



# Ontario: A Source Protection Program Overview

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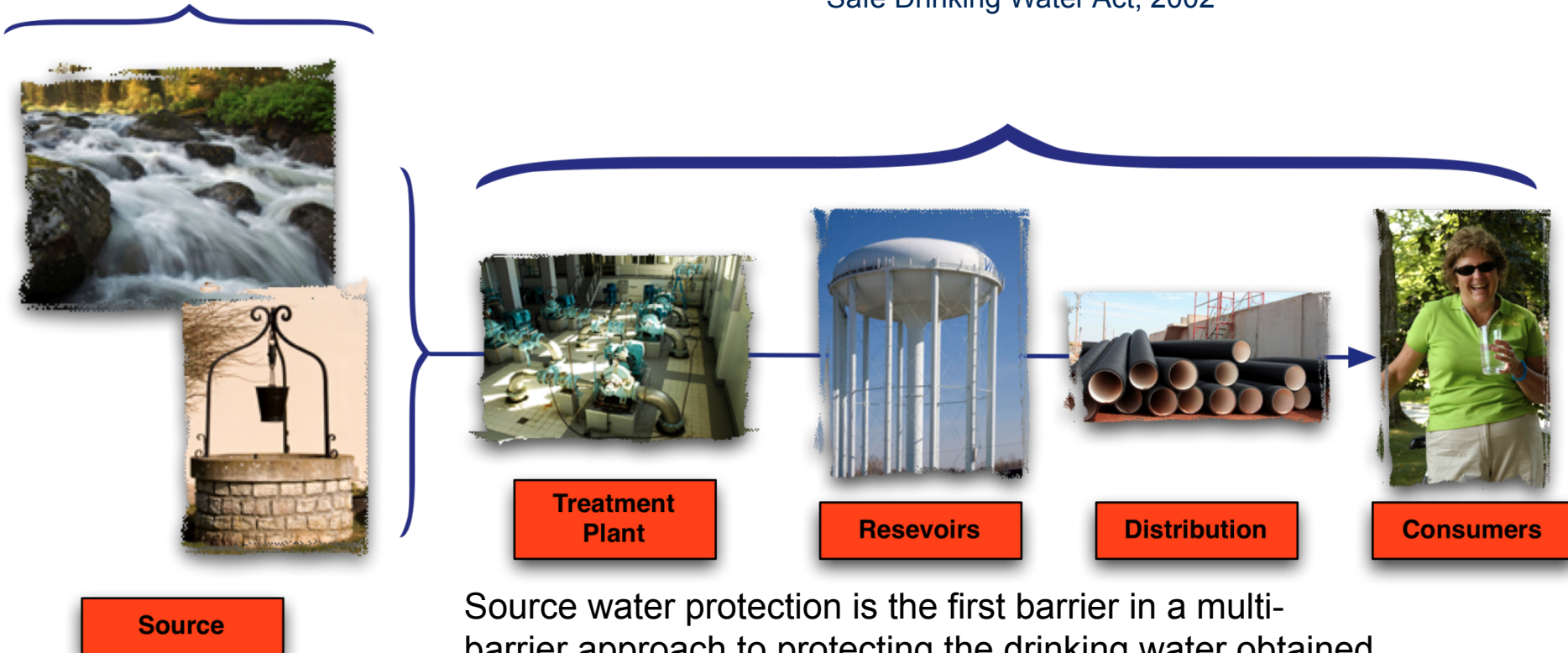
# Source Protection Program Context

- After the Walkerton tragedy in May 2000, Justice Dennis O'Connor was commissioned to lead an inquiry into the contamination of the Walkerton water supply and more broadly, the safety of Ontario's drinking water
  - Walkerton Inquiry Report made 121 recommendations
- *Clean Water Act, 2006 (CWA)* came into force July 3rd, 2007.
  - Fulfills 12 of the Justice O'Connor's recommendations.
- First Principle - concept of prevention in the safeguarding of our drinking water for our communities and our health.

# Multi-barrier Approach – Clean Water Act

Clean Water Act, 2006

Safe Drinking Water Act, 2002



Source water protection is the first barrier in a multi-barrier approach to protecting the drinking water obtained from Ontario's lakes, rivers and underground aquifers

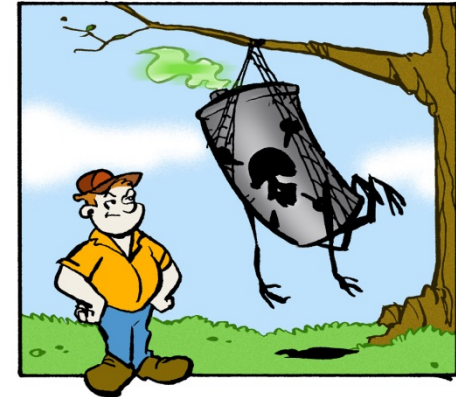
# *The purpose of the Clean Water Act, 2006 is to protect existing and future sources of drinking water.*

- Manages or prohibits activities that could be a risk to sources of drinking water in Ontario.
- Relies on existing legislation, regulations, and processes to manage or eliminate risks
- Creates new local tools - Part IV of the CWA – which provides municipalities with the authority to regulate activities that may pose a risk to drinking water.
- Where there is a conflict between pieces legislation – the one that is more protective of drinking water applies

**Identify**



**Address**



**Prevent**



**Monitor**

# How the Clean Water Act Applies

Mandatory for all **municipal residential drinking water systems** within source protection areas/regions. This captures approximately **90% of the population in Ontario** (i.e. areas of Conservation Authority jurisdiction)

First Nations drinking water systems may be included through band council resolution and a special regulation

Decision to include other systems (private, non-residential) rests with municipalities.



