



27 January 2022
Project Number: 210619

Ruth Aulthouse, MCIP, RPP, President
RFA Planning Consultants Inc
211 Dundas Street East, Suite 202
Belleville ON K8N 1E2

**RE: Response to Hydrogeology and Terrain Analysis Technical Review Comments
Proposed Cressy Bayside Estates, Part of Lots 64 and 65, Concession Bayside
Township of North Marysburgh, County of Prince Edward**

Dear Ms. Aulthouse:

As requested, BluMetric Environmental Inc. (BluMetric™) has prepared the following response to peer review comments for the BluMetric Hydrogeological Assessment Report dated 4 February, 2020 (BluMetric, February 2020), for the proposed Cressy Bayside Estates development. Peer review comments were provided in the following documents:

- Cressy Bayside Estates Official Plan and Zoning By-Law Amendment Applications, and Subdivision and Condominium Approval Applications, Part of Lots 64 and 65, Concession Bayside, Township of North Marysburgh, Municipality of the County of Prince Edward and is municipally known as 1041 County Road 7 (Cressy Bayside Estates Inc.). Development Services, The Corporation of the County of Prince Edward. October 15, 2021. (PEC, October 2021)
- Peer Review of a Hydrogeological Assessment for a Proposed Development on Part of Lots 64 and 65, 1041 County Road 7, Concession Bayside, Prince Edward County Ontario. Greer Galloway Consulting Engineers, July 6, 2021. (GG. July 2021)
- Application for Subdivision, Official Plan and Zoning By-law Amendment, Cressy Bayside Estates, 1041 County Road 7, North Marysburgh. Quinte Conservation, August 11, 2021.

Tel. 613-839-3053

Fax. 613-829-5376

BluMetric Environmental Inc.

1682 Woodward Drive, Ottawa, Ontario, Canada K2C 3R8

www.blumetric.ca



PEC, October 2021 Comments

Please provide an outline on how the quality of water is going to be ensured as the Wells act as "Shore Wells"

It is BluMetric's recommendation that those Lots serviced for water by a shore well be required to have minimum water treatment consisting of pre-filtration (25 and/or 10 micron and 5 micron) followed by absolute filtration to less than 1 micron prior to ultraviolet (UV) sterilization with a NSF Class-A device that provides visual and audible indication that the system is not performing and/or terminates the discharge of treated water. Since filtration and disinfection both contribute to the removal or inactivation of waterborne pathogens, both treatment processes are required. It should be anticipated by the owner that water treatment for hardness and/or manganese/iron may also be required prior to UV sterilization. It is recommended that the owner maintain a service contract with a qualified contractor to ensure the on-going maintenance and performance of the water treatment system.

The recommended setbacks between septic beds, shoreline and wells should be incorporated on the grading and drainage plan.

Further to Section 3.2.3 of the BluMetric, February 2020 report BluMetric recommends that the minimum separation distance between a shore well and the nearest septic system be 50 m. This is reflected in the attached updated Figure 5 – Proposed Septic Locations.

Please outline how proximity of the Cemetery to the Wells could impact the wells.

BluMetric understands that the last internment for the cemetery occurred in the early 1800s (~200 years). It is our professional opinion that the cemetery has exceeded its contaminating lifespan and there are no contaminants of concern posed by the cemetery.

Please outline how flooding could impact the Septic Systems and how this is proposed to be avoided and not cause impact.

BluMetric understands that the reported seasonal flooding is a result of drainage issues that will be addressed through the storm water management plan. If high water table conditions persist after drainage improvements, per Part 8 of the Ontario Building Code (Ontario Regulation 322/12, as amended), fully raised septic system design will be necessary to ensure a minimum 0.9 m separation distance between the bottom of the absorption trench and underlying seasonal high water table.

