

# Technical Review Memorandum



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To Sarah MacLeod-Neilson, Department of Science and Planning  
From Jennifer Gorrell M.Sc. P.Eng. P.Geo. on behalf of Department of Engineering and Regulation  
Date December 2, 2022  
File **21\_TAY\_ZBA\_0058, Maberly Pines Subdivision** Municipality of Tay Valley  
Type Subdivision  
Subject **Private Servicing**  
Submission Hydrogeological Review, Maberly Pines Subdivision, Contract #2021-PD-002, Draft Report, BluMetric, 2022-10-27

Previous subject memorandum dates • RVCA Review of Draft Hydrogeological Report 21\_TAY\_ZBA\_0058-Maberly Pines, February 1, 2022

## Status

I have reviewed the available information, within the following context, and recommend acceptance of BluMetric's draft report dated 2022-10-27 in support of the designated development application. My acceptance is discussed within the body of this memorandum.

## Review Scope

RVCA is retained by Lanark County to complete a technical peer review of hydrogeological studies, among other duties. A review was prepared on a report from BluMetric with a number of comments and questions. This memorandum reviews and provides comment on the revised report dated 2022-10-27.

## Development Proposal

Maberly Pines was originally planned for seasonal residences. A hydrogeological study was prepared by Water and Earth Science Associates in 1979 that provided development recommendations for private well and septic system development. The 1979 study noted the groundwater aquifer has limited yield and is hydrogeologically sensitive.

The current procedures for residential development evaluation, the Ministry of Environment's (MECP's) Procedures D-5-4 and D-5-5 were not implemented until after the original development was approved. To be clear, the 1979 study was completed to the standard of the day, but the approval requirements have evolved. A lot development plan was not part of the original study, and there were no test wells to assess groundwater quantity and quality, as would be today. There was also no water quality information from existing development in the area.

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The property is now zoned for permanent residences in zoning that includes provisions for a bed and breakfast. This could put a significantly different demand on the aquifer as well as produce higher sewage effluent than was originally envisioned.

The subdivision site is on hydrogeologically-sensitive terrain with broad areas of thin soil, steeply sloping topography and open surface water (ponds, Little Silver and Rainbow Lakes). There are a few established permanent and seasonal residences along the lake shores and Bolingbroke Rd.

## **Summary of Study**

The study addressed the deliverables requested by Municipality of Tay Valley. TVT was concerned that the guidelines for development had changed since the subdivision approval. TVT was looking for the guidance of a lot servicing plan that would assist future development planning and approvals in the naturally sensitive area.

### **Study Scope**

The hydrogeological study;

- reviewed the original hydrogeology report completed by WESA in 1979;
- completed a high-level review of the regional and site hydrogeology to revisit whether permanent residential development could be supported on each lot;
- reviewed available groundwater information and sampled xx existing residences to assess the ambient groundwater quality being used by residents;
- conducted a pumping test on a newly-constructed well to assess the capability of the target aquifer;
- Assess the suitability of each approved lot for development on conventional private well and septic systems (per Procedure D-5-4);
- If a lot was unable to meet the requirements and intent of Procedure D-5-4, to provide advice on the actions needed to permit the development.

### **Study Results and Conclusions**

1. Capability of the aquifer to provide satisfactory well yield and naturally safe water quality.

Four water samples were collected and analysed, interviews were conducted with the well users and one new well was tested for water quality and yield capability. The report concluded that the groundwater is providing a safe water supply that meets most of the Provincial water quality standards and objectives. Hardness was the only parameter that exceeded the water quality

objectives. The manganese concentration was detected at the operational guideline limit at 202 Red Pine Rd. A water softener is recommended for treatment of both these issues.

The report found that new wells have the potential to provide an acceptable well yield to service a three-bedroom residence (i.e. 4 people). Some wells may not intersect the fracture network that will provide a sufficient yield for normal residential use. If this is the case, the report recommends the added use of surface storage.

2. Capability of the lots to support a sewage disposal system that meets regulatory requirements and does not interfere with neighbouring property development (Lot Development Plan).

The report provided a preliminary assessment of the lot capability that considers the terrain and natural features of the property. The site is hydrogeologically sensitive due to the discontinuous thin overburden. Limitations to lot development included; thin soil to exposed bedrock, steeply sloping bedrock and the proximity to surface water.

Eighteen lots (two partially developed) were found to be capable of supporting conventional raised septic beds. Tertiary treatment systems are indicated for 6 lots. Alternative sewage treatment systems, such as composting or incinerating toilets are indicated for 29 of the lots. A lot development plan illustrating the results was provided.

## Report Recommendations

RVCA concurs with the recommendations provided in BluMetric's report. They are summarized below but the full content in the report should be referenced.

