions were saturated and it was difficult to determine a ground water level. Given the above, it is likely that the water observed was accumulated surface water that had run into the open excavations, and ground water where present would be near the shallow bedrock interface. Higher near surface ground water is likely in the low-lying wet areas near the creek where ponded water was observed at ground surface. For a more detailed opinion on ground water levels the hydrogeological report prepared by others should be consulted for confirmation as the test pits were freshly excavated at that time and observation with respect to seepage and inflow would be more apparent. It should be noted that groundwater level is subject to seasonal fluctuations with high levels occurring during wet weather conditions in the spring and fall and lower levels during dry weather conditions. As such additional precautions should be taken for ground water management if necessary.

2. GEOTECHNICAL RECOMMENDATIONS

2.1. General

This section of the memorandum provides guidelines on the geotechnical design aspects of the project based on the visual examination of in-situ soils presented above, the laboratory testing on select soil samples and the DCP data taken across the site. The recommendations included in this section are preliminary in nature and intended to provide guidance to the Client with respect to the foundation design and other geotechnical components of the project. Additional geotechnical investigation is recommended prior to detailed design to help better characterize the subsurface conditions of the site. The construction recommendations are intended to provide preliminary information regarding geotechnical concerns and issues during construction. Contractors bidding on or undertaking the construction should make their own interpretation of the provided subsurface information with respect to their planned construction methods, equipment selection, scheduling, and the like.

While site plans have not been provided, it is TULLOCH's understanding that the buildings will consist of relatively lightly loaded residential structures that will be applicable to Part 9 of the Ontario Building Code. Placement of the proposed structures is not known at this time, and it is recommended that the site plans be shared with TULLOCH further in development to help create an appropriate scope of work to provide additional geotechnical input and help verify/confirm the assumptions made in this report.

Based on the limited investigation and site overview it is anticipated that shallow bedrock will exist along the majority of the site particularly in areas of high relief, given the sloping nature of the site and visible bedrock/ shallow refusal in test pits it is likely that a significant cut/fill balance will be required including blasting to create appropriate foundation pads for the proposed development. The low-lying wet area is not recommended for construction without further investigation it is likely that poorer soils and a high water table will exist in this area which could be problematic for construction.

2.2. Foundation Recommendations

Based on the results of the subsurface investigation, foundations for various single-story buildings can be founded on conventional spread or strip style footings either on the native silty sand to sand soils, on competent bedrock, or on compacted fill placed on competent bedrock. The footing size can be determined based on the applied loads on the foundation. The loading information was not available to the geotechnical engineer at the time of writing this report. The designers should share the loading information and anticipated structures and locations with the

geotechnical engineer when available. This section provides preliminary estimated bearing capacity of shallow foundations placed on the undisturbed native sand to silty sand materials as well as on competent rock/engineered fill on competent rock.

A conservative estimate for bedrock bearing capacity was given from engineering experience within the area, however, it should be noted that bedrock was not confirmed or inspected for competence as part of the investigation. Foundations placed directly on bedrock should be dowelled/pinned to the rock to prevent sliding. Further detail can be discussed once design drawings have been provided.

For the bearing capacities for engineered fill on rock the perched foundations should consist of a well compacted granular pad consisting of either OPSS 1010 Granular Type A, B Type II or approved equivalent.

Table 2-1 summarizes the recommended design Ultimate limit State (ULS) and Serviceability Limit State (SLS) for the various bearing conditions discussed above. In determining the settlement characteristics of the proposed building, the SLS loads are required to be provided by the Structural or Design Engineer. At the time of preparing this report, information about the foundation settlement tolerance, or the footing size and embedment was not available to TULLOCH. As such, the geotechnical reaction at SLS was determined assuming that 25 mm of total settlement is acceptable. Foundation calculations are based on a minimum embedment of 1.2 m with foundations ranging in width from 0.5 to 1.0 m. If the design requires larger foundations, TULLOCH should be contacted to revise the recommendations.

Table 2-1: Bearing Capacity for Shallow Foundations

Limit State	Bearing Capacity (kPa)
ULS – Sand to Silty Sand	150
SLS – Sand to Silty Sand	100
ULS Competent Bedrock	300
SLS Competent Bedrock	Does not govern
ULS – Granular Pad over Competent Rock	250
SLS – Granular Pad over Competent Rock	150

It should be noted that care should be taken for foundations partially on bedrock and on soil due to the potential for differential settlement at the interface between the two media. Mitigation measures should be considered if such arrangements cannot be avoided. Generally, if there is not a minimum of 0.5 – 1.0 m of native competent sand to silty sand soil cover under foundation footprints to ensure a uniform foundation pad, it is recommended that the soil be removed down to the bedrock surface and foundations be placed either directly onto bedrock or on compacted engineered fill.

Further geotechnical investigation is recommended to confirm the results in Table 2-1.

2.3. Foundation Preparation Soils

The design specifications must include the following recommendations regarding preparation of subgrade for placement of concrete for the foundation.

- All topsoil including existing topsoil, any organics, deleterious material and or saturated material must be removed from the subgrade. This would also include removal of any oversize particles such as large cobbles or boulders within foundation footprints.
- If material at the bottom of the excavation for the foundation is disturbed, it must be recompact to its original density or 95% of the standard proctor maximum dry density (SPMDD).
- If any soft spots are detected, the material must be sub-excavated and replaced with compacted Granular A to 95% SPMDD.
- The subgrade should be compacted in the dry with no presence of excess water in the material. If the material is dryer than the optimum moisture content, water must be added prior to compaction to ensure the subgrade material is within 2 percent of the optimum moisture content.
- The subgrade and any fill shall be kept from freezing.
- All subgrade material shall be inspected and certified by a professional geotechnical engineer or their representative to verify the subgrade are reflective of the soils encountered and discussed in this memorandum. Inspection should take place prior to forming and the placement of concrete. If significant variation in soils are encountered additional engineering input will be required.

2.4. Foundation Preparation Bedrock

The design specifications must include the following recommendations regarding preparation of rock subgrade for placement of foundation concrete.

- All weathered, fragmented, or loose rock either from blasting or excavation should be scaled and removed to expose competent rock with a rock mass quality of fair to good as deemed by a geotechnical engineer.
- Upon completion of construction the surface should be thoroughly cleaned, and pressure washed to ensure the rock surface is free of dirt, debris, standing water, snow, or other deleterious materials.
- If the rock is found to be undulating lean concrete (min 5 MPa strength) should be added to level the foundation area for proper placement of concrete.
- The exposed and cleaned bedrock surface shall be inspected by a geotechnical engineer or their representative to determine the competency and cleanliness of the exposed rock. Construction of foundations may not commence until the bedrock subgrade surface has been certified by the geotechnical engineer in writing.

If significant pitting, undulation, or fissures are encountered after exposure of the bedrock surface the use of dental concrete may be required. TULLOCH should be contacted to provide further guidance if required/deemed necessary upon exposure.

2.5. Frost Protection

The estimated frost penetration depth at the site is 1.8 m as per OPSD 3090.101, as such, all exterior footings and foundations in unheated areas placed on native soils should be situated at 1.8 m below ground surface to provide adequate insulation against frost heaving. Permanently heated structures may place footings at an estimate of 1.4 m. Alternatively, insulation equivalent or soil cover can be used to raise the frost line. If shallower embedment is needed, Expanded Polystyrene (EPS) insulation or equivalent can be designed to prevent frost action. If the insulation material is expected to take any load, the design engineer should check the product specification(s) from the manufacturer and ensure the selected product(s) satisfy the expected loading conditions.

2.6. Open Cut Excavations

Excavation safety and the stability of temporary construction slopes and excavation support systems are the Contractor's responsibility. Where workers must enter excavations deeper than

1.2 m, the trench excavations must be suitably sloped and/or braced in accordance with the Occupational Health and Safety Act (OHSA), Ontario Regulation 213/9, Construction Projects, January 1, 2010, Part III - Excavations, Section 226. Alternatively, the excavation walls should be supported by engineered shoring, bracing, or trench boxes complying with Sections 235 to 239 and 241 under O. Reg. 231/91, s. 234(1).

Based on the OHSA, the in-situ native soils may be classified as Type 3 soils above the groundwater table. As the groundwater table was not encountered during the limited scope of this investigation, the in-situ soils are to be classified as Type 4 soils below the water table, if encountered during construction. Temporary excavation side slopes in Type 3 soils should remain stable at a slope of 1H:1V. Temporary excavation side slopes in Type 4 soils should remain stable at a slope of 3H:1V. The in-situ soils can be excavated using conventional earthmoving equipment.

Exposed bedrock faces should be scaled of all loose rock and inspected to help determine the safe cut angle. For reference a strong competent bedrock may be stable under temporary conditions at an approximate slope of 4V:1H.

2.7. Groundwater and Surface Water Control

Groundwater did not appear to be encountered during the investigation, however if soils become saturated de-watering will be required. It is anticipated that sump and pump techniques should be sufficient for de-watering excavations that can be limited to less than 0.3 m below the water table. It is likely that the soil/bedrock boundary will provide a preferential conduit for water as such management of seepage along the bedrock face should be anticipated. Furthermore, due to the steep topography and hilly terrain site surface water management will be important for excavations. Surface water should be shed away from open excavations and positive drainage should be promoted away from foundations and excavations during construction. The actual dewatering methods should be established at the contractor's discretion within the context of a performance specification of the project while following any applicable guidelines and rules under the Ontario Water Resource Act and the Water Taking and Transfer Regulation 387/04.

2.8. Reuse of Existing Fill

The sandy to silty native soils encountered during the investigation may be re-used as general fills. However due to a fines content in excess of 10% the material is likely frost susceptible and should not be used in areas where long term settlement is of concern including structural fills. Environmental sample testing was not part of the scope of this project; however, the contractor

must be prepared to test excavated material per Ontario Regulation 406/19 “Excess Soil Management”. Furthermore, soil disposal is considered outside the scope of this document. If required TULLOCH can provide further guidance with respect to excess soils management.

3. CLOSURE

This memorandum has been prepared for the exclusive use of the Polni Holdings. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering, for the proposed building. Classification and identification of soils, and geologic units have been based upon by visual inspection only and commonly accepted methods employed in professional geotechnical practice. No warranty or other conditions, expressed or implied, should be understood.

We trust that the information and recommendations in this memorandum will be found to be complete and adequate for your consideration. Should further elaboration be required for any portion of this project, we would be pleased to provide assistance.

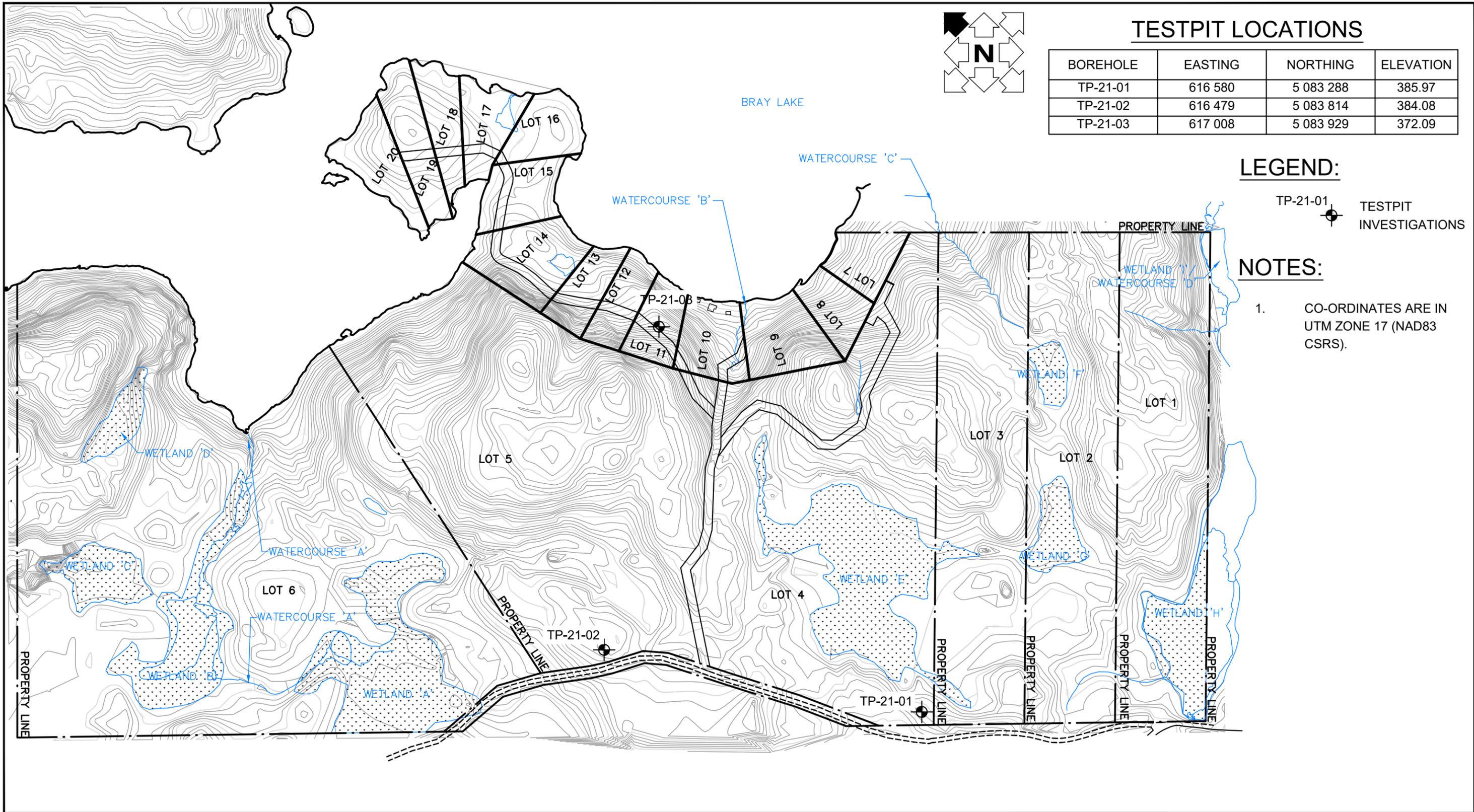
Sincerely,



Erik Giles, P. Eng.
Geotechnical Engineer



Site Plan



LEGEND:

TP-21-01  TESTPIT INVESTIGATIONS

NOTES:

1. CO-ORDINATES ARE IN UTM ZONE 17 (NAD83 CSRS).

No.	DATE	BY	ISSUES / REVISIONS
1	2022-08-29	DAM	PROPERTY BOUNDARIES UPDATED
0	2022-08-04	K.K	ISSUED FOR USE
A	2022-08-04	K.K	ISSUED FOR INTERNAL REVIEW



PROJECT:
**BRAY LAKE
SUBDIVISION**

DRAWING:
**GEOTECHNICAL INVESTIGATION
PLAN**

DRAWN BY:
K.K
DESIGNED BY:
E.G.
SCALE:
1:6000

CHECKED BY:
E.G.
APPROVED BY:
E.G.
DATE:
2022-08-04

PROJECT No. :
21-1851
DRAWING No.
G-01
REVISION No.
1

Site Photo Logs



Photo 1: TP21-01 Excavated from previous investigation – standing water in bottom of test pit.

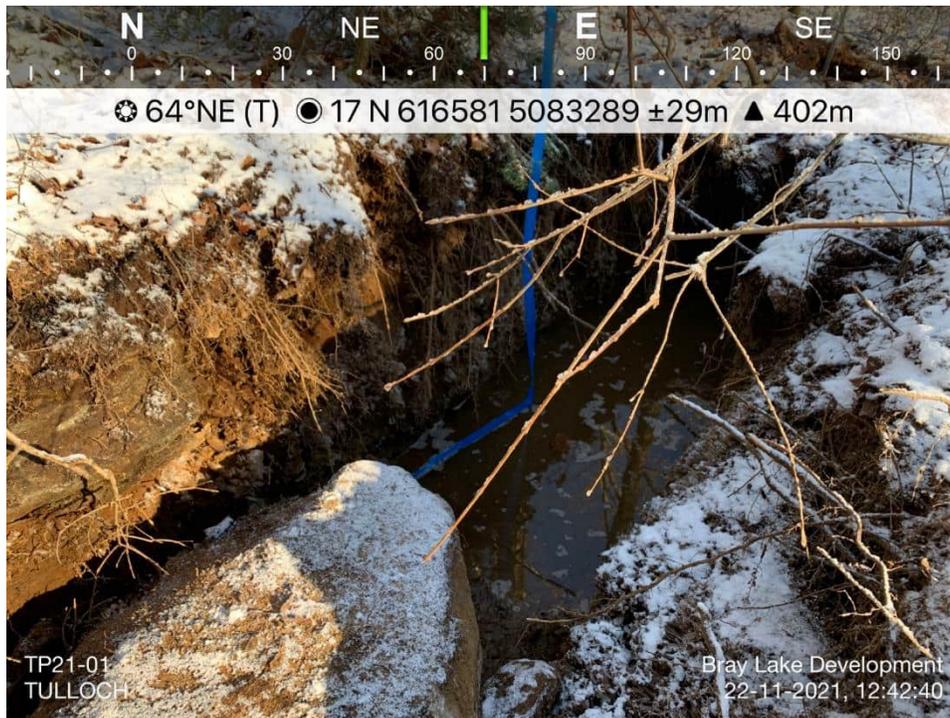


Photo 2: TP21-01 note large boulders in test pit at time of investigation.

CLIENT
Polni Holdings

PROJECT
Bray Lake Subdivision

CONSULTANT



YYYY-MM-DD 2022-02-16

PREPARED E.Giles

DESIGNED E.Giles

REVIEWED T. Maurer

APPROVED T. Maurer

TITLE
Soil Assessment

PROJECT NO.
21-1851

Phase/Task

Rev.
Rev 0

FIGURE
1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/A4 25 mm

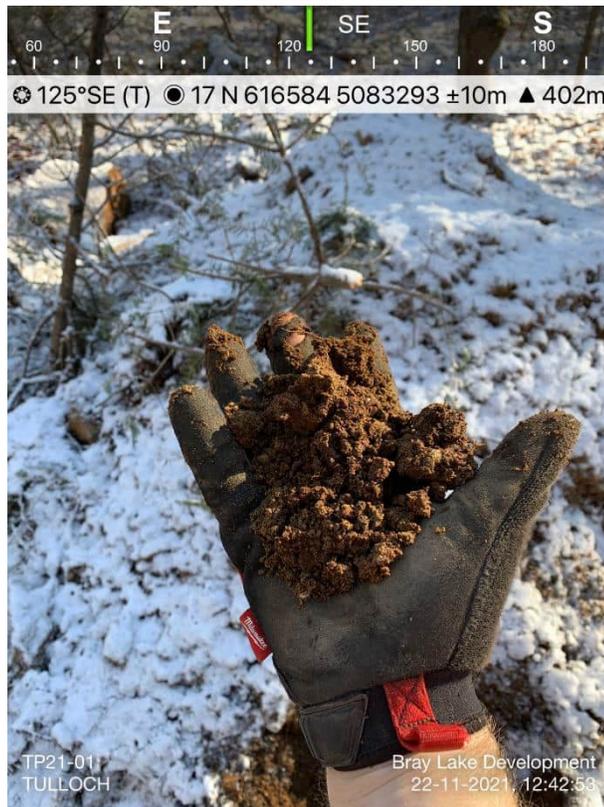


Photo 3: Typical sandy soil encountered at all Test pit locations contained gravel, cobbles and boulders



Photo 4: TP21-02 note standing water in bottom of test pit.

CLIENT
Polni Holdings

PROJECT
Bray Lake Subdivision

CONSULTANT



YYYY-MM-DD 2022-02-16

PREPARED E.Giles

DESIGNED E.Giles

REVIEWED T. Maurer

APPROVED T. Maurer

TITLE
Soil Assessment

PROJECT NO.
21-1851

Phase/Task

Rev.
Rev 0

FIGURE
2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/A4 TO A3



Photo 5: TP21-02 excavation note sandy soil stratum and standing water, hard surface noted at bottom of test pit.



Photo 6: TP 21-03 excavation – shallow refusal at approximately 0.9 m. Excavated into hillside with visible bedrock knobs.

CLIENT
Polni Holdings

PROJECT
Bray Lake Subdivision

CONSULTANT



YYYY-MM-DD 2022-02-16

PREPARED E.Giles

DESIGNED E.Giles

REVIEWED T. Maurer

APPROVED T. Maurer

TITLE
Soil Assessment

PROJECT NO.
21-1851

Phase/Task

Rev.
Rev 0

FIGURE
3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/A4 TO A3



Photo 7: TP21-03 – note standing water in test pit.



Photo 8: Hillside view from access road facing north, note significant bedrock outcrops.

CLIENT
Polni Holdings

PROJECT
Bray Lake Subdivision

CONSULTANT



YYYY-MM-DD 2022-02-16

PREPARED E.Giles

DESIGNED E.Giles

REVIEWED T. Maurer

APPROVED T. Maurer

TITLE
Soil Assessment

PROJECT NO.
21-1851

Phase/Task

Rev.
Rev 0

FIGURE
4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/A4 TO A4



Photo 11: low lying wet area with stream south of access road.



Photo 12: Low lying wet area south of access road possible creek in this area.

CLIENT
Polni Holdings

PROJECT
Bray Lake Subdivision

CONSULTANT



YYYY-MM-DD 2022-02-16

PREPARED E.Giles

DESIGNED E.Giles

REVIEWED T. Maurer

APPROVED T. Maurer

TITLE
Soil Assessment

PROJECT NO. Phase/Task
21-1851

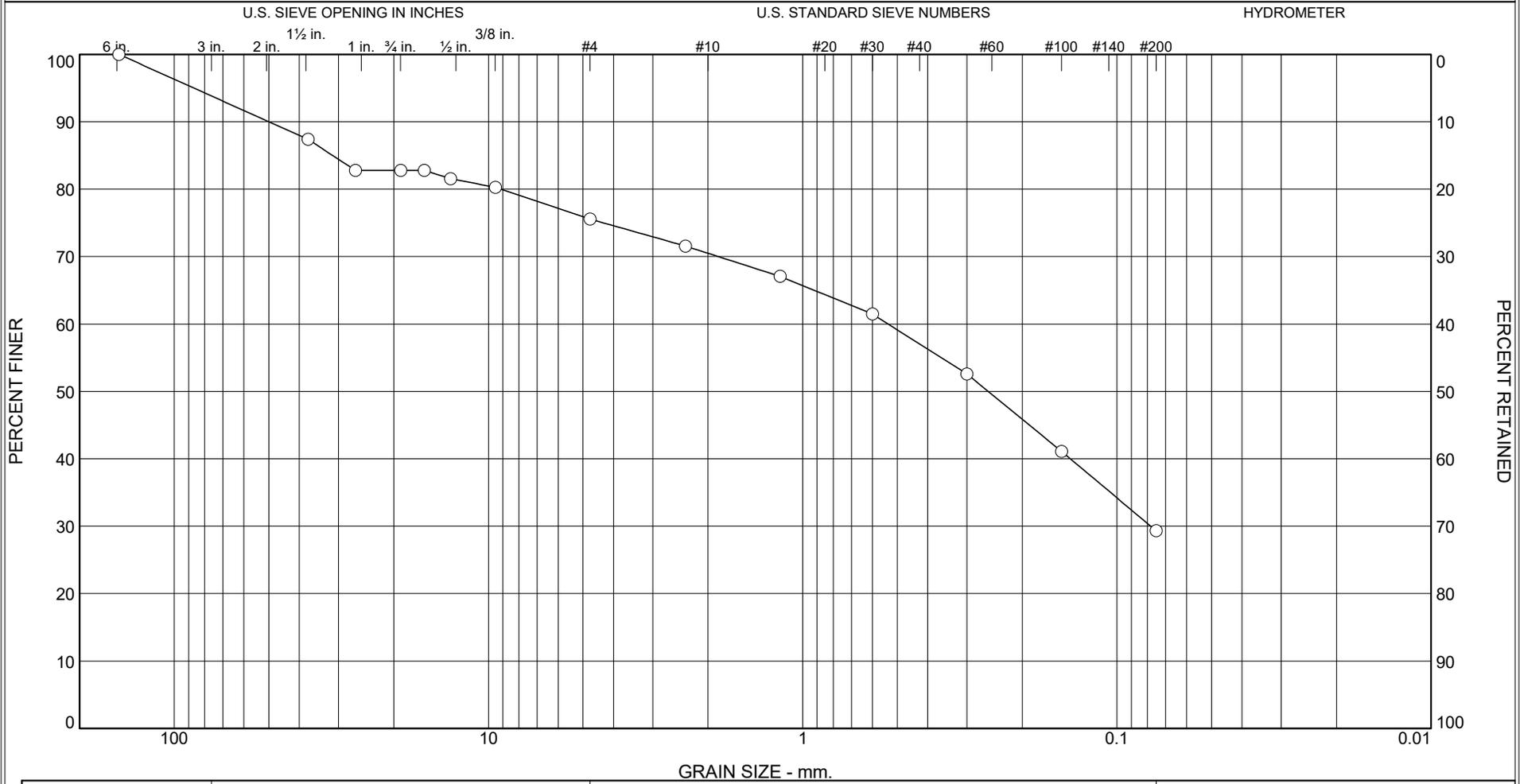
Rev.
Rev 0

FIGURE
5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/A4 TO A4

Laboratory Testing

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt
6.2	11.0	7.2	5.1	13.4	27.8	29.3

Identification			Date Sampled	Date Received	Date Tested
Source of Sample: TP21-02	Depth: 0.25m - 1.3m	Sample Number: SA1	Nov 9/21	Dec 3/21	Dec 7/21

Client	 <p>71 Black Road Unit 8 Sault Ste. Marie, ON P6B 0A3</p> <p>T. 705 949.1457 F. 705 949.9606 TF. 866 806.6602 Daren.Stadnisky@TULLOCH.ca</p>	
Project Bray Lake		
Project No. 21-1851		
Figure		

Tested By: L. Roach **Checked By:** T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

2021-12-09

Project: Bray Lake
Project Number: 21-1851
Location: TP21-02
Depth: 0.25m - 1.3m
Date Sampled: Nov 9/21
Tested by: L. Roach

Sample Number: SA1
Date Received: Dec 3/21 **Date Tested:** Dec 7/21
Checked by: T. Linley

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 1165.10
 Tare Wt. = 158.50
 Minus #200 from wash = 17.2%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained
1373.70	158.50	150mm	0.00	0.00	100.0	0.0
		37.5mm	153.30	0.00	87.4	12.6
		26.5mm.	55.80	0.00	82.8	17.2
		19mm.	0.00	0.00	82.8	17.2
		16mm.	0.00	0.00	82.8	17.2
		13.2mm.	15.20	0.00	81.5	18.5
		9.5mm.	15.40	0.00	80.3	19.7
		#4	57.30	0.00	75.6	24.4
		#8	48.60	0.00	71.6	28.4
		#16	54.60	0.00	67.1	32.9
		#30	68.00	0.00	61.5	38.5
		#50	107.90	0.00	52.6	47.4
		#100	139.70	0.00	41.1	58.9
		#200	143.10	0.00	29.3	70.7

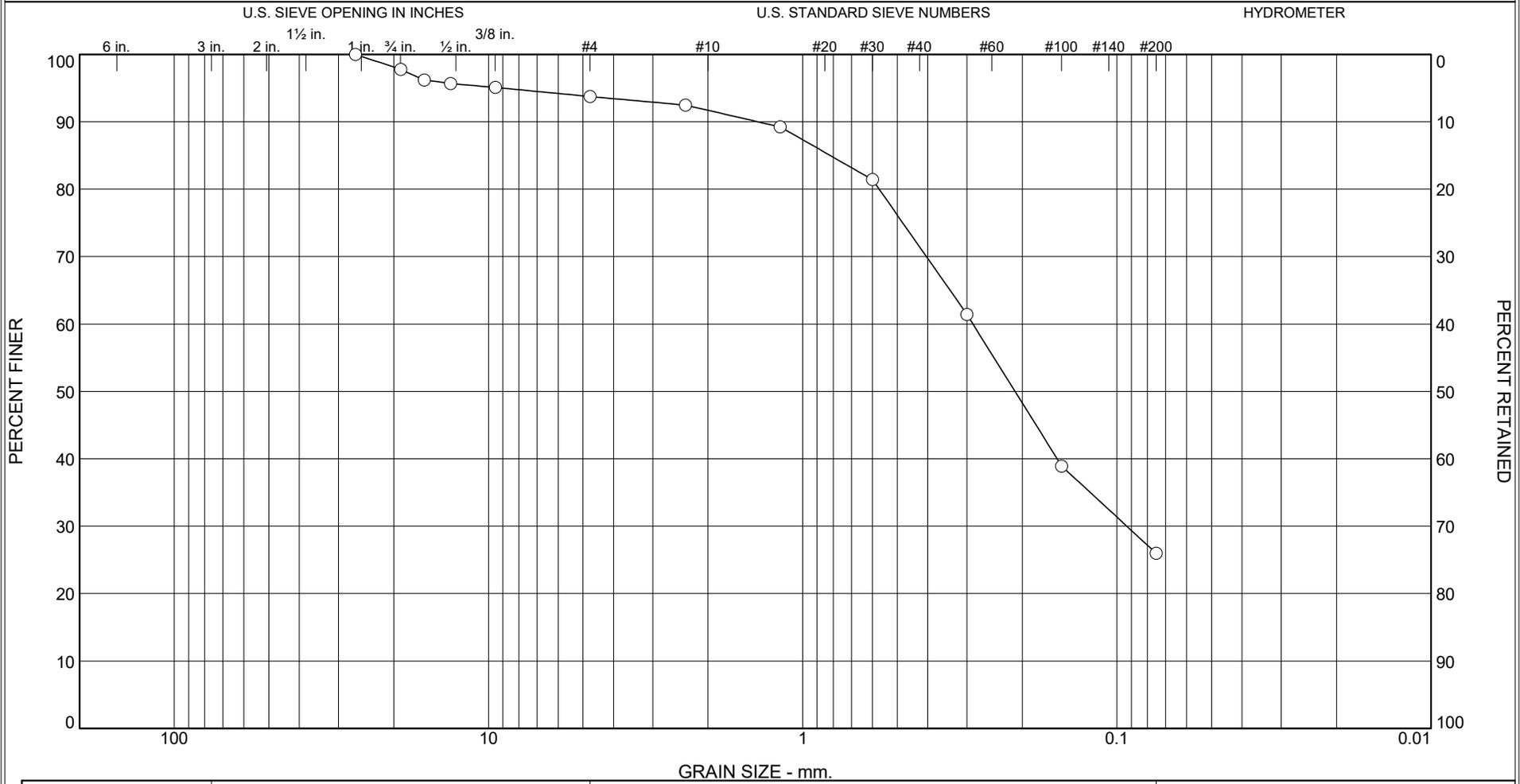
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
6.2	11.0	7.2	18.2	5.1	13.4	27.8	46.3			29.3

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
				0.0781	0.1406	0.2566	0.5349	9.1238	31.3127	49.9853	86.5898

Fineness Modulus
2.86

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt
0.0	2.2	4.1	2.0	20.2	45.5	26.0

Identification			Date Sampled	Date Received	Date Tested
Source of Sample: TP21-03	Depth: 0.3m - 0.8m	Sample Number: SA1	Nov 9/21	Dec 3/21	Dec 7/21

Client	 <p>71 Black Road Unit 8 Sault Ste. Marie, ON P6B 0A3</p> <p>T. 705 949.1457 F. 705 949.9606 TF. 866 806.6602 Daren.Stadnisky@TULLOCH.ca</p>	
Project Bray Lake		
Project No. 21-1851		

Tested By: L. Roach **Checked By:** T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

2021-12-09

Project: Bray Lake
Project Number: 21-1851
Location: TP21-03
Depth: 0.3m - 0.8m
Date Sampled: Nov 9/21
Tested by: L. Roach

Sample Number: SA1
Date Received: Dec 3/21 **Date Tested:** Dec 7/21
Checked by: T. Linley

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained
948.70	162.40	26.5mm.	0.00	0.00	100.0	0.0
		19mm.	17.60	0.00	97.8	2.2
		16mm.	12.20	0.00	96.2	3.8
		13.2mm.	4.20	0.00	95.7	4.3
		9.5mm.	4.60	0.00	95.1	4.9
		#4	10.60	0.00	93.7	6.3
		#8	10.00	0.00	92.5	7.5
		#16	25.40	0.00	89.2	10.8
		#30	61.50	0.00	81.4	18.6
		#50	157.30	0.00	61.4	38.6
		#100	176.80	0.00	38.9	61.1
		#200	101.80	0.00	26.0	74.0

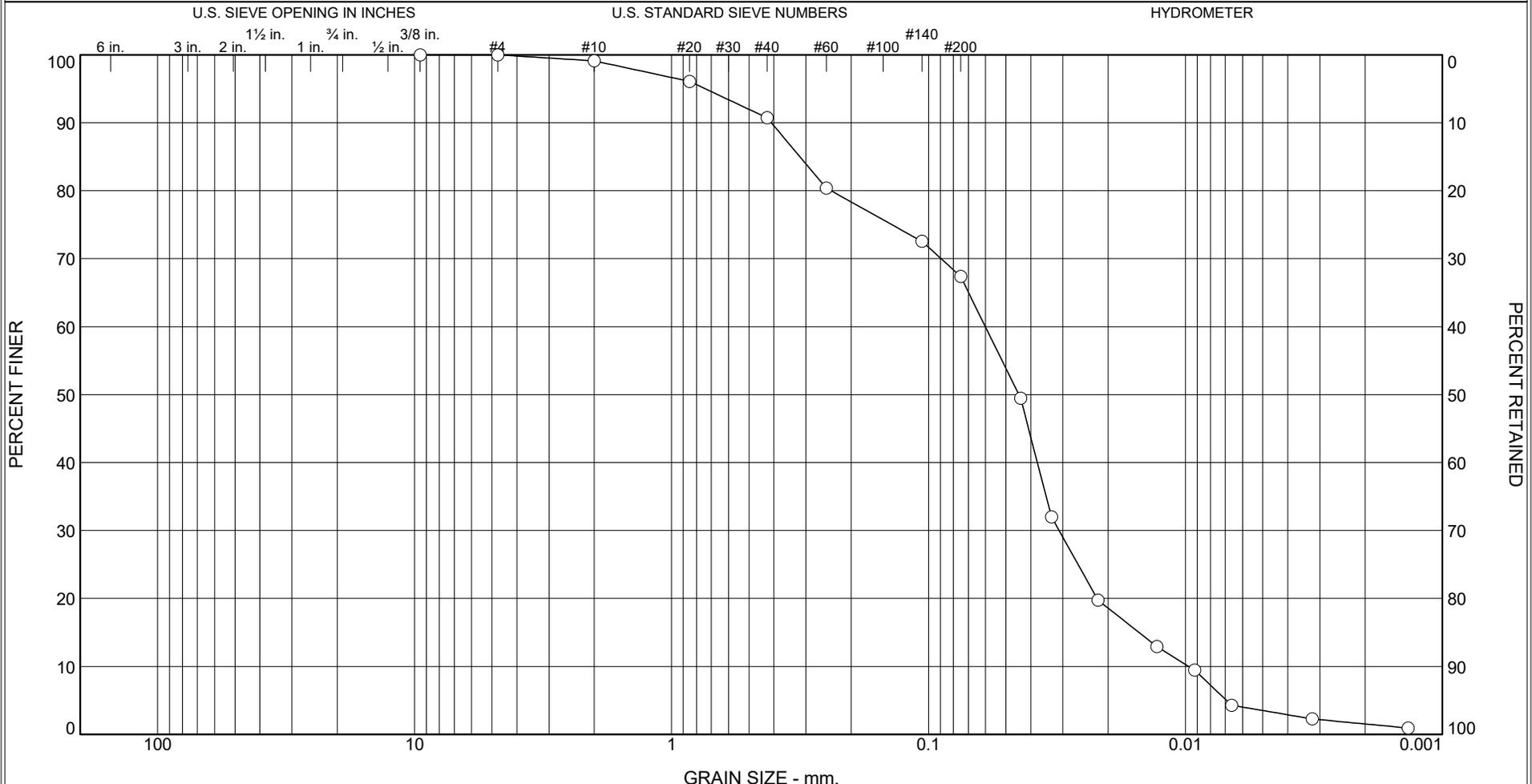
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	2.2	4.1	6.3	2.0	20.2	45.5	67.7			26.0

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
				0.0930	0.1550	0.2110	0.2872	0.5712	0.8178	1.3888	9.0661

Fineness Modulus
1.50

Particle Size Distribution Report



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.9	8.4	23.3	63.9	3.5

Identification			Date Sampled	Date Received	Date Tested
Source of Sample: TP21-04	Depth: 0.3m - 0.55m	Sample Number: SA2	Nov 9/21	Dec 3/21	Dec 7/21

Client	 <p>71 Black Road Unit 8 Sault Ste. Marie, ON P6B 0A3</p> <p>T. 705 949.1457 F. 705 949.9606 TF. 866 806.6602 Daren.Stadnisky@TULLOCH.ca</p>	
Project Bray Lake		
Project No. 21-1851		
Figure		

Tested By: T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

2021-12-09

Project: Bray Lake
Project Number: 21-1851
Location: TP21-04
Depth: 0.3m - 0.55m
Date Sampled: Nov 9/21
Tested by: T. Linley

Sample Number: SA2
Date Received: Dec 3/21
Date Tested: Dec 7/21

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained
987.71	164.90	9.5mm.	0.00	0.00	100.0	0.0
		#4	0.00	0.00	100.0	0.0
56.10	0.00	#10	0.50	0.00	99.1	0.9
		#20	1.70	0.00	96.1	3.9
		#40	3.00	0.00	90.7	9.3
		#60	5.80	0.00	80.4	19.6
		#140	4.40	0.00	72.5	27.5
		#200	2.90	0.00	67.4	32.6

Hydrometer Test Data

Hydrometer test uses material passing #10
 Percent passing #10 based upon complete sample = 99.1
 Weight of hydrometer sample = 56.1
 Automatic temperature correction
 Composite correction (fluid density and meniscus height) at 20 deg. C = -5
 Meniscus correction only = -1.0
 Specific gravity of solids = 2.70
 Hydrometer type = 152H
 Hydrometer effective depth equation: $L = 16.294964 - .164 \times R_m$

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.6	33.0	28.3	0.0132	32.0	11.0	0.0438	49.5	50.5
2.00	21.6	23.0	18.3	0.0132	22.0	12.7	0.0332	32.0	68.0
5.00	21.6	16.0	11.3	0.0132	15.0	13.8	0.0219	19.8	80.2
15.00	21.9	12.0	7.4	0.0131	11.0	14.5	0.0129	12.9	87.1
30.00	22.0	10.0	5.4	0.0131	9.0	14.8	0.0092	9.4	90.6
60.00	22.2	7.0	2.5	0.0131	6.0	15.3	0.0066	4.3	95.7
250.00	23.5	5.5	1.3	0.0129	4.5	15.6	0.0032	2.3	97.7
1440.00	22.5	5.0	0.5	0.0130	4.0	15.6	0.0014	0.9	99.1

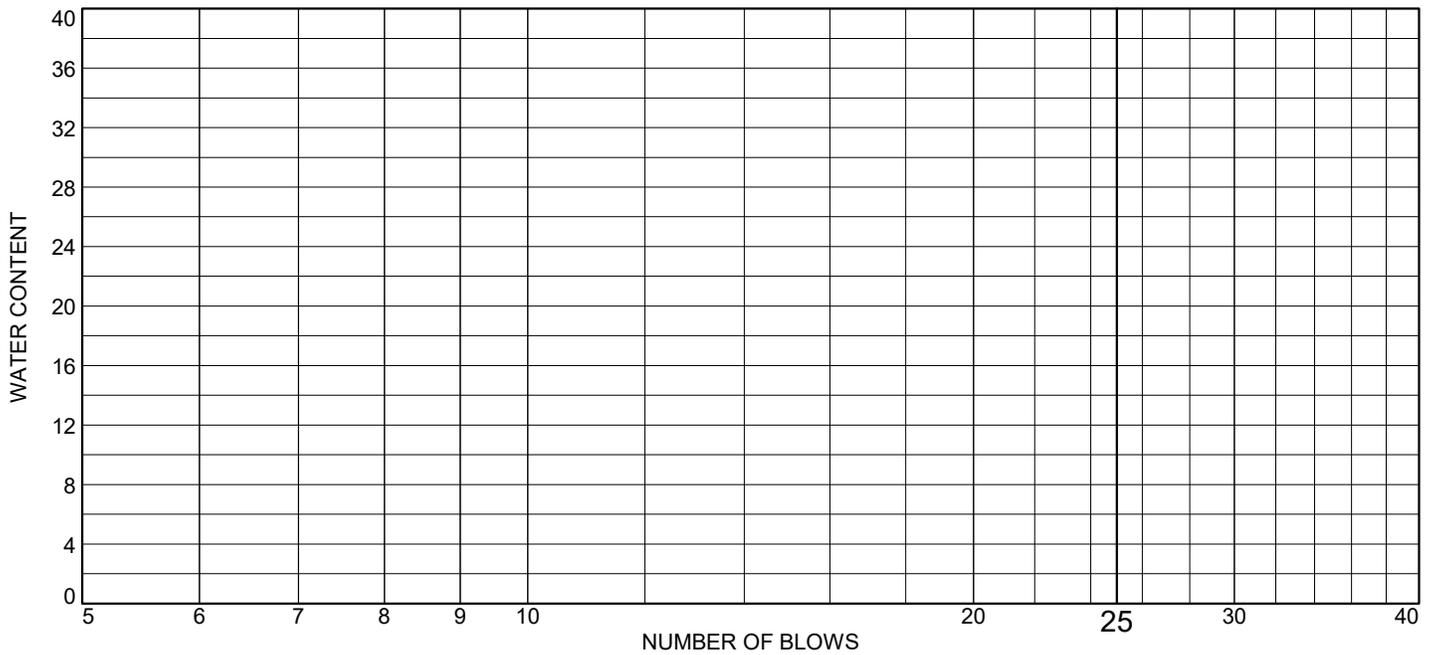
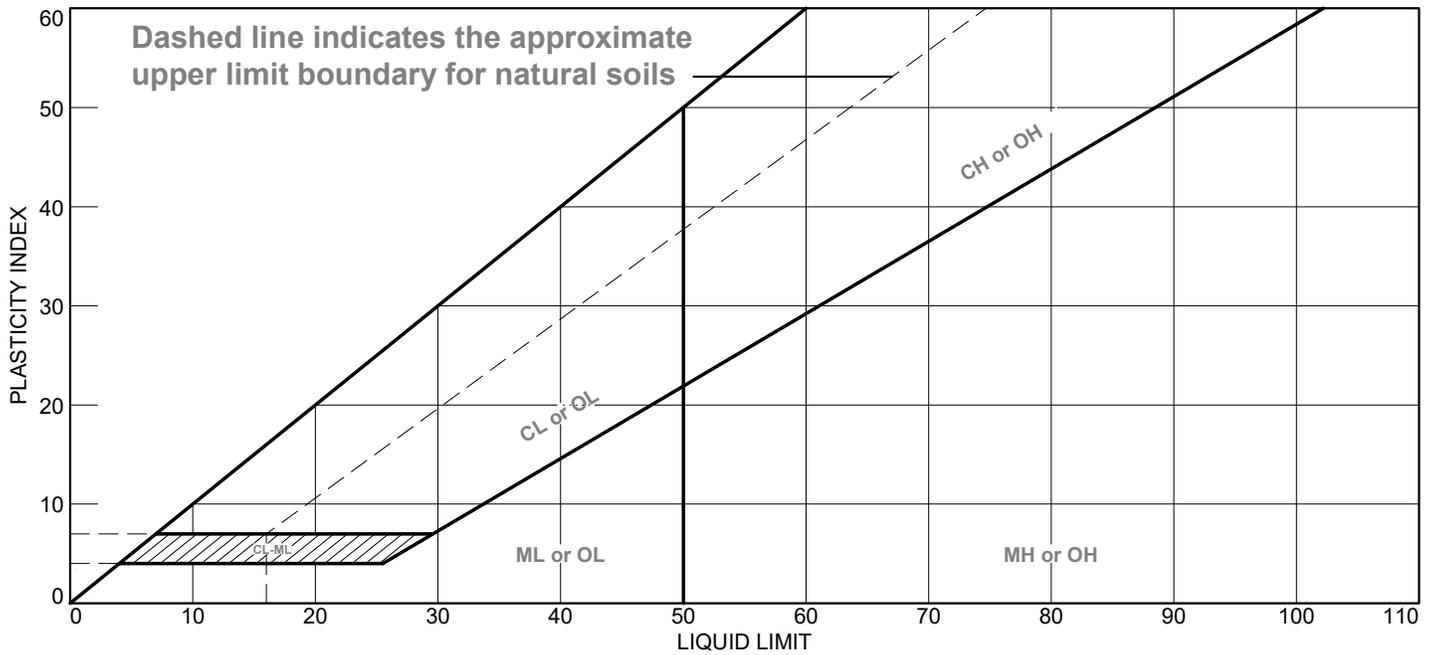
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.9	8.4	23.3	32.6	63.9	3.5	67.4