*R. C. Harris Water Treatment Plant, Toronto*



# Source Protection Process

## Source Protection Committees / Authorities

Assessment Report



Source Protection Plan



- Identify municipal water systems
- Delineate vulnerable areas associated with those systems
- Identifies threat activities that may pose a risk to drinking water

- Develop policies to address drinking water threat activities
- Multiple policy tools available to SPCs, eg. prescribed instrument, specify action , research

MOECC

Review and Approval



**Implementing Bodies**

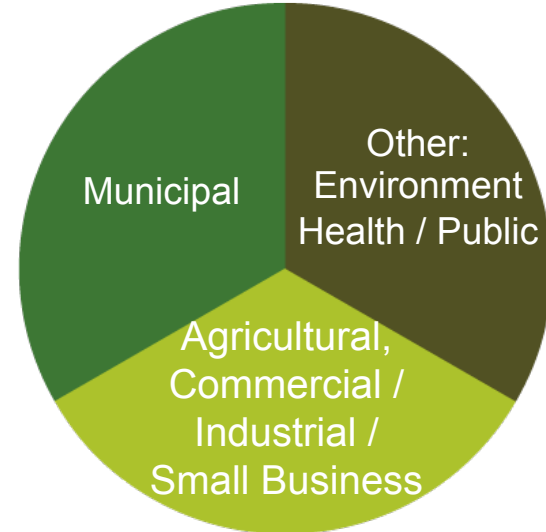
Implementation

Implementing policies, monitoring, reporting

# Key Players

## Source Protection Committee (SPC)

- Multi-stakeholder committee, 1/3 municipal representation
- Responsible for (1) terms of reference, (2) assessment report, and (3) source protection plan
- Lead local consultation in development of these documents



*support*

## Source Protection Authority (Conservation Authority)

- Appoints the SPC and provides administrative and technical support to the Committee
- A conservation authority exercises and performs the powers and duties of the source protection authority (SPA)



# Other Key Players

## Municipalities

- Participate in the development of the terms of reference (ToR), assessment report (AR) and source protection plan (SPP)
- Implementers and enforcers of local measures against drinking water threats.
- Lead implementer for Part IV policies

## MOECC – Source Protection Programs Branch

- Develop and provide guidance on CWA and Regulations
- Provide funding for SP planning
- Approvals (ToR, AR, SPP)
- Enforcement in unorganized territory

## Crown Ministries

- Implement SPP policies related to permits, approvals or licenses issued
- Implement non-legally binding specify action policies
- Provides guidance, data/information sharing, instrument amendments & compliance as required by policies

# Involving First Nations in Source Protection

## *Member of a Source Protection Committee:*

- The CWA regulation created seats for First Nations on source protection committees where their lands are located within the source protection regions.
- Committees are required to notify the Chiefs of these First Nations of the opportunity for Band Councils to select a person to be appointed to the SPC.
- Where there are more communities than seats available, they must jointly appoint a representative.
- The First Nations then decide if they want to have a representative in the available seat.

## *Review and Input into Planning Process:*

- SPCs are required to notify Chiefs of First Nations communities with reserves in source protection areas of their opportunity to review and comment on the draft terms of reference, assessment report and the source protection plan.

## *Including First Nations systems in Source Protection Plans:*

- The CWA provides for the source protection planning process to include First Nation systems, through band council resolution and provincial regulation.

# Assessment Reports: The Science

Summary documents containing the scientific work to assess Ontario's sources of drinking water:

- Maps vulnerable areas around wells and surface water intakes serving specific drinking water systems to be protected and risks from land based threat activities to water sources.
- Assesses water quality and quantity threats for both existing and future drinking water supplies.
- Prepared in accordance with the Clean Water Act, General Regulation, Director's Technical Rules, and local terms of reference (workplan).
- Threat identification based on intrinsic risk – not managed risk.

# List of Prescribed Drinking Water Threats – Activities

(General Regulation 287/07)

The establishment, operation or maintenance of a waste disposal site within the meaning of Part V of the Environmental Protection Act.

The application of agricultural source material to land.  
The storage of agricultural source material.  
The management of agricultural source material.

The application of pesticide to land.  
The handling and storage of pesticide.

The application of commercial fertilizer to land.  
The handling and storage of commercial fertilizer.

The handling and storage of non-agricultural source material.

The application of non agricultural source material to land

The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard

The management of runoff that contains chemicals used in the de-icing of aircraft.

The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage.

The handling and storage of an organic solvent

The handling and storage of a dense non-aqueous phase liquid.

The handling and storage of fuel.

