Conservation Ontario Submissions to the Walkerton Inquiry
on the
Long Term Viability of the
Provincial Groundwater Monitoring Network

Background

Following the recommendations of an inter-ministerial task force report published in 1999, an allocation of $6 million over 3 years (2000-2003) was approved by Cabinet in April 2000, for the implementation of a Provincial Groundwater Monitoring Network to be developed and operated in partnership with the Conservation Authorities of Ontario within the 3 year time frame.

Based on discussions and solicitations done prior to the formation of the inter-ministerial drought task force in 1999, the MOE determined that Conservation Authorities were not only the most interested stakeholders, but also the most appropriate based on their structure, location and operations. As local water delivery agents and managers, Conservation Authorities recognize that groundwater is an important component of the hydrologic cycle, for which, in general, there has been an information gap across Ontario. Conservation Authorities also recognize that the data from this initiative are necessary for them to meet their own business needs, such as the management of surface water resources (including flood management), wetlands and aquatic life.

The MOE is responsible for administration of the funds, marketing of the network, development of partnerships, overall project management and provision of technical guidance and criteria for the project. Eligible funding items include project management costs, the cost of equipment (one-time), basic well preparation, installation and testing, mapping costs (large scale), baseline water quality analytical costs (one sample per well), and information system development and training. C.A.'s are responsible for the provision of local input to the design of the network, with the task of locating suitable wells within the selected areas/target formations and with the operation of the network. Operations include Quality Assurance/Quality Control (QA/QC) and approval of the incoming data, costs of cellular air time for telemetry equipped wells and, as negotiated between each C.A. and MOE, water quality sampling and analytical costs. The operation commitment, as outlined in the agreements between C.A. Boards and MOE, is for a minimum of six years; both parties acknowledge that the network must be a long-term commitment for the data to be useful for decision-making.

The stated objective of the network is to provide support data for:

- Low water/Drought response;
- Scientific analyses (including the Ministry of the Environment's Permit To Take Water program (PTTW), Groundwater /Surface Water interactions, water balance modelling) and improved land use planning;
- The development of water policy for water use, wellhead protection, reasonable use, and aquifer classification and;
- To provide complementary data to Land Information Ontario (LIO) – (land based data warehousing and distribution project) and the Water Resources Information Project (WRIP).

The deliverables of the program are as follows:

- The establishment of approximately 380 dedicated wells instrumented for the continuous monitoring of groundwater levels in 38 Conservation Authorities by March 2003;
- The preparation of supporting aquifer and hydrogeologic mapping for C.A. watersheds where there is inadequate information to determine monitoring areas and target formations;
- The design and establishment of a long-term groundwater quality monitoring program;
- The design and establishment of an information management system that collects and stores the monitoring data for controlled access and distribution.

The network will be important to groundwater model calibration and verification efforts. The groundwater monitoring network can be thought of as analogous to the surface water monitoring network; both are fundamental to reporting on the state of the resource.

To date, the MOE reports that approximately 60 wells have been instrumented with continuous water level monitoring instruments, a database and information management system has been designed and is undergoing testing/modification, mapping standards have been developed in support of the mapping component (and other mapping initiatives within the government), and the discussion of issues associated with the water quality component of the network has commenced. Currently 28 C.A.s have signed agreements, 32 have selected or are actively selecting monitoring areas and 27 are actively soliciting actual well locations.

Conservation Authorities completely support the intent of this initiative and believe its deliverables should not be taken lightly. A provincial network to monitor the province's groundwater resources has not existed for close to 20 years. The data and information (knowledge) that are the end products of this work will assist in the management of Ontario's water resources. This information along with complementary information from other initiatives will fill the gaps that have grown over the last two decades, gaps that have made it very difficult to make accurate management decisions around water. Additionally, this partnership with C.A. input at all stages and the flexibility of the MOE, has demonstrated that the province is willing to work closely with C.A.'s in the management of the provinces' resources and that C.A.'s provide valuable services. While C.A.'s are supportive of this initiative and its goals, there are some challenges that may threaten the long-term operation of the network that need to be addressed.

