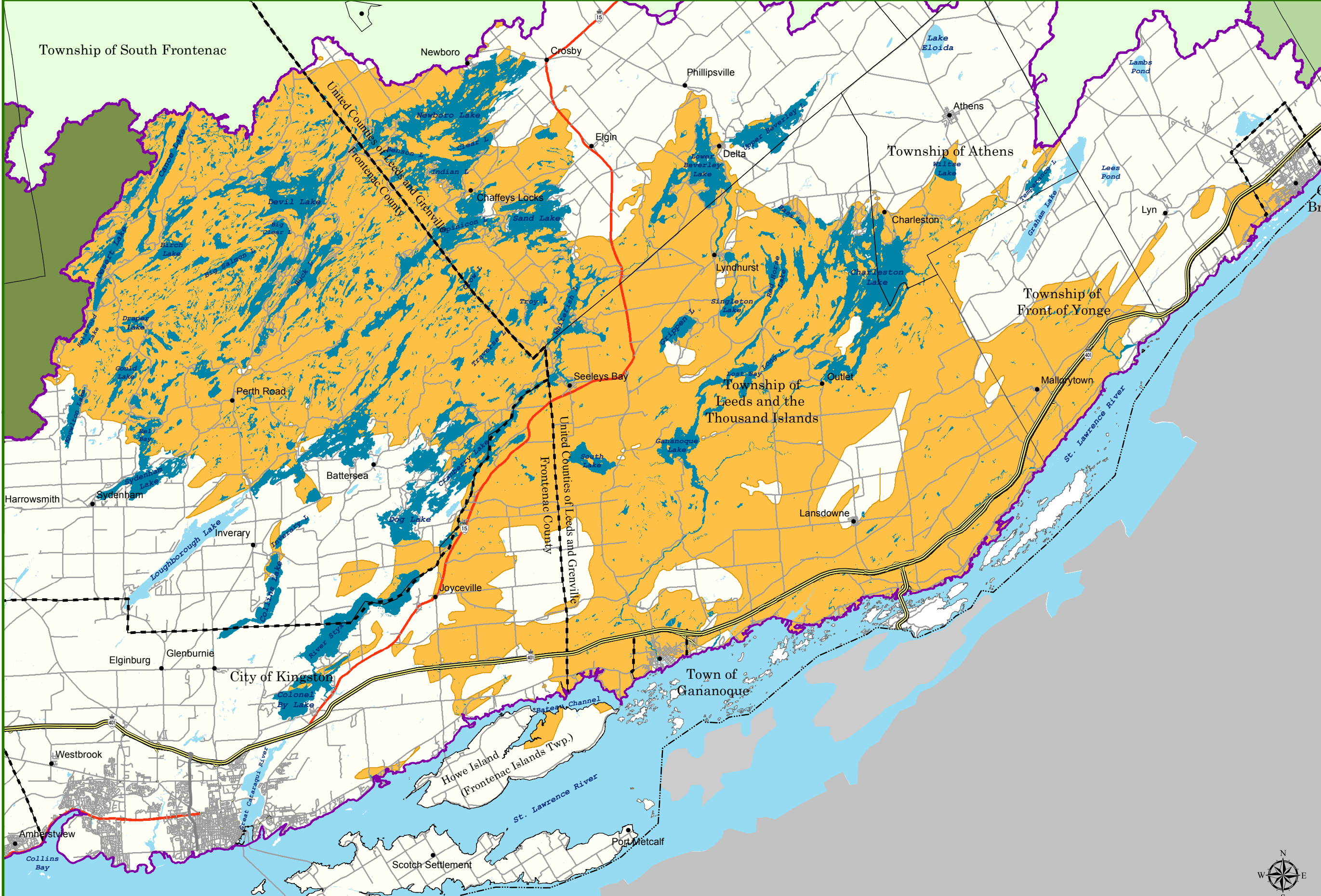


Catawaqui Region Conservation Authority Precambrian Shield Lakes

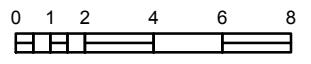


Legend

- Canadian Shield
- Waterbodies Completely or Partially on Shield
- Waterbodies
- CRCA Watershed

Application of Hutchison Report
subject to site specific confirmation.

