

# Thames-Sydenham and Region - Assessment Reports

## Drinking Water Quality Issues

Under the Clean Water Act (2006), drinking water quality issues must be identified. A drinking water quality issue is a parameter or pathogen shown to deteriorate, or trends toward a deterioration of raw (untreated) water quality for the purposes of drinking.

### What is an Issue?

The Technical Rules: Assessment Report indicates which parameters can be considered in the identification of drinking water quality issues in raw (untreated) source water. They are the Schedule 1, 2 and 3 parameters of the Ontario Drinking Water Quality Standards and Table 4 parameters of the Technical Support Document of the Ontario Drinking Water Standards, Objectives and Guidelines. The parameters are physical (e.g. taste, turbidity), chemical (e.g. lead, nitrate), radioactive (e.g. uranium-235) or indicator microbial (total coliform, E.coli). Safe levels of the parameters in treated drinking water are identified in the above referenced tables. Pathogens, which are disease causing organisms such as cryptosporidium or certain strains of bacteria, can also be considered.

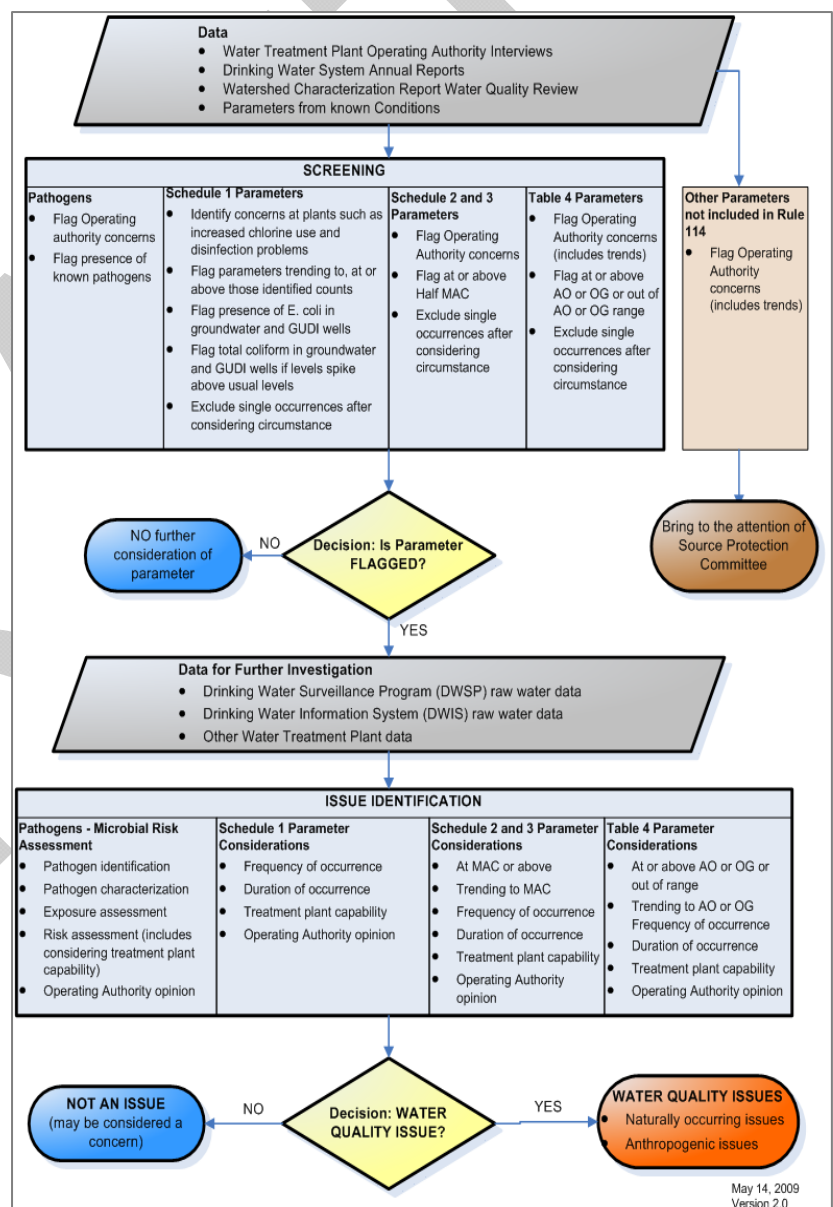
### Impact of Identifying an Issue

Activities that contribute to the identified issue within a vulnerable area are deemed a significant risk to the source of drinking water. Significant risks must be mitigated through the source protection plan. Further, the area and the activity contributing to a drinking water quality issue must also be identified. An intake protection zone -3 may be delineated to include the activity and area known to contribute to the drinking water quality issue.

