FINAL SUBMISSIONS
RELATING TO THE PROVISION OF
SAFE DRINKING WATER IN ONTARIO

SUBMITTED TO
MR. JUSTICE DENNIS O'CONNOR, COMMISSIONER
RESPECTING
PART II OF THE WALKERTON INQUIRY

PREPARED BY THE
ONTARIO WATER WORKS ASSOCIATION
AND THE
ONTARIO MUNICIPAL WATER ASSOCIATION

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I. INTRODUCTION

This document constitutes the final submissions of the Ontario Water Works Association and the Ontario Municipal Water Association ("OWWA/OMWA") for Part II of the Walkerton Inquiry.

The purpose of these submissions is two-fold. First, to provide the Commission with brief, succinct responses to the additional questions that the Commission issued by way of notices just prior to each Public Hearing in Part II of the Inquiry. Tentative responses to some of these questions were provided where time permitted during particular hearings. However, OWWA/OMWA undertook to respond to other questions contained in these notices or to provide fuller responses where only tentative comments had been provided, subsequent to the completion of the Part II Public Hearings themselves. Part II of this document contains the position of OWWA/OMWA on most of the questions contained in the Commission's notices.

The Commission should note that the statements contained in these final submissions may, in some instances, be at variance with statements made during the Public Hearings for some of these same questions. Where there is a material variance between an OWWA/OMWA response to a question during a Public Hearing, and a response contained in these submissions, the response in these submissions takes precedence.

The second purpose of these submissions is to provide the Commission with responses to other issues that arose during the course of the Public Hearings themselves that were in addition to the lists of questions contained in the Commission's notices. The Commissioner invited the Parties to comment on these other matters as well and Part III of this document contains the position of OWWA/OMWA on these selected issues.

The conclusion of these submissions provides brief final comments by OWWA/OMWA on the Inquiry. These final submissions have been prepared with the assistance of the special joint executive of OWWA/OMWA, consultants, and counsel for the OWWA/OMWA.

Appendix 1 of these submissions consolidates OWWA/OMWA recommendations from our reports filed with the Commission between June and September 2001.

In the following submissions, Commission notice questions or other issues are in **boldface** while OWWA/OMWA responses are in regular type.

II. COMMISSION NOTICES ON ADDITIONAL POINTS FOR CONSIDERATION

A. Public Hearing 1: Guiding Principles, Overall Government Role, First Nations

1. Guiding Principles

1. The Goal

The ultimate goal is a system in which the risks associated with drinking water are so small that a reasonable person, with adequate information, would accept that drinking water provided to the public anywhere in the province is safe.

OWWA/OMWA agree with this observation. However, OWWA/OMWA would add that the quality of water in Ontario is a vital link to both public and environmental health and ensuring clean, sufficient, and reliable sources of water for both public health and environmental protection should be a primary goal and responsibility of the Government of Ontario.

2. Well defined roles and responsibilities

The roles and responsibilities of each participant involved in the delivery of drinking water should be clearly set out and strictly enforced and coordinated through a Cabinet Committee on the environment.

OWWA/OMWA agree with this observation, with the caveat that the Ministry of the Environment should be the lead agency responsible for administering laws dedicated to ensuring both drinking water and source water protection in the province.

In addition, an advisory committee of the type OWWA/OMWA has recommended [a Professional Interest Advisory Forum ("PIAF")] should be established to assist MOE (see report of Ms. Judy A. MacDonald on Issue 12). A Cabinet Committee on the Environment would ensure that drinking water issues would be given high priority. However, the Ontario Government should form a PIAF to develop a drinking water quality management framework to implement the recommendations of the Commission, to entrench a continuous improvement culture in water system operations, and to improve the technical, managerial, and financial capacity of the MOE and water utilities.

A PIAF would perform a function similar to the National Drinking Water Advisory Council ("NDWAC") in the United States. The NDWAC consults on a continuing

basis with, and makes recommendations to, the United States Environmental Protection Agency ("USEPA") on matters related to the latter's activities, functions, and policies under the *Safe Drinking Water Act* of the United States. The membership of NDWAC is comprised of state and local agencies, private groups, academics, and members of the public concerned with drinking water issues.

In Ontario, OWWA/OMWA recommend that a PIAF represent decision-makers from provincial and municipal public health and environment agencies, water utilities, and non-government stakeholders with an interest in drinking water issues (e.g. OWWA/OMWA, other professional engineering and related organizations, environmental groups, academics, etc.).

3. Primacy of Public Health

Public Health should receive paramount consideration and, in cases where it is necessary to balance objectives, public health should always receive priority.

OWWA/OMWA agree with this observation. However, OWWA/OMWA would add that the principle should not be used as a basis for failing to undertake source water protection measures that could prevent drinking water problems from developing in the first place and that then only can be addressed through technically complicated and very expensive treatment measures. In short, prevention should precede cure as a matter of provincial drinking water law and policy.

2. Overall Government Role

1. Role of the Federal Government

The Federal Government should be encouraged to take a leadership role in Research and Development and in Standard Setting.

OWWA/OMWA agree with the above observation. The federal government needs to devote more resources to both research and development and standard setting in the area of drinking water protection (the latter activity through the on-going federal-provincial-territorial subcommittee on drinking water standards). Moreover, the activities of Health Canada and the subcommittee should be better publicized to ensure that the presentation of information on public health effects and standard setting is comprehensive, informative, and understandable. Furthermore, to ensure that any proposed drinking water guideline is reasonably achievable and meets the need that it is addressing, a formal review process should be set up to include representatives of all stakeholders (e.g. water utilities, environmental groups, government, industry, agriculture, etc.).

In addition, OWWA/OMWA submit there also is a potential federal role with respect to funding of drinking water infrastructure renewal. Clearly, the primary constitutional responsibility for drinking water protection resides with the province. However, OWWA/OMWA have noted that if the province needs to turn to the federal government for financial assistance to upgrade drinking water infrastructure in the province, there is no constitutional impediment to the federal government enacting legislation to provide such fiscal assistance pursuant to the federal spending power. In such circumstance, the federal government should focus primarily on the provision of loans not grants. In reports (See Castrilli, Issues 2 & 4, and Scandlan, Issue 14), during the Expert Meetings (See Expert Meetings 5 and 10), and during the Public Hearings (Public Hearings 1 and 8) OWWA/OMWA have recommended that the province consider, in conjunction with the federal government, establishing a revolving loan fund modeled in part on the regime now in place under federal drinking water law in the United States.

Federal fiscal assistance should be provided in a manner that is consistent with the overriding principle that to the maximum extent feasible water utilities should be self-financed, based on user fees and charges, and the charges should be based on a system of full-cost accounting, recovery, and pricing.

2. Two New Branches within MOE

Two new branches should be created within the MOE: (1) the Watershed Management Branch; and (2) the Drinking Water Branch. The focus of the Watershed Management Branch will be on source protection generally. The focus of the Drinking Water Branch will be on the treatment and distribution of drinking water.

OWWA/OMWA would prefer to see a single water branch within MOE consisting of three sections (1) drinking water, (2) water pollution control/source water protection, and (3) water conservation. We believe it would be more appropriate to have one branch addressing water matters in Ontario.

B. Public Hearing 2/3 : Provincial Government: Functions and Resources

1. Overall Policy and Standards

1. By what principles should it be determined whether a given stipulation regarding safe drinking water belongs in an act, a regulation, or a policy?

Discussion - Acts by their nature are difficult to amend or change. Regardless, given the importance of a safe and reliable supply of water, it is considered that an Act is required to provide the necessary profile needed for protection of public water supplies. The Commission's consultant Dr. E. E. Geldreich reported that: "Several of the utilities complained about the scattering of regulations through various legal publications that should be consolidated into one unified document." OWWA/OMWA agree with Dr. Geldreich's observation and suggest that it also points to the need for provincial drinking water legislation.

OWWA/OMWA Position - An Act should be drafted by a panel of experts consisting of persons with experience in operating and managing public water supply, persons with experience in public health, and with provincial civil servants. The Act should not be overly prescriptive in terms of standards so as to ensure that it does not frustrate the development and implementation by water utilities of best management practices and continuous improvement measures.

However, it should be recognized that it will take several years to develop and implement a safe drinking water law in Ontario. Accordingly, the government should consider developing an overall management strategy from the watershed to the customer's tap. What is needed is an approach that would ensure that best management practices are implemented as soon as possible for effective control over the processes and activities that govern water quality and safety. In the interim, the Government of Ontario should:

- provide funding to implement the International Water Treatment Alliance;
- amend the Engineer's report process as recommended in the OWWA/OMWA reports (see reports for Issues 7, 8 and 12);
- initiate the gap analyses and system viability assessments recommended by the OWWA/OMWA.

2. Approvals/Licensing

2. ***Do the Parties feel that organizations providing drinking water should be accredited and/or licensed?***

3. ***If so, then what would be the role of the Certificate(s) of Approval?***

4. ***If so, then what should be the conditions of license/accreditation?***

Discussion - Definitions of licensing and accrediting are necessary to respond to these matters. Licensing is the legal authority to operate a water system provided by a certificate of approval issued under the *Ontario Water Resources Act*. Accreditation is the recognition of a standard of excellence as judged by a panel of peers. Accreditation includes items such as operating standards, maintenance standards, staff training, financial administration, etc.

As a second point, there is confusion between the terms certification and licensing. Water treatment and distribution facilities are certified under O. Reg. 435/93. The level of certification is dependent upon the complexity of the facilities. The necessary qualifications of operators (certification level) who operate this are then based upon the level of certification of facilities. Facility certification is provided by a contracted service to the Human Resources Branch of MOE and there is no direct link between a licence (Certificate of Approval) and facility certification. Therefore, if a facility is made more complex as allowed by a new or amended Certificate of Approval, there is no automatic “trigger” to change the level of facility certification.

Certificates of Approval were originally intended as an approval to construct a facility. They have evolved into documents that are used to set operating standards. For example, certificates have been used to document capacities and monitoring requirements for new and upgraded water and wastewater infrastructure. Generally, certificates were issued on a project by project basis and typically "water supply system" certificates were not issued. The process under the Engineer's Report now requires that an overall system review be completed and "consolidated" certificates of approval issued to system owners. As such, Consolidated Certificates of Approval could be viewed, or could evolve into, "licences to operate" since they establish and document conditions of approval.

The licensing of operators and facility certification is the responsibility of the Human Resources Branch of MOE. This is a left-over from the time when MOE provided operator training. At that time, the Branch had trainers on staff who were knowledgeable in facilities operations. This Branch no longer has such persons on staff. To make up for this lack of expertise, exam questions are set by industry representatives and are coordinated with the Association of Boards of Certification (ABC).

OWWA/OMWA Position - The right to operate a water facility (the licence) should be provided by way of a certificate of approval. The certificate of approval, or licence to operate, should include the level of certification of the facility and that required of operators. This information should be forwarded to the Human Resources Branch of the MOE and the certification program administrator and also should form the basis for enforcement of O. Reg. 435/93.

The OWWA/OMWA recommend that the provincial government encourage water utilities to join an accreditation program to ensure establishment of a process of continuous improvement in the province. We would suggest that the Government of Ontario work with the OWWA/OMWA to establish an International Water Treatment Alliance ("IWTA") program in Ontario because IWTA is the necessary first step in facilitating continuous improvement, peer review, benchmarking, and accreditation. A dedicated Project Manager should be appointed to facilitate, demonstrate the benefits of, provide guidance with respect to, and assist in implementation of, this process.

Consultation with respect to the implementation of accreditation to complement regulation should occur concurrently (since accreditation standards are under development and are expected by 2004).

OWWA/OMWA have recommended that a third party - i.e. an entity external to government - do the accrediting, advise the utility of the results, including any deficiencies identified, and then the utility would be obligated to undertake corrective action in order to maintain its accredited status. Thus, accreditation would be a third party program that does not involve the government.

Regulation would continue to provide the basic ground rules but water utilities would rely on the accreditation program to demonstrate that they meet best practices. An accreditation program can verify to the owner that industry best practices are being employed to produce water of the highest quality, which usually will exceed the minimum established by law. By accrediting their operations, water authorities will be able to assure customers that they are conforming to best practices and minimize the need for potentially intrusive regulations that could frustrate the application of best practices and continuous improvement.

3. Oversight

1. ***Are the parties satisfied with the provisions of O. Reg. 459/00 (the Drinking Water Protection Regulation) regarding treatment, testing, notification, and corrective action?***

Discussion - O. Reg. 459/00 was necessarily drafted and promulgated in haste. A result is that some aspects of the regulation have been found to be problematic

and may need amendment. The regulation is an important step toward ensuring that water authorities in Ontario continue to produce safe drinking water in future. However, the regulation will require some "tweaking" to address the issues raised by the OWWA/OMWA reports, as well as the report prepared for the Commission by Dr. E.E. Geldreich. For example, OWWA/OMWA has identified issues related to requirements for small systems, water quality monitoring, variances, standard method testing, engineer's reports, water quality reports, and related matters.

OWWA/OMWA Position - The regulation is overly prescriptive in terms of treatment requirements. Many alternative processes are available to achieve comparable standards of water treatment. Although the regulation allows for equally effective treatment alternatives if acceptable to the MOE Director, it does not specify which methods of alternative treatment may be acceptable. OWWA/OMWA note that the Environmental Commissioner in his 2000-2001 Annual Report (*Having Regard*, at 112) also expresses concern about this matter. The Environmental Commissioner noted that this is "an extremely significant omission" and that MOE should have provided an interpretation defining alternate acceptable treatment technologies. MOE's failure to do so, according to the Environmental Commissioner, may stifle the development of new equivalent technologies that could provide equally effective treatment. Moreover, in the view of the Environmental Commissioner, it would be extremely helpful for smaller communities in particular to be informed of less expensive, equivalent alternatives from which they can choose.

Only certified labs can undertake testing for many parameters. In the case of microbiological testing the transportation time to these labs often exceeds industry standards and leads to false readings. Further, certified labs are normally only manned 8 a.m. to 5 p.m. Monday to Friday. The net result is a very narrow window for sampling, basically Monday morning to Thursday noon or 50% of the week if the lab is within a reasonable driving distance. If a sample is taken Thursday afternoon the results are normally not available until the following Tuesday. If courier services are used because of distance the sampling window is even narrower. This places the public at unnecessary risk than if other protocols with similar standards of reliability were available.

OWWA/OMWA also note in this regard the similar observations of Commission consultant Dr. E. E. Geldreich. In his report, Dr. Geldreich indicated that some utilities are only sampling on Monday and Tuesday for all of the required samples for the week. He indicated that "There is often no further monitoring for microbial contamination until the following week". He stated that "Reasons given for this fixed approach to monitoring water quality in the system are said to be dictated by the time required to get a test completed and results released by the laboratory to the proper water authorities within the work week." His recommendation was that "Certified laboratories must not dictate restricted days to analyze samples during the week and tests should be periodically done on the

weekend and holidays to monitor the water supply leaving the plant. Monitoring the public water supplies should be varied to cover all days of the week and all areas of the distribution system in a random fashion. ... It was suggested that the reason for restricted days to test water samples was driven by some commercial laboratories that have arbitrarily restricted water testing to specific days so that other types of laboratory activities could be scheduled for the remainder of the week. This approach to meeting the mandate for testing water samples needs to be changed with one or more water samples (number of samples dependent on population density served) collected from different locations in the distribution system on varying days in the work week."

To resolve these concerns, water utilities should be required to prepare a *Monitoring Plan*. The plan should outline the details of a water utility's microbiological monitoring program as well as its regulatory compliance and treatment plant process control monitoring programs. The plan should also include details of sampling sites and frequencies, the rationale for the sampling sites, collection methods, and field analyses. The *Monitoring Plan* appears to be similar to the "recommendations for a monitoring regime" that is required by the Ontario Ministry of the Environment Engineers' Reports for Waterworks.

Monitoring program design is a very important issue for all water utilities in Ontario. Currently, the Engineers' Report process addresses some of the aspects of a monitoring program. However, there is an opportunity for the Ontario Government to provide more guidance to utilities. Based on the types of water utilities in Ontario, the Government of Ontario could take a leadership role in monitoring program design to ensure consistency. Without assistance, small systems will have difficulty developing a comprehensive monitoring plan. Several tiers of monitoring could be developed, from Level 1 monitoring covering only essential requirements through to Level 3 or 5 describing the elements of a "best practice" monitoring program.

The regulation only considers results from certified labs or, in the case of operational parameters, results from person with a CL 1 Water Treatment Licence or Water Quality Analyst. This presents a problem in that if an analysis outside the scope of the regulation is found to be “adverse” the result is not reportable. There should be a requirement that <u>all</u> adverse samples are reported.

The regulation is part of the *OWRA* and applies to facilities for which a certificate of approval has been issued. In that case the owner is responsible and any finding of non-compliance is made against the owner. Many facilities are operated by contract and the regulation does not hold the contractor responsible. The regulation should be rewritten so as to state contractor responsibilities for non-compliance.

OWWA/OMWA recommend that extensive consultation occur with relevant stakeholders (e.g. water utilities, OWWA/OMWA, etc.) before modifications to the regulations are posted on the EBR registry.

2. ***If the abatement and enforcement functions of the Government of Ontario are separated, with which should the inspection function reside?***

Discussion - Water authorities and MOE staff have had, until recently, good working relationships that allowed for open discussion of problems without the threat of charges being laid. The OWWA/OMWA agree with the observations made by E. E. Geldreich that some utilities still have good communications with the MOE while others report a deterioration in communication and assistance. Geldreich notes that "Some of the problems relate to new employees at the Ministry of the Environment who are inexperienced in water supply problems, citing only references to regulations and providing no in-depth assistance. Another part of the problem appears to be a shift in program direction, together with loss of funding and experienced staff."

