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UPDATE ON STOUFFVILLE WATER SUPPLY SYSTEM

The Transportation and Works Committee recommends the adoption of the recommendation contained in the following report, August 25, 2008, from the Commissioner of Environmental Services:

1. RECOMMENDATION

It is recommended that:

1. This report be received for information.

2. PURPOSE

This report updates Regional Council on the status of additional water supply for the community of Stouffville and addresses concerns regarding groundwater levels and stream flows in the Rouge Watershed in response to Regional Council request after receiving Report No. 10 Clause 1 at their December 13, 2007 meeting. It also provides a preliminary discussion of the long term servicing strategy for Stouffville and the implications of replacing the existing groundwater supply system in its entirety with a lake-based supply system.

3. BACKGROUND

The Stouffville Water Supply System will be a blended groundwater and lake-based solution to service Stouffville up to 2036

Connection to the Lake Ontario based York Water System, working in conjunction with the existing groundwater based system, was identified and approved in the Class EA as the preferred solution to meet additional capacity needs for new development approved growth in the community for Stouffville. This was reported to Regional Council on June 19, 2008 Report No. 6 Clause 3 as part of regular infrastructure updates on priority projects. Key milestone dates for detailed design and construction were identified, with a final completion date anticipated for March 2009. The pump station has been designed to provide a firm capacity of 19 ML/day, and is ultimately expandable to 25 ML/day with expansions on York and Toronto water infrastructure. With the groundwater sources currently providing a capacity of 12 MLD, the combined lake-based and groundwater supplies can meet the community's expected maximum day demand of 25 MLD in 2036.

Rouge Park Alliance recommended the Region consider using lake-based water supplies for urban centres that are connected to the York Durham Sewage System

As a result of concerns for groundwater levels and stream flows in the Rouge Watershed, the Rouge Park Alliance passed a resolution at their October 5, 2007 meeting to recommend the Region consider a plan to increase the lake-based supply to the community of Stouffville with an objective to discontinue the use of groundwater wells in the future. The Alliance manage local activities within Rouge Park through their Management Plans and are a key stakeholder in any Environmental Assessment studies undertaken within the Park. Despite the termination of dewatering for York Durham Sewage System (YDSS) construction, certain Alliance members remain concerned about groundwater levels and stream flows.

Following the Rouge Park Alliance recommendation, Region staff provided to Whitchurch-Stouffville Council a summary of the opportunities and challenges to convert to a full lake-based system

At the request of Town of Whitchurch-Stouffville Council, Region staff presented on the “Supply of Groundwater to Whitchurch-Stouffville” at their December 18, 2007 meeting. The presentation provided an update on dewatering activities from the construction of the YDSS 16th Avenue Sewer, an overview of the Stouffville Groundwater Supply System, key challenges to convert to full lake-based supply and future directions. The presentation noted that there was no immediate need to convert to full lake-based supply and additional studies would be undertaken to evaluate the sustainability of the drinking water source as part of the technical work required for the *Clean Water Act 2006*. The delegation was received by their Council with no further action required.

However, Regional Council requested a detailed report on the Stouffville Water Supply in 2008 at their December 13, 2007 meeting after receiving Report No. 10 Clause 1.

4. ANALYSIS AND OPTIONS

UPDATE ON STOUFFVILLE WATER SUPPLY PROJECT

Additional water to the Stouffville community from the York Water System is anticipated by 2009

Construction commenced in March 2008 to connect the York Water System to the community of Stouffville, providing the community with lake-based supply by March 2009. This new connection will provide the opportunity to optimize the use from the groundwater and lake sources.

UPDATE ON DEWATERING ACTIVITIES ASSOCIATED WITH 16th AVENUE TRUNK SEWER PROJECT

The aquifer is recovering more quickly than expected

As reported to Regional Council on June 19, 2008 Report No. 6 Clause 3, the 16th Ave sewer construction dewatering ceased in 2007. The aquifer has been recovering more quickly than expected. Current estimates suggest a full recovery may be achieved as early as December 31, 2008.

STOUFFVILLE GROUNDWATER SUPPLY

The main source of the groundwater for Stouffville Water Supply originates from the shallow aquifer 15-27 metres (50-90 feet) below ground surface

Historically groundwater has been viewed as a viable drinking water option for many communities due to the natural filtration and low capital and operational costs. The Stouffville groundwater wells have been in production since the late 1960s, with the more recent addition of two wells in early 2000. There are five production wells currently providing groundwater to Stouffville Water Supply. Groundwater is pumped from two main aquifer sources. The shallow aquifer is the main source, providing approximately 65% of the current water supply for the Stouffville community. The remaining 35% is derived from the deeper Thorncliffe aquifer.

In the future, it is expected that production from the deep aquifer wells, screened ~100 m (350 feet) below the surface, will increase to meet supply needs. Groundwater will blend with the addition of the lake-based water from York Water System to satisfy the overall supply needs for the community of Stouffville.

Continuous groundwater monitoring data indicates the current pumping rate is sustainable

The Region has an extensive monitoring network to continuously assess impacts and sustainability of the aquifers. Staff continually monitor and assess groundwater levels using a network of 20 wells located strategically at various depths in the Whitchurch-Stouffville area. This data is routinely analyzed and shared with interested agencies including the Ministry of the Environment for the Region's Permit to Take Water, which was recently renewed in June 2007.