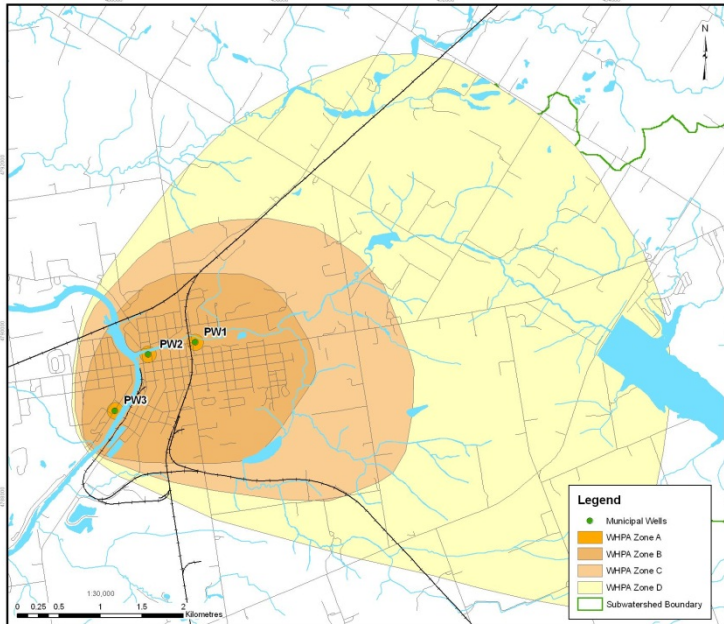
The storage of snow.

The application of road salt.  
The handling and storage of road salt.

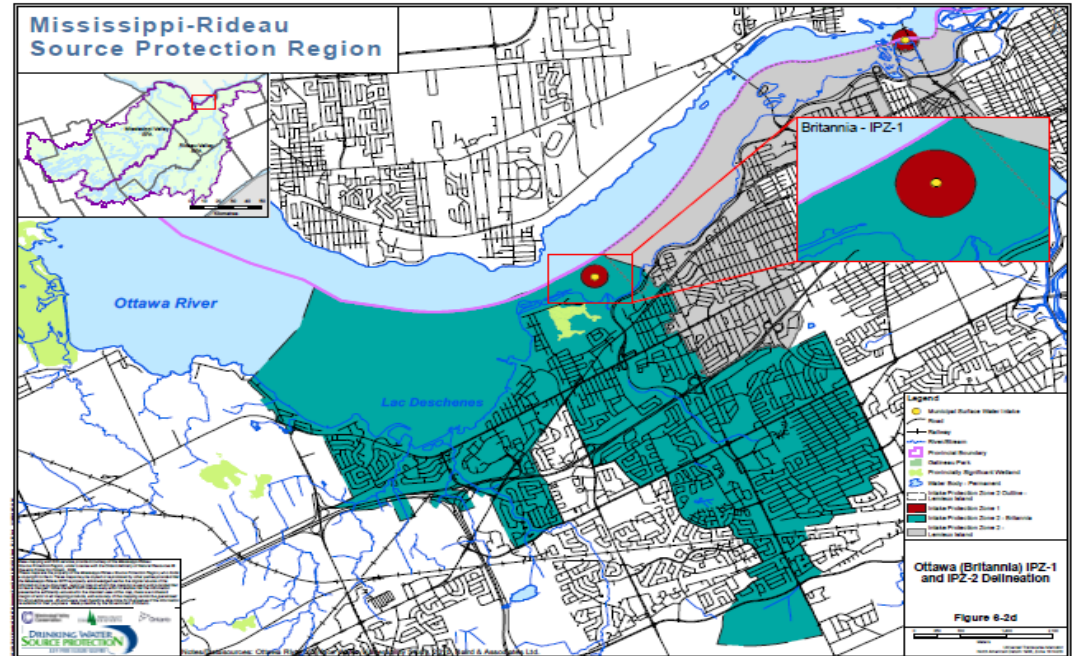
An activity that takes water from an aquifer or a surface water body without returning the water taken to the same aquifer or surface water body.

An activity that reduces the recharge of an aquifer.

# Assessment Reports



Example of Groundwater Vulnerable Area Delineation: Wellhead Protection Area (WHPA)