OWWA/OMWA Position - The Government of Ontario, water utilities, and other relevant stakeholders must work together to re-instate the concept of "partnerships" in the drinking water industry. Drinking water quality management requires commitment and involvement with numerous regulatory agencies and other relevant stakeholders, including inspection, abatement and enforcement functions of the MOE. The inspection function - or another new function of the MOE - should facilitate win-win situations whereby operators request advice on how to solve problems without fearing that doing so may lead to prosecution.

Inspection is an integral part of monitoring for compliance and achieving abatement. Traditionally, MOE district offices have performed the inspection function. Abatement inspection is not part of enforcement. As a matter of law, inspection is not meant to be and should not be perceived to be a means of gathering evidence for purposes of an enforcement action (e.g. initiating a prosecution) designed to compel someone to comply with, or be punished for failing to comply with, legislative requirements. The MOE's Investigations and Enforcement Branch ("IEB"), created in the mid-1980s, was designed to perform the enforcement function.

3. ***The following set of "Enforcement Principles", which represents a distillation of comments heard at the Expert Meetings. Enforcement should be:***

    1. ***Strict;***
    2. ***Equally applied, whether the operator is a municipality, a provincial body, or a private sector operator;***
    3. ***Independent of political or non-IEB interference; and***
    4. ***Adequately resourced.***

    What is your reaction to this set of principles?

OWWA/OMWA Position - We would add that:

- Enforcement staff should have extensive experience and knowledge of water treatment; and

- Enforcement staff should be adequately trained.

4. Public Involvement

1. ***How should the public be involved in the standards setting process? The Commissioner will be looking for specific recommendations regarding mechanisms for public involvement.***

Discussion - The general public and those operating water facilities must have confidence in those setting standards and be aware of proposed changes to standards. They must be offered an opportunity to participate in setting standards and/or comment in a timely manner. The procedures must not be cumbersome. The existing EBR registry was established for this reason but it is awkward and time consuming to use.

OWWA/OMWA Position - The EBR registry should be revamped to be more user friendly. Some specifics could be:

- Allowing for searches by specific categories based on area of interest such as geography, assessments, construction, etc.

- Alerts to registered parties who may wish notification based on categories such as geography, type of facility, etc.

In addition, as noted above the Ontario Government should form a PIAF to:

- Provide practical and independent advice to the MOE (and the Cabinet Committee responsible for drinking water) on matters and policies related to drinking water quality and hygiene;

- Maintain an awareness of developing issues and problems in the drinking water area and advise the regulator on emerging issues;

- Review and advise MOE on regulations and guidance required by O. Reg. 459/00 and/or a new safe drinking water law;

- Make recommendations concerning necessary special studies and research;

- Recommend policies with respect to the promulgation of drinking water standards;

- Assist in identifying emerging environmental or health problems related to potentially hazardous constituents in drinking water; and

- Propose actions to encourage cooperation and communication between the regulator and governmental agencies, interested groups, the general public and technical associations and organizations on drinking water quality.

Furthermore, the activities of Health Canada and the Federal-Provincial Sub-Committee should be better publicized to ensure that the presentation of information on public health effects and standard setting is comprehensive, informative, and understandable. In addition, the use of relative-risk reduction principles should be a major consideration in prioritizing the standard setting process of Health Canada and the Federal-Provincial Sub-Committee. The implementation of the above would provide greater opportunity for public education and participation in the standard setting process and drinking water related policy decisions.

5. Other Functions

2. Should testing of private well water quality be mandatory? If so, for what parameters, with what frequency, and who should pay?

Discussion - OWWA/OMWA are not involved with matters relating to provision of water from private wells. OMWA has participated with AMO and assisted with their position on this matter.

OWWA/OMWA Position - All water should be tested for health reasons. There is an argument that private wells should not be the concern of the province. To

counter this, there are seat belt laws for private vehicles for reasons of personal safety. Likewise there should be a requirement to test private well water in the interest of public safety. The frequency and parameters for testing of private wells must be risk-based. Just as persons supplied with public water pay for testing, likewise those who use private wells should pay for testing of their water supply.

A problem exists in that there is not a comprehensive inventory of wells. Accordingly, until such an inventory is developed, enforcement of any such regulations may by difficult.

It is the understanding of OWWA/OMWA that in Nova Scotia, drinking water supplies that do not require an approval must be registered with the Department of Environment and Labour (e.g. rural schools, restaurants, campgrounds, etc.) An owner of such a drinking water supply is required to sample the water supply quarterly for bacteriological parameters. For general chemical and physical parameters, the owner must sample a groundwater supply at least once every two years and a surface water supply at least annually. The owner is responsible for paying for the water quality tests. Costs are in the order of $300.00 per year. It is our understanding that there have been no complaints received to date from the owners of such systems (approximately 3000).

Nova Scotia owners of private residential wells are encouraged to have their water tested (but it is not mandatory).

The above protocol could be applied in Ontario in light of the minimal costs to confirm that water quality meets specified standards.

If the above protocol is not implemented OWWA/OMWA recommend that all owners be encouraged to test their water to confirm its quality and to take action to improve quality, if necessary. For rural schools, restaurants, etc. that serve the public, we recommend that owners post, in a publicly visible location, a statement as to whether the water quality has been tested. If the water quality has been tested, the results should be posted and a statement regarding whether it is potable provided. If the water quality has not been tested, a statement indicating that the water has not been tested should be provided. We also support the recent initiative of the province regarding "designated" water supply facilities.

6. Relationship to Health Units

3. Should there be specific, pre-defined circumstances under which a boil water advisory/order (BWA) is compulsory? If so, what would those circumstances be?

A boil water advisory should be issued when the risk of illness through the consumption of contaminated drinking water is a reasonable possibility. A boil water advisory should be issued when there is no other reasonable alternative to protect public health. The regulator and water authorities should agree on uniform guidelines on when to issue a boil water order and when to terminate the order.

Consistent "early warning" triggers also should be developed to initiate immediate corrective action that could avoid an adverse water quality condition (i.e. HPC count exceeds a specified limit). The underlying cause of the problem should be identified and measures implemented to prevent future occurrences.

4. Should there be mandatory systems for disseminating information in the event of a BWA? What should they be?

Considered and controlled responses to incidents or emergencies are essential for protecting public health, as well as maintaining consumer confidence. It is imperative that incident and emergency protocols, including communication and notification procedures, be developed and documented prior to an incident to enable efficient, effective and rapid responses that will minimize impacts on the community. Actions and protocols should be developed in consultation with relevant regulatory authorities and other key agencies.

5. Should the MOH be obliged to develop and publish a protocol for when a BWA will be issued?

Yes. As outlined in response to Questions 3 & 4 above.

Further Discussion on Questions 3 to 5 - Medical Officers of Health (MOH) are held responsible by statute for certain public health matters, including public water supply. Regulations cannot be drafted which will cover all circumstances and provide realistic remedies for all circumstances. A further problem with the current system is the relationship between the water authority and MOH. In our experience MOHs often do not become proactively involved with water utilities on a routine basis, but only in emergency situations where they are reacting to events. Measures are needed to improve communication and cooperation between water authorities and MOHs.

OWWA/OMWA Position:

- Adverse water samples including those outside the scope of OR 459/00 must be reported immediately to MOH;
- MOH should be provided with guidance as to action upon receiving adverse water reports, and MOH have discretionary powers to issue BWA or BWO;
- Water authorities should be required to prepare contingency plans to notify the public in the event of a BWA or BWO being issued. Those plans should be approved by MOH;
- There should be more contact and cooperation between MOHs and water authorities on a routine basis and not solely or primarily in emergency situations;
- There should be adherence to the recommendations contained in response to Questions 3-4.

C. Public Hearing 4: Source Protection

1. How should the overall goal for source protection be articulated?

The overall goal for source protection should be articulated through new provincial law(s) that address three matters in a coordinated fashion: (1) safe drinking water; (2) water pollution control/source water protection; and (3) water conservation matters. The Ministry of the Environment should have prime responsibility for articulating the goal, and ensuring that it is implemented within the province.

2. Is the scale for planning for source protection different from the scale for implementation (i.e. the watershed as opposed to provincial, municipal, or site specific)? Is it practical to have different scales?

The scales for planning and implementation for source water protection should both be the same under provincial jurisdiction (i.e. the watershed). Because the watershed, whether surface water or an aquifer, transcends a number of municipal boundaries, and because municipalities lack legal authority to control such cross-boundary matters, and since there might be site-specific trans-municipal problems within a particular watershed, or between watersheds, provincial regulation will be necessary.

3. What level of guidance should the province give to those making source protection plans? Principles? Intent of plans? Should guidance be statutory or in provincial policy?

Statutory authority on a province-wide basis is required to ensure appropriate development of source protection plans. This also may require regulation. Policy

guidance is not strong enough; there must be statutory and regulatory obligations. An expert panel or advisory panel may be useful in this regard.

OWWA/OMWA also suggest that regard should be had to certain provisions in the Model Water Conservation Act provided to the Commission by the Canadian Environmental Law Association (CELA). In particular, OWWA/OMWA would refer the Commission to the following sections of that model law:

- sections 5-9.1 (respecting licensing of activities having potential impacts on source waters);
- section 11(3) (the requirement that a water use assessment should be conducted on a watershed basis and setting out the particulars of what should be assessed);
- section 12.1 (the requirement to prepare a plan containing certain specified water conservation measures); and
- section 16.1(1)-(3) (the requirement to develop, on a watershed basis, remedial water plans and setting out the contents of such plans).

The CELA model law focuses on water conservation. However, the regime described therein contains a number of drinking water protection measures that are required by the USEPA under federal drinking water law in the United States and that are endorsed by the American Water Works Association in the drinking water context. In this latter regard, OWWA/OMWA would refer the Commission, for example, to an AWWA statement of policy and white paper we filed during Public Hearing 5 respecting the importance of water conservation measures for protection of drinking water.

4. What are the essential components of a source protection plan?

The essential components of a source protection plan are as follows. First, there should be an appropriate inventory and characterization of the water source. Second, there should be development of an up-to-date inventory of all point and non-point sources of water pollution in each watershed. Third, identification of the nature and quantity of pollutants discharged to each watershed is necessary. Fourth, there should be development of goals and implementation of strategies for remediation, monitoring, and evaluation for each watershed. See also the response to Question 3.

The particulars of the above-summarized components of a source water protection program are as follows:

(1) Inventory and characterize the water source:

- Watershed boundaries
- Natural setting
- Hydrology
- Hydrogeology

(2) Identify pollutant sources and relative impact:

- Sewage disposal
- Urban runoff
- Industrial disposal and runoff
- Animal waste disposal
- Agricultural runoff
- Forestry, soil disturbance runoff
- Recreation
- Mine disposal and runoff
- Solid and hazardous waste disposal and storage facilities
- Transportation spills
- Water diversions and resource facilities

(3) Assess vulnerability of intake to contaminants:

- Type of contamination and load entering the water source
- Correlate land use to contaminant load
- Conduct monitoring, modeling, and on-site assessment
- Identify high risk conditions

(4) Establish source water protection goals:

- Primary goal (i.e. provide an adequate supply of high quality water)
- Secondary goals

(5) Develop source water protection strategies:

- Land use controls (e.g. buffer zones, land acquisition, comprehensive planning, zoning, written agreements, legislative action, public information, education and participation, watershed/recharge area inspections, etc.)
- Site level best management practices (e.g. prohibited land use, controlled discharges, erosion control, crop rotation, etc.)

(6) Implementation of the program:

- Develop a formal structure to implement the program (consider issues related to ownership versus area jurisdiction)
- Establish relationships to administer the program with key stakeholders

- Acquire necessary resources (e.g. financial, personnel, etc.)
- Develop public information and involvement activities
- Protect the program from legal challenges (e.g. land use controls)
- Ensure compliance with, and enforcement of, program

(7) Monitor and evaluate program effectiveness:

- Routine monitoring
- Monitoring to evaluate the effectiveness of best management practices
- Special studies
- Early warning system

OWWA/OMWA believe that protection of source water is a continuous process that requires a long-term commitment and is essential in an overall program of drinking water protection. Source protection also requires a strong commitment at the local level, a combination of strategies, and cooperation of all stakeholders.

5. Should planning include guidance or principles for allotment of takings and/or loadings?

Planning should include principles for the allotment of takings and loadings as far as source water is concerned. A precedent for this approach is the Total Maximum Daily Load ("TMDL") approach under section 303 of the *Clean Water Act* of the United States. OWWA/OMWA's consultant, Brian Pett, discussed this program in his Issue 6 report.

6. What should be included in a provincial groundwater protection policy?

As noted in response to Question 10 below, conservation authority boundaries are based on surface watersheds. Groundwater aquifer boundaries often are not coextensive with surface watersheds. Consequently, protection of groundwater by conservation authorities under current legislative and regulatory regimes may be problematic.

The components of a provincial groundwater protection policy must be at least three-fold: (1) a *preventive regime* of licencing addressing both groundwater quality and quantity to prevent deleterious consequences from applications for industrial, commercial, agricultural or other activity that may adversely influence groundwater; (2) a *planning regime* that would both inventory the qualitative and quantitative status of groundwater and develop and implement a plan for its protection at least on a watershed basis to ensure overall improvements in future; and (3) a *remedial regime* to correct past mistakes with respect to ground water quality and quantity. For a precedent for what such a regime could look like see responses to Questions 3 & 4 above.

7. To what extent should other land use planning be constrained by regulations, policy, or plans regarding the protection of drinking water sources?

Commission consultant Geldreich stated the following "Regulatory oversight should include input to and review of watershed activities and veto power on any proposed discharge permits that might create poorly controlled effluents in the upstream segments of the water resource." Any industrial, commercial, agricultural or other land use development that is going to harm source waters within a watershed should be regulated under provincial law to minimize or completely avoid such harm to the water source. In particular, to be effective a legislative regime authorizing watershed or source water protection plans should override inconsistent land use planning decisions as a matter of law. For a precedent for what such a regime could look like see sections 9 and 9.1 of the CELA model law. OWWA/OMWA also would refer the Commission to the requirements of Nova Scotia law that are discussed under Public Hearing 5 below (Part II.D.1, Question 4).

8. What should be done about existing uses that do not conform to a new source protection plan?

Existing uses that do not conform to a new source protection plan should be phased out over time where they pose an irreversible threat to source water quality within a watershed and where they cannot be immediately curtailed, with appropriate compensation where necessary. This could mean legislation that would not recognize non-conforming uses.

9. Can provincial regulations, standards, or policy prevent competition between local decision-makers to attract development and economic activity?

Certainly provincial regulations and standards should prevent and overrule any competition between local politicians who, in their efforts to attract development and economic activity, may wish to ignore or minimize good practices in source protection.

10. Do municipalities require additional powers to protect sources? If so, what powers?

Source water protection arguably is best achieved on a surface watershed or aquifer zone of influence basis. However, municipal territory, and therefore authority, is not organized on this basis. The only agencies that are organized on a surface watershed basis are conservation authorities. However, the powers available to conservation authorities to protect surface source waters under the

Conservation Authorities Act are very limited. Under the *Planning Act*, conservation authority powers are non-existent.

Frequently, what a watershed-focused agency needs to protect source waters for drinking water, pollution control, and water conservation purposes are municipal-type by-law powers typically found only in the *Municipal Act* and the *Planning Act.* The solution may be for the province either to (1) invest conservation authorities with municipal-type powers as a matter of law, or (2) create watershed level planning bodies (a municipal-conservation authority mix) that would wield the power of municipalities but have the geographic (i.e. watershed) jurisdictional reach of conservation authorities.

An example of an entity of this type wielding such powers is found in the CELA model law (see sections 4.1-4.7 of model law). Examples of the types of additional municipal by-law type powers that would be of assistance in protecting source waters (albeit for water conservation purposes) are found at section 12.1 of the CELA Model Water Conservation Act. See also response to Question 3 above.

In all of the above cases, the powers should be exercised within the overall supervisory authority of the MOE.

11. What should the federal role in source protection be?

OWWA/OMWA note that the federal government already has very strong, if selectively used, powers under the *Fisheries Act* to (1) prevent harmful alterations of fish habitat without prior federal authorization, and (2) prohibit the deposit of deleterious substances into waters frequented by fish. These powers, which in the past in Ontario have been used by the province, can be employed, for example, to prevent the direct watering of livestock in streams, rivers, lakes, and other water sources.

However, it is unlikely that the federal government would want to greatly expand its legislative/regulatory role in this area, either under the criminal law power or the peace, order or good government clause of the Constitution, for fear of upsetting the balance of Canadian federalism. However, there is no reason why the federal government under the federal spending power could not contribute financially to the development and implementation of source water assessments and source water protection plans as a means of speeding up the process.

We note as well that there is a national concern with First Nations' communities under federal jurisdiction. These communities are primarily involved with source protection issues because they are so small that they cannot sustain effective preventive and treatment programs on a full cost recovery basis. As a result, they may need some sort of assistance from the federal government.

12. Should this Inquiry make any recommendations regarding the Great Lakes and other boundary waters? If so, what should they be? How should source protection planning be coordinated with or have regard to the regulatory regime for the Great Lakes?

The Commission should comment, generally, on the need for all jurisdictions bordering the Great Lakes Basin to protect the source waters of the Basin (i.e. all the tributary waters of the Lakes and their drainage areas). OWWA/OMWA noted in the report of Mr. Brian Pett (Issue 6), that over two decades ago the International Joint Commission recognized, for example, the threats posed by uncontrolled agricultural activity on the source waters of the Basin. The IJC also proposed a four-pronged solution consisting of coordinated measures respecting (1) land use planning, (2) regulation, (3) fiscal assistance, and (4) educational/technical assistance. OWWA/OMWA submit that this advice from the IJC is still relevant to Ontario and the other jurisdictions bordering the Basin.

