November 16, 2000

The Honourable Dan Newman Ontario Minister of the Environment c/o Standards Development Branch
Ministry of the Environment 7th Floor, 40 St. Clair Avenue West Toronto, ON M4V 1M2

Honourable Minister,

Re. Protecting drinking water for small waterworks in Ontario – Discussion Paper

On behalf of member Medical Officers of Health, Boards of Health and Affiliate organizations of the
Association of Local Public Health Agencies (aPHa), I am writing to submit comments on and
recommendations for the provision of safe drinking water by waterworks not yet covered by specific
legislation.

A working group, consisting of medical officers of health and environmental health supervisors, was
struck by aPHa to study the regulatory options and protective measures available to ensure the safety and
high quality of drinking water drawn from small waterworks. Attached for your examination is the final
report of the work group.

Our membership commends your Ministry’s continued efforts under Operation Clean Water, and
welcomes the opportunity to offer input to maximize the reach and effectiveness of this initiative. As
protectors of community health, our members will be willing and essential partners in implementing
strategies that will ensure that Ontario’s drinking water is safe for all of its residents.

We look forward to a reply at your earliest convenience.

Regards,

Andrew Papadopoulos, BASc, MBA Executive Director
Copy Dr. Colin D’Cunha, Chief Medical Officer of Health and Director, Public Health Branch Jim
Reffle, President, Association of Supervisors of Public Health Inspectors of Ontario Dr. Lynn
Noseworthy, Medical Officer of Health Section Chair, aPHa.

Protecting Drinking Water for Small Waterworks in Ontario
A submission in response to the Discussion Paper

Prepared by: aPHa – The Association of Local Public Health Agencies ASPHIO – The Association
of Supervisors of Public Health Inspectors of Ontario

November 15, 2000

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I. Introduction
On August 9, 2000, the Minister of Environment published a discussion paper, Protecting Drinking Water for Small Waterworks in Ontario. The Paper highlighted the Ontario government’s efforts to improve drinking water quality and protect public safety. It followed the introduction of the Drinking Water Protection Regulation for large waterworks. The Paper posed a series of questions about the need for and potential content of a counterpart regulation for small waterworks in Ontario.

Local boards of health have an immediate and direct interest in water quality. Access to a safe and sufficient supply of potable drinking water is a prerequisite for health. Under the Health Protection and Promotion Act, medical officers of health and public health inspectors are empowered to protect community health through the elimination or mitigation of health hazards. The Mandatory Health Programs and Services Guidelines provide the framework for public health programs in Ontario. The goal of the Safe Water program is to reduce the incidence of water-borne illness in the population, and as a primary objective, to ensure that community drinking water systems meet the health-related chemical, physical, microbiological and radionuclide objectives as published in the Ontario Drinking Water Objectives(revised 1994) and the Guidelines for Canadian Drinking Water Quality (sixth edition). (Note – the Ontario Drinking Water Objectives have been superceded by the Ontario Drinking Water Standards, August 2000).

The primary goal of local boards of health is to prevent disease and injury and to promote and protect health. This paper sets out a proposal for a regulatory framework containing a risk assessment protocol that would result in classification and regulation of small public waterworks under the Ontario Water Resources Act. In addition to providing answers to the questions posed in the Discussion Paper related to the regulation and monitoring of small waterworks, this submission attempts to position the issue in the broader framework of source water protection to safeguard our water supply.

II. Protection of Water Source
Small waterworks are usually found outside of developed urban areas served by large waterworks. As a result, protection of the watershed and aquifers that drinking water systems draw from should be a primary consideration, as part of a general strategy to prevent waterborne illness.

A. Agricultural Land Use
Agricultural land use has an impact on water quality. Local boards of health and the Ministry of the Environment should have more involvement in monitoring and reviewing agricultural land use. Currently, nutrient management programs are being promoted by the Ministry of Agriculture, but they are voluntary. These programs should be regulated and enforced by regulation.

Plans for new operations are required to include an environmental assessment. The Medical Officer of Health or designate should have an opportunity to comment on these plans. Plans for operations that are undergoing some change in land use may require approval by the municipality. The Medical Officer of Health or designate should also have an opportunity to comment on these plans.

The Environmental Farm Plan is currently voluntary and is promoted by the Ontario Federation of Agriculture. Implementation of this plan should be required and enforced by regulation.