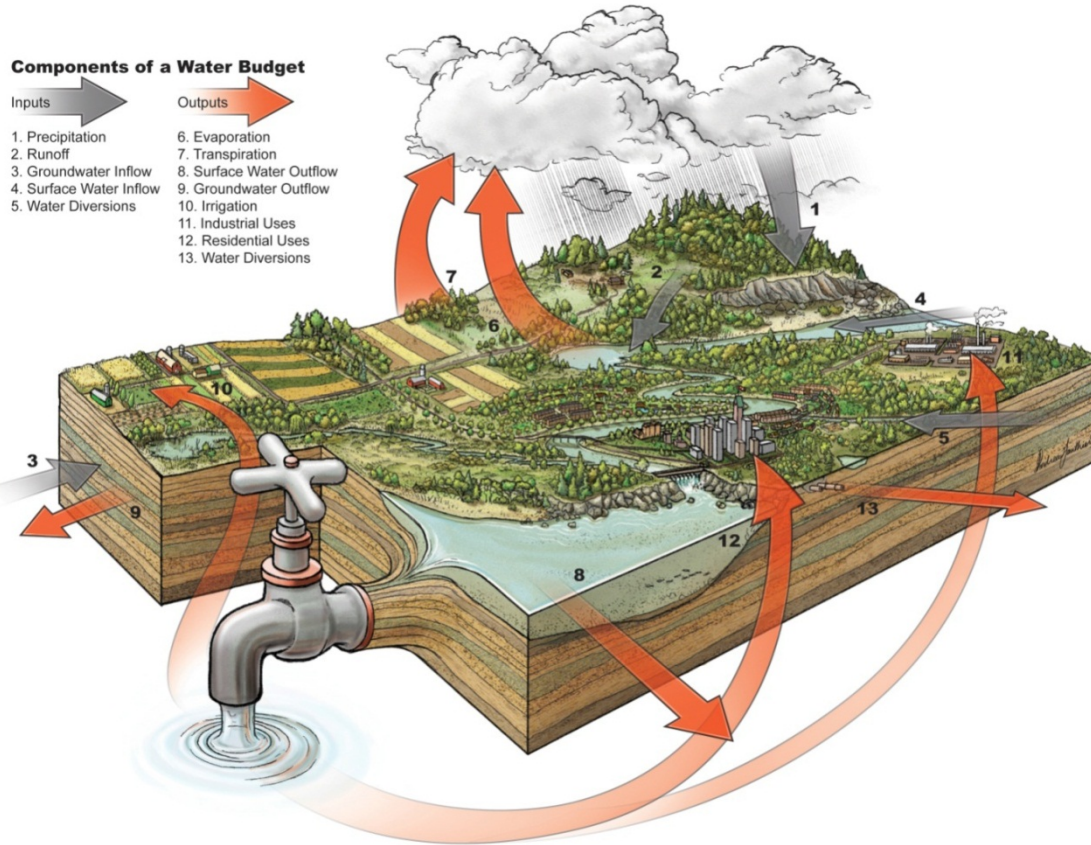


Example of Surface Water Intake Protection Zone (IPZ)

# Water Quantity Vulnerability Analysis – Water Budgets

## Components of a Water Budget

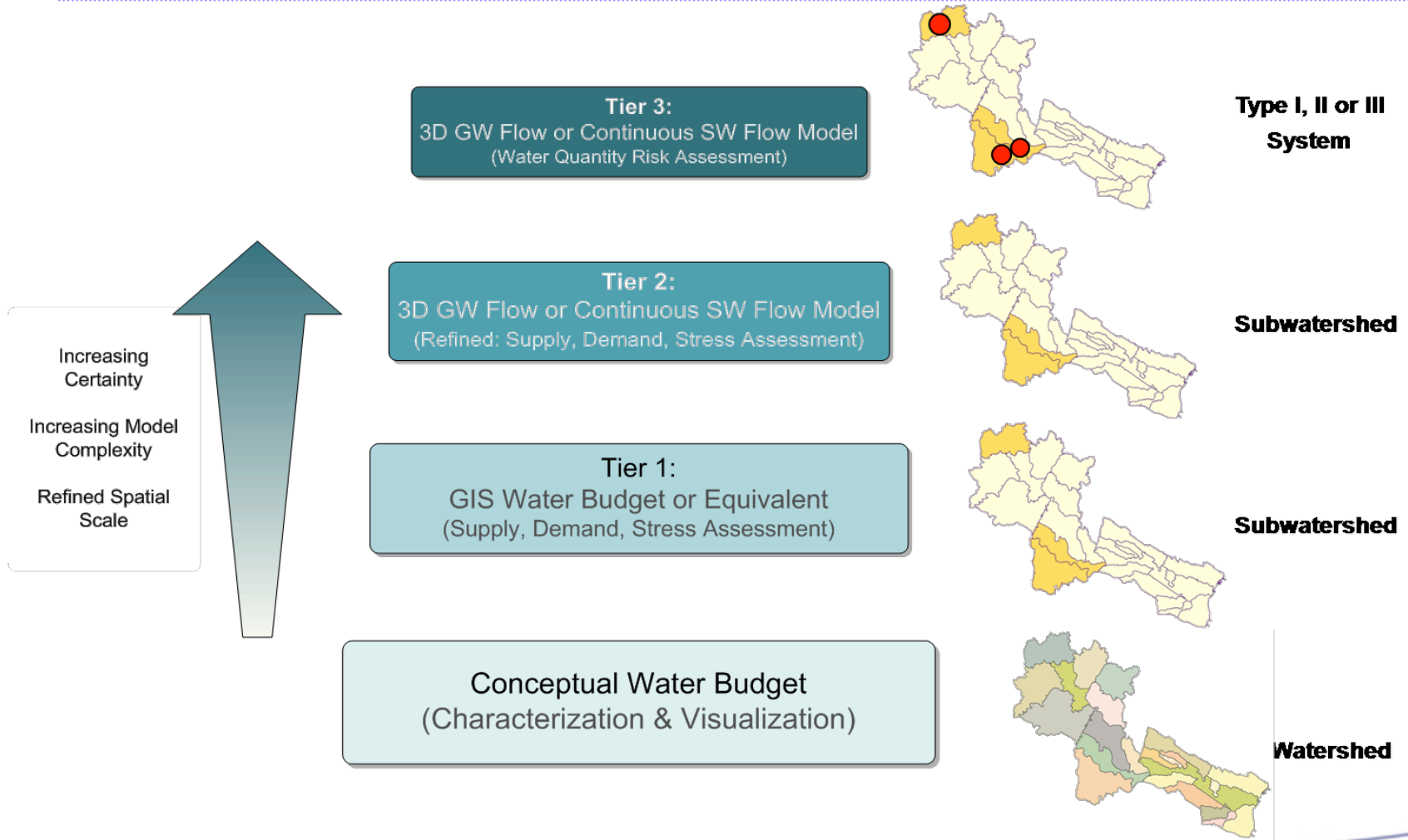
Inputs	Outputs
1. Precipitation	6. Evaporation
2. Runoff	7. Transpiration
3. Groundwater Inflow	8. Surface Water Outflow
4. Surface Water Inflow	9. Groundwater Outflow
5. Water Diversions	10. Irrigation
	11. Industrial Uses
	12. Residential Uses
	13. Water Diversions



(Conservation  
Ontario, 2009)

- Water Budgets focus on water quantity – the amount of water available
- By analyzing how much water enters a watershed, how much is stored and how much leaves, this information is used to balance needs between human uses and natural processes.
- The Water Budget process can include up to four levels of analysis, with the technical analysis becoming more complex if concerns about water quantity arises.