D. Public Hearing 5: Regulatory and Technical Issues for Specific Sources of Contaminants; Water Quantity

1. Watershed Planning Process

1. How should interested parties (industry, agriculture, environmental groups, municipalities) be represented in the planning process?

Involvement of interested parties should be at least two-fold. First, each watershed (or groups or portions of watersheds as currently is done with respect to the jurisdiction of Conservation Authorities) should be designated a watershed management planning area under new provincial source water protection legislation. Various groups could be represented on a stakeholder committee(s) for the purpose of providing input to development of the watershed management plan for the particular watershed. Second, once such a plan is issued in draft form the plan should be subject to notice, comment, and other forms of public consultation before being finalized for approval by the province.

2. Please give your ideas for the interaction between a Watershed Management Planning process and the regulation of agricultural activities, the regulation of waste water, septage and biosolids, the regulation of industrial discharges, the control of urban development and the regulation of any other potential sources of contamination. Discuss the interaction in relation to policy development, standard setting and monitoring and enforcement.

The Watershed Management Planning process should be driven by the achievement and maintenance of provincial water quality standards as a matter of law on a watershed by watershed basis. In such a context, watershed management plans could guide the provincial issuance or amendment of approvals to any number of sources of contamination (both point and non-point source, surface and groundwater) including agricultural activities, wastewater and industrial dischargers, development, etc. The plans could incorporate appropriate policy development, standard setting, monitoring, and enforcement requirements to complement or supplement existing provincial laws. See also responses to Questions 3-6 below.

3. Is it feasible for Watershed Management Plans to set out maximum nutrient or contaminant loads for entire watersheds or sub-watersheds. If so, how should allocations among entities be determined?

A precedent for this approach is the Total Maximum Daily Load ("TMDL") approach under section 303 of the *Clean Water Act* of the United States. OWWA/OMWA's consultant, Brian Pett, discussed this program in his Issue 6 report. Under this approach TMDLs, which apply to both point and non-point sources of water pollution, must be set at levels that implement applicable water quality standards (i.e. numerical standards on a pollutant by pollutant basis) that have been set under state law subject to federal (USEPA) oversight.

Ontario does not have enforceable source water quality standards, but does have Provincial Water Quality Objectives, developed by the province over the years, that could be used as surrogates. The question that would then have to be asked for each watershed is how much of a particular pollutant (e.g. phosphorous or other nutrients) can a water body assimilate on a daily basis without violating the water quality objective (or standard). To do this, you would have to determine how much contamination is coming from non-point sources on the watershed (which the province currently has very little control over) and how much is left over for point sources (which the province has more control over).

Undertaking an analysis of this type in the United States, allows state and federal agencies to set load allocations for each particular source and pollutant. That is, the amount of pollutant from non-point sources is deducted from the TMDL. What

is left over is divided between the permitted point sources. The point sources must comply with the effluent level established as a matter of law. This allocation constitutes the source's fair share of a load that the water body can assimilate without violating the applicable water quality standards. Various courts in the United States have suggested that the TMDL process could be used to help jurisdictions evaluate and develop land-management practices to mitigate non-point source pollution. (See Brian Pett Issue 6 report, Appendix D).

The further question that has to be asked is how can new pollution sources be allowed in a watershed in circumstances where there is already violation of a water quality standard (or objective) from existing sources? If Ontario water pollution law permitted the use of off-sets (a form of emissions trading, authority for which now exists under certain air pollution laws in the United States and Canada) a new source could obtain an off-set from an existing source (i.e. opportunity to discharge 10 pounds of pollutant x, if the existing source agreed to discharge 12 pounds less of the same pollutant) without further contributing to a violation of water quality standards in the watershed.

4. Should Watershed Management Plans determine those areas that are particularly sensitive to water contamination, and should specific land uses be prohibited in those areas? Under what authority?

Yes. Watershed Management Plans should determine those areas that are particularly sensitive to water contamination - both surface and groundwater - and should specify those land uses that are to be prohibited or their activities restricted. The watershed management-planning regime should be established under provincial law such as new source water protection legislation. Once the province approves a management plan for a particular watershed the plan should override inconsistent official plan, zoning, or other land use designations or approvals under the *Planning Act*.

A precedent for this approach may be found under the law of Nova Scotia. Under the *Environment Act*, the Nova Scotia Minister of Environment may establish a water resource management strategy for the province. The Minister, when requested by a waterworks operator, also may designate an area surrounding any existing or future water supply source as a protected water area and promulgate regulations to prohibit or regulate any activities that could impair water quality in the area. [Limited authority to define and enforce a public water supply protection area exists under Ontario law (See section 33 *OWRA*)]. Under the authority of Nova Scotia law, the Minister of Environment has designated protected water areas in the province and placed prohibitions or restrictions on forestry, landfill, mining, and agricultural activities (e.g. livestock building construction, manure handling, storage, and application rates).

5. If nutrient or contaminant loads are to be determined on an individual user-by-user basis, how is the acceptable load capacity of a watershed, sub-watershed or aquifer to be protected? (Where and how will cumulative effects be considered?)

See response to Question 3 above.

6. Should municipal by-laws be permitted to place greater restrictions on user activities than those contemplated by a Watershed Management Plan?

OWWA/OMWA submit that in the area of land and water use planning exclusive jurisdiction to protect a watershed should not be assigned to any one government level or agency if they are acting appropriately within jurisdiction. Municipal by-laws that place greater restrictions on user activities than those contemplated by a provincially approved watershed management plan should be permitted under provincial enabling legislation.

The Supreme Court of Canada decision in *Spraytech v. Hudson* recognized a place for jurisdictional pluralism in the environmental regulation of pesticides such that a tri-level regulatory regime that included municipal pesticide regulation was permissible in the circumstances because the municipal law was not directly contrary to provincial law. In a circumstance of direct conflict the municipal by-law should be inoperative but then only to the extent of the conflict.

2. Municipal Wastewater, Septics, Biosolids

7. Should the permitted municipal sewage effluent be limited by watershed management plans? Who should decide allocation issues when proposed loads exceed capacity?

Yes. See responses to Questions 2-5 above. MOE.

8. What should be done if existing discharges exceed the assimilative capacity determined under a watershed management plan?

There are a number of options. If the discharge is from a point source (i.e. a source that likely is currently subject to an approval under the *Ontario Water Resources Act*), the entity can be placed under an order and required to achieve specified discharge reductions under a schedule set out in the order. If the discharge is a non-point source and likely not under, or likely to become subject to, an approval under Ontario law the amount ascribed to the non-point source can be taken into account in formulating best management practices for that

source. In addition, an off-set (emissions trading) regime as described in response to Question 3 above could be employed to address the issue.

9. Your position, if any, on the system of regulation of septic systems, the role of the M.O.E. and the municipality, the need for inspections, certificates of approval, facilities for sewage disposal, education of owners. Should septic systems in higher risk areas be treated differently? If so, how?

10. Should the spreading of biosolids be banned? If there is no ban, what suggestions for improvement of current biosolid spreading requirements?

11. Assuming biosolid spreading is permitted, how should assimilative capacity be determined?

With respect to Questions 9-11, the OWWA/OMWA generally endorse the findings, conclusions, and recommendations of the Environmental Commissioner of Ontario on these issues as set out in his 2000-2001 Annual Report (*Having Regard*).

3. Other Contaminant Sources

12. Comment on the regulation of landfills, urban development, industrial activity, forestry, mining and the interaction with a watershed management planning process.

See response to Questions 2-8 above.

OWWA/OMWA also would note that runoff from golf courses may place an equally significant risk to source water. Such runoff includes both nutrients and pesticides. These impacts should be better regulated and considered in the watershed management planning process given the proximity of some golf courses to source waters.

4. Agriculture

13. Should there be any minimum standards applicable to all livestock or manure spreading operations, such as minimum number of days for manure storage, on site monitoring for storage leakage, prohibitions against overflow from manure storage, unconfined manure piles in sensitive areas, direct runoff into ground or surface water, and spreading manure in winter?

Yes. The report and recommendations of Mr. Brian Pett prepared for OWWA/OMWA on Issue 6 set out the need for minimum standards with respect to the above-identified matters.

USEPA, which has been regulating animal feeding operations in the United States since the 1970s, recently has proposed new rules to impose greater controls on manure from stockpiles, lagoons, and excessive land application. The agency has concluded that such rules are necessary because otherwise manure from these activities can reach waterways through runoff, erosion, spills, or via groundwater. These discharges, according to the agency, can result in excessive nutrients (nitrogen, phosphorous, and potassium), oxygen-depleting substances, pathogens, and other pollutants in water. The resulting contamination can kill fish, cause excess algae growth, harm marine mammals, and contaminate drinking water.

14. What criteria should determine whether something should be a mandatory standard? What role should cost play? What criteria should dictate reimbursement by the government?

In general, the tests or criteria for whether a standard should become mandatory should be based on (1) the seriousness of the potential contamination, and (2) the effectiveness of the measure in controlling the problem. Cost has a role to play in this analysis because the measures employed should be cost-effective (i.e. the measure, in comparison to other alternatives, should have a proven track record in contributing to resolution of the problem in this or another jurisdiction without imposing prohibitive costs). Government should contribute financially for some portion of implementing the measure where the farm operator can demonstrate that he or she otherwise does not have the financial capability to do so and the threat to water quality is serious.

15. Should farm operations in areas of high vulnerability be required to obtain a certificate of approval relating to manure storage and spreading which may be conditional on higher standards customized to the individual farm's circumstances?

In general, manure management by farmers, particularly, but not solely at the larger factory farms, needs to be regulated exactly like other waste management industries in Ontario. Accordingly, a certificate of approval should be necessary from MOE, whether under Part V of the *Environmental Protection Act*, the *Ontario Water Resources Act*, or the new *Bill 81 - The Nutrient Management Act, 2001*.

Moreover, OWWA/OMWA recommend that the province should move to a system of regulation of animal waste management activities similar to that found under the *Clean Water Act* of the United States. The U.S. places permit requirements on animal feeding operations (what Ontario describes as livestock operations) in two key circumstances. First, if a facility is above a certain number of animal units (currently 1000 soon to be reduced to 500) then the facility is automatically subject to the obligation to obtain a permit. Second, even if a facility is not above the numerical limit, if it nonetheless is a "significant contributor of pollution to the waters of the United States", then it is subject to the requirement to obtain a permit as if the facility was above the numerical limit. The factors considered in making this latter determination include:

- size of operation and amount of waste reaching waters of the U.S.,
- location of operation relative to waters of the U.S.,
- means of conveyance of animal and process waste into waters of U.S., and
- slope, vegetation, rainfall, and other factors affecting the frequency of discharge.

Where animal feeding operations are subject to the *Clean Water Act* permit requirements because they are above the numerical limit, or below the numerical limit but deemed a significant contributor of pollution to waters of the U.S., the following general requirements must be complied with by each permit holder:

- Development of a Permit Nutrient Plan for managing manure and wastewater at both the production area and the land application area;
- Record keeping, reporting, and monitoring;

- Retention of the permit until proper facility closure;
- Method of calculation of allowable manure application rates (i.e. generally at rates not to exceed the crop requirements for nutrients and the ability of the soil to absorb excess nutrients) ;
- Restrictions on timing and methods of application of manure and wastewater to assure prevention of water quality impairment (e.g. certain applications to frozen, snow covered, or saturated lands);
- Address risk of contamination via groundwater with a direct hydrological connection to surface water;
- Address risk of improper manure application off-site by either requiring the animal feeding operation to obtain from the off-site recipient(s) a certification that they are land applying the manure according to proper agricultural practices or requiring the animal feeding operation to provide information to manure recipients and keep appropriate records of off-site transfers, or both;
- Design standards to account for chronic storm events.

16. Should individual farm plans be directed at the control of pathogens? What would be included in a best management practice for pathogen management?

Yes. USEPA has specifically targeted pathogens as one of the reasons for the need to strengthen existing regulation of animal wastes under the *Clean Water Act*. See also response to Question 15.

OWWA/OMWA also would refer the Commission to the following excerpt from Appendix E of Brian Pett's Issue 6 Response Report (excerpts from AWWA comments on proposed USEPA amendments to rules under the *Clean Water Act* regarding concentrated animal feeding operations):

> "While the drinking water impacts from CAFOs can vary from region to region, increased pathogen levels is probably the greatest impact from a national perspective. EPA's Office of Groundwater and Drinking Water (OGWDW) is in the process of finalizing a proposal for a complex set of drinking water regulations that provide further protection from pathogens in drinking water sources, primarily focusing on Cryptosporidium. For the first time, in 2003 and 2004, utilities will monitor their source waters for average Cryptosporidium levels. The

resultant level will likely trigger additional treatment requirements for many surface water and some groundwater suppliers. It is not clear how many water utilities are affected by CAFO pollution, the experiences of Waco, Texas and Tulsa, Oklahoma are certainly not unique. Some utilities will see increased treatment requirements based on these new drinking water utilities. Other utilities will continue to battle taste and odor problems resulting from the increased nutrients in the source waters from CAFOs. A recent study of lakes and reservoirs in Iowa found that most of them were classified as hypereutrophic as a result of nutrient inputs from agricultural activities."

17. Should hydrogeological investigations be required for all farms, farms above a certain size or farms in areas vulnerable to source water contamination? Sierra Alert (p.47) suggests the nature and scope of such an investigation and suggests the costs would be $5000 to $10,000. Comments?

At a minimum, farms above a certain size and those vulnerable to source water contamination should have hydrogeological investigations performed. See also response to Question 15. There also should be a mechanism under any law reforms proposed to ensure that MOE is in a position to make an informed judgment about why a particular farm should not have a hydrogeological investigation performed.

18. Should all or some farms be required to develop Water Protection Plans dealing with matters such as manure storage, manure spreading, Nutrient Management Planning, M.D.S. abandoned wells, restricted areas for livestock, monitoring, tile drain outlets and sampling. For which farms would it be mandatory:

i. Farms of a given size?

ii. Farms in vulnerable areas?

iii. New operations?

iv. Any time a building permit is required?

All of the above four categories.

19. Is there any reason why the farm operator should not be responsible for the development of a water protection plan for the farm? Who should approve such plans? Should a watershed management planning body be involved?

No. MOE should approve in consultation with OMAFRA, municipalities, conservation authorities, and/or any future watershed planning body, which is likely to be some type of municipality-conservation authority mix.

20. Who should be responsible for monitoring and inspecting? M.O.E., OMAFRA, municipalities, conservation authorities? Should monitoring include the effectiveness of the plan?

MOE should be responsible for monitoring and inspecting in consultation with OMAFRA, municipalities, conservation authorities, and/or any future watershed planning body. Monitoring should include the effectiveness of the plan.

5. Water Quantity

21. Are current programs for groundwater and surface water monitoring adequate? Suggestions.

22. Should P.T.T.W. be administered locally by watershed planning bodies or by M.O.E.?

With respect to Questions 21-22, the OWWA/OMWA generally endorse the findings, conclusions, and recommendations of the Environmental Commissioner of Ontario on this issue as set out in his 2000-2001 Annual Report (*Having Regard*).

See also OWWA/OMWA responses to questions under Public Hearing 4: Source Protection provided above.

OWWA/OMWA would recommend that any future watershed planning bodies should report to MOE as a matter of law.

E. Public Hearing 6: Management of Technologies: Drinking Water Standards, Treatment, Distribution, and Monitoring

1. The standard-setting process

1. How can transparency be improved?

As OWWA/OMWA recommended in the Issue 5 report prepared by Dr. Les Gammie, each province should set up a formal review process by stakeholders in the province for proposed guidelines (or standards) produced by the federal-provincial subcommittee on drinking water. This stakeholder group should include water utilities, environmental groups, government agencies, university researchers, etc. This process should provide a "real-world" review of the proposals, and assist in development of guidelines that meet the needs being addressed and that are economically justifiable and workable.

For wider public involvement in guideline development, Health Canada needs to publicize the information available on its website, update the site more frequently, and make navigation simpler (drinking water is buried deep within the website, and should perhaps have a higher profile).

2. Are risk management principles appropriately applied?

Risk management principles for development of water quality standards are being followed, with water quality standards being set based on the basis of toxicity data. This work takes into account the prevalence and levels of each parameter found across the country, the economics of reducing levels, and the benefits to be achieved from meeting the standard.

One problem is that different countries often come up with different maximum acceptable levels for the same parameter, often based on the same background toxicity data, but with different safety factors or assumptions included in the calculation of the limit. This process and its limitations need to be better explained to the public. It needs to be explained that a limit is a setting of a level of risk deemed to be safe, it does not mean that the limit+1 ppb is unsafe, and that the limit-1 ppb is safe. The actual limit number has quite an error associated with it in most cases, so it is a "best-estimate" value. Everyone should strive to be lower than all acceptable limits, and if even lower levels can be achieved without too much economic impact, then the level of risk should be even lower.

3. What is the outlook for effective standards for protozoa and other microbes?

Because of the difficulty in obtaining good methodologies with good accuracy to analyse for protozoans, it is not recommended at this time that limits be set (e.g. x cysts /100 litres) for treated water based on regular monitoring. The monitoring of protozoan counts also does not indicate whether the cysts/oocysts are viable and infective.

It is however a good idea to monitor raw water under different conditions and seasonal time periods (runoff, rain events, dry weather, etc) to obtain an order of magnitude picture of the range of protozoans that might exist at the water plant intake. This data can be used to help design adequate treatment for removal/inactivation of the level of organisms found (3-log, 4-log, 5-log, etc).

