

The Walkerton Inquiry

Detailed Notes on the Expert Meeting

“Guiding Principles for Drinking Water Safety: Risk Management and Risk Communication Aspects”

**Ryerson University
April 19, 2001**

Revised Draft

Topics Discussed

Risk Management Issues I: Roles and Accountability
Risk Management Issues II: The Precautionary Approach
Risk Management Issues III: Risk Assessment and Perception of Risk
Risk Communication Issues I: Transparency, Access, Reporting
Risk Communication Issues II: Emergencies & Public Warnings
Concluding Overview: The Goals of Risk Management for DWS

The detailed notes for this expert meeting have been prepared to brief the Commissioner and to facilitate participation in Part 2 by those who were not present at the meeting. The notes are intended to represent the major items of discussion and positions put forward by participants. They are based on notes taken by Rapporteurs and are not intended to be an official report or transcript of the meeting. They do not represent the views of the Commissioner.

Meeting Summary: Guiding Principles for Drinking Water Safety

The agenda, prepared for the meeting by the Chair, provided the framework for the report. The report summarizes the main points of contention and agreement between the parties under the six main topics and related questions on the agenda.

1. Roles and accountability: Discussion on roles and responsibilities centred on the three levels of Government, third parties, and the public.
2. The precautionary approach: As there was no clear articulation of the term “precautionary approach” from the discussion, debate on this topic was limited. Discussion focused on prevention and the development of standards.
3. Risk assessment and perception of risk: Some contention exists regarding the value of a traditional, quantitative approach to risk assessment. There is some acknowledgment that perceptions of risk differ between professionals and the public.
4. Risk communication, transparency, access and reporting: The requirement for improvement in risk communication received general agreement. The discussion focused on the importance of communication for building trust, changing behaviour and successful system operation.
5. Risk communication, emergencies and public warnings: There was some contention around communication in emergency situations. The discussion focused on the type, timing, content and delivery of the message, particularly related to public warnings.
6. Goals of risk management for drinking water safety: Discussion on the goals of risk management was lively, and centred around issues of water as a human right and standard setting within the province.

Meeting Participants and Affiliations

Chairperson	William Leiss
Co-Chair	Ron Foerster
Issue Paper Author, University of Ottawa	Dan. Krewski
Issue Paper Author, University of Guelph	Katija Blaine, (for Doug Powell)
Issue Paper Author, University of Victoria	Rod Dobell
Government of Ontario, Ministry of the Environment (MOE)	Jim MacLean
Association of Local Public Health Agencies (ALPHA)	Andrew Papadopoulos
Chief Coroner of Ontario	David Gruber
Provincial Medical Officer - Ministry of Health and Long Term Care	Colin D'Cunha
Association of Municipalities of Ontario (AMO)	Nicola Crawhall
Christian Farmers Federation (CFF)	Elbert Van Donkersgoed
Ontario Farmers Environment Coalition (OFEC)	Paul Verkley
Canadian Association of Physicians for the Environment/ Sierra Legal Defence Fund (SLDF) Coalition	Kapil Khatter
Concerned Walkerton Citizens/ Canadian Environmental Law Association (CWC/CELA)	Theresa McClenaghan
Canadian Environmental Defence Fund (CEDF)	Burkhard Mausberg Bryan Davis
Pollution Probe (PP)	Rick Findlay
Ontario Medical Association (OMA)	Carol Jacobson Alex Hukowich
Ontario Society for Professional Engineers	Robert Goodings
Research Advisory Panel Members	Allison McGeer Steve Hrudey Doug MacDonald Michelle Prévost
Walkerton Inquiry Staff:	James Van Loon Karen Minden
Rapporteur Team Leader	Carolyn Johns
Rapporteurs	Sarah Hartley Sarah Wolfe

Guiding Principles for Drinking Water Safety Meeting

1. RISK MANAGEMENT ISSUES I: Roles and Accountability

The actors for drinking water safety (DWS) include: the public, the federal and provincial governments, municipalities (elected and appointed officials), water suppliers, public health, governments as regulators, governments as advisors, sellers of industrial technologies and professional services, and others.

Although the scope of the discussion was framed to focus on Ontario, it was raised at the outset that comparisons with other jurisdictions could be tabled to provide comparative insights into roles and guiding principles of risk management and risk communication related to drinking water safety.

1.1 Who is responsible for what, specifically where the management of drinking water risks is involved?

1.1.1 Government of Canada

The areas identified where the federal government has a role in drinking water risks included: Indian lands, fisheries, Great Lakes, trans-boundary issues and standard setting through the federal-provincial national water quality guidelines.

