

**REPORT ON HYDROGEOLOGICAL EVIDENCE  
PRESENTED BY THE CONCERNED WALKERTON CITIZENS  
AT THE WALKERTON INQUIRY**

Prepared by  
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**INTRODUCTION**

The Concerned Walkerton Citizens (“CWC”) was a full-time party in Parts I and II of the Walkerton Inquiry. The CWC was legally represented throughout the Inquiry by counsel provided by the Canadian Environmental Law Association (“CELA”).

The Walkerton Inquiry was established under Ontario’s *Public Inquiries Act* after seven people died – and thousands became ill – due to E. coli contamination of the water supply system in Walkerton (now part of the Town of Brockton) in May 2000.

**BACKGROUND**

Among other things, the mandate of the Walkerton Inquiry was to investigate the circumstances of the E. coli contamination and its cause(s). This broad mandate necessarily required Commissioner Dennis R. O’Connor to obtain and consider detailed hydrogeological evidence regarding the three wells that supplied water to Walkerton in May 2000.

Accordingly, Commission lawyers presented extensive documentary evidence and oral testimony from hydrogeologists, consultants, and members of an expert panel (known as the “physical cause” panel) in Part I of the Inquiry. With the assistance of experts retained by the CWC (eg. Dr. Stephen Worthington and Mr. Wilf Ruland), CELA lawyers undertook detailed cross-examinations of these witnesses, and filed additional exhibits on various hydrogeological issues.

Upon completion of the Commission’s evidence regarding hydrogeology, the CWC and its experts concluded that several key hydrogeological issues had not been adequately addressed to date. For example, there was conflicting (if not incomplete) evidence on the specific pathway (eg. overland flow or contaminated aquifer) that allowed E. coli to enter Walkerton’s water supply wells in May 2000. In the CWC’s view, this fundamentally important issue required further investigation to determine whether the May 2000 contamination was an unfortunate but isolated “one-time” event, or whether it was reflective of systemic vulnerability to bacteriological contamination.

In light of these and other outstanding issues, the CWC prepared and filed a legal motion to have Dr. Worthington called as a witness to offer expert opinion evidence on the key hydrogeological questions, as described below. However, before this motion could be argued, the Commissioner agreed that Dr. Worthington should testify in the Inquiry.

Thereafter, Dr. Worthington and two colleagues undertook field work, reviewed numerous documents, and prepared a detailed hydrogeological report, which was filed as Exhibit 416 at the Walkerton Inquiry.<sup>1</sup> On July 19, 2001, Dr. Worthington testified as an expert witness before the Commissioner, and he presented the main findings and recommendations of the report.<sup>2</sup>

### **OVERVIEW OF DR. WORTHINGTON'S REPORT**

The available hydrogeological evidence demonstrates that Walkerton's three supply wells (Wells 5, 6 and 7) are located in "karst aquifers". In general terms, karst aquifers contain complex, interconnected networks of solutionally enlarged conduits (eg. bedrock fractures or openings) that permit high-velocity groundwater flow over large distances in relatively short periods of time. Because of these flow characteristics, the U.S. EPA has recognized that karst aquifers are highly susceptible to bacterial contamination.

Despite the karstic nature of Walkerton's wellfields, Dr. Worthington was the only expert in karst hydrogeology to appear as a witness in the Walkerton Inquiry.

### **The Report's Findings regarding Walkerton Wells**

With respect to Well 5 (and nearby springs), the Worthington report identifies a 150 hectare groundwater catchment area. In this area, there are a number of natural and artificial breaches of the thin overburden (eg. excavations, post holes, gravel deposits, etc.) that allow for relatively rapid infiltration of surface water (and any contaminants therein) downward into the shallow aquifer. Once bacteriologically contaminated surface water reached the aquifer, the contaminants were transported to Well 5 and the springs in a matter of days or less. Accordingly, Dr. Worthington concluded that Well 5 was likely the point of entry for the May 2000 contamination. He further concluded that the specific pathway for the contaminants was the contaminated aquifer rather than overland flow, and that the source of the contamination was cattle manure that had been stored and applied in close proximity to Well 5.

With respect to Wells 6 and 7, the Worthington report identifies a 500 hectare groundwater catchment area. In his testimony, Dr. Worthington concluded that for various reasons, it was unlikely that Wells 6 and 7 caused or contributed to the May 2000 contamination. However, Dr. Worthington found pre- and post-May 2000 evidence indicating the potential (and ongoing) vulnerability of Wells 6 and 7 to bacteriological contamination from agricultural sources within their catchment area.