It can be useful as information to monitor treated water on occasion (if raw levels are high for example) to see if any protozoans are passing through the treatment process. If so, this would suggest that improvements should be made to particulate removal processes or that adequate disinfection be put in place to deal with these protozoans.

4. How should quality management standards, and process or hardware standards, be developed?

Development of quality standards for a wider range of water utility processes than water quality parameters is less well defined, but there are systems in place that should be made use of in setting up systems for Ontario (or Canada).

A. Materials. For materials used in production of drinking water (piping, valves, chemicals, linings, fixtures, meters, coatings, lubricants, etc) it would be helpful to have a Canadian system in place for formal approval for use. The National Sanitation Foundation (NSF) has such a system in the US, and many utilities in Canada use these approved lists of materials/chemicals as requirements in the specifications for purchase of materials. A Canadian system would provide those benefits to all users. The lack of such a system can result in poorer quality materials being used in Canadian systems.

B. Water Quality Laboratories. Standards for laboratory analyses of water quality are becoming standardized under the SCC/CAEAL organization (Standards Council of Canada/Canadian Association for Environmental Analytical Laboratories), and this process should provide good quality data in larger laboratories (private labs and large municipal water utilities). The major problem to date is that there has been very little effort to get this type of accreditation into smaller municipal water laboratories (who are usually reporting regulatory compliance of a small range of important operational tests such as turbidity,

chlorine residual, etc). Consideration should be given to an abbreviated and cost effective process for small laboratories or approved equal or alternative accredited processes also to test drinking water samples. There is also little formal accreditation or quality assurance requirements in place for online continuous monitoring analyses.

C. Management Processes. Developing management standards has been a bigger problem, but systems are becoming available which assess and measure compliance with best practices. Two such examples are the AWWA "QualServe " Program and the American Productivity and Quality Centre ("APQC") programs.

QualServe is a voluntary program offered by AWWA which includes self-assessment, peer review, benchmarking and accreditation processes, and looks at areas such as:

- organizational development (leadership, emergency planning, health and safety),
- water operations (plant operations, watershed management, distribution operations, water quality management),
- customer relations (customer service, customer strategies and satisfaction, and communication), and
- business operations (capital improvements, financial management, purchasing, engineering, information management).

The APQC programs include a number of tools for assessing organizational effectiveness including benchmarking, performance measures, process improvement, best practices, quality improvement, people systems, strategy, and organizational assessment.

In addition the CH2M Hill/Diamond Management Institute report "Total Quality Management System for Ontario" and the Australian NHMRC/ARMCANZ "Framework for Management of Drinking Water Quality" both present models for improving water quality including organizational and management issues.

2. Management of technology

1. Is there a need to regulate materials coming into contact with drinking water, and if so, who should do it?

Health Canada should proceed with the *Drinking Water Materials Safety Act* that would require accreditation of materials in contact with drinking water. This would provide protection for contaminants such as acrylamide and epichlorohydrin by mandating approval procedures such as those of the Canadian Standards Association ("CSA") or the National Sanitation Foundation ("NSF"). The Act should consider and encompass procedures and certifications already in place in

other jurisdictions in order to avoid duplication of effort and the possible impacts on one product needing to meet different standards in similar geographic areas (e.g. Canada and the United States).

2. How is the introduction of novel technologies best balanced, within a regulated system, with diligence about safety?

Novel technologies should be evaluated using bench scale, pilot scale, or full-scale studies. These experimental studies are necessary to confirm that the technology is capable of producing the required results under the conditions specific to the individual water supply system. Experience from other jurisdictions also should be considered.

Research and development also should be conducted to:

- increase the understanding of water supply systems and potential hazards;
- investigate improvements, new processes/products, emerging water quality issues and new analytical methods;
- increase the understanding of the relationship between public health outcomes and higher water quality.

3. Is MOE's capacity to assess new technologies adequate? What level of in-house assessment capacity can realistically be sustained?

Many of the water leaders in the public sector have retired or will retire in the next 5 to 10 years. As such, the MOE has limited capacity to assess new technologies. It is not necessary to build in-house research capability at the MOE. This task can be left to academic institutions and specialty firms. It will, however, be important to develop professionals in the drinking water industry that understand water quality and water treatment issues and that support coordinated research efforts through organizations such as NSERC, AWWARF, etc. and for the province to maximize the use of their expertise.

To develop the next generation of water leaders, it will be necessary to document and transfer the knowledge of current leaders to young professionals, as well as instill the organizational behaviour necessary to achieve excellence.

4. Are testing and certification procedures in respected jurisdictions recognized in Ontario?

In the recent past, MOE has adopted the testing procedures of other jurisdictions into Ontario regulations. For example, in amendments to the province's regulations respecting the definition and identification of hazardous wastes, which came into force in March 2001, Ontario incorporated the testing procedure

for identifying when a waste is leachate toxic waste relied upon by USEPA under American hazardous waste law.

In appropriate circumstances, there is no reason why Ontario could not do the same thing in the area of drinking water regulation.

5. ***Would a quality management approach plus engineering approval of designs obviate detailed-level Certificates of Approval? Would licensing still require a facility-level approval by MOE?***

The OWWA/OMWA do not believe that a quality management approach plus engineering approval of designs will eliminate the need for detailed Certificates of Approval. Each water system in Ontario is unique and continually changing. As such, a regular system wide review and documentation of "conditions to operate" or "performance standards" is necessary. The "Consolidated Certificate of Approval" that is to be issued for every water system in Ontario following the completion of the Engineer's reports will document these conditions.

6. ***Treatment regimes sometimes depend on whether a groundwater source is under the direct influence of surface water. Should a definition be added to regulations, and if so, what should it be?***

The Government of Ontario should work with stakeholders to set out a clear definition of "surface water", "groundwater", and "ground water under the influence of surface water", to allow the setting of required treatment standards for each type of source. Any groundwater source that is characterized by rapid changes to water quality indicators such as turbidity, conductivity, or any microbiological parameter must be classed as directly influenced by surface water and treated based on surface water requirements.

3. Advances in technology

1. ***Are there emerging or foreseeable improvements in technology that will lower risk or prices or both? Anything especially helpful for small systems?***

UV disinfection is proving promising for inactivating *Cryptosporidium* while membrane filters can remove *Cryptosporidium* and other fine particles if the pore size is small enough. Dissolved air flotation is being studied for low alkalinity and low turbidity waters. Smart pipe systems are being developed to detect distribution system upsets. Biosensors are being designed to provide on-line real time measurement of pathogens and heavy metals concentrations. SCADA systems and on-line instruments continue to evolve. Technologies are being tested to remove radon and arsenic. New and improved analytical methods

enhance our monitoring capabilities. Research facilitates the development of cost effective solutions to compliance requirements.

With regard to small systems, the US National Research Council suggests that small supply systems exhaust all other available alternatives before looking for a technological answer to water quality problems. One option is to find higher quality source water. This could entail switching from surface water to ground water or relocating a well to a cleaner aquifer. A second option is to purchase water from a nearby utility. These options are often more cost effective than adding water treatment processes to remove contaminants from poor quality source water. (National Research Council, Safe Water From Every Tap)

2. ***What can we expect from novel disinfection techniques, such as membranes, ultraviolet radiation, and ozonation?***

UV and ozone disinfection are proving promising for inactivating *Cryptosporidium* in low turbidity waters. Membrane filters can remove *Cryptosporidium* and other fine particles if the pore size is small enough.

3. ***Are there circumstances under which a chlorine residual in a (small) distribution system can be safely dispensed with?***

O. Reg. 459/00 outlines the steps that a utility must take to be exempted from disinfecting the water supply. Given that more waterborne disease outbreaks result from problems in the distribution system than breakdowns in treatment processes, these exemption provisions also should include enhanced distribution system monitoring requirements and system cleaning protocols.

4. ***Is there an adequate R&D capacity for drinking water technologies in Canada? What roles should we expect MOE labs, federal (NRC, Environment Canada) labs, AWWARF, industry, and consulting engineers to play? What mechanisms are there for piloting and evaluating new technologies in Ontario?***

It has been acknowledged, in the OWWA/OMWA Issue 2 and 4 Response Paper (Castrilli, 2001), that not nearly enough research is being done to address drinking water issues. In Canada, the cost of treating health problems related to water pollution is estimated to be in the order of $300 million per year (Health Canada, 1997). Canadians may be exposed in a variety of ways. They may ingest small amounts of pollutants in their drinking water, absorb contaminants through their skin while bathing or swimming, or they may ingest food, such as fish and shellfish, that has been contaminated by waterborne pollutants.

The intellectual capacity to conduct drinking water research exists in Canada, at universities such as: Dalhousie University (Halifax), Ecole Polytechnique (Montreal), University of Ottawa, University of Toronto, University of Waterloo

and the University of Alberta. This capacity could be greatly enhanced by funding academic initiatives that have industry partners be it through NSERC, AWWARF, etc. The province also should demonstrate its commitment by directly supporting its universities in this regard. Partner involvement provides a measure of the relevance of the research and further indicates the potential to advance economic and social goals in Canada.

The OWWA/OWMA recommends that the Government of Ontario and municipalities participate in drinking water research and encourage participation in the AWWARF. Any research activities must be coordinated to avoid duplication of effort while ensuring research relevant to local needs.

4. Measurement and monitoring

1. Do current protocols for sampling lead to an accurate characterization of water quality throughout treatment and distribution systems?

Current protocols focus on finished water and distribution system monitoring. Current regulations do not require sampling throughout the treatment train. Monitoring of turbidity on individual filters is required, however, other monitoring for microbial quality, chlorine residual, or other process variables is not currently specified by regulation. Unless this monitoring is specified in licenses to operate the treatment plant, there are currently very few measurements required to assess the treatment process. Distribution system monitoring is specified by current regulations, however, OWWA/OMWA believe that the current regulatory requirements are too generic to adequately protect public health. Utilities should be required to produce a Monitoring Plan for their distribution system to justify the sampling locations and frequencies and to ensure that the sampling adequately characterizes their distribution system.

2. Is the present scheme optimal across system size ranges?

Monitoring plans should ensure that monitoring requirements for process control, finished water, and distribution system water quality are optimal for each specific system.

3. Are discrepancies between standard methods for sampling and those prescribed in Ontario appropriate?

The publication "Standard Methods for the Examination of Water and Wastewater" should be followed without exception. Otherwise results are of questionable value.

4. What merit is there in total coliform monitoring as opposed to using heterotrophic plate count monitoring for distribution system integrity?

The Ontario Drinking Water Regulations require only 25% of distribution system samples to be analyzed for Heterotrophic Plate Count. The results obtained by counting the number of background colonies on a Total Coliform membrane filter analysis are acceptable. The background colonies on a total coliform membrane filter analysis may give similar trends but are not necessarily the same as those from an actual Heterotrophic Plate Count analysis. Heterotrophic Plate Count is a standard test, while background colonies on a Total Coliform test are not.

The E. coli, fecal and total coliform tests will provide very little information about the distribution system, because typically none of these organisms will be detected. Accordingly, most of the results will be reported as “non-detect” and hence will not give any indication of distribution system bacterial populations. The data will not be useful for statistical analysis of trends, neural network modeling of distribution system water quality or any mathematical assessment of data. Mathematical models require numbers, not the words “non-detect”. Even though Heterotrophic Plate Count is a non-specific indicator and the numbers are not associated with fecal contamination, it can be a good tracking tool for distribution system integrity.

In Calgary, the current approval from Alberta Environment for the operation of the city's water treatment plants (October 1999) specifies Heterotrophic Plate Count as one of the bacterial indicators that requires a specific response:

> “When coliform bacteria are present in any sample of treated water, or if a sample contains confluent growth with either more than 500 HPC colonies per millilitre, or more than 200 background colonies on a total coliform membrane filter, the approval holder shall ensure that the following actions are taken:
>
> - the sample is analyzed for fecal coliform or E. coli;
> - repeat samples are collected;
> - the cause of the coliform(s) or colonies presence is investigated and corrected."

The new Ontario regulations do not reflect the current science that Total Coliforms have no public health significance in drinking water. Their presence indicates undesirable water quality, but there is no health significance unless the coliforms include E. coli. If the focus of the regulations is on public health protection, then Ontario regulations must specify that E. coli always be tested rather than Total Coliforms alone. Public health advisories should never be issued merely on the basis of Total Coliform data.

There are specific commercial tests (Colilert) that can provide E. coli data in 18-24 h and all labs should be using these tests now. Ontario still allows the use of a non-standard Membrane Filtration methods for Total Coliforms. The Membrane Filtration method is inferior to the Colilert Test and requires up to 72 h to confirm Total Coliforms.

Further, the new methods of E. coli speciation are so simple and foolproof that all public water utilities should be allowed and encouraged to do their own daily testing. This would address the problem of time delay in using certified labs and allow for random testing. It is hard to understand why the new regulations focus on Total Coliforms and also require that utilities be certified or send their bacterial samples to a provincial or commercial lab. This adds unnecessary delay time to getting results back and also could introduce errors as a result of shipping, storage time, or other impacts of analytical delays.

Regarding Heterotrophic Plate Count and its role as an adverse public health indicator -- IT IS NOT. There is no clinical basis that HPCs in drinking water pose any health risk. Also, HPC populations must be determined when using Membrane Filtration method for detection of Total Coliforms, because high HPC counts can interfere with the results. This is another strong reason why HPC populations should be determined with Colilert Test methods (or equivalent) rather than Membrane Filtration.

Finally, fecal coliforms are not the same as E. coli and for a number of reasons well published in the scientific literature, fecal coliforms should be dropped from both drinking water and wastewater regulations.

5. Why retain fecal coliform monitoring given the improvements in E. coli measurement?

See answer to question 4. There is no reason to continue to do fecal coliform monitoring. Fecal coliforms are not the same as E. coli and for a number of reasons well published in the scientific literature, fecal coliforms should be dropped from both drinking water and wastewater regulations.

6. What is the rationale for current monitoring requirements for trace chemicals?

The analytes included in Schedule 3 Operational Parameters of the document “Regulation Made Under the Ontario Water Resources Act” are fluoride, color, aluminum, pH, turbidity, hardness, temperature, odor/taste, alkalinity, methane, chloramine, and residual chlorine. In addition to these basic parameters, licences to operate treatment facilities should specify other analytes depending on the source water quality.

OWWA/OMWA believe that site-specific monitoring requirements based on source water quality should be considered. Accordingly, a wide range of pesticides, for example, would not need to be analyzed seasonally if none were found after a period of base monitoring to ensure that these compounds are not used in the area or detected. Site specific testing, as mentioned earlier, could be accommodated in certificates of approval if the *OWRA* is amended to provide authority for variances as a matter of law.

7. To what degree can on-line process controls substitute for batch sampling?

On-line monitoring for chlorine and turbidity are very reliable and these two key indicators could be monitored continuously for regulatory compliance purposes rather than using batch analysis.

8. Is the Ontario proposal for boil-water advisories consistent with current methods for detecting E. coli?

The proposed protocol indicates that a boil water advisory should be issued immediately upon detection of E. *coli*. No reference was found to the detection method. "Standard Methods" should be followed without exception.

In addition, it is recommended that the Medical Officer of Health should have consideration for where samples are taken before issuing a boil water advisory. There are known examples of samples taken from restaurant kitchens becoming contaminated due to the close proximity of uncooked food.

5. Small systems

1. Given the variety of cases at the small end of the spectrum, is the present two-class regulatory system adequate?

OWWA/OMWA have serious concerns with the current two-class system. The definition of “small systems” in Ontario needs to be reviewed and lessons learned in the United States on regulation of small systems should be considered. Many small systems in Ontario will need a longer period to comply with regulation or some assistance as they move towards compliance.

2. Are there treatment and measurement techniques available that can lower the burden of compliance for small systems, however defined?

Simple kit methods and on-line monitoring are two options that can be used for basic monitoring of water quality in small systems. Kits are simple to use and give immediate results. On-line monitors for chlorine residual and turbidity are reliable and not cost prohibitive.

3. What is the state of the art in remote on-line monitoring for the purposes of quality assurance in small systems? How reliable and cost-effective are SCADA systems?

On-line monitoring for chlorine and turbidity is simple and reliable. SCADA systems are reliable. Cost-effectiveness of SCADA would be dependent on the installation and the number of controlled parameters wired into SCADA. OWWA/OMWA believe that remote SCADA system monitoring of a regional network of small systems might be worth considering. Individual SCADA systems may not be a cost-effective option for very small systems, for example, serving less than 500-1,000 people.

4. Can the monitoring requirements of O.R. 459-00 be safely modified for small systems and, if so, how?

The only way to modify the monitoring requirements safely would be to collect data on all the required monitoring parameters for a minimum of one year (through all seasons and water quality variations). At that point, monitoring frequencies and parameters could be modified if it was shown that certain analytes were not an issue at that particular location. If consistent water quality is to be assured, it will be difficult to justify reduced frequency monitoring for turbidity and chlorine residual. OWWA/OMWA believe that these two critical parameters should be monitored continuously and on-line at all systems.

In certain limited circumstances, variances from approved requirements could be permitted for individual systems. However, the variance process should be fully debated before being enshrined in future safe drinking water legislation, and individual applications for variances should be made subject to notice and comment procedures under the *EBR* to ensure transparency.

F. Public Hearing 7/8: Management and Financing of Drinking Water Systems and Laboratories

1. Governance

1. Should the Province play a role in determining:

- ***the internal governance structure (e.g. PUC, line department, or municipally-owned corporation), or***

- ***the operating entity (e.g. direct municipal operation; regional consolidation; or contracting out to other municipalities, OCWA, or the private sector)***

adopted by municipalities for water and wastewater utilities?