Scale 1:220,000



Kilometers

UTM Projection NAD 83

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While the CRCA makes every effort to ensure that the information presented is accurate for the intended uses of this map, there is an inherent error in all mapping products, and accuracy of the mapping cannot be guaranteed for all possible uses. All end-users must therefore determine for themselves if the information is suitable for their purposes.

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CATARAQUI REGION
CONSERVATION AUTHORITY

Appendix G: Site Evaluation Guidelines for Waterfront Development on Precambrian Shield Lakes

1.0 PURPOSE AND APPLICATION

The Cataraqui Region Conservation Authority (CRCA) aims to promote the protection, improvement and restoration of water quality across the region, including in our numerous inland lakes. Clean lake water is important for drinking supplies, fish and wildlife, recreation and tourism. Setting buildings and structures (e.g. septic systems) back inland from the shoreline of the lakes is one way to promote water quality.

The purpose of these guidelines is to help determine an appropriate horizontal setback (i.e. distance) between *development* and the shoreline of lakes on the Precambrian Shield. The Shield is characterized by the presence of igneous and metamorphic rocks (e.g. granite, gneiss). The guidelines are not intended for other settings (e.g. lakes with primarily limestone or sandstone bedrock, Lake Ontario or the St. Lawrence River). Also, the guidelines are intended for the assessment of development setbacks on individual residential lots created through consent, plan of subdivision or plan of condominium. They are not intended to assess the overall impact of proposed plans of condominium or subdivision, resorts or marinas on lake water quality and environmental health. This impact would generally be determined through other means such as a lakeshore capacity assessment.

These guidelines are based on work by Hutchinson Environmental Sciences Ltd. (Assessment of Municipal Site Evaluation Guidelines for Waterfront Development in Eastern Ontario's Lake Country). Their report was prepared in 2014 for the Cataraqui Region, Mississippi Valley and Rideau Valley Conservation Authorities to reflect current science and best practices.

This document is Appendix G to the CRCA Environmental Planning Policies (2015) and should be referred to in conjunction with those policies. Terms that are *italicized* throughout this document are defined in the glossary at its conclusion.

2.0 POLICY CONTEXT

Section 6.1.6 of the Environmental Planning Policies (2015) addresses the setback topic:

Development proposals should incorporate appropriate setbacks from the *high water mark* of a *waterbody* that reflect variable constraints imposed by waterbody-specific conditions (e.g., at capacity lake trout lakes) and site-specific conditions (e.g., slope height, slope angle, soil depth and type as well as vegetative cover). Where applicable, setback distances should be based on the findings of studies and tools such as lake management plans and site evaluation guidelines (see Appendix G for lakes on the Precambrian Shield).

These guidelines focus on practical considerations for a defining an appropriate setback distance. This is based primary on the anticipated impact of contaminants (e.g. bacteria, hydrocarbons, phosphorus) from the *development* on the water quality in the lake. The intent is for new *development* (i.e. buildings and structures including septic systems) to be set back from the water at least 30 metres, and to a greater extent appropriate for the lake and site. The Conservation Authority may also refer to these guidelines in cases where an addition to an existing building or structure has been proposed within 30 metres of the lake.

3.0 SITE EVALUATION GUIDELINES

These guidelines outline seven steps that can be followed to define a horizontal water setback distance on a site. Soil depth, soil texture, slope and vegetation in the vicinity of the potential *development* site are scored between “0” and “10”, and these scores are added to generate an overall value. A setback distance (in metres) is recommended for scoring ranges (e.g. 40 metres is recommended for sites with a score of between 11 and 15). Other site-specific factors may need to be considered when determining an appropriate setback.