Disposal of treated sewage sludge and septic system sludge on agricultural lands is regulated by the Ministry of the Environment. Monitoring and enforcement, currently triggered chiefly by complaints, must be enhanced. There should be an opportunity for comment by the Medical Officer of Health or designate when land is assessed for approval of sludge spreading.
The Environmental Farm Plan provides financial assistance to farmers to improve and protect water quality, covering items such as: storage and handling of fertilizers, pesticides, petroleum products and agricultural waste; location of livestock yards; manure use and management; nutrient management in growing crops; milking centre washwater and water wells (location, condition, and management of water supply). Additional areas for potential attention include livestock access restriction, erosion control structures, fragile agricultural land retirement and cropping practices. Grants will need to be provided in order to assist farmers in meeting the more stringent requirements. Cost is often cited as the reason that farmers are unable to take steps to improve and protect water quality.

**B. Approvals of Land Use**

New residential developments may adversely affect water quality. Land development approvals are usually a municipal decision. A few provincial ministries may be involved in the approval process. The Medical Officer of Health or designate should have the opportunity to comment on such developments. Proposed septic systems and water systems should receive approval from the local Medical Officer of Health or designate and the Ministry of Environment. For example, public health could ensure that any new wells are properly drilled. The approval of private sewage systems, formerly under the Environmental Protection Act, has been shifted to the Ontario Building Code. Since private sewage systems can impact on water quality, they should be regulated by the Ministry of Environment or public health, not by the Ontario Building Code.

**C. Watershed Management and Monitoring**

The Conservation Authorities have some responsibility for monitoring water quality and the impact of development on watersheds in urban areas. Where no Conservation Authority exists, the responsibility of watershed monitoring should fall to a provincial ministry (perhaps MNR). Watershed monitoring should be enhanced and appropriately funded. The recent MOE announcement regarding the establishment of a groundwater monitoring network in partnership with conservation authorities is a positive step.

Watershed management plans have been developed in many areas of the province on a multi-sectoral basis. Public health has an important role to play in these initiatives, and should be included in local efforts to develop such plans.

**D. Hydrogeologic Sensitivity Surveys**

Without hydrogeological information it may be difficult to determine the potential for contamination of a water source. The United States Environmental Protection Agency (EPA) has recently proposed a Ground Water Rule as part of a targeted risk-based regulatory strategy. It proposes that hydrogeologic sensitivity assessments be undertaken for all non-treated water systems. A one time assessment will be required over a 6 year phase-in period, and monthly monitoring will be required for all systems that were determined to be sensitive (e.g. gravel, fractured bedrock aquifers). Something similar should be considered in Ontario. The Ministry of Environment should maintain a database of all of this information from across the province, and it should be accessible to municipalities and Public Health Units. Hydrogeologic assessment should be part of the risk assessment process of small water systems.

**E. Sanitary Surveys/Inspections**

The EPA proposed ground water rule has indicated that states would be responsible for sanitary system surveys. This would apply to all ground water systems, and address eight components: source, treatment, distribution system, finished water storage, pumps/pump facilities and controls, monitoring/reporting/data verification, water system management and operator compliance with requirements. It would lead to the identification of any significant deficiencies and the enforcement of any necessary corrective action. This would be required every 3 years for community systems (e.g. residential), and every five years for non-community systems (e.g. schools, factories, hospitals, gas stations, campgrounds). Something similar should be considered in Ontario.
**F. Abandoned Wells**

Abandoned wells can provide an opportunity for aquifer contamination if not properly sealed. The Ministry of Environment regulates abandoned wells. The enforcement of this must be enhanced. At present there is no enforcement.

**III. Classification of Small Waterworks**

The Drinking Water Protection Regulation (OR 459/00) (hereafter referred to as DWPR) applies to all waterworks that use more than 50,000 L of water on any day or have the capacity to supply 250,000 or more L of water per day, or systems that serve six or more residences. The DWPR has considerably strengthened the application of drinking water standards in Ontario. However, the criteria used to classify whether a waterworks falls under DWPR has created some confusion:

- No register of waterworks exists, or is currently jointly accessible by public health and Ministry of Environment staff
- A review of each waterworks is necessary to determine if the water volume criteria apply
- Many waterworks exist without a certificate of approval, particularly if privately owned or established prior to the Ontario Water Resources Act

A clarification of the definition of residences is necessary to deal with the application of the DWPR in trailer parks and in land lease arrangements.