The province should establish the objectives or performance standards that the water authorities must achieve. Municipalities should establish the method of service delivery. The new Consolidated Certificates of Approval meet many of these requirements.

The OWWA/OMWA also has suggested that a "system viability" review be conducted. It is expected that this review would determine areas of service for viability purposes but not the method of service delivery. It is expected that municipalities would consider a number of options and select the preferred one.

2. Should the Province impose minimum standards for capacity (i.e. technological, managerial, and financial) and identify municipal systems that are non-viable? Is this an acceptable form of compelled re-structuring by the Province? If so, what are the transitional issues?

The province should impose minimum standards of technological, managerial, and financial capacity on water utilities. Where systems are identified as non-viable, OWWA/OMWA have noted the possibility of systems developing responses to these problems such as adopting a regionalization policy. (See OWWA/OMWA report of Ms. Judy A. MacDonald on Issue 8). In the interim, the province also will likely have to consider at least a transitional revolving loan fund regime to speed up bringing non-viable systems into compliance so that the public is protected.

3. ***Should OCWA be required to run small or remote systems that are unable to meet minimum standards when no one else wishes to do so and, if so, on what terms? Are there other ways to ensure non-viable municipalities achieve minimum competency?***

See response to Question 2 and the possibility of water utilities developing regional solutions.

2. Accreditation

1. ***What are the key components of a good accreditation program? How appropriate as models for Ontario are the AWWA model, the Australian Framework, and the OCWA Environmental Management System?***

The OWWA/OMWA reports prepared by Ms. Judy A. MacDonald for Issue 8 - Production and Distribution of Drinking Water and Mr. Allan Davies for Issue 11 - Management and Organizational Behaviour set out the key components of a good accreditation program. The AWWA accreditation model is appropriate for Ontario because the OWWA has been very active in developing the AWWA program.

Ten standards relating to water and wastewater utility operation will be developed by AWWA, namely:

- Distribution system operation and management;
- Water treatment plant operation and management;
- Source water management and protection;
- Business and planning practices management;
- Communications and customer relations management;
- Wastewater collection systems management;
- Wastewater treatment plant operations and management;
- Biosolids handling and management;
- Wastewater pretreatment management;
- Water and wastewater conservation and reclamation program management.

2. ***Should the Province play a lead role in developing an accreditation model for Ontario? What is the appropriate process?***

The OWWA/OMWA recommend that the provincial government encourage water utilities to join an accreditation program to ensure establishment of a process of continuous improvement in the province. We would suggest that the Government of Ontario work with the OWWA/OMWA to establish an International Water Treatment Alliance ("IWTA") program in Ontario because IWTA is the necessary first step in facilitating continuous improvement, peer review, benchmarking, and

accreditation. A dedicated Project Manager should be appointed to facilitate, demonstrate the benefits of, provide guidance with respect to, and assist in implementation of, this process.

Consultation with respect to the implementation of accreditation to complement regulation should occur concurrently (since accreditation standards are under development and are expected by 2004).

3. Who should be the accrediting authority?

OWWA/OMWA have recommended that a third party - i.e. an entity external to government - do the accrediting, advise the utility of the results, including any deficiencies identified, and then the utility would be obligated to undertake corrective action.

4. How should the Province regulate an accreditation program? Should anyone else be involved in the regulation?

At this time, OWWA/OMWA are recommending that accreditation be voluntary. See also response contained in paragraph 2, Question 2.

5. Should there be a separate audit function? By whom? How does this differ from regulation and inspection by the province? Would either of these functions – regulation and audit – become unnecessary in some instances?

OWWA/OMWA have recommended that audits be performed by an independent third party. There are different organizations that can undertake this role, such as the Canadian Standards Association. OWWA/OMWA do not currently recommend that the province play a role in approving the third party auditor. The third party auditors would obtain their approval through the accrediting body (e.g. CSA, etc.). OWWA/OMWA are familiar with the proposed Bill 56 - *The Brownfields Statute Law Amendment Act, 2001*, which contains provisions for the setting of standards by the Ministry of the Environment for environmental consultants who certify that contaminated site cleanups have been conducted according to Ontario requirements. However, OWWA/OMWA are reluctant to recommend such an approach at this time until the particulars of Bill 56 are known, which will not be the case until the regulations have been developed and made public.

OWWA/OMWA are recommending regulation by the province with voluntary accreditation. There would continue to be the need for government to undertake abatement, inspection, enforcement and related regulatory functions as necessary. Regulation blends best science with the setting of performance standards to achieve optimum delivery of safe drinking water. Accreditation deals with a much broader range of issues that regulation does not address and probably has no role in. Thus, while there likely will be some overlap between

regulation and the accreditation process, the good water utility will not see this dual functionality of regulation and audit as unnecessary duplication. It also is possible that a regulator might view a good accreditation program as achieving much of the regulatory requirements.

6. Should accreditation be a condition of the Certificate of Approval or an operating license?

See responses to Questions 3-5.

7. Does Accreditation differ significantly from the current process of Engineer's Reports for municipal systems?

The principal objectives of the first Engineers' review and Report were to assess the potential for microbiological contamination of the water works (i.e. source water characterization) and to identify operational and physical improvements necessary to mitigate this potential utilizing multiple barrier concepts. In addition, a monitoring regime for the entire system is to be identified to ensure compliance with the Ontario Drinking Water Standards and Regulation (MOE, August 2000 and Revised January 2001).

The accreditation process is much more encompassing - it covers all aspects of the water and wastewater utility business. Accreditation verifies that certain standards of best practice are being used to deliver high quality service. The results of regular accreditation are to be shared with the community, who will evaluate them and require improvements from those organizations that did not achieve acceptable levels of performance. Participating utilities are expected to use accreditation results for continuous improvement and customer satisfaction.

8. Should accreditation apply to both water and sewage systems? Could this delay implementation?

Yes, accreditation should apply to both water and wastewater systems. Manpower resources will dictate a phased approach.

3. Individual operators

1. Should mandatory training be required for new operators? For presently certified operators? What improvements should be made to current training programs? How much training should be required? Should the MOE approve training courses and accredit course providers?

Should mandatory training be required for new operators? OWWA/OMWA recommend that the Government of Ontario should require all applicants for an operator's licence at the entry level to complete a training course with a specific curriculum.

The training could be delivered in a number of ways. These include text material, college courses, classroom courses, video, correspondence courses, home-study courses, or on the internet.

Should mandatory training be required for presently certified operators? OWWA/OMWA recommend that a gap analysis be conducted to determine what training is required for grandfathered operators. Once this determination has been made, there may be a need for training for the grandfathered operators who have never taken training or passed certification exams.

For operators who are already certified, there is a requirement for 40 hours of professional development per year and 36 hours of continuing education in each three-year renewal period. This requirement will address the need for mandatory training in the long term. But, in the initial stages, before all operators have taken the mandatory entry level training, there may be a need for specific training for existing operators. The gap analysis recommended by OWWA/OMWA will determine the current and future needs for training.

What improvements should be made to current training programs? OWWA/OMWA recommend that the Ontario Government first determine needs for training and then form an alliance with stakeholders to facilitate the development, coordination, and delivery of the required training programs. This is a major undertaking and these should be the first steps in developing a comprehensive operator training strategy.

How much training should be required? The stakeholder group should determine the amount of training.

Should MOE approve training courses and accredit course providers? Yes.

2. Is there a role for an apprenticeship program?

There may be a small role for an apprenticeship program in the overall operator training and certification program. It could be one of the methods for operators to obtain education, continuing education and the prescribed experience for the certification program. An apprenticeship program is only one of the options for providing training that is competence-based and is part of a career development program for operators. However, it is not the only option. Apprenticeship programs would be most applicable in larger centers where there are people on staff to act as mentors and where the operators will need to progress through all of the levels of certification. An apprenticeship program will be difficult to administer in small, remote communities where there are no operators certified at the higher levels to act as mentors and where the operators are required to be certified at the first or second levels only.

Since there is a matrix of 11 different water certification exam categories (some of which are sequential) and operators generally do not need, or want, more than 4 – 6, a single program is not needed. Apprenticeship programs are more applicable when all of the students are striving for the same level of accreditation.

After the gap analyses recommended by the OWWA/OMWA are completed, it may be the case that some certification training would be more appropriately delivered by an apprentice-type program. The OWWA/OMWA do not support replacing the Water and Wastewater Operator Certification Program with an apprenticeship program for the reasons noted above. The certification program in Ontario is based on the Association of Boards of Certification (ABC) program that is recognized across North America. A reciprocity agreement exists between all Canadian provinces and territories.

3. What are the areas of greatest need for training and apprenticeship programs?

The area of greatest need for training is smaller systems. This is the case wherever there is no technical staff to supervise the operations staff. Generally, these are systems in municipalities with less than 20,000 population.

The greatest need for an apprenticeship program is with larger municipalities, where operators need to develop and progress from the entry level through the top levels of certification.

4. Is there a role for the federal government in training operators?

In the 1970s and early 1980s the federal Government, through Environment Canada and Health Canada, provided training programs, and funding for programs of a national nature. With cutbacks these programs were eliminated.

It would be a benefit to all of the provinces and territories if the federal government would fund training program development and provide program coordination across Canada. Currently, the Canadian Water and Wastewater Association Technical Committee on Training Education and Certification provides a coordination role for the training and certification programs in Canada. Funding for meetings is a problem and there is no program to develop common materials.

The certification programs for water system (and wastewater system) operators face the same problems across Canada. A government-supported, Canada-wide initiative would be welcome.

5. What is the future for grand-parented operators?

Grandfather certificates were issued so that persons who were employed as operators when the certification program was introduced would not lose their

jobs. Without this option, the opposition to the program from operators and facility owners would have made implementation very difficult. It was agreed that most of the operators had many years of experience, a thorough knowledge of the system, and the necessary skills to operate the system. The experience in other jurisdictions was that it took a matter of only a few years before the operators either obtained full certification or left their positions. A similar situation exists in Ontario, where the percentage of operators who were grand-fathered has diminished steadily over the past decade.

OWWA/OMWA recommend that a gap analysis be conducted to determine where training is required. When that analysis has been completed the actual number of grandfathered operators who have received no training and who have never passed a certification will be determined. Those grandfathered operators with no training and who have not gone on to write certification exams should be required to take the entry level training course that will be available for new operators. Then, they should be required to obtain the requisite professional development and continuing education to renew their licences. It is not recommended that grandfathered operators be required to pass certification exams. There is a risk that they will not pass and that the water authorities will have to replace them. In small or remote areas this may be difficult.

Finally, OWWA/OMWA believe there are many competent grandfathered operators in the province. Training should build on their existing knowledge base and should be specific to their needs. More aggressive actions, such as requiring grandfathered operators to also pass a certification exam, run the risk that smaller facilities, particularly in remote areas, could be left with no operators thereby placing communities at risk.

4. Financing

1. Should users pay the full cost of treated water? What expenses should be included in full cost recovery (e.g. laboratory services; research and development; source protection; or generation of profit/ surplus)?

The OWWA/OMWA believe that the cost necessary to develop the financial, technical, managerial and operational expertise and capacity of water utilities should be included in the cost of water. As well, it is felt that Ontario municipalities and the Province of Ontario should contribute to research. Research should be conducted in a coordinated manner to ensure no duplication of efforts while ensuring that the research is relevant to local needs.

In regard to other forms of costs, the OWWA/OMWA are concerned that, because of heightened interest in water issues in Ontario, that all forms of costs may be sought to be recovered by water revenues, whereas their recovery may be more appropriately recovered from other revenue sources. For example, source protection should not be solely placed onto the water rates. Source

protection may be categorized into many components with costs for each component recovered from different sources, as follows:

a. Conservation Authorities are funded by provincial funding and from municipalities (recoverable from property taxes) within the watershed area;

b. Improvements for municipal wastewater discharge should be recovered from wastewater rates;

c. Improvements for businesses with direct wastewater discharge should be recovered from the businesses directly either from them bearing the costs of the improvements and by fines for non-conformity;

d. Agricultural problems should be treated in a similar manner as businesses however, in some cases, some of the costs could be recovered through the municipality and collected via the property tax base.

In regard to profits and surpluses, municipalities are presently required to establish balanced budgets. However, reserve contributions may be included within the budgeted recoveries. Municipalities should be required to establish various forms of reserves for specific purposes such as asset replacement. Where municipalities contract out various services, profits may be generated by those businesses. As competition will normally occur in the tendering for the service contract, the level of profit generated for the business may be self-regulating.

2. Should the Province encourage or mandate full cost recovery or full cost pricing?

All costs of providing water service should be recovered by water user fees and charges and not be recovered through property taxes. This ensures that the water service is not considered as part of the property tax deliberations at budget time, but are considered as part of individual charges for the service. This also will discourage the use of water revenues to subsidize property taxes.

It is also important to distinguish that full cost pricing does not represent the recovery of all water costs by the water rate alone. Municipalities and other water service providers presently use a variety of rates, charges, and fees that reflect recovery on a benefits received basis, and hence cost recovery is sought for specific actions or services. OWWA/OMWA would wish to ensure the continued use of development charges, local improvement charges, local services installed by developing landowners, special assessments such as ss. 221, 222 of the *Municipal Act*, private/public partnerships (s.210.1 of the *Municipal Act*), and various service charges.

3. ***Should there be one-time subsidies to assist with a transition to full cost recovery or pricing? Is the OMWA/OWWA proposal for a revolving loan fund the best approach? Should there be a trustee appointed to guide recipient systems during the transition?***

Generally, OWWA/OMWA do not support subsidies to offset the true costs of providing water service. However, it is recognized that the recommendations that the Commission will provide to the province may require significant expenditures in a short period of time. Hence some form of one-time assistance may be needed to help very small system providers. As noted in the OWWA/OMWA report prepared by Mr. Gary Scandlan on Issue 14, for transitional purposes, we would recommend that loans be made available to assist with these transitional costs. It is felt that loans are a better method of assistance than grants, as they ensure accountability for repaying the cost of any system upgrades. Subsequently, this program may require further review to address whether there is a continuing need for such a loan regime, similar to the state revolving loan fund regime established under the federal safe drinking water law in the United States. This need would be dependent upon several factors (e.g. condition of individual systems, cost to implement and maintain Commission recommendations, etc.) which may not be quantifiable at this time. To implement this system, there should be a trustee established to guide the recipient system. See also OWWA/OMWA comments supporting development of a revolving loan fund regime above (Public Hearing 1, Part II.A.2, Question 1).

4. ***Is the Super Build study to identify deficiencies in existing systems adequate?***

This question is difficult to answer because the details regarding what and how the study is to be conducted have not been clearly established. The representative from Super Build was asked questions regarding this during the Expert Meeting 10 session. However, he was unable to provide details. Hence OWWA/OMWA are unsure as to the specifics of this undertaking. We are concerned whether there is a clear definition of what are the deficiencies. As well, as Super Build will not be undertaking an in depth analysis of individual systems, it is difficult to accept that the resulting studies will be able to clearly identify system deficiencies at any level of detail.

5. ***If subsidies are provided to systems for which full cost pricing is prohibitive, should they be paid to the water system or to individual households?***

Ontario water service providers should impose full cost pricing in the various rates and fees they charge. Should these rates and fees be unaffordable to certain users, then there may be a need to provide subsidies to individual households. OWWA/OMWA do not support subsidies for the full system.

However, should the cost of using water be too high for an individual household, then a subsidy should be provided to that household. The individual water system provider should not subsidize any household subsidy program. Any assistance would be a provincial matter similar to that of the Ontario Works Social Assistance program. It is felt that the province already has a system in place for providing assistance to individual households and for determining need for assistance and that any program would be best incorporated into this existing structure.

6. ***Should concerns about individual hardship for increased water prices be met by providing a basic amount of water at a very low cost (e.g. 100 litres per day per person) with increasing rates on a full cost basis beyond the basic amount? Should this be supported by a provincial subsidy or equalization program?***

The suggested structure is commonly referred to as an increasing block rate. It is the opinion of OWWA/OMWA that specific rate structures not be imposed on water service providers. The selection of any one rate is based upon a balancing of policy matters that the municipality must weigh in selecting the appropriate rate structure. These issues include administrative ease, equity, conservation, economic development, and security of revenue recovery. Water service providers are most in touch with customer profiles, issues facing the community, usage patterns, economic matters, etc. Hence, no one rate should be mandated as it would remove the potential benefits derived by the flexibility to determine the appropriate structure for the community.

7. ***Should water systems be required to employ full cost accrual accounting methods? Should all systems have identical procedures with regard to accounting and asset depreciation?***

Full cost accounting is not currently in place for municipalities in Canada. The federal and provincial governments have agreed to undertake this for their own accounting purposes commencing this year. American government levels are also implementing this system under GASB34. While this movement allows for the depreciating of assets and recording this information in the financial information of the government agency, it only provides limited information. Federal and provincial governments in Canada do not have specific rules as of yet on how they will approach this matter. Based on discussions with the CICA, the approach is somewhat permissive and is being left to these governments to decide how they will approach recording their assets. Similarly, the American system is somewhat permissive in that municipalities may use a standardized number of years to depreciate the asset. However, in the American situation, depreciation may not necessarily have to be recorded if other more detailed information is provided on the asset condition (in supplementary schedules).