GG. July 2021 Comments/Points

1. Request for Revised Predictive Nitrate Impact Assessment

An updated predictive nitrate impact assessment using conventional on-site septic systems is attached to address GG. July 2021 comment #1. The updated assessment was completed using conventional septic systems with a nitrate as nitrogen input of 40 mg/L per septic system for 8 lots ranging from 0.89 to 1.7 hectares (ha). A permeable area for the development of 85% was used based on values indicated in the site-specific Stormwater Management Brief prepared by Ainley Group. The resulting nitrate value of 5.40 mg/L includes a background nitrate value of 2.1 mg/L, the maximum nitrate as nitrogen concentration measured at any test well (TW2). It is BluMetric's opinion that the results of the predictive nitrate impact assessment show that the potential nitrate loading from the proposed development is well below the limit of 10 mg/L as prescribed by Ministry of Environment, Conservation and Parks (MECP) Guideline D-5-4. The predicted nitrate loading value along with the septic system setback distances to Adolphus Reach, as shown on Figure 5, indicates the level of concern for septic system impacts to surface water is low.

2. and 3. Should wells be constructed and tested for each Lot and reviewed by a Qualified Person after Draft Plan Approval and before Final Approval is granted? Should drilled wells be the preferred option despite water quality/quantity limitations?

As indicated in the BluMetric, February 2020 report, wells have already been constructed on each of the 8 Lots, with drilled wells located on Lots 2 and 4 and dug/shore wells located on the remaining 6 Lots. Four of the well supplies (Lot 1, Lot 2, Lot 4, and Lot 7) have already been successfully tested and assessed in the BluMetric, February 2020 report. BluMetric agrees that the remaining 4 well supplies should be tested for water quality and water quantity before Final Approval. The well on Lot 1 should also be pumped further to verify that measured field turbidity can be reduced below 5.0 NTU.

While drilled well supplies would be preferable for all Lots, only 2 of 5 drilled wells constructed in the development produced sufficient yield to support a residence. Consequently, the shore well alternative was explored and is considered a viable option for the development given the proposed minimum 50 m separation distance between well and septic system and the recommended water treatment system requirements for shore wells.

4. Recommendations for Tertiary Wastewater Treatment Systems and Well-Septic Separation Distances.

While tertiary wastewater treatment provides a benefit to wastewater quality in nearly all circumstances it is understood that the Hydrogeology Assessment is to be conducted to show that the development can support the installation of conventional wastewater systems. As indicated previously herein a minimum 50 m separation distance between a dug/shore well and the nearest septic system is recommended and shown on the attached revised Figure 5.

5. Qualifying statement regarding the potential need for fully raised leaching beds.

As indicated previously herein and per the Ontario Building Code, fully raised septic system design may be necessary to ensure that the bottom of the absorption trench is not less than 0.90 m above the high groundwater table, rock or soil with a percolation time of more than 50 minutes.

6. We ask the Consultant to consider and comment on the susceptibility of the tested wells to seasonal yield declines and whether confirmatory yield testing should be performed during the summer months.

BluMetric cannot comment on the susceptibility of the tested wells to seasonal yield declines. Confirmatory yield testing could potentially be performed during the summer months when addressing points 2 and 3 above.

7. Water Treatment Recommendations

Water Treatment Recommendations are provided previously herein.

8. Removal of Appendix A – Permission to Monitor Letters

BluMetric supports the redaction or removal of the letters provided in Appendix A of the report if deemed necessary.

Quinte Conservation, August 11, 2021 Comments

The septic system impact assessment contains errors relative to MECP Guideline D-5-4. However, upon review of the EIS completed by Ainley we concur with their assessment that compliance with MECP guideline D-5-4 is achieved due to the proposed large lot sizes that average greater than 1 hectare. However we note that the Ainley Assessment also mentions that the septic systems are a source of phosphorus to the Bay of Quinte. We would recommend that assurance be provided that loading of phosphorus to the adjacent surface water feature will not be an issue.