To use these guidelines, evaluators need to visit the site and document its characteristics using tools such as a camera, global positioning system device (GPS), hand auger, soil probe, inclinometer, survey level and tape measure.

STEP 1: CONSIDER THE CONTEXT OF THE SITE

Waterfront development proposals should be evaluated with consideration for the following aspects:

- Watershed and/or lake management plans, as applicable;
- The official plan, zoning by-law, development permit by-law and site plan guidelines of the subject municipality;
- Characteristics of the site that could affect the horizontal water setback, such as:
 - Natural hazards such as flooding and erosion;
 - Natural heritage, such as fish and wildlife habitat, wetlands and woodlands (notably, whether or not there are requirements for lake trout);

- Other regulatory requirements, including Ontario Regulation 148/06: Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses that is administered by the Conservation Authority;
- The proposed layout of buildings, structures, roads and pathways on the site and on adjacent properties; and
- Water quality protection, as discussed in these guidelines.

STEP 2: MARK THE HIGH WATER MARK

The *high water mark* is used by municipalities as the basis for measuring a horizontal setback to buildings and structures. The evaluator should therefore commence their site visit by inspecting the shoreline and marking the location of the *high water mark*.

STEP 3: CHARACTERIZE THE SOILS

The depth and texture of the soil at a site will affect its ability to attenuate contaminants from the development. Soil chemistry may also be relevant.

The evaluator should use a hand auger to assess the typical depth of the soil at the site and along the adjacent waterfront. This may require more than one test hole. The texture of the soil should be assessed at the same time, with reference to the Ontario soil mapping and a field guide. Soil texture refers to the relative proportion of clay, silt and sand particles. Following the evaluation, all holes should be filled and the surface cover restored.

Hutchinson (2014) has prepared scores for site characteristics, including soil depth and texture:

Site Characteristic	Criteria	Score
Soil Depth	Depth (cm)	
	>150	0
	100-150	2
	75-100	4
	50-75	6
	25-50	8
	<25	10

Site Characteristic	Criteria			Score
Soil Texture	Type	Percolation Rate	Phosphorus Retention Capability	
	Loam	Permeable to moderate	Medium to high	0
	Sandy loam	Moderate to low	Medium to high	3
	Silty sand, clayey sand, silt and fine sand	Moderate to low	Medium to high	3
	Well-graded sands	Permeable to moderate	Low to medium	5
	Silty clay and clay	Low to impermeable	High	7
	Coarse sand and gravel	Excessively rapid	Low	10

STEP 4: MEASURE THE SLOPE

The slope (i.e. grade) of a *development* site and the adjacent area along the waterfront will affect how quickly runoff moves from buildings, structures, roads and other surfaces into the lake and/or groundwater. The evaluator will need to determine a representative slope between the *development* and the shoreline. On a typical Precambrian Shield site there are sections of steep rock ledges and shallow (i.e. level) meadows, which together form an overall slope that represents the site.

One way to record the slope of site is as a percentage from the horizontal (0%). This is calculated as follows:

$$\text{Per cent slope} = (\text{rise} / \text{run}) * 100$$

The “rise” is the vertical change in height from the base of the slope, often at or near the shoreline, to the top of the slope. The “run” is the horizontal distance over which this change is measured. The evaluator may wish to measure the rise over a shorter run (e.g. 5 metres), rather than the entire slope.

The following scores were prepared by Hutchinson (2014) to evaluate slopes:

Site Characteristic	Criteria	Score
Slope	Slope Class	
	0%-13%	0
	13%-20%	8
	20%-25%	10
	>25%	12

While measuring the slope, the evaluator should consider how water runs off to the lake in the existing condition, and how this might change if the proposed development and site alteration were to occur. This assessment may result in recommended changes to the proposal, and/or mitigation measures using stormwater management techniques.

STEP 5: ASSESS THE VEGETATION

Vegetation such as trees, shrubs, vines, groundcovers and meadow grasses filters contaminants from runoff, minimizes soil erosion and provides habitat and food for fish and wildlife. Dense, healthy vegetation is more protective of water quality than active farm fields or open areas of bedrock.