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
0.0069	0.0097	0.0152	0.0221	0.0310	0.0377	0.0445	0.0601	0.2395	0.3167	0.4094	0.7391

Fineness Modulus	C _u	C _c
0.50	6.18	1.65

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●				90.7	67.4	

Project No. 21-1851 Project: Bray Lake Source of Sample: TP21-04 Sample Number: SA2	Client: Depth: 0.3m - 0.55m	Remarks: ● Atterberg attempted - material determined to be non-plastic
 71 Black Road Unit 8 Sault Ste. Marie, ON P6B 0A3 T. 705 949.1457 F. 705 949.9606 TF. 866 806.6602 Daren.Stadnisky@TULLOCH.ca		Figure

Tested By: T. Linley _____

DCP Results

Manual Dual Mass Dynamic Cone Penetration Test Report

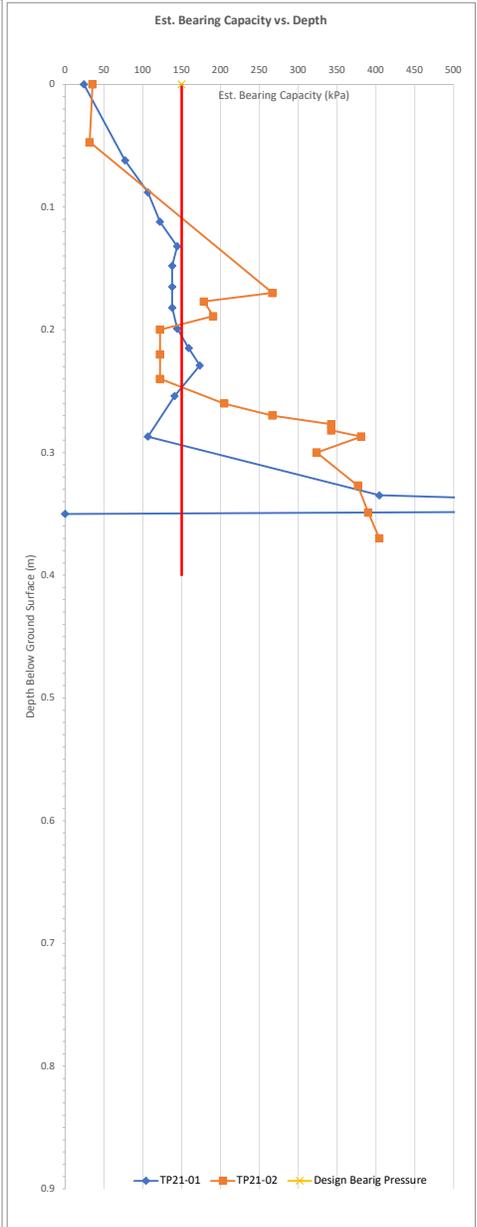
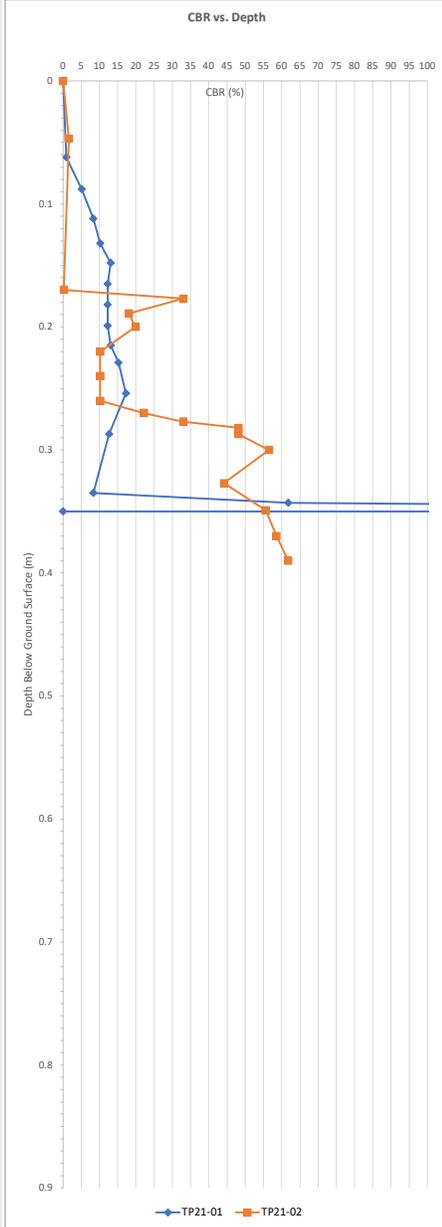
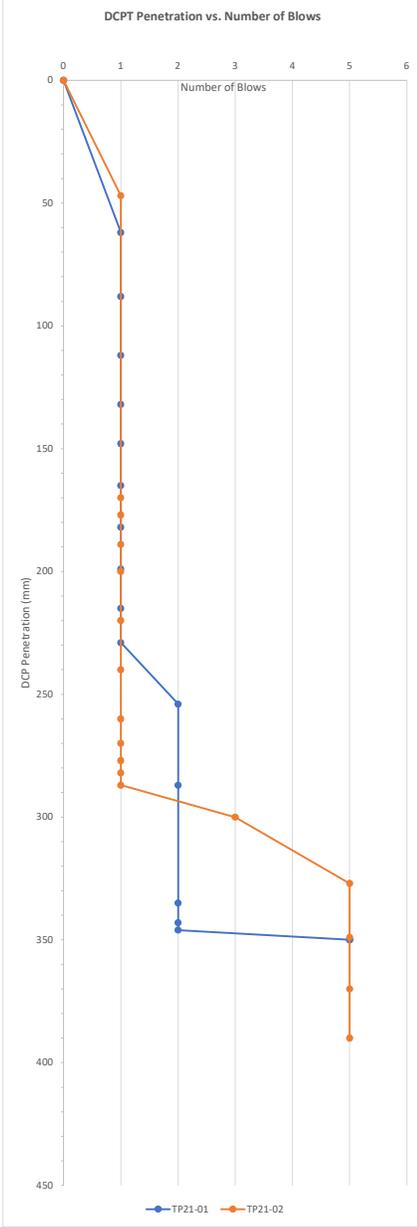
Project: Bray Lake Subdivision

Project Number: 21-1851

Dynamic Cone Penetration Test Number: DTP21-01 and TP21-02

DCP Starting Depth Below Ground Surface: ~0.3m below ground surface

Hammer weight: 8.0 kg
Fall of Hammer: 0.574 m



Notice to Reader

NOTICE TO READER

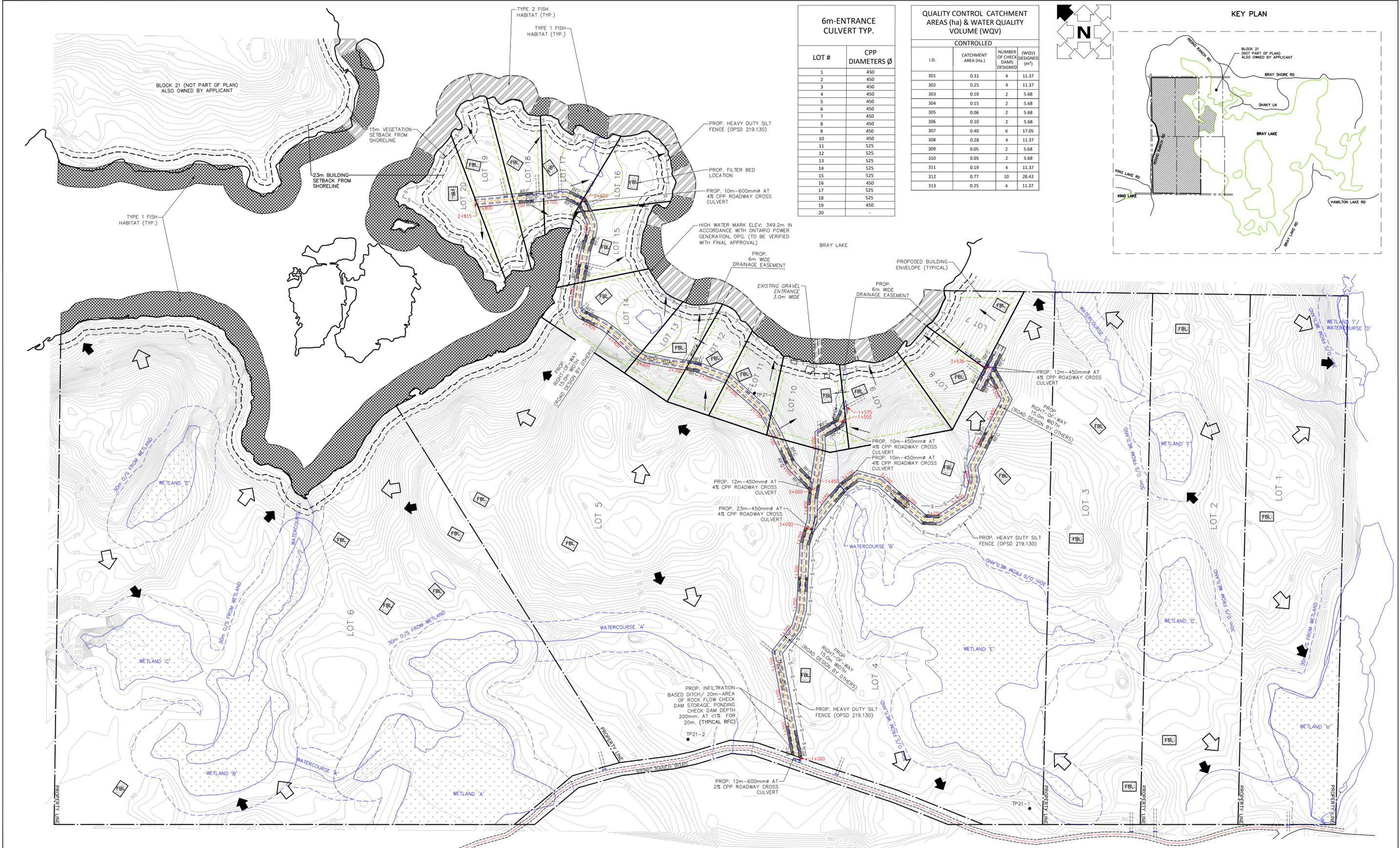
This Report has been prepared by TULLOCH Engineering Inc. ('TULLOCH') for the sole and exclusive use of Polni Holdings (the 'Client') to support preliminary recommendations for the development on Bray Lake (the 'Development') in Machar, Ontario (the 'Site'). The Report shall not be used for any other purpose, or provided to, relied upon or used by any third party without the express written consent of TULLOCH.

A visual site assessment was carried out from examination of existing test pits; and as such, the information collected and presented herein applies to visible soils only. The subsurface conditions that were not visible can change and accordingly any use of the data contained in this Report should take into consideration the nature of the materials and potential variation of soils.

This Report contains opinions, conclusions and recommendations made by TULLOCH using professional judgment and reasonable care for the purpose of foundation design for the Development. Use of or reliance on this report by the Client is subject to the following conditions:

- a) the report being read in the context of and subject to the terms of the Engineering Services Agreement for the Work, including any methodologies, procedures, techniques, assumptions and other relevant terms or conditions specified or agreed therein;
- b) the report being read in its entirety. TULLOCH is not responsible for the use of portions of the report without reference to the entire report;
- c) the conditions of the site may change over time or may have already changed due to natural forces or human intervention, and TULLOCH takes no responsibility for the impact that such changes may have on the accuracy or validity of the observations, conclusions and recommendations set out in this report;
- d) the classification of soils and rocks in this report is based on commonly accepted methods. However, the classification of geologic materials and the boundaries between subsurface layers involves judgement. Boundaries between different soils layers may also be transitional rather than abrupt. TULLOCH does not warrant or guarantee the exactness of these descriptions and boundaries.
- e) the subsurface conditions must be verified by a qualified geotechnical engineer during construction to ensure that the borehole data presented herein is representative of the actual site conditions so that the design recommendations contained herein remain valid; and
- f) the report is based on information made available to TULLOCH by the Client or by certain third parties; and unless stated otherwise in the Agreement, TULLOCH has not verified the accuracy, completeness or validity of such information, makes no representation regarding its accuracy and hereby disclaims any liability in connection therewith.

This report has been prepared with the degree of care, skill and diligence normally provided by engineers in the performance of comparable services for projects of similar nature. The scope of this report includes foundation engineering design only and it specifically excludes investigation, detection, prevention and assessment of the presence of subsurface contaminants. No conclusions or inferences should be drawn regarding contamination at the site including but not limited to molds, fungi, spores, bacteria, viruses, soil gases such as Radon, PCBs, petroleum hydrocarbons, inorganic and volatile organic compounds, polycyclic aromatic hydrocarbons and or any by products thereof.

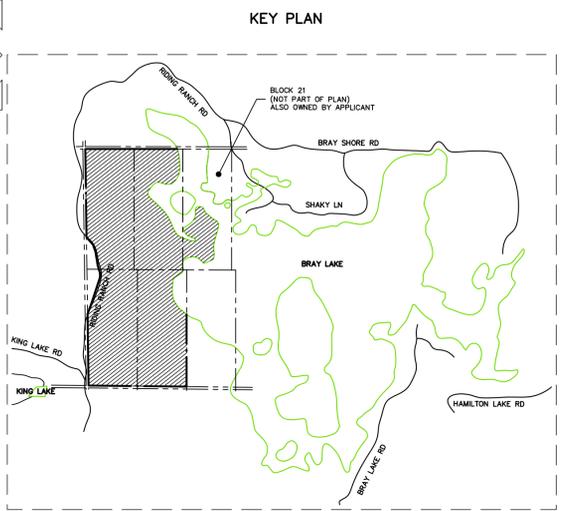
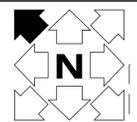


6m-ENTRANCE CULVERT TYP.

LOT #	CPP DIAMETERS Ø
1	450
2	450
3	450
4	450
5	450
6	450
7	450
8	450
9	450
10	450
11	525
12	525
13	525
14	525
15	525
16	450
17	525
18	525
19	450
20	-

QUALITY CONTROL CATCHMENT AREAS (ha) & WATER QUALITY VOLUME (WQV)

CONTROLLED			
I.D.	CATCHMENT AREA (ha)	NUMBER OF CHECK DAMS DESIGNED	(WQV) DESIGNED (m³)
301	0.31	4	11.37
302	0.25	4	11.37
303	0.10	2	5.68
304	0.15	2	5.68
305	0.06	2	5.68
306	0.10	2	5.68
307	0.40	6	17.05
308	0.28	4	11.37
309	0.05	2	5.68
310	0.05	2	5.68
311	0.19	4	11.37
312	0.77	10	28.42
313	0.25	4	11.37



LEGEND

PROPERTY LINE	—	(PROPOSED) BUILDING ENVELOPE	[Hatched]
EXISTING CONTOURS	—192	(PROPOSED) FILTER BED LOCATION	[FBL]
(PROPOSED) EDGE OF ASPHALT	- - -	(EXISTING) OVERLAND FLOW	[Arrow]
30m SETBACK	- - -	(PROPOSED) OVERLAND FLOW	[Arrow]
WETLAND	[Dotted]	100YR. SHEET FLOW	[Arrow]
(PROPOSED) DOCK LOCATION	[Symbol]		
(PROPOSED) DRIVEWAY	[Symbol]		

(PROPOSED) SILT FENCE (OPSD 219.130)	—S—S—	DENOTES TYPE 1 FISH HABITAT	[Symbol]
ROCK FLOW CHECK DAM	[Symbol]	DENOTES TYPE 2 FISH HABITAT	[Symbol]
STRAW BALE CHECK DAM	[Symbol]		
AREA OF INFILTRATION BASED STORAGE	[Symbol]		
(PROPOSED) DITCH	- - -		

REVISION:

No.	DATE	BY
1	AUGUST 31, 2022	C.S.

No.	DATE	BY
1	AUGUST 31, 2022	C.S.



**BRAY LAKE SUBDIVISION
BRAY LAKE, MACHAR, ON**

**PRELIMINARY STORMWATER MANAGEMENT,
PRIVATE SEWAGE SYSTEM ASSESSMENT &
CONSTRUCTION MITIGATION PLAN**



SCALE 1:2500

DRAWN E.V.

CHECKED C.S./M.B.B.

DATE AUGUST 31, 2022

PROJECT No. 21-1851

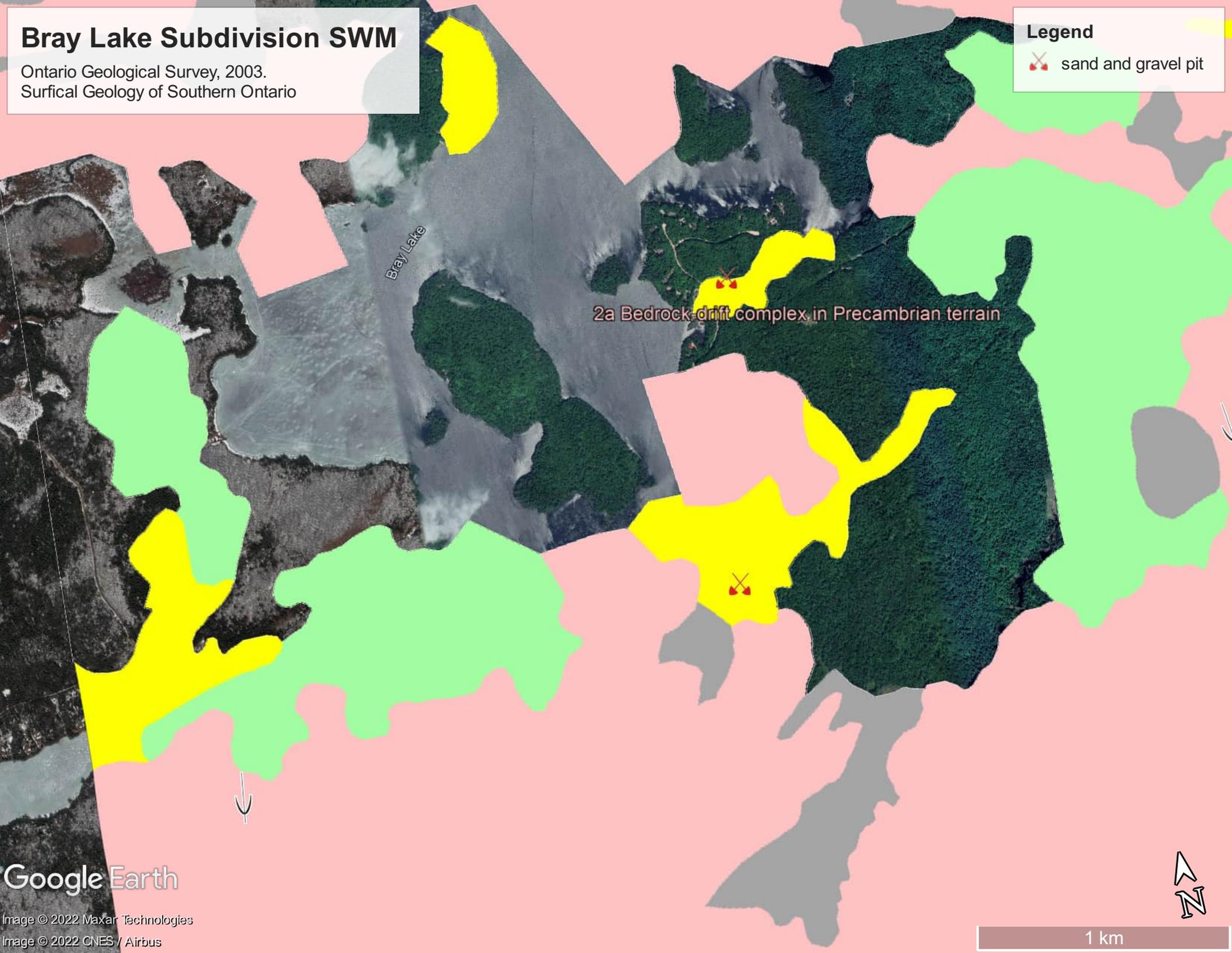
SHEET SWM 1

Bray Lake Subdivision SWM

Ontario Geological Survey, 2003.
Surficial Geology of Southern Ontario

Legend

-  sand and gravel pit



Google Earth

Image © 2022 Maxar Technologies
Image © 2022 CNES / Airbus



Ontario Geological Survey

SURFICIAL GEOLOGY OF SOUTHERN ONTARIO

This map is published with the permission of the Senior Manager, Sedimentary Geoscience Section, Ontario Geological Survey.



Location Map

SOURCES OF INFORMATION

Base map: Natural Resources and Values Information System (NRVIS)

Projection: NAD 83

CREDITS

Author: The Ontario Geological Survey

Acknowledgements: John Dodge (OGS), Andy Bajc (OGS), George Gao (OGS), Steve van Haften (OGS), Shannon Evers (OGS), Steve Loney (MNR), John Ernsting (MNR), Scott Christilaw (MNR), Andrew Moore (GSC)

Every possible effort has been made to ensure the accuracy of the information presented on this map; however, the Ontario Ministry of Northern Development and Mines does not assume any liabilities for errors that may occur. Users may wish to verify critical information.

Issued 2003.

Information from this publication may be quoted if credit is given. It is recommended that reference be made in the following form:

The Ontario Geological Survey, 2003. Surficial Geology of Southern Ontario.

LEGEND

- Fill
- Organic Deposits: peat, muck and marl
- Silt
- Clay
- Sand
- Gravel
- Till (Diamiction)
- Sedimentary (Paleozoic) bedrock
- Precambrian bedrock

Correlation Matrix:

Material	Current map units
Fill	21
Organic Materials	20
Silt & Clay	8, 10, 12, 13, 15, 18, 19
Sand & Gravel	6, 7, 9, 11, 12, 14, 16, 18, 19
Sand	6, 7, 9, 11, 12, 14, 16, 17, 18, 19
Till (Diamiction)	5, 5a, 5b, 5c, 5d, 5e
Sedimentary bedrock	3, 4
Precambrian bedrock	1, 2

LEGEND

PHANEROZOIC

CENOZOIC

QUATERNARY

RECENT

- 21** **Man-made deposits:** fill, sewage lagoon, landfill, urban development
- 20** **Organic Deposits:** peat, muck, marl
- 19** **Modern alluvial deposits:** clay, silt, sand, gravel, may contain organic remains
- 18** **Colluvial deposits:** boulders, scree, talus, undifferentiated landslide materials
- 17** **Eolian deposits:** fine to very fine sand and silt
- 16** **Coarse-textured marine deposits:** sand, gravel, minor silt and clay
16a Deltaic deposits
16b Littoral deposits
16c Foreshore and basinal deposits
- 15** **Fine-textured marine deposits:** silt and clay, minor sand and gravel
- 14** **Coarse-textured lacustrine deposits:** sand, gravel, minor silt and clay
14a Deltaic deposit
14b Littoral deposits
14c Foreshore and basinal deposits
- 13** **Fine-textured lacustrine deposits:** silt and clay, minor sand and gravel

PLEISTOCENE

- 12** **Older alluvial deposits:** clay, silt, sand, gravel, may contain organic remains
- 11** **Coarse-textured glaciomarine deposits:** sand, gravel, minor silt and clay
11a Deltaic deposits
11b Littoral deposits
11c Foreshore and basinal deposits
- 10** **Fine-textured glaciomarine deposits:** silt and clay, minor sand and gravel
10a Massive to well laminated
10b Interbedded silt and clay and gritty, pebbly flow till and rainout deposits
- 9** **Coarse-textured glaciolacustrine deposits:** sand, gravel, minor silt and clay
9a Deltaic deposits
9b Littoral deposits
9c Foreshore and basinal deposits
- 8** **Fine-textured glaciolacustrine deposits:** silt and clay, minor sand and gravel
8a Massive to well laminated
8b Interbedded silt and clay and gritty, pebbly flow till and rainout deposits
- 7** **Glaciofluvial deposits:** river deposits and delta topset facies
7a Sandy deposits
7b Gravelly deposits
- 6** **Ice-contact stratified deposits:** sand and gravel, minor silt, clay and till
6a In moraines, eskers, kames and crevasse fills
6b In subaquatic fans
- 5a** **Till:** Silty sand to sand-textured till on Precambrian terrain
5a Silty sand to sand-textured till on Precambrian terrain
- 5b** **5b** Stone-poor, sandy silt to silty sand-textured till on Paleozoic terrain
- 5c** **5c** Stony, sandy silt to silty sand-textured till on Paleozoic terrain
- 5d** **5d** Clay to silt-textured till (derived from glaciolacustrine deposits or shale)
- 5e** **5e** Undifferentiated older tills, may include stratified deposits

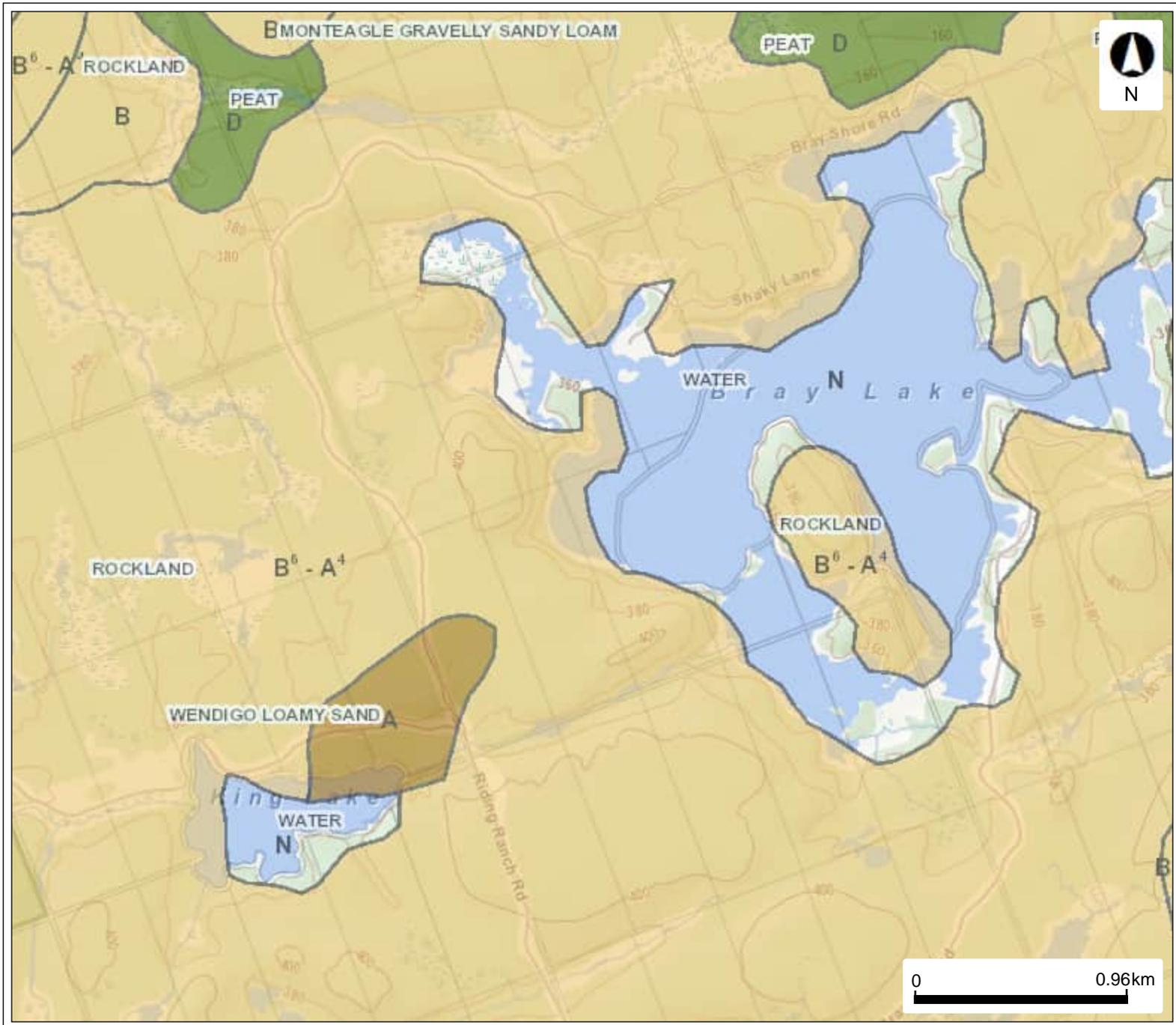
PALEOZOIC

- 4** **Bedrock-drift complex in Paleozoic terrain:**
4a Primarily till cover
4b Primarily stratified drift cover
 - 3** **Paleozoic bedrock**
- #### PRECAMBRIAN
- 2** **Bedrock-drift complex in Precambrian terrain:**
2a Primarily till cover
2b Primarily stratified drift cover
 - 1** **Precambrian bedrock**

SYMBOLS

- Clay pit (active or inactive)
- Peat and muck pit
- Location of quarry
- Sand or gravel pit;
- Tailings
- Stoss and lee feature; crag and tail
- Delta, glaciolacustrine
- Drumlin or drumlinoid ridges
- Dune
- Glacial fluting
- Fossil locality
- Geotechnical or stratigraphic borehole not reaching bedrock
- Kame
- Solution weathering feature
- Kettle
- Outcrop
- Observed pebble orientation in till
- Reservoir
- Roches moutonnee
- Sample site
- Small landslide scar
- Glacial striae; direction of ice movement known
- Glacial striae; direction of ice movement unknown
- Talus
- Area of sand dune
- Area of former lake bed
- Area of ribbed moraine or till ridges transverse to ice flow
- Area of scabland
- Beach ridges and near shore bars
- Shore bluff or scarp
- Crevasse filling
- Crests of large sand dune (eolian)
- Trend of moraine crest
- Bedrock scarp or escarpment
- Esker; direction of flow known
- Esker; direction of flow unknown
- Meltwater channel; inferred direction of flow
- Meltwater channel; direction of flow unknown
- Iceberg keel mark
- Ice-contact slope
- Clint and gryke topography
- Linear feature observed on aerial photograph
- Crest of megaripple
- Meltwater flow; inferred direction of flow
- Meltwater flow; direction of flow unknown
- Minor moraine
- Mapable edge of quarry or pit
- Bedrock pressure release ridge
- Ribbed or rogen moraine
- Edge of a mapable landslide scar
- Slump block, margin
- Abandoned meltwater channel or river channel; terrace escarpment
- Area of hummocky topography
- Area of moraine with no hummocky topography

Bray Lake Subdivision - Ontario Soil Survey Complex Hydrologic Soil Group



Legend

- Assessment Parcel
- Soil Name Label

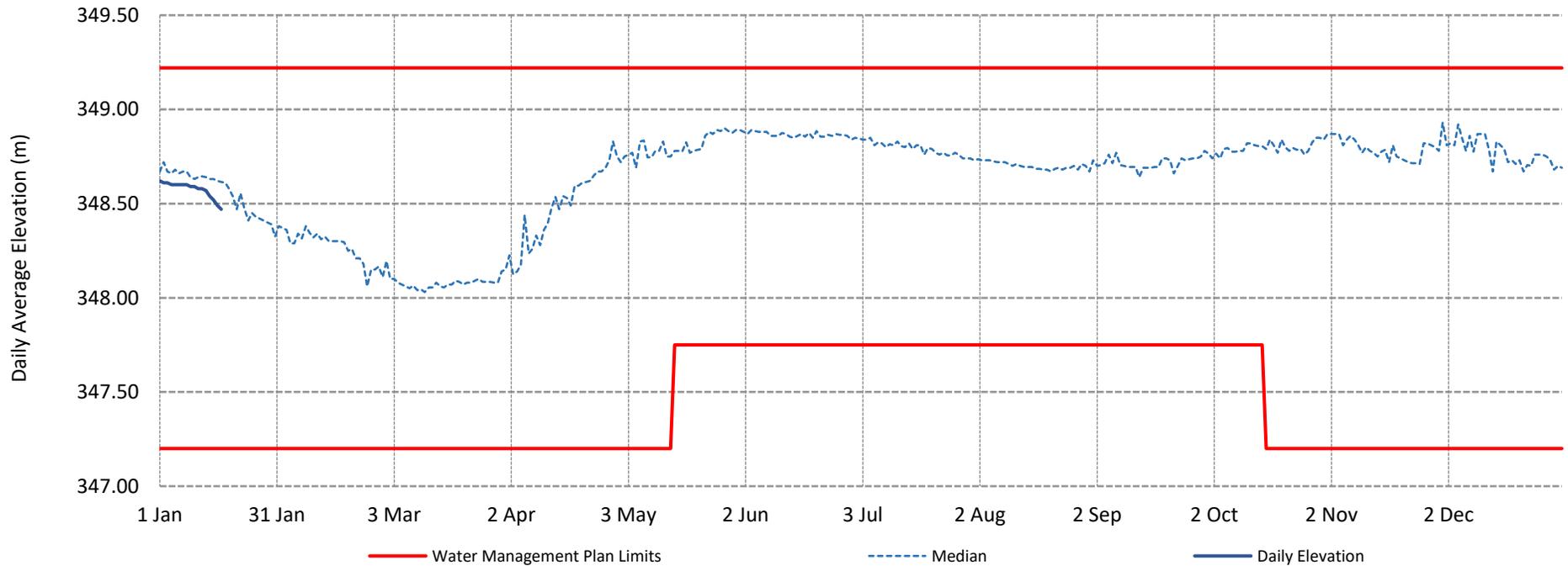
Hydrologic Soil Group

- A - High
- B - Moderate
- C - Slow
- D - Very Slow

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) shall not be liable in any way for the use or any information on this map. of, or reliance upon, this map.

Bray Lake Level 2022

Date	Level (m)	Flow (m ³ /s)
1/11/2022	348.58	0.3
1/12/2022	348.58	0.3
1/13/2022	348.57	1.0
1/14/2022	348.54	1.4
1/15/2022	348.52	1.2
1/16/2022	348.49	1.1
1/17/2022	348.47	1.0



Ontario Power Generation Provisional Data

For further info please contact

Kate Cantin
p: (705) 268-9197

Data current as of 1/18/2022

***RICK VAILLANCOURT
BOX 241
SOUTH RIVER, ONTARIO P0A 1X0***

705-386-2201

***EMAIL CONTACT-
rickvaillancourtsepticsevice@gmail.com***

***IF IN DOUBT
PUMP IT OUT!!!!***

December 19 2023

To whom it may concern;

This letter is confirmation that I will provide septic pumping service to
Polni Holdin Inc.
Part of Lot 18
Concession 12
Riding Ranch Road
Machar Township
South River Ontario
P0A1Xo

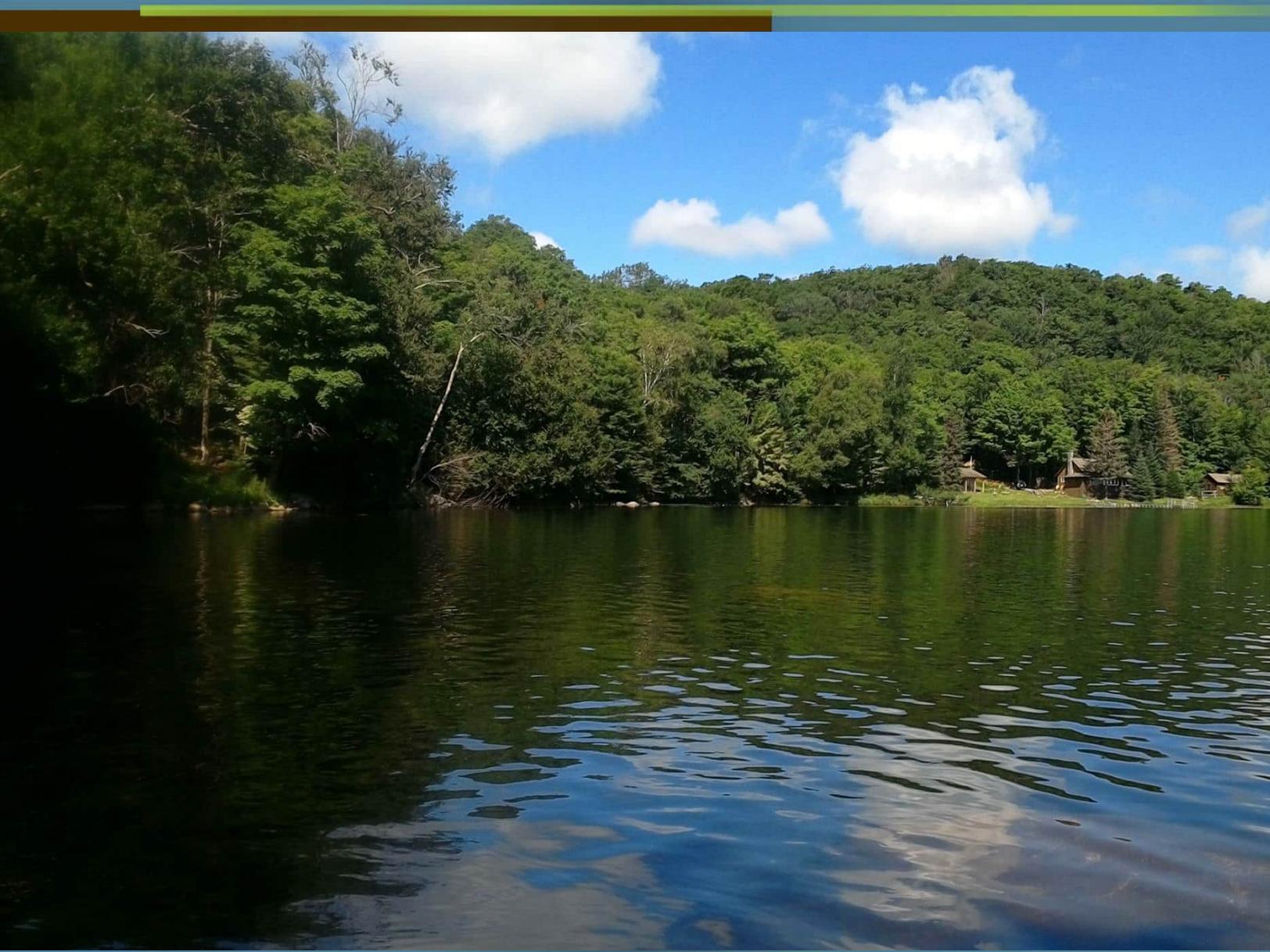
And the proposed 20 lots it will consist of.

Richard Vaillancourt
Owner/Operator
Rick Vaillancourt Septic Service



ENVIRONMENTAL IMPACT STUDY & LAKE CAPACITY ASSESSMENT

Bray Lake Property
Township of Machar
April 2023





RIVERSTONE

ENVIRONMENTAL SOLUTIONS INC.

April 27, 2023
RS# 2020-053

Frank Polsinelli and Nghi Nguyen

via email: frank.polsinelli@lcustom.com

**SUBJECT: Environmental Impact Study & Lake Capacity Assessment – Bray Lake,
Township of Machar**

Dear Mr. Polsinelli and Mr. Nguyen,

RiverStone Environmental Solutions Inc. is pleased to provide you with the attached report.

Please contact us if there are any questions regarding the report, or if further information is required.

Best regards,

RiverStone Environmental Solutions Inc.

Report prepared by:

Al Shaw, M.Sc.
Principal / Senior Ecologist

Jenn LeMesurier, HBES
Ecologist

ENVIRONMENTAL ASSESSMENT NON-TECHNICAL SUMMARY

Type of Study Environmental Impact Study (EIS) Lake Capacity Assessment		Date April 27, 2023
Project Manager Al Shaw	Legal Description Lots 19 and 20, Concession 11, and Lots 18, 19, and 20, Concession 12, Township of Machar, District of Parry Sound	Development Proposed Consent application to create twenty (20) single residential lots (15 waterfront, 5 backlot)
	Planning Authorities Township of Machar	Owner/Agent Mr. Frank Polsinelli and Mr. Nghi Nguyen / John P Gallagher & Associates

Report Summary

The purpose of this study was to address provincial and municipal requirements pertaining to the protection of significant natural features such as wetlands, watercourses, species at risk, and fish habitat.

Based on both desktop and on-site evaluations, RiverStone determined that:

1. The subject property contains steep slopes. These are located at the back of the proposed severed lots and will leave adequate room for future property development.
2. The property includes a number of watercourses that have potential to contribute to fish habitat.
3. The property includes a number of wetland areas; however they can be protected with mitigation measures.
4. Potential habitat of Species at Risk including endangered, threatened and special concern species was identified on the property; however, it can be protected with mitigation measures.

To ensure that the area’s significant features are protected, RiverStone has made a number of recommendations that are presented below.

RECOMMENDATIONS

Lake Capacity

Calculations related to lakeshore capacity model were found to be incapable of accurately predicting the phosphorus concentration in Bray Lake. This was confirmed with the Township peer reviewer prior to undertaking the EIS studies. In the absence of the model, the Provincial mandate is to utilize the interim Provincial Water Quality Objective (PWQO). The proposed development falls within the boundaries of the interim PWQO.

It is our expectation that although lake capacity is respected with the proposed development, best management practices will be applied to ensure that phosphorus movement into the lake will be minimized to the extent possible. Best management recommendations are as follows;

- **design of the septic system shall include pump-dosing or equivalent technology to uniformly distribute septic effluent over the tile bed;**
- **provision of a 30m minimum undisturbed shoreline buffer and soil mantle, with the exception of a pervious pathway;**
- **phosphorus attenuation measures such as directing runoff and overland drainage from driveways, parking areas, other hard surfaces to soak away pits, infiltration facilities should be included in the lot design;**
- **All imported soils used for leaching bed construction should be silt free, fine to medium grained non-calcareous soils, having the presence of iron and aluminum. Native soils removed for the placement of a dwelling may also be used should they meet all criteria noted above and those for septic use as noted in the Ontario Building Code.**

These recommendations, particularly the 30m setback, will be suitable to protect many other natural features and functions (**Section 5**, below) such as other components of water quality, fish habitat, and wildlife habitat.

