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SOURCE WATER PROTECTION PLANNING

Northern Ontario First Nations Environment Conference

Oct. 3, 2013

Sioux Lookout, ON

Stephanie Allen, Environmental Scientist



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OFNTSC – WHO WE ARE

Staff includes:

- Engineers
- Environmental Scientists
- Infrastructure Specialists
- Housing Advisor
- Fire Safety Officer
- O&M Advisor
- Emergency Planning Officer
- CRTP Water Trainers
- CRTP Fuel Trainer
- Communications Officer
- plus management, finance and administrative staff

- Established in 1995 by Ontario Chiefs in Assembly in response to devolution policy of federal gov't
- 24 member Board of Directors with representative of each Tribal Council, large First Nations, and UFN
- Provide technical advisory services to 134 First Nations and 16 Tribal Councils in Ontario
- Provide direct services to 22 unaffiliated First Nations
- Two offices: Toronto & Thunder Bay



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OFNTSC – ENVIRONMENT



Types of Services:

- **Advisory** – provision of information such as generic TOR, BMPs, guidance material, INAC process, forms, policy & legislation, funding
- **Training** – dependent on client needs and available funding
- **Technical** – scientific / technical project reviews, support to project committees
- **Special Projects** – based on need, time, and funding availability



OFNTSC – ENVIRONMENT



- Solid Waste Management & Diversion
- Environmental Assessment
- Spills & Environmental Emergencies
- Water Quality & **Source Water Protection**
- Contaminated Site Assessment & Remediation
- Community Sustainability & Planning
- Energy Efficiency & Conservation
- Environmental Legislation & Regulations
- Environment Funding Opportunities



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PRESENTATION OVERVIEW



1. What is Source Water Protection
2. The Planning Process
Activity: Why is Water Important
3. Gathering Background Information
4. Establishing Your Vision
5. Data Collection & Analysis
6. Taking Action

Activity: Brainstorming Actions



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Multi-barrier approach
Planning Scale
Water Contamination

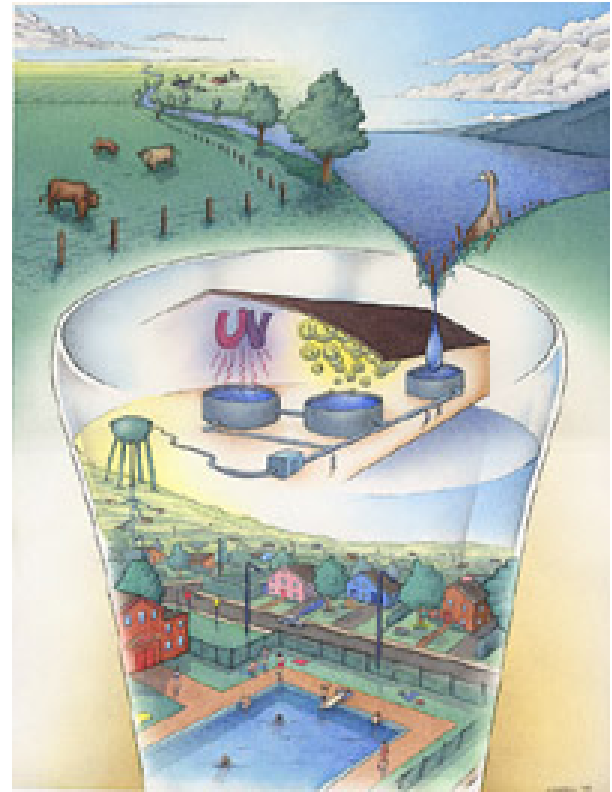
1. SOURCE WATER BASICS



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1. WHAT IS SOURCE WATER PROTECTION?

- Source water = untreated groundwater or surface water used to supply human drinking water
- Protection = both the quality and quantity of drinking water sources
- First Nations definitions tend to be broader and encompass ecological considerations



MULTI-BARRIER APPROACH

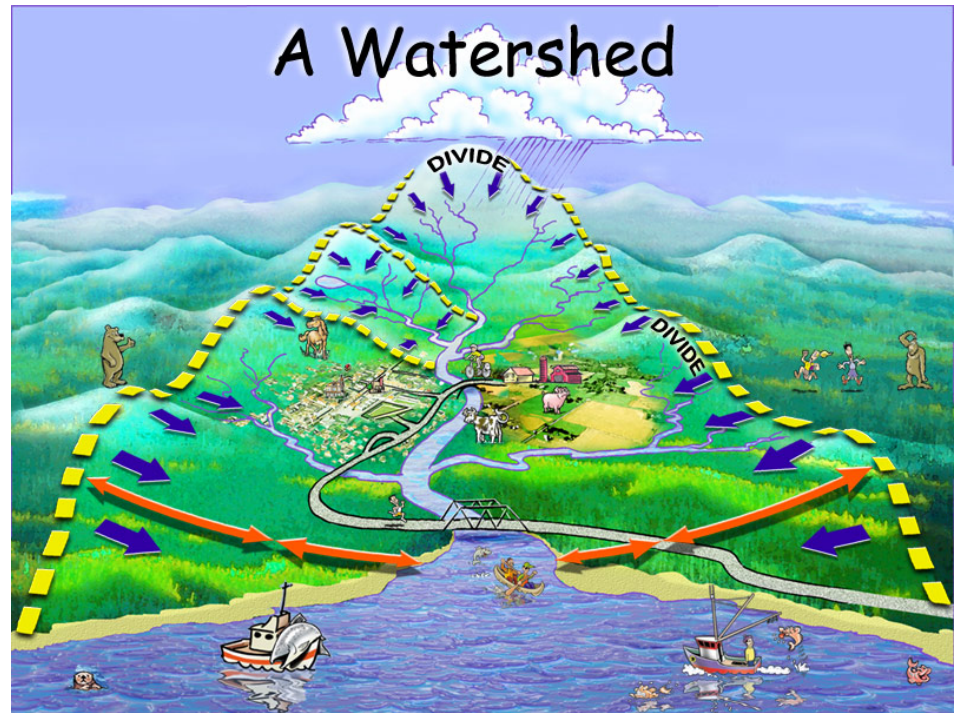


1. Source Water Protection
2. Water Treatment Technology
3. Distribution System Maintenance
4. Water Quality Monitoring, and Testing
5. Emergency Response Planning



SOURCE WATER: PLANNING SCALE

- Wellhead Protection
 - communal groundwater wells
- Intake Protection Zones
 - Surface water intake
- Source Protection
 - drinking water
- Watershed Management
 - ecosystem approach



WATER THE UNIVERSAL SOLVENT & THE MYTH OF ABUNDANCE

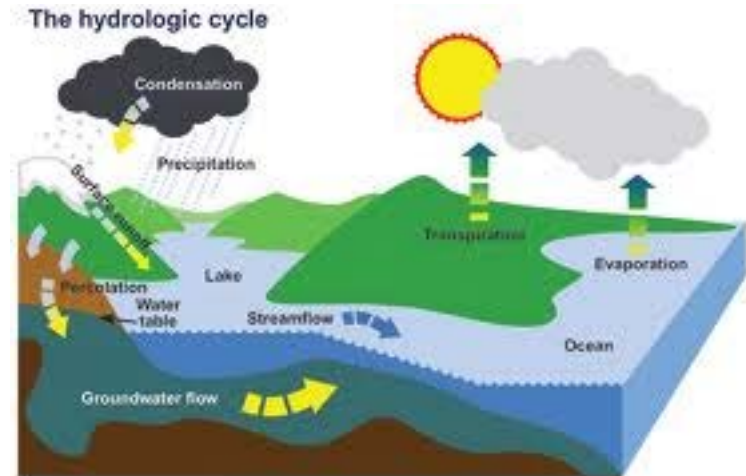
Pure water does not exist
in the natural
environment



