

Appendix 2 - Terms of Reference for a Water Quality Impact Assessment

Water Quality Impact Assessments will be carried out by a professional who can be qualified by the Ontario Municipal Board as an expert witness on these matters, if required, on the basis of education and experience in one or more of the following disciplines: soils science, hydrogeology, or limnology and with demonstrated experience working in Precambrian Shield environments. Water Quality Impact Assessments consist of three main steps. Firstly, a site condition analysis is required. Should this analysis determine that site conditions exist such that development can proceed without affecting water quality, the second step would involve the identification of a suitable building envelope and any required mitigation measures. As a third step, the final report will be reviewed by municipal staff and may also be subjected to a peer review.

Phase 1: Site Condition Analysis

A site condition analysis will be undertaken to determine if the required conditions exist on site so that development can occur in a manner that will ensure the protection of water quality. This analysis will include:

a. Site and Surrounding Area

A plan will be provided that identifies the physical features associated with the site and surrounding lands including land use, topographic features, watercourses, ponds, designated protected areas, and wetlands.

b. Site Description

A Plan will be provided showing a detailed description of the site including:

- Lot size including frontage, depth, area and general shape.
- Location of public and private access roads.
- Location of significant features, both geological and man-made, including such features as wetlands, off-site streams and other surface water.
- Site contours at an interval not more than 5 metres (OBM).
- Areas of slope between 0 to 9%; 10 to 25%; and over 25%.
- The location of all depressions and gullies that will channel stormwater toward the lake.
- The location of all permanent and seasonal or intermittent streams as well as details concerning observations of the amount of flows experienced within the streams at various times of year (minimum of spring freshet and summer drought periods) and an outline of the expected path of surface runoff from the development site to the lake of interest.
- Areas of aquatic vegetation and ecological description (dominant species, emergent/submergent/floating leaved).
- A description of the terrestrial vegetation community – size, composition, age and general health, as detailed below.

c. Soil Characteristics

The Impact Assessment will include a documentation and mapping of soil conditions in order to characterize the soils to be used in the construction of septic system leaching beds as well as the native soils in the mantle between the leaching beds and any surface water receptors.

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The location of the proposed septic system leaching bed and the expected pathway of the subsurface nutrient flow (septic plume) in relation to the ultimate receptor (waterbody) of the nutrient flow must be delineated on the Plan submitted. The proponent will also:

- Undertake manual auguring to map soil depth along the flow path of each septic plume within 30m of the tile field, with soil depths inferred from a minimum of twenty (20) points, or as many as required to ensure the integrity of the soil mantle.
- Document the location of sources of suitable soil to construct the partially or totally raised tile fields.
- Provide descriptions of soil characteristics –type, texture and colour for any soils (native or off site) used to construct the tile field and present in the mantle, as determined from soil profiles taken at the site of the tile field or source of the soil, as appropriate, and the mantle area.
- For lakes which are either highly sensitive or over the water quality threshold - provide an analysis of soil chemistry (lab analyses of phosphorus adsorption capability, mineral content and particle size) for any soils proposed for use in the tile field, and from the native soil mantle.
- Map the location of all on-site sample locations, and off-site locations of soils that are to be imported.

d. Vegetation cover

The Impact Assessment will map the location and characteristics of shoreline and upland vegetation communities and provide an explanation of the site characteristics that will provide natural buffer protection for the adjacent waterbody from overland and subsurface flow of sediment, nutrient and other potential pollutants. The Impact Assessment will include a photographic documentation of the property showing vegetative cover. The record shall include the following photographs, at a minimum:

- The shoreline across the entire width of the lot as viewed from the lake,
- The tile field and mantle areas, along the direction of subsurface flow towards the lake
- The building envelope, along the shortest distance between the envelope and the lake

e. Findings

A determination of the suitability of the site conditions to ensure development will not adversely impact water quality will be provided.

Phase 2: Identification of Recommended Building and Septic Envelope and Mitigation Measures

Where a site has been determined to have the conditions required to permit development based on the findings of the Site Condition Analysis, a Plan will be provided showing a detailed description of the manner in which development should occur to protect water quality, including:

- Building location, septic system location, paths, decks, accessory buildings, shoreline structures, parking areas and any other hard surfaces;
- Proximity to significant features, both geological and man-made, including such features as wetlands, off-site streams and other surface water.

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- The location of proposed leaching beds in relation to permanent and intermittent streams or other drainage courses.

Specific mitigation measures necessary for the effective elimination of the impacts of nutrient and sediment loading on water quality should also be identified, including:

- Detailed construction mitigation plans including methods to deal with sediment and nutrient loading. Map the proposed location of all proposed facilities.
- Detail and map stormwater mitigation measures including methods to deal with sediments and nutrient loading during construction and occupation.
- The location, design and construction of septic systems and leaching beds.
- Shoreline setbacks and buffer areas.
- The delineation of building envelopes for proposed building structures and uses, including septic systems for each lot. Building envelopes are defined as the area bounded by the minimum setback from the shoreline and minimum yard setbacks for all development.
- Measures for protecting the natural vegetation, slopes and soil mantle for the area located outside of the building envelopes. Design criteria (including size and construction materials) for uses, buildings and structures that may be permitted within this area. (e.g. boat docks, meandering walkways to the shoreline, and driveways).

Step 3: Municipal Review

The District of Muskoka and/or the Local Municipality will review the Impact Assessment, or submit it to peer review to establish:

- The completeness of the assessment regarding the requirements herein,
- Interpretation of the assessment by the proponent,
- The effectiveness of the mitigation measures proposed
- The likelihood that the assessment supports a conclusion of no nutrient impact to the subject water body.

The assessment will be maintained on file for the possibility of re-assessment of the site to ensure that mitigation measures have been implemented and maintained over time.