Water Quality and Fish Habitat

The subject property includes rugged terrain with varying topography. There are areas of the property that include steep slopes. In areas with moderate to steep slopes, the functionality of vegetated buffers is reduced as the slopes act to increase the speed of water moving over the land. To increase the functionality of vegetated buffers adjacent to the shoreline of Bray Lake and wetland communities on the subject property, development should be located in areas of moderate or low slopes and with an increased setback. To this end, RiverStone recommends:

- **Development of the primary dwelling for each of the proposed lots be setback a minimum of 23 m and 30 m for the septic systems from the shoreline of Bray Lake (Figure 3).**
- **Development of the primary dwellings and septic systems for each of the proposed lots be setback a minimum of 30 m from identified wetlands and watercourses (Figure 3).**
- **No additional vegetation clearing outside of the identified development envelopes is to occur within 30 m of the shoreline of Bray Lake.**

To ensure that water quality is not negatively impacted by stormwater runoff during construction activities (e.g., land clearing and grubbing, dwelling and septic system construction, driveway construction), RiverStone recommends the following measures in addition to those already imposed through the lakeshore capacity review above:

- **When the native soil is exposed, sediment and erosion control works, in the form of heavy-duty sediment fencing, be positioned along the downgradient edge of any construction envelopes adjacent to water bodies, wetlands, or watercourses.**
- **Temporary storage locations of aggregate material be located no less than 30 m from the shoreline of Bray Lake in areas of low slopes. This material is to be contained by heavy-duty sediment fencing.**

- **The sediment fencing must be constructed of heavy material and solid posts to ensure its integrity and be properly installed (trenched in) to maintain its integrity during inclement weather events.**
- **Additional sediment fencing and appropriate control measures (e.g., straw bales) be stockpiled on site so that any breach can be immediately repaired through construction of check dams.**
- **Regular inspection and monitoring will be necessary to ensure that the structural integrity and continued functioning of the sediment control measures is maintained (i.e., proper installation is not the only action necessary to satisfy the mitigation requirements).**
- **Inspections of sediment and erosion control measures be completed within 24 hours of the onset of a storm event.**
- **Sediment control measures be maintained in good working order until vegetation has been established on the exposed soils.**
- **Offloading of construction materials and aggregate should be completed during fair weather.**

To ensure that the wetland communities and their protective buffers are not negatively impacted by increased nutrient loading and run off, RiverStone recommends the following measures:

- **Vegetation is not to be removed within 30 m of the wetlands unless it is a safety hazard, and debris from clearing or materials to be used in construction are not to be placed within this area.**
- **Because stormwater runoff can impact the thermal regime of watercourses, where stormwater management is applied, Low Impact Development (LID) techniques should be implemented, that promote infiltration and use of vegetated swales to take-up overland runoff, before entering watercourses.**

Species at Risk

Eastern Hog-nosed Snakes

Eastern Hog-nosed Snakes were not documented on the subject property during field investigations; however, due to the cryptic nature of this species, it is possible they are present but were not located. Based on the observations made during RiverStone's on-site assessments, features on the subject property are suitable to function as general habitat for Eastern Hog-nosed Snakes. In order to prevent impacts upon the habitat of Eastern Hog-nosed Snakes, and other snakes, that may be utilizing the subject property, RiverStone recommends the following:

- **Aggregate storage, particularly sand, is a suitable nesting substrate for Hog-nosed snakes. Should sand be stored on the property between June 1 and August 31, the stockpile should be surrounded by exclusion fencing to prevent access.**

Endangered Bats

Habitat for bats is prevalent throughout Central Ontario. As a predominantly forested area, habitat for maternal roosting bats is not limited across the landscape. The primary reason for these species of bats

being listed under the *ESA* is the prevalence of White-nose Syndrome, which is a fungus that infects bats as they hibernate over winter. This fungus grows on their muzzle, ears and wing-membranes, continually waking them from hibernation and causing dehydration, resulting in mortality.

In order to prevent impacts to the habitat of at-risk bats that may be utilizing the subject property, RiverStone recommends the following:

- **Tree clearing for the purposes of development on each proposed lot only occur in the fall, winter and early spring (from October 15 to April 15). This timeframe is outside of the maternal roosting period.**
- **In the event that tree clearing must occur between April 15 and October 15, additional studies will need to be completed to confirm the presence or absence of SAR bats. These studies will include snag tree surveys and acoustic monitoring of the area where trees will be removed, by a qualified professional. Should SAR bats be detected, the MECP should be contacted to determine if a permit would be required to proceed.**

Significant Wildlife Habitat

Wood Thrush and Eastern Wood-pewee are both small forest birds that are found in intermediate to mature aged forests. These two species are most sensitive to disturbance during the nesting season when alteration of vegetation communities can result in damage or destruction of nests and young. To minimize the likelihood that these two species are impacted by the proposed development, RiverStone recommends:

- **Vegetation removal should be restricted during the migratory bird nesting season, May 1st to Aug 15th each year. This timeframe falls entirely within the restricted timing window for removal of trees as it relates to roosting bats and noted above. In the event that tree clearing must occur between May 1st and Aug 15th, a qualified professional should complete a nest survey for the area where tree clearing is proposed. If nesting birds are found, tree clearing should wait until the birds have fledged.**

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1 BACKGROUND

RiverStone Environmental Solutions Inc. (hereafter “RiverStone”) was retained by Mr. Frank Polsinelli and Mr. Nghi Nguyen, through Mr. Tom Harsani, to complete an Environmental Impact Study (EIS) related to a proposed development application to create twenty (20) new single residential lots on a property located on Bray Lake in the Township of Machar (hereafter “Township”). The subject property is approximately 162 ha (400 ac) in size with approximately 2438 m (8000 ft) of shoreline and is legally described as Lots 19 and 20, Concession 11, and Lots 18, 19, and 20, Concession 12, Township of Machar, District of Parry Sound (**Figure 1**). According to the Township of Machar’s Zoning by-law (45-12), the subject property is zoned as a combination of Shoreline Residential (SR), Environmental Protection (EP), and Rural (RU).

It is our understanding that the proposed development will include an application to create a total of twenty (20) lots from the subject property. According to discussions, and consultation with Township as well as their consulting planner and peer review consultants, two studies are required to further the application; first, a lake capacity assessment following provincial guidelines is required to determine the capacity of the lake for new development, and an EIS is required to assess significant natural features and functions following Section B5.6.2 of the Township of Machar Official Plan. This includes, but is not limited to, wetlands, watercourses, fish habitat, significant wildlife habitat, and species at risk habitat. In advance of completing the studies, we communicated with the peer review consultant, Hutchinson Environmental Sciences Ltd. (hereafter “Hutchinson”), regarding our preliminary application of the lake capacity model to ensure we agreed on certain components of the model and its applicability.

RiverStone submits this lake capacity assessment and EIS in fulfillment of the requirements under the Town’s Official Plan.

2 APPROACH AND METHODOLOGY

The approach and methods used to carry out this EIS and Lake Capacity Assessment are detailed in this section. Broadly speaking, this includes:

1. Assessing the capacity of the lake using the provincial lakeshore capacity handbook and model.
2. Gathering background biophysical information for the subject property and adjacent lands to become familiar with existing mapping of natural heritage features and occurrences of species of conservation interest and their habitat prior to the site investigation.
3. Conducting a site investigation to field-verify the presence or absence of natural heritage features and/or habitat for species of conservation interest identified during background information gathering, and to identify any additional significant features (where present).
4. Determining the potential for negative impacts associated with the proposed development and ways that these negative impacts can be avoided, minimized and mitigated, and/or compensation measures.
5. Providing an assessment of conformance of the proposed development with applicable municipal, provincial, and federal environmental policies and law.

2.1 Guiding Environmental Legislation and Policy

The following documents guided the investigations:

- Lakeshore Capacity Assessment Handbook Protecting Water Quality in Inland Lakes on Ontario’s Precambrian Shield (2010). Ministry of the Environment, Ministry of Natural Resources, Ministry of Municipal Affairs and Housing
- Provincial Policy Statement (2020) and supporting documents (i.e., Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005 (OMNR 2010), as they relate to Species at Risk
- Provincial *Endangered Species Act* (ESA), S.O. 2007, c. 6, including:
 - Ontario Regulation 230/08: Species at Risk in Ontario List
 - Ontario Regulation 242/08: “Exemption Regulation”

2.2 Information Sources Used to Assess Site Conditions

Information pertaining to the biophysical features and functions of the subject property and surrounding lands was obtained from the following sources:

- **Township of Machar Official Plan** (October 8, 2013)
- **Township of Machar Zoning By-law 45-12** (September 2016), including
 - Zoning By-law Schedule A
- **MNR Natural Areas Mapping** from the Natural Heritage Information Centre (NHIC) regarding information on occurrences of species of conservation interest on or adjacent to the subject property, as well as significant natural areas (accessed June 2020)
https://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US
- **Ontario Breeding Bird Atlas (OBBA) Online Database** and Atlas of the Breeding Birds of Ontario, 2001–2005 (Cadman et al. 2007) regarding birds that were documented to be breeding in the vicinity of the subject lands during the 2001–2005 period (atlas square number: 17PL18)
<http://www.birdsontario.org/atlas/squareinfo.jsp>
- **iNaturalist Mapping and Online Database** regarding citizen scientist observations documented in the vicinity of the subject lands accessed June 8 at: <https://inaturalist.ca/projects/nhic-rare-species-of-ontario>
- **SAR Range Maps** provided on MNR’s website:
http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/MNR_SAR_WHATS_AT_RISK_EN.html
- **Great Lakes Conservation Blueprint for Aquatic Biodiversity, Volume 2** (Phair et al. 2005) regarding aquatic biodiversity within tertiary watershed 2EC (Black River – Lake Simcoe).
- **Digital Ontario Base Maps (OBMs; 1:10,000)** to ascertain topography.
- **Colour aerial photography** of the property (digital orthophotos: leaf-off, Spring).
- RiverStone’s **in-house databases and reference collections**.
- On-site investigations by RiverStone staff (see **Section 2.3**)

2.3 Site Investigation

The results of background information gathering outlined above in **Section 2.2** helped direct on-site data collection activities associated with a site investigation. The site features were assessed on four (4) separate visits in the spring/summer of 2020 by Al Shaw (Principal/Senior Ecologist), Craig Mann (Ecologist/Arborist) and Jenn LeMesurier (Ecologist/Arborist). The surveys included a general walkthrough of the subject property as well as visiting targeted areas of the subject property identified through air photography interpretation, as having higher potential for SAR and conducting breeding bird surveys based on Bird Studies Canada protocol. These areas included forested lands, watercourses, wetlands and shoreline communities. Overall, the level of effort expended on-site was deemed adequate to document potential habitat for SAR species given the location and habitat conditions on the property. Features of interest were photographed, and all information collected was catalogued for future reference.

Evidence for the presence of a species or use of an area was determined from visual and/or auditory observation (e.g., song, call) and observation of nests, tracks, burrows, browse, skins, and scats. General vegetation mapping was completed to provide information regarding the likelihood that plant species of conservation interest may be present (for example, most rare plants have strong affinities for specific ecological communities). Additionally, if a potentially rare plant not in flower was encountered, then a second site visit would have been conducted during the appropriate season for flowering or fruiting to confirm identification. This approach acceptably minimizes the risk that rare plant species would have gone undetected.

Natural features of interest (e.g., SAR habitat, vegetation community boundaries) were delineated in the field with a tablet with highly accurate built in GPS. Features of interest were photographed, and all information collected was catalogued for future reference. Photos representative of onsite conditions are provided in **Appendix 1**.

2.3.1 Terrain, Drainage, and Soils

Geology is a significant factor in the formation of soil, the physical characteristics of a watershed, and ultimately surface water quality. The bedrock and overlying deposits influence surface runoff and infiltration, directly influencing the nutrient balance of receiving water bodies. Knowledge of the existing terrain in a study area is important in understanding how a property and its associated natural environment will respond to development pressures. The geophysical setting of the property was reviewed using OBMs, soils mapping, and aerial photography, and subsequently verified on-site.

2.3.2 Vegetation Communities

The vegetation communities on the subject property were characterized in accordance with Ontario's Ecological Land Classification (ELC) system. The ELC system defines ecological units or communities based on bedrock, climate (temperature, precipitation), physiography (soils, slope, aspect), and corresponding vegetation. Use of the system permits biologists and other land managers to use a common language to describe ecological communities, which in turn facilitates the identification of communities likely to support features or functions of conservation interest. The ELC system is an organizational framework that can be applied at different scales. The ecological units most useful for site-specific evaluations are ecosites and vegetation types (also known as ecoelements). Vegetation types are the finest level of resolution in the ELC system and are recurring patterns found in the plant species assemblages that are associated with a particular ecosite (Lee et al. 1998).

Vegetation communities were classified using the Great Lakes-St. Lawrence ELC manual (Banton et al, 2009). Plant nomenclature is generally consistent with the Southern Ontario Vascular Plant Species List, Third Edition (Bradley 2013) except where updates that postdate publication of the list are noted in the Integrated Taxonomic Information System database.

2.3.3 Wildlife

2.3.3.1 *Breeding Bird Surveys*

Three (3) rounds of breeding bird surveys were conducted in 2020 in accordance with the Ontario Breeding Bird Atlas (OBBA) protocol (Bird Studies Canada *et al.* 2001). Surveys were conducted within the appropriate season (May 28–July 7), time of day (between dawn and 5 hours after dawn), and weather conditions (no rain; wind speed ≤ 3 on the Beaufort Wind Scale). Five (5) point count stations were established and situated systematically to cover potentially significant bird habitats (**Figure 2**). Surveys occurred for a minimum duration of 10 minutes at each station. Birds were also recorded incidentally in transit between stations during the breeding bird survey, and incidentally during other field activities on-site.

The OBBA provides four breeding categories to accompany each observation:

Observed: Species observed during its breeding season (no evidence of breeding).

Possible Breeding: Includes any of the following observation types: 1) species observed in its breeding season in suitable nesting habitat, and 2) singing male present, or breeding calls heard, in its breeding season in suitable nesting habitat.

Probable Breeding: Includes any of the following observation types: 1) pair observed in their breeding season in suitable nesting habitat, 2) permanent territory presumed through registration of territorial song on at least 2 days, a week or more apart, at the same place, 3) courtship or display between a male and a female or 2 males, including courtship feeding or copulation, 4) visiting probable nest site, 5) agitated behaviour or anxiety calls of an adult, 6) brood patch on adult female or cloacal protuberance on adult male, and 7) nest-building or excavation of nest hole.

Confirmed Breeding: Includes any of the following observation types: 1) distraction display or injury feigning, 2) used nest or egg shell found (occupied or laid within the period of the study), 3) recently fledged young or downy young, including young incapable of sustained flight, 4) adults leaving or entering nest site in circumstances indicating occupied nest, 5) adult carrying faecal sac, 6) adult carrying food for young, 7) nest containing eggs, and 8) nest with young seen or heard.

2.3.4 Natural Features and Functions of Conservation Interest

2.3.4.1 *Habitat-based Approach*

RiverStone's primary approach to site assessment is habitat-based. This means that our field investigations first focus on evaluating the potential for features within an area of interest to function as habitat for species considered potentially present, rather than searching for live specimens. An area is considered potential habitat if it satisfies a number of criteria, usually specific to a species, but occasionally characteristic of a broader group (e.g., several turtles of conservation interest use sandy shorelines for nesting, numerous fish species use areas of aquatic vegetation for nursery habitat). Physical attributes of a site that can be used as indicators of its potential to function as habitat for a

species include structural characteristics (e.g., physical dimensions of rock fragments or trees, water depth), ecological community (e.g., meadow marsh, rock barren, coldwater stream), and structural connectivity to other habitat features required by the species. Species-specific habitat preferences and/or affinities are determined from status reports produced by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Cadman et al. (2007a), published and unpublished documents, and direct experience.

In instances where habitat features are such that either (i) a species presence cannot be easily determined through an assessment of habitat feature alone, or (ii) habitat features are such that they suggest a species may be present in an area where development is proposed and impacts are likely, RiverStone adds an additional level of assessment by completing further species-specific observations (e.g., Whip-poor-will call surveys, Massasauga hibernation/gestation surveys, etc.) in accordance with industry standard methods and protocols.

As described above, RiverStone's primary approach to site assessment is habitat-based. For species and ecological communities of conservation interest, this approach involves both desktop and on-site assessments. The results of these assessments, as well as descriptions of the methodology and rationale employed are provided in **Appendix 2**.

2.3.4.2 Species at Risk – Endangered and Threatened Species

This report considers those species listed as endangered or threatened on the Ontario species at risk list (*O. Reg.* 230/08) that receive protection under s.9 and s.10 of the *ESA*. These species are considered within the local Official Plan and Provincial Policy Statement as SAR.

As described in **Section 2.3.4.1**, RiverStone's approach to site assessment is primarily habitat-based. The assessment included a thorough review of available information, our previous work on the subject property, site visits, and assessment of findings. The results of these assessments are provided in **Section 4.5** below and in **Appendix 2**.

2.3.4.3 Fish Habitat

The following recommendations for completing a fisheries assessment have been made by DFO and MNRF:

- 1) confirm the presence or absence of fish habitat
- 2) identify any potential fisheries features including intermittent watercourses and seasonally flooded areas, and assess their importance in terms of supporting fisheries functions
- 3) determine the fish communities located at a specific site and understand the life-cycle requirements
- 4) determine the sensitivity of the fish habitat on a site-specific basis

Fish habitat assessment is completed using the most recent classification criteria established by the MNRF. The three key habitat types are described in **Table 1** and differ based on their sensitivity to development and overall productive capacity for fish. Fish habitat mapping, fisheries records, thermal regime, and the known fish community of a lake or watercourse are used in conjunction with site-specific field evaluation, to determine what areas should be considered Type 1 or Type 2 habitat in any waterbody.

Table 1. Classification of Fish Habitat Types.

Classification Type	Description
Type 1	Habitats have high productive capacity, are rare, in space and/or time, are highly sensitive to development, or have a critical role in sustaining fisheries (e.g., spawning and nursery areas for some species, and ground water discharge areas for summer and/or winter thermal refuges).
Type 2	Habitats are moderately sensitive to development and, although important to the fish population, are not considered critical (e.g., feeding areas and open water habitats of lakes).
Type 3	Habitats have low productive capacity or are highly degraded, and do not currently contribute directly to fish productivity. They often have the potential to be improved significantly (e.g., a portion of a waterbody, a channelized stream that has been highly altered physically).

2.3.5 Wildlife Habitat

The terms of reference for environmental impact studies in the Township's Official Plan notes that the assessment must consider endangered and threatened species presence and/or significant habitat, although no further details are provided (s. B5.6). RiverStone has taken the approach that the intention is to consider habitat of endangered and threatened species, and significant wildlife habitat (SWH).

2.3.5.1 *Endangered and Threatened Species*

This report considers those species listed as endangered or threatened on the Ontario Species at Risk List (*O. Reg. 230/08*) that receive protection under s.9 and s.10 of the provincial *Endangered Species Act, 2007* (ESA). As described in **Section 2.3.4.1**, RiverStone's approach to site assessment is primarily habitat-based. The results of these assessments are provided in **Appendix 2**.

2.3.5.2 *Significant Wildlife Habitat*

The Provincial Policy Statement (PPS) protects SWH from development and site alteration unless it can be demonstrated that no negative impacts on the feature or its function will occur. As outlined in the SWH Technical Guide (OMNR 2000) and supporting Ecoregion Criteria Schedules (OMNRF 2015a, 2015b, 2015c), SWH is composed of four principal components:

1. Seasonal concentration areas of animals;
2. Rare vegetation communities or specialized habitats;
3. Habitat of species of conservation concern; and
4. Animal movement corridors.

The process for identifying SWH is outlined in s. 9.2.3 of the *Natural Heritage Reference Manual* (OMNR 2010b). **Step 1** requires the answers to two questions:

- A. Does the development proposed involve a trigger for significant wildlife habitat; and
- B. Has any confirmed significant wildlife habitat been identified?

Triggers for significant wildlife habitat (question A) are outlined in s.9 of the *Natural Heritage Reference Manual* {OMNR, 2010 #2473} and include:

- Creation of more than three (3) lots through either consent or plan of subdivision;
- Changes in land use, not including the creation of a lot, that required approval under the Planning Act;

- Shoreline consent along a large inland lake, small inland lake or large river that is within 120 m along the shoreline of an existing lot of record or lot described in an application for subdivision or consent; and.
- Construction for recreational uses (e.g., golf courses, serviced playing fields, serviced campgrounds, and ski hills) that require large-scale medication of terrain, vegetation or both.

If the development proposed involves a trigger (question A), the assessment of SWH proceeds to **Step 2**.

Confirmed SWH (question B) are areas that have been identified in existing planning documents (e.g., official plans) or by the MNRF. Where confirmed SWH is present, and the development proposed does not involve a trigger (question A), the assessment of SWH proceeds to **Step 4**.

Step 2 of the SWH assessment involves undertaking a more thorough analysis of features, functions, and habitats on the subject property *via* ELC. The list of ELC Ecosite codes generated for the subject property is compared to those codes considered candidate SWH in the relevant ecoregion criterion schedule (*i.e.* 5E, 6E, or 7E) in **Step 3**. Where a positive match between an ELC ecosite and candidate SWH exists, the area is considered candidate SWH.

In **Step 4**, two options are available for candidate or confirmed SWH:

1. the area may be protected without further study, or
2. the area may be evaluated to ascertain whether confirmed SWH is present. Evaluation may involve generating more detailed maps of vegetation cover or conducting surveys of the wildlife population within the candidate SWH including reproductive, feeding, and movement patterns.

If the area is confirmed SWH, the final step in the process (**Step 5**) is the completion of an impact assessment to demonstrate that no negative impacts to the confirmed SWH or its function will occur. The impact assessment process is assisted by SWH Mitigation Support Tool (OMNRF 2014).

RiverStone employed the approach as outlined above (*i.e.* **Steps 1-5**) in assessing the potential for SWH to exist on the subject property. Technical results of our assessment and additional discussion is provided in **Section 4**.

2.4 Impact Assessment

RiverStone employs the following approach in order to carry out a standardized, rigorous assessment of impacts associated with the proposed development (as described in **Section 0**):

1. *Predict* impacts to existing biophysical features and functions on site based on the proposed development plan (from construction to post-completion), including both direct (e.g., vegetation clearance, etc.) and indirect (e.g., light pollution, encroachment post-development, etc.) impacts.
2. *Evaluate* the significance of predicted impacts to existing biophysical features and functions based on their spatial extent, magnitude, timing, frequency (how often), and duration (how long).
3. Assess the *probability* or likelihood that the predicted impacts will occur at the level of significance expected (e.g., high, medium, low probability).

In instances where a reasonable potential for impact to a significant feature with recognized status exists, opportunities to mitigate (avoid, minimize, compensate) and/or enhance such features are provided.

2.5 Assessment of Conformance with Applicable Environmental Policies

The suite of relevant municipal and environmental policies that apply to the subject property and proposed development are listed below. Based on the results of the background information gathering, site investigation, impact assessment, and recommendations, RiverStone has advised the extent to which the proposed development conforms to all applicable environmental policies in **Section 6**.

- Federal *Migratory Birds Convention Act*, S.C. 1994, c. 22, including:
 - Migratory Birds Regulations.
- Federal *Fisheries Act*, R.S.C. 1985, c. F-14, including:
 - *Applications for Authorization under Paragraph 35(2)(b) of the Fisheries Act Regulations*, S.O.R/2013-191
 - Fisheries Protection Policy Statement (Oct. 2013)
- *Provincial Policy Statement*, 2020, pursuant to the *Planning Act*, R.S.O. 1990, c. P.13, including:
 - Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005 (OMNR 2010)
- Provincial *Endangered Species Act* (ESA), S.O. 2007, c. 6, including:
 - Ontario Regulation 230/08: Species at Risk in Ontario List
 - Ontario Regulation 242/08: “Exemption Regulation”
- Township of Machar Official Plan (October 8, 2013)
- Township of Machar Zoning By-law (45-12, Consolidated September, 2016)

3 LAKE CAPACITY ASSESSMENT

As background to this component of the study, lakeshore capacity is based entirely on phosphorus. Phosphorus occurs in dissolved and particulate, organic and inorganic forms in aquatic ecosystems. In a chemically combined state (the elemental form is rare), it is virtually non-toxic to aquatic life; however, it has been shown to be the principal nutrient causing eutrophication of surface waters of many parts of Canada (Schindler 1974). Phosphorus present in human and domesticated animal wastes, farm and industrial wastewater, and a variety of products, such as soaps and fertilizers, which are components of sanitary sewage and stormwater or runoff. The most readily documented and obvious effects of increased levels of phosphorus in surface waters are a marked increase of algae and aquatic vegetation, reduced water clarity, and in some cases reduced habitat for coldwater fish species such as lake trout. These changes are generally considered undesirable, although it should be emphasized that native aquatic plants are an important component of a healthy, productive aquatic ecosystem.

Lakes located on the Canadian Shield have a relatively low natural concentration of phosphorus compared to southern Ontario lakes, because their basins are formed in rock and the surrounding landscape has thin soils, which only leach a comparatively small concentration of nutrients. The exceptions are dystrophic lakes that have variable nutrient concentrations and dark tea-stained water, resulting from high concentrations of humic acids. Humic acids are produced during the decay of plant material from wetlands within the upper watershed of a lake system. The provincial government,

through the Ministries of Environment, Conservation and Parks (MECP, Formerly Ministry of Environment and Climate Change), Natural Resources and Forestry (MNR) and Municipal Affairs and Housing (MMAH), developed the Lakeshore Capacity Assessment Handbook, most recently updated in 2010, to provide direction in determining the capacity of a lake for shoreline development using the lakeshore capacity model (LCM) and phosphorus as the key nutrient to determine lake capacity.

Section B4.8 of the Township of Machar Official Plan states that Bray Lake, along with three other lakes, “have unique characteristics and limited carrying capacity with respect to the amount of shoreline development they can accommodate”. The policy continues to state that new development shall not raise the phosphorus concentration in the lake more than 50% above its natural background or exceed 20 ug/L. The Lakeshore Capacity Assessment Handbook includes the lakeshore capacity model (LCM) which uses watershed and lake characteristics to predict the natural background and future concentrations of phosphorus.

The completion of the Lakeshore Capacity model calculations for Bray Lake was completed in advance of beginning the EIS component. Without establishing that there was capacity for future development, it did not make sense to complete other studies. The results that are presented in the following sections were discussed and reviewed with the peer reviewers (Hutchinson Environmental Sciences, Brent Parsons) commissioned by the Township to ensure that the results of the model were corroborated and the interpretation to proceed validated.

3.1 Lakeshore Capacity Model

The Lakeshore Capacity Model (LCM) has a long history directing development along lakeshores throughout Ontario. In the mid-1970’s the Dorset Environmental Science Centre was established to devise technical methods to predict changes in water quality due to increasing recreational development on lakeshores (Yan et al. 2008). The LCM has been reviewed and modified several times since its inception, updating coefficients and relationships as new studies were completed and verified (Dillon et al. 1986, Hutchinson et al. 1991, 2002, Dillon et al. 1994, Paterson et al 2006). The MOE officially began a review of the LCM in 2009 and published the updated Lakeshore Capacity Assessment Handbook in May 2010.

The LCM is a steady state, mass balance, mathematical model that uses empirical relationships to predict ice-free concentrations of phosphorus. The model can also be used to predict how phosphorus concentrations would change, should additional development within 300 m of the lake shoreline be permitted. This is how the model will be used for the present assignment; that is to construct the LCM for Rock to determine where the lake currently is in relation to phosphorus and how the concentration will change should additional lots be permitted to be developed. Phosphorus is the primary nutrient that controls plant growth (including algae) in lakes on the Canadian Shield (Schindler et al. 1971) and similarly over the world’s north temperate lakes (Schindler 1977), which is the primary reason for limiting lakeshore development based on phosphorus concentrations. Phosphorus can enter a lake through atmospheric deposition, stream and overland flow, and groundwater. Within a lake, phosphorus concentration is determined by local geology, land-use, lake morphometry and human activity. These factors, along with various coefficients are used in the LCM to predict phosphorus concentration during the ice-free period (**Table 2**). The human inputs of phosphorus are of prime importance to this study, as they can be controlled by limiting the amount of development along a lake shoreline. To understand the expected change in phosphorus concentration due to additional development on a lake, the model is used to predict the current concentration of phosphorus, which includes the existing inputs from development on the lake, then the model is calculated a second time

with the additional proposed development included. The proposed development in this assessment includes an additional fourteen (14) lots fronting on Bray Lake and six (6) backlots.

As noted above, the province determines the capacity of a lake based on the background concentration of phosphorus. A lake is deemed to be at capacity for development when the modeled concentration of phosphorus is 50% higher than the background concentration. Further development is permitted by the province until the model predicts that the 50% over background concentration is reached. The background concentration of phosphorus is determined through the LCM, inputting all necessary watershed, lake and development data particular to a lake.

It should also be noted that the model is not effective in predicting phosphorus concentrations in all lakes. It has been our experience that in some cases where water components of the model are not well understood, the model may not accurately predict phosphorus concentrations. In some cases, this can be overcome by considering the oxygen status of the bottom waters (anoxia). In other cases, the model just does not predict well, and the results are considered unreliable. Model accuracy is a component of the calculations, and the results are presented below.

Table 2. Lakeshore Capacity Model Parameters and Calculated Components, Rock Lake

Model Parameter	Value	Units	Description	Reference
Lake Surface Area	340.0	ha	Area of lake surface at high water	OMNR Lake Fact Sheet, Bray Lake, Ontario Flow Assessment Tool
Watershed Area	940	ha	Upstream watershed	OMNR Lake Fact Sheet, Bray Lake, Ontario Flow Assessment Tool
Watershed Wetland Area	15.0	%	Area of wetlands in watershed	Ontario Base maps/aerial photo interpretation
Precipitation on lake	0.95	(m/y)	Water falling on lake surface	Hydrological Atlas of Canada 1978
Lake Evaporation	0.65	(m/y)	Lake water loss by evaporation	Hydrological Atlas of Canada 1978
Runoff	0.526	(m/y)	Overland drainage from watershed	Hydrological Atlas of Canada 1978
Phosphorus settling velocity	12.4	(m/y)	Phosphorus bound to sediments	Paterson et al 2006
Atmospheric phosphorus load	16.7	mg/m ² /yr	TP load from precipitation	Paterson et al 2006
Overland phosphorus export	5.5	mg/m ² /yr	TP load from adjacent lands	Paterson et al 2006
P load from residences	0.66	kg/capita y/y	TP load from dwellings	Hutchinson 2002, Paterson et al 2006
Septic/Soils retention coefficient	0	%	Amount of septic TP escaping tiled and natural soils	Hutchinson 2002, Paterson et al 2006
Watershed/Wetland - Slope	0.47		Relationship between wetland area and TP export	Paterson et al 2006
Watershed/Wetland - Intercept	3.82		Relationship between wetland area and TP export	Paterson et al 2006

3.2 Current Provincial Guidelines for Lake Phosphorus

The current Provincial Guidelines for Phosphorus concentrations in lakes as they relate to shoreline development are governed by the MOECP. Under the 1994 Provincial Water Quality Objectives (PWQO), there is an interim guideline for phosphorus, which is as follows:

To avoid nuisance concentrations of algae in lakes, average total phosphorus concentrations for the ice-free period should not exceed 20µg/L;

A high level of protection against aesthetic deterioration will be provided by a total phosphorus concentration for the ice-free period of 10µg/L or less. This should apply to all lakes naturally below this value;

Additionally, the MOECP's Water Management Policy Guidelines (Procedure B-1-1, "Blue Book") set out policies for the management of surface and ground water resources, and is a companion to the PWQO document noted above. The Blue Book provides further details on lakes where water quality currently meets or exceeds the PWQO; in this case, phosphorus. The policies are as follows:

Policy 1

"In areas which have water quality better than the Provincial Water Quality Objectives, water quality shall be maintained at or above the Objectives." Although some lowering of water quality is permissible in these areas, degradation below the Provincial Water Quality Objectives will not be allowed, ensuring continuing protection of aquatic communities and recreational uses

Policy 2

"Water quality which presently does not meet the Provincial Water Quality Objectives shall not be degraded further and all practical measures shall be taken to upgrade the water quality to the Objectives."

In consideration of the Provincial policies above, should a lake have a phosphorus concentration below 10 µg/L, changes to land use that would cause water quality to exceed 10 µg/L would not be permitted.

The more recently released Lakeshore Capacity Assessment Handbook (MOECP 2010), includes a proposal to revise the PWQO for phosphorus as it relates to the protection of aquatic life. The revised approach for lakes on the Precambrian Shield **"allows for a 50 per cent increase in phosphorus concentration from a modelled baseline of water quality in the absence of human influence"**. The purpose for the change is to recognize the individual nature of each lake and maintain a diversity of lakes on the shield, as opposed to ultimately generating many lakes near 10 µg/L and 20 µg/L. Although the handbook has been finalized, the associated policy change recommendations have yet to be incorporated into the PWQO's; however, the background + 50% development limit is promoted and considered by the MECF to be the benchmark governing this assessment.

3.3 Lakeshore Capacity Model Results and Discussion

As previously stated, the purpose of this assessment is to determine the development capacity of Bray Lake according to the Provincial LCM, as it relates to the current proposal to develop a long section of shoreline with new lots having waterfront access.

Using the parameters and values shown in **Table 2**, the results of the LCM for Bray Lake show that the predicted spring total phosphorus concentration is **5.24 µg/L**, which is the background value before any of the existing or proposed development is considered. Based on the current guidelines for lake development, the capacity of the lake is calculated as 50% above the background concentration; **7.86 µg/L**. These calculations also consider that the lake is anoxic, introducing the idea that an internal load of phosphorus is possible, further elevating the expected background concentration.

The current state of phosphorus in Bray Lake is determined by including the current number of shoreline residents. These data were established by using the current lot fabric and through counting the number of dwellings using aerial photography. Many back-lots were also included if they were estimated to be within 300 m of the shoreline as required by the LCM. A total of a combined 57 dwellings and vacant lots of record were noted. The amount of phosphorus that is exported from each lot is partly a function of the amount of time the dwellings are used. The LCM considers various categories of cottage usage, including permanent, extended seasonal and seasonal. It was noted that the roads accessing cottages along the lakeshore are not winter maintained road and therefore would not support permanent dwellings. Based on this, we have considered all 57 lots to be used in an extended seasonal manner; although it is very likely that many of the cottages are used seasonally only. Based on the existing development, the resulting phosphorus concentration increased from a background concentration of **5.24 µg/L** to **6.89 µg/L**. This accounts for all of the current development on the lake, as well as existing lots that have yet to be developed up to 300 m from the shoreline.

The final step in the modeling scenario is to add the additional proposed development to determine the increase in phosphorus concentration that can be expected following development. In this case, the proposal is to add an additional 14 lots with shoreline access and 6 backlots (all considered to have development within 300 m of the lake shoreline). The resulting concentration of the lake is modeled to be **8.03 mg/L**.

3.4 Model Validation

Given the model is a predictor of total phosphorus and uses primarily mapped data and coefficients; it does not incorporate actual measured values of phosphorus in its calculations. Measured values are used to validate and check the model to determine how well the model predicts current concentrations of phosphorus and therefore how well it will quantify water quality changes expected by proposed developments. As noted above, the model is not effective in predicting phosphorus concentrations in all lakes. This is determined through the validation of the model by comparing modeled phosphorus values with measured values of phosphorus.

Measured values were collected by Lake Partner Program volunteers in 2007 and 2008. Water samples are collected by lake resident volunteers and analysed for a number of parameters, including phosphorus, by the MECP. The duplicate samples from May 2007 were reported as **10.6 µg/L** and **10.6 µg/L**, while July 2008 samples were reported as **12.7** and **11.0 µg/L**. In order to determine the validity of using the model, Hutchinson et al. (1991) suggests that the LCM is considered an adequate predictor of lake phosphorus concentration if the modeled spring overturn values are within $\pm 20\%$ of measured values, as variation in this order can be experienced even in intense water quality sampling programs. The model has predicted a spring overturn phosphorus concentration of **6.89 µg/L**, based on the current development level on the lake (57 lots). The spring values reported through the lake partner program in 2007-2008 have an average of **11.22 µg/L**, which is **33.1%** different from the modeled values and outside of the criteria established by Hutchinson et al. (1991).

The model does not provide any reason for the discrepancy, it just notes that the model is not a suitable predictor of phosphorus in the lake, underpredicting the measured phosphorus by over 33%. It is our assumption that the dam at the lake outlet may be one significant factor. It is logical that the construction of the dam has elevated water levels and flooded additional lands. These lands have become prominent wetlands in the northwest and southwest portions of the lake. Wetlands and their soils are exporters of phosphorus to the adjacent lake and could therefore be responsible for some of the additional phosphorus measured in the lake above what the model predicted. The dam also is an

artificial means of controlling the outlet of the lake, which would differ from an unregulated lake. There are no means of addressing these items in the model. Finally, Bray Lake is a fairly shallow lake with an average depth of 4m. Shallow lakes are known to potentially exhibit an internal load of phosphorus, which could elevate the measures values that are not contemplated in the model. In any case, the model calculations were not applicable to the lake as a reliable means of predicting phosphorus; therefore, the model is also an unreliable means of predicting the change in phosphorus that would be expected through additional development.

In cases where the model does not predict phosphorus concentrations within acceptable limits (20%), it is recommended that the interim PWQO be followed as a guideline, with the Lakeshore Capacity Assessment Handbook noting that “a total phosphorus concentration of **20 µg/L** will be used as the upper limit to protect against nuisance algal blooms” (Section 4.3 pg 32). In the case of Bray Lake, if we consider the modeled change in phosphorus from existing development to proposed new 17 lots, a rise of **1.14 µg/L (6.89 µg/L to 8.03)** in total phosphorus was expected. If that additional **1.14 µg/L** is added to the measured phosphorus concentration, **11.22 µg/L**, the result is **12.36 µg/L**, which is well below the interim PWQO of **20 µg/L**. As a result, the proposed 14 shoreline and 6 backlots would be permitted.

It is our expectation that although lake capacity is respected with the proposed development, best management practices will be applied to ensure that phosphorus movement into the lake will be minimized to the extent possible. Best management recommendations are as follows;

- **design of the septic system shall include pump-dosing or equivalent technology to uniformly distribute septic effluent over the tile bed;**
- **provision of a 30m minimum undisturbed shoreline buffer and soil mantle, with the exception of a permeable pathway;**
- **phosphorus attenuation measures such as directing runoff and overland drainage from driveways, parking areas, other hard surfaces to soak away pits, infiltration facilities should be included in the lot design;**
- **All imported soils used for leaching bed construction should be silt free, fine to medium grained non-calcareous soils, having the presence of iron and aluminum. Native soils removed for the placement of a dwelling may also be used should they meet all criteria noted above and those for septic use as noted in the Ontario Building Code.**

These recommendations, particularly the 30m setback, will be suitable to protect many other natural features and functions (**Section 5**, below) such as other components of water quality, fish habitat, and wildlife habitat.

4 BIOPHYSICAL FEATURES AND FUNCTIONS

4.1 General Site Conditions

The subject property is currently developed with a cottage dwelling, bunkie, sauna, and pile/post dock. Generally, the natural features of the property consists of upland forest, various wetland communities, watercourses, and lake shoreline habitat. Riding Ranch Road is located on the western edge of the property, and bisects the property in one section, and there is an access driveway to the existing development on the subject property. There is also a smaller piece of property located on the opposite

shore of Bray Lake, owned by the same ownership group as the subject property. It is accessed from Riding Ranch Road at a single location on the northwest corner of the lake. This parcel has been subdivided under a separate application, although the natural features were assessed as part of this study and contributed to that application. Vegetation communities on the subject property consist of deciduous forest, coniferous forest, rock barren, wetlands and riparian watercourse. Existing vegetation communities are identified on **Figure 2**.

4.2 Terrain, Drainage, and Soils

The subject property is situated in the Ecodistrict 5E-8 (Huntsville). This ecodistrict is comprised of bedrock exposures (primarily orthogneisses and migmatites) complexed with a veneer of glacially-derived sandy substrate (Henson and Brodribb 2005). Differential erosion of the bedrock since the Grenville Orogeny over one billion years ago has generated a landscape of gently- to steeply-sloping ridges separated by hollows filled by wetlands or lakes. Proglacial Lake Algonquin (a precursor to Lake Huron) drowned most of the western half of the ecodistrict following glacial recession around 10,000 years ago, including the subject property.

Overland drainage from the subject property is conveyed toward the watercourses and wetland communities identified on **Figure 2**, as well as directly toward Bray Lake. The property has varying topography throughout the 400-acre parcel. Steep slopes are present in some areas adjacent to the shoreline, with long stretches of more level ground. (**Figure 32**). The steepest slopes on the subject property exist in the northern and central portions along the shoreline of Bray Lake. In some areas, slopes have been identified as between 20-40%, and other areas over 40%. The remainder of the property is quite rugged; however, there are considerable areas that provide terrain suitable for development (**Figure 3**).

4.3 Vegetation Communities

Existing forest communities on the subject property were assessed during the on-site investigation. A desktop exercise was undertaken to approximately map forest community boundaries using background information sources and current aerial photographs; the mapped forest communities were then ground-truthed and boundaries updated following the site investigation. Forest community mapping in accordance with Wester et al. (2015) is provided on **Figure 3**.

4.3.1 Terrestrial Vegetation Communities

G051Tt Dry to Fresh, Coarse: Hemlock-Cedar Conifer

The riparian shoreline areas, and the majority of the western side of the subject property contains a forest community that is dominated by Eastern Hemlock (*Tsuga canadensis*). These areas contain relatively low vegetation diversity due to the low nutrient and moisture holding capacity of the substrates. Other vegetation species that were noted within this community include Balsam Fir (*Abies balsamea*), Sugar Maple (*Acer saccharum*), Black Cherry (*Prunus serotina*), Yellow Birch (*Betula alleghaniensis* var. *fallax*), Red Maple (*Acer rubrum*), Striped Maple (*Acer pensylvanicum*), Beaked Hazelnut (*Corylus cornuta*), Canada Mayflower (*Maianthemum canadense*), Spinulose Wood Fern (*Dryopteris carthusiana*), Partridgeberry (*Mitchella repens*), Tree Groundpine (*Lycopodium dendroideum*), Club Moss Species (*Lycopodium* sp), Wild Sarsaparilla (*Aralia nudicaulis*), and Drooping Woodland Sedge (*Carex arctata*). Common mosses and lichens were also present throughout this community in areas where there was exposed rock. This community was present along much of the riparian area of the shoreline. Species within these areas also included Leatherleaf

(*Chamaedaphne calyculata*), Sweetgale (*Myrica gale*), Three-way Sedge (*Dulichium arundinaceum*), Canada Bluejoint (*Calamagrostis canadensis*), White Meadow-sweet (*Spiraea alba var. alba*), Broadleaf Cattail (*Typha latifolia*), Common Sheep Sorrel (*Rumex acetosella*), Black-girdle Bulrush (*Scirpus atrocinctus*), Marsh St. Johnswort (*Triadenum virginicum*), and Water-horehound (*Lycopus sp.*).

G058Tt Dry to Fresh, Coarse: Maple Hardwood

The central portion of the subject property is dominated by Sugar Maple and is best classified as Maple Hardwood. Rich soils in this area support a canopy of mature Sugar Maple, American Beech (*Fagus grandifolia*), and White Birch (*Betula pendula*), with some Eastern Hemlock. Balsam Fir, Yellow Birch, Red Maple, and Black Cherry were also present. Understory species include Striped Maple, Northern Starflower (*Trientalis borealis*), Wild Sarsaparilla, Spinulose Wood Fern, Red Trillium (*Trillium erectum*), White Trillium (*Trillium grandiflorum*), New York Fern (*Thelypteris noveboracensis*), Canada Mayflower, Hobble Bush (*Viburnum lantanoides*), Red Raspberry (*Rubus occidentalis*), Rose Twistedstalk (*Streptopus lanceolatus*), Bearded Shorthusk (*Brachyelytrum erectum*), Indian Pipe (*Monotropa uniflora*), Cinnamon Fern (*Osmunda cinnamomea*), and Common Lady Fern (*Athyrium filix-femina ssp. angustum*).

4.3.2 Wetland Vegetation Communities

G130Tt Intolerant Hardwood Swamp

Throughout the subject property, there are forested wetland pockets that are hydrologically connected with the watercourses that lead toward Bray Lake. The best classification for this community type is an intolerant hardwood swamp dominated by Black Ash (*Fraxinus nigra*). Other tree species include Yellow Birch, Red Maple, and Sugar Maple. The herbaceous layer is dense and includes Sensitive Fern (*Onoclea sensibilis*), Spotted Jewelweed (*Impatiens capensis*), Horsetail Species (*Equisetum sp.*), Interrupted Fern (*Osmunda claytoniana*), Fringed Sedge (*Carex crinita var. crinita*), Canada Bluejoint, and Wood-sorrel Species (*Oxalis sp.*).