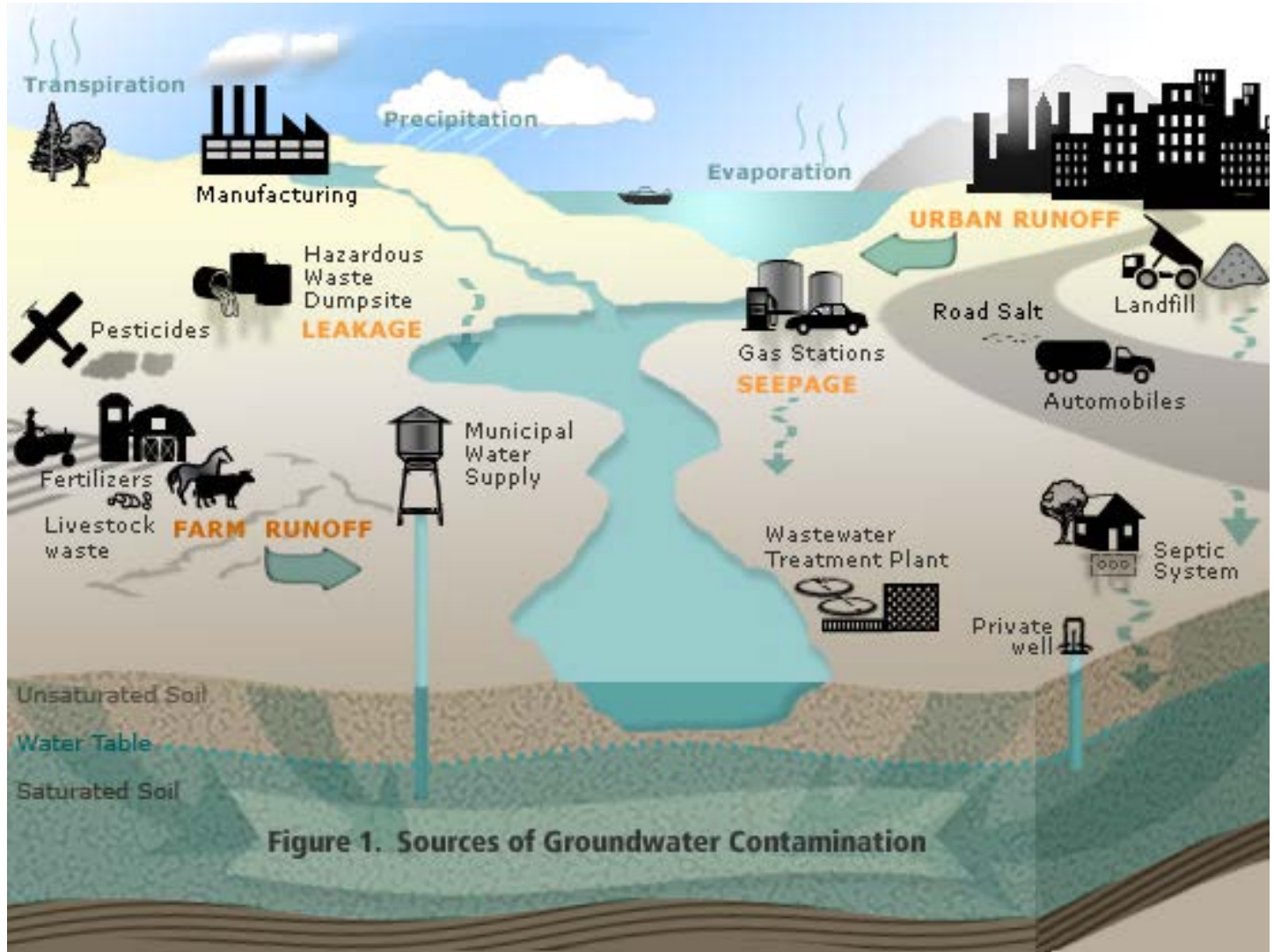
Salt dissolved in water

The myth of abundance

- Fact: Only 1% of Canada's Freshwater is Renewable (groundwater, contamination)

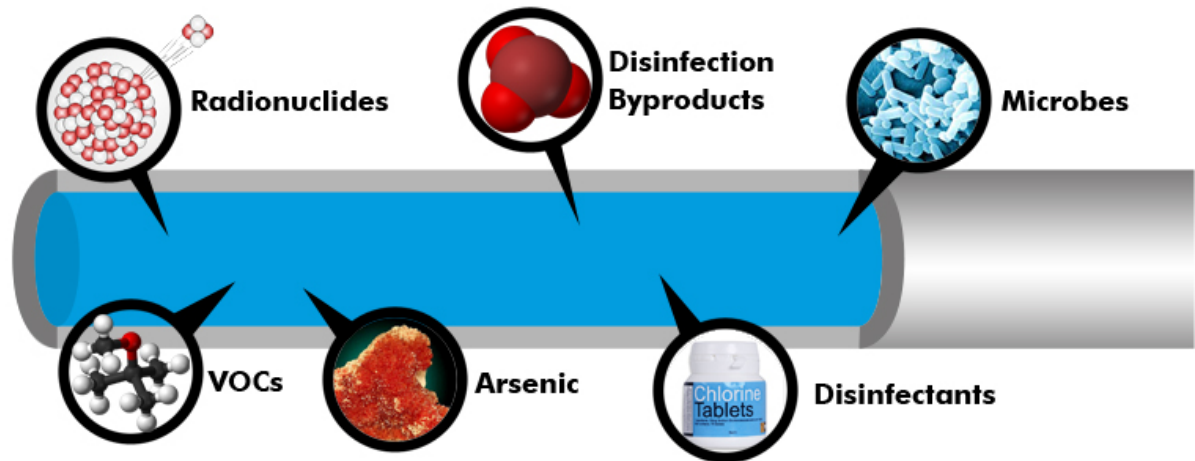


SOURCES OF CONTAMINATION



DRINKING WATER CONTAMINATION

1. Physical
2. Microbial
3. Inorganic
4. Organic
5. Radioactive



Ontario's SWP Planning Process
AANDC SWP Planning Guide
First Nations Planning Processes

2. THE PLANNING PROCESS



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PLANNING: ENVIRONMENTAL ASSESSMENT VS. SOURCE WATER

Source Water (SW)

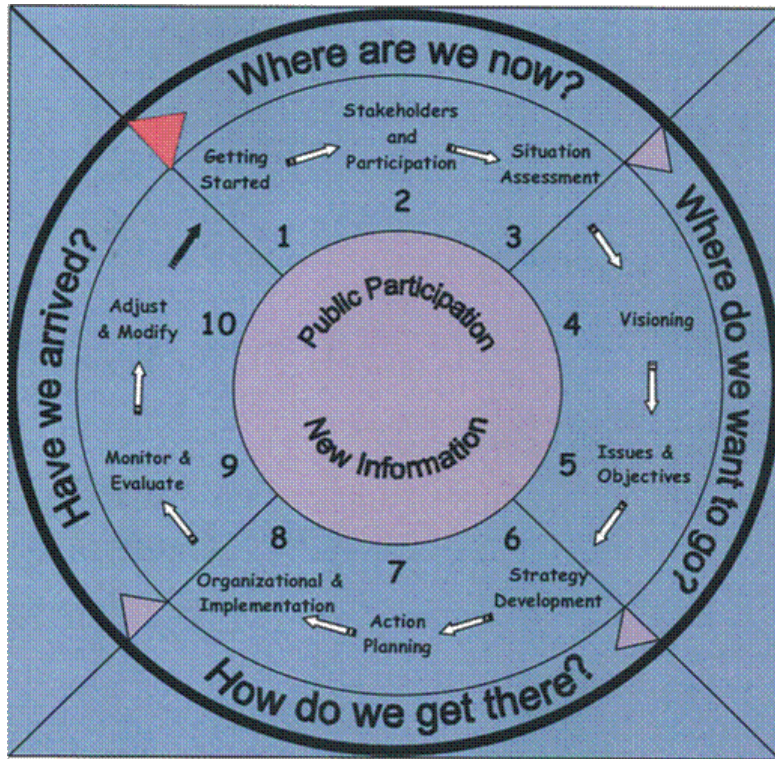
- Scope: drinking water
- Conducted on existing conditions (and future if known)
- Area: entire watershed
- Planning process
- Aim: reduce or eliminate significant threats to SW

Environmental Assessment (EA)

- Scope: air, water, land, plants, animals
- Conducted on future project(s)
- Area: project area (watershed, airshed, depends on project)
- Planning process
- Aim: reduce or eliminate significant environmental threats



2. THE PLANNING PROCESS

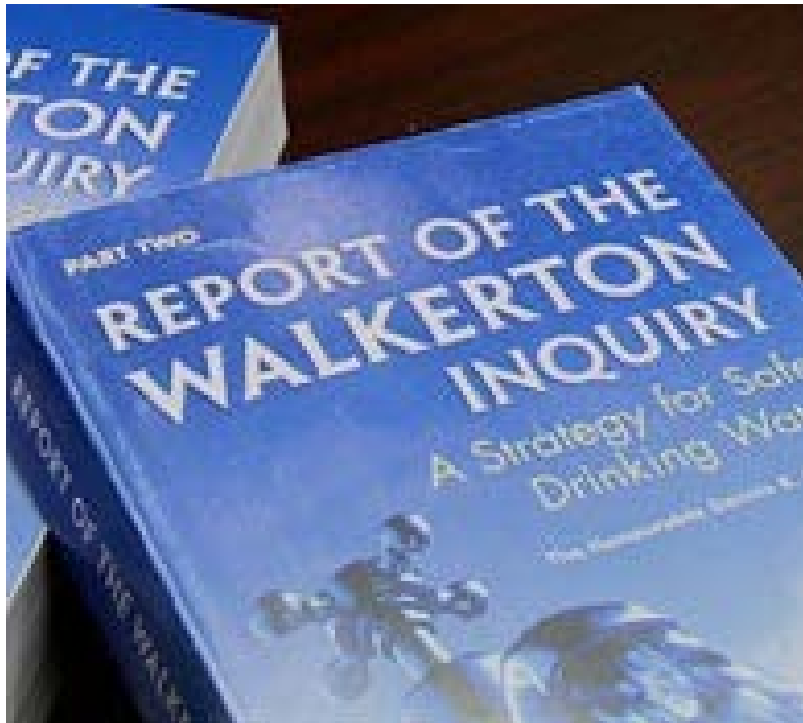


Source: W. Trousdale, EcoPlan International, It



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Ontario & Source Water Protection



- Walkerton tragedy in 2000
- Walkerton Inquiry 2002
 - "The first barrier to the contamination of drinking water involves protecting the sources of drinking water."* - Justice Dennis O'Connor
- Ontario Clean Water Act 2006
- Source Protection Plans by August 2012
- Goal: manage or eliminate significant threats to source water



Ontario Source Water Protection



- 19 Source Protection Areas
- Source Protection Committees:
 - 1/3 Agri/Business
 - 1/3 Municipal
 - 1/3 Public/Other
 - 279 seats
 - 23 First Nation seats (only 12 of 19 SPCs)
- Support provided by Conservation Authorities & Municipal staff



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Ontario's SWP Planning Process



- 2005-2012
 - Ontario Gov't: \$175 million+ to date??
 - *Includes Ontario Drinking Water Stewardship Program (\$28 million)*
- Watershed Studies
- Municipal Technical Studies
- Terms of Reference
- Assessment Report
- Source Protection Plans



So Why Don't We Just Use Ontario's SWP Process??