1. A database for the development should be initiated and maintained by Tay Valley Township that includes well records, pumping test data and well water quality analysis. The data should be reviewed by a licenced hydrogeologist on a biannual basis to ensure the ongoing sustainability of development on private wells within the subdivision.
2. Future development within the Maberly Pines Subdivision should not include any permanent occupancy exceeding three-bedroom residential houses on each lot, with a maximum **permanent** occupancy of four persons.
3. The Township should ensure that future development precludes high-volume water use in the subdivision, such as extra apartments, coach houses, guest houses (e.g. bed and breakfast) or high water demand commercial operations.

### **Water Supply**

4. Wells must be installed by a licensed well contractor in accordance with Ontario Regulation 903.
5. Water supply wells must be constructed at least 30 m from and up-gradient of the septic system locations (*on site and on adjacent lots<sup>1</sup>*). All new water supply wells on the subdivision should be located more than 30 m from the high water line of surface water courses and water bodies.
6. Recommended well construction:
  - A 10-inch (0.25 m) diameter hole should be drilled through the overburden and at least 12 m into bedrock.
  - New 6-inch (0.15 m) diameter steel casing should be installed in the drilled hole. Steel casing must extend 12 m into bedrock.
  - The annular space between the well casing and the drilled hole should be sealed with high early strength cement grout, prepared with 4% bentonite.
  - Ontario Reg. 903 well placement requirements and grouting procedures should be followed to ensure that surface derived contaminants cannot enter the well.
  - Each well should be completed with a submersible pump, pitless adaptor and vented vermin proof well cap.
  - The grading around the well casing should be slightly elevated to direct surface runoff away from the well.
  - The casing should project approximately 400 mm above the mounded soil within 3 m in all directions from the casing.
7. Newly constructed wells should be pumped for a minimum of six hours after construction to ensure adequate well development and to reduce groundwater turbidity to acceptable levels before connection to the residences plumbing system.

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<sup>1</sup> RVCA clarification

8. New wells should be chlorinated after completion of well development produce a free chlorine residual of at least 50 mg/L (ppm). The chlorine should be mixed with the standing water in the casing using a procedure that will result in the thorough vertical mixing of the chlorine over the entire depth of the well.
9. the installed water well must be maintained by the well owner as per the requirements under Ontario Reg. 903 (and subsequent amendments).
10. If the well yield is less than 15 L/min, additional water storage may be required to meet the peak demand flow. The storage system should be designed by an Ontario licensed professional engineer.
11. A water softener is recommended to address natural water quality issues such as elevated hardness and manganese. Since conventional water softeners will introduce sodium into the water supply, and it may be appropriate to bypass the water softener with a separate tap for drinking water.

### ***Wastewater Treatment and Disposal***

RVCA concurs with the recommendations for lot-specific sewage disposal and treatment discussed in the report summarized in Table 8 and illustrated on Figure 5.

RVCA is aware that at the time the lots are developed, the Ontario Building Code can be given precedence over these planning recommendations. RVCA strongly urges the municipality to implement the report recommendations for the overall protection of the subdivision residents and to comply with the recommendations of the Source Water Protection Committee for long term groundwater management and protection.

The BluMetric report recommends the following:

12. The relative position of the home, sewage system and well should be maintained. In all cases, wells should be upgradient relative to septic beds, and the indicated minimum separation distances must be taken into account.
13. A minimum setback distance of 30 m must be maintained between the water body high water line and any septic bed. The exceptions are Lot 44 and Lot 45 where this will not be possible. On these lots, the OBC minimum distance of 15 m must be maintained. It is recommended that dwellings and wells on these lots be positioned as far as reasonably possible away from the pond.
14. Best management practices are recommended such as regular pumping of the septic system, cursory inspection of break-out, consideration as to what materials are being discharged to the septic.



15. Homeowners should take all reasonable measures to conserve water and promote infiltration of water into the subsurface within each of their lots.
16. On lots smaller than 0.5 ha or lots with steep slopes, tertiary treatment systems are suitable. The systems must be approved for use in Ontario and comply with the design requirements of the Ontario Building Code Section 8.
17. 29 lots were found to be unable to support conventional (Class IV) sewage systems. Selected alternative treatment systems within the OBC Class I systems such as incinerating toilets, composting toilets, chemical toilets or other Ontario-approved self contained portable toilets. Class V (holding tank) systems are provided as another alternative if the lot conditions permit the installation, although pit privies should not be permitted.

Respectfully,

A handwritten signature in blue ink that reads 'Jennifer B. Gorrell'.

**Jennifer B. Gorrell M.Sc. P.Eng. P.Geo.**

Senior Geoscientist

***Disclaimer***

*The Rideau Valley Conservation Authority (RVCA) has not conducted an independent site investigation to confirm the validity of the data, analyses, interpretations and recommendations presented in BluMetric, 2022-10-27, Hydrogeological Review, Maberly Pines Subdivision, Contract #2021-PD-002, Draft Report report. RVCA has accepted the findings as conveyed and the professional opinions of the qualified professional who has conducted and signed the subject report, within the context of the above memorandum.*