# Tiered Water Budget Framework



# Water Quantity Risk Assessment Process

## Study Area Characterization

Step 1 – Document physical characteristics of study area

Step 2 – Document water use

Step 3 – Detailed municipal well characterization and pumping rates

Step 4 – Document existing and planned land use

Step 5 – Document “other water uses”

## Numerical Model Development

Step 6 – Develop and calibrate Tier 3 numerical models (surface water & groundwater)

## Risk Assessment

Step 7 – Delineate IPZ-Q, WHPA-Q1, WHPA-Q2 and Local Areas

Step 8 – Evaluate risk assessment scenarios and impacts to “other water uses”

Step 9 – Assign risk levels to Local Areas

Step 10 – Identify and list Significant Drinking Water Threats



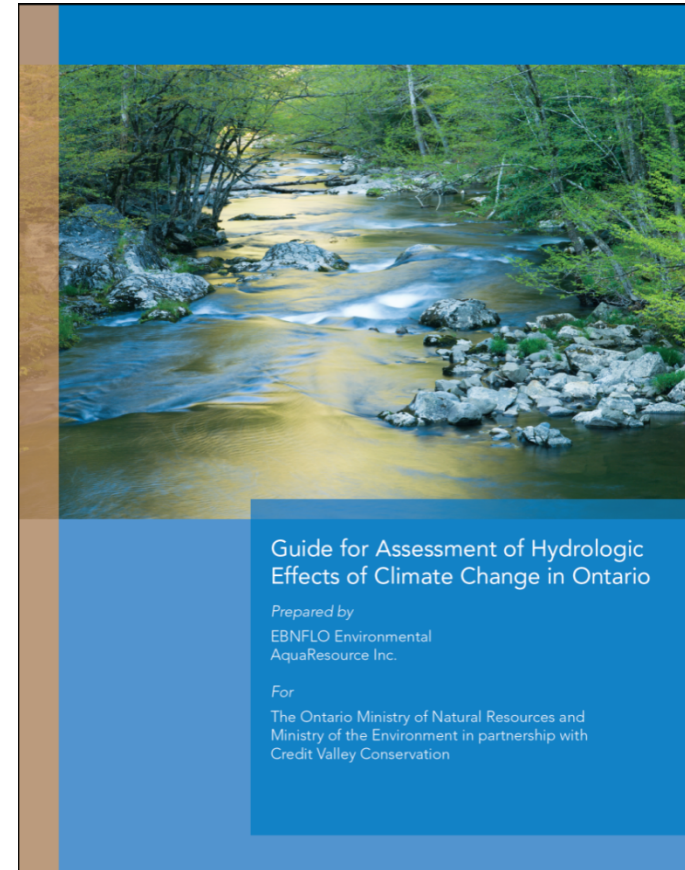
# Climate Change

- The Director's Technical Rules which govern the content of an Assessment Report enables the inclusion of climate change projections into an Assessment Report.
- Under the Technical Rules the Director of MOECC's Source Protection Programs Branch can give direction to a Source Protection Committee to consider climate change projections in any aspect of an Assessment Report.
- The Source Protection Committee can also be directed to use a specific climate data set and include this information in an updated water budget.
- Guide developed to help incorporate climate change information and data sets were generated for use in water budget models

# Guide for Assessment of Hydrologic Impacts of Climate Change

<http://waterbudget.ca/publications>

- Background on Observed and Projected Climate Change
- Global Climate Change Models (GCMs) and GHG Emission Scenarios
- Methods for Developing Local Climate Future Climate Data Scenarios
- Summary of Potential Hydrologic Impacts of Climate Change
- Step by Step Climate Change Impact Assessment and Case Study



# Future Climate Data Series and WEB Application 2011

- Gridded GCM projections downloaded from Canadian Climate Change Scenarios Network [www.cccsn.ca](http://www.cccsn.ca)
- Change Fields calculated and applied to existing climate data for all 339 climate stations
  - 27 GCM runs
  - Up to 3 emission scenarios
  - 2020's, 2050's and 2080's
- Also weather generator output (4 GCMs & 3 emission scenarios)
- Investigating including output from Regional Climate Modelling

## GCM/RCM Monthly Data Download

**Geo-selection**

Map | Satellite | Hybrid | Terrain

Start Latitude: 57.04      Start Longitude: -95.63  
End Latitude: 41.90      End Longitude: -73.39

**GCM Variable Selection**

Select Assessment: SAR (1995) | Select Model: CNRMCM3 - Run 1 | Select Experiment: SR-A1B | Select Variable: Air Temperature - Mean Max (2m)

TAR (2001) | CSIROMc3.0 - Run 1 | SR-A2 | Air Temperature - Mean Min (2m)

