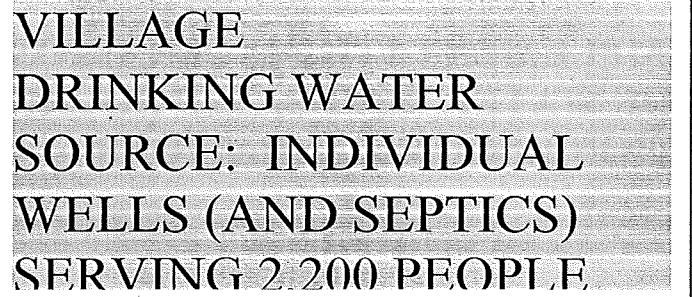


**ONTARIO WATER WORKS ASSOCIATION
SPECIALTY TREATMENT SEMINAR
MARCH 17, 2005**

**REVIEW OF IMPLEMENTATION SCENARIOS
ARISING OUT OF WATERSHED BASED SOURCE
PROTECTION RECOMMENDATIONS**

**CASE STUDIES
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**NB SCENARIOS FOR ILLUSTRATION ONLY; BASED ON ASSUMPTIONS
NOT ACTUAL STUDIES; PROPOSED MEASURES FOR DISCUSSION AND
ILLUSTRATION PURPOSES ONLY**



VILLAGE
DRINKING WATER
SOURCE: INDIVIDUAL
WELLS (AND SEPTICS)
SERVING 2 200 PEOPLE

Assumptions:

- Non-municipal system
- Community of 2200 all on own private wells and on site waste disposal systems (septics).
- Ground water flow is north from the agricultural area into the community and into Creek.
- Community land-use includes agricultural, residential, industrial.
- Water is from shallow surficial sand aquifer for entire community.
- Nitrates entering community are at 50% of Ontario Drinking Water Standard at the edge of agricultural lands.
- In the residential area, nitrates are over the Ontario Drinking Water Standard.
- Nitrates are from both agricultural and residential impacts.
- The area is also a high water use area.

About the Proposed Measures:

- Based on discussion at scenarios workshop held by the Implementation Committee working group;
- Sought consensus that the proposed measures were things a source protection planning committee could reasonably select that would respond appropriately to the need for risk reduction, and be effective.
- Not intended to imply this is the only measure or the best measure etc.

VILLAGE ACUTE RISK # 1:

On site waste disposal systems (both point source and cumulative risks)

Proposed Measures:

- Education and information
- **Interim**** well and septic re-inspection, maintenance program
- Enhanced performance measures from septic and wells

**These tools need to be available to municipalities asap.

Who implements

- Municipality makes by-law

Costs issues

- Fee for program & homeowner pays for inspection, maintenance;
- Initial financial assistance to home-owners (incentives)

Time frame to implement:

- Underway by the time the SPP is completed, early start

Method/ time frame to gauge effectiveness

- Municipality do proactive water quality monitoring

Relevant tools proposed in IC
recommendations:

- Education and outreach
- Incentives
- Septics re-inspection and cost-recovery powers
- Private wells remediation
- Enhanced performance measures

Village Acute Risk # 2:

- Chemical spill at a manufacturing facility (potential point source risk)

Proposed Measures:

- Checklist - physical assessment of plant and plan for engineered controls on storage and handling of chemicals
- Needs prov. storage control requirements beyond fuel
- Spills contingency/ prevention plan

Who implements:

- Industry implements subject to prov req. & municipal req.

Costs issues:

- Industry pays, possible cost-share incentive

Time frame to implement:

- Negotiated

Relevant tools proposed in IC recommendations:

- Municipal sphere or by-law powers / new site control powers
- Broader provincial chemical storage requirements
- Incentives

Chronic Risk:

Part of designated high water use area

Proposed Measures:

- Identify high water use areas as hot spots for compliance
- Review PTTW
- Area conservation plan among sectors to achieve required reductions
- Cooperative agricultural or all user water management – self governance within public framework
- Incentives for water retention measures and water conservation measures
- Need for water taking permit issuance to be better tied to land use approval

Relevant tools proposed in IC recommendations:

- Integrate source protection plans and permits to take water
- Water quantity / conservation tools
- Incentives

Mr. Domesticus

Assumptions:

- Mr. Domesticus has long standing well in community.
- Heating in area is by oil.
- Nitrate at depth is over the Ontario Drinking Water Standard; common in the watershed.
- Nitrate issues picked up in the issues identification process.
- In many areas, difficult to quantify the proportionate contribution from septic systems and agriculture.
- Historical use means this issue will continue for many years.

