

June 9, 2011

Augusta Township
3560 County Road 26
R.R. #2 Prescott, ON
K0E 1T0

Attention: Kevin Hart

Re: Comment on Site Suitability for Construction and Development

Dear Mr. Hart:

WESA Inc. (WESA) was retained by Augusta Township to provide consulting services in the areas of hydrogeology and onsite wastewater treatment for a proposed senior's residential development at 18 Sarah Street, in Maitland, Ontario. The following summarizes the work that WESA has undertaken, including recommendations for future development and sustainability for the site.

Terrain Analysis

WESA completed a Terrain Assessment in early 2011 to provide information on the native soil characteristics and determine the feasibility of onsite wastewater treatment with subsurface effluent disposal. The Terrain Assessment included a background information review on the Quaternary geology of the area and review existing water well records for the area and a field investigation to assess the overburden type and thickness.

WESA excavated ten (10) test pits on the subject property. One test-pit was excavated on the south-east (front) portion of the property, while the other nine (9) test-pits were distributed evenly across the site: five (5) of these are located towards the north-west and four (4) are located on the north-east side. All test-pits were excavated to bedrock, which was found between 1.22 and 2.64 m below ground surface. Representative samples from two (2) locations were submitted for grain size analysis and laboratory determined percolation times.

The percolation times was reported to be in the order of 40-50 and 50-60 min/cm. Table 1 summarizes the reported results from the soil grain size analyses.

Table 1: Summary of Results from Soil Grain Size Analyses

Test Pit	Sampled Soil Depth (mm)	Soil Description	Percolation Time (min/cm)
TP2	610-1220	Clayey Sand	40-50
TP7-1	200-610	Silty Fine Sand	50-60

Leaching Bed System

The Ontario Building Code (OBC) does not permit installation of a standard in-ground leaching bed when the percolation time is less than 1 min/cm or more than 50 min/cm. In such instances, alternative options for onsite sewage effluent disposal include: a raised leaching bed, shallow buried trenches, or a raised filter bed. An additional sewage treatment unit capable of producing tertiary quality effluent is required for shallow buried trenches. The advantage of additional sewage treatment is the smaller footprint of the effluent disposal leaching bed and the reduced organic, bacterial and nutrient (nitrogen and phosphorus) loading to the sub-surface environment; reducing the potential impact on the receiving groundwater and surface water. Section 8 of the OBC defines the design and construction specifications for the various sewage treatment and effluent disposal options.

The soil percolation time (also referred to as the T-time) is used to calculate the length of distribution pipe of an absorption trench or the area of a filter bed. For example, an onsite sewage system for a 4-unit condominium with 2 occupants per unit would generate a sanitary design flow (prescribed by OBC) of 2200 L/d, to be constructed on a property with a soil T-time of greater than 50 min/cm (and less than 125 min/cm), may include a septic tank followed by a tertiary wastewater treatment unit discharging to a series of three (3) shallow buried trenches. The approximate footprint for the shallow buried trench leaching bed is 110 m². Comparatively, a conventional septic system would require a leaching bed footprint greater than 587 m².

Once a development design is finalized, it would be beneficial to confirm the soil characteristics for design of the leaching bed system.

Hydrogeological Assessment

On May 26, 2011, WESA conducted a six-hour pumping test on the constructed test well at 18 Sarah Street. During the pumping phase and the recovery phase of the pumping test in-well dataloggers were used to records water levels in the pumping well, Community Centre well and domestic supply wells located at 14 Sarah St., 15 Sarah St., and 24 Sarah St. Results from the pumping tests were evaluated in the following terms:

Quantity

The test-well was pumped at 12 US gal/min (45 L/min). The results from the in-hole logger at the pumping well indicate that the well can sustain a moderate demand from a potential residential establishment; in short the well is a good producer.

Quality

Results from the water analysis were compared to the Ontario Drinking Water Standards, Objectives and Guidelines (ODWSOG) and indicate a good quality potable water supply. All parameters were within the ODWSOG with the exception of elevated concentrations of turbidity and hardness. Turbidity was only marginally above the ODWSOG. Turbidity is an aesthetic objective and may affect the taste, odour and water colour. Though increased levels of bacteria can be found with higher levels of turbidity, the bacterial results from this study were all within the ODWSOG. Hardness also registered above the ODWSOG limit. However, the ODWSOG states that water hardness above 300 mg/L are considered “very hard;” only waters with hardness “in excess of 500 mg/L are unacceptable for most domestic purposes.” Water chemistry results can be found in Table 2 at the end of this document.

Potential Interference to Surrounding Properties

The results from the pumping test indicate, from the loggers in observational wells, that the surrounding wells are not expected to be adversely affected by water takings for the proposed development at the subject property.

Results and Recommendations

The results of the Terrain Assessment identify that there is sufficient area and infiltration capacity on the subject property to accommodate subsurface effluent disposal from the proposed residential development.

Results from the Hydrogeological Assessment indicate that the water carrying capacity and quality at the site is sufficient to continue plans for construction. A conceptual design for the proposed development should be completed and reviewed with input from WESA for water supply and wastewater disposal aspects. It is recommended that the number of dwellings serviced by an individual well be kept to five (5) connections or below to avoid becoming governed by regulations that would require significant monitoring, sampling and reporting costs.

If you have any question please do not hesitate to contact the undersigned.

Sincerely,



Phil Tibble, M.Sc., P.Geo.
Hydrogeologist



Lise Comartin, M.Sc.
Environmental Scientist

Table 2: Water Chemistry Results