- CELA outlined that roles and responsibilities of stakeholders need to be clarified.
- Alberta was cited as the only province to adopt and enforce Canadian Drinking Water Guidelines. Ontario recently put its drinking water guidelines into regulations.***check reference with press release (OSPE)
- It was argued that the problems can be solved within the province with federal assistance including support for research and science on emerging pathogens, endocrine-disrupting substances, and other long-term risks not well understood in the scientific community. (Dobell, Foerster).
- The Federal government should assume a coordination role for a Canada-wide effort in research and development (Prévost)
- There was a concern raised about the capacity of the federal government to engage in risk assessment (PP).

1.1.2 Government of Ontario

The areas identified where the province of Ontario has constitutional responsibility related to drinking water included a legislative role, standard-setting role and varied delivery role in providing safe water to Ontarians. (Foerster)

- CELA views drinking water safety as a provincial responsibility and articulated the need for a safe drinking water act in Ontario.
- OMA articulated that with multiple jurisdictions, accountability has to be clear. An important current problem is the lack of understanding of who has

- responsibility for what and therefore it is difficult to hold each other accountable, rather than just identifying where one's own responsibility stops.
- The issue of "buck-passing" was raised and the CEDF document "Local Stories" was referenced to illustrate intergovernmental and accountability issues (Leiss).
- A question about the provincial role in monitoring and research was raised (the sub-agreement under the Canada-wide Accord was mentioned).

1.1.3 Municipal Governments

The role of municipal governments was articulated as the implementation of standards (established by the provincial government), treatment and distribution of drinking water.(Foerster)

- There was some discussion about the roles assumed and delegated by the province and the roles and responsibilities at the Municipal level for delivery and treatment. There was no clear discussion of various roles although there was some consensus that municipalities had an implementation role.
- Concerns were raised that the management of source water was not comprehensive enough. The AMO proposed that the system should be considered from source to tap, from source protection through to operations, monitoring, inspections and financing.

1.1.4 Public & Third Parties

- Concern was expressed regarding the lack of public access to the system of risk assessment and management.
- The public's contrasting, but complementary, perceptions of risk (see Krewski paper) were recognized as valuable.
- There was some consensus that a role for the public is required at all stages. (SLDF, CEDF, CELA, Hrudey, Dobell). However, there was no discussion on how the public could or should be included.
- Krewski encouraged the participants to consider possible roles for experts from national and international standard setting organizations.

1.2 Who or what ensures that the roles of all actors fit together into a seamless structure for drinking water safety?

- The goal of a "perfect" system [zero risk, seamless] for drinking water safety was recognized as an unachievable public expectation (SLDF). However, achieving a seamless structure was acknowledged as difficult (OMA, CELA). To avoid the possibility of "falling through the cracks of the seams", overlaps were considered necessary to provide redundancies (discussed further below).
- There was debate, and no consensus, about whether it is reasonable to set a standard for a perfect system, or whether the standard should be set at a level which is likely attainable.

- It was argued that complexity is inherent but oversight [by an agency] is not necessarily redundancy and that the system should recognize the likelihood of mistakes (Dobell). CEDF argued that although the public expects a seamless system, it [the approach] should not start with a defeatist premise and needs to consider how communities can manage.
- Opinions differed on whether crises were a result of individual capacity or system design failure. Some argued that while individuals make judgements and mistakes within the system, it is the system that is ultimately accountable (Hrudey, Dobell).
- In contrast, the proponents of systemic accountability argued that the impossibility of a “perfect” system did not negate the requirement to develop a coherent default system based on best practices and inclusive of a range of stakeholders.
- Inherent complexity required that the system have built in controls, for example, statutes and other mechanisms for critical checks and balances (CELA, OMA, AMO). Some overlap would be deemed acceptable and an example of the multiple default systems operating in airplanes was cited in support. The example was used to illustrate that just because a redundant system is never used does not mean it is undesirable.
- AMO outlined that we are currently managing many different parts of a complex system from beginning to end; source protection to operations to inspections and enforcement to financing and operations.
- Krewski argued for the removal of systemic redundancies to prevent duplication of efforts and unnecessary tax burdens. Krewski articulated a need for checks and balances rather than built in redundancies. He also proposed that external audits of the system by third parties would be beneficial.
- ALPHA argued that overlap and duplication are important in creating redundancy for safety but should still try and eliminate duplication in cases where no value is added.
- The OMA maintained that removal of redundancies was not the best approach as they provide minimum safety margins. SLDF agreed that the “streamlining” approach advocated and pursued by the provincial government is not helpful.
- Recognizing that a system operates with uncertainty and flux due to information constraints (Dobell), it is important that contextual elements such as public perceptions of risk, political constraints, and economic viability are included in defining the water management structure. (SLDF, CEDF).