ARR (2007) | CSIROMc3.5 - Run 1 | SR-B1 | Precipitation - Total

ECHAM5OM - Mean | ECHO-G - Mean | Sea Level Pressure

Surface Downwelling Shortwave Radiation

**Temporal Selection**

Time of Year: All Months

Select a Time Period: Custom      2041 - 2070

Perform anomaly

**Output Options**

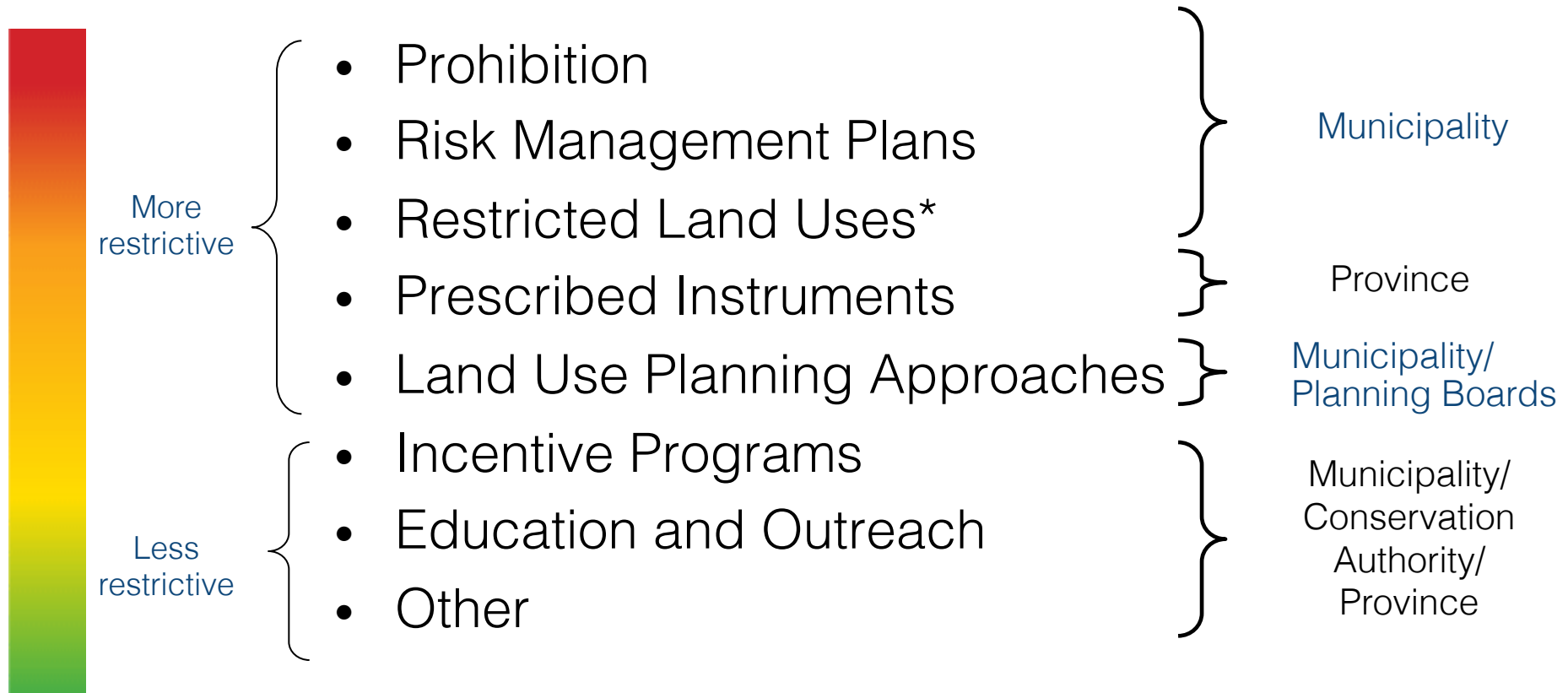
raw (CSV)

Retrieve

# Source Protection Plan – Address Risks

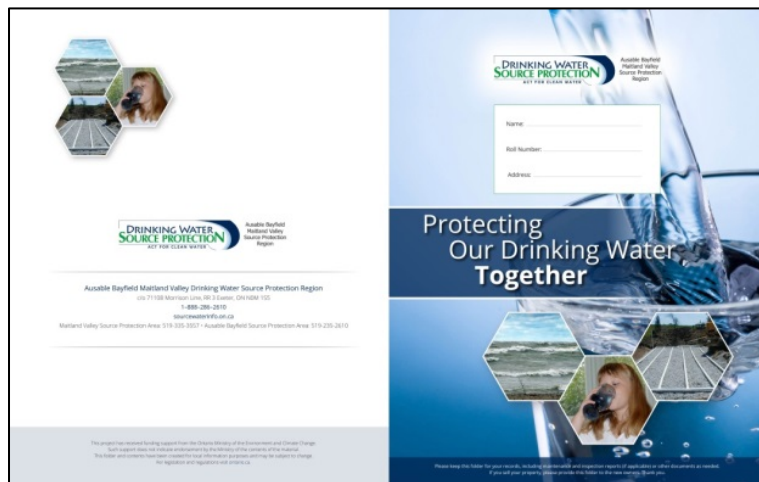
- Source Protection Plans contain policies to protect existing and future sources of drinking water
- Policies use a range of implementing tools and may affect activities and land use planning in identified vulnerable areas

# Source Protection Plan - Tools



# Source Protection Plan Implementation

- 22 source protection plans protect the sources of over 450 municipal drinking water systems across Ontario.
- All source protection plans are now in effect. Implementation of the plans is underway across Ontario.