RAMON WAS A POLISHED PERFORMER, BUT THIS WAS MADNESS... A SQUARE PEG IN A ROUND HOLE, UNASSISTED, AND BLINDFOLDED!!

Graphic by Tim Mellish

- \$\$\$\$
- Conservation authorities & staff
- Structure of Committees: Municipal, Business, NGO
- Scope e.g. individual wells
- Ontario Planning Act related actions



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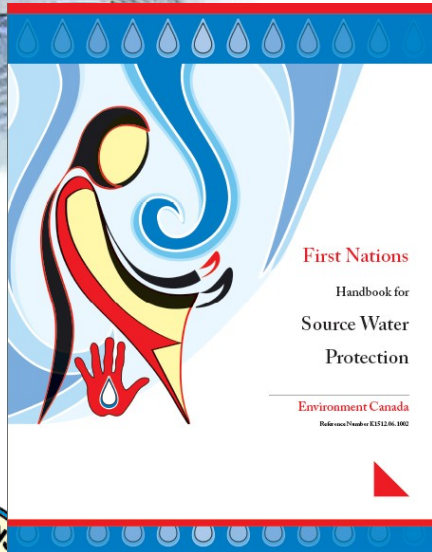
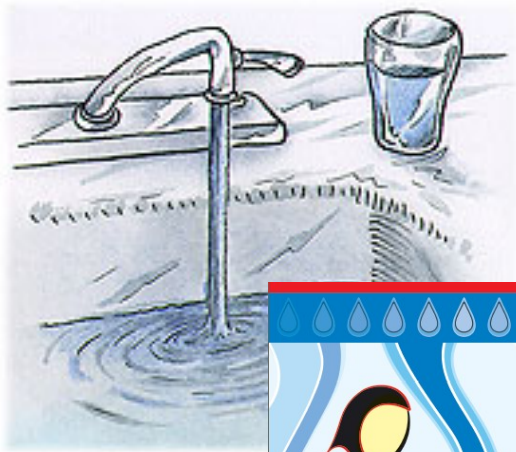
NEW FEDERAL LEGISLATION



- Bill S-8, The Safe Drinking Water for First Nations Act, passed June 19/13
- Federal Backgrounder states: The Act lays out the areas that federal regulations could address, including: ***the protection of sources of drinking water located on reserve***
- The Act itself states: ***(b) the protection of sources of drinking water from contamination*** (emphasis mine).



AANDC GUIDE & TEMPLATE

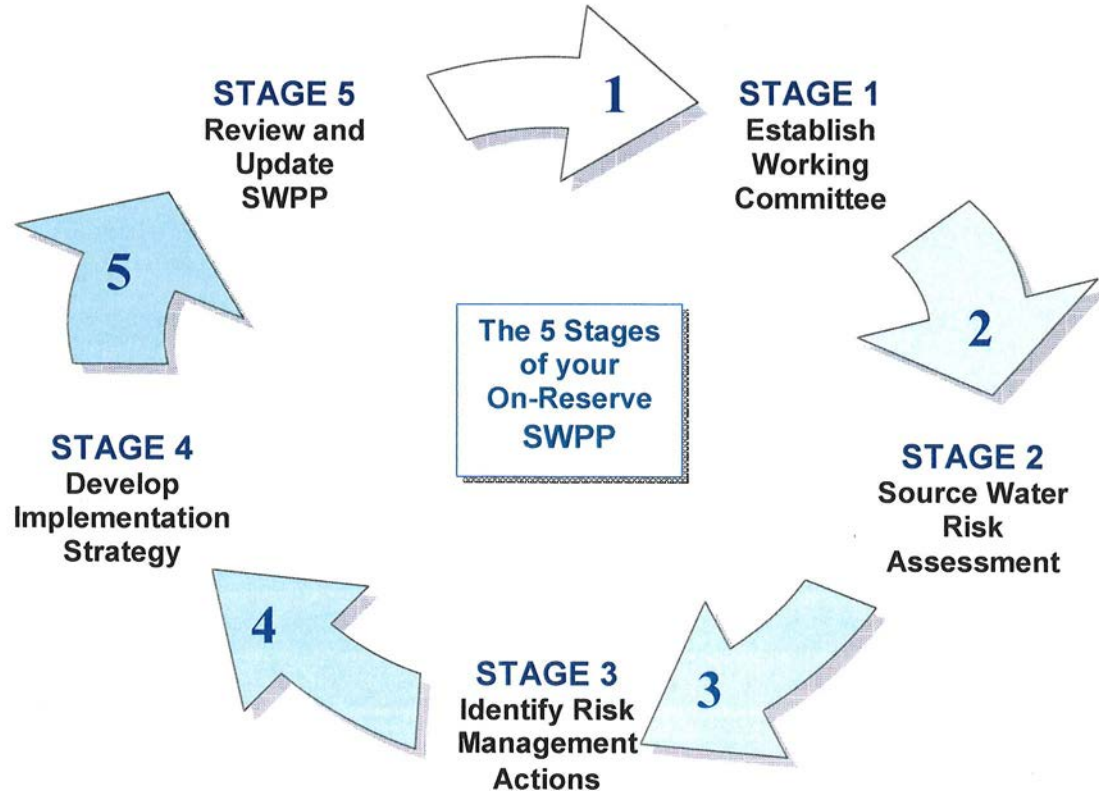


- First Nations On-Reserve Source Water Protection Plan: Guide and Template
- June 2013
- AANDC HQ
- Dr. Robert Patrick, University of Saskatchewan
- Pilot: Siksika First Nation (Alta)



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AANDC SWP STAGES



ELEMENTS OF SUCCESSFUL FIRST NATIONS PLANNING PROCESSES



- Participatory/Community-Based
- Culturally- Appropriate
- Orientated to Capacity Building
- Strategic
- Ongoing & Adaptive
- Action-oriented
- Decision-making Guide



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ACTIVITY: WHY IS WATER IMPORTANT?

Instructions:

- In your break-out group discuss ***why water is important to you*** based on who you have been assigned
- Record your points on flipchart and post your sheet on the wall when finished.
- 10 minutes



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***In every deliberation we must consider
the impact on the seventh generation....***

***WATER IS LIFE. With one mind we send
greetings and thanks to the water.***

Kaianerekowa
(The Great Law of Peace,
Haudenosaunee/Iroquois)



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EVERY PROCESS IS UNIQUE

Survey:

- Who has a WTP? Surface or groundwater? Great Lakes intake? Who has wells? Both?
- Who has WWTP? Type? Who has septic? Both?
- Landfill on-reserve? Fuel tanks? Gas stations?
- Major roads? Harbours/marinas/boat traffic?
- Important waterbodies in community?
- Unique soils and geology e.g. fractured bedrock?
- What industry is in the area?
- What is going on in your watershed? Urbanized or not?



Watersheds, Wellheads, Intakes
Determining Geographic Scope
Sources of Information

3. GATHERING INFORMATION



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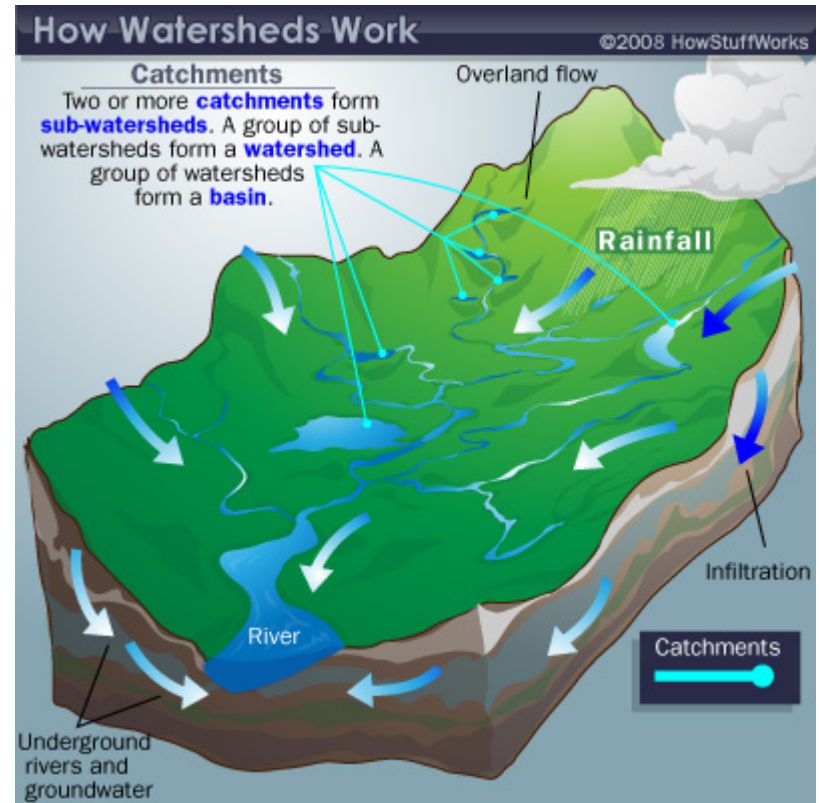
3. GATHERING BACKGROUND INFORMATION