- OMA proposed continuous quality improvement methodology as a way to provide checks and balances and to determine where redundancies were required for safety. The system design should be from beginning to end - not just focusing on water treatment as standard setting varies at different points in the system. Total Quality Management (TQM) and the "cradle to grave" perspectives were also mentioned.
- The system should be designed to reduce complacency through checks and balances as well as access to information (OFEC). The system should be sufficiently inflexible so that once established, it cannot be tinkered with; this is a solution to complacency (OMA)
- Ministry of Environment argued that it is not easy to design systems that are both flexible and inflexible
- The AMO outlined that impacts are uneven across communities. Private well systems were given as an example. It was highlighted that standard setting will vary depending on public versus scientific risk assessment.

1.3 How does formal law and regulation co-exist with a risk management approach?

1.3.1 Statutes

- CELA agreed that a perfect model was difficult to achieve but that attempts should be made to manage the system through clearly articulated roles and regulations.
- Comments were made regarding unilateral changes made by government such as the downsizing of MOE.
- OMA articulated that the advantage of legislation would be full discussion and public debate, preventing unilateral changes to the system.

1.3.2 Capacity Issues

- The argument that the government is "giving away" its capacity and infrastructure while neglecting the current and impending research requirements was generally accepted (Pollution Probe, OMA, Krewski).
- The OMA and MacDonald argued that the reductions [cuts] were deliberate policy decisions. These decisions were considered to be shortsighted and likened to canceling an insurance policy because no crisis had occurred. OMA outlined that complacency has been an issue in public health. People forget why precautions are taken when the precaution has been successful in eliminating a risk to public health. They become complacent, and over time, authorities may decide the precaution is no longer necessary.

1.4 What are the requirements for accountability for the various actors, and, in particular, how does (or should) a risk management approach distribute accountability among the actors?

There was very little discussion in this area. Dobell mentioned that accountability expectations are higher for publicly managed systems.

2. RISK MANAGEMENT ISSUES II: The Precautionary Approach

2.1 What are, for the interested parties assembled for this meaning, some important aspects of the definition of a Precautionary Approach?

There was little discussion on the precautionary approach, and although Krewski requested a definition, no party defined it.

- Pollution Probe said it was working on a report in this area (copy to be provided to the Inquiry).
- SLDF suggested the precautionary approach is concerned with prevention and the development of standards.
- OMA requested clarification on whether the precautionary approach was the same as a preventative or proactive approach.
- Dr. Krewski suggested the precautionary approach was not the same as a preventative approach.

2.2 More specifically, what meanings can be attached to a precautionary approach in the context of DWS itself, and also as an aspect of a risk management framework for DWS?

There was not a full discussion on this question. For reference information on the precautionary principle from the issue papers, refer to:

Dobell, Rod. *Annex A: The Precautionary Principle and the Weight of Evidence in Social Risk, Political Rationality and Official Responsibility: Risk Management in Context*, Issue Paper for Part II of the Walkerton Inquiry, March 2000.

2.3 What institutions, policy frameworks, or legal and regulatory structures are needed in order to implement a precautionary approach to drinking water safety? In the context of DWS, is a “precautionary” approach the same thing as a “sustainable” approach? If not, what are the significant differences between them?

There was no discussion in this area, however there was some consideration of a proactive or preventative approach.

- Krewski, the OMA, PP, and the OFEC all agreed on the need for a proactive and preventative approach to risk management and water management more generally
- Prévost suggested that source protection and watershed protection were needed to avoid future problems such as emerging pathogens.

3. **RISK MANAGEMENT ISSUES III: Risk Assessment & Perception of Risk**

3.1 **Are there different approaches to risk assessment and, if so, what consequences (if any) flow from them for the way in which such risks should be managed?**

- Advocates of standard risk assessment methodology argued that it is a necessary system regardless of a degree of inherent uncertainty (Prévost, Krewski).
- Critical analysis of the current procedure for risk assessment suggests there are specific flaws in the system. Risk assessment is only a method of assigning a number to a perception of risk. In risk approaches we should avoid the numbers trap and instead stress robustness and resilience of the system. For example, rates of cancer risk in a population may be generated as an upper boundary of plausible risk. Merely achieving numbers is not an indicator of success or failure and should not be the final objective of a management regime (Hrudey).
- Determination of risk is not simply sampling and testing. Risk and control of risk must be strongly oriented to the source of water (OSPE).
- Instead, assessment requires the development and implementation of system standards. SLDF argued that risk assessment was not science, but values, and therefore must be inclusive of public perception. CELA argued that the assessment process should make distinctions between goals and costs.