# Source Protection Plan Policies: Implementation Responsibilities

# Annual Progress Reporting

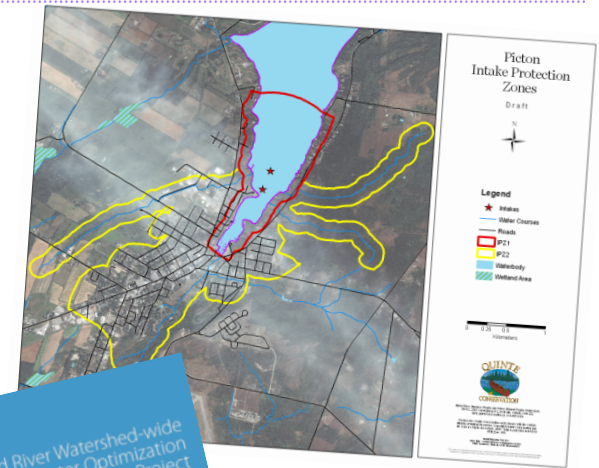




# Provincial Investment

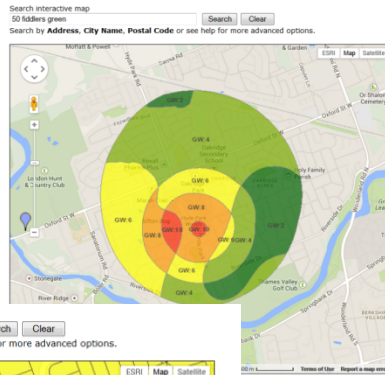
Province has invested over \$250M in the source protection program since 2006 which has resulted in:

- Building local capacity – 19 multi-stakeholder source protection committees and source protection authority staff
- Pulling together existing and new science on a watershed scale, which is benefitting multiple program areas beyond drinking water
- Assisting local municipalities and local communities through the Ontario Drinking Water Stewardship Program
  - over 3000 projects funded
- Assisting about 200 small, rural municipalities to implement source protection plans through the Source Protection Municipal Implementation Fund

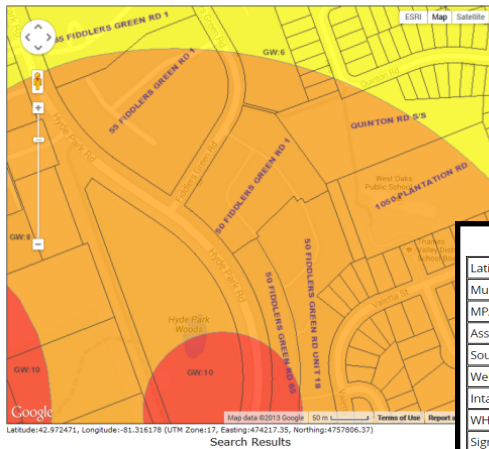


# Source Water Protection Environment Map

Search interactive map  
50 fiddlers green  
Search by Address, City Name, Postal Code or see help for more advanced options.



Search interactive map  
50 fiddlers green  
Search by Address, City Name, Postal Code or see help for more advanced options.



- Housed on Ontario.ca. ( <http://www.applications.ene.gov.on.ca/swp/en/> ).
- User friendly and interactive with a search results box that provides property details and maps.
- Hyperlinks to partner websites and tools (a one stop shop for source protection).
- Email [Sourceprotection@ontario.ca](mailto:Sourceprotection@ontario.ca) for assistance.

## Search Results

Latitude: 43.325520 Longitude: -79.799032	UTM Zone: 17 Easting: 597371 Northing: 4797665
Municipal - Upper Tier: REGIONAL MUNICIPALITY OF HALTON	Municipal - Single and Lower Tier: CITY OF BURLINGTON
MPAC Street Address: 426 BRANT ST CITY OF BURLINGTON	Township, Concession and Lot: NELSON BRANTS BLOCK,
Assessment Roll Number: 24020606050110000000	Property Information Number: 070820163
Source Protection Area Name: Halton	
Wellhead Protection Area (WHPA): No	Groundwater Vulnerability Score: N/A
Intake Protection Zone 1 or 2: IPZ-2	Surface Water Vulnerability Score (if $\geq 8$ ): N/A
WHPA - Groundwater Under Direct Influence (GUDI): No	GUDI Vulnerability Score: N/A
Significant Groundwater Recharge Area: No	Highly Vulnerable Aquifer: High
Issue Contributing areas (ICA): No	ICA Issues: N/A
Niagara Escarpment Development Control Area: No	Oak Ridges Moraine Planning Area: No

