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GROUNDWATER MANAGEMENT STRATEGY DEVELOPMENT PROGRESS UPDATE - OCTOBER 2003

The Transportation and Works Committee recommends the adoption of the recommendation contained in the following report, September 16, 2003, from the Commissioner of Transportation and Works:

1. RECOMMENDATION

It is recommended that:

1. This report be received for information by Transportation and Works Committee and Regional Council.

2. PURPOSE

This report provides Committee and Regional Council with an update of the status of work to develop and implement a comprehensive groundwater management strategy for The Regional Municipality of York.

3. BACKGROUND

Work to develop a comprehensive groundwater management strategy was initiated in 2001 and has been the subject of regular reports to Committee and Regional Council. The most recent status update was provided in Clause 5 of Report No 6 of the Commissioner of Transportation and Works as presented to Committee on June 18, 2003. Reports will continue to be provided on a quarterly basis.

4. ANALYSIS AND OPTIONS

This section provides an overview of the progress made towards developing comprehensive groundwater management strategy since the last update in June 2003. The report follows the organizational structure as introduced in previous reports. *Attachment 1* provides an overview of the status of the current schedule of delivery for individual initiatives.

Many of the technical studies being completed in order to develop a groundwater management strategy are also key component studies in the development of watershed plans as required by the Oak Ridges Moraine Conservation Plan. Regional Staff and staff of the Lake Simcoe Region Conservation Authority and Toronto and Region Conservation Authority are working closely together to minimize duplication of effort in completion of these studies.

In addition to the work on the initiatives described below, the York Peel Durham Toronto Groundwater Management Strategy Study (YPDT Study) submitted a series of papers to

be presented at the 56th Canadian Geotechnical Conference and 4th Joint International Association of Hydrogeologists – Canadian National Chapter/Canadian Geotechnical Society (IAH-CNC/CGS) Groundwater Specialty Conference from September 29 to October 1 in Winnipeg, Manitoba. The papers outline the benefits and accomplishments in groundwater management achieved through the YPDT Study partnership and describe the methodologies for the technical projects that are underway through this program.

4.1 Central Hydrogeological Data Management System

A Central Hydrogeological Data Management System, hereafter to be referred to as the York Region Groundwater Information Management System (YRGIMS) is now in place on the York Region servers and being used on a routine basis by staff of the Water and Wastewater Branch. The primary datasets being managed by York Region include records of volumes pumped from municipal water supply wells, water elevations in wells monitored by York Region, and water quality in York Region municipal water supply wells (both raw and treated water quality).

Work to improve the operation of this data management system and to integrate it more widely into York Region's business continue. The current schedule will provide for training and exposure of the capabilities of this system to York Region staff through the fall of 2003.

4.2 Conceptual Geological Model for York Region

A digital model of the three-dimensional distribution of geological units beneath York Region has been developed by Gartner Lee Limited and Earthfx Inc. This conceptual geological model is consistent across York, Peel, and Durham Regions; the Oak Ridges Moraine Area; and the City of Toronto. Some additional refinements to this interpretation continue in order to improve the accuracy of the numerical groundwater flow model.

Gartner Lee Limited provided a draft report entitled "Geology and Hydrogeology of York Region" in September 2003. This report describes the distribution of geological units and the process used to develop this understanding. The draft report is currently being reviewed and is intended to be finalized before the end of 2003.

4.3 Numerical Groundwater Flow Model for York Region

A three-dimensional numerical groundwater flow model has been developed for York Region. The model has been calibrated to reproduce best estimates of original groundwater levels (pre-development and use of the resource), current groundwater levels based on available monitoring data, and stream flows. This model is a state-of-the-art product and is intended to be applied to provide insight into conditions for a wide array of problems that typically confront the region. Some examples include, assessing effects of water taking, optimizing water taking from multiple sources, identifying wellhead protection areas, identifying interference from other water taking, and assessing the effects of future development on groundwater and surface water systems.

The draft report described above contains a description of the basic model, documents the process through which it was constructed and validated, and provides an overview of some of the key findings with respect to groundwater flow patterns, general effects of water taking, and a regional water balance.

4.4 Potential Contaminant Source Inventory

A draft report documenting the work completed by Marshall Macklin Monaghan Limited and Golder Associates Limited (MMM/Golder) to develop an inventory of potential contaminant sources was submitted in June 2003. York Region staff have provided comments to MMM/Golder and work is underway to finalize this report by mid-November 2003. To date, comments have not been received from the Ontario Ministry of the Environment.

York Region staff are currently working with MMM/Golder to introduce the mapping products developed in this study into the York Region Geographic Information System (GIS).

4.5 Water Use Inventory

A draft report documenting the work completed by MMM/Golder to develop an inventory of potential contaminant sources was submitted in June 2003. York Region staff have provided comments to MMM/Golder and work is underway to finalize this report by mid-November 2003. To date, comments have not been received from the Ontario Ministry of the Environment.