G142N Mineral Meadow Marsh

Along the western boundary of the subject property there are three wetlands that are best classified as mineral meadow marsh vegetation communities. These areas are located near Riding Ranch Road, and include some pockets of open water wetland, but are dominated by herbaceous vegetation with sporadic tree growth. Vegetation species include: Joe-pye-weed Species (*Eupatorium sp.*), Canada Bluejoint, White Meadow-sweet, Leatherleaf, Broadleaf Cattail, Black Raspberry, Eastern White Pine (*Pinus strobus*), Red Maple, Black Spruce (*Picea mariana*), Marsh St. Johnswort, and Harlequin Blue Flag (*Iris versicolor*).

4.4 Wildlife

4.4.1 Breeding Birds

Breeding bird surveys in accordance with the OBBA were undertaken by RiverStone on two (2) occasions between May 28 and July 14, 2020 at five designated survey stations illustrated on **Figure 2**. Additional incidental observations of individuals were noted during all assessments when new species were heard or observed. RiverStone field studies recorded a total of twenty-one (21) different bird species during the breeding bird surveys conducted in 2020 (**Table 3**). The assemblage and abundance

of birds recorded during the OBBA surveys generally reflects the structure and composition of on-site vegetation communities (per **Figure 2**). Recorded species and field data are illustrated in **Table 3**. No bird species listed under the ESA were recorded; however, one (1) bird was recorded that is listed as species of special concern by the Province. Further recommendations are provided in **Section 4**.

Table 3. Breeding Bird Survey Results, 2020. Shaded blue rows indicate species of conservation concern.

Date	Station	Temperature	Beaufort Wind	Cloud Cover	Species				
25-Jun-20	1	13°C	0-1	100%	Roughed Grouse				
					Red-winged Blackbird				
					Red-eyed Vireo				
					Black-and-white Warbler				
					Chestnut-sided Warbler				
					Eastern Phoebe				
					Ovenbird				
					Black-throated Green Warbler				
					Blue Jay				
					Great Blue Heron				
					White-throated Sparrow				
					Wild Turkey				
					2	13°C	0-1	80%	White-throated Sparrow
									Ovenbird
Chestnut-sided Warbler									
Song Sparrow									
Common Raven									
Tree Swallow									
Common Yellowthroat									
Hermit Thrush									
3	14°C	0-1	60%	Black-throated Green Warbler					
				Common Yellowthroat					
				White-throated Sparrow					
				Black-throated Blue Warbler					
4	15°C	0-1	50%	Hermit Thrush					
				Black-throated Green Warbler					
				Red-eyed Vireo					
5	15°C	0-1	50%	Red-eyed Vireo					
				Black-throated Green Warbler					
				Ovenbird					
				Eastern Wood Pewee					
14-Jul-20	1	16°C	0-1	5%	Black-and-white Warbler				
					Red-eyed Vireo				
					Ovenbird				
					Red-winged Blackbird				
					Eastern Phoebe				
					White-throated Sparrow				
2	22°C	0-1	5%	Tree Swallow					

				Song Sparrow
				American Crow
				White-throated Sparrow
				Common Yellowthroat
				Veery
3	26°C	0-1	5%	White-throated Sparrow
				Blue Jay
				American Crow
				Common Raven
				Veery
				Red-winged Blackbird
4	26°C	0-1	5%	White-throated Sparrow
				Red-eyed Vireo
				Blue Jay
				American Crow
				Common Raven
				Hermit Thrush
				Black-throated Green Warbler
5	26°C	0-1	5%	Common Yellowthroat
				Eastern Phoebe
				Eastern Wood Pewee
				Pine Warbler
				Ovenbird

4.5 Fish Habitat

Existing information from the MNRF indicates that Bray Lake is approximately 340 ha in area, with a maximum depth of 16 m and a mean depth of 4 m. The shoreline perimeter is 24 km in length with several large bays. Bray Lake is located within the South River basin and drains several small watercourses and wetland communities surrounding the lake, through to the northeast side of the lake via a dam into Bray Creek. There are no locks for boat passage or ladders for fish passage. Shoreline development on the lake is considered low with some shoreline residential dwellings. The water levels are regulated and controlled by a dam that is owned and operated by Ontario Power Generation. Flows and levels are dictated by the South River Water Management Plan (draft).

Bray Lake supports a typical warmwater fish community including Smallmouth Bass (*Micropterus dolomieu*), as well as Bluntnose Minnow (*Pimephales notatus*), White Sucker (*Catostomus commersonii*), Trout-perch (*Percopsis omiscomaycus*), Blacknose Shiner (*Notropis heterolepis*), Golden Shiner (*Notemigonus crysoleucas*), Yellow Perch (*Perca flavescens*), Pumpkinseed (*Lepomis gibbosus*), Pearl Dace (*Margariscus margarita*), and Brown Bullhead (*Ameiurus nebulosus*). These warmwater species are typical of similar shallow warmwater lakes.

RiverStone's observation of fish habitat conditions were completed from shore and by kayak along the length of the subject property in the summer of 2020. As noted in **Section 2.3.4.3** above, our assessment intended to observe many habitat characteristics for comparison to the requirements of fish species found in Bray Lake, and ultimately classify the habitat according to MNRF criteria (**Table 1**).

During our assessment of the entire frontage of the property on Bray Lake was surveyed for fish habitat characteristics. As previously noted, key variables related to habitat quality include substrates, nearshore slopes, presence of aquatic vegetation, and cover objects, as well as riparian vegetation. Beginning from the southern property boundary, fish habitat was characterized by moderate to steep shoreline slopes with cobble and boulders at the shoreline edge. Substrates included silt over a sandy bottom with some detritus. Nearshore slopes were very shallow ranging from 1 m depths at 5 m from the shoreline to 1 m depths at 10 m from the shoreline. Water temperature recorded on July 14, 2020 was 21 degrees Celsius. Riparian vegetation was complete and dense of the vast majority of the shoreline frontage, with the exception of the area with existing development, where vegetation had been removed. There was abundant cover objects within the lake, including fallen trees and overhanging branches, as well as ample downed woody debris in many sections along the shoreline frontage. Aquatic vegetation was present in many locations and included species such as American Eel Grass (*Vallisneria americana*), White Water Lily (*Nymphaea odorata*), Pickerelweed (*Pontederia cordata*), Seven-angle Pipewort (*Eriocaulon aquaticum*), Pondweed Species (*Potamogeton sp*), Watershield (*Brasenia schreberi*), Softstem Bulrush (*Schoenoplectus tabernaemontani*), and Yellow Pond Lily (*Nuphar lutea*). **Figure 2** outlines the fish habitat conditions along the entire frontage of the subject property with respect to MNRF classification guidelines.

Several watercourses (both intermittent and permanent) were noted on the subject property, as outlined on **Figure 2**. These watercourses generally drained from the wetland communities on the western edge of the subject property toward Bray Lake. It should be noted that fish habitat typing for watercourses are not typically completed by the MNRF, as it is for lakes; however, we did assess

Based on our assessment of the watercourses, the permanency and thermal regime of each are illustrated on **Figure 2**. The permanent watercourse that enters Bray Lake had clearly defined channel banks and substrates differing from the surrounding lands. The other watercourses outlined on **Figure 2** are best classified as intermittent based on the characteristics of very shallow to non-existent channel banks, vegetation that did not differ from the surrounding upland area, and substrates that were not sorted or typical of permanently flowing features. Each of the watercourses on the subject property should be considered either direct or indirect habitat for fish species in Bray Lake and protected as such.

4.6 Endangered and Threatened Species

Based on the initial steps of our desktop analysis and contact with the MNRF, eleven (11) endangered or threatened species had the potential to occur on the property or on adjacent lands. Following review of the aerial photography and our on-site assessment, four (4) endangered or threatened species have the potential to use features in the location of the subject property based on the habitat-based approach: Blanding's Turtle (*Emydoidea blandingii*), Eastern Hog-nosed Snake (*Heterodon platirhinos*), Little Brown Myotis (*Myotis lucifugus*) and Northern Long-eared Myotis (*Myotis septentrionalis*). Features with the highest potential to provide habitat for species at risk on the subject property were associated with the wetland, watercourses, and forest communities (**Figure 2**). See **Appendix 2** for a detailed technical description of RiverStone's assessment to review the boundary of these habitat features and potential habitat for each SAR species.

Although no SAR species were directly observed during the site investigation, the potential habitat was documented on the subject property. In the absence of targeted studies for each species at the appropriate time of year, it is not possible to conclusively determine whether the habitat features are absolutely used by any of the potential SAR that we determined may occur on the property. Therefore,

these habitats are being treated as if the species are present, with mitigation measures implemented to ensure no impacts to the habitat of endangered or threatened species occurs according to the applicable legislation and policy.

Blanding's Turtle

Habitat for Blanding's Turtles in Ontario is characterized by three categories to direct appropriate habitat protection. These categories are outlined in **Table 4**. Potential Blanding's Turtle habitat was observed on the subject property and is outlined in **Appendix 2**. The wetland habitat present on the subject property would be suitable as a movement corridor and foraging area between adjacent wetland areas. The subject property habitat could also provide suitable water depths for overwintering or suitable nesting locations. While species were not documented during site investigations, they should not be ruled out as utilizing the subject property. The wetland habitats on the subject property are best described as Category 2.

Table 4: Habitat categorization for Blanding's Turtle

Category 1	Nest and the area within 30 m or Overwintering sites and the area within 30 m
Category 2	The wetland complex (i.e. all suitable wetlands or waterbodies within 500 m of each other) that extends up to 2 km from an occurrence, and the area within 30 m around those suitable wetlands or waterbodies
Category 3	Area between 30 m and 250 m around suitable wetlands/waterbodies identified in Category 2, within 2 km of an occurrence

4.7 Significant Wildlife Habitat

The results of RiverStone's desktop, habitat-based, and targeted assessments of potential features and communities that could function as significant wildlife habitat (SWH) per provincial policies is provided in **Appendix 3**. Four (4) communities or features with the potential to be identified as SWH were identified. Based on the initial steps of our desktop analysis, seven (7) special concern species had the potential to occur on the subject property. Following review of the aerial photographs and onsite assessment, four (4) special concern species had the potential to use features found on the subject property.

The following SWH features or communities have the potential to be impacted by the proposed development. An impact assessment is provided for each SWH feature in **Section 5.3**.

- Seasonal Concentration Areas of Animals
 - Bat Maternal Colonies
 - Turtle Wintering Areas
- Specialized Habitats for Wildlife
 - Amphibian Breeding Habitat (Woodlands)
 - Amphibian Breeding Habitat (Wetlands)
- Habitat of Species of Conservation Concern
 - Special Concern and Rare Wildlife Species

- Snapping Turtle (*Chelydra serpentina*)
- Eastern Wood-pewee (*Contopus virens*)
- Wood Thrush (*Hylocichla mustelina*)
- Monarch (*Danaus plexippus*)
- Animal Movement Corridors
 - Amphibian Movement Corridors

5 IMPACT ASSESSMENT AND RECOMMENDATIONS

Based on the results of the assessment conducted, features and functions of conservation interest have been identified. **Figure 3** illustrates the features and functions of conservation interest and any protective measures (those recommended by RiverStone).

The proposed development plan for the subject property includes severance for twenty (20) new lots, including fifteen (15) shoreline residential lots and five (5) backlots, with a right-of-way to access each of the lots. These proposed lots are outlined on **Figure 3** and **Appendix 4**. The proposed lot frontages and area dimensions meet the current standards required under the zoning to permit the creation of the lots. As previously noted, the smaller separate parcel along the northern shoreline of Bray Lake was included in a separate application.

RiverStone has reviewed the existing zoning and our impact assessment takes into consideration the activities that are permissible within the context of the proposed development. Our determination of whether the risk of potential impacts on a specific feature is acceptable relies upon the relevant policies and legislation referenced in **Section 2.3.4.1**, as well as our assessment of the significance or quality of the particular feature.

5.1 Water Quality and Fish Habitat

As part of the impact analysis, potential impacts on the wetlands and watercourses, as well as steep slopes and fish habitat, were assessed. In general, negative impacts on water quality and fish habitat can result via the following processes:

- stormwater runoff during construction activities
- modification of drainage patterns or flow rates
- inappropriately located sewage treatment systems that increase nutrient (phosphorous) loading to water bodies
- increased runoff due to an increase in the extent of hard surfaces (e.g., rooftops, driveways, patios)
- construction of in-water structures (e.g., culverts, docks)
- changes to in-water structural features (e.g., substrates, woody debris, aquatic vegetation)
- changes to onshore structural features (e.g., removal of vegetation or soil, importation of aggregates)

Although the land use changes that are proposed have the potential to have negative impacts on the wetland community, it is RiverStone's opinion that the mitigation measures recommended below can reduce the risk of negative impacts to an acceptable level. Several of the mitigation measures relate to establishing vegetated buffers or setbacks. Within vegetated buffers, trees, shrubs, ground cover, and associated leaves and twigs slow rainfall and surface-water flows to water bodies and thus allow additional time for water to soak into the ground. This facilitates nutrient uptake and provides less opportunity for erosion by stabilizing soils. The retention of vegetation allows for a continual source of

woody debris and leaves, while increasing the uptake of phosphorus from overland run off prior to it entering the wetland.

The subject property includes rugged terrain with varying topography. There are areas of the property that include steep slopes. In areas with moderate to steep slopes, the functionality of vegetated buffers is reduced as the slopes act to increase the speed of water moving over the land. To increase the functionality of vegetated buffers adjacent to the shoreline of Bray Lake and wetland communities on the subject property, development should be located in areas of moderate or low slopes and with an increased setback. To this end, RiverStone recommends:

- **Development of the primary dwelling for the each of the proposed lots be setback a minimum of 23 m and 30 m for the septic systems from the shoreline of Bray Lake (Figure 3).**
- **Development of the primary dwellings and septic systems for each of the proposed lots be setback a minimum of 30 m from identified wetlands and watercourses (Figure 3).**
- **No additional vegetation clearing outside of the identified development envelopes is to occur within 30 m of the shoreline of Bray Lake.**

To ensure that water quality is not negatively impacted by stormwater runoff during construction activities (e.g., land clearing and grubbing, dwelling and septic system construction, driveway construction), RiverStone recommends the following measures in addition to those already imposed through the lakeshore capacity review above:

- **When the native soil is exposed, sediment and erosion control works, in the form of heavy-duty sediment fencing, be positioned along the downgradient edge of any construction envelopes adjacent to water bodies, wetlands, or watercourses.**
- **Temporary storage locations of aggregate material be located no less than 30 m from the shoreline of Bray Lake in areas of low slopes. This material is to be contained by heavy-duty sediment fencing.**
- **The sediment fencing must be constructed of heavy material and solid posts to ensure its integrity and be properly installed (trenched in) to maintain its integrity during inclement weather events.**
- **Additional sediment fencing and appropriate control measures (e.g., straw bales) be stockpiled on site so that any breach can be immediately repaired through construction of check dams.**
- **Regular inspection and monitoring will be necessary to ensure that the structural integrity and continued functioning of the sediment control measures is maintained (i.e., proper installation is not the only action necessary to satisfy the mitigation requirements).**
- **Inspections of sediment and erosion control measures be completed within 24 hours of the onset of a storm event.**
- **Sediment control measures be maintained in good working order until vegetation has been established on the exposed soils.**

- **Offloading of construction materials and aggregate should be completed during fair weather.**

To ensure that the wetland communities and their protective buffers are not negatively impacted by increased nutrient loading and run off, RiverStone recommends the following measures:

- **Vegetation is not to be removed within 30 m of the wetlands unless it is a safety hazard, and debris from clearing or materials to be used in construction are not to be placed within this area.**
- **Because stormwater runoff can impact the thermal regime of watercourses, where stormwater management is applied, Low Impact Development (LID) techniques should be implemented, that promote infiltration and use of vegetated swales to take-up overland runoff, before entering watercourses.**

5.2 Endangered and Threatened Species

Appendix 2 presents our assessment of potential impacts to endangered and threatened species while **Figure 3** graphically outlines the features and functions of conservation interest and recommendation detailed below. RiverStone field assessments have identified the habitat of four (4) species at risk with confirmed or potential habitat on the subject property: Blanding’s Turtle, Eastern Hog-nosed Snake, Little Brown Bat, and Northern Long-eared Bat (hereafter “endangered bats”). RiverStone recommends the following measures:

Blanding’s Turtle

Based on the observations made during RiverStone’s onsite assessments, wetland and watercourse features on the subject property would be most appropriately categorized as Category 2 habitat for Blanding’s Turtle, including the immediate 30 m adjacent to the wetland habitats. The recommendations made above to protect wetland and watercourse features, including a 30 m development setback and buffer, are suitable to also protect Category 2 habitat for Blanding’s Turtles.

Eastern Hog-nosed Snake

The Eastern Hog-nosed Snake specializes in hunting and eating toads, and usually only occur where toads can be found. They prefer sandy, well-drained habitats such as beaches and dry forests where they can lay their eggs and hibernate. Eastern Hog-nosed Snakes are a highly mobile species and somewhat generalist with respect to habitat preferences. They use large areas to carry out life processes such as foraging, thermoregulation, mating and dispersal. Because of their mobility, they have large activity ranges and long average distances moved daily. These habitat areas can include a mosaic of open natural areas such as woods, brushland and meadow; forest and forest edge; rock barrens; and sandy areas. The most significant threats to Eastern Hog-nosed Snake are habitat loss, fragmentation and road mortality.

Eastern Hog-nosed Snakes were not documented on the subject property during field investigations; however, due to the cryptic nature of this species, it is possible they are present but were not located. Based on the observations made during RiverStone’s on-site assessments, features on the subject property are suitable to function as general habitat for Eastern Hog-nosed Snakes. In order to prevent impacts upon the habitat of Eastern Hog-nosed Snakes, and other snakes, that may be utilizing the subject property, RiverStone recommends the following:

- **Aggregate storage, particularly sand, is a suitable nesting substrate for Hog-nosed snakes. Should sand be stored on the property between June 1 and August 31, the stockpile should be surrounded by exclusion fencing to prevent access.**

This has been accomplished through the design of road access to the lots presented in the development plan (**Appendix 4**). All efforts have been made to shorten road length and minimize the expectation of potential road mortality.

Endangered Bats

Potential roosting habitat for two (2) endangered bats, Little Brown Bat and Northern Long-eared Bat is located across the subject property in the forested vegetation communities.

Habitat for bats is prevalent throughout Central Ontario. As a predominantly forested area, habitat for maternal roosting bats is not limited across the landscape. The primary reason for these species of bats being listed under the *ESA* is the prevalence of White-nose Syndrome, which is a fungus that infects bats as they hibernate over winter. This fungus grows on their muzzle, ears and wing-membranes, continually waking them from hibernation and causing dehydration, resulting in mortality.

In order to prevent impacts to the habitat of at-risk bats that may be utilizing the subject property, RiverStone recommends the following;

- **Tree clearing for the purposes of development on each proposed lot only occur in the fall, winter and early spring (from October 15 to April 15). This timeframe is outside of the maternal roosting period.**
- **In the event that tree clearing must occur between April 15 and October 15, additional studies will need to be completed to confirm the presence or absence of SAR bats. These studies will include snag tree surveys and acoustic monitoring of the area where trees will be removed, by a qualified professional. Should SAR bats be detected, the MECP should be contacted to determine if a permit would be required to proceed.**

5.3 Significant Wildlife Habitat

As mentioned in **Section 3.7** of this report, the subject property contains a number of features that have the potential to meet the definitions of Significant Wildlife Habitat according to the Significant Wildlife Habitat Criteria Schedules for Ecoregion 5E (OMNRF 2015a). The following impact assessment considers direction provided by MNRF in their Significant Wildlife Habitat Mitigation Support Tool (OMNRF 2014). **Appendix 3** presents our assessment of potential impacts on significant wildlife habitat and **Figure 3** outlines the features and functions of conservation interest and recommendations.

5.3.1 Seasonal Concentration Areas for Wildlife Species

5.3.1.1 Bat Maternal Colonies

During the summer season, pregnant and lactating female bats will move from roost to roost each morning in responses to changes in thermal conditions and prey (insect) availability. Areas containing a high density of snags increases the chances of use by endangered bats as these areas provide a variety

of microhabitat conditions. Changes within the forest community adjacent to maternal roosts have the potential to reduce the suitability of a given snag or cavity tree by changing the extent of shading by adjacent trees, which can result in changes to thermal conditions within the roost. Additionally, as roosting trees inherently exhibit some level of decay, removal of trees surrounding roosts may increase the potential for wind-throw of both the roost itself and surrounding trees, thereby damaging or destroying the habitat feature.

As mentioned above, habitat for bats is prevalent throughout much of the landscape surrounding the subject property. Where portions of the municipality are predominantly forested, habitat for maternal roosting bats is not limited. The recommendations provided to address potential impacts to endangered bats is sufficient to ensure that there are no impacts to the ecological form and function of the subject property as it pertains to bat maternal colonies.

5.3.1.2 Turtle Wintering Areas

Turtles overwinter in ponds, streams, and lakes. Ideal overwintering habitats provide low temperatures and high dissolved oxygen conditions but must not freeze to the bottom. Some species of turtles, (e.g., Snapping Turtles) are able to overwinter in areas with limited dissolved oxygen. Based on the results of the background and onsite assessment, the watercourses and marsh communities (G142N) located on the subject property have the potential to provide overwintering habitat for turtles. To minimize the potential for negative impacts to these ecological features and their ability to function as turtle wintering areas the recommendation to provide a 30 m development setback from all wetland communities (**Figure 3**) will provide the appropriate protection.

5.3.2 Specialized Habitats for Wildlife

5.3.2.1 Amphibian Breeding Habitat (Woodland)

In Ontario, many species of amphibians breed in permanent, seasonal, or ephemeral pools within forest communities. Breeding typically occurs early in the spring as the hydroperiod of many of these ecological features does not extend into the warmer months. Swamp communities with the potential to contain standing pools of water early in the spring were identified, in addition to forested wetlands and open water meadow marsh communities. These communities have the potential to function as breeding habitat for amphibians. Maintaining the ecological function of these areas requires that the overland surface runoff be maintained, and that the extent of surrounding vegetation be maintained to minimize the potential to alterations to the hydroperiod. The previous recommendation to implement a 30 m development setback from treed swamp communities (**Figure 3**) will provide the appropriate protection for woodland breeding amphibians.

5.3.2.2 Amphibian Breeding Habitat (Wetland)

Wetland communities are commonly associated with amphibians. Choruses of calling amphibians are commonly encountered in wetland communities during spring and summer months during the evening in Ontario. On the subject property, several marsh communities are present. While these areas appear to have direct connection to a watercourse and the adjacent lake, suggesting the presence of predatory fish species, the marshes have a high likelihood of functioning as breeding habitat for amphibians. To minimize the potential for negative impacts to these ecological features and their function as amphibian breeding habitat, the previous recommendation to require a 30 m development setback from all wetland communities (**Figure 3**) will provide the appropriate protection.

5.3.3 Habitat for Species of Conservation Concern (excluding Endangered or Threatened Species)

5.3.3.1 *Special Concern and Rare Wildlife Species*

There are seven (7) species that have the potential to be present or use vegetation communities on the subject property or within adjacent lands based on existing records and range mapping. This list of species was refined to four (4) species that had the potential to be present on the subject property. These remaining species were anticipated to be found within the wetland/watercourses [Snapping Turtle (*Chelydra serpentina*)], forested habitat [Eastern Wood Pewee (*Contopus virens*) and Wood Thrush (*Hylocichla mustelina*)], and edge/anthropogenic habitats [Monarch (*Danaus plexippus*)] which are present on the subject property.

Snapping Turtle

Snapping Turtles make use of wetland and shoreline habitats. Snapping Turtles spend most of their lives in the water. They prefer to hide under the soft mud and leaf litter with only their noses exposed to the surface to breathe. During nesting season, females will travel overland in search of suitable sandy/gravelly areas along streams or wetlands. They often take advantage of man-made structures for nest sites, including roads and aggregate pits. Potential habitat for this species is largely restricted to the shoreline of Bray Lake and the inland wetland communities as mapped on **Figure 2**. In-water basking structure is present on the subject property, but due to the steep slopes in some areas of the subject property and the extent of vegetative cover, potential nesting habitat may be limited. To maintain the existing habitat, the previous recommendations to maintain a 30 m development setback from wetlands and 15 m setback from the shoreline of Bray Lake will maintain habitat for snapping turtles.

Wood Thrush and Wood Pewee

Wood Thrush and Eastern Wood-pewee are both small forest birds that are found in intermediate to mature aged forests; both species prefer deciduous forests but can be found in mixed stands as well. Wood Thrush nest in saplings, trees, or shrubs, often selecting American Beech or Sugar Maple as a preferred nesting site. Eastern Wood-pewee's select nesting sites in the mid-canopy layer and prefers forests with little to no understory vegetation. These two species are most sensitive to disturbance during the nesting season when alteration of vegetation communities can result in damage or destruction of nests and young. To minimize the likelihood that these two species are impacted by the proposed development, RiverStone recommends:

- **Vegetation removal should be restricted during the migratory bird nesting season, May 1st to Aug 15th each year. This timeframe falls entirely within the restricted timing window for removal of trees as it relates to roosting bats and noted above. In the event that tree clearing must occur between May 1st and Aug 15th, a qualified professional should complete a nest survey for the area where tree clearing is proposed. If nesting birds are found, tree clearing should wait until the birds have fledged.**

This timing restriction also provides protection of birds under the *Migratory Bird Convention Act, 1994* or provincial *Fish and Wildlife Conservation Act, 1997*.

Monarch

As caterpillars, Monarch's feed exclusively on Milkweed (*Asclepias* spp.). Given this species reliance on a host plant, breeding habitat for Monarch is limited to areas where Milkweed is present. As adult butterflies, Monarchs seek out wildflowers such as Goldenrods (*Solidago* spp.), Asters (*Doellingeria* spp., *Eurybia* spp., *Oclemena* spp., *Symphotrichum* spp., and *Virgulus* spp.); non-native species such as Purple Loosestrife (*Lythrum salicaria*) also provide a food source for adults.

The proposed development plan requires the removal of vegetation from the forest community on the subject property. Based on the development plan, full removal of breeding and foraging habitat for Monarch is not anticipated as the suitable habitat was restricted to the driveway/roadway and in an open area where the existing development is located. Potential food sources and breeding habitat is found along the margins of the forest community and boundaries of the site; these areas are proposed to be left in a natural state. Given the location and extent of the development proposed, there is a low likelihood that negative impacts will occur to the site's ecological form and function as habitat for Monarch. Also, the primary reason for the consideration of Monarch as a species of special concern relate to the aggressive loss of critical habitat during their life cycle in Mexico.

5.3.4 Animal Movement Corridors

5.3.4.1 Amphibian Movement Corridors

The subject is bound by a single roadway and Bray Lake. Generally, roads are a known source of mortality for amphibians. Avoiding placement of development between features that amphibians utilize for the various elements of their life history requirements will limit the potential for negative impacts while increasing the likelihood that existing movement corridors will be maintained. The proposed development is primarily located along the shoreline of Bray Lake and will be accessed by two private driveways (one which is existing) that will avoid the identified wetland communities. Most of the subject property will be left in its current condition, thereby maintaining ability of amphibians to move between seasonal habitats. Based on the development as proposed, there is a low likelihood that it will result in negative impacts to features with the potential to function as amphibian movement corridors on the subject property.

5.4 Other Natural Features and Functions

The proposed land use changes will result in the felling of both deciduous and coniferous trees, and vegetation will be removed or substantially modified within the development footprints for each proposed lot. Outside of the significant features and functions noted above, migratory birds in general have protection under the *Migratory Birds Convention Act* (the "MBCA"). To be compliant with this Federal legislation, RiverStone recommends:

- **Vegetation removal (e.g., tree/shrub clearing, etc.) should be completed outside of the primary breeding bird nesting window (i.e., between April 1 and August 31). If vegetation removal occurs during this period, a nest survey should be conducted by a qualified biologist within 5 days of commencement of construction activities to identify and locate active nests of bird species (where present) covered by the federal *Migratory Bird Convention Act, 1994* or provincial *Fish and Wildlife Conservation Act, 1997*. If a nest is located or evidence of breeding noted, a mitigation plan should be developed to avoid any potential impacts on birds or their active nests. Mitigation may require establishing appropriate buffers around active nests or delaying construction activities until the conclusion of the nesting season.**

6 CONFORMANCE WITH APPLICABLE ENVIRONMENTAL POLICIES

6.1 Federal Fisheries Act (R.S.C., 1985, amended 2019-08-28)

The *Federal Fisheries Act* states that:

34.4 (1) No person shall carry on any work, undertaking or activity, other than fishing, that results in the death of fish.

35. (1) No person shall carry on any work, undertaking or activity that results in harmful alteration, disruption or destruction of fish habitat.

DFO further states that “under subsection 35(1) a person may carry on such works, undertakings or activities without contravening this prohibition, provided that they are carried on under the authority of one of the exceptions listed in subsection 35(2), and in accordance with the requirements of the appropriate exception. In most cases, this exception would be Ministerial authorizations granted to proponents in accordance with the *Authorizations Concerning Fish and Fish Habitat Protection Regulations*.”

The recommendations included in this report will keep development and site alteration away from all fish habitat identified on the subject property. As such, it is the opinion of RiverStone that activities proposed on the property will not contravene the *Fisheries Act*, and that an Authorization under the Section 35(2) is not likely required. Should however, during the course of this project, situations arise and lead to occurrences that result in a HADD, persons responsible for the project have a “duty to notify” DFO, take corrective actions, and provide written reports under Section 38 of the *Act*.

6.2 Provincial Endangered Species Act, 2007 (ESA)

The *Endangered Species Act* (ESA) protects designated endangered and threatened species in Ontario from being killed, harmed, or harassed (s. 9) or having their habitat damaged or destroyed (s. 10). The protection afforded to Endangered and Threatened species “habitat” is defined as follows (s. 2[1])

- (a) with respect to a species of animal, plant or other organism for which a regulation made under clause 55 (1) (a) is in force, the area prescribed by that regulation as the habitat of the species, or*
 - (b) with respect to any other species of animal, plant or other organism, an area on which the species depends, directly or indirectly, to carry on its life processes, including life processes such as reproduction, rearing, hibernation, migration or feeding,*
- and includes places in the area described in clause (a) or (b), whichever is applicable, that are used by members of the species as dens, nests, hibernacula or other residences; (“habitat”).*

A detailed assessment of potential endangered and threatened species and their habitat on the subject property is provided in **Section 5.2** and **Appendix 2**. Provided that RiverStone’s recommended measures outlined in **Section 5** are implemented in full, the proposed development is anticipated to be consistent with the ESA.

6.3 Provincial Policy Statement, 2020 (PPS)

The significant natural features documented on the subject property include, potential habitat for endangered and threatened species, significant wildlife habitat, and wetlands/watercourses with the

potential to function as fish habitat. Based on these identified features the following provisions from Section 2.1 of the 2020 PPS are relevant to this assessment:

2.1.5 *Development and site alteration shall not be permitted in:*

d) significant wildlife habitat;

...unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Based on the results of RiverStone's background review and assessment of the subject property and contingent on the implementation of the recommendations outlined in **Section 4** of this report, the development as proposed is consistent with policy 2.1.5 of the PPS.

2.1.6 *Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.*

As per **Section 5.1** fish habitat was identified along the shoreline of the subject property fronting onto Bray Lake and within the wetlands and watercourses present on the property. Adherence to the recommendations outlined in **Section 4** of this report will ensure there are no negative impacts to fish habitat.

2.1.7 *Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.*

Excluding development and site alteration from the areas shown on **Figure 3** and implementing the mitigation measures outlined in **Section 5** will ensure that these activities do not occur in areas that could be considered habitat of endangered or threatened species which is consistent with policy 2.1.7.

2.1.8 *Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.1.5 and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.*

The extent of the area evaluated for negative impacts on potentially significant natural heritage features as described in **Appendix 2** and in **Section 5** are more than sufficient to ensure that impacts on adjacent lands were appropriately assessed. Careful evaluation of the ecological function of the lands potentially affected by the permissible development and site alteration on the subject property indicates that the activities will be consistent with policy 2.1.8, as long as the recommended mitigation measures are followed.

6.4 Township of Machar Official Plan (October 8, 2013)

The preceding sections discuss how the proposed land use change would comply with federal and provincial legislation and policy, as well as the policies of the District Municipality of Muskoka. Many of the policies addressed are similar to those set out in the Township's Official Plan. Specifically, issues pertaining to the protection of endangered and threatened species habitat as per the requirements and recommendations of the Official Plan have been addressed.

Section C1.2 of the Township of Machar OP addresses environmental features that are not included in the natural heritage protection designation.

Section C1.2.1 outlines that it is the intent of the plan to protect all lakes, rivers, and streams from incompatible development to minimize the impacts of such development on their function. The subject property includes approximately 2438 m (8000 feet) of shoreline on Bray Lake, in addition to wetland communities and several watercourses. **Figure 3** outlines these natural features and RiverStone has provided recommendations for locating development outside of these constraints and their recommended buffers to protect the natural feature and its function.

Section C1.2.2 outlines measures for protecting fish habitat and states that “new development may be permitted within fish habitat if it can be demonstrated through an EIS that such development will have no negative impact on the feature”. Presently, the shoreline of the subject property is listed as “unknown” fish habitat. As part of this EIS, RiverStone completed a fish habitat assessment for the entire shoreline of the subject property to determine areas that are classified as both Type 1 and Type 2 fish habitat according to MNR guidelines. **Figure 2** outlines each of these areas and **Figure 3** illustrates the additional recommendations that are outlined in **Section 4** of this report to protect fish and fish habitat on the subject property.

Section C1.2.4 outlines that “new development and site alteration may be permitted within or adjacent to areas of significant wildlife habitat or the adjacent lands only where it can be demonstrated through an EIS that such development or site alteration will have no negative impact on the feature or the ecological function”. As illustrated in **Section 3.7** of this report, SWH has been identified on the subject property (**Appendix 3** provides an assessment of SWH); however, recommendations outlined in **Section 4** will ensure that both candidate and confirmed SWH will be protected.

6.5 Township of Machar Zoning By-law No. 45-12

The subject property is currently zoned Shoreline Residential (SR), Rural (RU), and Environmental Protection (EP) in the Township of Machar Zoning By-law. Section 4.2 of the Zoning By-law addresses regulations for permitted uses within the Shoreline Residential Zone. Minimum lot requirements within the SR zone are that lots be a minimum of 1.0 ha in area with a minimum of 60 m of water frontage. The proposed lots to be located along the shoreline are consistent with the requirements of the SR zone. Section 4.8 of the Zoning By-law addresses regulations for permitted uses within the Rural Zone. Minimum lot area is required to be 10 ha with a minimum lot frontage of 135 m. Proposed lots 1, 2, and 3 are consistent with the requirements of the RU zone.

Environmental Protection (EP) zoning restrictions are outlined in Section 4.16. This section states that “no person shall within any Environmental Protection Zone use any land, or erect, alter or use any building or structure”. The recommendations outlined in **Section 4** of this report will ensure that the proposed severance for the subject property will be consistent with these requirements.

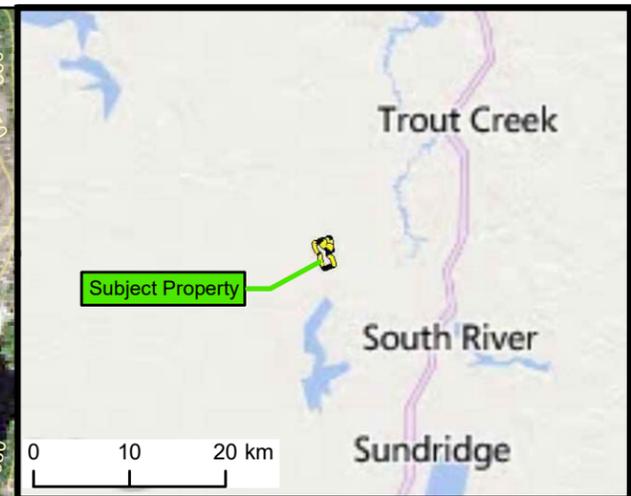
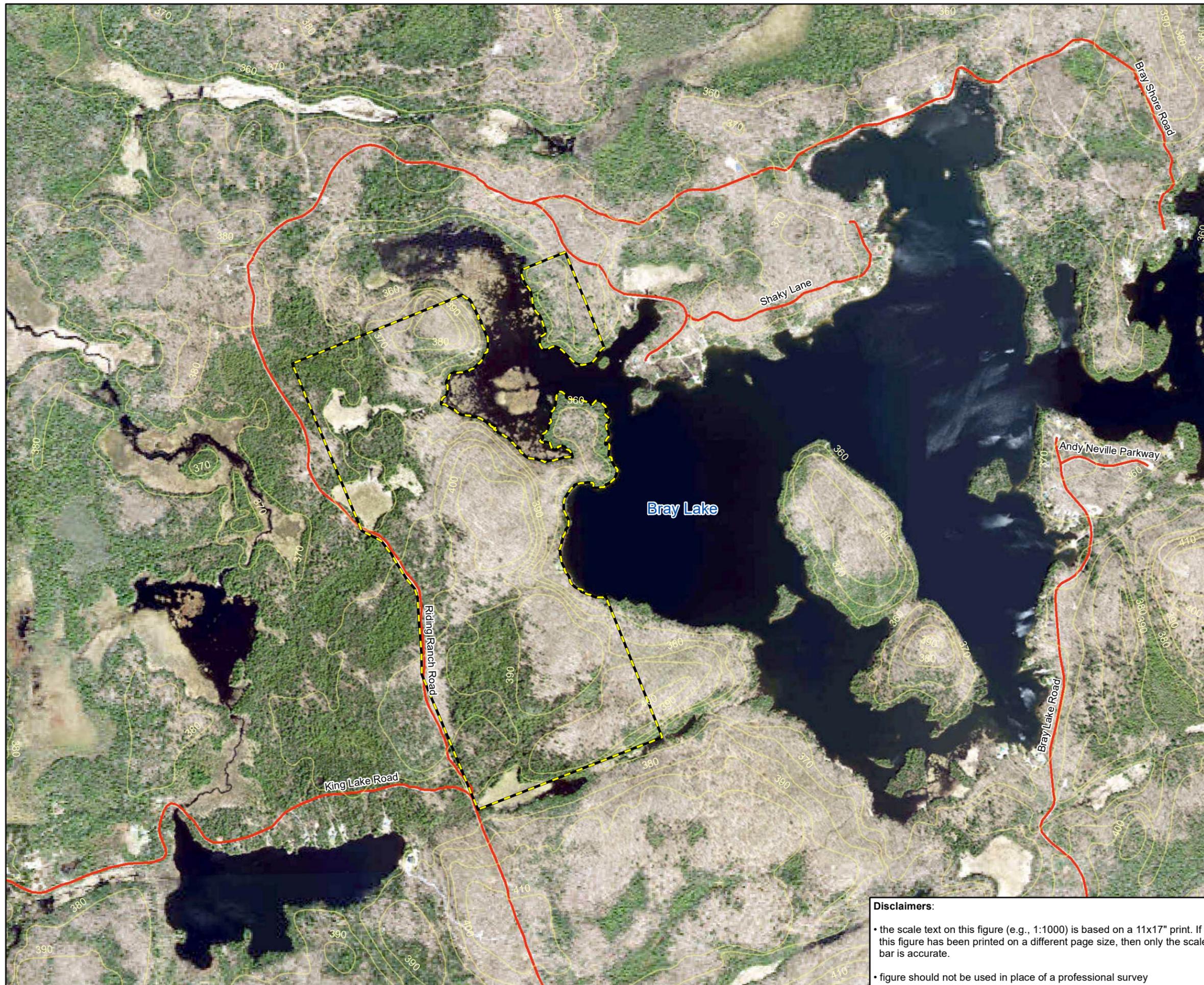
7 CONCLUSIONS

Based upon the findings presented in this report and contingent upon the implementation of the recommendations made herein, we conclude that the proposed development application will not negatively impact any features of conservation interest protected under relevant municipal, provincial, or federal environmental policies as outlined. Given this, and providing that our recommended measures to minimize the potential for impact are implemented, RiverStone is of the opinion that the proposed development is compliant with the relevant environmental legislation and policies. We

advise that the recommendations in this report be incorporated into any development or building permits for the subject property.