# Making it Easier - Available Resources

Agriculture,  
Nutrients and  
Pesticides

Hazardous  
Liquids

Road Salt/Snow

Handling and  
Storage of  
Heating Fuel

Handling and  
Storage of  
Liquid Fuel

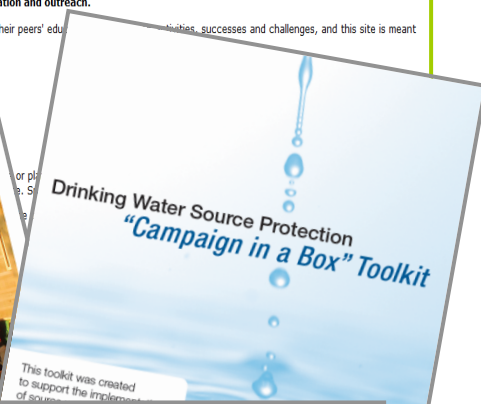
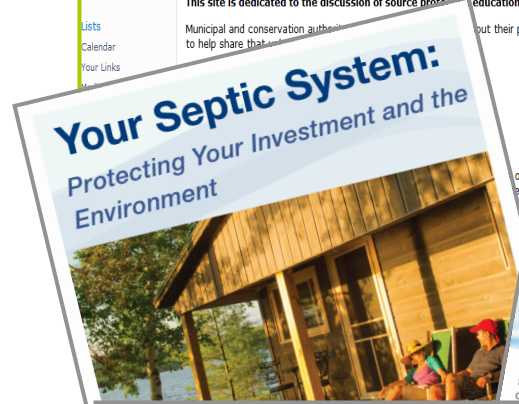
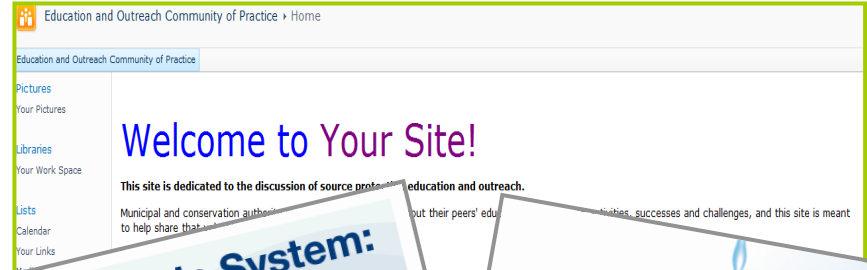
On-site Sewage  
(Septic)  
Systems

Well  
Abandonment  
and Testing

General  
Messages

Water  
Conservation

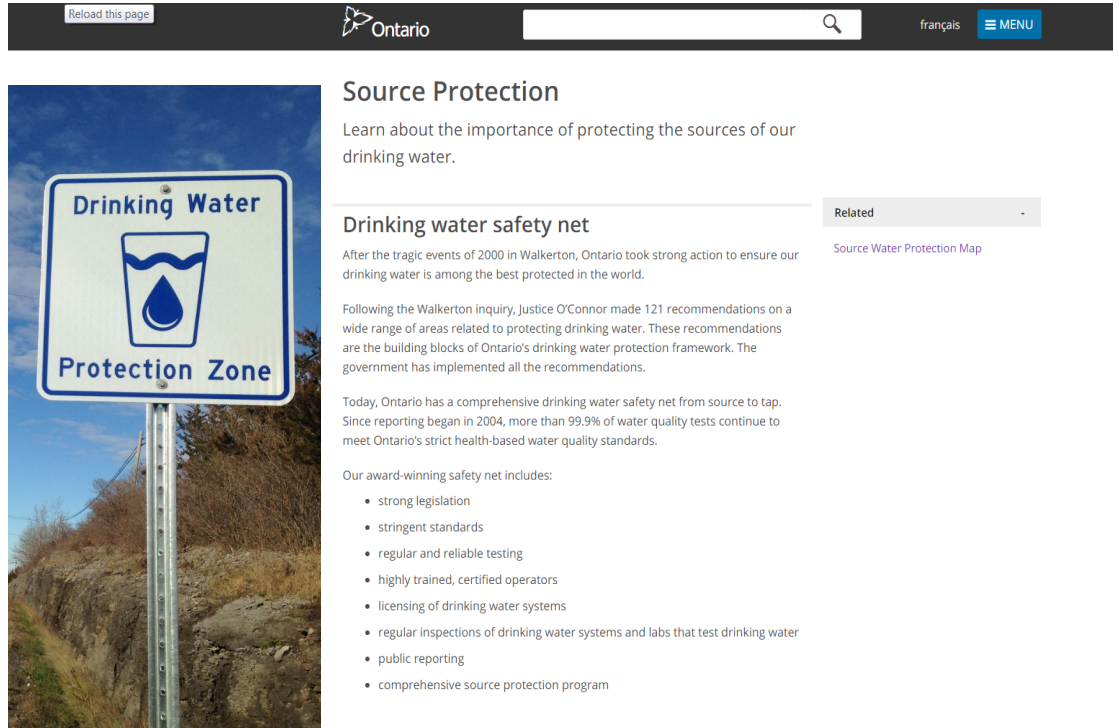
Drinking Water  
Protection Zone  
Road Signs



# More Information

<https://www.ontario.ca/page/source-protection>

Have a Question → E-Mail:  
[source.protection@ontario.ca](mailto:source.protection@ontario.ca)



The screenshot shows the Ontario government website's 'Source Protection' page. At the top, there is a navigation bar with a search icon, the text 'français', and a 'MENU' button. Below the navigation bar, the page title 'Source Protection' is displayed. The main content area includes a sub-header 'Drinking water safety net' and a list of bullet points detailing the safety net's components. A 'Related' section on the right side of the page features a link to the 'Source Water Protection Map'. A 'Reload this page' button is visible in the top left corner of the page content area.

Reload this page

Ontario

français MENU

## Source Protection

Learn about the importance of protecting the sources of our drinking water.

### Drinking water safety net

After the tragic events of 2000 in Walkerton, Ontario took strong action to ensure our drinking water is among the best protected in the world.

Following the Walkerton inquiry, Justice O'Connor made 121 recommendations on a wide range of areas related to protecting drinking water. These recommendations are the building blocks of Ontario's drinking water protection framework. The government has implemented all the recommendations.

Today, Ontario has a comprehensive drinking water safety net from source to tap. Since reporting began in 2004, more than 99.9% of water quality tests continue to meet Ontario's strict health-based water quality standards.

Our award-winning safety net includes:

- strong legislation
- stringent standards
- regular and reliable testing
- highly trained, certified operators
- licensing of drinking water systems
- regular inspections of drinking water systems and labs that test drinking water
- public reporting
- comprehensive source protection program

Related

[Source Water Protection Map](#)