Since 2000, production from the shallow aquifer has reached and maintained maximum operational rates. Ongoing review of the shallow aquifer groundwater levels within the vicinity of the production wells indicate that water levels remain at the same level over the long term. That is, our taking of groundwater does not appear to impact the aquifer from year to year. The data indicates there is no influence from our water taking beyond a 500 m radius from the shallow municipal wells.

In the deep aquifer, the zone of influence is less clear due to competing influences from other permit holders. Further hydrogeological studies will be undertaken in late 2008 to isolate the external influences and evaluate the aquifer response specific to the deep aquifer pumping.

Shallow and deep aquifers are not connected in the Stouffville area based on current geological knowledge

The hydrogeology in the Region is complex. In recent years, significant investment has been undertaken by the Region to collaborate with groundwater studies across the Oak Ridges Moraine to increase local understanding. The development of a geological model based on over 180,000 geological interpretations was created through collaborative efforts with the Geological Survey of Canada, Region of Durham, Region of Peel, City of Toronto and Conservation Authorities. This significant work, which is ongoing, suggests the deep and shallow aquifers are not connected in the Stouffville area. Furthermore, the groundwater level data supports this conclusion.

Technical studies under the *Clean Water Act* provide the opportunity to further assess the overall watershed water use to determine if there is a threat to the water resources

There are many competing uses for groundwater in the Rouge Watershed. To evaluate whether these uses exceed the watershed's capacity to provide supply, Conservation Authorities as part of the *Clean Water Act 2006*, initiated technical studies to assess the potential for water budget stress. A detailed assessment is undertaken to estimate the total demand for water in the context of the available supply across the watershed. Consideration is given to all types of water uses, including estimated flow from wells used to supply ponds to determine the overall demand for water. The level of detail undertaken to evaluate potential stress escalates when the demand appears to exceed the available supply. That is, at the Tier 1 stage, only available data is considered, whereby at the Tier 3, significant work is done to obtain actual data. Region staff participate in the review process and provide input as necessary. The findings will be ultimately captured in the Assessment Report, anticipated for early 2010. Should the findings suggest a significant stress at the Tier 3 assessment, the Source Protection Plan will identify mitigation measures to reduce the stress to water resources supply.

STOUFFVILLE LONG TERM WATER SUPPLY STRATEGY

The Master Plan Update will update long term servicing options for the Community of Stouffville

The Region is currently undertaking the Water and Wastewater Master Plan Update. The Master Plan Update, expected to be complete by early 2009, will review the long term servicing strategy for the Region, including the Stouffville community. An analysis will

be undertaken to consider servicing alternatives including replacing existing groundwater supply in Stouffville with lake-based water supply. Further studies may also be required to assess the impact to groundwater levels, if existing wells are to be decommissioned.

Estimated costs to convert the Stouffville Water Supply to a 100% lake-based supply system is approximately \$28 million dollars

While the long term strategy for servicing Stouffville will not be fully known prior to the completion of the Master Plan Update, preliminary analysis indicates that the total capital cost to convert the Stouffville groundwater supply system in its entirety to a lake-based supply system is in the order of \$28 million, comprising of the following works:

- Upgrade the pumps prior to 2036 at an estimated cost of approximately \$4 million
- Decommission existing wells and upgrade the Regional water transmission system to convey additional lake-based supply to Stouffville community will cost approximately \$8 million, based on very preliminary ballpark estimates.
- Cost to secure supply from Toronto and/or Peel at an estimated cost of approximately \$16 million

Preliminary results from the Master Plan Update indicate that there is sufficient water supply capacity in the current supply agreements with Peel Region and City of Toronto to replace the Stouffville groundwater supply with lake-based supply, in addition to meeting the Region's overall growth need to 2031. Replacement of groundwater supply in Stouffville will take away capacity that would otherwise be used for additional growth in other urban centers beyond 2031. As stated above, the capital cost of lake-based water supply from Toronto and Peel to replace the entire groundwater supply in Stouffville, is in the order of an estimated cost of approximately \$16 million.

5. FINANCIAL IMPLICATIONS

Currently this analysis has not resulted in any additional financial implications to the current Environmental Services 10-year Capital Budget Plan. Should the latest Master Plan Update suggest complete conversion to lake-based supply for the community of Stouffville, it is anticipated significant costs will be incurred and would be captured under the regular Capital budget process at that time.

6. LOCAL MUNICIPAL IMPACT

The community of Stouffville has a sustainable source of potable water as a result of good long term planning undertaken by the Region to support the long term growth plans for this community. Groundwater continues to provide an excellent local source of drinking water. Currently groundwater levels in the shallow aquifer within the vicinity of

the production wells continue to return to the same level from year to year. We also anticipate the same stabilization of the deep aquifer once it has achieved full recovery due to 16th Ave. dewatering activities. As part of the primary sustainability principles outlined in the Master Plan Update, significant consideration is given to the impact of the natural environment. Staff will continue to plan for current and future needs to provide the most environmental and economical options for this community.

7. CONCLUSION

In the community of Stouffville, lake-based water will be blended with the existing groundwater supply as early as March 2009. Current data suggests that the water taking to support the Stouffville groundwater supply is a sustainable use of water resources. Additional studies undertaken by the Conservation Authorities as part of the *Clean Water Act 2006* will further assess the overall water use within the Rouge Watershed to ensure there are no current or future threats to the water resources. Using sustainability principles as a guideline, future servicing alternatives including replacing existing groundwater supply in Stouffville with lake-based water supply will be reviewed under the current Master Plan Update.

For more information on this report, please contact Tracey Carrigan at Ext. 5095.

The Senior Management Group has reviewed this report.