3.2 **Do public perceptions of drinking water risks also have consequences for the management of those risks?**

- There is an implicit social contract between the government and citizens that the water in Ontario is safe [no deaths from disease from contaminated water] (MacDonald).
- *As there was no consensus on a definition of “safe water”, subsequent to the meeting OSPE offered the reference to the MOE Ontario Drinking Water Objective document (1994) for a definition of safe drinking water. “The primary purpose of Drinking Water Objectives is to protect public health. Water intended for human consumption should not contain disease-causing organisms or hazardous concentrations of toxic chemicals or radioactive parameters”.*

- The perception of risk is significantly different between science and public assessments.
- Public perception is that the risk associated with water consumption is very low (Krewski, OMA). Some of the factors influencing risk perception are familiarity, personal contact and the media.
- AMO noted that we might not be able to agree on a definition of safe water and might need a relative definition such that everyone should have equally safe water in Ontario.
- The Krewski paper was cited related to process for defining risk and setting drinking water quality objectives in Canada.
- MOE 1994 document "Ontario Drinking Water Objectives" the definition of safe drinking water is defined in terms of human health. "The primary purpose of Drinking Water Objectives is to protect human health. Water intended for human consumption should not contain disease-causing organisms or hazardous concentrations of toxic chemicals or radioactive parameters" (provided by OSPE).

4. RISK COMMUNICATION ISSUES I: Transparency, Access and Reporting

4.1 What are the requirements for transparency and access to information in a risk management framework for DWS?

What types of information should be provided by whom, to whom, in what formats, and when?

How much information is enough, and how detailed should it be? How is the reliability of information to be assessed (for example, through third party auditing provisions)?

There was a general discussion focusing on the importance of communication for building trust, changing behavior, and successful system operation.

4.1.1 Transparency and Access

- There was general agreement concerning the importance of increased communication, information availability, and transparency at all times (CELA, OMA, CFF, SLDF).
- The SLDF maintained that there was a need for informed consent from the public which could be established only by providing information and conveying the level of risk. By doing so, the public will be capable of making decisions. Hudey agreed that risk management requires public involvement in order to establish what types of information are required.
- PP noted that public dialogue is needed to increase public confidence.

- The OMA stressed that information must be true and helpful.

4.1.2 Participants

- There was general consensus that communication should be both among professionals, to reduce the likelihood of a system failure, and between professionals and the public, to change public behavior (MacDonald, Hrudey, Dobell)
- MacDonald and Hrudey also noted the need to clarify roles and responsibilities in this regard.

4.1.3. Trust

- The CFF and the OMA suggested that significant improvements in the amount of communication are needed to increase consumer confidence and trust in the long term. Both argued this should be a goal of risk communication.
- However, CWC/CELA noted that the public's trust in the system results in the public making assumptions that water is safe and this is a dangerous assumption that contributed to the Walkerton tragedy.

4.1.4 The Internet

- The use of technology for communication of timely, automatic test results was discussed. The regular flow of information similar to the quarterly reporting in the City of Toronto was cited as an example.
- Several participants felt the Internet would be a useful tool for communicating to the public (Leiss, Prévost, Pollution Probe, CFA) and would provide access for "healthy skeptics" who may want to monitor water safety reports on an ongoing basis.(Dobell)
- It was outlined that this type of information is now only available for treatment plants but not reservoirs and other upstream components of the system (OSPE).

5. RISK COMMUNICATION ISSUES II: Emergencies & Public Warnings

5.1 What do we know about best practices in this area? Are the necessary information and resources available in Canadian communities to sustain best practices?

What are the “background” information delivery requirements needed to ensure that directives issued to the public in emergencies are understood and carried out promptly?

There was general discussion about best practices for emergency management and public advisory warnings. Discussion focused on the type, timing, content and delivery of communication with the public.

5.1.1 Type

- Current advisories issued were characterized as precautionary. There was some discussion about the distinction between precautionary and full public advisories but no consensus was reached on the distinction.