The term *Small Waterworks* was defined in the MOE Discussion Paper as those which provide less than 50,000 L of water on any day, do not have the capacity to supply 250,000 L of water per day, and serve five or fewer residences. The Discussion Paper provides examples of small waterworks, divided into three categories based on the size of the population served. It is important to note that other examples of small waterworks need to be considered in the development of a new proposed regulatory framework.

The existing DWPR and the proposed regulatory framework has the fundamental goal of protecting public safety and ensuring consumer confidence in water supplies which are regularly and routinely available and accessible to members of the public. An implicit assumption is that residents of and visitors to this province can be confident that community water supplies accessed by members of the public are regularly assessed, routinely monitored, and secure.

In order to ensure these objectives, the application of a regulatory framework for small waterworks needs to be broadened to include sites other than those provided as examples in the discussion paper. This would include:

- Trailer parks (contingent upon the application of the criteria of the DWPR)
- Roadside rest areas
- Industrial sites on independent supply
- Migrant farm worker housing arrangements
- Publicly accessible springs
- Provincial parks
- Conservation authorities
- Municipally owned buildings often used as a site of public gatherings (e.g. Firehalls)
- Private clubs
- Rental accommodation of five or fewer units (e.g. a legal duplex or triplex)

When viewed from this perspective, the classification of small waterworks is dependent on the following criteria:

- Waterworks does not meet the criteria of the DWPR
• Water supply is accessible to members of the public, or there is reasonable likelihood that members of the public will be exposed to the water supply
• Is not a private residence serving the property owner

The DWPR’s private residence criterion establishes a proxy for population served that is important to consider in any extrapolation to small waterworks. Six residences served by a single waterworks, each occupied by single person, and inhabited year-round would equate to 2190 person-days of exposure, or consumer servings. Many of the sites identified as small waterworks in the Discussion Paper would have equal or greater person-days exposure. For example, some small waterworks will supply water to:
• large and transient groups on only a few days of the year (e.g. special events)
• a small and constant group throughout the year (e.g. a school or long term care facility)
• a small and transient group throughout the year, or a significant portion of the year (e.g. a campground)

How have other jurisdictions handled this dilemma of regulating small waterworks? New Zealand has recently published revisions to its drinking water standards. It defines community drinking-water supplies as water supplies that serve more than 25 people for at least 60 days per year. The New Zealand criterion is therefore based on 1500 consumer servings (25 people multiplied by 60 days). All community drinking-water supplies are listed in the Register of Community Drinking-Water Supplies in New Zealand. The Register exists as an internet-accessible catalogue of all community drinking water supplies by health district and community, and summarizes the source, plant, zone, population served and provides a grade for source and distribution system water. The United States Environmental Protection Agency has recently proposed a Ground Water Rule as part of a targeted risk-based regulatory strategy. Currently, a public water system is one that serves 25 or more people or has 15 or more service connections and operates at least 60 days per year. Public water systems are sub-classified as follows:
• Community water systems serve at least 15 service connections used by year round residents or regularly serve at least 25 year round residents
• Non-community water systems do not have year-round residents but serve at least 15 service connections used by travelers or intermittent users for at least 60 days each year or an average of 25 individuals for at least 60 days per year.

The EPA was requesting comment on the definition of public water systems as many drinking water providers serve far more 1,500 consumer servings at a site just a few days per year. As such, the EPA was considering a reduction in the time frame to 30 days, and the addition of an equivalency clause “or serves at least 750 people for one or more days”.

It is clear that the term Small Waterworks covers a wide variety of different sites. It would be impossible to apply a single regulatory standard to everything from a small hospital on the one hand, to a landlord-tenant arrangement on the other. For this reason, this paper proposes that the Small Waterworks be categorized using a risk assessment protocol as Small Public Waterworks or Other Waterworks. In this risk assessment approach, the term “public” is used to denote access to the water supply by members of the public, not ownership.

• Small Public Waterworks
• a waterworks serving 25 or more people served or 15 or more service connections, operating at least 30 days per year or serving at least 750 people on one or more days, or
• a waterworks serving populations at increased risk of waterborne illness (e.g., children, institutionalized elderly, hospitalized patients)
• a waterworks which uses water for food production or processing.
• Other Waterworks
All other waterworks not meeting the criteria of large waterworks in the DWPR or small public waterworks as specified above.