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N

Legend

Ontario Base Mapping (OBM)

- Roads
- 5 m Contours

Planning Boundaries

- Subject Property

Orthorectified aerial photo - spring 2018

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0 225 450 Metres

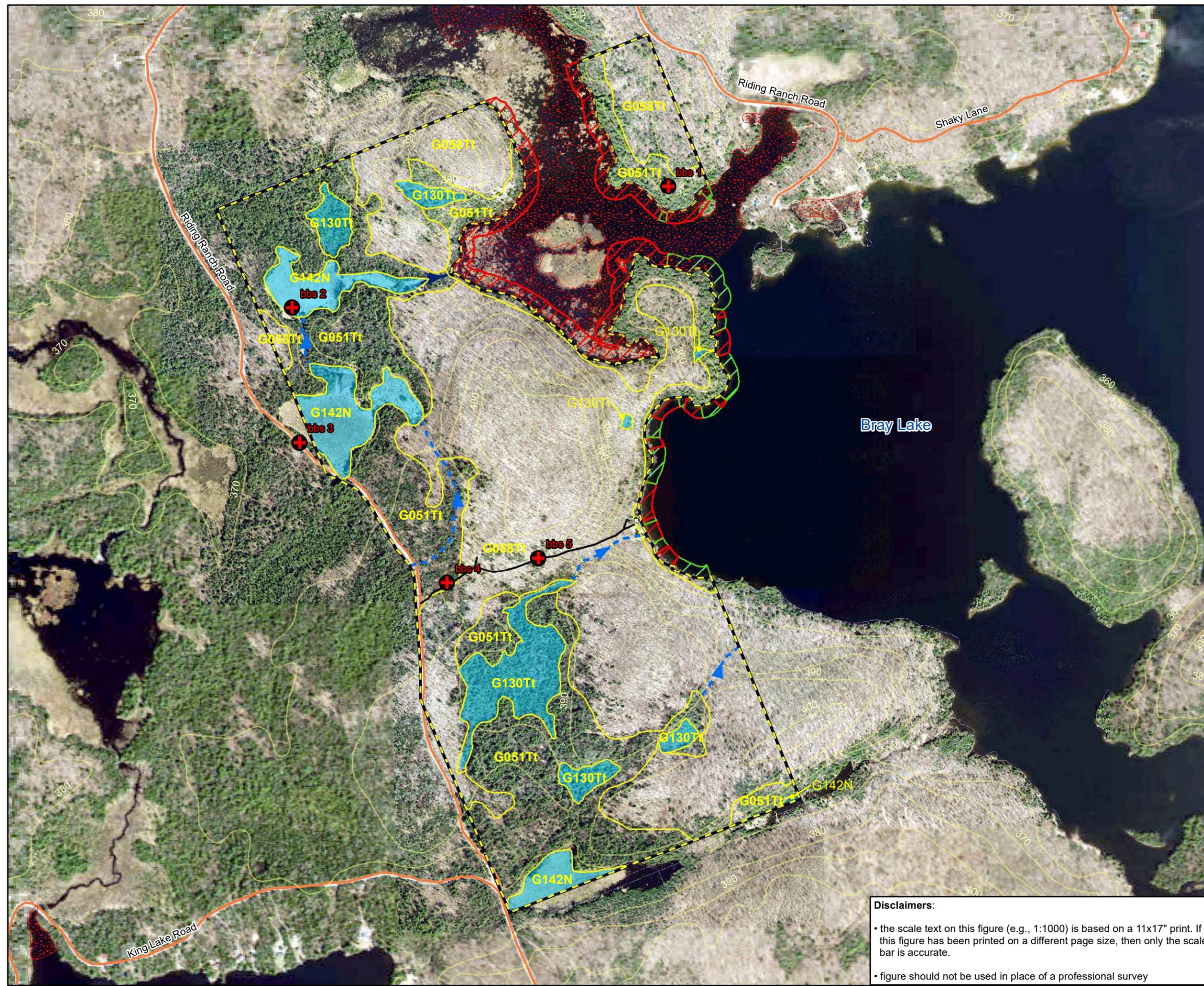
Figure 1. Location Of Subject Property.
 1791 Riding Ranch Road .Lots 19 and 20,
 Concession 11, and Lots 18, 19, and 20, Concession
 12, Township of Machar, District of Parry Sound

Prepared for: Frank Polsinelli and Nghi Nguyen

Inset: General Location Of Subject Property

Disclaimers:

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- figure should not be used in place of a professional survey



Legend

Ontario Base Mapping (OBM)

- Roads
- 5 m Contours

Planning Boundaries

- ▭ Subject Property

Features with Recognized High Natural Heritage Value - Identified by the Province or the Relevant Approval Authorities

- ▨ Fish Habitat (MNR)

Features Taken from Existing Survey

- Access Road
- ▭ Accessory Building
- ▭ Cottage

Biophysical Features+Functions-RiverStone

Ecological Communities

- G051Tt: Dry to Fresh, Coarse: Hemlock-Cedar Conifer
- G058Tt: Dry to Fresh, Coarse: Maple Hardwood
- G130Tt: Intolerant Hardwood Swamp
- G142N: Mineral Meadow Marsh

Features with Recognized Natural Heritage Value - Identified by RiverStone

- ▶ Intermittent Watercourse
- ▶ Permanent Watercourse
- Shoreline
- ▨ Type 1 Fish Habitat
- ▨ Type 2 Fish Habitat
- ▨ Wetland – Species At Risk Habitat and Significant Wildlife Habitat

Survey Station

- ⊕ Breeding Bird Station

Orthorectified aerial photo - spring 2018

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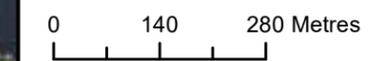
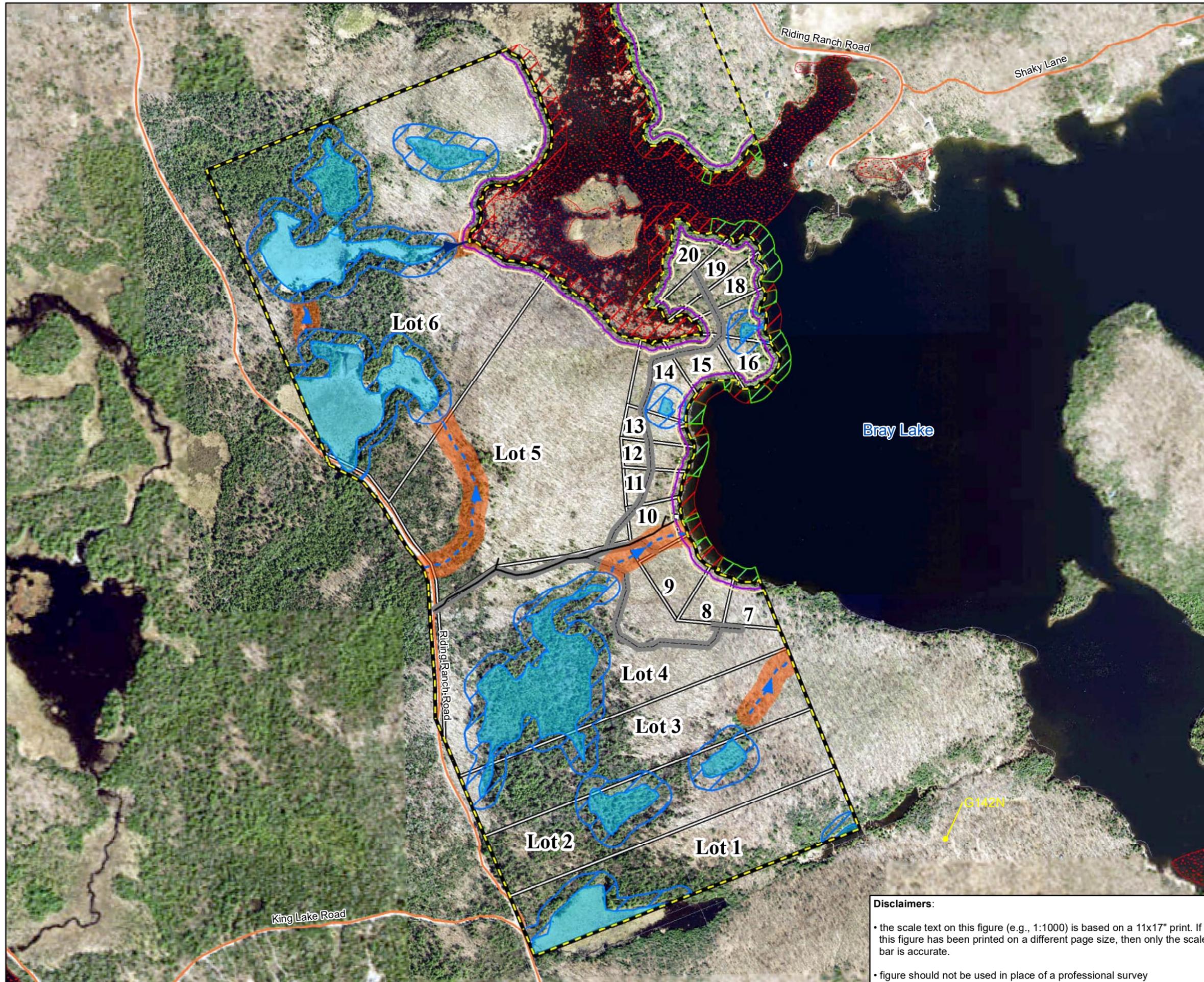


Figure 2. Existing Conditions.
 1791 Riding Ranch Road .Lots 19 and 20, Concession 11, and Lots 18, 19, and 20, Concession 12, Township of Machar, District of Parry Sound

Prepared for: Frank Polsinelli and Nghi Nguyen

Disclaimers:

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- figure should not be used in place of a professional survey





Legend

Ontario Base Mapping (OBM)

- Roads

Planning Boundaries

- Subject Property

Features Taken from Existing Survey

- Access Road
- Accessory Building
- Cottage

Features with Recognized Natural Heritage Value - Identified by RiverStone

- Intermittent Watercourse
- Permanent Watercourse
- Shoreline
- Type 1 Fish Habitat
- Type 2 Fish Habitat
- Wetland – Species At Risk Habitat and Significant Wildlife Habitat

Development Setbacks Required by Relevant Approval Authorities

- 23 m Shoreline Setback (Township of Machar Zoning By-law)
- 15 m Shoreline Natural Vegetative Buffer (Township of Machar Zoning By-law)
- 30 m Watercourse Buffer (Township of Machar Zoning By-law)

Measures Recommended by RiverStone to Prevent and/or Reduce Impacts

- 30 m Wetland Setback

Proposed Development and Site Alteration

- Right-of-Way
- Lot Lines

Orthorectified aerial photo - spring 2018

Scale	RS Project No.	Date Last Updated	By
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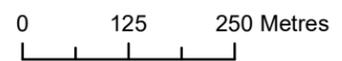




Figure 3. Proposed Development And Recommendations.
 1791 Riding Ranch Road .Lots 19 and 20, Concession 11, and Lots 18, 19, and 20, Concession 12, Township of Machar, District of Parry Sound

Prepared for: Frank Polsinelli and Nghi Nguyen

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- figure should not be used in place of a professional survey

Appendix 1. Site Photos





Photo 1. Existing cabin and bunkie development on subject property (June 25, 2020).



Photo 2. Existing sauna development on subject property (June 25, 2020).



Photo 3. Sugar Maple dominated forest community on subject property (June 25, 2020).



Photo 4. Sugar Maple dominated forest community on subject property (June 25, 2020).



Photo 5. Watercourse on subject property within Sugar Maple dominated forest community (June 25, 2020).



Photo 6. Watercourse on subject property within Sugar Maple dominated forest community (June 25, 2020).



Photo 7. Watercourse leading to shoreline of Bray Lake depicting rugged terrain on subject property (June 25, 2020).



Photo 8. Meadow marsh wetland community on subject property (June 25, 2020).



Photo 9. Riparian area of meadow marsh community on subject property (June 25, 2020).



Photo 10. Rock face within maple hardwood vegetation community on subject property (June 25, 2020).



Photo 11. Fish habitat characteristics fronting existing development on subject property (July 14, 2020).



Photo 12. Type 1 fish habitat characteristics fronting the subject property (July 14, 2020).



Photo 13. Sandy substrates with abundant downed woody debris along shoreline of subject property (July 14, 2020).



Photo 14. Evidence of bass nests along shoreline of subject property (July 14, 2020).



Photo 15. Type 1 fish habitat within northern bay on subject property (July 14, 2020).



Photo 16. Intolerant hardwood swamp community on subject property (August 3, 2020).



Photo 17. Intolerant hardwood swamp community on subject property (August 3, 2020).



Photo 18. Permanent watercourse on subject property flowing from wetland communities to Bray Lake (August 3, 2020).

Appendix 2. Assessment of Endangered and Threatened Species



Habitat-based Approach

Properly assessing whether an area is likely to contain Endangered or Threatened species for the purposes of determining whether a proposed development is likely to have a negative impact is becoming more difficult as the number of listed species increases. Approaches that depend solely on documenting the presence of individuals of a species in an area almost always underrepresent the biodiversity actually present because of the difficulty of observing species that are usually rare and well camouflaged. Given these difficulties, and the importance of protecting habitats of Endangered and Threatened species, RiverStone's primary approach to site assessment is habitat-based. This means that our field investigations focus on *evaluating the potential for features within an area of interest to function as habitat for species considered potentially present, rather than searching for live specimens*. An area is considered potential habitat if it satisfies a number of criteria, usually specific to a species, but occasionally characteristic of a broader group (e.g., several turtles use sandy shorelines for nesting, multiple bat species use dead or dying trees for roosting habitat). Physical attributes of a site that can be used as indicators of its potential to function as habitat for a species include structural characteristics (e.g., physical dimensions of rock fragments or trees, water depth), ecological community (e.g., meadow marsh, rock barren), and structural connectivity to other habitat features required by the species. Species-specific habitat preferences and/or affinities are determined from status reports produced by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Cadman et al. (2007), published and unpublished documents, and direct experience.

Table 1 provides RiverStone's desktop screening and on-site assessment for Endangered and Threatened species. RiverStone measures species- and feature-specific distances from the boundaries of proposed lots or development area(s)—rather than from the boundary of the significant natural heritage feature—and refers to this area as *adjoining lands (AL)*. Evaluating the likelihood of species' presence and the potential for negative impacts using this approach ensures that the Adjacent Lands test of the PPS will be met.

For the purposes of RiverStone's assessment, the *subject property* as shown in **Figure 1** is referred to as the Area of Interest (AOI) and the adjoining lands (AL) extents were measured from the boundaries of the AOI.

Common Name ¹	Scientific Name	Step 1 (Desktop): Rationale for considering	Step 2 (Desktop): Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from aerial photography and other information sources indicate that potential habitat or communities might be present?		Step 3 (On Site): Potential and/or confirmed habitat documented during on-site assessment		Step 4: Is there potential for the species, its habitat, or ecological community to be negatively impacted by the activities that would be permissible within the AOI?
			Area of Interest (AOI)	Adjoining Lands (AL)	Area of Interest (AOI)	Adjoining Lands (AL)	
Endangered & Threatened (Provincially): status from Species at Risk in Ontario List (O Reg 230/08); updated August 2018							
Blanding's Turtle	<i>Emydoidea blandingii</i>	SAR by Geo-Township Tool (MNR)	YES, suitable wetland and/or aquatic communities are present.	YES, suitable wetland and/or aquatic communities are present.	YES, suitable wetland and/or aquatic communities are present.	YES, suitable wetland and/or aquatic communities are present.	YES.
Eastern Hog-nosed Snake	<i>Heterodon platirhinos</i>	SAR by Geo-Township Tool (MNR)	YES, a mosaic of open-canopy communities and mixed forest are present.	YES, a mosaic of open-canopy communities and mixed forest are present.	YES, a mosaic of open-canopy communities and mixed forest are present.	YES, a mosaic of open-canopy communities and mixed forest are present.	YES.
Eastern Whip-poor-will	<i>Caprimulgus vociferus</i>	SAR by Geo-Township Tool (MNR)	NO, majority of property is forested with openings in canopy limited to the wetland communities.	NO, majority of property is forested with openings in canopy limited to the wetland communities.	NO, majority of property is forested with openings in canopy limited to the wetland communities.	NO, majority of property is forested with openings in canopy limited to the wetland communities.	NO, see steps 2 and 3.
Bobolink	<i>Dolichonyx oryzivorus</i>	SAR by Geo-Township Tool (MNR)	NO, suitable grassland or agricultural communities are absent.	NO, suitable grassland or agricultural communities are absent.	NO, suitable grassland or agricultural communities are absent.	NO, suitable grassland or agricultural communities are absent.	NO, see steps 2 and 3.
Chimney Swift	<i>Chaetura pelagica</i>	SAR by Geo-Township Tool (MNR)	YES, dark sheltered hollow vertical structures (large trees with cavities and rock crevices) suitable for nesting or roosting may be present.	YES, dark sheltered hollow vertical structures (large trees with cavities and rock crevices) suitable for nesting or roosting may be present.	NO, dark sheltered hollow vertical structures (chimneys, smoke stacks, silos, large trees with cavities and rock crevices) suitable for nesting or roosting are absent.	NO, dark sheltered hollow vertical structures (chimneys, smoke stacks, silos, large trees with cavities and rock crevices) suitable for nesting or roosting are absent.	NO, see step 3.
Barn Swallow	<i>Hirundo rustica</i>	SAR by Geo-Township Tool (MNR)	YES, man-made or natural structures suitable for nesting may be present.	YES, man-made or natural structures suitable for nesting may be present.	NO, man-made or natural structures suitable for nesting are absent.	NO, man-made or natural structures suitable for nesting are absent.	NO, see step 3.
Eastern Meadowlark	<i>Sturnella magna</i>	SAR by Geo-Township Tool (MNR)	NO, suitable grassland or agricultural communities are absent.	NO, suitable grassland or agricultural communities are absent.	NO, suitable grassland or agricultural communities are absent.	NO, suitable grassland or agricultural communities are absent.	NO, see steps 2 and 3.
Bank Swallow	<i>Riparia riparia</i>	SAR by Geo-Township Tool (MNR)	YES, man-made or natural structures suitable for nesting may be present.	YES, man-made or natural structures suitable for nesting may be present.	NO, man-made or natural structures suitable for nesting are absent.	NO, man-made or natural structures suitable for nesting are absent.	NO, see step 3.
Eastern Small-footed Myotis	<i>Myotis leibii</i>	SAR by Geo-Township Tool (MNR)	YES, dark sheltered hollow vertical structures (e.g., large trees with cavities or rock crevices) suitable for gestating or roosting may be present.	YES, dark sheltered hollow vertical structures (e.g., large trees with cavities or rock crevices) suitable for gestating or roosting may be present.	NO, potential habitat not observed; however, trees suitable for gestating or roosting may be present. Although areas of exposed rock faces were present on the subject property, they were too vegetated to provide suitable habitat.	NO, potential habitat not observed; however, trees suitable for gestating or roosting may be present.	NO, see step 3.
Little Brown Bat	<i>Myotis lucifugus</i>	SAR by Geo-Township Tool (MNR)	YES, dark sheltered hollow vertical structures (e.g., large trees with cavities or rock crevices) suitable for gestating or roosting may be present.	YES, dark sheltered hollow vertical structures (e.g., large trees with cavities or rock crevices) suitable for gestating or roosting may be present.	YES, dark sheltered hollow vertical structures (e.g., large trees with cavities or rock crevices) suitable for gestating or roosting are present.	YES, dark sheltered hollow vertical structures (e.g., large trees with cavities or rock crevices) suitable for gestating or roosting are present.	YES, development and site alteration has the potential to damage habitat.
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	SAR by Geo-Township Tool (MNR)	YES, dead or partially-decayed trees with crevices beneath exfoliating/peeling bark may be present.	YES, dead or partially-decayed trees with crevices beneath exfoliating/peeling bark may be present.	YES, dead or partially-decayed trees with crevices beneath exfoliating/peeling bark are present.	YES, dead or partially-decayed trees with crevices beneath exfoliating/peeling bark are present.	YES, development and site alteration has the potential to damage habitat.

¹Shaded rows denote species or communities for which negative impacts have been deemed possible.

Appendix 3. Assessment of Significant Wildlife Habitat



Ecoregion 5E	Candidate Significant Wildlife Habitat*	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
Seasonal Concentration Areas of Animals			
Waterfowl Stopover and Staging Areas (Terrestrial)	<p>Fields with sheet water during Spring (mid March to May)</p> <p>Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl.</p> <p>Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available.</p>	<p>These field/meadow ELC ecosites with appropriate soils and vegetation: G060-062, G077-079, G093-095, G109-111</p> <p>Plus evidence of annual spring flooding from melt water or run-off.</p>	NO, the assessment area and surrounding lands do not contain fields or agricultural areas.
Waterfowl Stopover and Staging Areas (Aquatic)	<p>Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration.</p> <p>Sewage treatment Ponds and storm water Ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify.</p> <p>These habitats have an abundance food supply (mostly aquatic invertebrates and vegetation in shallow water)</p>	ELC Ecosites: G142-G152	NO, while the assessment area does contain frontage on Bray Lake, conditions associated with the lake in the vicinity of the assessment area do not provide shelter and water depths limit the availability of aquatic invertebrates. There is a low likelihood that the assessment area is associated with aquatic waterfowl stopover and staging areas.
Shorebird Migratory Stopover Areas	<p>Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats.</p> <p>Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October.</p> <p>Sewage treatment ponds and storm water ponds do not qualify as a SWH.</p>	ELC Ecosites: G005-G006, G160-G162, G170-G172, G176-G178, G186-G188, G204-G214	NO, while the assessment area has frontage on Bray Lake, the shoreline is well vegetated and contains moderate slopes suggesting area is unsuitable for use by shorebirds.
Raptor Winter Feeding and Roosting Areas	<p>The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors.</p> <p>Raptor wintering sites need to be > 20 ha with a combination of forest and upland.</p> <p>Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands</p> <p>Field area of the habitat is to be wind swept with limited snow depth or accumulation.</p>	<p>A combination of meadow/field and forest/woodland ecosites.</p> <p>Need to have a forest ELC Ecosite: G011-G19, G023-G028, G033-G043, G048-G059, G064-G076, G081-G092, G097-G108, G133-G125 or Central Ontario FEC Ecosites ES11-ES35</p> <p>AND a meadow/field ELC Ecosite: G020-022, G029-G032, G044-G047, G060-G063, G077-080, G093-096, G109-G112</p>	NO, while the assessment area contains forest/woodland ecosites, meadow/field ecosites are not present suggesting this area does not provide winter feeding and roosting areas for raptors.

Ecoregion 5E	Candidate Significant Wildlife Habitat*	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
Bat Hibernacula	<p>Hibernacula may be found in caves, mine shafts, underground foundations and Karsts.</p> <p>Active mine sites are not SWH.</p> <p>The locations of bat hibernacula are relatively poorly known.</p>	<p>Bat Hibernacula may be found in association with components of cliffs and rock talus in these ELC Ecosites: G158-G159, G164, G180-G181</p> <p>Or Central Ont. FEC: ES4, ES5</p> <p>Note: buildings are not considered to be SWH</p>	<p>NO, while the assessmetn area contains steep slopes, tock crevices, caves, and mine shafts suitable for use as hibernation sites are absent.</p>
Bat Maternal Colonies	<p>Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH).</p> <p>Maternity roosts are not found in caves and mines in Ontario</p> <p>Maternity colonies located in Mature (dominant trees > 80yrs old) deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees</p> <p>Female Bats prefer wildlife trees (snags) in early stages of decay, class 1-3 .</p> <p>Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred.</p>	<p>Maternity colonies considered SWH are found in forested Ecosites.</p> <p>ELC Ecosites: G016-G019, G028, G040-G043, G055-G059, G070-G076, G088-G092, G103-G108, G118-G125</p> <p>or:</p> <p>Central Ontario Forest Ecosites: ES14, ES17, ES18, ES23, ES24, ES25, ES26, ES27, ES28, ES29, ES30</p>	<p>YES, the subject property contains the appropriate ELC ecosite, large undisturbed forest communities, and mature trees containing snags with a significant number of these features (i.e., > 10/ha).</p>
Turtle Wintering Areas	<p>-For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates.</p> <p>-Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen</p> <p>-Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH.</p>	<p>For Snapping and Midland Painted turtles; ELC Ecosites: G128-G135 G140-G152</p> <p>For Northern Map Turtle - Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.</p>	<p>YES, wetland habitats both within the subject property and along the shoreline of the property could provide appropriate habitat for turtle wintering.</p>

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 5E (January 2015)

Ecoregion 5E	Candidate Significant Wildlife Habitat*	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
Snake Hibernaculum	<p>-For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH.</p> <p>-Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line</p> <p>-Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover.</p> <p>-Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures.</p>	<p>For all snakes, habitat may be found in any forested ecosite in central Ontario other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats.</p> <p>The existence of rock piles or slopes, stone fences, and crumbling foundations assist in identifying candidate SWH.</p> <p>For Five-lined Skink; Central Ontario Forest Ecosites: ES14.2, ES17 – ES20, ES23 – ES30 Or; ELC Ecosites: G056-G059 G070-G076 G087-G092 G103-G108 G118-G125</p>	<p>NO, while the assessment area contains steep slopes, it lacks piles of loose rock and areas of rock crevices that may provide suitable hibernation habitat for snakes.</p>
Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)	<p>-Any site or areas with exposed soil banks, sandy hills, borrow pits, steep slopes, and sand piles that are undisturbed or naturally eroding that is not a licensed/permitted aggregate area.</p> <p>-Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles.</p> <p>-Does not include a licensed/permitted Mineral Aggregate Operation.</p>	<p>Eroding banks, sandy hills, borrow pits, steep slopes, sand piles, cliff faces, bridge abutments, silos, barns.</p> <p>Habitat found in the following ELC Ecosites: G001-G004 G007-G008 G020-G021 G029-G031 G044-G046 G060-G062 G077-G079 G093-G095 G109-G111 G173-G175 G201-G203 G210-G212</p>	<p>NO, while the assessment area and adjacent lands contain steep slopes, these areas are forested and do not provide opportunities for bank and cliff nesting avian species.</p>
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)	<p>-Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used.</p> <p>-Most nests in trees are 11 to 15 m from ground, near the top of the tree.</p>	<p>ELC Ecosites: G064-G076 G081-G092 G097-G108 G113-G125 G128-G136</p> <p>Central Ontario Forest Ecosites: ES11.2 ES12.2 ES13.2 ES14.2 ES15.2 ES16.2 ES17.2 ES18.2 ES19.2 ES20.2 ES21.2 ES23.2 ES24.2 ES25.2 ES26.2 ES27.2 ES28.2 ES29.2 ES30.2 ES31 ES32 ES33 ES34 ES35</p>	<p>NO, no large stick nests were identified during on site assessments.</p>

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 5E (January 2015)

Ecoregion 5E	Candidate Significant Wildlife Habitat*	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
Colonially - Nesting Bird Breeding Habitat (Ground)	<p>-Nesting colonies of gulls and terns are on islands or peninsulas (natural or artificial) associated with open water, marshy areas, lake or large river (two-lined on a 1:50,000 NTS map).</p> <p>-Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands.</p>	<p>Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map).</p> <p>Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) G001-G004 G007-G008 G020-G021 G029-G031 G044-G046 G060-G062 G077-G079 G093-G095 G109-G111 G142-G145</p>	<p>NO, evidence of colonial nesting was not documented in the assessment area or adjacent lands.</p>
Deer Yarding Areas	<p>-Deer wintering areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20 cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30 cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter.</p> <p>-The Core of a deer yard (Stratum I) is located within Stratum II and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60%.</p> <p>-OMNRF determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual".</p> <p>-Woodlots with high densities of deer due to artificial feeding are not significant.</p>	<p>May be found in all Tall Treed forest and swamp ELC Ecosites; G12-G15 G23-G27 G33-G38 G48-G54 G64-G69 G81-G87 G97-G103 G113-G118 G128-G129</p> <p>Central Ontario Forest Ecosites: ES11 ES14 ES16 ES18 ES20 ES21 ES22 ES27 ES28 ES30 ES31 ES32 ES33 ES34</p> <p>Note: OMNRF to determine this habitat.</p>	<p>NO, deer wintering area has not been identified on the assessment area and adjacent lands by OMNRF.</p>
Rare Vegetation Communities			
Beach / Beach Ridge / Bar / Sand Dunes	<p>Vegetation can vary from patchy and barren to tree cover but less than 60%. Characterised by unstable sand.</p> <p>Indicator Spp. Marram Grass (<i>Ammophila breviligulata</i>), Beach Pea (<i>Lathyrus japonicus</i>)</p>	<p>Central Ontario FEC: ES1, ES2 ELC Ecosites: G005-G006, G166-G168, G182-G184, G213-G214</p>	<p>NO, communities characterized by unstable sand with less than 60% vegetation cover were not identified on the assessment area or adjacent lands.</p>
Shallow Atlandtic Coastal Marsh	<p>Shallow marsh occurs on shallow mineral (sand) or mineral organic (sandy peat) shoreline subject to low wave energy, on inland lakes and beaver ponds particularly those that experience fluctuating water levels from year to year (i.e. some years with exposed shorelines in summer /fall).</p> <p>Indicator Spp.: Virginia Meadowbeauty (<i>Rhexia virgininica</i>)</p> <p>Other Associated Spp: <i>Rhynchospora capitellata</i>, <i>Xyris difformis</i>, <i>Panicum spretum</i>, <i>Triadenum virginicum</i>, <i>Polygonum careyi</i> and <i>Juncus militaris</i>.</p>	<p>ELC Ecosites: G143-G145, G148-G152</p>	<p>NO, the ELC ecosite associated with this SWH was not present on the subject property.</p>

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 5E (January 2015)

Ecoregion 5E	Candidate Significant Wildlife Habitat*	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
Cliffs and Talus Slopes	<p>Vegetation can vary from patchy and barren to tree cover but less than 60%.</p> <p>Cliffs and talus slopes in 5E are primarily Precambrian rock and are typically sparsely vegetated.</p> <p>Characteristic flora for cliffs and talus slopes include: lichen, such as Rock Tripe <i>Umbilicaria</i> spp., and ferns <i>Polypodium virginianum</i>, <i>Cystopteris fragilis</i> and <i>Woodsia ilvensis</i>, <i>Cryptogramma stelleri</i>, <i>Woodsia alpina</i>, and <i>Saxifraga paniculata</i>.</p>	ELC Ecosites: G158-G159, G166-G168, G173, G175, G182-G184, G201-G203	NO, while there are some areas of steep cliffs, they are within a forested ecosite and are not large enough to be considered their own community.
Rock Barren	<p>Vegetation can vary from patchy and barren to tree cover but less than 60%. Rock barrens are characterized by extensive areas of exposed granitic rock bedrock sparsely vegetated.</p> <p>Characteristic flora for Rock Barrens include: lichens <i>Cladina</i> spp. and mosses <i>Polytrichum</i> spp.), sparse grasslands of <i>Danthonia spicata</i> and <i>Deschampsia flexuosa</i>, low shrubs (<i>Juniperus communis</i>, <i>Vaccinium angustifolium</i>, <i>Comptonia peregrina</i>, and stunted open grown trees <i>Quercus alba</i>, <i>Quercus rubra</i> and <i>Pinus strobus</i>. Also, <i>Pteridium aquilinum</i>, <i>Aralia hispida</i>, <i>Spiranthes casei</i>, <i>Saxifraga virginensis</i>, <i>Gaylussacia baccata</i>, <i>Corydalis sempervirens</i>, <i>Prunus pennsylvanica</i>, and <i>Comandra umbellata</i>.</p>	ELC Ecosites: G163-G165, G179-G181 Central Ontario Forest Ecosites: ES8	NO, the assessment area does not contain rock barren communities.
Sand Barren	<p>Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.</p> <p>Characteristic plant species of sand barrens in 5E include: <i>Cladina</i> spp., <i>Carex houghtoniana</i>, <i>Carex merrittferaldii</i>, <i>Comptonia peregrina</i>, <i>Rubus flagellaris</i>, <i>Selaginella rupestris</i>, and <i>Viola labradorica</i>, <i>Polygonella articulata</i>, and <i>Stipa spartea</i>.</p>	ELC Ecosites: G007, G215 Central Ontario Forest Ecosite: ES10	NO, communities characterized by exposed sand were not documented in the assessment area or adjacent lands.
Alvar	<p>An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars may be complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover.</p> <p>5E Alvar Plant Indicator species: <i>Penstemon hirsutus</i>, <i>Panicum philadelphicum</i>, <i>Scutellaria parvula</i>, <i>Rhus aromatica</i>, <i>Monarda fistulosa</i>, <i>Senecio pauperculus</i>.</p>	Southern Ontario ELC Ecosites: ALO1, ALS1, ALT1, FOC1, FOC2, CUM2, CUS2, CUT2-1, CUW2 Central Ontario Forest Ecosites on very shallow soils: ES13.1, ES14.1, ES16.1, ES21.1, ES9	NO, alvar communities were not documented in the assessment area or adjacent lands.

Ecoregion 5E	Candidate Significant Wildlife Habitat*	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
Old Growth Forest	Old Growth forests are characterized by exhibiting the greatest number of old-growth characteristics, such as mature forest with large trees that has been undisturbed. Heavy mortality or turnover of overstorey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Long-lived forest spp. within these Central Ontario Forest Ecosites: ES11, ES12, ES14, ES20, ES21, ES22, ES23, ES24, ES25, ES26, ES27 ES28 ES29 ES30 or ELC Ecosites: G011-G15, G017-G018, G023, G027, G033, G036, G039-G042, G048, G051, G054-G058, G064, G066, G069, G071-G075, G081, G084, G087, G089-G091, G103, G105-G107, G113, G115, G118, G120-G124.	NO, based on a review of available background documentation, old growth forest communities were not present on the assessment area. This was supported by conditions documented during on-site review (i.e., trees observed were of insufficient size).
Bog	Bogs are nutrientpoor, acid peatlands dominated by peat mosses (<i>Sphagnum</i> sp.), ericaceous shrubs and sedges (<i>Cyperaceae</i>). The water table is at or near the surface in spring and slightly lower the remainder of the year and is vitually isolated from mineral soil waters.	ELC Ecosites: G126, G137-G138	NO, communities characterised by nutrient poor peatlands with a high water table were absent from the assessment area and adjacent lands.
Tallgrass Prairie	Tallgrass Prairie is an open vegetation with less than < 25% tree cover, and dominated by prairie species, including grasses. Indicator Spp. <i>Andropogon gerardii</i> and <i>Spartina pectinata</i> Characteristic Spp. <i>Bromus kalmii</i> , <i>Ceanothus herbaceus</i> , <i>Lechea intermedia</i> , <i>Monarda fistulosa</i> , <i>Penstemon hirsutus</i> , <i>Polygala polygama</i> , <i>Rudbeckia hirta</i> , <i>Sorghastrum nutans</i> , <i>Viola fimbriatula</i> .	Southern ELC Ecosites: TPO1, TPO2 Central Ontario Ecosite: ES10	NO, communities dominated by prairie species with less than 25% tree cover were not documented in the assessment area or adjacent lands.
Savannah	A Savannah is related to tallgrass prairie, but includes trees, which vary from 25 – 60% canopy cover. The open areas between the trees are dominated by prairie species, while forest species are found beneath the tree canopy.	Southern ELC Ecosites: TPS1, TPS2, TPW1, TPW2, CUS2	NO, communities dominated by prairie species were not documented in the assessment area or adjacent lands.
Rare Forest Type - Red Spruce	Red Spruce is a valued wildlife cover tree. Historically red spruce was much more abundant than it is now within the Ecoregion 5e forests. Red spruce is a shade tolerant conifer that evolved within tolerant hardwood forests. Red spruce grows best in a cool, moist climate. It will grow in shallow, till soils (ave. of 46 cm) and may grow on sites unfavourable for other species such as organic soils over rock, steeper slopes, and wet bottomlands, although poorly drained sites will inhibit growth.	ELC Ecosites: G036, G051, G066, G084, G086, G100, G102, G116, G117 Central Ontario Forest Ecosites: ES 30.1, ES 30.2	NO, Red Spruce were not documented in the assessment area.
Rare Forest Type - White Oak	White oak is a valued wildlife mast producing tree. The mast produced by the white oak tree is often preferred over the more common red oak acorn. Forest stands containing white oak trees are uncommon in the Great Lakes St. Lawrence Forest.	ELC Ecosites: G017, G041, G057, G072, G090, G106, G121 Central Ont. FEC: ES 14.1, ES14.2	NO, White Oak were not documented in the assessment area.

Ecoregion 5E	Candidate Significant Wildlife Habitat*	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
Specialized Habitats for Wildlife			
Waterfowl Nesting Area	<p>A waterfowl nesting area extends 120 m from a wetland (> 0.5 ha) or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur.</p> <p>Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests.</p> <p>Wood Ducks, Bufflehead, Common Goldeneye and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites.</p>	<p>All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: G129-G135, G142-G152</p> <p>Note: includes adjacency to provincially Significant Wetlands</p>	<p>NO, while wetland habitats are present on the subject property, waterfowl nesting is not known to occur, and species presence was not documented during on-site breeding bird surveys.</p>
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	<p>Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water.</p> <p>Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy.</p> <p>Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms).</p>	<p>Forest communities directly adjacent to riparian areas – rivers, lakes, ponds and wetlands</p>	<p>NO, stick nests were not documented in the assessment area or along the shoreline of adjacent lands</p>
Woodland Raptor Nesting Habitat	<p>All natural or conifer plantation woodland/forest stands.</p> <p>Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Merlin or Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands.</p> <p>Includes nest sites within tree cavities for Barred Owl and sometime Great Horned Owls and Merlin.</p> <p>In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest.</p>	<p>May be found in all forested ELC Ecosites in Community Class: TR</p> <p>May also be found in the forested swamp ELC Ecosites: G128-G133</p>	<p>NO, stick nests were not documented in the assessment area. Trees with cavities suitable to function as nesting habiat for owls were not documented.</p>
Turtle and Lizard Nesting Areas	<p>Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals.</p> <p>For an area to function as a turtle nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH.</p> <p>Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.</p> <p>Skinks will nest under logs, in stumps or under loose rock in partially wooded areas.</p>	<p>Turtle Nesting areas may be adjacent to these ELC Ecosites: G138, G140-149</p> <p>For Five-lined Skink - Central Ontario Forest Ecosites: ES14.2, ES17–ES20, ES23–ES30 or; ELC Ecosites: G056-G059, G070-G076, G087-G092, G103-G108, G118-G125</p>	<p>NO, the assessment area does not contain features that are suitable to function as nesting habitat for turtles. Open areas containing sand or gravel suitable for excavation of nests are absent as well. While the property does contain numerous stumps and logs, these are located within the forest community that lacks sufficient openenings in the canopy to provide areas suitable for use by lizards for nesting.</p>

Ecoregion 5E	Candidate Significant Wildlife Habitat*	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
Seeps and Springs	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system. Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species.	NO, areas of groundwater upwellings were not documented in the assessment area.
Aquatic Feeding Habitat	MNRF maps these location on Crown land and rates the site on a scale of 0 – 4, with 4 being the best. Feeding sites classed 3 or 4 are potential/candidate significant. Where Moose Aquatic Feeding Areas (MAFA) habitat is in low supply, class 2 MAFA habitat could also be considered potential/candidate significant. Wetlands and isolated embayments in rivers or lakes which provide an abundance of submerged aquatic vegetation such as pondweeds, water milfoil and yellow water lily are preferred sites. Adjacent stands of lowland conifer or mixed woods will provide cover and shade.	Habitat may be found in all forested ecosites adjacent to water.	NO, the assessment area contains frontage on Bray Lake, and Official Plan mapping shows Moose Aquatic Feeding Areas on adjacent lands. Wetland areas and isolated embayments containing submerged aquatic vegetation were documented.
Mineral Lick	This habitat component is found in upwelling groundwater and the soil around these seepage areas. It typically occurs in areas of sedimentary and volcanic bedrock. In areas of granitic bedrock, the site is usually overlain with calcareous glacial till.	Habitat may be found in all forested ecosites.	NO, groundwater upwellings nor seepage areas were not identified on the assessment area which suggests that mineral licks are absent as well.
Denning Sites and Mink, Otter, Martin, Fisher, and Eastern Wolf	Mink prefer shorelines dominated by coniferous or mixed forests with dens usually underground. Mink will sometimes use old muskrat lodges. Otters prefer undisturbed shorelines along water bodies that support productive fish populations with abundant shrubby vegetation and downed woody debris for denning. They often use old beaver lodges or log jams and crevices in rock piles. Marten and fisher share the same general habitat, requiring large tracts of coniferous or mixed forests of mature or older age classes. Denning sites are often in cavities in large trees or under large downed woody debris.	Habitat may be found in all forested ecosites.	POSSIBLE, features potentially functioning as denning sites were documented in the assessment area; however, no dens or excavated areas were documented.
Amphibian Breeding Habitat (Woodland)	Presence of a wetland or pond >500 m ² (about 25 m diameter) within or adjacent (within 120m) to a woodland (no minimum size). The wetland, lake or pond and surrounding forest, would be the Candidate SWH. Some small wetlands may not be mapped and may be important breeding pools for amphibians. Breeding ponds within the woodland or the shortest distance from forest habitat are more significant because of reduced risk to migrating amphibians and more likely to be used. Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat.	All forested, ELC Ecosites; The wetland breeding ponds (including vernal pools) may be permanent, seasonal, ephemeral, large or small in size and could be located within or adjacent to the woodland.	YES, wetland habitats that meet the size requirements for this SWH are present on the subject property in several locations.

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 5E (January 2015)

Ecoregion 5E	Candidate Significant Wildlife Habitat*	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
Amphibian Breeding Habitat (Wetlands)	<p>Wetlands and pools (including vernal pools) >500 m² (about 25 m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats.</p> <p>Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators.</p> <p>Bullfrogs require permanent water bodies with abundant emergent vegetation.</p>	<p>ELC Ecosites: G129-G135,G142-G152</p> <p>Typically these wetland ecosites will be isolated (>120 m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g., Bull Frog) may be adjacent to woodlands.</p>	<p>YES, wetland habitats that meet the size requirements for this SWH are present on the subject property in several locations.</p>
Mast Producing Areas	<p>Most important areas are mature forests >0.5 ha containing numerous large beech and red oak trees that supply the energy-rich mast that wildlife prefer.</p> <p>Other significant tree species include hickory, basswood, black cherry, ironwood, mountain ash, pin cherry, and butternut. Significant shrub species include blueberries, wild black berry, serviceberry, raspberry, beaked hazel, choke cherry and hawthorn.</p> <p>Sites providing long-term, relatively stable food supplies, forest openings or barrens >1 ha provide excellent sites for mast producing shrubs. Sites such as clear-cuts or burns are temporary source of food and are less significant.</p>	<p>ELC Ecosites: G015, G017, G019, G027-G028, G041-G043, G057, G059, G072, G090, G106, G108, G121,</p> <p>Central Ontario Forest Ecosites: ES14, ES17.1, ES23, ES24, ES25, ES26</p>	<p>NO, the ELC ecosite associated with this SWH was not present on the subject property.</p>

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 5E (January 2015)

Ecoregion 5E	Candidate Significant Wildlife Habitat*	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
Habitat for Species of Conservation Concern (not including Endangered or Threatened Species)			
Marsh Bird Breeding Habitat	<p>Nesting occurs in wetlands.</p> <p>All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present.</p> <p>For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water.</p>	<p>ELC Ecosites: G138-G152</p> <p>For Green Heron: above Ecosites plus G129-G136.</p>	<p>NO, while the subject property contains wetland communities with shallow water and emergent aquatic vegetation, breeding bird surveys conducted during the appropriate timing window did not result in observations that meet the criteria for confirming SWH.</p>
Open Country Bird Breeding Habitat	<p>Large grassland areas (includes natural and cultural fields and meadows) >30 ha Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e., no row cropping or intensive hay or livestock pasturing in the last 5 years).</p> <p>Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older.</p> <p>The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species.</p>	<p>ELC Ecosites: G008-G009, G020-G021, G029-G031, G044-G046, G060-G062, G077-G079, G093-G095, G109-G111</p>	<p>NO, open grassland areas such as natural or cultivated fields are not present in the assessment area.</p>
Shrub/Early Successional Bird Breeding Habitat	<p>Large field areas succeeding to shrub and thicket habitats >30 ha in size. Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e., no row-cropping, haying or livestock pasturing in the last 5 years).</p> <p>Larger shrub thicket habitats (>30 ha) are most likely to support and sustain a diversity of these species.</p> <p>Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or lightly grazed pasturelands.</p>	<p>ELC Ecosites: G009-G010, G021-G022, G031-G032, G046-G047, G062-G063, G079-G080, G095-G096, G111-G112, G134-G135</p> <p>Patches of shrub ecosites can be complexed into a larger habitat for some bird species.</p>	<p>NO, the assessment area does not contain, nor is it adjacent to, large field communities that are succeeding into shrub and thicket habitats.</p>
Special Concern and Rare Wildlife Species	<p>All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species.</p> <p>All plant and animal element occurrences (EO) within a 1 or 10 km grid.</p> <p>Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy</p>	<p>When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or Provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites</p>	<p>See Table 2</p>
Animal Movement Corridors			

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 5E (January 2015)

Ecoregion 5E	Candidate Significant Wildlife Habitat*	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
Amphibian Movement Corridors	<p>Corridors may be found in all ecosites associated with water.</p> <p>Corridors will be determined based on identifying the significant breeding habitat</p>	<p>Movement corridors between breeding habitat and summer habitat.</p> <p>Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Amphibian Breeding Habitat –Wetland (see above)</p>	<p>YES, due to the abundance of wetland communities on the subject property and the possibility of breeding habitat (both woodland and wetland) for amphibians, it is possible for movement corridors to be present on the subject property.</p>
Cervid Movement Corridors	<p>Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH (see above), Moose Aquatic Feeding Area, or Mineral Lick Habitat are identified.</p> <p>A deer wintering habitat identified by the OMNRF as SWH will have corridors that the deer use during fall migration and spring dispersion.</p> <p>Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges).</p> <p>Corridors will be multifunctional (i.e., these will function for any smaller mammal species as well).</p>	<p>Corridors may be found in all forested ecosites.</p>	<p>POSSIBLE, given the presence of an identified moose aquatic feeding areas on adjacent lands, movement corridors for cervids may be present; however, due to the topography on the subject property and on adjacent lands, it is unlikely moose would utilize the subject property to access the aquatic feeding area on adjacent lands to the north.</p>
Furbearer Movement Corridor	<p>Mink and Otter den sites are typically found within a riparian area of a lake, river, stream or wetland. The den site will potentially have a movement corridor associated with it.</p> <p>All Mink or Otter den sites identified under the habitat of Denning Sites for Mink, Otter, Marten Fisher and Eastern Wolf (see above) are to be considered for an animal movement corridor.</p>	<p>All Forested Ecosite Codes adjacent to or within shoreline habitats.</p>	<p>NO, as features potentially functioning as denning sites were not documented in the assessment area there is a low likelihood that the assessment area contains movement corridors for burbearers.</p>

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 5E (January 2015)

Appendix 4. Site Plan (Tulloch Engineering)



OTHER INFORMATION

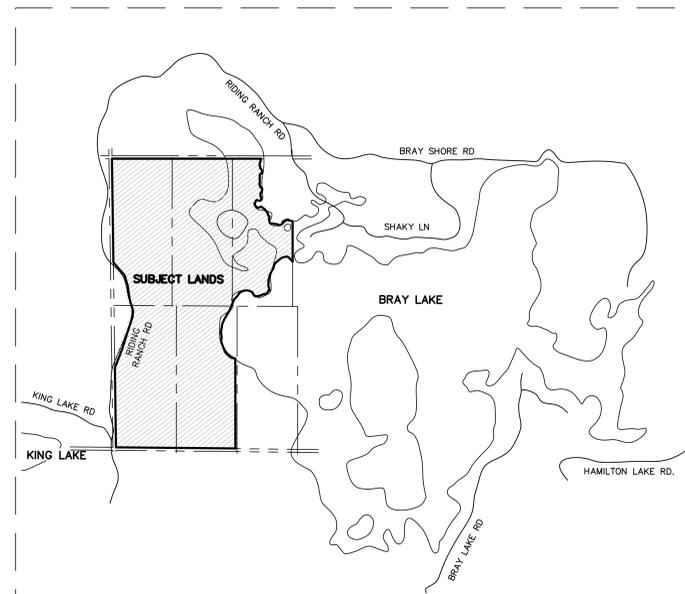
- 1) ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT:
 - A. LAND BOUNDARIES ARE AS SHOWN ON DRAFT PLAN
 - B. ROADWAYS ARE AS SHOWN ON DRAFT PLAN AND KEY PLAN
 - C. KEY PLAN IS AS SHOWN ON DRAFT PLAN
 - D. PROPOSED LOTS ARE FOR RURAL, NATURAL HERITAGE PROTECTION/ENVIRONMENTAL PROTECTION, AND SHORELINE USE, AS SHOWN ON PLAN
 - E. ADJACENT USES: CROWN, RURAL, NATURAL HERITAGE PROTECTION/ENVIRONMENTAL PROTECTION, AND SHORELINE, AS SHOWN ON PLAN
 - F. LOT DIMENSIONS ARE APPROXIMATE ONLY
 - G. TOPOGRAPHIC FEATURES ARE AS SHOWN, DERIVED FROM ORTHO PHOTOGRAPHIC IMAGERY FROM FIRST BASE SOLUTIONS DATED JULY 29, 2020
 - H. WATER SUPPLY IS TO BE PROVIDED AND OPERATED BY INDIVIDUAL LAND OWNERS
 - I. GEOTECHNICAL INVESTIGATION WILL BE REQUIRED TO CONFIRM SOIL AND GROUND COMPOSITION
 - J. 1m CONTOURS ARE AS SHOWN ON DRAFT PLAN
 - K. SEPTIC SERVICES ARE TO BE PROVIDED AND OPERATED BY INDIVIDUAL LAND OWNERS
 - L. PROPOSED LOTS CONTAIN AREAS IDENTIFIED AS A WATERCOURSE, MOOSE AQUATIC FEEDING AREA, OTHER WETLANDS AND FLOODPLAIN AS SUCH WILL HAVE RESTRICTIONS AFFECTING THE SUBDIVISION LANDS



LEGEND:

- EP DENOTES ENVIRONMENTAL PROTECTION (NATURAL HERITAGE PROTECTION) ZONING AREA
- FP DENOTES FLOOD PLAIN ZONING AREA
- SR DENOTES SHORELINE ZONING AREA
- RU DENOTES RURAL ZONING AREA
- FN DENOTES FENCE
- T DENOTES TREE
- DENOTES 15m VEGETATED NATURAL SHORELINE BUFFER
- - - DENOTES 23m BUILDING SETBACK FROM SHORELINE
- - - DENOTES 30m WETLAND / WATER COURSE SETBACK
- DENOTES TYPE 1 FISH HABITAT
- DENOTES TYPE 2 FISH HABITAT

KEY PLAN



OWNER'S CERTIFICATE

THIS IS TO CERTIFY THAT:
POLMI HOLDINGS INC. BEING THE REGISTERED OWNERS OF THE SUBJECT LANDS,
HEREBY SUBMITS A DRAFT PLAN OF SUBDIVISION FOR APPROVAL.