### **The Report's Recommendations**

The report offers a number of recommendations aimed at ensuring the current and future safety of drinking water in Walkerton and other municipalities that draw water from karst aquifers. In particular, Dr. Worthington and his colleagues recommended that Ontario should identify, map,

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<sup>1</sup> This report, entitled *Karst Hydrogeological Investigations at Walkerton* (by Worthington et al.) is available online at [www.cela.ca](http://www.cela.ca).

<sup>2</sup> The transcript of Dr. Worthington's testimony is available online by following the links at [www.walkertoninquiry.com](http://www.walkertoninquiry.com).



and assess aquifers on the basis of their vulnerability to contamination. Similarly, the report recommends that Ontario should develop guidelines for assessing and monitoring supply wells located in karst or other fractured bedrock settings.

With respect to wellhead protection programs, it should be noted that Dr. Worthington participated on behalf of the CWC in an "expert meeting" on source protection in Part II of the Walkerton Inquiry.

It should be further noted that as Walkerton continues its search for a new water supply well, Dr. Worthington has continued to work closely with the CWC. For example, Dr. Worthington has been extensively involved in the design of "tracer testing" that will be undertaken shortly by the Town's consultants to better understand karstic flow patterns in the Walkerton area. This work has assumed greater urgency since Wells 5 and 6 are no longer in use, and the Town is now drawing all of its drinking water solely from Well 7.

### **CONCLUSIONS**

With the technical assistance of Dr. Worthington and his colleagues, the CWC was able to present hydrogeological data, opinions, and perspectives that otherwise would not have been made available to the Walkerton Inquiry. In particular, Dr. Worthington's report not only supplemented (and confirmed) some previous testimony heard by the Commissioner, but it also presented new information and opinion evidence on matters within Dr. Worthington's special expertise in karst aquifers.

In the CWC's view, the Worthington report has significantly improved the current level of understanding about the hydrogeological setting of Walkerton's wells, and the report will assist the Commissioner in fulfilling the mandate of the Walkerton Inquiry. Moreover, the Worthington report raised important concerns about the ongoing vulnerability of Walkerton's wells, and the report continues to provide invaluable assistance to the CWC and others as the Town continues to identify and assess its options for delivering safe drinking water to Walkerton residents now and in the future.

October 15, 2001



CANADIAN ENVIRONMENTAL LAW ASSOCIATION  
L'ASSOCIATION CANADIENNE DU DROIT DE L'ENVIRONNEMENT

July 12, 2000

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Re: Information Relating the Intervenor Project Funding Act

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Further to my conversation with you on Monday, I have enclosed some material from our library on the *Intervenor Funding Project Act*. As mentioned, the principles and criteria contained within the Act and the guidance documents that were developed to implement the Act may provide some insight for establishing an intervenor funding regime for the upcoming public inquiry.

While we have been retained by Concerned Walkerton Citizens with respect to the public inquiry, I am forwarding this material to you solely for your interest.

If you recall, the Act was enacted in 1988. It was renewed in 1992 and then it expired in 1996. Its primary function was to establish a mechanism for intervenor funding before the Environmental Assessment Board, Ontario Energy Board and the Consolidated Hearings Board.

The documents I have forwarded to you are as follows:

*Save the Valley Committee Case*: This case crystallized the need for intervenor funding since "costs in advance" was found not to be a way to assist intervenors.

*Press Release dated 1992 Extending the Act*: This release gives some context to the statute.

*Article Entitled: "Intervenor Funding: How to Get Funding to Protect Your Interest in Public Hearings"* This is a "how to" guide to the Act. The appendices includes both the Act and Environmental Assessment Board guidelines with respect to the Act.

*Public Interest Advocacy Centre, OIFPA, 1988: Its Review and Reform*: This study is another analysis of the Act.



*Bogart and Valiante, Access and Impact:* This study was conducted by two professors at the University of Windsor. This evaluation was undertaken at the request of the Ontario government.

*CELA Submission No. 266:* This submission responds to a questionnaire on the operation of the Act.

*Joint Board Decision - Interim Waste Authority:* I have included this decision because it relates to participant funding. Phase I funding was made available by an Order in Council (and therefore may provide some insight on a different model). The *Intervenor Funding Project Act* was triggered once the Environmental Assessment Act process was initiated.

As mentioned, two people who have excellent experience with the Act are Grace Patterson [981-9374 ](former chair of the Environmental Assessment Board ) and Alan Levy [929-8181] (who was a member of the Board). While both Grace and Alan are members of our board, I still trust they can give you a fair and practical perspective on both intervenor and participant funding regimes.

I am pleased to simply give you this material. *However, I do not have copies of the two surloxbound documents (PIAC and Bogart studies). I would ask if you could send back those two studies at your convenience.*

Please do not hesitate to contact me should you have any questions or need any further information.

Yours very truly,

**CANADIAN ENVIRONMENTAL LAW ASSOCIATION**



Paul Muldoon  
Executive Director