

The 'At Capacity' Designation and How it Relates to Development on Lakes with Lake Trout Populations

What does the term 'at capacity' mean?

When a lake is determined to be 'at capacity' in a biological sense, it means that development which has the potential to add additional phosphorous or other nutrients, directly or indirectly, into the lake will not be permitted within 300 metres of the lake.

How is a lake determined to be 'at capacity'?

There is science behind this designation based upon lake trout biology and life history patterns. Lake trout are a very temperature and oxygen sensitive species. In addition, juvenile lake trout need to be able to escape their parents or else end up on the menu. To do this, the juveniles inhabit the deeper, colder waters of a lake, generally below 28 metres whereas the adults inhabit the upper levels, typically with water in a temperature range from 8 to 12° C. When nutrients increase in a lake, plant and algae production increases. The decomposition of plants and algae uses up oxygen and thus places significant stresses on lake trout particularly in late summer and beyond. It has been determined that the average oxygen level of water below the **thermocline** (1) should be above 7 parts per million (ppm) in order for lake trout to adequately carry out their life processes.

To determine oxygen levels, the lake is sampled in early September. A temperature/oxygen profile is taken for the entire depth of the lake and the average oxygen level is determined for the waters below the thermocline. The capacity designation is then based upon whether the oxygen level is above or below 7 ppm.

Some lakes have oxygen levels that are very close to 7 ppm, either slightly above or below. These lakes are sampled more frequently to try to determine exactly where they might lie as there may be small discrepancies in oxygen levels due to the weather of that year or the sampling equipment. A few lakes show wide fluctuations – one year being way above and the next time way below the 7 ppm threshold. These lakes are also sampled more frequently to determine a more accurate level.

What government agency determines the 'at capacity' designation?

The Ontario Ministry of the Environment carries out the sampling and would normally assign the designation but sometimes the Ontario Ministry of Natural Resources can do it as well.

What are the implications for future development on the lake?

If a lake has a reading consistently *above* 7 ppm, then new development can occur. If a lake is consistently *below* 7 ppm, then no new development can take place as described above. However, in some instances, there may be **existing approved lots** (2) that have not yet been developed. Development of these lots may still occur but no new lots may be created. The exception to this would be if the newly created lot contains a building site greater than 300 metres from the lake or the drainage of the lot is into a different watershed or lake that is not at capacity.

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- (1) **Thermocline:** The mid-layer of a lake in which there is the most rapid decrease in water temperature. This is characterized by at least a degree centigrade drop per metre.
- (2) **Existing approved lots:** These are existing lots on record with the municipality. It could be part of a planned subdivision or an individual lot that was created prior to the lake designation. If a developer purchases existing lots and tears down the dwellings, they can be re-built but the municipality makes the call on what can or can't be done. Municipalities are aware of 'at capacity' designations and what it means.