TOM HARSANYI DATE _____
AUTHORIZED AGENT FOR POLMI HOLDINGS INC.
"I HAVE THE AUTHORITY TO BIND THE CORPORATION"

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:
THE BOUNDARIES, DIMENSIONS AND AREAS SHOWN AND THEIR RELATIONSHIP TO
THE ADJACENT AND SURROUNDING LANDS ARE CORRECTLY SHOWN ON THIS PLAN

KEVIN KUJALA HUNTSVILLE, ONTARIO
ONTARIO LAND SURVEYOR

DRAFT

		PEER REVIEW COMMENT	APPLICANT RESPONSE	PEER REVIEWER RESPONSE	RIVERSTONE 2 nd REPLY (WHERE REQUIRED)
Agency: Township of Machar Representative: Hutchinson Environmental Sciences Limited (HESL)	1	<p>“The subject property contains steep slopes. These are located at the back of the proposed severed lots and will leave room for future property development” (p. ii).</p> <p>The utilization of the Provincial Water Quality Objective of 20 µg/L allows for the development of 229 additional extended seasonal lots according to RiverStone’s Lakeshore Capacity Model. Please indicate what future property development is being considered and if so, how a responsible development capacity can be determined given modelling inaccuracies.</p>	<p>For clarification, the intent was to note that although there are areas of steep slopes on the property, there is considerable room outside of this constraint for the future development of the proposed lots. There is no intent at this time to further subdivide the property that would create additional lots that would contribute to the Lakeshore Capacity Assessment calculations.</p>	<p>Acknowledged. No further response is required.</p>	N/A
	2	<p>“Development Proposed: Consent application to create twenty (20) single residential lots (15 waterfront, 5 backlot).” (i)</p> <p>“In this case, the proposal is to add an additional 14 lots with shoreline access and 6 backlots.” (p. 12)</p> <p>Please confirm, is the proposed development for 14 or 15 shoreline lots and 5 or 6 backlots?</p>	<p>Acknowledged. The development plan proposed fourteen (14) shoreline lots and six (6) backlots as noted on Figure 3. Each of the backlots are within 300m of the shoreline and were therefore included in the Lakeshore Capacity Modeling.</p>	<p>Acknowledged. No further response is required.</p>	N/A
	3	<p>The catchment area is 1017 ha according to the Ontario Watershed Information Tool (OWIT) which replaced the Ontario Flow Assessment Tool reference cited in Table 2. Please measure the lake in GIS and indicate if 940 ha from the Lake Fact Sheet or 1017 from OWIT is more accurate and appropriate to utilize.</p>	<p>Measuring the watershed area from Provincial contour data (5m) using GIS resulted in a watershed area of 975 ha; in comparison to 940 ha from the Provincial lake fact sheet and 1017 from the Provincial OWIT mapping tool.</p> <p>As expected, a greater watershed area increases the inflow of phosphorus to the lake through the model, thereby increasing the lake TP concentrations. Applying 975 ha watershed area results in the modeled TP concentration, following the proposed development, from 8.03 ug/L to 8.13 ug/L. The results of our initial model noted that the difference between the predicted concentration and measured concentrations were too far apart to validate the use of the model to accurately reflect the lake. If a larger watershed area is considered in the model, this outcome does not change.</p>	<p>Acknowledged. No further response is required.</p>	N/A

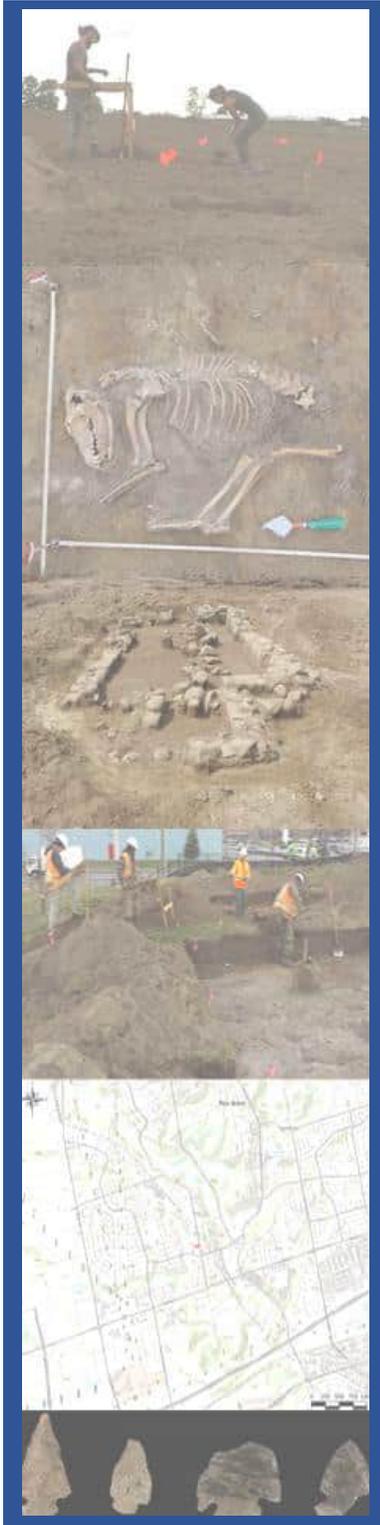
	<p>4 The wetland % in the catchment is 2.3% according to OWIT. Please provide a figure to showcase manual wetland delineation that was completed with Ontario Base maps as indicated in Table 2, and the subsequently high 15% wetland input utilized.</p>	<p>The value we used for wetlands in the model was an error. In review of our notes, the correct wetland value is 2.3% and was therefore an oversight on our part when calculating the model. When the same model is run, using 2.3% for wetlands in place of 15%, the predicted TP concentration for the current level of development decreases from 6.89 ug/L to 5.23 ug/L. This is expected as wetlands are exporters of TP into downstream lakes. This change in wetland value then further increases the gap between modeled and measured data, resulting in the same conclusion that the model does not validate.</p>	<p>Please ensure that modelling errors are corrected when predicting future TP concentrations and comparing modelled concentrations to the PWQO of 10 µg/L.</p>	<p>Please see the answer provided for peer review comment 10 below, as the expectation was to have the two correct values included in the model to see how this result compares to the target of 10ug/L.</p>
	<p>5 A phosphorus settling velocity of 12.4 m/y is listed in Table 2 but it appears that an anoxic settling coefficient of 7.2 m/y was used in the Lakeshore Capacity Model. No late summer dissolved oxygen profiles are presented or referenced to justify the selection of an appropriate settling coefficient. Please describe how an anoxic settling coefficient was selected.</p>	<p>It is acknowledged that the report table does show a settling velocity of 12.4 m/y, while our model used 7.2 m/y. Our error was in the table. As noted in Paterson et al. (2006), settling velocity can be estimated as 12.4 m·yr⁻¹ for dimictic, oligotrophic lakes on the Precambrian Shield with oxic hypolimnia. In lakes that experience prolonged periods of anoxia during the ice-free season, the settling velocity should be reduced to 7.2 m·yr⁻¹. It is correct that we did not have the advantage of late summer oxygen profile to guide the selection of the appropriate value; however, if the model is calculated using 12.4 m/y as the settling velocity, the resulting TP concentration is reduced, moving further away from the measured values. As a result, it seemed logical to proceed using the anoxic value.</p>	<p>Acknowledged. No further response is required.</p>	<p>N/A</p>
	<p>6 Please provide information on the reference used to derive model inputs used for precipitation, lake evaporation and runoff (Hydrological Atlas of Canada (1978)). Information on the reference is not included in the references section. Based on our experience, the MECP Runoff Lookup Table is typically used to determine mean annual runoff and embedded formulas in the Lakeshore Capacity Model are used to derive lake outflow discharge based on mean annual runoff.</p>	<p>An error was made leaving old references in the report. The MECP Runoff Lookup Table is the correct reference to the data used to determine the Mean Annual Runoff; however, we did notice a difference in the value used in the model and that from the lookup table when checked (0.518). inserting this value into the model changed the result by 0.03mg/L (higher), which does not alter the conclusions of the model. Other data was derived from the online Provincial Watershed Information Tool.</p>	<p>Please ensure that modelling errors are corrected when predicting future TP concentrations and comparing modelled concentrations to the PWQO of 10 µg/L.</p>	<p>Please see the answer provided for peer review comment 10 below, as the expectation was to have the two correct values included in the model to see how this result compares to the target of 10ug/L.</p>
	<p>7 Please provide additional information on what lot fabric was utilized to count lots and how vacant lots of record were determined</p>	<p>Land Information Ontario data was used as a lot fabric to count shoreline lots, and backlot that fit within a 300m setback from the lake, established through GIS. Aerial photography was used to note whether the lots were developed or vacant. All backlots within 300 m were included as a developed lot.</p>	<p>Acknowledged. No further response is required.</p>	<p>N/A</p>
	<p>8 "Measured values were collected by Lake Partner Program volunteers in 2007 and 2008. Water samples are collected by lake resident</p>	<p>We were not aware of any other data when the report was completed. Or they would have been included in the calculations and analysis. Although the data were old,</p>	<p>Acknowledged. No further response is required.</p>	<p>N/A</p>

		volunteers and analysed for a number of parameters, including phosphorus by MECP. The duplicate samples from May 2007 were reported as 10.6 ug/L and 10.6 ug/L, while July 2008 samples were reported as 12.7 and 11.0 ug/L.” (p. 12) The phosphorus data are 16 and 17 years old. Please indicate if more recent data are available from other potential sources and comment on the suitability of utilizing old data	they were the only data available for which to test the validity of the model. These remain the only data available for comparison.		
	9	Please indicate how Best Management Practices will be implemented (e.g. Site Plan Control or the recent equivalent in the Township of Machar). Also, leaching bed soil requirements are ambiguous; indicate if more specific soil requirements could be developed.	Best management practices are best implemented through site plan control. Although the Province removed this possibility, it was reinstated for waterfront properties and can therefore be administered on these created lots. In regard to leaching beds, where development is proposed on highly sensitive lakes, we provide very specific recommendations for soil characteristics, such as >1% iron and aluminum and <1% calcium carbonate, similar to the native soil requirements for development on lake trout lakes at capacity. These soils would be used as a 0.25m thick base under the filter/area bed for new septic systems. Given that it was shown that Bray Lake is not at capacity, our recommendations were less specific, while attempting to provide additional TP removal. We would support the revision of the leaching bed recommendation to read as follows: Sewage treatment systems to service the proposed lots should meet Ontario Building Code requirements. Systems designed to maximize the degree of TP attenuation should be required, such as the Waterloo Biofilter with EC-P unit, EcoFlo Biofilter or the use of a tank and bed system that incorporates soils that are high in phosphorus retention, aluminum and iron, and low in calcium carbonate	Acknowledged. No further response is required.	N/A
	10	We agree that the Lakeshore Capacity Assessment commonly does not accurately predict phosphorus concentrations and that there is limited and often contradictory guidance from MECP on how to proceed in such situations. Since modelled total phosphorus concentrations are <10 ug/L, we recommend that modelled total phosphorus concentrations shouldn't increase above 10 ug/L instead of 20 ug/L as part of a conservative approach to lake management.	We are in agreement with the conclusions of the peer review report, including the guidance to restrict development to 10ug/L as opposed to 20ug/L as was previously allowed by the Province. As noted, the development proposal for 20 new lots will not move the lake beyond capacity. The implementation of best management practices will be included in site plan control and will ensure their implementation.	Please ensure that modelling errors are corrected when predicting future TP concentrations and comparing modelled concentrations to the PWQO of 10 µg/L.	The model was re-run with updated values for wetland area (2.3%) and for mean annual runoff (0.518 from MECP lookup table). IN addition, the watershed Area for Bray Lake was updated to 975ha as noted above in comment 3. The reason for re-running the model was to determine if these updated values would “correct” the model when comparing the modeled vs measured TP concentration, as was concluded in the original modeling.

REVIEW OF FIRST SUBMISSION: Environmental Impact Study, Bray Lake, Machar
PROJECT: 220-053
APPROVAL AUTHORITIES: Township of Machar, District of Parry Sound
DATE: October 17, 2024

APPLICATIONS: 1st Draft Submission
Lots 19 and 20, Concession 11 and Lots 18, 19 and 20 Concession 12, Township of Machar

	<p>Other considerations such as recreational capacity calculations and in-depth review of water quality in Bray Lake could also be completed to inform the capacity assessment. Regardless, the modelled future total phosphorus concentration of 8.03 µg/L associated with the proposed development of 20 lots is less than 10 ug/L.</p>			<p>The results of re-running the model confirmed that updating these values did not change the conclusions. Original Modeling: TP 6.89ug/L (existing development) Updated Modeling (wetland and runoff): TP 5.29ug/L</p> <p>The conclusion that the modeled and measured values for TP is still valid. The original model noted the difference was 33.1%. The updated model is further separated from the measured TP concentration (47.4%). This confirms that the use of the interim PWQO is suitable, also supporting the further restriction noted in comment 9 above, only supporting development to a maximum modeled concentration of 10ug/L.</p> <p>The updated modeling results show that the expected change in TP concentration following the addition of 20 total new homes (permanent) is elevated from 5.23 ug/L to 6.43 ug/L, below a modeled concentration of 10ug/L.</p>
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Stage 1 & 2 Archaeological Assessment

**Bray Lake Development
Part of Lots 19 and 20, Concession 11
Lot 20 and part of Lots 18 & 19, Concession 12
Geographic Township of Machar
District of Parry Sound**

Prepared for:
Polni Holdings Inc.
24 Hibberd Road
Huntsville, Ontario
P1H 1C9

**Licensee: Shane McCartney
PIF: P321-0186-2020
Original Report**



Earthworks Archaeological Services Inc.
2365 Watts Road,
Haliburton, Ontario
K0M 1S0

January 18, 2021

Executive Summary

Earthworks Archaeological Services Inc. was retained to conduct a Stage 1 and 2 archaeological assessment of a 166.5 ha area legally described as Part of Lots 19 and 20, Concession 11, Lot 20 and part of Lots 18 & 19, Concession 12, Township of Machar, Parry Sound District, Ontario. The assessment is undertaken in support of a future Plan of Subdivision Application and was conducted as part of the requirements defined in Section C2.16.9 of the *Official Plan Township of Machar* which requires an archaeological impact assessment of areas exhibiting archaeological potential that might be affected by future development

The study area contains evidence of archaeological potential. The location of Bray Lake and several small lakes and wetlands within and along the edge of the study area indicates the potential for locating Pre-Contact Aboriginal archaeological material. In summary, a Stage 2 archaeological assessment was determined to be required in order to identify and document any archaeological material that may be present. The heavy forest of the study area precluded the possibility of ploughing for a pedestrian survey, and as a result, a test pitting survey was determined to be required.

The Stage 2 archaeological assessment of the study area was conducted between August 25 and September 1, 2020 under PIF #: P321-0186-2020, issued to Shane McCartney, M.A. (P321). The weather during the survey was sunny and warm. At no time were weather or lighting conditions detrimental to the observation or recovery of archaeological material.

Due the location of the study area in northern Ontario the test pit strategy followed Section 2.1.5 of the *Standards and Guidelines for Consultant Archaeologists*. As a result, a 50 metre zone bordering the edges of Bray Lake and several small ponds within the study area were test pitted at maximum intervals of 5 metres apart, accounting for 31% of the study area. Approximately 70% of the surveyed area was not assessed due to permanent inundation from wetlands and their feeder creeks, steep slope in excess of 20°, and evidence of subsurface disturbance from the construction of a gravel driveway and two associated cabins. The remaining 69% of the study area did not exhibit archaeological potential and was not assessed. Each test pit was excavated by hand to 30 cm in diameter, and was excavated into the first 5 centimetres of subsoil. Test pit depth averaged 15 cm. Each test pit was examined for stratigraphy, cultural features, or evidence of fill, and all soil was screened through wire mesh of 6 millimetre width. All test pits were backfilled. The soil consisted of a light brown sand topsoil horizon over an ash layer which varied in depth and is consistent with a forest fire event. Subsoil consisted of an orange-brown sandy loam. No archaeological material was identified during the course of the survey.

Based on the results of the Stage 1 background investigation and the subsequent Stage 2 test pit survey, the study area is considered to be free of archaeological material, and no additional archaeological assessments are recommended.

The Ministry of Heritage, Sport, Tourism and Culture Industries is requested to review this report and provide a letter indicating their satisfaction that the fieldwork and reporting for this archaeological assessment are consistent with the Ministry's 2011 Standards and Guidelines for Consultant Archaeologists and the terms and conditions for archaeological licences, and to enter this report into the Ontario Public Register of Archaeological Reports.

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Project Personnel

Managing Director:	Anthony Butler, M.Sc. (P310)
Licensed Archaeologist:	Shane McCartney, M.A. (P321)
Field Director:	Michael Golloher M.Sc. (R1037)
Field Crew:	Brian Ellis (A1220)
Report Production:	Michael Golloher M.Sc. (R1037)
Graphics:	Kelsea Dawn, PG(GIS)
Technical Review:	Shane McCartney, M.A. (P321)



1.0 Project Context

1.1 Development Context

Earthworks Archaeological Services Inc. (Earthworks) was retained by Polni Holdings Inc. to conduct a Stage 1 and 2 archaeological assessment of a 166.5 ha area legally described as Part of Lots 19 and 20, Concession 11, Lot 20 and part of Lots 18 & 19, Concession 12, Township of Machar, Parry Sound District, Ontario (Map 1). The assessment is undertaken as part of a Plan of Subdivision Application and was conducted as part of the requirements defined in Section C2.16.9 of the *Official Plan Township of Machar* which requires an archaeological impact assessment of areas exhibiting archaeological potential that might be affected by future development (Township of Machar 2013:51).

The objectives of the Stage 1 & 2 archaeological assessment, as outlined by the Ministry of Heritage, Sport, Tourism and Culture Industries' (MHSTCI) *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), are as follows:

- To provide information about the property's geography, history, previous archaeological fieldwork and current land condition
- To evaluate the property's archaeological potential.
- To document archaeological resources located on the property
- To determine whether any identified archaeological resources require further assessment
- To recommend Stage 3 assessment strategies for any archaeological sites determined to require additional assessment.

As part of this assessment, background research was conducted in Earthworks corporate library and the Parry Sound Land Registry Office (LRO 42).

Permission to access the property was provided by John Gallagher of John P. Gallagher & Associates on behalf of Polni Holdings Inc.



1.2 Historic Context

1.2.1 Pre-Contact Indigenous History

Table 1 provides a breakdown of the general culture history of northern Ontario, as based on Munson and Jamieson (2013)

Table 1 Pre-Contact Culture History of northern Ontario

Culture Period	Archaeological/Material Culture	Calibrated Dates
Early Paleo-Indian		>11,500 BCE
Late Paleo-Indian		10,500 BCE 9,500 BCE 8,500 BCE
Early Archaic	Lakehead Complex	8,500 BCE 7,500 BCE 6,500 BCE
Middle Archaic	Shield Archaic	6,500 BCE
Late Archaic		5,500 BCE
		4,500 BCE
		3,500 BCE
		2,500 BCE
		1,500 BCE
		1,000 BCE
Early Woodland		600 BCE
		200 BCE
Middle Woodland	Laurel	200 BCE
		1 CE
		200 CE
		600 CE
		1,000 CE
Late Woodland	Blackduck/Selkirk, Sandy Lake	1,000 CE
		1,400 CE
European Contact	Algonqian	1,400 CE
		1,800 CE



1.2.2 Post-Contact Indigenous History

The surrounding area enters the historic record in 1615, when Samuel de Champlain arrived at the western boundary of Muskoka, who recorded the inhabitants of the area as Algonquin Aboriginals and who travelled with them in the area to the Nipissing and the Huron. Early accounts by European explorers suggest the study area was considered part of a loosely defined overlapping hunting territory associated with the Huron Confederacy and the Nipissing, who inhabited Lake Nipissing approximately 143 kilometres north of the study area (Trigger 1994, Trigger & Day 1994). European influence in the region was generally restricted to the beaver pelt trade, and Indigenous groups practiced a way of life that did not differ significantly from the Pre-Contact period. By the 1640's, the increasing scarcity of beaver pelts prompted the invasion of Huronia by the League of Five Nations Iroquois. By 1649, five Huron villages were destroyed, and the remainder abandoned, resulting in the complete disintegration of the Huron Confederacy and the absorption of their members into the Petun, Neutral and other groups (Stone and Chaput 1978). Additionally, the Nipissing were defeated in a skirmish with the Mohawk in 1653 and relocated west to Lake Nipigon (Day 1978:789). The Nipissing returned to the area in 1667 following a peace agreement between the French and the Mohawk. There is little evidence to suggest a concentrated period of settlement in the region during the eighteenth century, with Anishnabeg groups known to traverse through the area practicing traditional hunting and fishing.

Following their defeat of the French at the Battle of the Plains of Abraham in 1759, the British began purchasing large tracts of land in Ontario through treaties with the Aboriginal communities in the region. The Royal Proclamation of 1763 asserted British sovereignty over the region while declaring the land to be in possession of the Indigenous people who occupied it and establishing the policies for Crown purchase of these lands (Surtees 1994:93). These purchasing efforts were intensified following the conclusion of the American Revolutionary War in 1783 and the War of 1812 in 1814, which saw successive waves of migration of United Empire Loyalists and British settlers into Upper Canada. The current study area forms part of a large block of land north of Lake Ontario that was initially purchased by Sir John Johnson and Col. John Butler in 1788. Irregularities in the original treaty documents lead to them being declared invalid under the terms of the Royal Proclamation, and a formalized cession of these lands was concluded under the Williams Treaties in 1923 (Surtees 1994:107).

1.2.3 European Settlement History

The Township of Machar was founded in 1875 and named after Reverend John Machar of Kingston by Sir Oliver Mowat, the Premier of Ontario. Prior to the establishment of the township Machar was being logged by several companies who would float logs down the South River. Settlers arrived via the Nipissing Road and began clearing farming land in the late 1870's. Peter Shaughnessy built the first post office and general store in Machar in 1878. It was located eight miles east of the present town of South River in an area known as Uplands. A school and cheese factory opened soon afterward near Uplands, but the community was later abandoned,



likely due to shallow soils in the area not being able to sustain agricultural farming (Mika & Mika 1981: 591). The second post office to open in Machar was Bray Lake run out of “Red” John Taylors shanty. The township never experienced a large population increase in the 20th century with only 549 residents in 1979.

1.2.4 Land Use History of Study Area

Crown patent mapping indicates that Lot 20, Concession 12 and Lot 20 Concession 11 was originally owned by James Alfred Joy. John Preston Rolston was the original owner of Lot 18 and 19 Concession 12, and Mary Ann Bennett is indicated as the owner of Lot 19 Concession 11 in the southeast portion of the study (Map 2). None of these individuals are mentioned in census records for 1881. The 1891 census record indicates James Joy as the 15 year old son of English born Robert and Mary Ann Joy (Government of Canada 1891: 22). James Joy was later known to operate saw mills on Bray Lake from 1916 to 1935. The first mill opened on the west side of Bray Lake in 1916 and burned down in 1919. This was rebuilt and burned again in 1921. A new mill was erected on the North end of Bray Lake and this burned in 1935 (Morris 2020). Historic land claim mapping indicates that the study area has remained as uninhabited wilderness up to the present day except for a single cottage and cleared manicured lawn area in the northeast corner of Lot 19 Concession 11 (Map 3).

1.3 Archaeological Context

1.3.1 Current Conditions

The study area consists of a mixed wooded area with steep slopes leading to Bray Lake and several small wetlands (Images 1 thru 36). The study area also includes a single cottage on Bray Lake with an outbuilding and a manicured lawn area.

1.3.2 Natural Environment

The study area is situated within shallow till and rock ridges (Map 4) of the Algonquian Highlands, a physiographic region overlaying Precambrian bedrock and granite. It mostly consists of a shallow horizon of acidic, sandy and stony soil, with frequent valleys floored with outwash sand and gravel or covered in swampland (Chapman and Putnam 1984: 211).

Surficial geological mapping indicates that the study area is primarily till covered bedrock-drift complex in Precambrian terrain with silty sand to sand-textured till on Precambrian terrain in the centre and southeast portion, and coarse-textured glaciolacustrine deposits of sand and gravel with minor silt and clay in the southwest corner of the study area (Map 5). Soil mapping of the study area indicates that it is Precambrian Rock (Hoffman et al. 1964).



The nearest water source is Bray Lake and several small lakes within and along the edge of the study area. Bray Lake drains into the South River via Bray Creek approximately 5.9 kilometres the east, which empties into Lake Nipissing approximately 25 kilometres north of the study area

The study area is located within the Huntsville District of the Georgian Bay Ecoregion, which itself is situated on the southern part of the Ontario Shield Ecozone. This region encompasses 7,447,869 hectares, and contains a diverse array of flora and fauna. It is characterized by a mix of eastern white pine, red pine, eastern hemlock, and yellow birch, in addition to sugar maple, American beech, wild black cherry, American basswood, and white ash in the southern part of the region.

Representative fauna include little brown bat, American black bear, moose, fisher, North American river otter, beaver, common loon, osprey, broad-winged hawk, ruby-throated hummingbird, pileated woodpecker, yellow-bellied sapsucker, winter wren, veery, Blackburnian warbler, black-throated blue warbler, yellow-rumped warbler, scarlet tanager, rose-breasted grosbeak, red-spotted newt, northern two-lined salamander, four-toed salamander, gray treefrog, pickerel frog, American bullfrog, snapping turtle, smooth greensnake, and northern ring-necked snake. In the numerous lakes and rivers, fish such as lake trout, brook trout, lake whitefish, yellow perch, walleye, bluegill, rock bass, brown bullhead, bluntnose minnow, northern redbelly dace, and golden shiner are found.
(Crins et al. 2009:40-41)

1.3.3 Known Archaeological Sites

A search of registered archaeological sites within the MHSTCI Archaeological Sites Database was conducted. No archaeological sites have been recorded within a one kilometre radius of the study area. Additionally no previous archaeological surveys within 50 metres of the property were identified.

1.4 Summary

As documented in Section 1.0, the study area contains evidence of archaeological potential. The location of Bray Lake and several small lakes and wetlands within and along the edge of the study area indicates the potential for locating Pre-Contact Aboriginal archaeological material. In summary, a Stage 2 archaeological assessment was determined to be required in order to identify and document any archaeological material that may be present. The heavy forest of the study area precluded the possibility of ploughing for a pedestrian survey, and as a result, a test pitting survey was determined to be required.



2.0 Field Methods

The Stage 2 archaeological assessment of the study area was conducted between August 25 and September 1, 2020 under PIF #: P321-0186-2020, issued to Shane McCartney, M.A. (P321). The weather during the survey was sunny and warm. At no time were weather or lighting conditions detrimental to the observation or recovery of archaeological material.

Due the location of the study area in northern Ontario the test pit strategy followed Section 2.1.5 of the *Standards and Guidelines for Consultant Archaeologists*. As a result, a 50 metre zone bordering the edges of Bray Lake and several small ponds within the study area were test pitted at maximum intervals of 5 metres apart, accounting for 31% of the study area (Images 37 thru 46). Approximately 70% of the surveyed area was not assessed due to permanent inundation from wetlands and their feeder creeks, steep slope in excess of 20°, and evidence of subsurface disturbance from the construction of a gravel driveway and two associated cabins. The remaining 69% of the study area did not exhibit archaeological potential and was not assessed.

Each test pit was excavated by hand to 30 cm in diameter, and was excavated into the first 5 centimetres of subsoil. Test pit depth averaged 15 cm. Each test pit was examined for stratigraphy, cultural features, or evidence of fill, and all soil was screened through wire mesh of 6 millimetre width. All test pits were backfilled. The soil consisted of a light brown sand topsoil horizon over an ash layer which varied in depth and is consistent with a forest fire event, and a subsoil consisted of an orange-brown sandy loam (Images 47 and 48). No archaeological material was identified during the course of the survey.

The results of the Stage 2 archaeological survey are presented in Maps 6 thru 8.



3.0 Record of Finds

Table 2 provides an inventory of the documentary record generated in the field.

Table 2: Information Inventroy of Documentation Record

Document	Location	Description
Field Notes	Earthworks Office Project File	3 page of notes
Photographs	Earthworks Office Project File	283 digital photographs,
Field Map	Earthworks Office Project File	1 page



4.0 Analysis and Conclusions

A Stage 1 & 2 Archaeological Assessment was conducted on a 166.5 ha area legally described as Part of Lots 19 and 20, Concession 11, Lot 20 and part of Lots 18 & 19, Concession 12, Township of Machar, Parry Sound District, Ontario. A Stage 2 test pit survey was conducted between August 25 and September 1, 2020.

The Stage 2 archaeological survey did not yield any evidence of archaeological material. As a result, no additional archaeological assessments are required.



5.0 Recommendations

Based on the results of the Stage 1 background investigation and the subsequent Stage 2 test pit survey, the study area is considered to be free of archaeological material, and no additional archaeological assessments are recommended.

The MHSTCI is requested to review this report and provide a letter indicating their satisfaction that the fieldwork and reporting for this archaeological assessment are consistent with the Ministry's 2011 *Standards and Guidelines for Consultant Archaeologists* and the terms and conditions for archaeological licences, and to enter this report into the Ontario Public Register of Archaeological Reports



6.0 Advice on Compliance with Legislation

This report is submitted to the Ministry of Heritage Sport Tourism and Culture Industries as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Heritage Sport Tourism and Culture Industries, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act*.

The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.



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8.0 Images



Image 1: Study Area Conditions. Facing Southeast



Image 2: Study Area Conditions. Facing North





Image 3: Study Area Conditions. Facing North



Image 4: Study Area Conditions. Facing North West





Image 5: Study Area Conditions. Facing North West



Image 6: Study Area Conditions. Facing North West





Image 7: Study Area Conditions. Facing Northwest



Image 8: Study Area Conditions. Facing Northwest





Image 9: Study Area Conditions. Facing South



Image 10: Study Area Conditions. Facing West





Image 11: Study Area Conditions. Facing Northwest



Image 12: Study Area Conditions. Facing West





Image 13: Study Area Conditions. Facing West



Image 14: Study Area Conditions. Facing West





Image 15: Study Area Conditions. Facing Northwest



Image 16: Study Area Conditions. Facing North





Image 17: Study Area Conditions. Facing Northwest



Image 18: Study Area Conditions. Facing East





Image 19: Study Area Conditions. Facing West



Image 20: Study Area Conditions. Facing Southwest





Image 21: Study Area Conditions. Facing West



Image 22: Study Area Conditions. Facing North





Image 23: Study Area Conditions. Facing Northwest



Image 24: Study Area Conditions. Facing South





Image 25: Study Area Conditions. Facing East



Image 26: Study Area Conditions. Facing East





Image 27: Study Area Conditions. Facing West



Image 28: Study Area Conditions. Facing East





Image 29: Study Area Conditions. Facing West



Image 30: Study Area Conditions. Facing East



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Image 31: Study Area Conditions. Facing Northwest



Image 32: Study Area Conditions. Facing Northwest.



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Machar Township



Image 33: Study Area Conditions. Facing West



Image 34: Study Area Conditions. Facing West.



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Bray Lake
Machar Township



Image 35: Study Area Conditions. Facing Southwest.



Image 36: Study Area Conditions. Facing South.





Image 37: Test Pit Survey in Progress. Facing South



Image 38: Test Pit Survey in Progress. Facing West





Image 39: Test Pit Survey in Progress Facing Northwest



Image 40: Test Pit Survey in Progress. Facing South





Image 41: Test Pit Survey in Progress. Facing South



Image 42: Test Pit Survey in Progress. Facing Northwest





Image 43: Test Pit Survey in Progress. Facing North



Image 44: Test Pit Survey in Progress. Facing West





Image 45: Test Pit Survey in Progress. Facing Southeast



Image 46: Test Pit Survey in Progress. Facing Southeast





Image 47: Open Test Pit Showing Subsurface Stratigraphy.



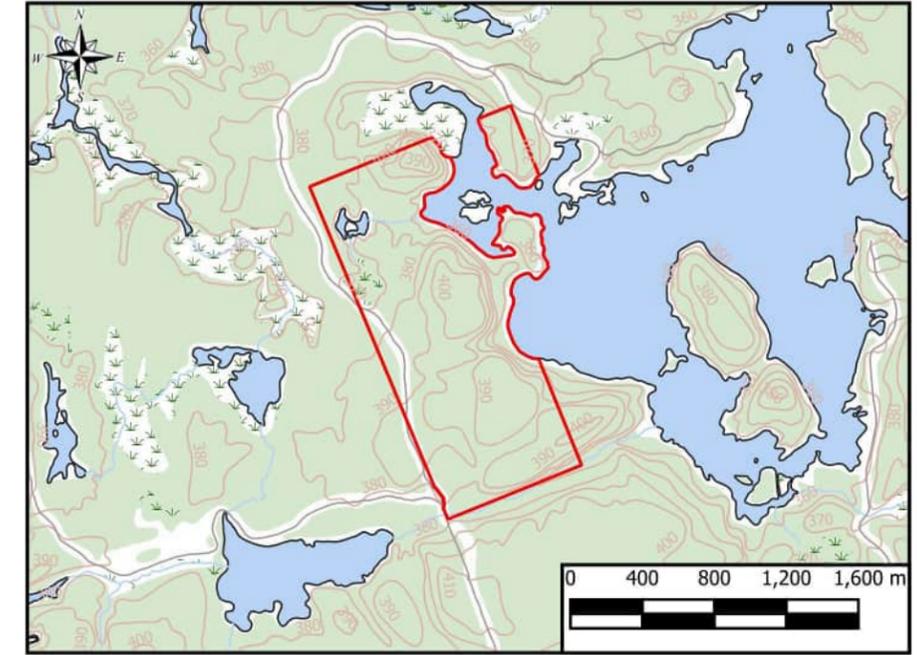
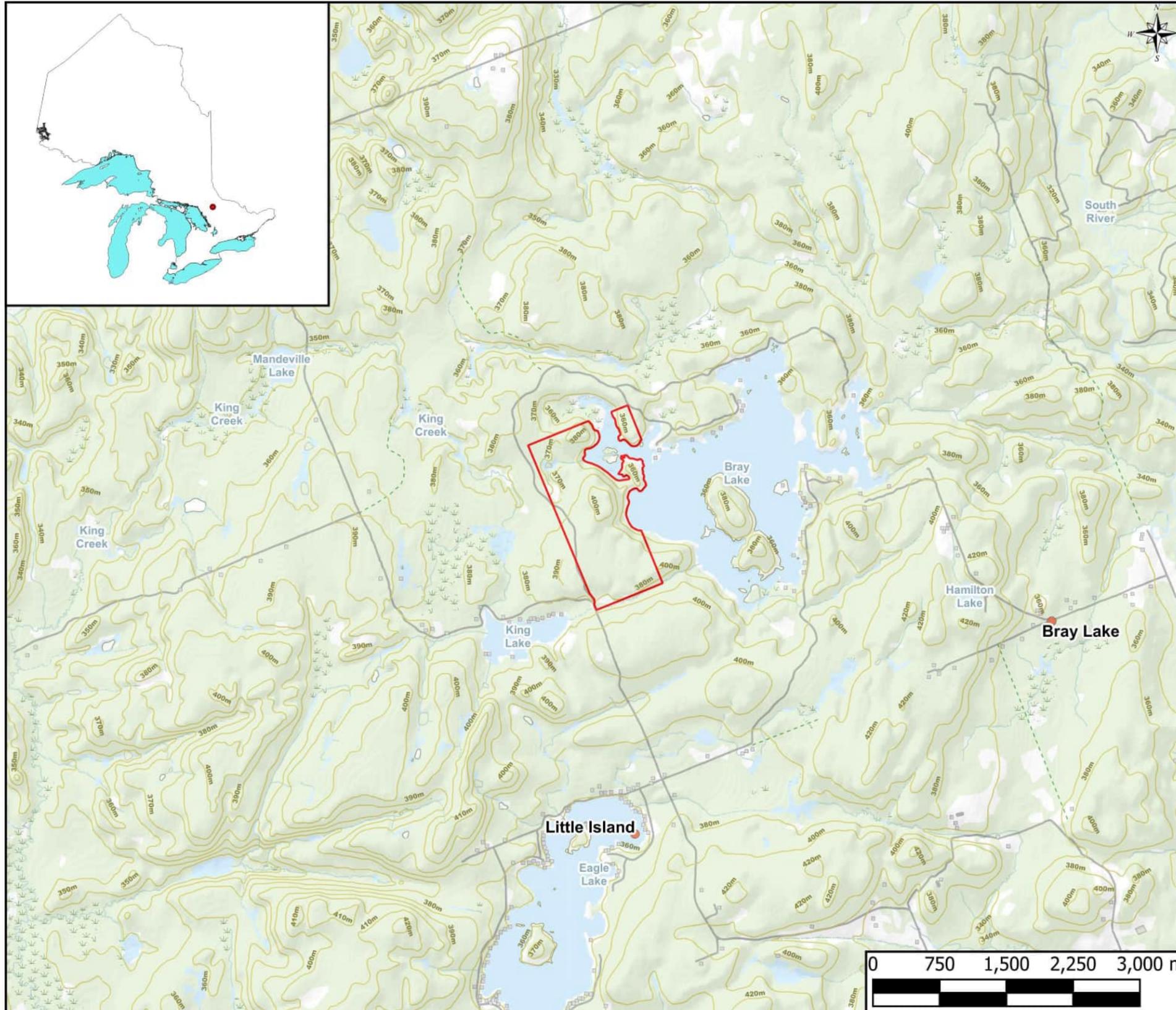
Image 48: Open Test Pit Showing Subsurface Stratigraphy.



9.0 Maps



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Machar Township



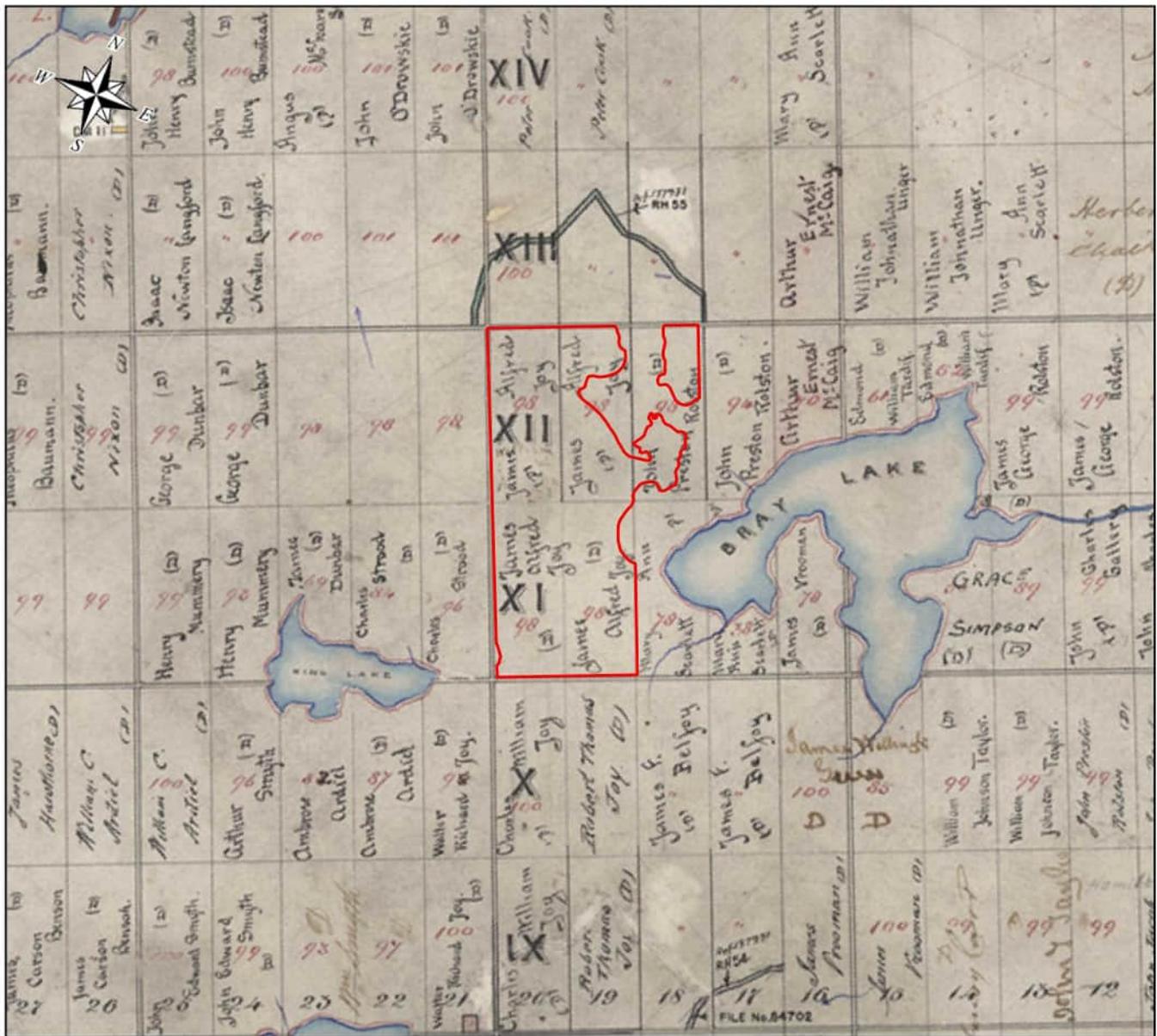
Legend

 Study Area

Reference:
Canvec Data. Scale 1:50000
Ontario Basic Mapping. Scale 1:40000
ESRI Basemap.