Depreciation is used by the private sector to record the using up of the asset as an expense against taxes payable. Accordingly, where there are profits and corresponding taxes to be paid, depreciation provides a specific use to those companies. However, in the municipal setting, this information would be limited. Valuing an asset, dividing it by a number of years of anticipated life, and then recording this amount in the financial records provides limited information. While OWWA/OMWA are not against the movement towards full cost accounting, it should not be used in place of sustainable asset management and lifecycle costing. The recommendation of OWWA/OMWA is that water service providers be required to keep accurate and up to date information on their physical assets. As well, that an assessment of the water system infrastructure be undertaken at least every five years. In conjunction with this asset condition assessment, a long-term financial plan should be developed for the maintenance, upgrade and replacement of infrastructure. In particular, the principles of sustainable asset management and lifecycle costing should be implemented to ensure that proper management and replacement of physical assets of the water system are being carried out.

8. Should the choice as to the appropriate funding mechanism (e.g. user fees, property taxes, development charges, etc.) be solely that of the municipality?

The choice of the appropriate funding mechanisms should be left to the individual service providers. The choice of any financial tools is a matter of public policy and must be reviewed at the local level in order to adopt the most appropriate approach to water cost recovery. Any decisions as to how costs are to be recovered and at what price levels must be considered in light of many local factors. As noted earlier, water service providers are most in touch with customer profiles, issues facing the community, patterns of usage, economic matters, etc. As a result, no specific funding mechanisms should be mandated, as they would remove the potential benefits derived by the flexibility to determine the appropriate structure for the community.

However, we are concerned that certain of the existing funding mechanisms presently in place may be removed in the future. Discussions regarding a new *Municipal Act* and revised *Development Charges Act* may result in the removal of many financial tools presently in place to finance water capital and operating costs. OWWA/OMWA recommend that funding tools available currently to water service providers should not be reduced.

Finally, the province should mandate, if appropriate following the system viability assessment, that sufficient funds be budgeted on an annual basis for infrastructure replacement.

5. Laboratories

1. Is there any need to modify the current CSA and CAEAL-based accreditation program?

OWWA/OMWA believe that some improvements could be made. There is a need to look at an abbreviated and cost effective process for medium and small water authorities that do limited in-house testing (i.e. turbidity, chlorine residual, etc.), or an "approved equal" process.

2. Should laboratories be required to use identical testing methods?

Standard Methods should be used without exception. In instances where methodologies are being developed or HACH methods (which tend to be modified for immediate on-site results) are being used, acknowledgement of the use of said method for specified parameters should be received from the regulator or approval agency.

3. Should the Province play any role in inspecting and regulating private or municipal laboratories?

No. The SCC/CAEAL-based accreditation program is well established and provides national consistency.

4. Are there any issues relating to conflict of interest when municipalities test samples from their own system?

Water quality monitoring programs need to include "chain of custody" protocols. The protocols should consider the feasibility of requiring that other utility staff not associated with the treatment plant process be responsible for collection of distribution system samples in order to increase confidence in test results and minimize the opportunity for sample tampering or misrepresentation.

5. What is the appropriate role of the MOE Laboratory Services Branch (e.g. research, support, standard setting, policy development, regulatory functions, monitoring drinking water database; monitoring the accreditation status of private and municipal labs)?

No comment.

6. Is there unnecessary overlap between MOE and MOH labs? What should be done?

OWWA/OMWA have no comment regarding the issue of overlap. Whatever roles and responsibilities are established, the QA/QC of the laboratories should be communicated to relevant stakeholders.

7. Should municipalities be permitted to do Presence / Absence testing for coliforms in house? If so, what safeguards should apply?

The Geldreich report noted that some water works operators in Ontario receive their total coliform reports in a presence or absence format. Although this is acceptable under the Ontario's drinking water regulation, Geldreich went on to state that "the opportunity is lost in providing the plant operator some information about the magnitude of the problem from the same test material." Erika Hargesheimer, the author of OWWA/OMWA's Issue 7 Response Report noted that "non-detect" (or "absence") results give no indication of distribution system bacterial populations. As such, the data are not useful for statistical analysis of trends, neural network modeling of distribution system water quality or any mathematical assessment of data. In essence, "non-detect" or "absence" results provide limited information with respect to understanding the water system.

Ms. Hargesheimer also noted that the new methods of E. coli speciation (i.e. Colilert Test) are so simple and foolproof that all public water utilities should be allowed and encouraged to do their own daily testing. This would address the problem of lack of random testing and delays in obtaining results. Geldreich noted that Colilert test results "provide the operator with some indication that the water quality being released at the plant is meeting the limits for total coliform and E. coli."

Water authorities should produce a monitoring plan for compliance and process control requirements. Compliance monitoring differs from process control monitoring not only in purpose but also in terms of parameters to be measured, sampling locations and frequency of sampling. Compliance monitoring should be regarded as the final check that the multiple barriers and preventive measures are working effectively to protect the public. Process control monitoring is intended to assess operational effectiveness and to indicate a failure of a barrier and/or provide an indication of potential contamination.

Based on the foregoing, utilities could be permitted to use the Presence/Absence (P/A) test for their use, subject to protocols being in place for training and QA/QC. The Standard Method Colilert test, however, can provide E. coli data in 18-24 hours. As such, it is superior to the Presence/Absence test and all labs should be using this test now (Hargesheimer, Issue 7 Response Report, 2001).

8. Should the public be entitled to free testing for private wells?

The public should be encouraged to have their water quality tested. However, those who use private wells should pay for testing of their water supply. Guidelines should be developed as to the frequency and types of tests performed as well as rules regarding those who use a private well but could access a municipal system.

9. Who should investigate emerging contaminants in drinking water?

The OWWA/OMWA have recommended that the Province of Ontario form a Professional Interest Advisory Forum ("PIAF") to implement a drinking water quality management process in the short term and then to provide ongoing oversight to ensure success of the program. The ongoing oversight could include, but not be limited to:

- Reviewing data and trends from DWSP and identifying the need for new standards based on same;

- Reviewing standard setting schedule and recommending revisions accordingly;

- Identifying emerging issues and new technologies in the drinking water industry - while having regard for the time it can take to conduct research, prepare guidelines, and implement treatment improvements; and

- Identifying research needs to address emerging issues, assessing new technologies and new standard requirement, and revising implementation priorities accordingly.

Once research needs have been identified, a proposal call could occur or be coordinated through Health Canada, NSERC, NRC, AWWARF, etc.

Based on the foregoing, the PIAF (which would be responsible for providing practical and independent advice to the regulator on matters and policies related to drinking water quality) would oversee Ontario's research activities related to emerging contaminants in conjunction with the MOE and would communicate regularly with similar organizations to avoid duplication of effort while ensuring research relevant to local needs.

III. OTHER ISSUES ARISING DURING PUBLIC HEARINGS

1. Non-compliance by waterworks with existing legal requirements.

During the course of the Part II Public Hearings and also arising from media reports based apparently on MOE documentation, there have been allegations made of hundreds of municipalities out of compliance with drinking water requirements. In 2000, for example, according to media reports 311 orders had been issued to water treatment plants to improve testing, disinfection, and training procedures. However, this information has not been made public on a case-by-case basis or in consolidated form by MOE. OWWA/OMWA attempts to obtain this information from MOE for purposes of analysis have not been successful. We were met with the response that the information has not been posted on the MOE website and that there would be only two ways to obtain this information. First, we could contact each MOE District Office and request the information on a case-by-case basis. Second, we could submit a *Freedom of Information Act* request, which would result in a centralized response from MOE carrying the usual fee implications. A third way would be to obtain it directly from OWWA/OMWA members. Given the Inquiry timeframe and cost implications of any of these approaches we have not pursued acquisition of this information.

As the Commission is aware, municipal officials have expressed concern that the allegations and at least some of the orders are "nitpicking" and are having the effect of undermining public confidence in tap water as well as generally damaging the reputation of public water systems in the province.

OWWA/OMWA do not minimize the need to correct significant violations where they occur, and to prevent them from recurring in future. That is why the organizations have made in excess of 100 recommendations to the Commission during Part II of the Inquiry. However, we also submit that the blanket allegations of non-compliance lodged during Part II of the Inquiry are not of great assistance in the absence of an independent opportunity to review the factual underpinnings of the situation.

Overall, it is the impression of OWWA/OMWA that accurate data on non-compliance is not readily available. It often has been stated that a large percentage of reported violations represent procedural issues (late reporting or not reporting information that does not represent a threat to public health), but there is little back up to this perception. USEPA in October 2000 published a report on “Data Reliability Analysis of the EPA Safe Drinking Water Information System”. This report was prepared in response to concerns expressed by drinking water associations that the USEPA database contained gross errors and that it “over-reported” violations (reporting violations that did not exist).

This Report reached the conclusion that “the quality for a subset of 8 required inventory items is high, that the quality of violations data is low (principally because they are incomplete), and that enforcement actions data are of moderate quality”.

It was also concluded that “the thousands of compliance decisions that are made correctly by state drinking water programs are not enumerated” and that “only a small percentage of systems have any health-based violations”. Many problems were reported to arise from data entry and resource limitations.

In the absence, therefore, of reliable or readily accessible data in Ontario, OWWA/OMWA believe that the situation may be similar to that reported by USEPA. We believe that accurate compliance data would be an important tool in identifying specific problems that need to be addressed. In order to do this, however, particular attention must be paid to the accuracy of the database on which the information is based. This is necessary to overcome the acknowledged problem of data entry, which is exacerbated when data is handled or transferred through several hands such as occurs with sampling, analysis, reporting to a municipality and to a regulatory authority.

Finally, OWWA/OMWA have provided to the Commission the report of Michael Brodsky (Response Report on Issue 3) regarding reported incidents in Ontario where drinking water was a vehicle of gastrointestinal disease. The information contained in the Brodsky report covers the period 1974-2000. The Brodsky report demonstrates that of the thirty reported incidents in Ontario where drinking water was a vehicle of gastrointestinal disease during this period, 80 per cent of those events involved private, non-municipal systems.

2. A new cause of action that would provide a substantive (enforceable right) to safe drinking water in the province.

Some Parties to Part II of the Inquiry proposed that a new cause of action be created under Ontario law that would provide a substantive (enforceable right) to safe drinking water in the province. OWWA/OMWA note that we have already a number of rights and remedies under Ontario law including:

- Availability of judicial review for excess of jurisdiction;
- Right to sue for negligence, including regulatory negligence;
- New right to sue for significant harm to a public resource (where there also is a violation of a statute, regulation, or instrument) under section 84 of the *Environmental Bill of Rights, 1993*;

- Ability to sue for direct economic loss or personal injury as a result of a public nuisance causing environmental harm under section 103 of the *Environmental Bill of Rights, 1993*;

- Availability of injunctive relief where a statutory duty has been breached, etc;

- Class action lawsuits for damages that are now permitted under the *Class Proceedings Act*.

OWWA/OMWA support compliance and enforcement measures that will improve protection of source waters. However, OWWA/OMWA are not convinced that a new cause of action directed specifically at water providers is necessary given the arsenal of available rights and remedies listed above, among others, that can be and have been invoked successfully against water providers.

3. Whether certain statutory barriers to, or exemptions from, civil liability should be removed for those who provide municipally delivered water?

The flip side of the issue listed in Question 3 was raised by Parties who suggested that the province should remove certain barriers to civil law suits found under provincial law against those who provide municipally delivered water. The primary provisions at issue are sections 331.2 -331.3 and 207(50) of the *Municipal Act*. In the respectful submission of OWWA/OMWA the Commission should not adopt the suggestions of these other Parties for the following reasons. First, section 331.2 prohibits an action in nuisance from being commenced against a municipality, member of a municipal council, or an officer, employee, or agent of a municipality, in connection with the escape of water or sewage from sewage works or water works. (The prohibition on nuisance actions also applies to local boards). However, the prohibition does not extend to other types of common-law causes of action such as negligence, strict liability, trespass, or riparian rights actions. Accordingly, all of these other causes of action continue to be available against municipalities, council members, and municipal employees. Thus, the suggestion of some Parties during Part II of the Inquiry that this section shields municipalities, etc. from "common-law liability for poorly operating water…systems by forbidding nuisance proceedings…" is an overstatement. Only nuisance actions have been prohibited. The common law liability of municipalities under the other causes of action we identify above remains in place.

Second, section 331.3 prohibits an action in negligence against municipalities, council members, and municipal employees if the exercise of discretionary power that is the subject of the negligence action results from a policy decision made in a good faith exercise of the discretion. This exemption from liability in negligence largely mimics what the Supreme Court of Canada has endorsed in the line of cases beginning with the 1989 decision in *Just v. British Columbia*. But as the

Supreme Court made clear in *Just*, while development of policy may protect government from a negligence action, faulty implementation of a policy (e.g. a poor system of inspection) would still attract liability in negligence. In the circumstances, section 331.3 appears largely to codify the developing case law in this area.

Third, section 207(50) permits a municipality to contract for insurance to protect municipal employees for acts or omissions done by them while performing a statutory duty and allows the contract of insurance to include coverage of the costs of their defence and the payment of any damage awards. In the respectful submission of OWWA/OMWA, this type of insurance coverage could be expected to exist whether the water service provider was in the public or private sector.

4. Whether certain AWWA guidance documents should be referenced directly in the new drinking water regulations.

It is increasingly common practice to incorporate by reference guidance documents, manuals, etc. from other jurisdictions directly into Canadian and Ontario law. For example, in amendments to the province's regulations respecting the definition and identification of hazardous wastes, which came into force in March 2001, Ontario incorporated the testing procedure for identifying when a waste is leachate toxic waste relied upon by USEPA under American hazardous waste law. Canadian law also frequently incorporates by reference the standards of organizations like the Canadian Standards Association.

In appropriate circumstances, there is no reason why Ontario could not refer directly to AWWA guidance documents in the new drinking water regulations. AWWA Standards and Manuals could be referenced as a group of publications covering 116 products and procedures that have wide acceptance in the water supply business. Throughout the world, they are the most used and respected drinking water standards. They also are consensus standards developed by volunteer committees representing all segments of the drinking water community.

5. Comments on the Val Gibbons report.

The Gibbons Report (*Managing the Environment: A Review of Best Practices*, January 2001) emphasized the need to encourage continuous improvement beyond minimum regulatory compliance standards (Gibbons, Vol. 1, 70-71 and Vol. 2, Research Paper # 1, Environmental Compliance Assurance: A Review of International Best Practices). This approach is consistent with the views of OWWA/OMWA. As the Commission is aware, we have recommended that any proposed legal or regulatory regime on drinking water in Ontario should recognize and encourage the identification and implementation of best management practices, including continuous quality improvement programs, by water utilities in the province.

OWWA/OMWA also note that the Gibbons Report called for a multi-ministry approach to environmental protection (203-211). OWWA/OMWA submit that with respect to source water and drinking water protection in the province, the preferred approach is for the MOE to take the lead, through a single water branch organized to address drinking water, source water, and water conservation matters in a coordinated manner.

6. How should we measure the effectiveness of compliance and enforcement measures?

The traditional approach to measuring the effectiveness of compliance and enforcement measures has been to measure just outputs - i.e. how many prosecutions, total and average level of fines, numbers of annual inspections, investigations, convictions, etc. However, newer approaches are focusing more on (1) outcomes - e.g. compliance rates, rate of repeat offences, etc. and (2) environmental quality resulting from the implementation of effective compliance and enforcement measures. OWWA/OMWA recommend that the Commission urge the Government of Ontario to focus on reporting outcomes and resulting environmental quality and not just outputs in future.

7. Comments on the Jim Merritt report prepared for the Commission on governance matters.

By electronic message received on July 20, 2001, just prior to Public Hearing 2/3, Mr. Ron Foerster, Commission Counsel sought comments from the Parties to Part II of the Inquiry regarding a Commission-sponsored report authored by Mr. Jim Merritt. Mr. Merritt's report is a functional review of the MOE and drinking water protection in the province, noting both strengths and weaknesses in MOE's delivery of drinking water services.

Among the strengths identified by Mr. Merritt was the province's introduction in 1995 of an integrated multi-media (air, land, water) approach to environmental protection in the province. The purpose of a multi-media approach is to ensure, for example, that government activities to prevent air pollution do not result in the creation of land or water pollution problems.

However, Mr. Merritt also indicates that a weakness he observed is that there has been a reduction in the level of expertise within MOE. This has arisen in part due to major cuts in staffing. However, it also has occurred because the number of tasks environmental officers are expected to undertake is large, and the skills these officers bring to bear is too general and broad to be able to permit them to execute detailed inspections of complex operations such as water treatment facilities. Thus, according to Mr. Merritt, the benefits of the multi-media approach have been "sorely undermined by the loss of skills and expertise" within MOE.

Mr. Merritt draws a number of conclusions from the above observations. First, that dedicated full time inspectors need to be introduced that are knowledgeable about the systems and industries they are inspecting. Second, the introduction of new programs and policies needs to be properly supported with sufficient additional resources before they commence along with a clear plan for implementation and ongoing delivery. OWWA/OMWA support these observations and conclusions on the strengths and weaknesses of the current MOE system as it relates to drinking water and what should be done in future.

8. Final comments on adequacy of Bill 81 - The Nutrient Management Act, 2001 as protection for source waters threatened by agricultural activity.

The Commission now has before it information that clearly sets out the magnitude of the potential impacts to source water quality arising from agricultural activities. The Johns report, for example, indicates that non-point sources are contributing as much as two-thirds of the surface water pollution in waterways of the United States. The largest contributor by far is agricultural activity including sediment runoff, nutrient loadings, and pathogens from livestock.