Project Concerns and Challenges – Short Term

Implementation Costs

CA.'s have indicated that there has generally been inadequate technical and operational support from the MOE, that C.A.'s are increasingly incurring unplanned and unforeseen costs in the location of suitable wells, and in numerous cases the modification of these wells to meet regulatory and operational requirements. It is thought that the MOE should revise its budget to fund the construction of some monitoring wells as the costs associated with locating and modifying wells in many areas has surpassed the cost of construction.

Communications

C.A.'s have indicated that the goals and objectives of the program are not always clear and thus make the program difficult to "sell" to municipal representatives and board members. Where the program is not aggressively marketed to ensure the support of municipal representatives for the collection of watershed based data, it may be difficult for C.A.'s to find funds to even initiate the program.

Additionally, C.A.'s have indicated the information provided by the MOE regarding long-term costs has been inadequate for proper planning submissions to municipal councils and C.A. boards.

Water Quality

The groundwater quality monitoring design needs clarification as C.A.'s express concern about follow-up activities (including reporting requirements), C.A. and well owner liability and the MOE's role and responsibility. It is understood that the implementation team is currently pursuing internal discussions regarding these issues, but as the program progresses, and for those C.A.'s that have assured their boards that water quality is a component of the program and secured funding for analyses, the resolution of this issue is becoming a matter of urgency. (See long term cost concerns later in the report.) Negotiations between MOE and the C.A.'s need to continue on this matter.

Lack of Coordination

The province has recently announced $10 million to support continued efforts on the Provincial Water Protection Fund program. This Phase 2 is focussed on wellhead protection analyses and activities, but the program continues to support resource assessment activities, including groundwater mapping. The Ministry of Northern Development and Mines has reported plans to implement a hydrogeological mapping project for Ontario in the near future. Both of these projects will be producing maps on a scale that will be far more useful to stakeholders than anything that currently exists. The Province through the Groundwater Monitoring Network initiative proposes to complete aquifer mapping for the purpose of selecting well monitoring locations where information does not exist. The money for this initiative would be better spent funding new well

construction rather than duplicating efforts of the Groundwater Protection Fund ($10 million) and potential projects through MNDM.

The Groundwater Monitoring Network PGMN initiative and the Provincial Groundwater Protection Studies should be more closely aligned. There should be a portion of the Provincial Groundwater Protection Study funding allocated to new monitoring well construction. Resource assessment mapping efforts proposed as part of the Provincial Groundwater Protection Studies should be encouraged. Information collected as part of the Provincial Groundwater Protection Fund should build a foundation for future MNDM efforts if they unfold.

The Ontario Federation of Agriculture has received approximately $7 million in Healthy Futures for Ontario Agriculture funding for a water wells project aimed at upgrading existing wells and decommissioning abandoned wells. Given the high use of privately owned wells for the PGMN, coordination is required to ensure that the provincially funded OFA initiative does not conflict with the needs of the PGMN.

Project Timelines

The project is scheduled for completion by March 31, 2003. Thirty-eight C.A's and 380 wells are to be instrumented and operational by that date, not withstanding winter "down time" for field activities. This leaves 320 wells to be instrumented during the end of this field season and the season of 2002 (March to November). As demonstrated during the first year of the program, the identification of suitable available wells have proved difficult and time consuming. It is unlikely that the project can be completed on schedule. The project timeline along with funding should be extended to accommodate these unforeseen difficulties.

Project Concerns and Challenges - Long-term

Costs

Long-term costs remain a concern for C.A.'s. There still appears to be uncertainty around the ownership of the equipment and who is responsible for equipment replacement and upgrade (software and hardware) in the long-term. Telemetry is an option promoted by the MOE in order for stakeholders to have quick access to the data. Though the MOE is funding the instrumentation (and have expanded the funding to cover the cellular air time during the implementation period), the C.A.'s are expected to cover the long-term cost of the airtime. Telemetry equipment does not make sense in all cases but even where it does, many C.A.'s will have difficulty carrying the costs. Additionally, while the MOE continues to fund the analytical components to other monitoring programs such as the Provincial Surface Water Quality Monitoring Network (PWQMN) or Bio-Monitoring, the PGMN initiative is seeking a commitment from C.A's to absorb those costs in the long-term. Many C.A's cannot afford to carry these costs

and are concerned about the implications to other monitoring programs of accepting such responsibilities under the PGMN. It is believed that the government must show its commitment by supporting these broader operational costs as well as hire and dedicate some internal staff towards continued network support and analysis of data to produce management tools.