Map 1: Regional Map

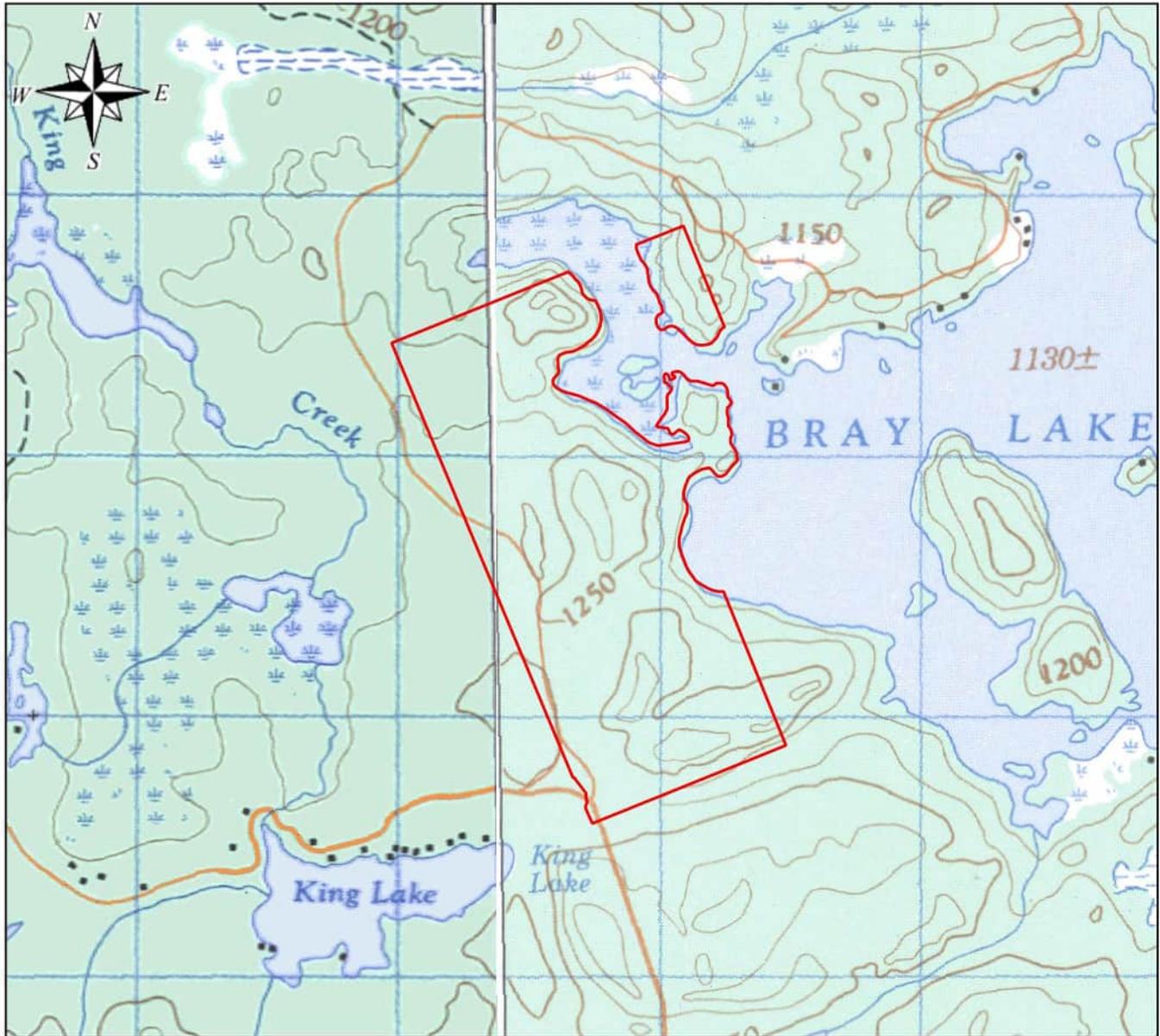
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 Bray Lake
 Machar Township



<p>Legend</p> <p> Study Area</p>	<p>Base Map: Map of the Township of Machar, Province of Ontario. Department of Crown Lands, Toronto. 1876.</p>	<p style="text-align: center;">Not to Scale</p>
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Map 2: 1876 Map of Machar Township





Legend

 Study Area

Base Map:
Canada, Department of Energy, Mines and
Resources [Natural Resources Canada].
South River, Ontario. 1:50,000. Map Sheet
31E/14, ed. 4, 1990.

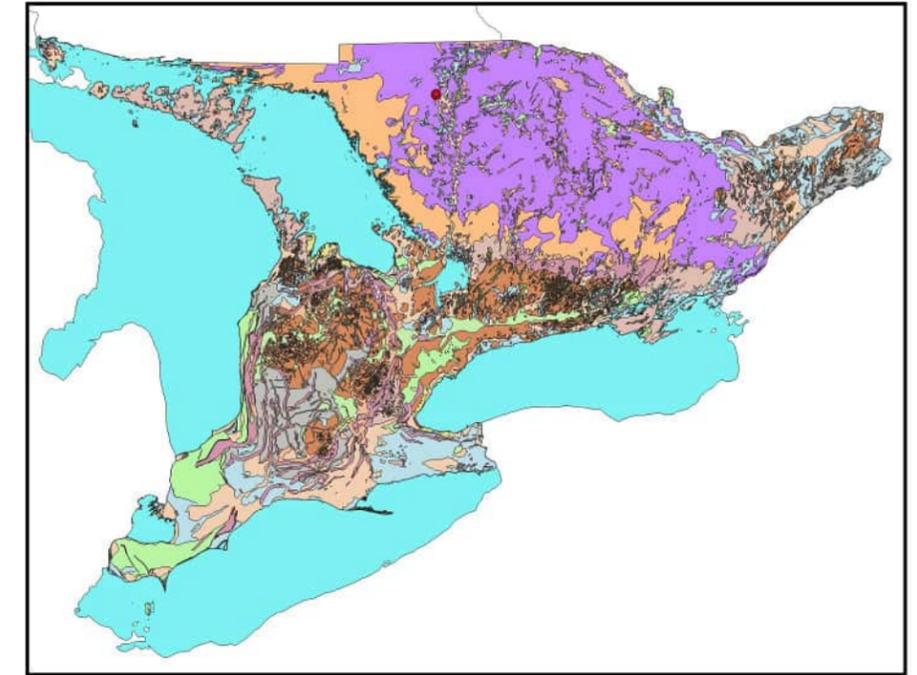
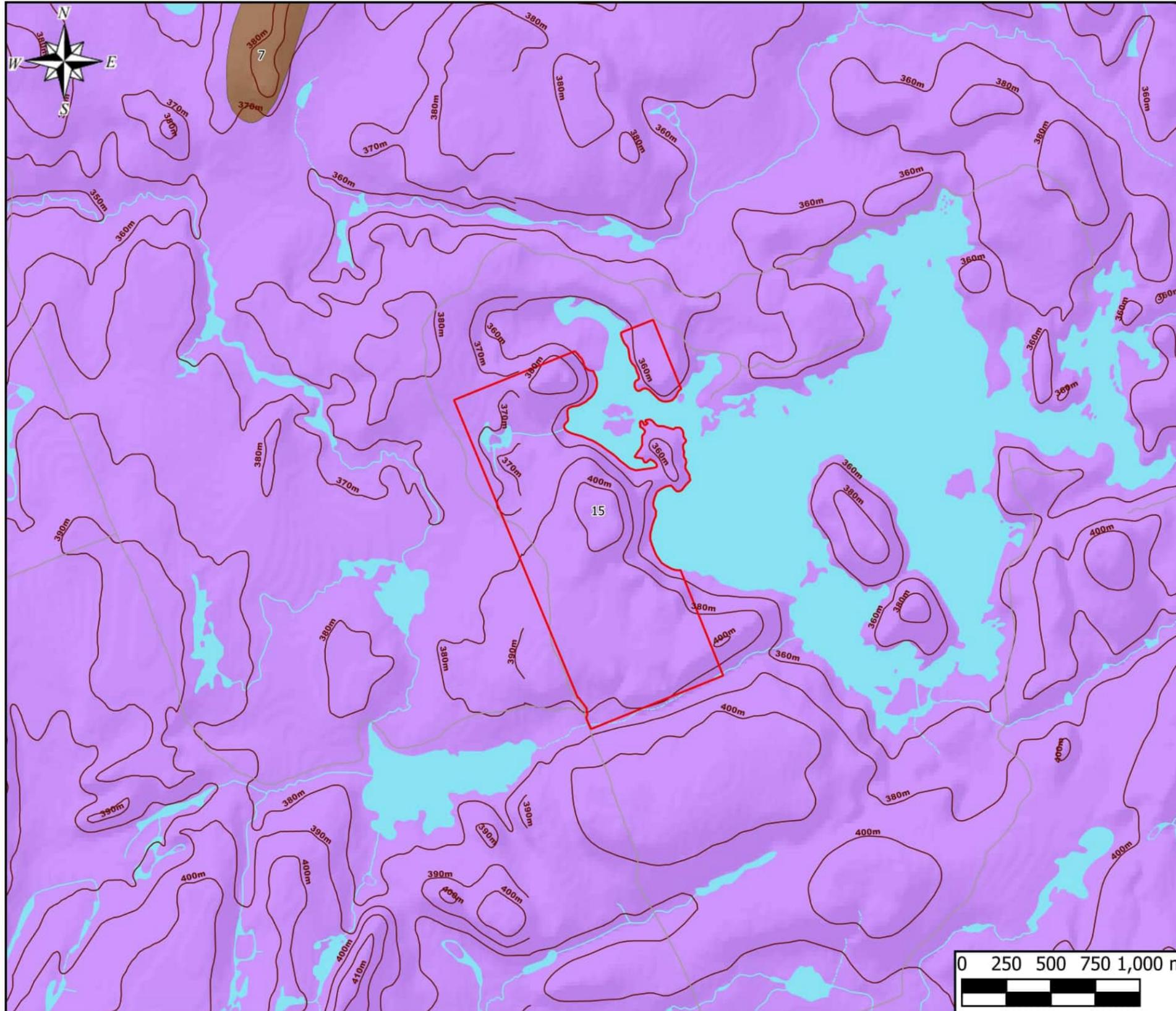
0 250 500 750 1,000 m



Map 3: Nineteenth Century Topographic Mapping



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Machar Township



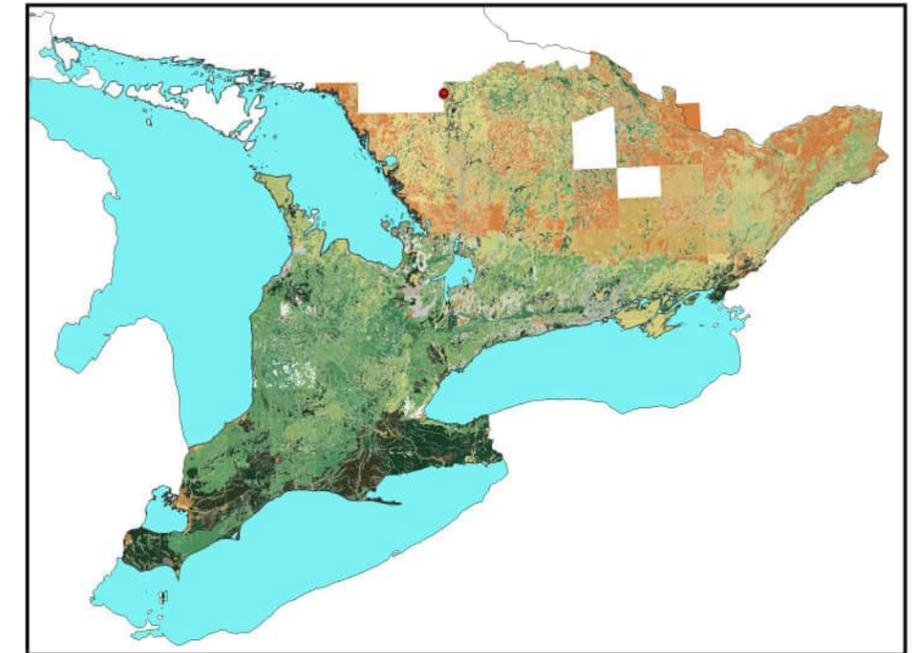
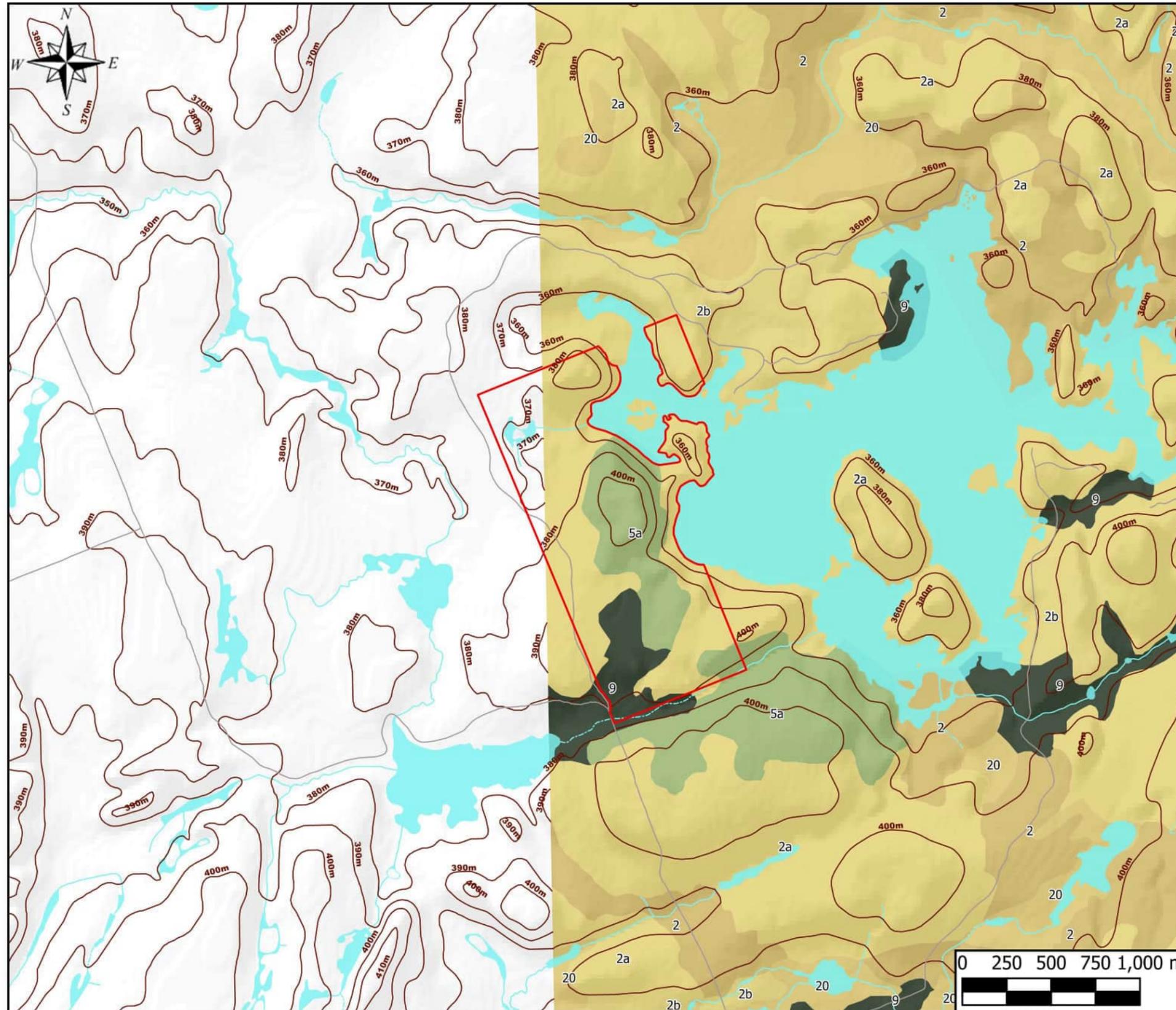
Legend

-  Study Area
-  Road Network
-  7 - Drumlins
-  15 - Shallow Till And Rock Ridges

Base Data:
Chapman, L.J. and Putnam, D.F. 2007. Physiography of southern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 228.

Map 4: Physiographic Landforms

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 Bray Lake
 Machar Township

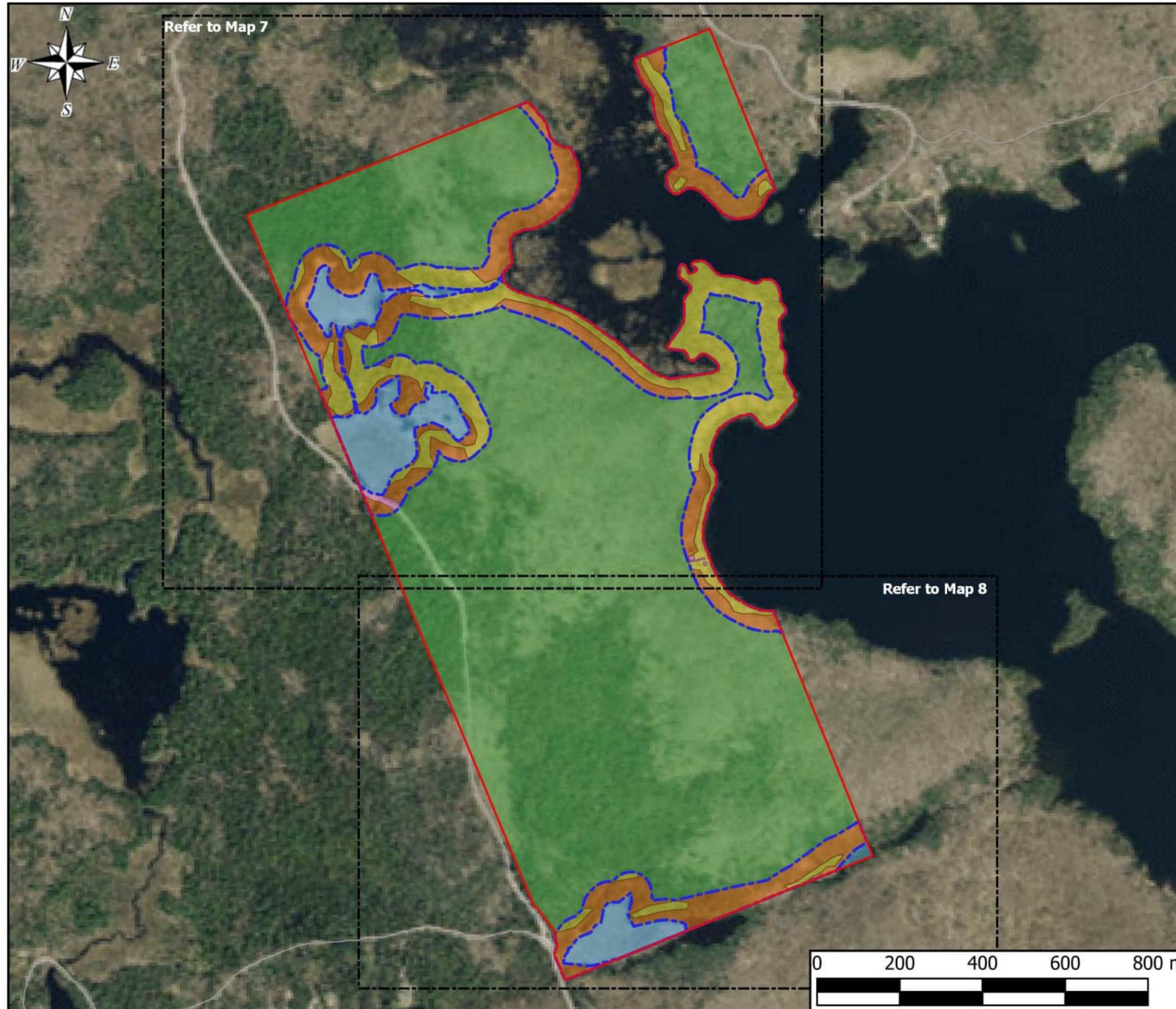


Legend

- Study Area
- Road Network
- 2 - Unsubdivided: thin, discontinuous drift
- 2a - Till
- 2b - Stratified sediments cover: gravel, sand, silt and clay
- 5a - TILL: generally >1 m thick; leeside and meltout till
- 9 - Deltaic, valley fill, nearshore: sand, gravel
- 20 - peat, muck, marchlands

Base Data:
 Ontario Geological Survey 2010. Surficial geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data
 128-REV ISBN 978-1-4435-2483-4

Map 5: Surficial Geology

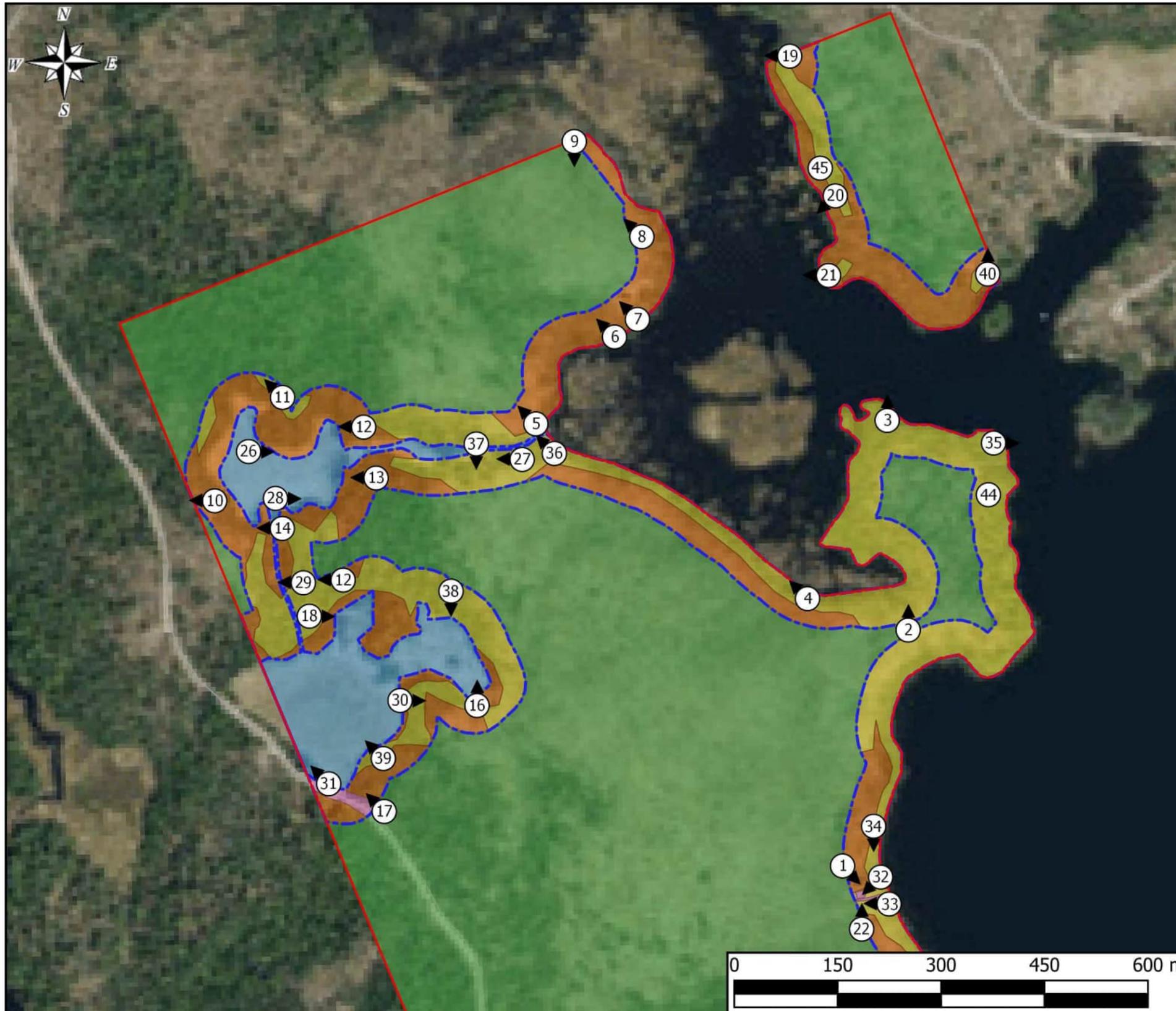


Legend

- Study Area
- 50 metre Zone of Archaeological Potential
- Area Subject to Test Pit Survey at 5 metre intervals
- Area of Low Archaeological Potential (Northern Standards)
- Not Assessed
- Area of Permanent Inundation - Not Assessed
- Area of Steep Slope - Not Assessed
- Area of Subsurface Disturbance - Not Assessed
- Photo Location and Direction

Reference:
Esri Basemap

Map 6: Stage 2 Assessment Results



Legend

- Study Area
- 50 metre Zone of Archaeological Potential
- Area Subject to Test Pit Survey at 5 metre intervals
- Area of Low Archaeological Potential (Northern Standards)
- Not Assessed
- Area of Permanent Inundation - Not Assessed
- Area of Steep Slope - Not Assessed
- Area of Subsurface Disturbance - Not Assessed
- # Photo Location and Direction

Reference:
Esri Basemap

**Map 7: Stage 2
 Assessment Results**



Legend

-  Study Area
-  50 metre Zone of Archaeological Potential
-  Area Subject to Test Pit Survey at 5 metre intervals
-  Area of Low Archaeological Potential (Northern Standards)
- Not Assessed
-  Area of Permanent Inundation - Not Assessed
-  Area of Steep Slope - Not Assessed
-  Area of Subsurface Disturbance - Not Assessed
-  # Photo Location and Direction

Reference:
Esri Basemap

**Map 8: Stage 2
Assessment Results**



WILDLAND FIRE RISK ASSESSMENT

Bray Lake Property
Township of Machar

December 2023



RIVERSTONE
ENVIRONMENTAL SOLUTIONS INC.



RIVERSTONE

ENVIRONMENTAL SOLUTIONS INC.

December 8, 2023
RS# 2020-053

Frank Polsinelli and Nghi Nguyen

Via email: frank.polsinelli@lcustom.com

SUBJECT: Wildland Fire Risk Assessment – Bray Lake, Township of Machar

Dear Mr. Polsinelli and Mr. Nguyen,

RiverStone Environmental Solutions Inc. is pleased to provide you with the attached report.

Please contact us if there are any questions regarding the report, or if further information is required.

Best regards,

RiverStone Environmental Solutions Inc.

Al Shaw, M.Sc.
Principal / Senior Ecologist

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1 BACKGROUND

RiverStone Environmental Solutions Inc. (hereafter, “RiverStone”) was retained by Mr. Frank Polsinelli and Mr. Nghi Nguyen, through Mr. Tom Harsani, to complete and Environmental Impact Study (EIS) and Wildland Fire Risk Assessment (WFRA) required by the Township of Machar as part of a consent application for a severance to create twenty (20) new single residential lots on a property located on Bray Lake in the Township of Machar (hereafter, “Township”). The EIS component of the project has been submitted under separate cover by RiverStone dated April 2023. The subject property is approximately 162 hectares (400 acres) in size with approximately 2,438 metres (8,000 feet) of shoreline and is legally described as Lots 19 and 20, Concession 11, and Lots 18, 19, and 20, Concession 12, Township of Machar, District of Parry Sound (**Figure 1**).

It is our understanding that the WFRA is required to further the application for severance to address the potential for wildland fire risk. Mapping provided by Ministry of Natural Resources and Forestry (MNR) has identified potentially hazardous forest types requiring evaluation for wildland fire risk on portions of the subject property. Policy 3.1.8 of the 2020 Provincial Policy Statement (PPS) require that development shall generally be directed to areas outside of lands that are unsafe for development due to the presence of hazardous forest types for wildland fire, and that development within hazardous forest types may only be permitted where risks are mitigated. To assess on-site forest types for wildland fire risk, and (where appropriate) mitigate identified wildland fire risks, this WFRA has been carried out in accordance with the Wildland Fire Risk Assessment and Mitigation Reference Manual (MNR 2017) (hereafter, “MNR Reference Manual”) in support of the Provincial Policy Statement, 2020, as described below in **Section 2**.

2 METHODOLOGY

2.1 Level 1 and Level 2 Wildfire Risk Assessment

The process for undertaking a WFRA is outlined in Chapter 5 of the MNR Reference Manual (2017). The overall purpose of a WFRA is to evaluate a site to determine: 1) whether there is potential for wildland fire risk (i.e., is forest present), and if so 2) what level of risk exists (i.e., are hazardous forest types present). A Level 1 WFRA involves screening a property using background information, including current aerial photographs and online mapping tools such as the Natural Heritage Areas web application that includes information from the Natural Heritage Information Centre (NHIC). MNR’s generalized wildland fire hazard mapping was also reviewed and consists of satellite imagery (e.g., Landsat) and the provincial Forest Resources Inventory. MNR’s generalized wildland fire hazard mapping is coarse and must be refined (where wildland fire potential is identified) based on a detailed investigation of on-site forest types.

If the results of a Level 1 assessment indicate that forest (and particularly hazardous forest types) are present, or have the potential to be present, a more detailed Level 2 assessment is required. A Level 2 assessment involves a site investigation to further assess forest characteristics. Key elements of this site assessment include:

- Mapping forest composition and dominant vegetation (e.g., fuel types) to assess wildland fire risk;
- Describing forest conditions (e.g., presence of disease, storms) which may contribute to fire risk;
- Describing forest stand density (e.g., tree spacing, etc.) which may contribute to fire risk; and,
- Confirming the presence and characteristics of ladder fuels (e.g., conifer species with low branches) and ground fuel (e.g., dense shrub layer, coarse woody debris) accumulation.

The site investigation should occur during snow-free conditions to improve ground visibility and allow an accurate assessment of ground fuel accumulation. The Level 2 assessment area should encompass the entire subject property and (where possible) lands within 100 m of and building locations if proposed.

If the results of the site investigation confirm the presence of hazardous forest types, and development activities (e.g., construction of a dwelling, etc.) are proposed within or immediately adjacent to hazardous forest types, it must then be determined whether wildland fire risk can be sufficiently mitigated. Mitigation measures may involve surface fuel reduction (i.e., removal of downed woody debris), thinning to increase spacing between trees, pruning of ladder fuels, and/or building design/structural modifications. Where fire risk cannot be sufficiently mitigated (e.g., where the presence of significant natural heritage feature inhibits vegetation management techniques, etc.), development should generally be directed to other portions of the property that do not contain hazardous forest types for wildland fire.

2.2 Site Investigation

Based on the initial desktop assessment it was determined that portions of the subject property are mapped by the province as “moderate” with the majority of the property mapped as “low” wildland fire hazard as per the MNRF generalized mapping. Thus, a Level 2 WFRA is required as part of the severance application for the subject property considered herein. Site features were assessed on four (4) separate visits in the spring/summer of 2020 by Al Shaw (Principal/Senior Ecologist), Craig Mann (Ecologist/Arborist) and Jenn LeMesurier (Ecologist/Arborist). The site investigations involved characterizing forest types as described in **Section 2.1**. Representative photographs taken during the site investigation are assembled in **Appendix 1**, depicting the assessment of forest type and ground fuel.

2.3 Limitations of Assessment

Organic matter (living or dead) is fuel that will ignite and burn under suitable conditions (i.e., in the presence of heat and oxygen). By extension, all forested areas have the potential to burn and pass fire to neighbouring areas irrespective of their internal characteristics (e.g., species, composition, structure, etc.) and overall risk categorization (e.g., extreme, high, moderate, low, etc.). Mitigation measures such as siting a building envelope outside of hazardous forest types, implementing vegetation management strategies, and incorporating fire-resistant materials into building design will lower, but will not eliminate fire risk, particularly in landscapes with significant amounts of natural cover (e.g., Canadian Shield). The mitigation measures incorporated into this report are aimed at minimizing the potential for uncontrollable wildland fire behaviour (which has the greatest likelihood of causing catastrophic property damage or loss of human life), rather than minimizing the potential for low-intensity ground fires that spread along the forest floor (via leaves, needles, duff, etc.).

3 WILDLAND FIRE RISK ASSESSMENT

3.1 General Site Conditions and Land-uses

The subject property is located on the western shores of Bray Lake and is accessed via Riding Ranch Road that is located on the western edge of the property. The property is approximately 162 ha (400 acres) in area and is currently developed with with a cottage dwelling, bunkie, sauna, and pile/post dock in the central portion of the property. The property is bordered by similar seasonal residential

properties, and vacant land. The property is largely undeveloped with upland forest communities, wetland habitat scattered throughout, rock barrens, and watercourses.

3.2 Vegetation Communities

Existing vegetation communities on the subject property were assessed during the on-site investigations. A desktop exercise was undertaken to approximately map forest community boundaries using background information sources and current aerial photographs; the mapped forest communities were then ground-truthed and boundaries updated following the site investigation. The proposed severed lot general forest community mapping in accordance with Wester et al. (2015) is provided on **Figure 2**.

3.2.1 Terrestrial Vegetation Communities

G051Tt Dry to Fresh, Coarse: Hemlock-Cedar Conifer

The riparian shoreline areas, and the majority of the western side of the subject property contains a forest community that is dominated by Eastern Hemlock (*Tsuga canadensis*). These areas contain relatively low vegetation diversity due to the low nutrient and moisture holding capacity of the substrates. Other vegetation species that were noted within this community include Balsam Fir (*Abies balsamea*), Sugar Maple (*Acer saccharum*), Black Cherry (*Prunus serotina*), Yellow Birch (*Betula alleghaniensis* var. *fallax*), Red Maple (*Acer rubrum*), Striped Maple (*Acer pensylvanicum*), Beaked Hazelnut (*Corylus cornuta*), Canada Mayflower (*Maianthemum canadense*), Spinulose Wood Fern (*Dryopteris carthusiana*), Partridgeberry (*Mitchella repens*), Tree Groundpine (*Lycopodium dendroideum*), Club Moss Species (*Lycopodium* sp), Wild Sarsaparilla (*Aralia nudicaulis*), and Drooping Woodland Sedge (*Carex arctata*). Common mosses and lichens were also present throughout this community in areas where there was exposed rock. This community was present along much of the riparian area of the shoreline. Species within these areas also included Leatherleaf (*Chamaedaphne calyculata*), Sweetgale (*Myrica gale*), Three-way Sedge (*Dulichium arundinaceum*), Canada Bluejoint (*Calamagrostis canadensis*), White Meadow-sweet (*Spiraea alba* var. *alba*), Broadleaf Cattail (*Typha latifolia*), Common Sheep Sorrel (*Rumex acetosella*), Black-girdle Bulrush (*Scirpus atrocinctus*), Marsh St. Johnswort (*Triadenum virginicum*), and Water-horehound (*Lycopus* sp).

G058Tt Dry to Fresh, Coarse: Maple Hardwood

The central portion of the subject property is dominated by Sugar Maple and is best classified as Maple Hardwood. Rich soils in this area support a canopy of mature Sugar Maple, American Beech (*Fagus grandifolia*), and White Birch (*Betula pendula*), with some Eastern Hemlock. Balsam Fir, Yellow Birch, Red Maple, and Black Cherry were also present. Understory species include Striped Maple, Northern Starflower (*Trientalis borealis*), Wild Sarsaparilla, Spinulose Wood Fern, Red Trillium (*Trillium erectum*), White Trillium (*Trillium grandiflorum*), New York Fern (*Thelypteris noveboracensis*), Canada Mayflower, Hobble Bush (*Viburnum lantanooides*), Red Raspberry (*Rubus occidentalis*), Rose Twistedstalk (*Streptopus lanceolatus*), Bearded Shorthusk (*Brachyelytrum erectum*), Indian Pipe (*Monotropa uniflora*), Cinnamon Fern (*Osmunda cinnamomea*), and Common Lady Fern (*Athyrium filix-femina* ssp. *angustum*).

3.2.2 Wetland Vegetation Communities

G130Tt Intolerant Hardwood Swamp

Throughout the subject property, there are forested wetland pockets that are hydrologically connected with the watercourses that lead toward Bray Lake. The best classification for this community type is an intolerant hardwood swamp dominated by Black Ash (*Fraxinus nigra*). Other tree species include Yellow Birch, Red Maple, and Sugar Maple. The herbaceous layer is dense and includes Sensitive Fern (*Onoclea sensibilis*), Spotted Jewelweed (*Impatiens capensis*), Horsetail Species (*Equisetum sp*), Interrupted Fern (*Osmunda claytoniana*), Fringed Sedge (*Carex crinita var. crinita*), Canada Bluejoint, and Wood-sorrel Species (*Oxalis sp*).

G142N Mineral Meadow Marsh

Along the western boundary of the subject property there are three wetlands that are best classified as mineral meadow marsh vegetation communities. These areas are located near Riding Ranch Road, and include some pockets of open water wetland, but are dominated by herbaceous vegetation with sporadic tree growth. Vegetation species include: Joe-pye-weed Species (*Eupatorium sp*), Canada Bluejoint, White Meadow-sweet, Leatherleaf, Broadleaf Cattail, Black Raspberry, Eastern White Pine (*Pinus strobus*), Red Maple, Black Spruce (*Picea mariana*), Marsh St. Johnswort, and Harlequin Blue Flag (*Iris versicolor*).

3.3 Wildfire Risk Assessment

According to the MNR Reference Manual (p. 8) hazardous forest types are those that, under dry conditions, would likely exhibit high to extreme wildland fire behaviour should a fire ignite. The following **forest types** are considered by MNR to exhibit high to extreme wildland fire risk:

- Natural conifer forests and unmanaged conifer plantations including those that contain White Spruce (*Picea glauca*) or Black Spruce (*Picea mariana*);
- Jack Pine (*Pinus banksiana*) and Balsam Fir (*Abies balsamea*) tree species;
- Immature Red Pine (*Pinus resinosa*) and Eastern White Pine (*Pinus strobus*); and
- Mixedwood forests with more than 50 per cent conifer cover, including Jack Pine, White Spruce (*Picea glauca*), Balsam Fir, and immature Red Pine or White Pine.

The following **forest conditions** are associated with high to extreme wildland fire risk:

- Vegetation that has sustained storm or insect damage or is diseased;
- Trees that are close to one another (high density) within conifer forests; and
- An abundance of ground fuel accumulation (e.g., large amount of woody debris, branches and or needle litter on the ground)

The assessment of wildland fire risk is provided in **Figure 2** and is based on RiverStone's desktop and on-site assessment of forest conditions on the subject property. MNR's general wildland fire hazard mapping is also included on **Figure 2** for reference, along with the proposed severance lines.

The MNR mapping suggests that that the property is classified as potentially hazardous (moderate and low wildfire hazard risk). Based on the site assessment, the subject property contains areas of conifer dominated forest communities that include Eastern Hemlock. These communities are typically located along the shoreline and adjacent to wetland communities. Trees within these communities are well established and mature which has created a sparse understory. Table 4-1 of the MNR Reference

Manual indicates that stands of Cedar, Hemlock, and Tamarack are typically considered low risk for wildland fire. Considering the mature species present, the lack of downed woody debris to provide ladder fuel, and lack of lower branching on mature trees, the conifer communities should be considered moderate to low risk for wildland fire. Deciduous forest communities and wetlands dominated by hardwood species and marsh conditions should be considered low.

4 WILDLAND FIRE RISK MITIGATION

As described in **Section 3.3** and shown on **Figure 2**, the subject property contains moderate to low risk forest types for wildland fire. The 2020 PPS requires that development be directed to areas outside of hazardous forest types for wildland fire. Where development is considered/permitted within hazardous forest types, mitigation measures must be implemented to reduce the risks of wildland fire. Note that our assessment characterised the entire property as moderate to low risk; however, all development within forested landscapes are at some risk and mitigation is recommended by the Province, even within the lowest risk category.

Figure 2 shows the provincial mapping as well as the results of RiverStone’s wildland fire risk assessment. While there is currently no detailed development plans proposed for each of the severed lots, there is an expectation for future development to occur on each of the created lots. A key component of wildland fire mitigation is related to clearing of vegetation in the area surrounding buildings in hazardous forest types. Should a fire start, having a cleared buffer around buildings and accessory structures would reduce the risk of fire affecting the structures. The removal of trees, particularly close to natural heritage features (such as the lake shoreline, wetland and associated buffer, habitat of species at risk, vernal pools), would be counter to the protection measures put in place for these features, and would conflict with conservation goals. The MNRF has recognized the conflict, noting in the reference manual that “the implication for wildland fire policies is that if wildland fire mitigation measures such as vegetation manipulation are proposed, and they would result in negative impacts, then such mitigation measures cannot be applied”. This rationale is to be applied to all natural heritage features identified on the subject lands for any future development proposed for the severed lot. RiverStone did not identify any natural heritage features on the subject property that would require protection with buffers/setbacks

The following sections detail the ways in which the severance and future development should proceed on the proposed severed lot to minimize wildland fire risks.

4.1.1 Building Envelope Siting

Where possible, the preferred approach for mitigating wildland fire risk is to situate buildings in the lowest hazardous forest types (i.e., avoidance). In this case, the portions of the proposed severed lot that contain pine plantation that has been classified as within the extreme / high category for wildland fire. Therefore, meaning any future development on the proposed severed lot should carefully follow the recommended mitigation outlined below.

4.1.2 Vegetation Management

Vegetation (both living and dead) is the fuel that ignites and burns during wildland fires; by extension, vegetation management is a useful tool to reduce fuel accumulation. Surface fuels occur on the forest floor and include downed woody debris, leaf litter, needles, duff, brush piles, and grass. Ladder fuels include regenerating saplings and sub-canopy coniferous trees/shrubs, and dead understory branches that provide vertical continuity between surface fuels and the forest canopy. Dense arboreal lichens

(e.g., *Usnea* spp., etc.) and peeling/flaking bark may also facilitate fire movement into the forest canopy. Fuels may also be classified based on how quickly they ignite and whether they are fully consumed by fire.

As noted in the MNRF Reference Manual, vegetation management techniques are employed to create a defensible space where fire cannot jump to adjacent trees or structures, that surrounds a building or structure based on priority zones. Priority Zone 1 encompasses an area 10 m around the building and is the most critical in terms of creating and maintaining defensible space. Priority Zones 2 and 3 extend between 10 m and 30 m, and from 30 m to 100 m, respectively. The MNRF Reference Manual recognizes that in most cases vegetation management in Priority Zones 1 and 2 is sufficient to mitigate wildland fire risk to acceptable levels (i.e., vegetation management in Priority Zone 3 is required only in rare circumstances).