Recommendations
1. That the Small Public Waterworks Regulation (SPWR) establish a definition for a small public waterworks as: 25 or more people served or 15 or more service connections, operating at least 30 days per year or serving at least 750 people on one or more days; a waterworks serving populations at increased risk of waterborne illness; or a waterworks which uses water for food production and processing.

2. That the Ministry of Environment establish an internet accessible Register of Ontario Waterworks to contain data by community of all waterworks including the name, location, source, plant, and population served. This Register would categorize each waterworks as to whether it falls under the DWPR or proposed SPWR.

IV. Risk Assessment of Source Water
Ontario has a safe and dependable water supply. Nevertheless, the emergence of new waterborne pathogens (e.g., E. coli 0157/H7, cryptosporidium) transmitted or transmittable from public water supplies forces us to re-examine water sources to assess the potential for acute bacterial, viral or parasitic illness. Further, there is also recognition of potential adverse health effects from prolonged exposure to chemical or radionuclide contamination.

In establishing a regulatory framework for small public waterworks, a delicate balance must be sought between protecting public health and minimizing unnecessary treatment and monitoring. For these reasons, the proposed SPWR will need to consider the source of the water as a prime factor in a regulatory framework.

Water can be drawn from the following potential sources:
- Rain water
- Surface water (river or lake)
- Ground water under the influence of surface water
- Ground water.

Rain water is generally not used as a public water source in Ontario, but has been used by some as an adjunct cistern supply. Surface water is frequently contaminated with microorganisms. The DWPR currently identifies the requirements for filtration and disinfection that apply to large waterworks obtaining water from a surface water source.

Shallow groundwater sources, or wells obtaining water from a karst, fractured bedrock or gravel hydrogeologic setting are vulnerable to microbiologic contamination from surface waters. Drinking water regulations in the United States define ground water under the direct influence of surface water as any water beneath the surface of the ground with significant occurrence of insects, or other microorganisms, algae, or large diameter pathogens such as Giardia lamblia or Cryptosporidium, or significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions. Ground water under the direct influence of surface water is subject to the same treatment requirements as surface water.

The United States Environmental Protection Agency has also proposed requirements for sanitary surveys for all ground water systems, and hydrogeologic sensitivity assessments for all non-disinfecting ground water systems.
The New Zealand Drinking Water Standards 2000 define secure groundwater as “water contained beneath the land surface which is abstracted via a secure well head or similarly proven structure. It must not be under the direct influence of surface water or demonstrate any significant and rapid shifts in characteristics such as turbidity, temperature, conductivity or pH which closely correlate to any climatological conditions, surface water conditions or land use practices, as demonstrated by:

• less than 0.005 percent of the water having been present in the aquifer for less than one year (demonstrated by the tritium and CFC methods) and/or
• variations in the groundwater characteristics not exceeding a coefficient of variation of more than: – 3.0 percent in conductivity – 4.0 percent in chloride concentration – 2.5 percent in nitrate concentration (standardized variance). There must also be no insects, other macro-organisms such as algae, organic debris, large diameter pathogens or E. coli in 12 successive monthly samples.”

Recommendations
3. That all small public waterworks be classified by the Ministry of Environment accounting for the source of water (surface, surface under the direct influence of ground water, ground water).

V. Requirements for Treatment
The requirements for filtration and disinfection of surface waters are explicit for large waterworks. Due to the risks of microbial contamination, small waterworks obtaining water from a surface water source need to be subject to the same requirements.

Ground water sources which are under the direct influence of surface water need to be disinfected regardless of the size of the waterworks. No monitoring strategy or source water protection program will provide a sufficient safeguard for public health.

All small public waterworks drawing from ground water sources not under the direct influence of surface water need to be disinfected. An application by the owner/operator for an exemption might be considered if a secure ground water source can be proven (see above), and acceptable monitoring history demonstrated. The exemption criteria should be formulated in a manner similar to those in the DWPR, with the opportunity for input from the medical officer of health. The exemption criteria should not apply to waterworks serving vulnerable populations (e.g. children in schools, institutionalized elderly in hospitals and long term care facilities).