5.1.2 Timing

- The current practice of waiting until final results are available before warnings are communicated was challenged. A best practice example (U.S. Safe Drinking Water Act amendments) where a three-tier system for notification was implemented and literature citations were provided (CELA, Krewski, CEDF).
- CWC/CELA argued early warning are required and timing constitutes a significant issue for the citizens of Walkerton, who would rather have known early, so precautions could have been taken. OFEC and OMA outlined that early and frequent warnings increase complacency, therefore it is better to put increased effort into reducing the need for warnings. A need for enhanced population health surveillance was outlined as even a slight increase in detection time can have big prevention gains.
- Hrudehy also mentioned that there are substantial costs associated with communicating an early warning in error. The Sydney crisis where costs from a monitoring mistake reached \$50 million was cited as an example.

5.1.3 Content

- Several participants emphasized the importance of message content; Saskatchewan was cited as a best practice example (CEDF, see Krewski paper Appendix B, p.208)
- Another example from the Peterborough Town Hall meeting was mentioned where the medical officer had written a very clear communication to residents about the water quality problem, reducing concern in the community (Foerster)
- Warnings must change consumer behavior, and cited the Edmonton case where authorities had failed to achieve this (Hrudehy). Details on this case were not provided.

5.1.4 Delivery

- Modes of message delivery were recognized as critical in message effectiveness (CEDF).
- Public health organizations may lack capacity in this regard, due to insufficient resources (ALPHA).
- Krewski argued that the maxim in communication was "early and often" and supported providing information as early as possible. CELA argued

that to maintain a healthy skepticism, people need information early and often and that generally there is a need for greater access to information.

- The focus on warnings was insufficient; a need to increase information availability to the public in a more general sense (SLDF).
- The CFF argued a communication strategy must include long term planning to build trust and confidence in the system.
- How regulators and operators could cooperate in a communication system for emergencies and non-emergencies was also tabled as an issue.

The OFEC suggested the possibility of vaccination to prevent emergencies. The OMA and Hrudely strongly disagreed.

There was debate on whether regular drinking water safety reports, similar to UV index and air quality reports currently available on a daily basis, would cause desensitization from information overload.

- The OFEC and OMA were concerned that continuous advisories (i.e. to boil water) will overload the population and lower consumer confidence. Providing public notice should not be the end result or purpose of a water management/communication system.
- ALPHA agreed that daily information updates would not help the public.
- Krewski highlighted that air quality advisories ten years ago were obscure but have now standard and meaningful messages have been established for the public.
- Hrudely agreed but argues that messages must be designed to influence behaviour.
- Establishment of best practices in communications between utilities was also discussed as critical for effective message delivery.

6. CONCLUDING OVERVIEW: The Goals of Risk Management for DWS

Ideally, good risk management for DWS could be viewed as a “partnership” between (a) governments and suppliers, acting in the interests of public safety, health and environmental protection, and (b) citizens, whose own awareness of risk factors and access to pertinent information, allows them to make informed choices about the adequacy of a risk management regime (“informed consent”).

6.1 What are the necessary conditions for this partnership to work effectively? For example, is the government/supplier role to minimize the risk from drinking water to such an extent that the well-informed person on the street would have confidence in the safety of drinking water?

6.1.1 *Water as a human right*

- All individuals in Ontario should have the right of access to clean water (OMA, CEDF) and the “reasonable” person should feel secure in consumption (SLDF, Hrudehy) from a "publicly accessible tap".
- There was discussion of the definition of "a reasonable person" and "publicly accessible tap" but there was no agreement on definitions.
- There was no clear agreement on this assertion.

6.1.2 *Standard setting within the province*

- There was discussion over the range of standards within the province. CEDF, CELA and Krewski argued that the goals are the same (safe water) and therefore the same standard should be applied across the province. OFEC and AMO disagreed due to practical implementation and cost issues; different systems should have different standards.
- OSPE disagreed and stated funding is not an issue – people will pay more.
- There was acknowledgement that public and private water systems are different but should be subject to the same standards (CELA, AMO, Foerster). OFEC initially articulated a differentiation between private and public wells, but noted that a distinction was false on the grounds that private wells could quite feasibly pollute aquifers, and visa versa. Leiss agreed that the distinction is false.
- CELA argued that private wells may require different approaches than public water sources, rather than lower standards. CELA and AMO proposed that private wells should have different testing requirements from municipal systems and differences in required action in cases of adverse results, among others.
- Dobell questioned the implications of situations where the community "opts out" of the specific management practices and cited the chlorination example to raise questions related to this approach.
- Krewski outlined that the resources required regarding knowing our risks are not adequately funded; and that funding for future emerging risks is even less well resourced.

6.2 *Is the public's role to ensure that it has the resources to hold those other parties accountable for the safety of drinking water?*

- There was general consensus that there should be public involvement.
- AMO argued that the public must have access to resources to facilitate recourse and take initiative.