- Describe your watershed
- Describe your community
 - Population
 - Housing lay-out
 - Infrastructure
 - Businesses and industry
 - Roads

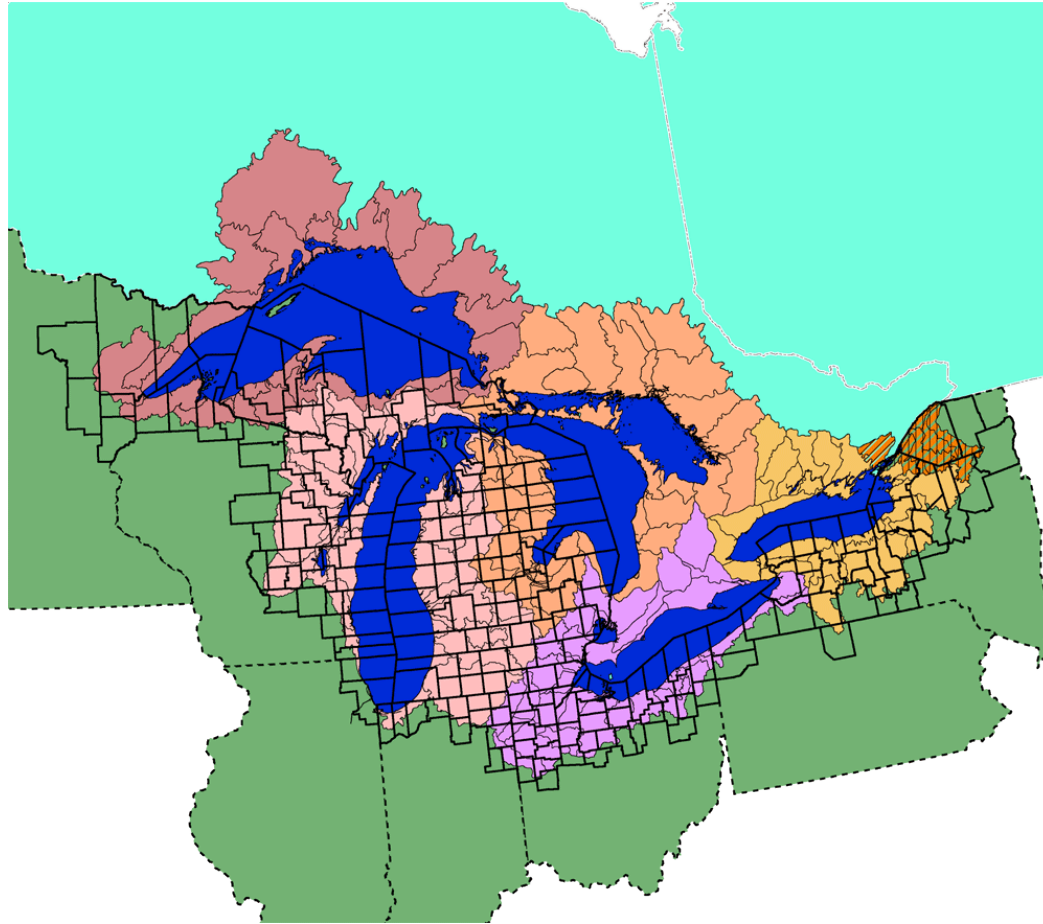


WHAT IS A WATERSHED?

- A Watershed is defined as a specific geographical area whose surface water drains into a common river or lake
- Catchments, sub-watersheds, watersheds, basins

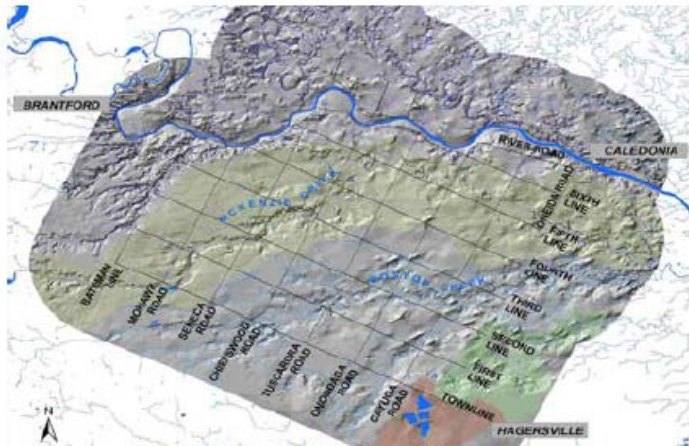


GREAT LAKES WATERSHEDS

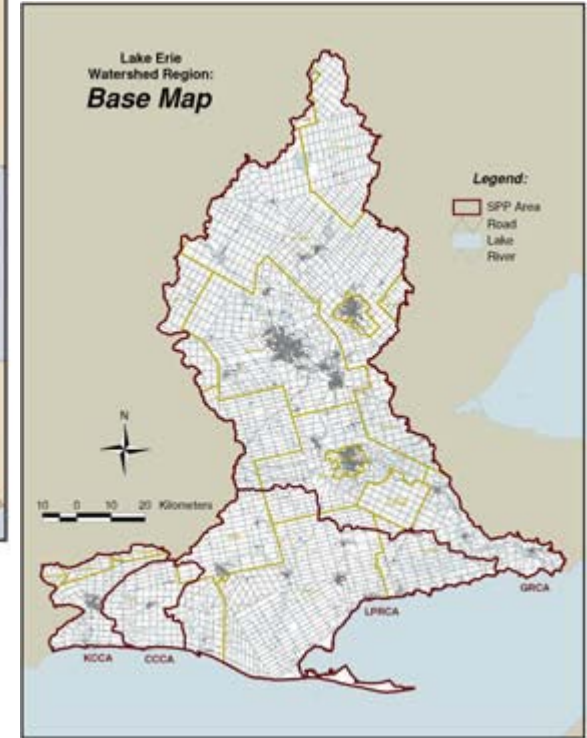
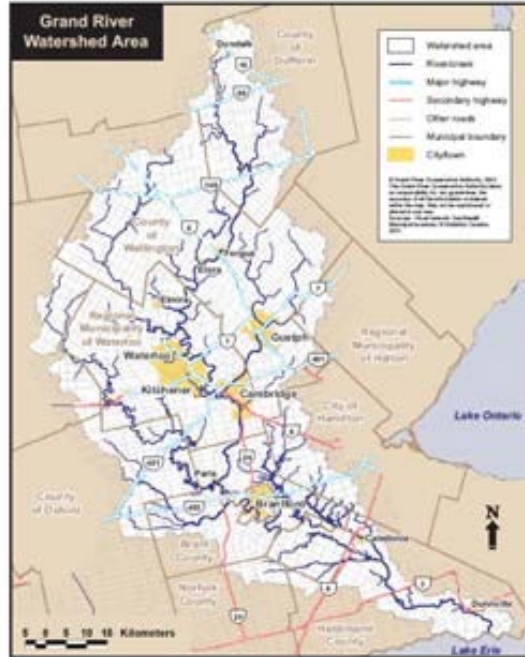


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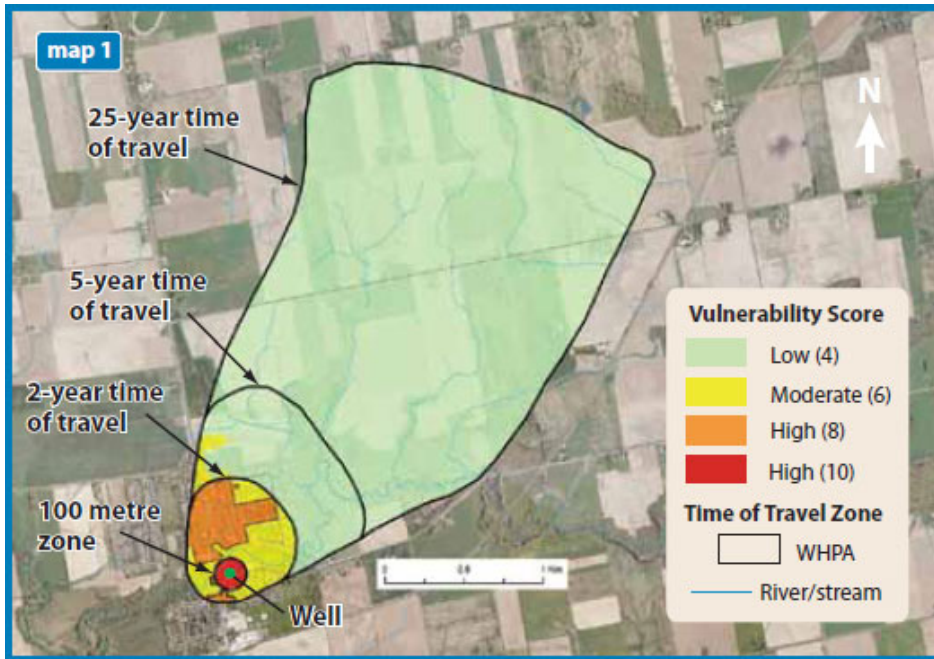
SIX NATIONS & GRAND RIVER



The McKenzie Creek and Boston Creek sub-watersheds cover most of Six Nations.