Security of Well Tenure

Many of the wells selected to date lack security of tenure. A long- term objective of the network should be to have all wells located on public lands or under long-term easements where currently located on private lands. A related security issue involves wells that have been selected to get the project underway but which may not be structurally suitable for long-term operation or are in less than desirable locations.

A Network That Works

The PGMN network as it is currently evolving is a good start, but it will not meet the long-term needs of the province, the municipalities or the Conservation Authorities unless there is an ongoing commitment to achieve what is really required. C.A.'s believe what is needed is a foundation of water monitoring stations that are long-term (50-100 years) and at a scale appropriate for watershed management. The process of locating should include the consideration of multi-purpose needs (i.e. in this case water quantity and quality at a variety of depths and a variety of locations based on soils and underlying geology). This would suggest that each location should have nested wells in order to plot profiles of water quality by depth and to monitor quantity impacts at a variety of depths.

The network has to date been compromised in several ways. It is based in part on private wells (no long-term commitment), sample locations don't have nested wells for depth profiles and we are using existing wells that may or may not have been constructed to standards or that match MOE's own well records. There does not appear to be a long-term commitment to this network because the required resources are not being invested at the most critical design stage. As a result, there is a system being put in place, but there is no overall framework for what a truly effective PGMN would entail. Three hundred and eighty wells will not be enough, even if they were all in ideal locations. What needs to be done as soon as practical, is for the partners to agree on how many wells are needed, where they should be located and how best to take the present interim network and evolve it into one that works for the long-term. This issue is being examined informally as each watershed is being assessed for well locations but the assessment is limited by the knowledge/data available regarding the underlying groundwater system. It requires a long-term commitment of MOE groundwater expertise.

MOE Commitment

C.A.'s have historically partnered with the MNR and MOE in the operation of the surface water networks (quantity and quality), where C.A.'s were held accountable for the field component of operations and the province supported the ongoing cost of the infrastructure and the cost of water quality analyses. With budgetary constraints and subsequent priority shifts within these ministries, such arrangements have been challenged as equipment has failed or become obsolete, where stations have been cut in order to reduce costs and where data access has become inconsistent. C.A.'s do not want to see the same process repeat itself with the PGMN.

There is also great apprehension about the MOE's long-term commitment to the program. The data is of no value if it is not used to produce management tools for stakeholders. Discussions regarding the analyses of the data (and MOE planned resources for this work) subsequent to the completion of the implementation phase and termination of MOE funding remain vague.

Though the MOE has pledged long-term support for the PGMN, neither monetary nor analytical staff commitment has yet been made by the Ministry beyond 2003. While there's support for C.A.'s being the operational arm of the MOE for water, we have serious concerns about the long-term costs which may be prohibitive for many C.A.'s**.** Failure to address these concerns raises questions about the government's long-term commitment to the PGMN initiative and will threaten the long-term operation of this very important network.

Summary and Recommendations

In spite of these concerns, the achievements of this initiative are already considerable. This partnership with C.A. input at all stages and the flexibility of the MOE, has demonstrated that the province is willing to work closely with C.A.'s in the management of the provinces' resources and that C.A's provide valuable services. This is an important message for C.A.'s and the Province to understand and embrace. This initiative is a **partnership**, owned and operated by both agencies. C.A's are co-owners of the data and will likely manage all the assets of the project. Working cooperatively with each other and the MOE to meet the objectives continues to be promoted amongst C.A.'s and they remain committed to implementing the PGMN initiative as indicated by the concerns raised in this report.

