



CANADIAN ENVIRONMENTAL LAW ASSOCIATION  
L'ASSOCIATION CANADIENNE DU DROIT DE L'ENVIRONNEMENT

**ONTARIO'S CLEAN WATER ACT, 2006: CELA FAQ #5**

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**QUESTION:** In Assessment Reports prepared under the *Clean Water Act, 2006*, how will local Source Protection Committees identify and evaluate potential threats to drinking water quantity?

**ANSWER:** Activities or conditions which may adversely affect drinking water quantity (i.e. consumptive uses or activities reducing aquifer recharge) must be evaluated in Assessment Reports in accordance with technical rules issued by the Ministry of the Environment under the *Clean Water Act, 2006*. These rules require Source Protection Committees to prepare water budgets at varying scales and levels of detail in order to accurately understand groundwater flows, surface water flows, and potential stresses on these resources. Where necessary, detailed risk assessments shall be undertaken by Source Protection Committees in local areas in order to determine whether such activities or conditions constitute significant or moderate drinking water threats.

**ANALYSIS:**

*Background: Assessment Reports*

Assessment Reports are generally intended to serve as the technical and scientific basis for developing appropriate Source Protection Plans under the *Clean Water Act, 2006* ("CWA"). In essence, Assessment Reports must:

- identify and evaluate the vulnerability of groundwater and surface water resources;
- identify and evaluate activities or conditions that pose risks to the quantity or quality of drinking water sources; and
- rank these risks as significant, moderate or low drinking water threats.<sup>1</sup>

*Defining Drinking Water Quantity Threats*

If water is withdrawn from an aquifer or watercourse at a rate faster than it is being naturally replenished, then local water users may experience short- or long-term water shortages. In

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<sup>1</sup> CWA, section 15(2); O.Reg.287/07, section 13.

addition, excessive water withdrawals may adversely affect environmental features and functions (i.e. wetlands), or cause impairment of water quality (i.e. less dilution of contaminants).

The CWA defines “drinking water threat” as “an activity or condition that adversely affects or has the potential to adversely affect the quality or quantity of any water that is or may be used as a source of drinking water, and includes an activity or condition that is prescribed by the regulations as a drinking water threat (emphasis added).”<sup>2</sup>

With respect to quantitative threats, the general regulation under the CWA specifically prescribes two particular types of activities as “drinking water threats”:

- an activity that takes water from an aquifer or surface water body without returning the water taken to the same aquifer or surface water body; or
- an activity that reduces the recharge of an aquifer.<sup>3</sup>

Given these broad definitions, it will be incumbent upon SPCs to evaluate various activities at the local level (i.e. food and beverage production; industrial manufacturing processes; creation of impervious surfaces in recharge areas, etc.) to determine if such activities constitute threats to drinking water quantity.

#### *Evaluating Drinking Water Quantity Threats: Water Budgets/Risk Assessment*

Under the CWA, the assessment of drinking water quantity threats generally follows a multi-tiered series of sequential documentary steps which become increasingly detailed, technically complex, and spatially refined as the evaluation process moves towards completion. These steps are generally intended to answer the following key questions in each source protection area:

- where are the water resources (i.e. aquifers, wetlands, creeks, streams, rivers, lakes)?
- how do the water resources move (i.e. flow patterns, surface water/groundwater interactions)?
- where and what are the stresses on the water resources (i.e. water-takings)?
- what are the overall water supply/demand trends (i.e. water usage, water levels, droughts)?

The CWA expressly requires Assessment Reports to include “water budgets” which address the foregoing questions.<sup>4</sup> The substantive requirements for preparing water budgets under the CWA are set out in Technical Rules issued by the Ministry of the Environment (“MOE”).<sup>5</sup>

At the outset of the assessment process, each SPC must prepare an area-wide “conceptual” water budget,<sup>6</sup> which is intended to broadly describe groundwater and surface water flows into and out of the watershed-based boundaries of the source protection area, using historical data and

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<sup>2</sup> CWA, section 2(1).

<sup>3</sup> O.Reg.287/07, section 1.1, paras. 19 and 20.

<sup>4</sup> CWA, section 15(2)(c).

<sup>5</sup> The Technical Rules (December 12, 2008) are available at: [www.ene.gov.on.ca/en/water/cleanwater/cwa-technicalstudies.php](http://www.ene.gov.on.ca/en/water/cleanwater/cwa-technicalstudies.php).

<sup>6</sup> Rules 3, 9(1)(b), and 9(2)(d). Rule 19 sets out the mandatory elements of the conceptual water budget.

considering average annual conditions (i.e. precipitation, evapotranspiration, withdrawals, etc.). These matters may also be discussed in the general “watershed characterization” reports which have been prepared for many source protection areas across the province, and which will form part of the forthcoming Assessment Reports.

While the conceptual water budget provides a basic overview of the entire area, it lacks the spatial, temporal and technical data that is necessary to make informed, site-specific decisions about whether a particular activity poses a threat to drinking water quantity.

Therefore, the next step for each SPC is the preparation of a “Tier 1” water budget, which consists of a more detailed and quantified analysis of water supply, demand, and “stresses” (i.e. consumptive water uses or activities) at the subwatershed scale.<sup>7</sup> At a minimum, each SPC must prepare a Tier 1 water budget for each subwatershed within its jurisdiction,<sup>8</sup> and must generally use geographic information system (“GIS”) tools to assess groundwater flows/levels, surface water flows/levels, and the interactions between them.