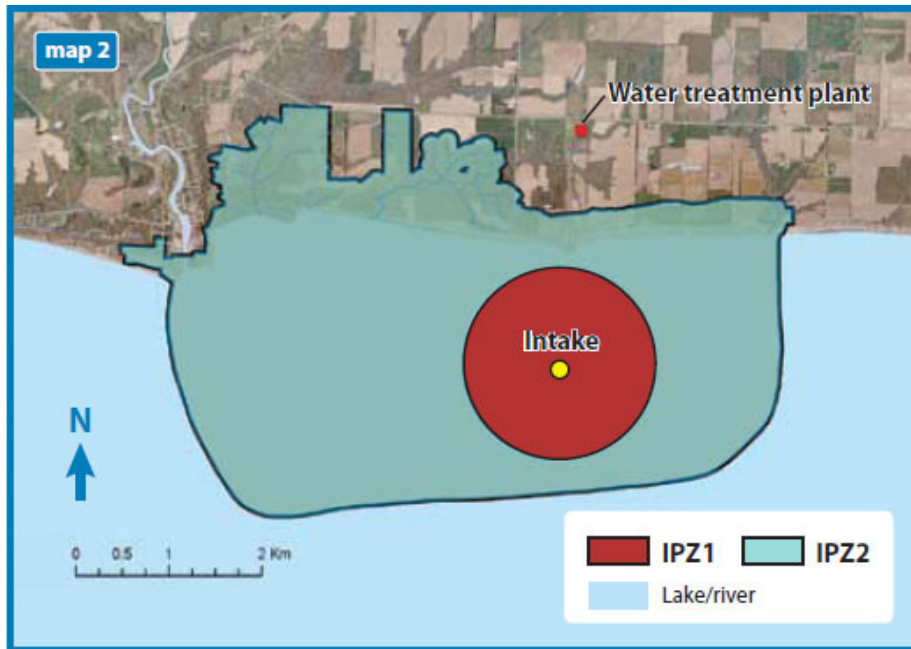
WELLHEAD PROTECTION AREA



- Time of travel
 - 100 m zone
 - 2-year time of travel
 - 5-year time of travel
 - 25-year time of travel



INTAKE PROTECTION ZONES



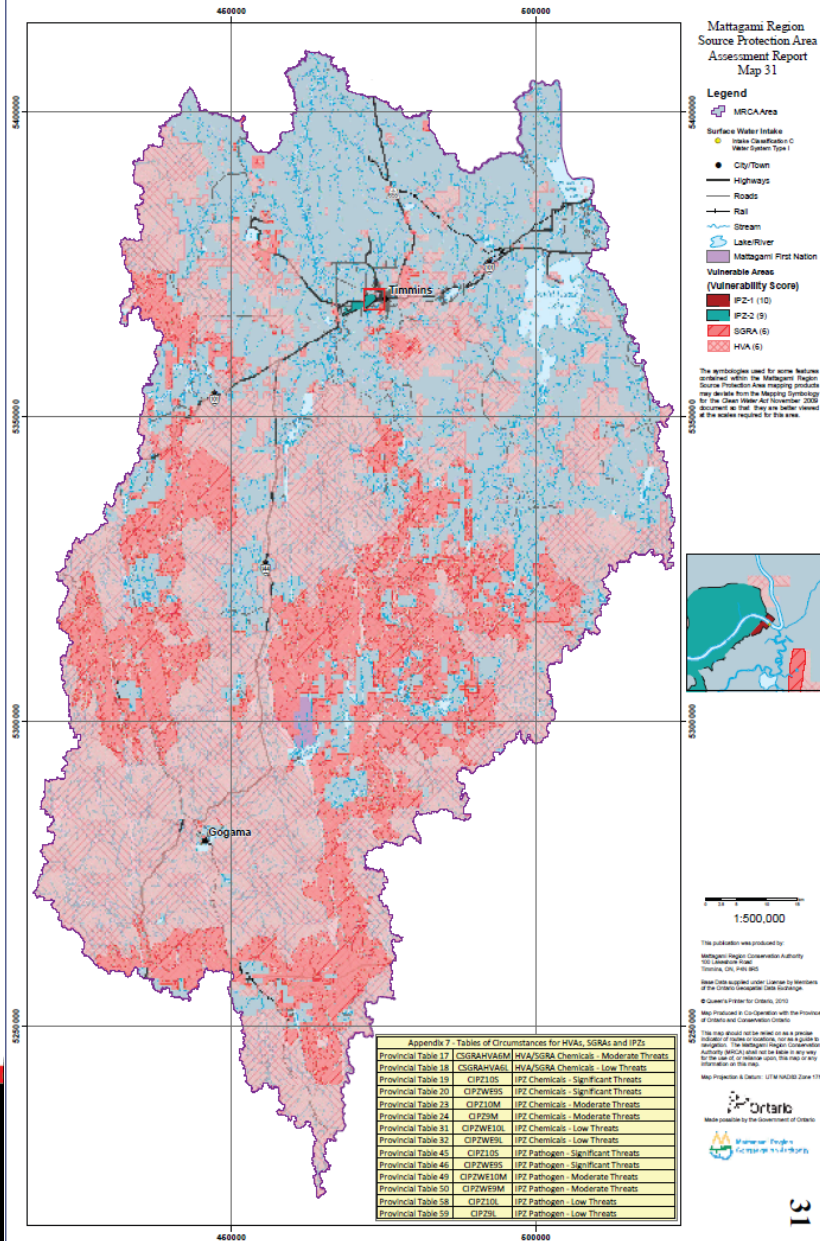
Intake Protection Zones are the areas of land and water that are upstream of a water intake

- Intake Protection Zone 1: most vulnerable
- Intake Protection Zone 2: 2 hour time of travel