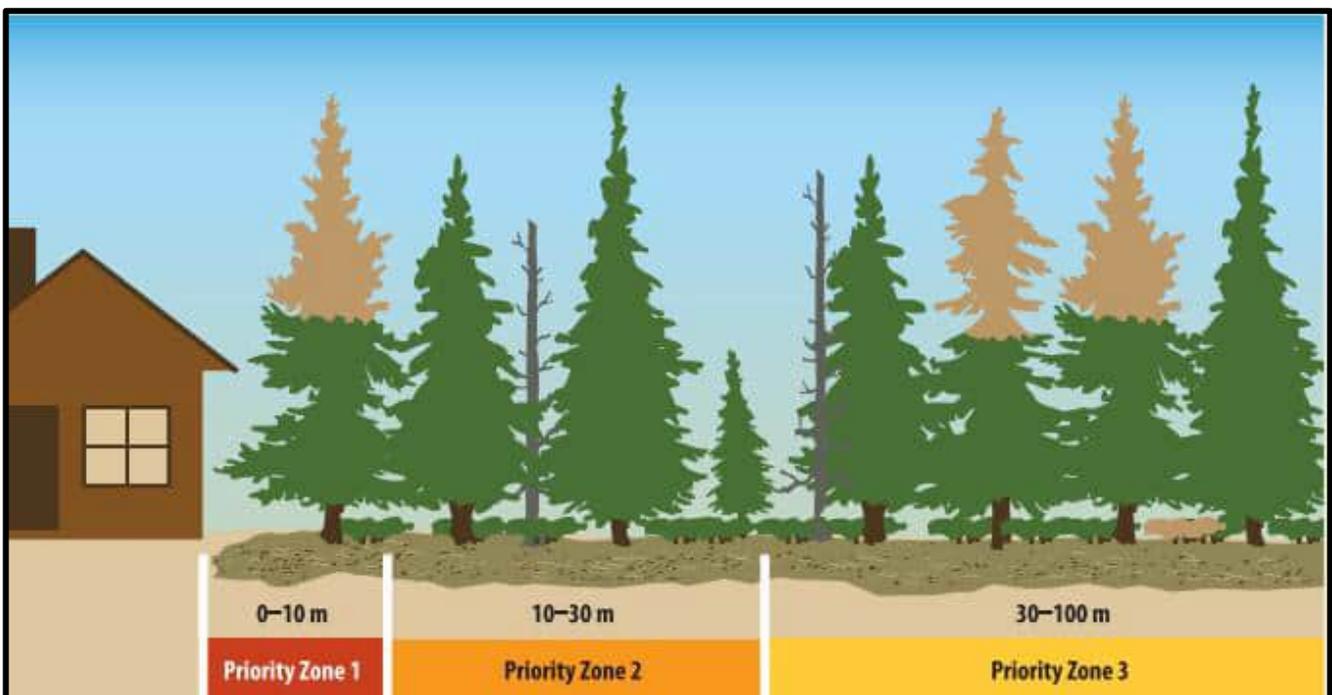


Figure 7.1 from MNRF Wildland Fire Risk Assessment and Mitigation Reference Manual (2017)

Based on the assessment, the proposed severed lot contains extreme/high risk forest types; however, future development is permissible in these areas with vegetation management recommended to reduce risk. RiverStone recommends implementation of the following vegetation management measures to further reduce wildland fire risk for any future building envelopes proposed within the proposed severed lot on **Figure 2**.

- **Remove conifer species (e.g., Pine, Spruce, Balsam Fir, Hemlock, etc.) of all sizes (i.e., canopy trees, sub-canopy trees, seedlings, saplings) that occur within Priority Zone 1 (10 m). Individual conifers occurring beyond 10 m of a building envelope (i.e., in Priority Zone 2), but having branches that encroach within Priority Zone 1, should be pruned such that no branches extend within Priority Zone 1. It is expected that very little tree removal will be required to satisfy this recommendation as the area adjacent to the building (Priority Zone 1) will generally be cleared to permit construction access to the building envelope as well as for the septic systems.**

- **Remove all downed woody debris (e.g., rotting logs, sticks, etc.) within Priority Zone 1 (10 m).**
- **Prune all deciduous tree branches within Priority Zone 1, that overhang the building envelope.**
- **Any manicured grass/lawn installed in Priority Zone 1 should be maintained regularly (i.e., mowed, watered, etc.).**
- **Hydro services will be provided to the proposed severed lots through a combination of underground and aboveground wires. It is recommended that vegetation around the hydro poles and overhead wires be kept clear by a qualified person to prevent branches from coming into contact with wires. We expect that this will fall under the authority of the hydro provider.**
- **Any trees planted for landscaping purposes within Priority Zone 1 should be low fire risk native deciduous species (e.g., Maple, Oak, Poplar, Birch, etc.). Fire-resistance in deciduous trees and shrubs is conferred by their greater leaf moisture, minimal deadwood, well-spaced branches, and water-like sap. No conifer species (native or otherwise) should be planted within Priority Zone 1.**
- **Within Zone 2 (10 -30 m from buildings), all conifer trees are to be thinned so that tree crowns are 3- 6 m apart with removal of dead woody debris.**
- **Any replanting within Zone 2, is to be completed with hardwood tree and shrub species native to the local area.**
- **Consider non- or low-combustible landscaping options for garden beds and walkways such as gravel mulch or composted bark chips (rather than plant-based mulch). Keep gardens and planted vegetation away from building envelopes to the extent possible. Locate brush piles outside of Priority Zone 1.**

4.1.3 Building Design

RiverStone’s recommended mitigation measures outlined in **Section 4.1.1** and **4.1.2** are largely aimed at reducing the spread of fire to proposed dwellings on the proposed lots via conduction (i.e., direct contact with flames) or radiant heat from burning trees and vegetation. Wind-dispersed embers released during a wildland fire that contact the roof or sides of buildings are a separate risk factor that is more appropriately mitigated via building design. The vegetation management techniques outlined in **Section 4.1.2** (which reduce the potential for high-intensity crown fires) are expected to decrease, but not eliminate, the release of embers to low levels; as such, RiverStone recommends the consideration (rather than prescription) of fire-resistant construction materials during building design as below:

- **Consider incorporating fire resistant construction materials as part of building design (e.g., roofing, siding, windows, and doors, etc.). FireSmart Canada’s guidelines for home construction are provided as a reference in Appendix 2.**

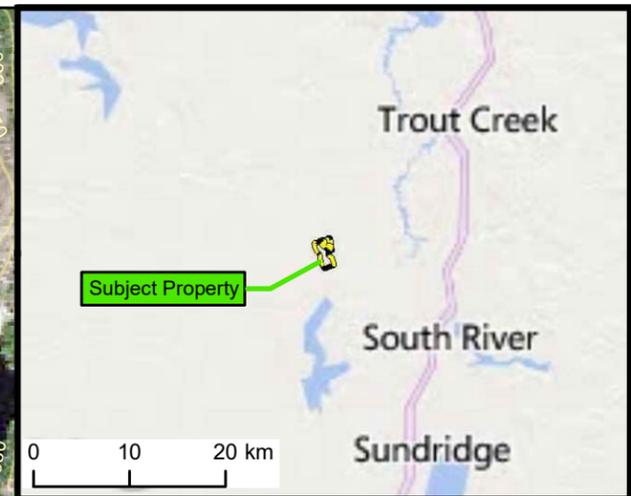
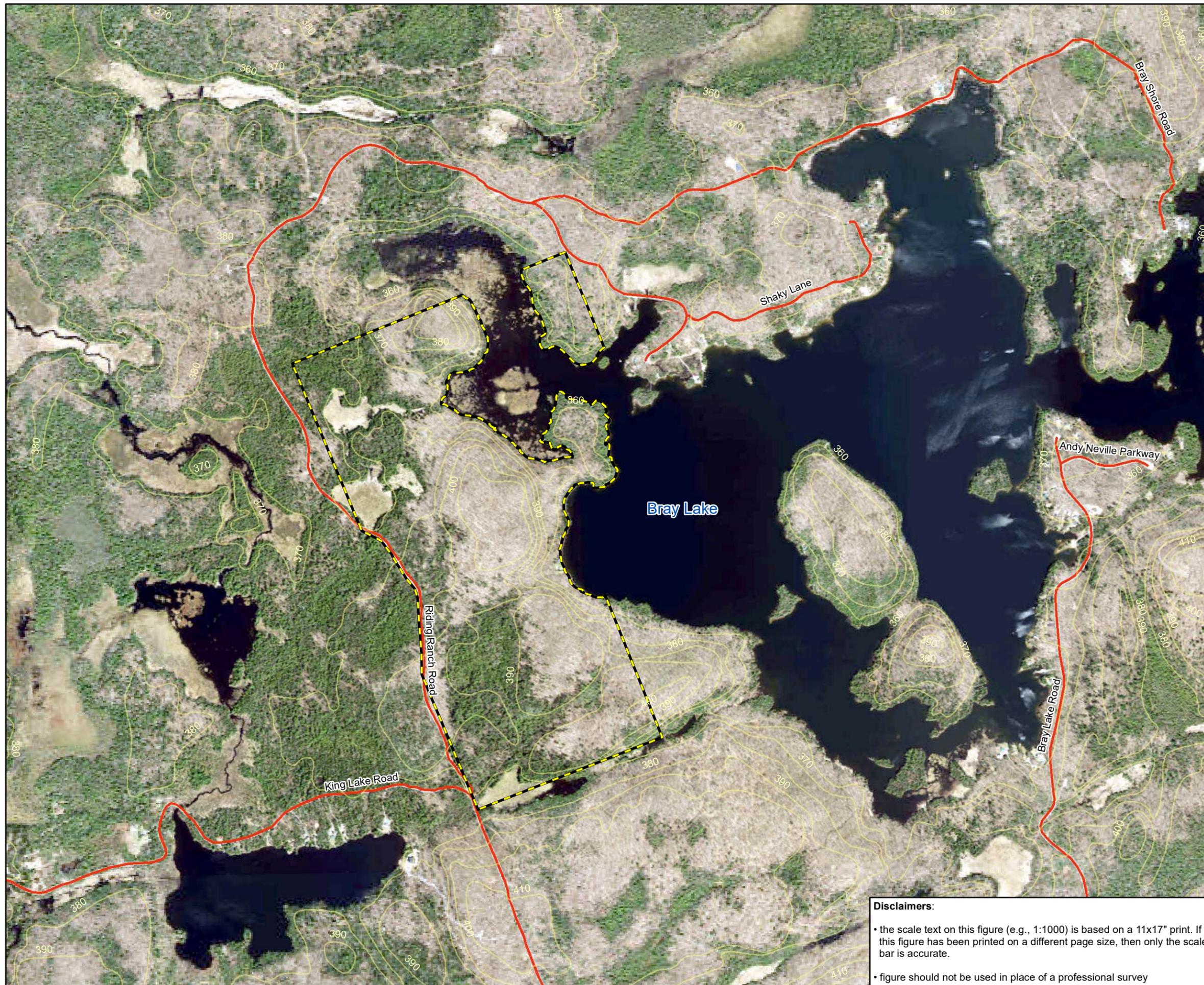
5 CONCLUSIONS

Based on desktop-based and on-site assessment of forest types and characteristics on the subject property, and contingent upon implementation of the recommendations outlined in **Section 4**, RiverStone has determined that the identified wildland fire risks associated with the proposed

severance application can be mitigated to an acceptable levels according to Provincial Guidelines. It is noted that development within the forest will always have some level of risk that cannot be fully mitigated. Based on the assessment contained herein, the proposed application is considered consistent with s. 3.1.8 of the 2020 PPS and Township of Machar Official Plan policy. We advise that the recommendations contained in this report be incorporated into any relevant development agreements or conditions of development approval for the subject property that are subsequently enforced with appropriate by-laws.

6 **REFERENCES**

MNRF. 2017. Wildland Fire Risk Assessment and Mitigation Referecne Manual in support of the Provincial Policy Statement, 2014 .



Legend

Ontario Base Mapping (OBM)

- Roads
- 5 m Contours

Planning Boundaries

- Subject Property

Orthorectified aerial photo - spring 2018

Scale	RS Project No.	Date Last Updated	By
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0 225 450 Metres

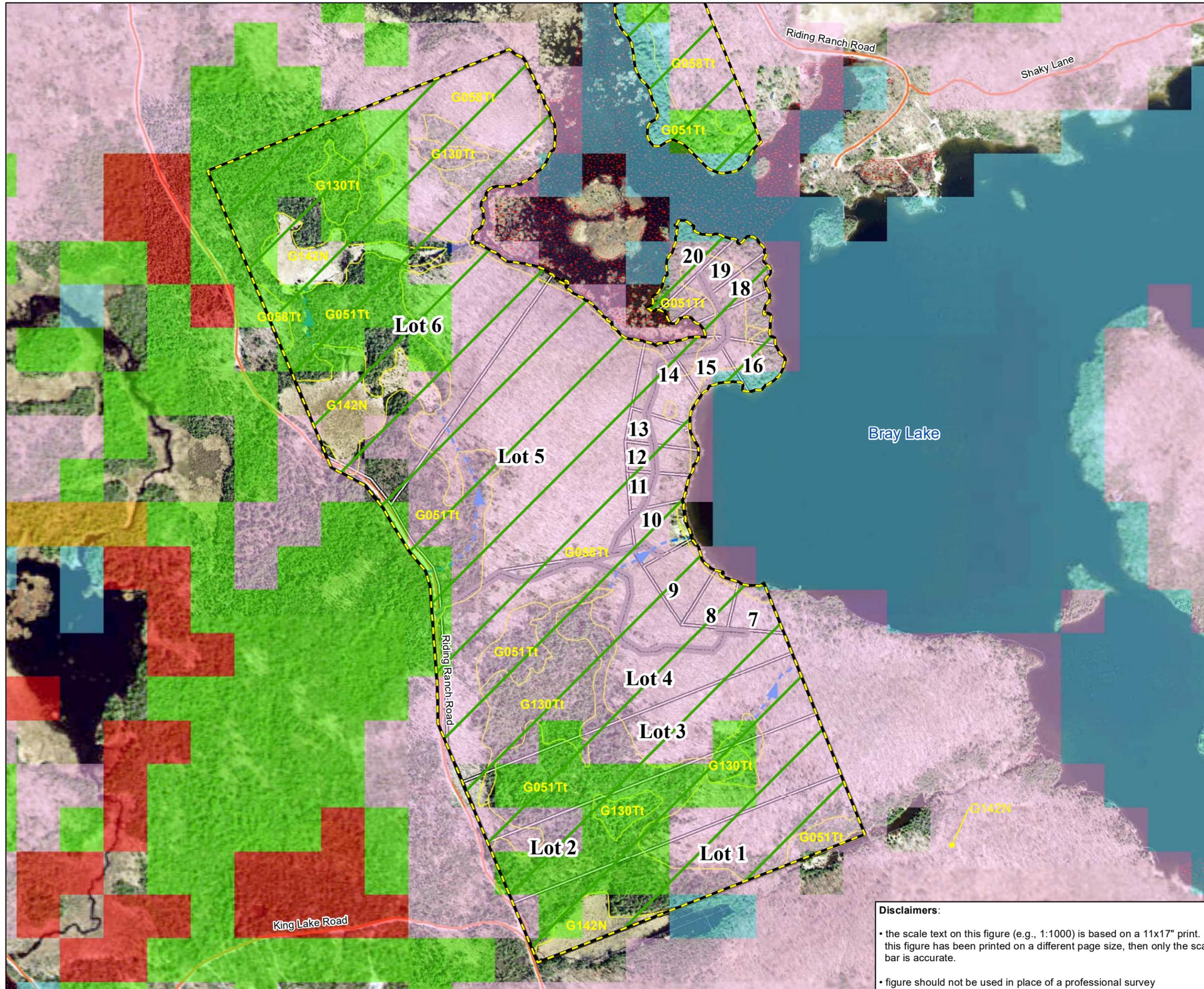
Figure 1. Location Of Subject Property.
 1791 Riding Ranch Road .Lots 19 and 20,
 Concession 11, and Lots 18, 19, and 20, Concession
 12, Township of Machar, District of Parry Sound

Prepared for: Frank Polsinelli and Nghi Nguyen

Inset: General Location Of Subject Property

Disclaimers:

- the scale text on this figure (e.g., 1:1000) is based on a 11x17" print. If this figure has been printed on a different page size, then only the scale bar is accurate.
- figure should not be used in place of a professional survey



Legend

Ontario Base Mapping (OBM)

- Roads

Planning Boundaries

- Subject Property

Features with Recognized Natural Heritage Value - Identified by RiverStone

- Intermittent Watercourse
- Permanent Watercourse
- Shoreline

Ecological Communities

- G051Tt: Dry to Fresh, Coarse: Hemlock-Cedar Conifer
- G058Tt: Dry to Fresh, Coarse: Maple Hardwood
- G130Tt: Intolerant Hardwood Swamp
- G142N: Mineral Meadow Marsh

Proposed Development and Site Alteration

- Right-of-Way
- Lot Lines

Wildland Fire Risk Rating - Identified by MNRF

- Extreme - C1, C2, C4
- High - C3, M2>50%, M4
- Pine Needs Evaluation - C5, C6
- Low - D1, M2<25%
- Water
- Moderate - M2 >25% - <50%

Wildland Fire Risk Rating - Identified by RiverStone

- Moderate/Low Risk

Orthorectified aerial photo - spring 2018

Scale	RS Project No.	Date Last Updated	By
1:8,500	2020-053	Dec 7, 2023	AS

0 125 250 Metres

Figure 2. Wildland Fire Risk Assessment.
 1791 Riding Ranch Road .Lots 19 and 20, Concession 11, and Lots 18, 19, and 20, Concession 12, Township of Machar, District of Parry Sound

Prepared for: Frank Polsinelli and Nghi Nguyen

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- figure should not be used in place of a professional survey

Appendix 1. Select Photos from Site Visit





Photo 1. Existing cabin and bunkie development on subject property (June 25, 2020).



Photo 2. Existing sauna development on subject property (June 25, 2020).



Photo 3. Sugar Maple dominated forest community on subject property (June 25, 2020).



Photo 4. Sugar Maple dominated forest community on subject property (June 25, 2020).



Photo 5. Watercourse on subject property within Sugar Maple dominated forest community (June 25, 2020).



Photo 6. Watercourse on subject property within Sugar Maple dominated forest community (June 25, 2020).



Photo 7. Watercourse leading to shoreline of Bray Lake depicting rugged terrain on subject property (June 25, 2020).



Photo 8. Meadow marsh wetland community on subject property (June 25, 2020).



Photo 9. Riparian area of meadow marsh community on subject property (June 25, 2020).



Photo 10. Rock face within maple hardwood vegetation community on subject property (June 25, 2020).



Photo 11. Fish habitat characteristics fronting existing development on subject property (July 14, 2020).



Photo 12. Type 1 fish habitat characteristics fronting the subject property (July 14, 2020).



Photo 13. Sandy substrates with abundant downed woody debris along shoreline of subject property (July 14, 2020).



Photo 14. Evidence of bass nests along shoreline of subject property (July 14, 2020).



Photo 15. Type 1 fish habitat within northern bay on subject property (July 14, 2020).



Photo 16. Intolerant hardwood swamp community on subject property (August 3, 2020).



Photo 17. Intolerant hardwood swamp community on subject property (August 3, 2020).



Photo 18. Permanent watercourse on subject property flowing from wetland communities to Bray Lake (August 3, 2020).

Appendix 2. FireSmart Home Construction Guidelines



The guidelines below were produced by FireSmart Canada and can be accessed here:
<https://firesmartcanada.ca/homeowners/home-construction/>

Roofing

The most **fire-resistant roofing** materials are metal, clay tile and asphalt shingles. Untreated wooden shakes and shingles provide no resistance to flames and sparks generated from a wildfire. Use only class A, B or C rated fire resistant roofing. **Clean debris from your roof annually.** Ensure your roof is free of combustible needles and leaves and there are no overhanging trees or branches that can provide fuel for airborne sparks and embers. Make sure your **chimney is to code** and has spark arrestor screens installed.

Siding

Materials such as stucco, metal, brick and concrete offer superior resistance to wildfire. Logs and heavy timber are less effective, and wood and vinyl siding offer very little protection.

Doors and Windows

Be sure to remove flammable forest fuels within 10 metres of glazed window and door openings. Tempered, thermal or smaller double-paned windows will provide far greater protection than single paned glass.

Eaves troughs

Eaves and vents are ready-made openings that can allow heat and embers to enter a building and ignite. Ensure eaves are closed in and screen all vents and soffits. Keep areas under decks and porches clear of debris and sheath the undersides with fire resistant materials.

Access

Make sure that fire fighters are able to approach your home in a safe manner. There are a few things you can do to improve their safety and help them find your home quickly:

- Make sure your driveway is wide enough to accommodate emergency vehicles so they have enough space to turn around
- Have your address, municipal fire number or lot number clearly visible for quickly identification by fire services
- Provide an emergency access route to and from your property
- Clear your driveway of trees to a distance of at least 3 metres on either side

Bray Lake Residential

Township of Machar

Traffic Brief

Polni Holdings

Type of Document:
Draft Report

Project Number:
JDE – 21112

Date Submitted:
July 27th, 2022



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Legal Notification

This report was prepared by **JD Northcote Engineering Inc.** for the account of **Polni Holdings**.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. **JD Northcote Engineering Inc.** accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.

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1 Introduction

1.1 Background

Polni Holdings [The Client] is proposing a residential development located on the east side of Riding Ranch Road, along the shoreline of Bray Lake in the Township of Machar [Township]. The proposed development is anticipated to include 20 single-detached residential units.

The proposed development will include a single full-movement accesses onto Riding Ranch Road [Site Access]

The Client has retained **JD Engineering Inc.** [JD Engineering] to prepare this traffic brief in support of the proposed development.

1.2 Study Area

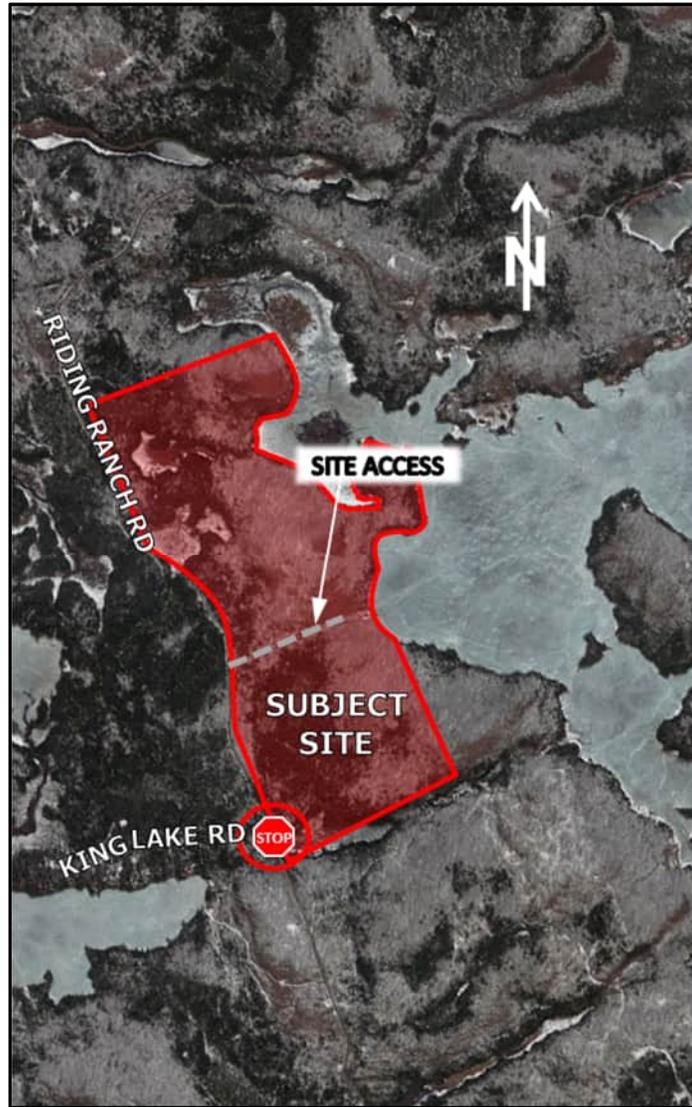
Figure 1 illustrates the location of the subject site and study area intersections, in relation to the surrounding area. The site plan provided by **Tulloch Geomatics Inc.** is included in **Appendix A**.

The subject site is bound by Riding Ranch Road to the west, Bray Lake to the east and undeveloped rural lands to the north and south.

The scope of this letter includes a functional review of the following intersection:

- Site Access / Riding Ranch Road

Figure 1 – Proposed Site Location and Study Area



1.3 Study Scope and Objectives

The purpose of this study is to identify the potential impacts to traffic flow at the site access and on the surrounding roadway network. The study analysis includes the following tasks:

- Determine existing traffic volumes and circulation patterns;
- Estimate future traffic volumes if the proposed development was not constructed, including the impact of additional proposed developments in the area;
- Estimate the amount of traffic that would be generated by the proposed development and assign to the roadway network;
- Complete a review of the impact of the proposed development traffic generation on the study area intersections;
- Complete a sight distance review for the proposed Site Access driveway;
- Comment on how the Site Access driveway will be maintained year round;
- Complete a site visit to determine if there any traffic hazards with the proposed Site Access; and
- Document findings and recommendations in a final report.

1.4 Analysis Periods

The weekday morning [AM] and afternoon [PM] peak hour has selected as the analysis periods for this study.

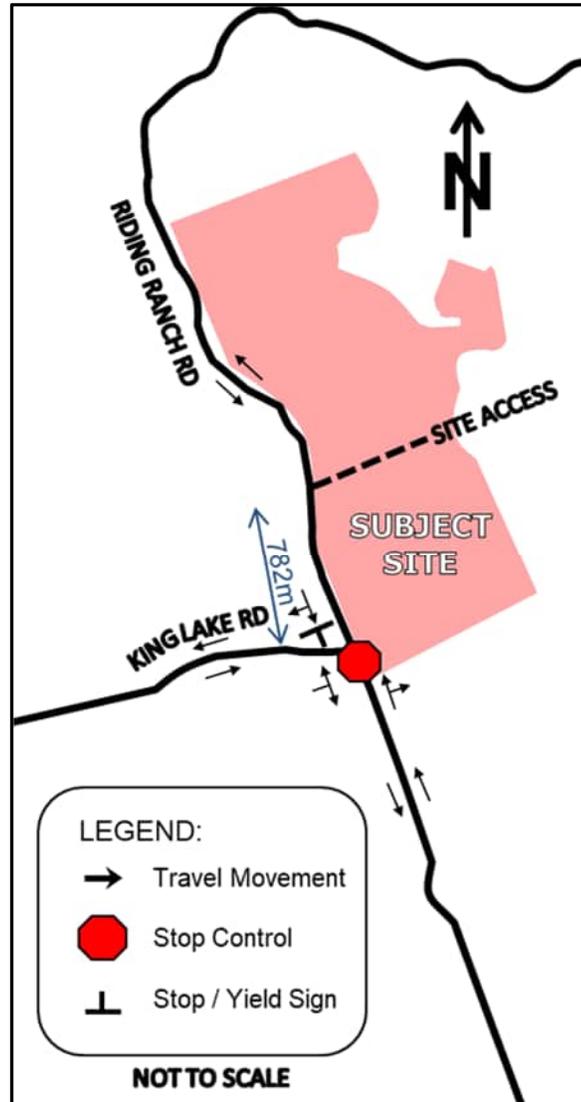
2 Information Gathering

2.1 Street and Intersection Characteristics

Riding Ranch Road is a two-lane local road (year-round maintained gravel roadway) with a rural cross-section and gravel shoulders. Riding Ranch Road has an unposted (assumed) speed limit of 50 km/h and under jurisdiction of the Township.

The existing intersection spacing and lane configuration within the study area is illustrated in **Figure 2**.

Figure 2 – Existing Intersection Lane Configuration within Study Area



2.2 Local Transportation Infrastructure Improvements

Based on a review of the Township’s 2020 Capital Budget and the Township’s 10-year Asset Management Plan Roads and Bridges (2014-2024) there are no infrastructure improvements planned that would impact traffic in the study area.

2.3 Transit Access

There is no municipal transit available near the study area.

3 Proposed Development Traffic Generation and Assignment

3.1 Traffic Generation

The traffic generation for the subject site has been based on the Institute of Transportation Engineers [ITE] Trip Generation Manual (11th Edition) [ITE Trip Generation Manual]. The following ITE land uses have been applied to estimate the traffic from the proposed:

- ITE land use #210 (Single-Family Detached Housing) – General Urban/Suburban

The estimated trip generation for the proposed development is illustrated below in **Table 1**. The AM and PM peak traffic generation for the proposed development is not expected to exactly align with the AM and PM peak hour; consequently, we have applied the peak hour of adjacent street traffic values provided in the ITE Trip Generation Manual.

Table 1 – Estimated Traffic Generation of Proposed Development

Land Use	Size	AM Peak Hour			PM Peak Hour		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Single-Family Detached Housing ITE Land Use: 210	20 units	5	13	18	14	8	22

3.2 Traffic Assignment

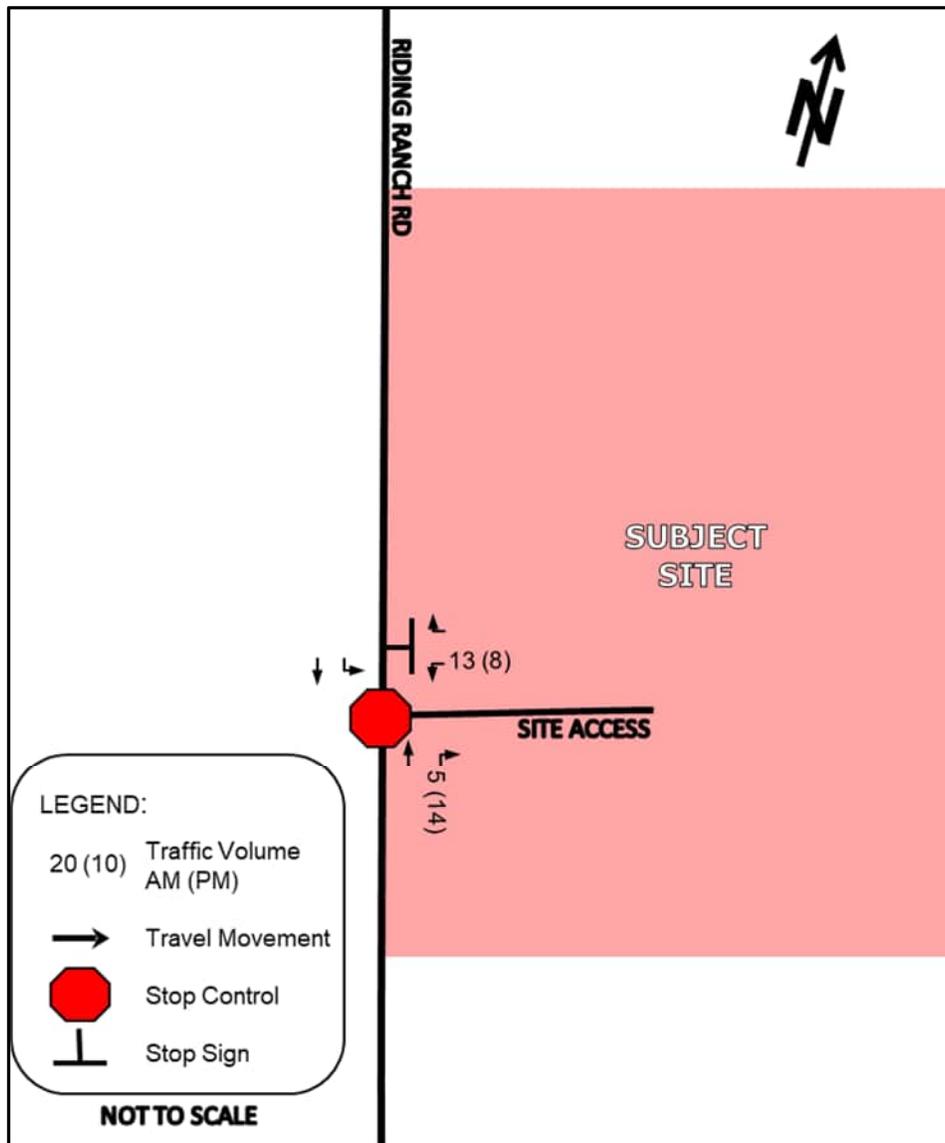
For the purposes of this study, it has been assumed that all traffic generated by the proposed development will be new traffic and would not be in the study area if the development was not constructed.

It is anticipated that 6 of the 20 residential units will have access directly on Riding Ranch Road; however, for the purposes of this report, we have assumed that all new traffic in the study area will travel to / from the south on Riding Ranch Road, via the Site Access driveway.

The internal distribution of traffic at the Site Access driveway is based on the proposed internal driveway network for the subject site (illustrated in the Site Plan in **Appendix A**).

Figure 3 illustrates the traffic assignment for the proposed development.

Figure 3 – Traffic Assignment for Proposed Development



4 Intersection Operation with Proposed Development

4.1 Traffic Impact Analysis

A 45-minute traffic count on Riding Ranch Road at the Site Access was completed at 10:00 during a site visit on Tuesday, March 29th, 2022. The traffic counts were extrapolated to estimate the following peak hour volume:

- 1 northbound vehicles
- 0 southbound vehicles

The proposed development will add approximately 15 AM and 19 PM peak hour trips on Riding Ranch Road.

Based on the excess capacity available on Riding Ranch Road, the additional traffic generated by the proposed development will not adversely affect the traffic operations on Riding Ranch Road or result in any traffic safety issues with the study area. The existing road network can accommodate the additional traffic generated by the proposed development.

4.2 Sight Distance Review

A review of the available sight distance for the proposed Site Access driveway was completed as part of this analysis (sight distance site visit figures provided in **Appendix B**).

The sight distance north (85 metres) and south (137 metres) of the Site Access meets the minimum stopping sight distance requirements as identified in the Transportation Association of Canada *Design Guide for Canadian Roads* (2017) [TAC Guidelines] for a design speed of 60 km/h (85 metres).

Consequently, there are no issues with the sight distance available for the Site Access driveway.

4.3 Site Access

The Site Access driveways will operate efficiently as full-movement access driveways with stop control for egress movements. A single ingress and egress lane at the Site Access driveway will provide the necessary capacity to service the proposed development. It is recommended the Site Access driveway be maintained year-round to provide access to the residential lots.

Riding Ranch Road is a year-round maintained gravel roadway. Based on a review of the road conditions on Riding Ranch Road at the site access, vehicles travel at reduced speeds on the road due to the gravel road conditions and the vertical curvature. As noted in Section 4.2, there are no issues regarding the available sight distance at the proposed locations of the driveways. No improvements on Riding Ranch Road are required as a result of the proposed development.

The proposed spacing between the Site Access and King Lake Road (767 metres – measured centre of road to centre of driveway) is in excess of the minimum intersections spacing for a local road as identified in the TAC Design Guide for Canadian Roads (2017) [TAC Guidelines] – 40 metres.

5 Summary

Polni Holdings retained **JD Engineering** to prepare this traffic brief in support of the proposed residential development located on the east side of Riding Ranch Road, along the shoreline of Bray Lake in the Township of Machar. The proposed Site Plan is shown in **Appendix A**. This chapter summarizes the conclusions and recommendations from the study.

The proposed redevelopment is anticipated to include the development of 20 single-detached residential units.

1. The proposed addition is expected to generate 15 AM and 19 PM peak hour trips in the study area.
2. An estimate of the amount of traffic that would be generated by the Subject Site was prepared and assigned to the study area streets and intersection.
3. No additional infrastructure improvements are recommended within the study area as a result of the proposed development
4. The Site Access driveway will operate efficiently as full-movement access driveway with stop control for egress movements. A single ingress and egress lane at the Site Access driveway will provide the necessary capacity to service the proposed development.
5. The sight distance available for the Site Access driveway meet the minimum stopping sight distance requirements.
6. In summary, the traffic generation from the subject site will not cause any operational or traffic safety issues.

Appendix A – Site Plan

PIN 52053-0306
ORIGINAL ROAD ALLOWANCE BETWEEN CONCESSIONS 12 AND 13

**BRAY LAKE SUBDIVISION
DRAFT PLAN OF SUBDIVISION**

PART OF LOTS 18, 19 AND 20, CONCESSION 12
AND PART OF LOTS 19 AND 20, CONCESSION 11
TOWNSHIP OF MACHAR
DISTRICT MUNICIPALITY OF PARRY SOUND
SCALE 1:2500

25m 0 25 125m
KPK SURVEYING INC., O.L.S.
2022

OTHER INFORMATION

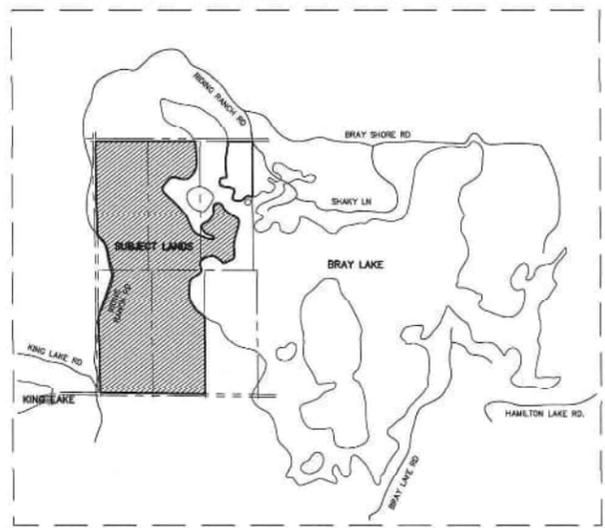
- 1) ADDITIONAL INFORMATION REQUIRED UNDER SECTION 6(17) OF THE PLANNING ACT:
 - A. LAND BOUNDARIES ARE AS SHOWN ON DRAFT PLAN
 - B. ROADWAYS ARE AS SHOWN ON DRAFT PLAN AND KEY PLAN
 - C. KEY PLAN IS AS SHOWN ON DRAFT PLAN
 - D. PROPOSED LOTS ARE FOR RURAL, NATURAL HERITAGE PROTECTION/ENVIRONMENTAL PROTECTION, AND SHORELINE USE, AS SHOWN ON PLAN
 - E. ADJACENT USES: CROWN, RURAL, NATURAL HERITAGE PROTECTION/ENVIRONMENTAL PROTECTION, AND SHORELINE, AS SHOWN ON PLAN
 - F. LOT DIMENSIONS ARE APPROXIMATE ONLY
 - G. TOPOGRAPHIC FEATURES ARE AS SHOWN, DERIVED FROM ORTHO PHOTOGRAPHIC IMAGERY FROM FIRST BASE SOLUTIONS DATED JULY 28, 2022
 - H. WATER SUPPLY IS TO BE PROVIDED AND OPERATED BY INDIVIDUAL LAND OWNERS
 - I. GEOTECHNICAL INVESTIGATION WILL BE REQUIRED TO CONFIRM SOIL AND GROUND COMPOSITION
 - J. 1ST CONTOURS ARE AS SHOWN ON DRAFT PLAN
 - K. UTILITY SERVICES ARE TO BE PROVIDED AND OPERATED BY INDIVIDUAL LAND OWNERS
 - L. PROPOSED LOTS CONTAIN AREAS IDENTIFIED AS A WATERCOURSE, MOOSE AQUATIC FEEDING AREA, OTHER WETLANDS AND FLOODPLAIN AS SUCH WILL HAVE RESTRICTIONS AFFECTING THE SUBDIVISION LANDS



LEGEND:

- EP DENOTES ENVIRONMENTAL PROTECTION (NATURAL HERITAGE PROTECTION) ZONING AREA
- FP DENOTES FLOOD PLAN ZONING AREA
- SR DENOTES SHORELINE ZONING AREA
- RU DENOTES RURAL ZONING AREA
- FN DENOTES FENCE
- DENOTES TREE
- DENOTES 15m VEGETATED NATURAL SHORELINE BUFFER
- DENOTES 23m BUILDING SETBACK FROM SHORELINE
- DENOTES 30m WETLAND / WATER COURSE SETBACK
- DENOTES TYPE 1 FISH HABITAT
- DENOTES TYPE 2 FISH HABITAT

KEY PLAN



OWNER'S CERTIFICATE

THIS IS TO CERTIFY THAT:
POLAR HOLDINGS INC. BEING THE REGISTERED OWNERS OF THE SUBJECT LANDS,
HEREBY SUBMITS A DRAFT PLAN OF SUBDIVISION FOR APPROVAL.

 TOM MARSHALL DATE 07/22/22
 AUTHORIZED AGENT FOR POLAR HOLDINGS INC.
 I HAVE THE AUTHORITY TO SIGN THE CORPORATION

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:
THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO
THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN ON THIS PLAN.

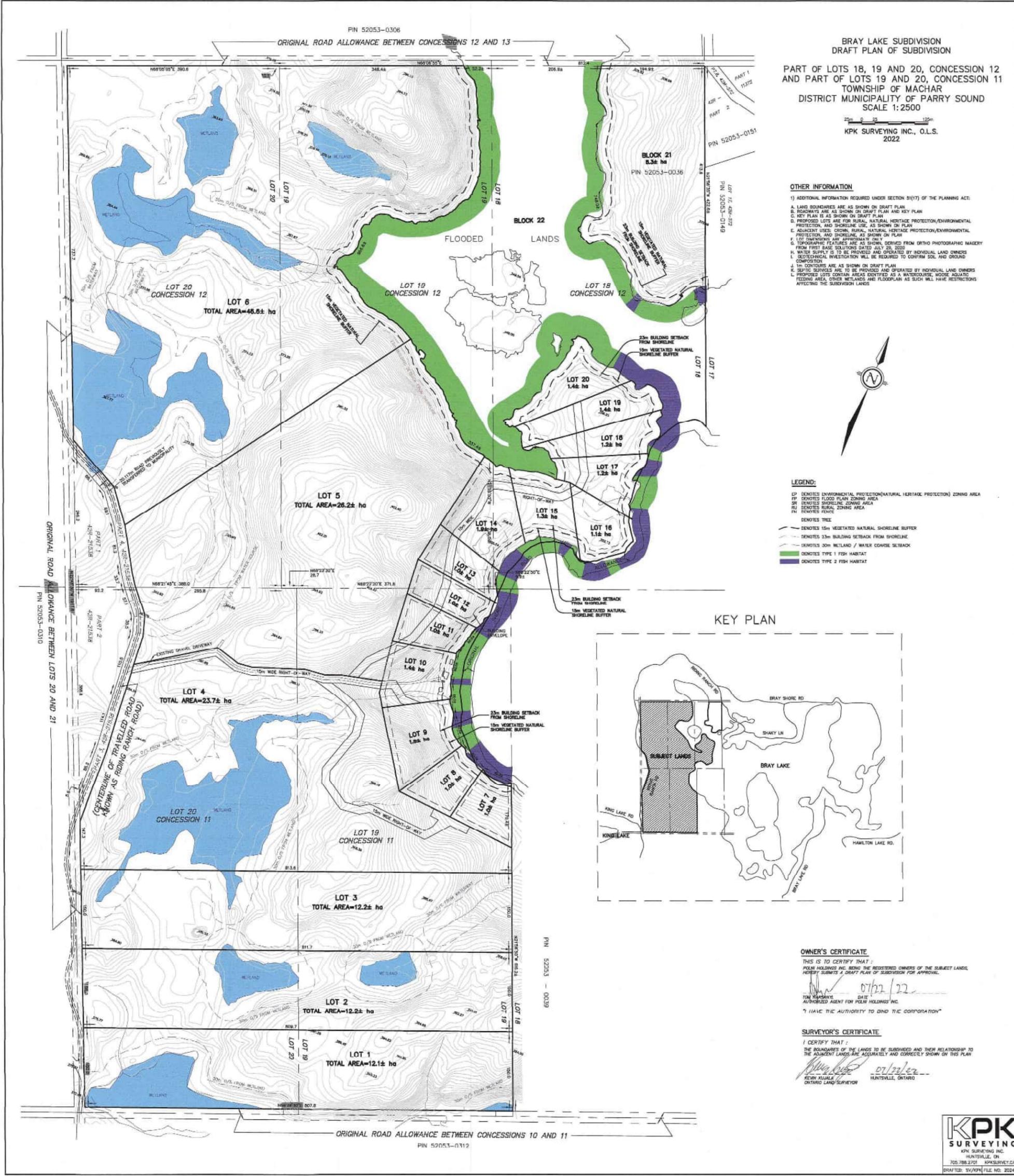
 [Signature] DATE 07/22/22
 TERRY KAMALA HUNTSVILLE, ONTARIO
 ONTARIO LAND SURVEYOR HUNTSVILLE, ONTARIO



PIN 52053-0312
ORIGINAL ROAD ALLOWANCE BETWEEN CONCESSIONS 10 AND 11

ORIGINAL ROAD ALLOWANCE BETWEEN LOTS 20 AND 21
PIN 52053-0310

PIN 52053-0309



Appendix B – Sight Distance Site Visit Figures

Figure A – Sight Distance Available – Site Access (North)



Figure B – Sight Distance Available – Site Access (South)

