

SUBMISSION CONCERNING

**THE GROUNDWATER INDUSTRY
IN ONTARIO**

for

Walkerton Inquiry, Part II

by:

Ontario Ground Water Association

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INTRODUCTION

The Ontario Ground Water Association (OGWA) is a not-for-profit industry based association that represents the groundwater industry in Ontario. Our membership includes:

- \$ the drilling contractors that drill and construct water wells
- \$ the contractors who install the well pumps
- \$ manufacturers of well supplies and pumps, and
- \$ groundwater consultants

Phase I of the Walkerton Inquiry heard that the bacterial contamination of the municipal water supply was caused by the direct entry of surface runoff into a well via passageways in the bedrock. This presentation focuses specifically on the safeguards that are needed in the water well and drilling industry to protect groundwater supplies.

Our presentation is different from the other submissions you have received, which tend to cover broad-based groundwater issues. General topics such as: watershed management; risks of chemical contamination; protection of groundwater and groundwater research are thoroughly addressed in many of the other submissions.

It is our objective to present the key issues where changes are needed for the protection of both public health and safety and the natural environment. We strongly believe that these changes are needed to restore public confidence in groundwater supplies. Ontario's groundwater resources are the safest and least vulnerable water supply source in the Province. The key areas of concern can be addressed under four topics:

1. Water Well Construction and Abandonment
2. Water Well Inspection and Security
3. Well Records and Data Access
4. Water Well System Integrity, Efficiency, and Monitoring

To be concise for you, we have summarized our comments and recommendations as a Comment Sheet for each issue. Recommendations are presented and are intended to provide guidance to the Inquiry regarding measures that can be taken to strengthen Regulations that govern water wells and the protection of public health.

The OGWA urges the Walkerton Inquiry to prioritize recommendations to protect groundwater supplies in Ontario. The greatest risk of groundwater contamination is at the actual well site.

Therefore, we request that the top priority be placed on strengthening the Regulations that govern water wells.

The water well and groundwater industry in Ontario has a technical capability and expertise second to none. As such, we recommend that this capability be used to advantage in the development of revisions to regulations, guidelines and standards for the industry. A Water Well Task Force comprised of OGWA, professional associations (eg: International Association of Hydrogeologists) academics (eg: Sir Sandford Fleming College) and government experts would be best equipped to formulate amendments to the existing Regulations.

The Task Force should be given about 6-months to develop and complete the amendments. Since the OGWA members have a direct interest in the outcome of new water well Regulations, we are committed to working cooperatively with regulators, as we have done in the past.

GROUNDWATER IN ONTARIO

The growth and economic development of most non lake-front municipalities in Ontario has been based, at least in part, on the availability and development of a sustainable, potable groundwater supply. To date, only a small percentage of the aquifer systems in Ontario have actually been developed and only a very few have been developed to their full potential. Thus, groundwater resources are available to provide the potable water needed for the next century of growth in the Province.

The Walkerton tragedy has raised public concern about the safety of groundwater everywhere. This heightened awareness of groundwater resources will enable Ontario to ensure that there is an appropriate level of knowledge, understanding, and protection of the resource. Much has been said in submissions to the Walkerton Inquiry about groundwater contamination and the risk of contamination from a variety of sources, both urban and rural in nature. In reality, the 15,000 to 20,000 wells that are drilled in Ontario each year rarely encounter non-potable groundwater. The industry has found that existing contaminated groundwater is very limited, occurring mainly in isolated, unprotected shallow aquifers and in urban areas. It is estimated that less than 1% of Ontario's groundwater has been affected.

It is evident that the natural protection afforded by the blanket of glacial soils in southern Ontario provides a high level of protection to most aquifers. Groundwater experts have known for some time that microbial contamination is not a widespread threat to protected aquifers. This is due to a

number of factors including the short life span of bacteria and viruses in the subsurface (measured in weeks) and the filtering effects of glacial soils. Pathogens are filtered out of groundwater as they migrate through the protective glacial soils. Even in permeable soils, like sand, microbial transport in groundwater is seldom more than a few tens of metres. Nevertheless, future land use planning must consider every opportunity to protect the more sensitive and unprotected aquifer systems.

In the wake of the Walkerton tragedy, our groundwater industry has investigated thousands of wells for bacterial contamination. Follow up investigations have confirmed that unsecured and abandoned wells and aquifers that have a direct hydraulic connection to surface water system are the primary causes of bacterial impacts. Unsealed wells and exposed fractured rock provide direct entry of bacteria into the water supply. The bacterial entry points in wells are usually an unsealed annulus around the well casing, or openings at the top of the well casing. Fortunately, the problem is easy to remedy, but legislative tools are needed to ensure the appropriate corrective action is taken.

The following comment sheets identify key water well related issues and present recommendations to strengthen existing Regulations that apply to water supply wells.

COMMENT SHEET 1: WATER WELL CONSTRUCTION AND ABANDONMENT

Comment	<p>The greatest risk of bacterial and chemical contamination of a well is, by far, faulty well construction. The most direct pathway for contaminants reaching an aquifer is via an unsealed passageway around the well casing or openings in the casing. These impacts are usually immediate and are potentially hazardous. Contrary to public perception, the risk to groundwater from infiltration of surface contamination through surficial soils into an aquifer is much lower than direct entry into the well itself.</p> <p>Guidelines and standards for the construction and abandonment of water wells are included in Regulation 903 of the Ontario Water Resources Act, 1990. In the mid-1990's, the OGWA worked with MOE staff to up-date the regulations in order to improve the security of wells. The proposed amendments included improvements to the requirements for well construction, such as deeper Annular space® seals and specifications for well casings.</p> <p>The MOE completed proposed Revised Regulations in 1998 and posted the changes on the EBR. The proposed changes incorporated many of the OGWA recommendations. The OGWA strongly urges the Walkerton Inquiry to recommend that the MOE should complete the amendments to Regulation 903.</p>
Recommendations	<p>1-1 Regulation 903 of the Ontario Water Resources Act (1990) should be amended to incorporate modern drilling methods and well materials. The guiding principle to be followed in preparing the amendment should be the protection of public health and safety.</p> <p>1-2 The amended water well construction standards should give special attention to the prevention of all sources of bacterial contamination from entering a well via unsealed openings and passageways.</p> <p>1-3 The updated well construction and abandonment standards should be made in consultation with the OGWA. This will ensure that best practices for drilling and well sealing methods and materials are followed.</p>