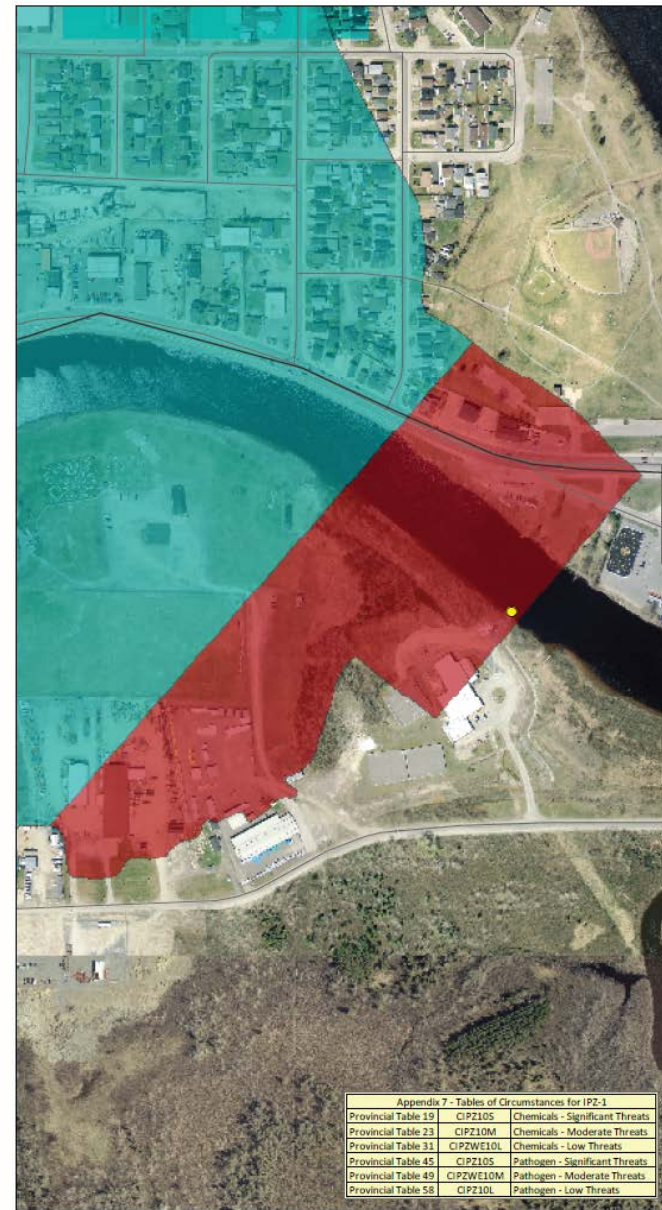


MATTAGAMI WATERSHED & INTAKE PROTECTION ZONE

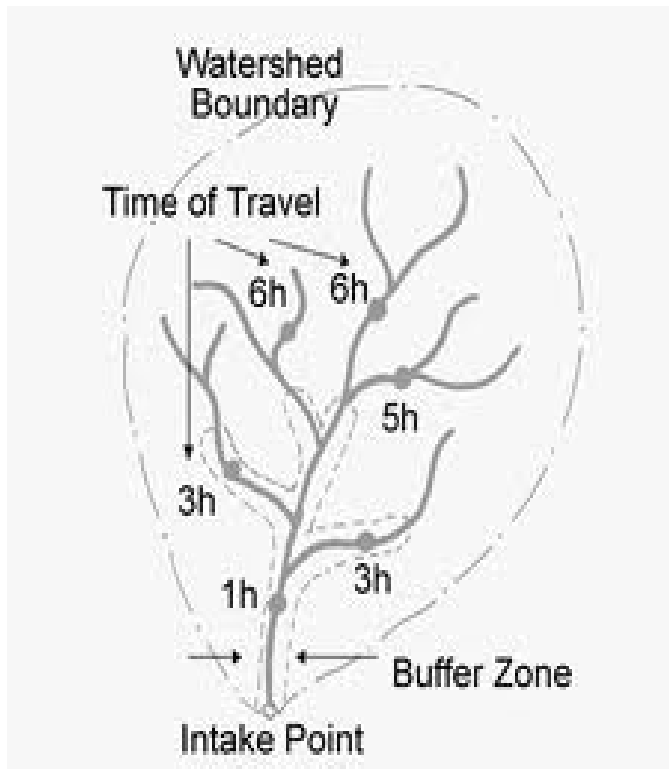
Areas of Potential Significant, Moderate, Low Threats



Intake Protection Zone 1



DETERMINING GEOGRAPHIC SCOPE



- Hydrogeological modeling vs do-it-yourself (BC Guide)
- GW vs SW – think of capital costs and treatment complexities
- GW – think wells, type of soils can calculate
- SW – 6Nations Grand River water, hardest to treat, issue of wells
- Contingencies required if focus on-reserve only



SOURCES OF INFORMATION

- Hydrogeo studies – WTP, WWTP, Landfill
- Conservation Authorities (only 27 FNs)
- AANDC – EII reports, contaminated site database, land lease records
- OMNR
- OMOE – Well Records database
- OMOE – CofAs, brownfields, contaminated sites
- Airphotos (library in Ottawa)
- Similar to a Phase 1 ESA – need to also interview knowledgeable people in the FN



Participatory planning
Indigenous knowledge
Scope of the planning process

4. VISION & SCOPE



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4. ESTABLISHING YOUR VISION

- Define the scope of the planning process
- Yukon River Inter-Tribal Watershed Council – 70 First Nations & Tribes:
Our vision, put simply, is “to be able to drink water directly from the Yukon River”



PARTICIPATORY PLANNING

- Community input
- Values
- Indigenous knowledge
- Data sharing agreements and consent
- Opportunity to support other initiatives e.g. land-use planning



Hands on planning

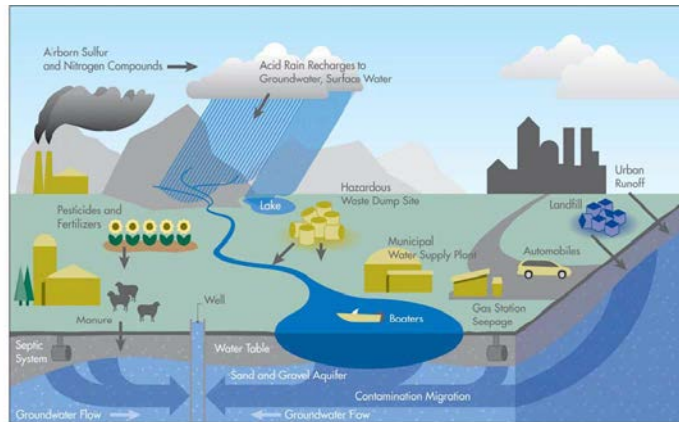
Working Community Planning Weekend, 2007, John Thompson & Partners.

"If you want to know how the shoe fits, ask the person who is wearing it, not the one who made it."



PHOTOVOICE EXAMPLE

- Provides pictorial evidence of community issues (a picture being worth a thousand words)
- One example of a participatory activity
- “Participatory photography and digital storytelling”
- Tool for communication, self-expression & advocacy





Across the bridge

by Krista Harper and the Sajó River Association



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"The very same week that this picture was taken, water pipes were being upgraded in neighborhoods across the bridge." (Photo: Sándor Kelemen)



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"The sewer lines stop at the bridge. This is not a small village—over 2000 people live here. It smells bad, and people can't use their yards for gardening and playing when there is an outhouse in back." (Photo: Sándor Kelemen)



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"Every time you need to wash or cook or clean, someone has to go to the street for water." (Photo: Mariann Bari)



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"Everyone dumps their trash next to our neighborhood...if you look at these piles, there are brands that people in our neighborhood don't use." (Photos: Krista Harper, left; Judit Bari, right)



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"Some families can afford to buy wood, but otherwise you have to collect it along the river. If you get caught, they'll fine you or take your bike away." (Photo: Klaudia Kelemen)



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INDIGENOUS KNOWLEDGE



- Becomes the plan foundation when visioning and values incorporated from outset
- Research protocols
- Information sharing
- Can support other community initiatives: land use planning, land claims research, IK documentation



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Watershed Information
Community Data
Technical Assessment

5. DATA & ANALYSIS



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5. DATA COLLECTION & ANALYSIS

- General Watershed Information
- Community Demographic Data
- Scientific/Technical
- Community: issues, values, Indigenous Knowledge



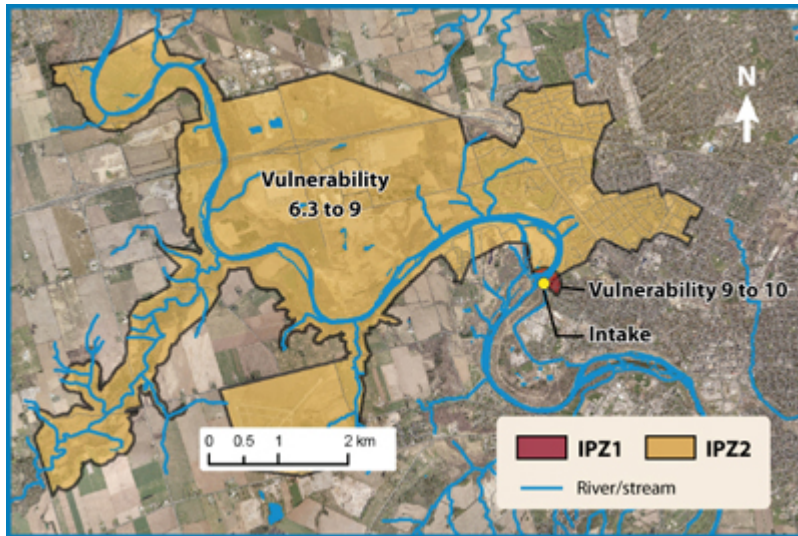
SCIENTIFIC/TECHNICAL ASSESSMENT

- Watershed Characterization
- Water Budget
- Water Quantity Threats Analysis
- Surface Water Vulnerability
- Groundwater Vulnerability
- Drinking Water Quality Threats Analysis

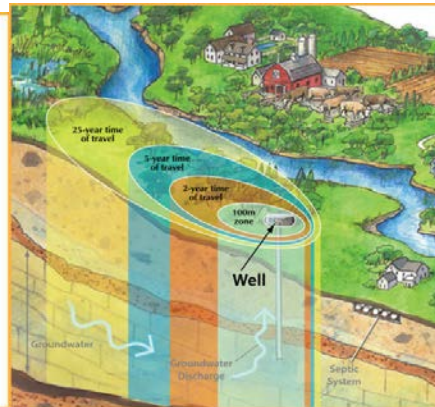
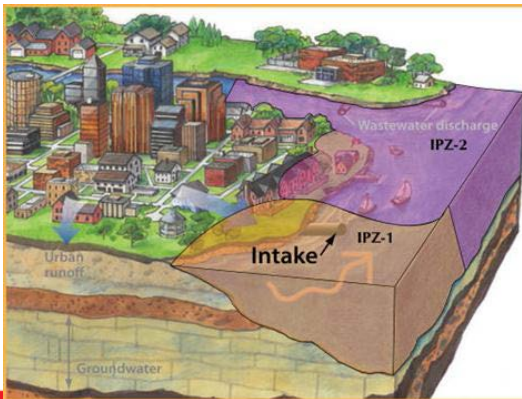