Recommendations
4. That all small public waterworks drawing from a surface water source be required to ensure the provision of a minimum level of treatment consisting of chemically assisted filtration and disinfection.

5. That all small public waterworks drawing from a ground water source under the direct influence of surface water be required to ensure the provision of a minimum level of treatment consisting of filtration and disinfection.

6. That all small public waterworks obtaining water from a ground water source not under the direct influence of surface water be required to ensure the provision of a minimum level of treatment consisting of disinfection.

7. That the Ministry of Environment undertake a hydrogeologic sensitivity assessment of all non-disinfecting ground water systems to determine the vulnerability to microbial contamination, need for disinfection and other corrective action.
VI. Requirements for Monitoring
The DWPR specifies the requirements for monitoring for large systems. Tests for health-related parameters must be conducted in an accredited laboratory.

The proposed SPWR must identify appropriate monitoring requirements for small public waterworks. While not as onerous as the requirements for large waterworks, the testing must provide a safeguard for water supplies accessible to the public.

A. Bacteriologic
The SPWR should identify the minimum requirements for bacteriologic testing for small public waterworks based on the risk assessment protocol which considers water source and population served. The minimum requirement for testing should be monthly.

Seasonal supplies should be sampled more frequently during periods of peak use.

B. Chemical
The SPWR should identify the minimum requirements for testing of health-related parameters in a manner similar to the former Ontario Drinking Water Objectives. These objectives specified the following type of requirements:

- Disinfectant residuals – 8 per month done weekly (2 per week)
- Volatile organics – quarterly if detected in the first sample or if the supply is vulnerable. Once every 5 years if not detected in the first sample.
- Inorganics – once every three years
- Nitrates/nitrites – annually unless four consecutive samples contain nitrates/nitrites at levels greater than 50% of the MAC (10.0 ppm), then frequency is quarterly.
- Pesticides and PCB’s – quarterly at supplies considered vulnerable (agricultural basin). All other supplies every ten years.

While the periodicity should be adjusted to make the requirements as straightforward as possible for the owner/operator, the application of these principles would ensure that a comprehensive baseline assessment of small public waterworks is established, and that future testing burden is predicted based on water quality test results.

Recommendations
8. The SPWR should define requirements for bacteriologic and chemical testing of small public waterworks. Minimum frequencies for bacteriologic testing should be specified. A schedule for chemical testing should be specified which might be based on category specific results. Radionuclide testing should be included if locally relevant.

VII. Notification and Corrective Action
As in the Ontario DWPR, the laboratory should be required to notify the water works owner, MOE and local Medical Officer of Health if analytical results exceed the health-based standard, or indicate adverse water quality. Notification must be done by informing a "live person", and be followed up in writing within 24 hours. The local MOH is responsible for declaring water unsafe and issuing boil water orders or other actions. The public must be notified by means of a posting at the site if an exceedence occurs and corrective action has not been taken.

The owner must take the appropriate corrective action in the event that a health standard is exceeded or an indicator of adverse water quality is demonstrated. The corrective actions may be required by the MOH and/or MOE. The local MOH should be responsible for consultation, assessment and remediation when
an adverse result is received. The MOH would take a lead role if the system were not one that is currently treated. The MOE should be responsible for requiring owners to take corrective action, particularly when remediation of a regulated or treated system is required, and field orders are necessary relating to maintenance, equipment, and engineering. The MOH and/or MOE should be able to reclassify a "secure" system as "insecure" in the event of an adverse event.

**Recommendations**

9. That the template for notification and corrective action included in the DWPR be utilized in the SPWR, with appropriate modification to deal with the requirements of small waterworks.

**VIII. Requirements for Implementation**

An appropriate infrastructure and support will be required to successfully implement the small water systems regulation. Training and certification of operators will be required and should be provided by the Ministry of Environment. An increase in resources for the Public Health Laboratory will be required to meet the increased demand for testing. Grants should be made available through the Ministry of Agriculture and Ministry of Environment to assist with necessary equipment and other upgrades. The Ministry of Environment and Public Health Units will require sufficient staff and resources to appropriately monitor and enforce the regulation.

**Recommendations**

10. That the regional offices of the Ministry of Environment be provided with sufficient staff and resources to monitor and enforce the regulation.

11. That local boards of health be provided with sufficient staff and resources to support implementation of the regulation, including the monitoring and enforcement role where relevant.