The following recommendations cover both the implementation period and the long-term with the aim of moving the project forward and ensuring its long-term success.

1) Conservation Authorities should continue to participate as partners with MOE in the PGMN and the Conservation Ontario PGMN Liaison position should be maintained on a long-term basis.

2) Ensure that government-wide initiatives are vetted through the Cabinet Committee on the Environment in order to ensure coordination and to avoid unnecessary and costly duplication.

3) MOE should, in the short term:
   - Extend the project timeline for 2 additional field seasons (2005) along with funding rollouts.
   - Reassign the budget for mapping towards the construction of monitoring wells in areas where no suitable wells exist, including associated costs such as registering easements and collection, analysis and storage of borehole samples.
   - Establish a groundwater quality working group comprised of MOE, Ministry of Health, C.A's, and MNR to resolve the technical (methodology) and policy issues and to utilize other government programs (MOH's Bacteria Sampling program) to assist with the assessment of provincial groundwater quality.
   - Provide for increased program marketing directed at municipalities.
   - Provide funding for the plugging of sub-standard historical monitoring wells encountered during field surveys. This should be an integral part of the program as versus a separately funded program.
   - Identify priority areas for mapping required for establishing PGMN well locations for the purposes of directing priorities for PGPF and MNDM initiatives
   - Update the water well data base to include MOE landfill monitoring/study wells, Ministry of Transportation wells and private wells that are currently not being brought into the system. The Water Resource Information Project (WRIP) would be an excellent vehicle for this initiative.

4) MOE should, in the long-term:
   - Based on knowledge developed to date; finalize the design of the PGMN to address quality and quantity issues, including budgets and timelines for achieving it.
   - Show its commitment to the long-term operation of the network by agreeing to fund upgrades to the network (every 5 years for equipment and every 2 years for software along with the necessary training) and develop an ongoing cost share/equipment ownership agreement.

- Continue to cover the cost of cellular airtime for telemetry-equipped stations and water quality analysis.
- Hire a full time program hydrogeologist, 2 assistant hydrogeologists and a database analyst for the analyses of the data in the long-term to provide tools for resource management.
- Convert PGMN funding from a one time startup allocation to the permanent MOE base operating budget.

Other Groundwater Management Issues

Conservation Authorities wish to take this opportunity to briefly comment on the additional groundwater management issues that the Province should address as they affect the success of the network and the overall management of the resource.

The delineation and characterization of groundwater resources is the first step in managing the resource. Without an understanding of the extent and nature of an aquifer, one cannot develop an effective management plan. The Province in the 1960's, wisely developed and continues to maintain the Water Well Information System (WWIS), a database containing attributes such as spatial position, and, geological and hydrogeological conditions recorded when a water well is constructed in the province. This important database is the basis of all hydrogeological investigations in the province. The submission of this data is legislated under the Ontario Water Resources Act – Regulation 903. It has been noted, however, that enforcement of this regulation by the Province, particularly submission requirements, has been inadequate. As part of the PGMN exercise, field implementation staff has reported that upward of 40% of water wells are unreported. Even water wells constructed by other Ministries (MTO) and landfill wells constructed under a MOE Certificate of Approval, do not appear in the WWIS. These data are essential to assessment of the resource and would provide PGMN implementation staff with increased monitoring site options. Additionally, the WWIS database should be linked to the PGMN database for improved groundwater assessment.

Regarding the WWIS, many of the well records in the system are incomplete and still require geo-referencing. This is essential for use in computerized analyses. Under the regulation, water well contractors are not required to submit these attributes and the Province decided in the late 1980's that this follow-up activity is too costly to continue. Contractors are, by and large, the most appropriate personnel to provide those data, but often do not have the resources or the incentive to purchase the equipment to collect this data. In the opinion of C.A.'s, the Province should show its commitment to groundwater and to the industry that supports it by providing the necessary equipment to water well contractors in order to collect this data. The equipment (Global Positioning Stations – GPS) is inexpensive relative to the value of the data and with approximately 2500 licensed contractors in the province the investment can be easily justified, assuming that MOE enforces the requirement for the data to be submitted.