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VULNERABLE AREAS



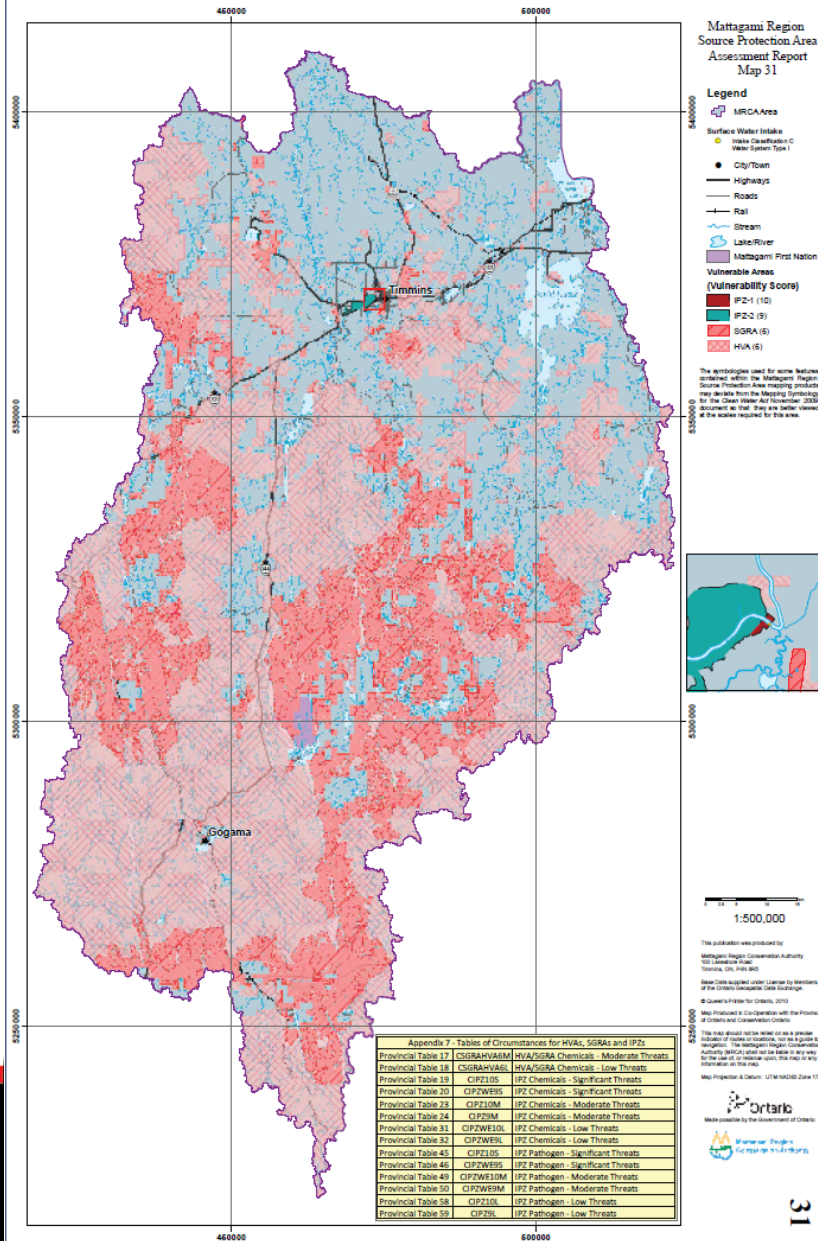
- Intake Protection Zones
- Wellhead Protection Areas
- Highly Vulnerable Aquifers
- Significant Groundwater Recharge Areas



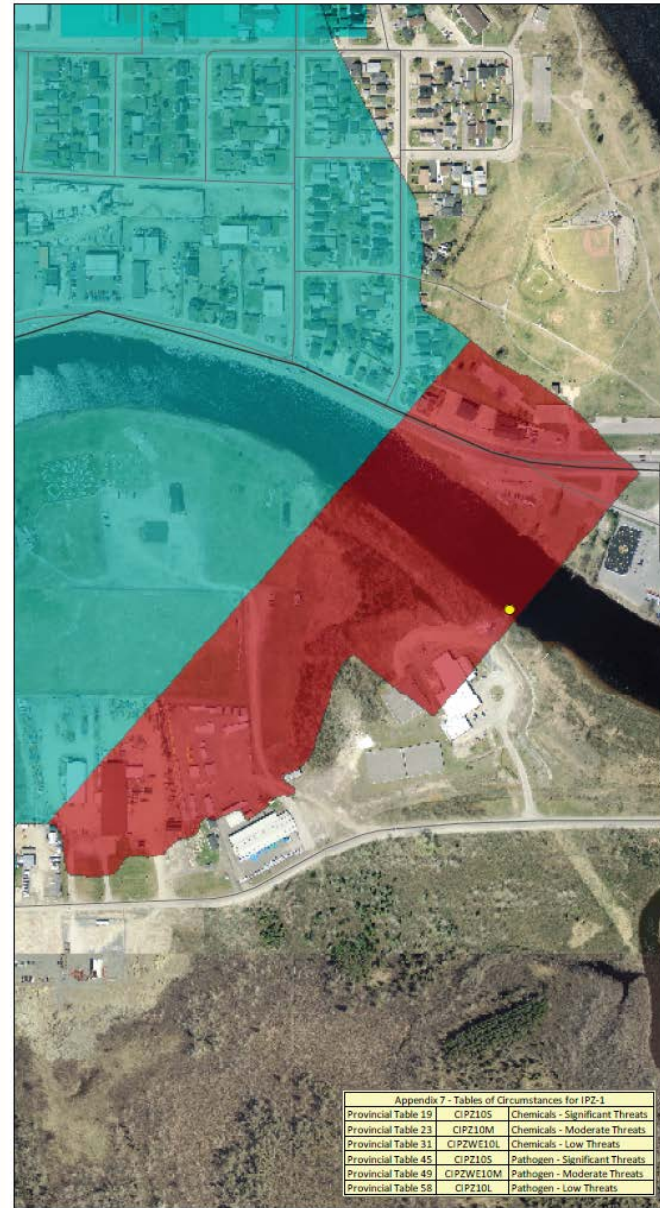
MATTAGAMI VULNERABLE AREAS



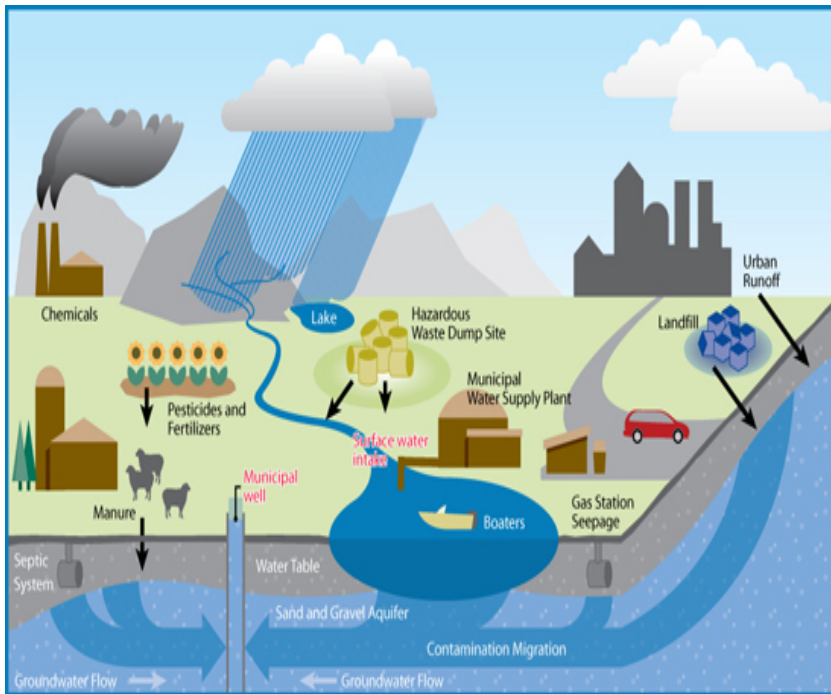
Areas of Potential Significant, Moderate, Low Threats



Intake Protection Zone 1



THREATS



Ontario's *Clean Water Act* identifies two main categories of threats: **chemicals** and **pathogens**:

- Chemical threats include things like solvents, fuels, and pesticides.
- A pathogen is a disease-causing bacteria or virus found in human or animal waste.



DRINKING WATER THREATS

1. The establishment, operation or maintenance of a **waste disposal site** within the meaning of Part V of the Environmental Protection Act.
2. The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of **sewage**.
3. The **application of agricultural source material to land**.
4. The **storage of agricultural source material**.
5. The **management of agricultural source material**.
6. The **application of non-agricultural source material to land**.
7. The **handling and storage of non-agricultural source material**.
8. The application of **commercial fertilizer** to land.
9. The handling and storage of **commercial fertilizer**.
10. The application of **pesticide** to land.
11. The handling and storage of **pesticide**.
12. The application of **road salt**.
13. The handling and storage of **road salt**.
14. The storage of **snow**.
15. The handling and storage of **fuel**.
16. The handling and storage of a **dense non-aqueous phase liquid**.
17. The handling and storage of an **organic solvent**.
18. The management of runoff that contains chemicals used in the **de-icing of aircraft**.
19. 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**.
20. An activity that **reduces the recharge of an aquifer**.
21. The use of land as **livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard**. O. Reg. 385/08, s. 3.