York Region staff are currently working with MMM/Golder to introduce the mapping products developed in this study into the York Region Geographic Information System (GIS).

4.6 Wellhead/Source Protection Policy/Area Development

Preliminary outlines of wellhead protection areas for York Region wells were developed in April 2003. The portions of these wellhead protection areas within the Oak Ridges Moraine area have been outlined for inclusion in amendments to the Official Plans of the local municipalities as per the Oak Ridges Moraine Conservation Plan.

Updated and finalized wellhead protection areas based on the calibrated numerical groundwater flow model are to be provided to York Region in mid-October 2003. Once these areas have been defined, York Region will initiate a process to introduce wellhead protection areas into the Official Plan.

4.7 Aquifer Management Guidance – Yonge Street Aquifer

The calibrated numerical groundwater flow model is being applied to conduct analysis to develop guidance for long-term management of the Yonge Street Aquifer Water Supply System that services Newmarket, Aurora, Holland Landing, Sharon, and Queensville. This analysis is intended to confirm the maximum sustainable rate of water taking that the aquifer can support, identify any impacts that might arise from pumping, optimize the

operating parameters for the regional municipal wells, and identify any uncertainties in the analysis that could be reduced if additional information was available.

Gartner Lee Limited has indicated that a draft report on this work will be provided to York Region in mid-October 2003. This work will form the cornerstone for an application to renew the Permit To Take Water for the Yonge Street Aquifer system as required to be submitted by September 30, 2004, six months in advance of the permit expiry.

4.8 Water Resource Exploration – Whitchurch-Stouffville

Jagger Hims Limited has been overseeing work to locate and develop new water supplies to meet the future needs of the Community of Stouffville since July 2002. Test drilling began this summer and to date four target sites have been tested. One of these sites has shown favourable results and additional testing is continuing. The testing program is expected to be complete by December 2003.

MacViro Inc. was contracted to undertake a Class Environmental Assessment in support of the new water supply development. Public Information Centres are scheduled through the fall and the findings of this work will be co-ordinated with the water resource exploration component.

4.9 Technical Groundwater Studies – King City/Schomberg

Conestoga Rovers and Associates Limited and MMM/Golder were contracted in May 2003 to assist in completing detailed hydrogeological investigations in support of applications to renew the Permits to Take Water for King City and Schomberg. Field work for these programs has been delayed until fall to ensure that this work would not interfere with York Region's ability to meet peak demands for these water supplies through the summer months. These work programs are designed to meet requirements to renew the Permits by September 2004.

4.10 Long Term Planning – Groundwater Management Strategy

The long term planning component of the groundwater management strategy requires completion of the basic studies that define the geology and hydrogeology of the groundwater flow systems. As these initial studies are being finalized, the long-term plan for groundwater management initiatives is continually being refined.

In preparation of the 2004 capital budget and 10 year capital plan regional staff have considered that groundwater management work will include the following components:

- Development, implementation and maintenance of the Aquifer/Source Protection Plan for York Region.
- Implementation of Aquifer Management and Monitoring Programs for each municipal wellfield.
- Development of new water supply wells as required by the Water Supply Master Plan.

- Continued support in partnership activities for groundwater and watershed management via the conservation authorities.

The Aquifer Management and Monitoring Programs for each water supply include:

- Assessments of the historical and projected water quality.
- Detailed assessments of the hydrogeology to address gaps in current understanding.
- Installation of “sentry wells” for monitoring water quality to ensure that potential threats are identified before they reach the production wells.
- Application of numerical models.
- Maintenance and upkeep of the numerical models.

5. FINANCIAL IMPLICATIONS

All elements of the Groundwater Management Strategy are progressing within budget.

The work program outlined in Section 4.10 has been used to develop the 2004 Capital Budget and the 10 year capital plan associated with groundwater management. The content of this plan will be reviewed and refined annually to ensure that the investment in groundwater management produces a quantified value to York Region.

6. LOCAL MUNICIPAL IMPACT

The initiatives in progress, as outlined in this report, are essential to ensuring that an adequate supply of high quality drinking water remains available to service the local municipalities. The implementation of wellhead or source protection policy, as required by the Oak Ridges Moraine Conservation Plan, or under pending Source Protection legislation, will directly affect Official Plans on both a Regional and Local Municipal level. Staff of York Region and the local municipalities will be required to co-operate in developing workable aquifer or wellhead protection policies and in communicating these to achieve public acceptance.

7. CONCLUSION

The activities as described in this report are in the best interests of York Region and its residents so as to ensure that an adequate supply of high quality drinking water will be available to future generations.

The Senior Management Group has reviewed this report.

(A copy of the attachment referred to in the foregoing is included with this report and is also on file in the Office of the Regional Clerk.)