Acute Risk: Spill during fuel oil delivery (focus on prevention)

Proposed Measures:

- Authorization, certification of storage tanks,
- secondary containment
- New tanks above ground
- Regulation & update of wells to reduce vulnerability
- Spills response training / risk management re delivery

Relevant tools proposed in IC recommendations:

- Expanded storage tanks regulation by province
- Municipal by-law powers
- Private wells programs
- Risk management and spills response training for delivery agents

Chronic Risk:

Nitrates

Proposed Measures:

- Nutrient management plans
- incentives for nutrient management planning for crop operations in vulnerable areas,
- water protection plans for others e.g. golf courses
- Incentives to change crops / crop rotation and lower nitrate applications in high nitrate using crops such as corn, vegetables, ginseng etc.
- Septic system inspection and maintenance,
- limits on density
- Urban issue – equiv fertilizer reduction, water conservation

Relevant tools proposed in IC recommendations:

- Nutrient management plans outside context of livestock
- Water protection plans for non-agricultural land-owners but encompassed in municipal by-law / source protection sphere recommendations
- Septic systems recommendations
- Water conservation
- Planning Act consistency

City - Surface Water Supply
(River)

First Nation – Surface Water
Supply (River)

Source: Surface Water Supply – River

Population: 90,000

Municipal supply and First Nations supply

Assumption:

- Municipal surface water system takes water from the River. Within two hour time of travel (and less than potential response time), a 400 series highway bridge crosses the River with steep, gravel banks in a gypsum, limestone setting. Potential for a truck with chemical cargo to overturn at that location and insufficient time to respond at the municipal intake.

- Cryptosporidium is a significant pathogen issue; variability of loading or pathogens, turbidity and ammonia, especially spikes, interferes with treatment processes.
- Crypto sources are urban non-point, rural non-point and large upstream waste water systems.
- Turbidity sources are land use practices and vegetation removal on banks.
- Ammonia spikes are primarily from large upstream sewer treatment plants without denitrification, especially a winter problem.

Acute Risk # 1:

Chemical spill at HWY and River

Proposed Measures:

- Municipal spills containment/ emergency response plan, preparedness.
- Flagged & prov required to put in prevention/ control system at highway.
- Increased water supply storage.
- Alternate emergency water supply.
- Build into EA process and bridge design criteria.

Relevant tools proposed in IC recommendations:

- Emergency response
- Alternate water supplies; subsequent barriers
- Highway retrofits for source protection

Acute Risk # 2:
Pathogens (Cryptosporidium)

Proposed Measures:

- Farm water protection plans with measures such as fencing streams
- Runoff controls – enhanced buffering, wetlands, riparian vegetation, urban storm water controls
- Improvements to wwtp including reducing risk of raw water bypasses – C of A

Relevant tools proposed in IC recommendations?

- Farm water protection plans
- Buffering, wetlands, riparian
- Storm water recommendations
- Waste water recommendations

Chronic Risk #1:

Pathogens and turbidity from storm water events

Proposed Measures:

- Variety of measures to keep soil on the land and river banks:
 - Buffering & riparian vegetation, natural cover, fencing, wetland restoration, rural storm water management, slow water down, construction site sediment & erosion controls
- Supply intake design, control sediment entry
- Build on other programs

Relevant tools proposed in IC recommendations:

- Buffers, wetlands
- Stormwater management
- Integration with other programs

Chronic Risk #2:

Ammonia from point and non point upstream sources

Proposed Measures:

- Put nitrification in upstream wastewater treatment plants – C of A

Relevant tools proposed in IC recommendations:

- Wastewater recommendations