### Issue Evaluation Methodology

Identifying issues is a key step in the overall process of protecting drinking water quality. In the Lower Thames Valley Source Protection Authority, issues are identified by following the Thames-Sydenham and Region Issues Evaluation Methodology (May 14, 2009). The

**Section Summaries - The Assessment Reports for the Thames-Sydenham Region are large summary documents compiling information from many technical reports. These technical reports include Water Budgets, Watershed Characterization Reports and many SP Technical Studies related to municipal drinking water systems. That information has been summarized and compiled into the Assessment Reports of the Region. Each section of the Assessment Reports has been summarized in a series of Section Summaries.**



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evaluation is a two step process. Firstly, raw (untreated) water quality data is screened based on certain criteria, such as comparison against a benchmark or water treatment plant operator concerns. Secondly, an investigation of the flagged parameter is undertaken to identify an issue, including the review of trends and spikes, consideration of existing water treatment plant capabilities and discussions with the water treatment plant operating authority. Pathogens are evaluated differently. A known pathogen of concern that is flagged through a screening process must be subject to a microbial risk assessment to identify it as an issue, involving pathogen characterization, exposure assessment and risk characterization.

The benchmarks for parameters are generally the half the human health based Ontario drinking water standards (Maximum Acceptable Concentrations, or MAC), and the full levels of the aesthetic objectives (AO)

and operational guidelines (OG).

## Identified Issues

In the Lower Thames Valley Source Protection Authority, the drinking water quality issues identified are summarized by drinking water system in the Table 1 below. Certain parameters may be due to anthropogenic sources, i.e. due to the activities on land, or naturally occurring, or both. No pathogens are identified as issues in the raw (untreated) source water in the Lower Thames Valley SPA.

## Data Gaps

Schedule 2 and 3 (chemical and radiological) data for the West Elgin and Wheatley intake raw water were not available. Additional data collection would facilitate future issues evaluation.

**Table 1: Drinking Water Quality Issues Identified in the Lower Thames Valley Source Protection Area**

System	Issue	Brief Description of Evaluation	Natural or Anthropogenic Source
<b>Wheatley</b> (Lake Erie intakes)	Turbidity	From review of raw (untreated) water turbidity data, 86% of the sampling results measure above the treated water AO of 5 NTU. Prolonged elevated levels of turbidity are a cause of concern to the plant operator.	Possibly both natural and anthropogenic causes, further investigation required
<b>Chatham/ South Kent</b> (Lake Erie intake)	Aluminum	From review of the raw (untreated) water aluminum data, 43% of the sample points were above the treated water OG benchmark of 0.1 mg/L, and 70% measured above the 50% benchmark.	Possibly both natural and anthropogenic causes, further investigation required
	Organic nitrogen	Approximately 100% of the available raw water data measured above the treated water OG of 0.15 mg/L. The trend line implies that the organic nitrogen levels have been slightly increasing over time.	Possibly both natural and anthropogenic causes, further investigation required
	Turbidity	Approximately 47% of the raw water sampling results measure above the treated water AO benchmark of 5 NTU.	Possibly both natural and anthropogenic causes, further investigation required
	Hardness	Of the raw water samples collected and analyzed for hardness, 100% of the samples exceeded the treated water OG benchmark range of 80-100 mg/L.	Naturally occurring
<b>West Elgin</b> (Lake Erie intakes)	Turbidity	From review of raw (untreated) water sample turbidity data, 74% of the sampling results measured above the treated water AO of 5 NTU.	Likely naturally occurring, further investigation required
<b>Ridgetown</b> (groundwater wells)	Fluoride	There are 21 instances since 2000 of fluoride concentrations in the raw (untreated) water being above the treated water MAC of 1.5 mg/L.	Naturally occurring
	Methane	Methane levels historically known to be high, and from other studies are found to be regularly above the AO of 3 L/m <sup>3</sup> . A cascading aeration system is in place to address high methane levels.	Naturally occurring
<b>Highgate</b> (groundwater wells)	Fluoride	There are 14 instances since 2003 of fluoride concentrations in the raw water being above the treated water MAC of 1.5 mg/L and a further 6 instances where concentrations were above 50% of the MAC.	Naturally occurring
	Methane	Between 2004 to 2008, raw water methane levels are typically 17 to 55 L/m <sup>3</sup> , regularly above the treated water AO of 3 L/m <sup>3</sup> .	Naturally occurring
	Organic nitrogen	Since 2004, the available raw water data levels of organic nitrogen measured above the treated water OG of 0.15 mg/L. The aquifer contains a high concentration of organic rich shale material from the underlying Kettle Point Formation.	Likely naturally occurring.