OWWA/OMWA through the report prepared by Brian Pett on Issue 6 also noted the work of the International Joint Commission *in the late 1970s - early 1980s* in reporting the impacts to Ontario waterways of agricultural activity. The IJC reported that the Great Lakes Basin as a whole, including central and southwestern Ontario, was being polluted from nutrient runoff from feedlots and other livestock operations, inadequate soil conservation and drainage practices, and improper or excessive fertilizer application, including spreading of manure in winter. Because of the make-up of the group advising the IJC (federal and Ontario government representatives) in effect representatives of the governments of Canada and Ontario were advising the IJC on what the problems were and what should be done. In turn, the IJC was recommending to the governments of Canada and Ontario that they follow this advice.

As drinking water providers, the American and IJC findings on the magnitude of pollution contributed to source waters by agricultural activities greatly concern OWWA/OMWA. That is why we recommend today to the Commission, what the IJC recommended to governments twenty years ago. What was recommended by the IJC at the time was a four-pronged strategy for solving the problem consisting of the following measures: (1) land use measures, (2) regulatory measures, (3) fiscal measures, and (4) educational/voluntary/technical assistance measures.

It is with this background in mind that OWWA/OMWA have raised concerns about the province's proposed solution to the problem Bill 81 - *The Nutrient Management Act, 2001*. First, with respect to land use measures, section 60 of Bill 81 states that provincial regulations on a subject supercede a municipal by-

law that addresses the same subject matter. As worded, it is not merely the case that the by-law would be of no force or effect if there were operational conflict between a provincial regulation and a municipal by-law. Merely addressing the same subject matter as the regulation is sufficient for the by-law to be overridden by the regulation. Thus, section 60 has the potential to remove all municipal land use planning powers under provincial enabling law from addressing concerns with agricultural impacts. The reason OWWA/OMWA say this is because municipalities make land use planning decisions under the *Planning Act* through the passage of by-laws. Accordingly, any municipal land use decision implemented in the normal course through passage of a by-law (e.g. official plan, zoning, etc.) merely by addressing the same subject matter as a regulation promulgated under Bill 81, will be rendered inoperative. As a result, the province appears to have no land use strategy planned under Bill 81 for protecting water quality from agricultural activities.

Second, there are no fiscal or technical assistance measures proposed under Bill 81.

Finally, it is unclear at this stage what the true nature and effectiveness of the preventive regulatory regime contemplated under section 5 of Bill 81 will be because the teeth of the law are to be found in the regulations, which have not yet been made public.

Accordingly, OWWA/OMWA continue to urge upon the Commission the need for the province to go beyond the Bill 81 approach to addressing agricultural impacts to water quality and to adopt the four-pronged approach recommended by the IJC and ourselves.

9. Comments on suggestions during public hearings regarding lack of innovation in Ontario and lack of drinking water leadership within MOE.

Professionals in public water supply generally are cautious in adopting new technologies. In the experience of OWWA/OMWA, MOE has been successful in balancing the need to encourage new technologies while always asking the hard questions that need to be posed to ensure the supply of safe drinking water in a reliable fashion. Organizational approaches within MOE have not always made this easy (particularly the multi-media approach rather than dealing with all aspects of drinking water under one Branch). However, MOE staff is very knowledgeable and, given the right organizational structure, will continue to provide leadership in Ontario and throughout Canada and North America through their involvement in professional activities and associations such as OWWA and AWWA.

10. Comments on the CH2M Hill - Diamond Management Institute report prepared for the Commission on current and future utility practices and structure.

The purpose of the CH2M Hill-Diamond Management Institute report, as noted in the Executive Summary, is two-fold. First, to examine the superior practices of water authorities in Ontario and elsewhere that have risen far above minimal expectations. Second, to suggest a model water utility structure that will encourage a return of public confidence and support. The majority of the report describes the model utility framework (Part 2 - What We Could Have) and Part 3 outlines the regulatory framework necessary to move from the current situation to "what we could have".

The model utility framework includes a personnel management system (PMS) that operates under a total-quality water management system (TQWMS). Sufficient financial capacity is necessary to invest in people, quality and sustainable asset management. A Board of Directors governance structure is proposed to oversee the utility. The Directors are to possess the required skills, knowledge and experience to carry out their responsibilities effectively.

The model utility framework appears to be based on a modified "Australian Framework" approach. The proposed PMS outlines extensive requirements to establish the "commitment to drinking water quality" (i.e. step 1 of the Australian Framework). The proposed TQWMS encompasses the remaining steps although several of the Australian Framework steps have been collapsed into one TQWMS step and the order has been revised.

It is noteworthy that the Australian Framework was designed to guide utilities through the process of preparing a comprehensive plan to proactively manage risk through their system from catchment to consumer. It is meant to be a self-examination continuous improvement program. Utilities enter into the program where appropriate (i.e. step 1 or step 8, etc.) and use/develop what is appropriate for their circumstances. This "continuum" does not appear in the model utility framework proposed for Ontario.

Furthermore, the Australian Framework is still in the public consultation phase. The Framework is expected to become part of the Australian Guidelines and hence will have no legal effect. This contrasts with the proposed mandatory process in Ontario. One issue raised by the Australian Water Association during consultation is the ability of under-resourced utilities to cope with the process. This concern also was raised by Mr. Allan Davies at Expert Meeting 9 vis-a-vis the Ontario proposal.

In addition to the ability of under-resourced utilities to cope, the PMS is premised on retaining high quality leaders and certified managers. It is already known that the workforce will contract in the next 5 to 10 years due to demographics. As

such, there may be a shortage of leaders and certified managers to implement the model utility framework. Training and development will therefore likely be a prerequisite to implement the plan.

It is expected that only the most sophisticated of utilities could implement the proposed plan in the timeline suggested. The proposed framework is untried and unproven and warrants significant industry consultation before implementation. This is critical to ensure "buy-in" into the process and to assess issues such as leadership, technical competence, and utility viability. Financial and insurance impacts related to not being able to implement the program need to be considered beforehand and the costs of implementing the plan need to be estimated. The public has a right to know what the expected impacts will be to water rates before we embark on these improvements.

The utility regulation framework includes a standard setter, a regulator, and an auditor (registered third party). The report recommends that Health Canada be the standard setter and that the MOE be the regulator. The OWWA/OMWA recommends that the MOE remain the standard setter in Ontario (within the current Federal-Provincial framework) to facilitate enhanced utility and public consultation within the province. This would be difficult for Health Canada to achieve.

The report outlines specific roles and responsibilities for the regulator, implementation tasks and a timeline, as well as a role for professional associations. The report recommends that a Ministerial Task Force be set up to guide the implementation process.

Notwithstanding the significant thought that has been given to implementation, the schedule appears to be very aggressive. First, the CSA indicated in their report to the Commission that developing a standard for a quality management system for Ontario would take 12-18 months assuming that a good "seed" document was available. Second, we need to consider the lessons learned in Victoria, Australia vis-a-vis what was contentious and the time it took to negotiate arrangements. Third, the technical workforce in Ontario (consultants included) cannot keep up with the existing pace of work without some burnout. The plan needs to incorporate motivating a "tired" workforce - many of whom are on the verge of retirement. An "achievability review" needs to be completed to ensure that the proposed schedule is not so aggressive that it prompts those very people that are needed to implement improvements to retire.

One of the biggest complaints about O. Reg. 459/00 was the lack of consultation. The timeframe allowed for the Ministerial Task Force to develop the TQWMS, take a leadership role in developing strategies for addressing capacity issues, establish new utilities, and prepare sample standard operating procedures will not facilitate sufficient consultation. The process appears to be very prescriptive and may be viewed as another imposed requirement thereby compromising "buy-in" and the credibility of the program.

At this critical juncture, the water works industry cannot afford to expend energy on "buy-in" and "credibility" issues. Extensive consultation will be necessary to take a concept that has been recommended as a "Framework" in Australia (where considerable change had already occurred and the culture was ready for it) into a "regulated" municipal organization in Ontario where acceptance and recognition of the concepts is in its infancy. The time to consult, and the issues raised as part of that consultation, cannot be constrained. The synergy between accreditation and the Gibbons approach may be an interim approach that should be considered while the consultation for more aggressive change occurs.

11. Comments on the Geldreich report prepared for the Commission on small system problems.

The Geldreich report did a commendable job of summarizing a number of issues facing water systems in Ontario, namely:

- the scattering of regulations through various separate legal publication;
- limited technical capacity in small systems;
- the monitoring burden;
- specific bacterial monitoring issues and the limited use of some results;
- the need for audit samples;
- the need for more accessible public information;
- the need for improved relations with the MOE.

The report presented a number of conclusions that are consistent with the information submitted by the OWWA/OMWA, namely:

- The goal should always be to do a better job than required because of the importance to human health. The regulations should be understood as minimum requirements;
- The more knowledgeable the operator, the greater protection the public has;
- The most important aspect of training is to ensure that the operator training and certification system measures success by ensuring that all operators are involved in the process and the

MOE is confident that operators have the basic knowledge needed to operate their specific plant.

To address these issues the Geldreich report made a number of recommendations which OWWA/OMWA endorse, namely:

- There is the need to have a group responsible for planning on a watershed basis (see OWWA/OMWA Issue 6 report prepared by Brian Pett);

- There is the need to have improved compliance and process control monitoring for the treatment train and the distribution system (see OWWA/OMWA Issue 7 report prepared by Dr. Erika Hargesheimer).

- There is the need to have improved source water characterization monitoring (see OWWA/OMWA Issue 5 report prepared by Dr. Les Gammie).

- There is the need to have an improved cross-connection control program (see OWWA/OMWA Issue 8 report prepared by Judy A. MacDonald).

- There is the need to review what information the public wants (see OWWA/OMWA Issue 12 report prepared by Judy A. MacDonald).

- There is the need to have competence, skills based training (see OWWA/OMWA Issue 10 report prepared by Gerald Samuel).

- There is the need to restore the public's trust in drinking water institutions (see OWWA/OMWA Issue 11 report prepared by Allan Davies and Issue 12 report prepared by Judy A. MacDonald).

- There is the need to establish a Professional Interest Advisory Forum (see OWWA/OMWA Issue 12 report prepared by Judy A. MacDonald).

While the Geldreich report touches on the above issues, the OWWA/OMWA reports provide specific recommendations to address each of the above matters. As such, we would refer Inquiry staff to our reports.

One criticism of the Geldreich report is that is does not discuss the issue of groundwater under the influence of surface water. Rather, it continues to

perpetuate the perception that "groundwater normally provides a barrier protection to surface contamination". One of the biggest issues arising from the Engineers' Reports has been groundwater under the direct influence of surface water (GUDI). There are many small and vulnerable groundwater systems in Ontario - in fact, Walkerton was one of them. The need to educate utilities and the public in this regard cannot be underestimated.

Geldreich also suggests a "circuit rider" program to address issues related to building the technical capacity of small systems. There has been some discussion in the past as to whether circuit riders improve the knowledge of small system operators, or merely provide quick fixes in case of problems. In recent years, there has been greater cooperation in the United States between the National Rural Water Association (the entity that developed the circuit rider system) and AWWA such that NRWA can better use AWWA's technical resources in its well-developed small system network. Whatever program is developed, the key will be to develop the technical capacity and skills of small systems - not provide a telephone number for quick problem resolution with no learning.

IV. FINAL COMMENTS

As we did at the close of the Public Hearings in September 2001, the OWWA/OMWA want to again thank the Commission for the manner in which Part II of the Inquiry was conducted. We believe that the process employed by the Commission engendered much good will and assistance in the effort to find solutions for the future of the drinking water system in the province. OWWA/OMWA wish the Commission well in the development of its final report on Part II matters and stand ready to provide any additional assistance or information required, if necessary.

V. APPENDIX 1: CONSOLIDATION OF OWWA/OMWA RECOMMENDATIONS TO THE WALKERTON INQUIRY FROM JUNE TO SEPTEMBER 2001

Issues 2 and 4 - Governance (Joseph Castrilli)

1. That any proposed legal or regulatory regime on drinking water in Ontario should recognize and encourage the identification and implementation of best management practices, including continuous quality improvement programs, by water utilities in the province.

2. That if federal legislation in the drinking water field becomes necessary, it should be recognized as being justified under the federal spending power and the federal government urged to focus primarily on the provision of loans as opposed to grants, particularly with respect to drinking water infrastructure development and renewal. Otherwise, to the maximum extent feasible, water utilities should be self-financed, based on user fees and charges, and the rates charged should be based on a system of full-cost accounting.

3. That the MOE retain the lead for drinking water protection in the province under a legal and regulatory system enhanced along the lines described by D'Ombrain.

4. That the following elements be developed, integrated, or enhanced (where they are already in place) as part of any drinking water law reforms in the province:

    - Development, implementation, updating, and enforcement of legal standards for certain drinking water contaminants and treatment measures;

    - Groundwater protection consisting of three elements (a) identification of sole source aquifer areas, (b) protection of critical aquifer areas (within the sole source aquifers), and (c) wellhead protection;

    - Watershed (source water) assessment and protection not otherwise covered in the groundwater protection initiatives referred to above;

    - Operator training and certification;

    - Consumer and public access to information;

    - Capacity development measures;

- ❖ A financial regime (such as a revolving loan fund) to sustain the above elements of the program and to develop and maintain the drinking water infrastructure that is consistent with principles of full-cost accounting.

5. That stakeholders (including OWWA/OMWA and others) be afforded an opportunity to participate and be formally consulted through meetings and other mechanisms on the development of proposed legislative and regulatory reforms with respect to drinking water including the development of new or amended standards prior to their adoption as regulations.

6. That the OWWA/OMWA governance submissions and recommendations contained in this document should be viewed together with, and as complementary/supplementary to, those contained in our other reports to the Commission and adopted by the province.

Issue 3 - Drinking Water Pollution Outbreaks (Michael Brodsky)

1. Water utilities should engage in constant monitoring of performance parameters, such as turbidity, particle counting, free and residual chlorine and pH, as these measures offer a more preventative approach than intensive microbiological monitoring activities.

2. Drinking water must be kept pathogen-free water by (a) selecting high-quality, uncontaminated source waters, (b) applying efficient treatment and disinfection measures to water, and (c) protecting water from contamination during distribution to the user.

3. Public health protection requires a preventive approach to detect and correct problems before they affect the quality of the finished water supply. The development of a formal framework for water quality management incorporating preventive management principles and elements of internationally recognized risk management systems such as Hazard Analysis Critical Control Point (HACCP) is paramount.

4. Consideration should be given to establishing "sentinel systems" to enhance microbiological monitoring in smaller communities and to complement DWSP. These "sentinel systems" would require the collection of water potability data from various "high risk" locations (e.g. loops, end of line, etc.) throughout the distribution system on a more frequent basis. These samples would be analyzed for microbial parameters with results communicated accordingly.

Issue 5 - Drinking Water Standards (Les Gammie)

1. The current Ontario Drinking Water Standards (2000) compare favorably with those in the rest of Canada and are on a reasonable par with international regulations.

2. There is an absence of coordinated overall water supply management strategies from the watershed to the customer's tap. Water quality standards, guidelines, and regulations may have to be modified or developed to the point of being all-inclusive in protection of drinking water from source to tap. Management strategies should include reference to requirements for adequate monitoring, ongoing system evaluation, corrective actions, defined responsibilities, and proper training of personnel. That would require a meshing of current responsibilities from various diverse areas of government, including environment, health, municipal affairs, industry and agriculture.

3. Ontario should maintain one set of standards for all waterworks systems in the province, but should ensure that small systems have the technical and financial capability to meet those standards.

4. Guideline limits for pesticides are more extensive and often set at lower limits in other jurisdictions (WHO, USEPA, Australia - see Section 2 above). Health Canada should explain more clearly the rationale for the setting of the Canadian guideline levels, and why they differ from other jurisdictions.

5. The Federal-Provincial Sub-Committee and Health Canada should apply more resources to the task of evaluating the risks and setting of guideline values for the current backlog of possible contaminants on their drinking water priority list.

6. Health Canada should proceed with the Drinking Water Materials Safety Act which would require accreditation of materials in contact with drinking water. This would provide protection for contaminants such as acrylamide and epichlorohydrin by mandating approval procedures such as those of the Canadian Standards Association or the National Sanitation Foundation. The Act should consider and encompass procedures and certifications already in place in other jurisdictions in order to avoid duplication of effort and the possible impacts on one product needing to meet different standards in similar geographic areas (e.g. Canada and the United States).

7. Health Canada and/or Provincial Health Authorities should maintain an online database of waterborne outbreaks, with information on causative organisms, number of people affected, dates of duration, and follow-up actions, so as to highlight the incidence of waterborne disease, and help justify improvements in treatment and watershed protection.

8. The MOE, in conjunction with the Federal Provincial Sub-Committee and Health Canada should look at setting some requirements for control of protozoans and viruses. The approaches should recognize existing requirements such as the US Surface Water Treatment Rule.

9. Adequate monitoring for microbiological risks should be carried out over a number of years to ensure that the full range of contaminant loadings has been identified, and the overall treatment system designed accordingly.

10. Watershed protection and source evaluation should be emphasized as an integral part of the multiple-barrier concept of drinking water protection. This would require more regulatory support and coordination between multiple agencies with responsibilities for source water protection and drinking water production.

11. The provincial members of the federal-provincial sub-committee on drinking water should institute a formal system of review by stakeholders in each province/territory for any proposed guideline.

Issue 6 - Water Pollution and Sources of Contamination (Brian Pett)

Land Use Planning Measures

1. That the province provide clear guidelines and policies in the land use planning process for the protection of both source water and drinking water so that land and water resource management are integrated at the local level to minimize non-point source pollution from agricultural activities.

2. That the province provide stringent baseline performance standards and where necessary provide municipalities with the necessary land use planning tools to apply local initiatives such as groundwater protection and nutrient management policies.