COMMENT SHEET 2: WATER WELL INSPECTION AND SECURITY

Comment	<p>Inspection of water wells is not mandatory in most parts of Ontario, although some Municipal wells may be inspected by groundwater consultants. The lack of water well inspections encourages the use of unqualified or unlicensed (Ontario) drilling contractors, creating an unknown level of risk of bacterial impacts to water wells.</p> <p>The OGWA strongly supports the implementation of a water well inspection program. This was a key component of our proposal to ARevitalize the Groundwater Industry in Ontario® that was submitted to the MOE in 1997. We suggest that the inspections should start with new well construction and eventually encompass periodic audit inspections of all water wells in the Province. The OGWA would provide support for the inspection program by initiating a parallel public education program about the stewardship of water supply wells.</p>
Recommendations	<p>2-1 A comprehensive water well inspection program should be developed and implemented for all water wells in Ontario.</p> <p>2-2 The scope of the water well inspection program should be developed in consultation with the proposed Water Well Task Force (see Introduction). The following work is suggested as a minimum:</p> <ul style="list-style-type: none"> \$ inspect all new water wells at the time of construction \$ conduct periodic inspection audits of wells over 25 years old \$ inspect all well abandonment sites \$ locate all wells using a geographic positioning system (GPS) <p>2-3 The water well inspection program should be implemented by a technical agency that is experienced with field inspections. The Technical Standards and Safety Authority (TSSA) is an excellent example of a well established inspection agency. Since receiving their delegation from the government 4 years ago, they have been responsible for the public safety system in many important areas (e.g., elevators, fuel systems, and pressure vessels). As TSSA is a not-for-profit corporation, the concern about prejudicing quality for profit gain would not be an issue.</p> <p>2-4 The cost of the water well inspection program should be financed by revenues for well inspection fees.</p>

COMMENT SHEET 3: WELL RECORDS AND DATA ACCESS

Comment	<p>Water well records form an integral part of the geological and hydrogeological data base available to the groundwater industry and the general public in Ontario. Regulation 903 requires that water well records must be filed with the Ministry of Environment for all test holes and water wells. In addition to well construction details, the records are used to understand the geology of an area (the presence, depth and thickness of aquifers and confining geological aquitard formations) and to provide information on aquifer and well yields.</p> <p>The management and availability of the information in the water well record system needs improvement. It is the MOE mandate to administer the well record database. At present, however, the system is not functioning effectively or efficiently. There are a substantial number of well records that have not been entered into the standard water well record database. Part of the records management to ensure that the well location is correctly referenced to a standard system such as the Universal Transverse Mercator System (UTM). Thousands of new well locations have not been confirmed, making the well location information unavailable and unreliable.</p>
Recommendations	<p>3-1 The water wells records produced by the licensed well drillers should be more effectively managed and the data be made readily available, at a reasonable cost. The data should be available in both hard copy and electronic form.</p> <p>3-2 Well drillers should continue to be required to submit water well records as complete and accurate as possible, as per Regulation 903. The cost of preparing the well record should be born by the well owner.</p> <p>3-3 The scope of the water well record management program should be developed in consultation with the proposed Water Well Task Force (see Introduction).</p> <p>3-4 The water well record management program should be implemented by a technical agency that is experienced with data management systems, such as the TSSA (see Comment Sheet 2).</p>

COMMENT SHEET 4: WATER WELL SYSTEM INTEGRITY, EFFICIENCY, AND MONITORING

<p>Comment</p>	<p>Over time, pumping from a water well can cause changes to the performance and integrity of the well and water supply system. These changes are, in many cases, a function of well hydraulics, well use (e.g. pumping rate, duration, and frequency) and groundwater quality. If detected early by some simple testing, these changes can be readily managed and/or avoided by proper well maintenance.</p> <p>At present, there is no mandatory periodic inspection or monitoring and maintenance requirement for municipal/public well water supply systems. The OGWA supports the implementation of a mandatory program designed to ensure that municipal/private water wells are properly monitored and maintained. Such a program would allow early detection of possible well deterioration, risks from contaminants surface water, and ensure long-term, secure public water supplies.</p>
<p>Recommendations</p>	<p>4-1 The Ontario Drinking Water Regulation should be amended to include mandatory periodic (e.g. every 5 years) inspection of municipal/public well systems by a qualified Hydrogeologist. The testing program should address the well integrity, well efficiency, and aquifer hydraulics. Should a significant change be noted, the well/system should undergo either additional testing or rehabilitation, depending on the issues identified.</p> <p>4-2 A record of the water well testing results, and any resulting actions/maintenance, should be maintained by the municipality for as long as the well is in service, up to and including a well abandonment record.</p> <p>4-3 The well testing and rehabilitation requirement should be regulated. The well testing results and rehabilitation actions should be reported to the MOE or an agency that has the infrastructure and experience to administer such a program (such as TSSA), as part of the engineers/hydrogeologists reports that are currently required.</p>