The evaluator will need to identify a vegetative cover type that represents the site, notably in the waterfront area adjacent to the proposed *development*. For wooded sites, “disturbed woodlands” are those where buildings and structures are already present, or existed in the past, or that have been used for purposes such as camping or livestock grazing.

The following scores were prepared by Hutchinson (2014) for assessing vegetation:

Site Characteristic	Criteria	Score
Vegetation	Vegetation Cover Type	
	Undisturbed woodlands, old fields, and meadows	0
	Disturbed woodlands, old fields, and meadows	3
	Close-seeded legumes (clover, alfalfa) and rotation meadows	5
	Row crops	7
	Fallow fields and base bedrock outcrops	10

The evaluator should consider whether or not the proposed *development* would necessitate extensive *site alteration* and changes to the vegetation cover. Mitigation measures may be

appropriate during construction (e.g. snow fencing placed at the dripline of trees) and after it has concluded (e.g. planting native vegetation).

STEP 6: GENERATE AN OVERALL SCORE

Hutchinson (2014) recommends the following horizontal setback values from the *high water mark* to development, based on the sum of the soil depth, soil texture, slope and vegetation component scores.

Overall score	Horizontal water setback (metres)
36-40	90
31-35	80
26-30	70
21-25	60
16-20	50
11-15	40
≤10	30

The evaluator should mark the horizontal setback at the *development* site, being careful to: (1) commence measurement at the *high water mark*, and (2) measure horizontally, rather than along the surface of the slope. The setback should be measured with consideration for the corner or face of the building or structure that is closest to the lake.

STEP 7: CONSIDER THE IMPLICATIONS

The implications of the setback distance for the proposal should be considered while the evaluator is on the site. The following questions may be relevant:

- Can the *development* be accommodated as proposed?
- Is the topography at the setback location generally suitable for buildings and structures?
- Are there potential impediments that arise from the location of existing features, whether human (e.g. roads, power lines) or natural (e.g. rock, mature vegetation)?
- If necessary, are there alternate *development* locations on the parcel of land that could be considered by the proponent? In the case of additions to existing buildings and structures, how can the water setback be maximized?
- Which mitigation methods would be appropriate, during and after construction, in order to protect the water quality of the lake? Relevant measures are outlined in Appendices A (planting guidelines), F (ecological buffers), H (erosion and sediment control), and I (stormwater management) to the CRCA Environmental Planning Policies (2015).

GLOSSARY

Development means the creation of a new lot, a change in land use, or the construction of buildings and structures (including but not limited to open and enclosed decks, gazebos, swimming pools and sewage systems).

High water mark means the highest water level that has been maintained for a sufficient duration (on an annual basis) as to leave physical evidence upon the landscape marking the boundary between that water level and upland areas.

The boundary may be identified by:

- a. an examination of the bed and bank of the *waterbody*, to determine where the presence and action of water has been so common and usual and long continued in all ordinary years to mark upon the bed or bank a character distinct from that of the abutting upland; and/or
- b. a distinction between either open water or dominant aquatic/*wetland* vegetation, and dominant upland vegetation.

Site alteration means activities, such as grading, excavation, and the placement of fill that would change the landform and natural vegetative characteristics of a site. (PPS 2014)

Water setback area means the area of land between the *high water mark* and the recommended minimum horizontal distance, at a given location, between the *high water mark* and the primary *development* on a property (e.g., a residential dwelling).

REFERENCES

Hutchinson Environmental Sciences Ltd. 2014. Assessment of Municipal Site Evaluation Guidelines for Waterfront Development in Eastern Ontario's Lake Country. Glenburnie Ontario: Cataraqui Region Conservation Authority, Mississippi Valley Conservation Authority and Rideau Valley Conservation Authority.

Ontario Ministry of Municipal Affairs and Housing. 2014. Provincial Policy Statement. Queen's Printer for Ontario.

FOR MORE INFORMATION

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