An updated septic system impact assessment was provided previous herein. The calculated nitrate loading before the addition of a background nitrate concentration was 33% of the nitrate limit. This provides an indication that with the large lot sizes and development density that significant dilution of phosphorus will also occur before reaching the Bay of Quinte. Also, the large septic system setback distances from the well water supplies as provided on the updated Figure 5, will also be protective of potential phosphorus loading to Bay Quinte. Consequently, its BluMetric's professional opinion that loading of phosphorus to the adjacent surface water feature will not be an issue for the proposed development.

Should you have any questions regarding the information provided herein, please do not hesitate to contact the undersigned at (613) 839-3053 xt 233.

Respectfully submitted,
BluMetric Environmental Inc.



Robert Hillier, B.Sc. P.Geo.
Senior Hydrogeologist

Encl. Figure 5
Table 6 Nitrate Attenuation from Septic Systems - Cressy Bay Estates

Ref: 210619 Cressy Bayside Estates Response to Hydrogeology Technical Comments 27Jan2022.docx



LEGEND

- Test Well (Drilled)
- Test Well (Dug)
- Test Pit
- Property Boundary
- Proposed Lot
- Proposed Road
- Proposed Residence Location
- Proposed Septic Location

NOTES:
 Property Boundary, parcels, and butternut tree locations sourced from RFA Planning Consultants Preliminary Concept Plan, December

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

REFERENCES
 PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

1:1,700

CLIENT
 Cressy Bayside Estates Inc.
 6 Talbot St. S-1,
 Picton, ON K0K 2T0

PROJECT
 Hydrogeological Assessment for
 Proposed Development
 Part Lots 64&65 Concession Bayside,
 Township of North Marysburgh, ON

TITLE
 Proposed Septic Locations

*The Tower - The Woolen Mill,
 4 Cataragui St.,
 Kingston, Ontario K7K 1Z7
 TEL: (613) 531-2725
 FAX: (613) 531-1852
 Email: info@blumetric.ca
 Web: http://www.blumetric.ca*

PROJECT # 210619-00		DATE November 15, 2021	
DRAWN GM	CHECKED AB	FIG NO. 05	REV 0

Table 6 Nitrate Attenuation from Septic Systems - Cressy Bay Estates
Updated November 18-2021

Parameters		Units	Information Source/Calculation
Annual Precipitation (P) =	0.9483	m/year	Canadian Climate Normals 1981-2010 Station Data, Mountain View.
Infiltration/groundwater recharge (R) =	0.25	m/year	As specified by Greer Galloway Consulting Engineers, July 6, 2021
Concentration of Nitrate =	40	mg/L	Values as specified in Section 5.6.2 of Procedure D-5-4 Technical Guideline For Individual On-Site Sewage Sytems: Water Quality Impact Risk Assessment, Last Revision August 1996
Concentration of Nitrate =	40000	mg/m3	
Daily Flow rate of Sewage =	1000	L /day	
Number of units =	8		Total Lot area (Lots 1 to 8) plus adjacent road access area Stormwater Management Brief prepared by Ainley Group
Yearly Sewage Volume (S _y) =	2920	m ³ /year	
Total Property Surface Area =	153000	m ²	
% Pervious Area =	85%		
Infiltration Surface Area (A _d) =	130050	m ²	
<u>Infiltration Flux, R</u>	32512.50	m ³ /year	R=P-Q-E
Yearly Volume of Sewage (S_y) =	2920	m ³ /year	My/(S _y + R)
Yearly Volume of Infiltration (R) =	32513	m ³ /year	
Yearly Mass Loading of Nitrate (M_y) =	116800000	mg/year	
Nitrate Conc.at Downgradient Prop.Boundary =	3296.41	mg/m ³	
" =	3.30	mg/L	
Background Nitrate Concentration =	2.10	mg/L	Max. concentration measured at test wells (TW2)
Nitrate Total =	5.40	mg/L	