If the Tier 1 water budget determines that a particular subwatershed may be under stress (as defined by provincial thresholds<sup>9</sup>) and contains a municipal drinking water system, then the SPC must prepare a more detailed “Tier 2” water budget in order to more fully evaluate the situation.<sup>10</sup>

The Tier 2 water budget involves the use of computer-based, three-dimensional groundwater flow models, and computer-based continuous surface water flow models. If the Tier 2 water budget finds that the stress level in the subwatershed is “low”, then no further water budget work needs to be undertaken by the SPC. However, if the Tier 2 water budget finds that a particular subwatershed has a “significant” or “moderate” stress level for either groundwater or surface water,<sup>11</sup> then the SPC must prepare a “Tier 3” water budget.<sup>12</sup>

Where required, the Tier 3 water budget must be completed for each groundwater-based or surface water-based drinking water system in order to fully assess whether the local stresses constitute significant or moderate drinking water threats. In essence, the Tier 3 water budget is a detailed risk assessment exercise that will: (a) consider various factors and circumstances (i.e. current/future land cover, hydraulic flow control, drought conditions, etc.); (b) delineate the local area(s) under review; (c) assign risk/exposure levels to these local area(s) and tolerance levels for the drinking water systems within such areas<sup>13</sup>; (d) delineate an Intake Protection Zone – Quantity (“IPZ-Q”) for surface water-based local areas;<sup>14</sup> and (e) delineate Wellhead Protection Areas – Quantity (“WHPA-Q1”<sup>15</sup> and “WHPA-Q2”<sup>16</sup>) for groundwater-based local areas.<sup>17</sup>

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<sup>7</sup> Rule 21.

<sup>8</sup> Rule 20.

<sup>9</sup> Rules 32-33.

<sup>10</sup> Rules 22-23.

<sup>11</sup> Rules 34-35.

<sup>12</sup> Rules 26-27, 30.

<sup>13</sup> Rules 97 to 107.

<sup>14</sup> Rules 76-78.

<sup>15</sup> The WHPA-Q1 is the combined area representing the municipal well’s “cone of influence”, and the cones of influence of other nearby wells which intersect the municipal well’s cone of influence.

If the Tier 3 water budget finds that the local area risk is “significant”, then any existing or future consumptive activities are significant drinking water threats if they occur within the IPZ-Q or WHPA-Q1.<sup>16</sup> In addition, in such local areas, any existing or future activities that reduce recharge to the aquifer are significant drinking water threats if they occur in the IPZ-Q or WHPA-Q2.

Similarly, if the Tier 3 water budget finds that the local area risk is “moderate”, then any existing consumptive activities in an IPZ-Q or WHPA-Q1, or any existing activities that reduce recharge in an IPZ-Q or WHPA-Q2, are moderate drinking water threats. Any new or increased activities that are consumptive and require water-taking permits in an IPZ-Q or WHPA-Q1, or any new or increased activities that reduce recharge in an IPZ-Q or WHPA-Q2, are moderate drinking water threats (unless the activity increases the risk level to significant, in which case the activity is a significant drinking water threat).

The Assessment Report’s determination of whether a particular activity constitutes a “significant” or “moderate” drinking water threat has important implications for the content of Source Protection Plans to be developed by SPCs under the CWA.

For example, if a drinking water threat is found to be “significant”, then the threat must be addressed in the Source Protection Plan through appropriate mandatory measures (i.e. land use prohibitions/restrictions, risk management plans, etc.). If a drinking water threat is found to be “moderate”, then mandatory measures are unavailable, but the threat can be addressed in the Source Protection Plan through appropriate voluntary measures (i.e. outreach/education programs, stewardship agreements, etc.).

### Public Interest Considerations

When reviewing Assessment Reports in relation to drinking water quantity, it will be instructive for public interest representatives to consider the following “checklist” of questions and issues:

- does the Assessment Report’s analysis of water quantity threats properly reflect the precautionary principle, and ensure that lack of scientific certainty does not delay or preclude policies intended to address such threats?
- has the Assessment Report identified and evaluated all known or suspected threats to local drinking water quantity (i.e. direct, indirect or cumulative impacts from water-takings)?
- are the Assessment Report’s conclusions clear, traceable, rational, and substantiated by appropriate information at a sufficient level of detail?

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<sup>16</sup> The WHPA-Q2 includes any area where a further reduction in recharge would have significant impacts.

<sup>17</sup> Rules 53-54.

<sup>18</sup> Generally, see Rules 110-113 and Table 5 for a description of “significant” and “moderate” drinking water threats in the context of drinking water quantity.

- were suitable analytical models used, and were the modelling outcomes verified by field work or monitoring?
- were appropriate data, variables and assumptions used for groundwater and/or surface water modelling purposes?
- does the Assessment Report include proper uncertainty analyses,<sup>19</sup> or identify data gaps which should be addressed in the future?
- does the Assessment Report's conclusions regarding groundwater and surface water flows incorporate the potential impacts of climate change over the next 25 years?<sup>20</sup>
- have the water budget/risk assessment reports been peer reviewed prior to adoption by the SPC?

While the above-noted water budgets/risk assessments cannot be appealed to an administrative tribunal or the courts, public interest representatives should directly raise any concerns about the evaluation of drinking water quantity threats with the SPC, Source Protection Authority or the MOE Director before the Assessment Report is approved.

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<sup>19</sup> Rule 36.

<sup>20</sup> O.Reg.287/07, section 13(1), para.7.