3. As part of the land use planning process, there should be conducted by municipal entities, in partnership with conservation authorities or other provincial entities on a watershed-by-watershed basis, on-going identification of point and non-point sources of pollution:

   - Point sources would include manure storage areas, silo areas, etc.

   - Non-Point sources would include inadequate soil conservation and drainage practices, and improper or excessive fertilizer application including spreading of manure in winter.[1]

[1] Defining the watershed as to the predominance of these sources would aid water supply providers in capital spending for either existing facilities or upgrading of facilities. For example, if

Regulatory Measures

4. That the MOE maintain the primary lead role in respect of water quality and drinking water protection under the Environmental Protection Act, the Ontario Water Resources Act, and Bill 81 - the Nutrient Management Act, 2001 in respect of agricultural pollution.

5. That provincial environmental legislation define and regulate such matters in the agricultural context as:

   - Agricultural storm water discharge to include only discharge from waste application fields on which manure or wastewater has been applied at an agronomic rate.
   - Animal feeding operations including waste application fields.
   - Land application areas including waste application fields on which manure or wastewater from a concentrated animal feeding operation (CAFO) is applied. This would include fields under a contractual relationship with the owner or operator of the CAFO.
   - Land application areas including land to which manure or process wastewater is or may be applied.

6. Regulations should apply to any livestock operation not just "large" livestock operations or CAFOs where such operations may be significant contributors to pollution of Ontario waterways or groundwater.

7. There should be a province-wide prohibition on manure spreading during winter months or during times of adverse weather conditions.

Fiscal Measures

8. To assist farmers with compliance or technical assistance in meeting new standards promulgated under regulations developed under Bill 81, or other environmental laws, fiscal measures, including loans, grants, tax incentives, cost-sharing arrangements and other fiscal measures, should be made available.

9. Such fiscal measures should be made conditional on implementing non-point source and animal waste management requirements to protect source waters.

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the main point and non-point sources of pollution within a watershed were of a particular type, then the water utility might decide to install treatment equipment appropriate to the contaminant. This would also provide the water utility with information on when to sample for specific substances or to prepare for specific events such as heavy rainfalls and potential elevated turbidity levels.

Voluntary/Educational Measures

10. That the province, in conjunction with regulatory requirements, initiate informational, educational, and technical assistance programs directed at the agricultural community on new measures for source water protection. Specific areas should include:

    - Minimum distance separation.
    - Nutrient management strategy.
    - Best management practice. (The Guide to Agricultural Land Use - OMAFRA, 1995).
    - Proper storage of liquid/solid manure.
    - Manure land spreading/irrigation practices.
    - Well head protection.
    - Procedures for well abandonment.
    - Implementation of agricultural multiple barrier approach consisting of at least pollutant source controls, landscape controls, and stream corridor controls.

11. MOE, OMAFRA, and other appropriate agencies should be provided with sufficient technical and financial resources in order to advise/assist farmers to address environmental issues from both a land use and water resource protection perspective.

Issue 7 - Measurement of Source and Finished Water Quality (Erika Hargesheimer)

1. Conduct a gap analysis for monitoring and analysis requirements, including consideration of the roles of on-site analysis, contract/provincial laboratories, as well as the use of test kits and online monitoring. Consider monitoring requirements for distribution system integrity, source water protection and optimizing treatment processes (e.g., disinfection/contact time).

2. The Government of Ontario should evaluate the criteria used to define small systems. The impacts of the regulations and standards on small systems and their ability to comply should also be evaluated. The Government of Ontario should consider whether small systems need more time to comply with new regulations.

3. The Government of Ontario should investigate whether the number of samples collected is adequate to characterize a distribution system and the quality of the water reaching consumers in that system. The factors that should be considered include:

- whether one sample per week is adequate protection for the population served,

- When water utilities collect the samples (i.e. are samples evenly spread throughout the month or is a utility that serves up to 100,000 people choosing to take one sample per week for three weeks of a month and the remainder in the fourth week)

- How many water utilities have voluntarily increased the number of samples taken and at what cost? What benefits have been attained from extra sampling and are costs offset?

- What level of monitoring does the public expect and are they prepared to pay a premium for additional monitoring?

- Are there differences between surface water and groundwater systems, small systems and large systems?

- The analysis should assess what types of tests are required in distribution systems and question the rationale of testing only 25% of the samples for Heterotrophic Plate Count.

4. The Ontario Government should expand Section 13 of Ontario Regulation 459/00 regarding the water works reviews in the manner suggested by the OWWA/OMWA in this Review. In particular, the province should focus on:

   - Development and implementation of a monitoring program that includes plant process control requirements as well as distribution system requirements

   - A review of the "state of readiness" of the utility to undertake the recommended plant process control and distribution system monitoring program should be completed, including a physical inspection of existing online instrumentation, a review of their installation, maintenance and operation.

   - A review of standard operating procedures for flushing, main replacement programs, main repair procedures, including chlorination practices and sampling strategies should be included in the water works review.

   - Development and implementation of a monitoring program that distinguishes between compliance monitoring, process optimization monitoring and response monitoring. It should include details of sampling sites and frequencies, the rationale for the sampling sites, collection methods and field analyses.

   - Development and implementation of a monitoring program that includes "chain of custody" protocols. The protocols should consider the feasibility

of requiring that staff not associated with the treatment plant process be responsible for collection of distribution system samples.

- Consider implementing monitoring program reforms in the next 18 months to three years

5. The Government of Ontario should work with appropriate stakeholders to develop the above noted "chain of custody" protocols for drinking water sampling and "standard operating procedures" for flushing, chlorination, sampling/analysis during any distribution system main disruption, etc. The sampling protocols and standard operating procedures will need to address field test kit and online monitoring requirements, as well as training, installation and maintenance requirements. In addition, consideration must be given to issues and challenges relating to small systems.

6. The Government of Ontario should ensure the Ministry of the Environment's testing methods comply with standard methods (i.e., 48-h storage time for microbial tests be revised to the accepted Standard Methods) and ensure that standard methods for monitoring turbidity, disinfection residual and other regulated parameters.

7. The Government of Ontario should consider the value of seasonal source water monitoring programs for *Giardia* and *Cryptosporidium,* except in cases where clear evidence exists that the source water is not at risk from contamination by these pathogens.

8. The Government of Ontario should work with stakeholders to clearly define criteria for "Ground Water Under the Direct Influence of Surface Water".

9. The Government of Ontario should review whether the public is reading the water quality reports, and if not, how they should be improved.

Issue 8 - Production and Distribution of Drinking Water (Judy MacDonald)

Best Management Programs

1. That any proposed legal or regulatory regime on drinking water in Ontario should recognize and encourage the identification and implementation of best management practices, including continuous improvement programs, while having regard for the programs developed by the American Water Works Association, including but not limited to: QualServe™, Partnership for Safe Water and the International Water Treatment Alliance.

And further, that the Government of Ontario work with the OWWA to implement the International Water Treatment Alliance in Ontario.

And further, that the OWWA/OMWA be consulted with respect to the implementation of other developing programs such as accreditation.

Treatment and Distribution

2. That the Government of Ontario continue to support the practices of filtration of surface water used as sources of public water supply, disinfection of public water supplies, including the maintenance of residual disinfectant in the distribution system, and adequate monitoring to assure conformance with water quality standards.

3. That the Government of Ontario encourage utilities to implement best management practices for water distribution systems as outlined in this review.

4. That there be created, by statute, the position of Chief Water Official for each water authority in the Province.

   And further, that the Government of Ontario clarify, by statute or regulation, the roles and responsibilities of the Chief Water Official as they relate to cross connection control and other areas of potential jurisdictional conflicts related to private property.

5. That the Government of Ontario and municipalities participate in drinking water research and that participation in the AWWA Research Foundation be encouraged.

6. That the Government of Ontario support the consumer principles outlined in this review.

Capacity Development

7. That an analysis be conducted to determine how much additional investment will be needed over the coming decades for infrastructure upgrades. These infrastructure needs should encompass both what is required to comply with Ontario Regulation 459/00 (Drinking Water Protection), as well as what will be needed to replace and rehabilitate aging water treatment and distribution facilities regardless of regulatory mandates.

8. That a system viability analysis be performed and in conjunction with, or pending the results of, that analysis regulations be developed that would permit municipalities to decide how to achieve a legislative obligation to have sufficient financial, technical, managerial, and operational expertise and capacity through such options as retaining consultants, sharing resources

with adjacent municipalities, or voluntarily entering into amalgamations having regard to the need to potentially protect drinking water quality on a watershed basis.

And further, that the costs necessary to develop the financial, technical, managerial, and operational expertise and capacity of water utilities be included in the cost of service.

Issue 10 - Training and Accreditation (Gerald Samuel)

Certification

1. The Ontario Government should continue to support mandatory certification of persons performing operational work in water treatment and distribution facilities.

   And further, all applicants for an operator's licence should have a high school diploma or specified education equivalent.

   And further, all operators should have continuing education as a condition of licence renewal.

   And further, all persons involved in water system operations should be encouraged to gain certification.

2. The Ontario Government should require all applicants for an operator's licence at the entry level to complete a training course with a specific curriculum.

3. The Ontario Government should update the mandate for the Water and Wastewater Operator Certification Advisory Committee.

4. The Ontario Government should ensure the Ontario Water and Wastewater Operator Certification Program is adequately staffed to meet ABC standards and that the program is self-financed.

5. The Ontario Government should have a system to monitor training and continuing education for operator re-certification.

6. The Ontario Government should work with appropriate stakeholders to ensure private water system operators are adequately trained and certified.

Training

7. The Ontario Government, in collaboration with water utilities and other appropriate stakeholders (i.e. OWWA, OMWA, WEAO, AMO, MEA, PEO,

OSPE, private trainers, etc.), should establish competence-based training and career development programs for water (and wastewater) utility staff.

8. The Ontario Government should conduct a gap analysis to determine the long-term training and capacity development requirements of the water works industry.

9. The Ontario Government should establish a mandatory water supply training course for regulatory staff and public health officials.

10. The Ontario Government should provide guidance to water utilities regarding "how to" get CEU training approved for utility staff.

11. The Ontario Government should provide guidelines and require water utilities to adopt personnel development provisions that authorize adequate time and funding for the training of personnel at all levels of the system's operations.

Issue 11 - Management and Organizational Behaviour (Allan Davies)

Based on the foregoing analysis, the OWWA/OMWA urge that in its final report the Commission recommends that the Ontario Government support, encourage, and promote in consultation with the water industry and other stakeholders the following guiding principles for the achievement of superior performance by water utilities:

1. Water utility leadership development plan. The purposes of the plan would include ensuring that utility leaders have:

    - a vision to serve and protect public health and welfare by providing safe, reliable, and sufficient water supplies to consumers;
    - management strategies that create a pride in drinking water;
    - a continual-improvement program based upon elements of accountability for optimum performance; and
    - appropriate attraction, retention and motivational roles that will foster an appropriate learning environment.

2. Recognition that water utilities must be sustainable, such that the required infrastructure improvements to produce safe drinking water demanded by the public and the financing capability to achieve this result.

3. Investigation of gaps or needs in the current system. Such investigation should include:

    - the appropriate institutional governance model(s) (including scale/size) for utilities to ensure sustainability;

- organizational and structural requirements for whatever governance model(s) are adopted;
- consumer and public education and information needs; and
- financial, technical, and managerial learning needs.

4. Water quality regulations are necessary and should be viewed as the collaborative research and development requirement of the industry. Regulatory effort will allow best science, economics, and risk analysis to be combined with the resulting knowledge being accessible and shared with all stakeholders.

5. Water utilities should consider water quality regulations and standards as the minimal acceptable level of performance, and always strive to go beyond this base level of performance.

6. The water utility needs to be regularly audited and accredited by a third party as part of the review. The foundation for this approach is available through the AWWA QualServe, Benchmarking, and Accreditation Programs.

7. Results of accreditation must be regularly presented to consumers. They must have the ability to influence utility policy especially when changes and challenges are identified through the audit.

Issue 12 - Communications (Judy MacDonald)

1. The Ontario Government should develop programs to provide practical guidance to water utilities on what should be done in a drinking water related public health emergency. Such guidance should include information on what circumstances should trigger an emergency response, what steps must be taken when a trigger is reached, and the importance of building relationships with water utilities and health departments.

2. The Ontario Government, in collaboration with water utilities and local medical officers of health, should establish operational procedures for use prior to and during a public health emergency (to address issues raised in Section 2 of this Review).

3. The Ontario Government should provide guidance to and require water utilities to implement risk communication plans that apply risk management principles while having regard to the need for any training and education of water utility staff that may be necessary to entrench this approach in water system operations.

4. The Ontario Government should apply relative-risk reduction principles, and ensure that appropriate communication of these principles to the public occurs, so that contaminants representing the most significant health risks are regulated first.

5. The Ontario Government should expand section 12 of O. Reg. 459/00 regarding public right-to-know in the manner suggested by the OWWA/OMWA in this Review. In particular, the province should focus on:

   - Requiring water utilities to produce an annual water quality report that must be sent to all consumers. This requirement would ensure that all consumers are informed regarding the level of contaminants in the drinking water provided by the system. Quarterly reports as submitted to the Director per Section 12 of Ontario Regulation 459/00 (Drinking Water Protection) should continue to be made available to consumers. The frequency of reporting, however, should be reviewed for both public communication and compliance purposes. The recommended Professional Interest Advisory Forum (see Recommendation 6) could undertake this review. Less frequent public reporting (i.e. annual) would address concerns that extensive reporting may cause the public to lose interest in their drinking water quality, especially for parameters that do not change. More frequent compliance reporting (i.e. monthly) could be beneficial for enforcement monitoring.

   - Making water quality reporting part of an overall public consultation and communications strategy. Positive relationships must be developed with consumers before water quality reports are distributed to ensure customers are receptive to the information being disseminated. Water utilities should be encouraged to present the results of the source water assessments or protection plans, and information on significant sources of contaminants, to the public. This will provide the public with the opportunity to comment on the establishment of levels of service, costs, existing water quality problems, and the options for protection and improvement of drinking water quality including land use constraints, changes in treatment or infrastructure. Consumers should also be consulted on monitoring requirements and mechanisms for public reporting of system performance.

   - Training and education of water utility staff. This will be necessary to develop and implement comprehensive communication and outreach strategies envisioned. Training needs will include: media relations, customer service, etc.

   - AWWA focus group results as summarized in this Review (and fully documented in the AWWA document entitled "Preparing Consumer Confidence Reports (CCRs)".

6. The Ontario Government should form a Professional Interest Advisory Forum (PIAF) as described in Section 5 of this Review to develop a drinking water quality management framework to implement the recommendations of The Walkerton Inquiry, to entrench the continuous improvement culture in water

system operations and to improve the technical, managerial and financial capacity of the Ministry of Environment (i.e. the regulator) and water utilities.

7. The Ontario Government should support the Water Utility Management Institute of Ontario initiative as developed by the Ontario Water Works Association, through its Management Committee.

Issue 14 - Infrastructure Financing (Gary Scandlan)

1. That the full-cost accounting for the provision of water should be adopted by water service providers in Ontario.

2. That Ontario water service providers should implement full-cost pricing. Pricing should not be limited to water rates as the sole basis for recovering costs, but also should encompass a combination of various fees and service charges that would be adopted by individual service providers. Implementation of various funding measures including those set out in Recommendation 4 should be done carefully to ensure consumer understanding of the actual or true cost of water (i.e. that low water rates do not encourage economic efficiency or water conservation).

3. That water service providers not be restricted as to the types of rates structures that they may select to recover their water costs. This may include the use of flat rate structures for water systems where it may be cost prohibitive to incur the costs of installing meters in homes. However, declining block rate structures should be discouraged.

4. That, in light of the provincial initiative to adopt a new *Municipal Act*, water service providers maintain the ability to use a variety of user fees and charges and funding mechanisms as follows:

    a. Debt;
    b. Reserves;
    c. Reserve funds;
    d. Development Charges;
    e. Local Improvement Charges;
    f. Local Services installed by developing landowners;
    g. Special Assessments such as s. 221, 222 of the *Municipal Act;*
    h. Private/Public Partnerships (s. 210.1 of the *Municipal Act*);
    i. Various services charges.

5. That loans be made available to small municipalities to assist with the implementation of new regulations on a transitional basis. Consideration of whether the loan program needs to be continued subsequently should be based upon an evaluation of the impacts of the Commission's

recommendations. Loans should be contingent upon a commitment to achieve system viability in accordance with Recommendation 7 below.

6. That water service providers be required to keep accurate and up to date information on their physical assets. As well, that an assessment of the water system infrastructure be undertaken at least every five years. In conjunction with this asset condition assessment, that a long-term financial plan be developed for the maintenance, upgrade and replacement of infrastructure. In particular, the principles of sustainable asset management and lifecycle costing should be implemented to ensure that proper management and replacement of physical assets of the water system are being carried out.

7. Recognizing that the Commission may recommend watershed planning as a means of protecting source waters, a systems viability analysis should be performed and in conjunction with, or pending the results of, that analysis regulations should be developed that would permit municipalities to decide how to achieve a legislative obligation to have sufficient financial, technical, managerial and operational expertise and capacity through such options as hiring staff, retaining consultants, sharing resources with adjacent municipalities, voluntarily entering into amalgamations, or other inter-municipal arrangements.

8. That all water service providers be required to undertake capital and operating budgets that forecast budgeted expenditures and revenue sources including rates over a minimum five-year period.

9. That dedicated revenues be mandated for public water service providers, requiring that all revenues be used for the benefit of the public water system and not for other purposes.

10. That the above recommendations be incorporated into new regulations and that a reporting structure be developed for ensuring the proper financial management of water systems in Ontario.