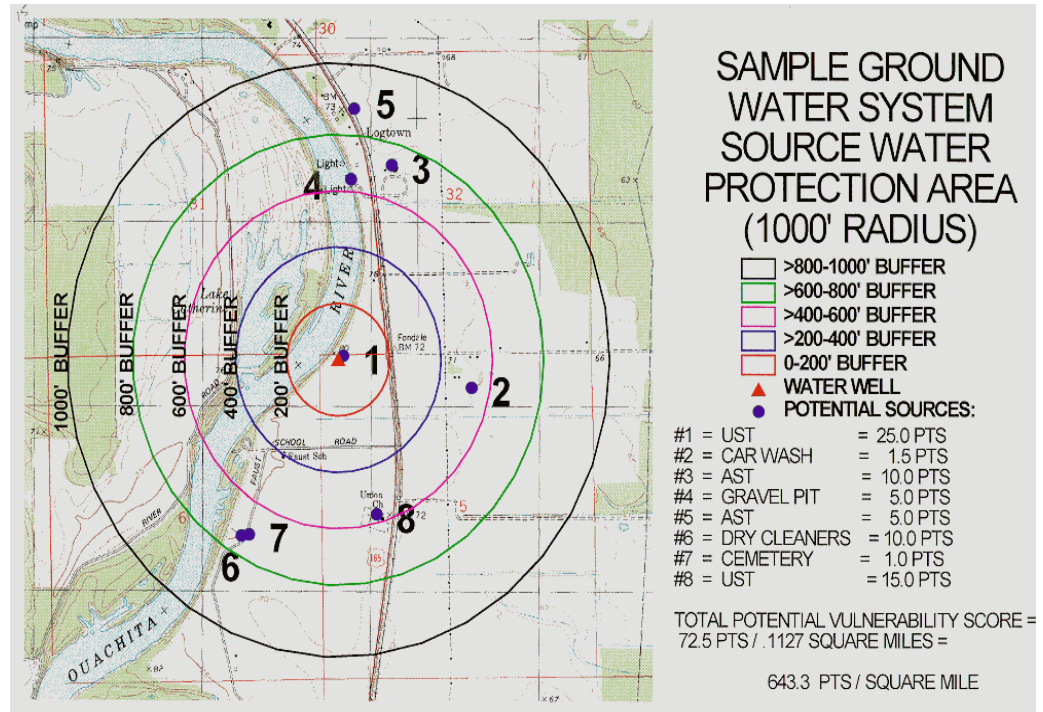


RISK ASSESSMENT

Ontario Risk assessment =
vulnerable areas (4) x threats
(21)

Based on the results of the
calculation, threats are placed
into one of three categories:

- **Significant threat 80 to 100**
- **Moderate threat 60 to 79**
- **Low threat 41 to 59**



RISK ASSESSMENT MATRIX

Likelihood of Occurrence	Impact of Occurrence				
	Insignificant 1	Minor 2	Moderate 3	Severe 4	Catastrophic 5
Most Unlikely 1	1	2	3	4	5
Unlikely 2	2	4	6	8	10
Likely 3	3	6	9	12	15
Probable 4	4	8	12	16	20
Almost Certain 5	5	10	15	20	25

"High Risk"



Ontario Actions

First Nations Actions

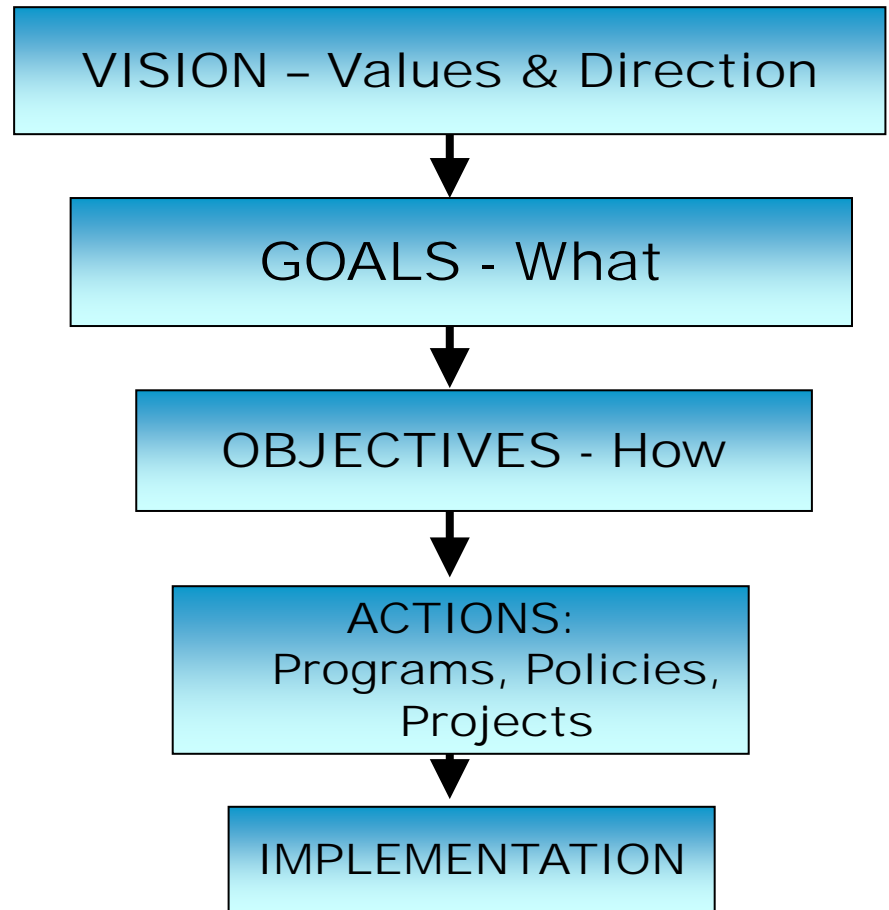
6. TAKING ACTION



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6. TAKING ACTION

- The point of your plan is to affect change
- ACTIONS = policies, programs, projects, education, etc.
- Example: Mattagami Region Source Water Protection Plan identified a “Septic Systems Policy”



ONTARIO ACTIONS

Soft Tools (non-legal mechanisms)

- Research programs
- Pilot projects
- Stewardship programs
- Incentives
- Education and Outreach
- Best Management Practices



Regulatory Tools (legal mechanisms)

- Land use planning/other municipal tools
- Use of Prescribed Instruments (E.g. Certificates of Approvals, Permits, Nutrient Management Plans)
- Risk Management Plans- to be negotiated with landowner
- Prohibition



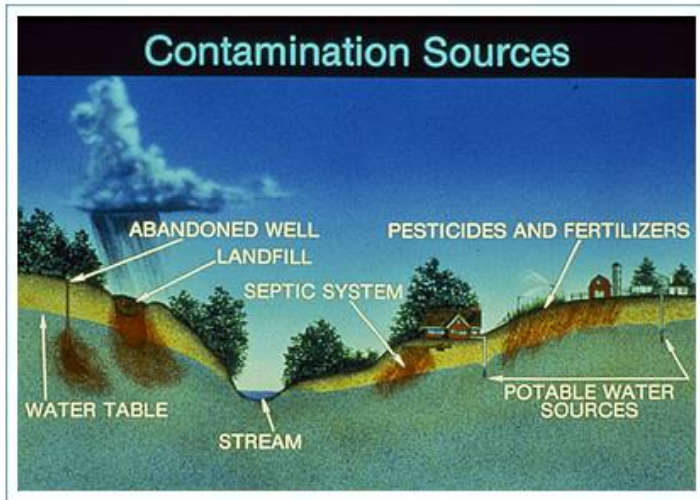
EXAMPLES FROM ONTARIO PLANS



- Road Salt: salt management plan within Intake Zone 2
- Update emergency response and spill contingency plan to address Transport of Dangerous Goods within IPZs
- Education and outreach program to advise fuel distributors, outlets, and property owners in IPZ2
- With Health Unit and others design a water education and outreach program
- **Recommendation to MNDM re mine closure**
- Policy on WWTP discharges
- Mandatory on-site septic system maintenance inspection program



EXAMPLES FROM FIRST NATIONS PLANS



- Six Nations: plugging abandoned natural gas wells
- Yukon tribes: solid waste management initiatives
- Driftpile FN (Alta): Maintain/restore riparian buffer areas to decrease surface flow of pollutants



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ACTIVITY: BRAINSTORM ACTIONS



Instructions:

- In your break-out groups brainstorm possible actions that can be taken to address the risk you have been assigned
- ***Remember actions = policies, programs, projects***
- Record your actions on flipchart and post your sheet on the wall when finished.
- 20 minutes



OFNTSC Pilot Project & Training
For More Information

WRAP-UP



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7. OFNTSC PILOT PROJECT & TRAINING

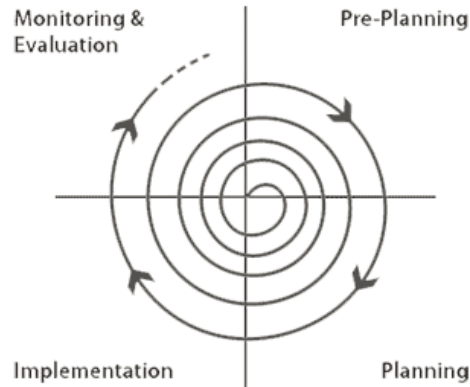
- Work with one FN to develop a Source Water Protection Plan
- Use this experience to develop more detailed guidance material and training for Ontario First Nations



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8. WRAP-UP

- SWPP is one component of larger plans
- Planning is a cyclical process
- Local/indigenous knowledge + scientific/technical



“A community that destroys its land forfeits its future.”



QUESTIONS?