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CONSULTING SERVICES FEE FOR ADDITIONAL SCOPE REQUIRED FOR KESWICK WATER POLLUTION CONTROL PLANT EXPANSION IN THE TOWN OF GEORGINA, PROJECT 72240

The Environmental Services Committee recommends the adoption of the recommendations contained in the following report dated March 30, 2011 from the Commissioner of Environmental Services.

1. RECOMMENDATIONS

It is recommended that:

1. Regional Council authorize an increase to existing Blanket Purchase Order Number B00009631 issued to Hatch Mott MacDonald Ltd. for the detailed design, contract administration and site inspection services for the Keswick Water Pollution Control Plant expansion from \$2,702,560.40 to \$3,575,225.40, excluding HST, for additional engineering, contract administration and site inspection services.
2. The Commissioner of Environmental Services be authorized to adjust the contract administration and site inspection fees using the original competitive unit price of \$3,750.00 per week, excluding taxes, to match actual construction duration.

2. PURPOSE

This report seeks Council authorization to increase Blanket Purchase Order Number B00009631 for consulting services for additional contract administration and site inspection services for the Keswick Water Pollution Control Plant expansion beyond contingency and additional scope allowances provided in the Purchasing By-law.

3. BACKGROUND

Detailed design, contract administration and site inspection services assignment awarded to Hatch Mott MacDonald Ltd. in 2006

In May of 2006, Hatch Mott MacDonald Ltd. was retained to provide engineering services for the detailed design, contract administration and site inspection of the Keswick Water Pollution Control Plant expansion. Accordingly, Blanket Purchase Order Number B00009631 was issued to Hatch Mott MacDonald Ltd. for the assignment. The estimated construction cost for the plant expansion in 2006 was \$12.3 million.

Past project scope changes primarily driven by the Ministry of the Environment's new Lake Simcoe Protection Plan

Since the inception of the project, a number of scope changes have driven the need for additional engineering services that could not have been anticipated at the time that Hatch Mott MacDonald Ltd. submitted their fee for the assignment. The most significant driver of scope change was the development of the Lake Simcoe Protection Plan by the Ministry of the Environment which commenced after the Region completed the Environmental Study Report for the plant expansion.

The Lake Simcoe Protection Plan requirements significantly reduced the plant's allowable effluent phosphorus limit from 0.3mg/L to 0.1mg/L. The initially proposed treatment technology for the Water Pollution Control Plant expansion recommended by the original Environmental Study Report could not achieve this far more stringent criteria. As such, other alternative solutions considered in the amended environmental study fundamentally changed the design and associated cost of the plant expansion.

As a result, the plant expansion design had undergone a number of engineering studies and design alternatives to satisfy the Ministry of the Environment's requirements, namely a Lake Simcoe Assimilative Capacity study, Policy 2 Deviation Report. Subsequently, a back-up power generator, Permit to Take Water and a tertiary membrane filtration system were added to the project scope.

The most significant of these changes was the need for membrane type tertiary filtration as the plant's existing sand filters could not achieve the reduced effluent phosphorus criteria mandated by the new Lake Simcoe Protection Plan. The addition of the membrane system not only significantly increased the capital cost of the plant expansion, but also extended the construction duration to complete the project.

In close consultation with the Ministry of the Environment, staff reviewed and agreed to the required scope changes and implemented the changes following the project change management process. Hatch Mott MacDonald Ltd.'s fee quotations were based on the competitive hourly rates received in their original Financial Proposal for the assignment. The level of effort was reviewed and deemed adequate for the type of work. The overall quotation represents good value for the magnitude of additional work required. The total value of the current Purchase Order is \$2,702,560.40, exclusive of taxes.

Project currently in construction and on schedule for completion in December 2012

The project was tendered in April 2009 and closed in June 2009. The contract was awarded to Graham Construction and Engineering at the tender price of \$52,285,000, excluding taxes. Construction commenced in November 2009 and is currently scheduled for completion in December 2012.

4. ANALYSIS AND OPTIONS

Hatch Mott MacDonald Ltd. has recently provided quotes for additional out-of-scope activities that are essential to address various emerging new project requirements related to regulatory permitting conditions, new design/operational standards and construction administration services that could not have been anticipated at the initial stages of the project. As previously noted the capital cost of the plant expansion dramatically increased from an initially anticipated \$12 million to over \$52 million primarily related to changes in regulations. Staff have reviewed each of these quotations received from Hatch Mott MacDonald Ltd. to ensure the level of effort is reasonable for the new scope and the hourly rates are in line with their original Financial Proposal for the assignment. Furthermore, since Hatch Mott MacDonald Ltd. continues to provide services on this project for the original scope of work, extending their assignment represents the best value to the Region for these required additional activities.

Hatch Mott MacDonald Ltd.'s proposed fee for fulfilling Ministry of the Environment Certificate of Approval conditions equals \$167,884

A condition of the Certificate of Approval received for the plant stipulates that the facility must be tested for a full year to confirm it can achieve the more stringent effluent criteria as mandated by the new Lake Simcoe Protection Plan. To fulfill this condition, a detailed implementation plan must be prepared and submitted to the Ministry of the Environment for their review and approval. The one year testing program must then be carried out in accordance with the approved implementation plan with regular progress reporting to the Ministry of the Environment.

Hatch Mott MacDonald Ltd. has provided a quote for completion of this additional work of \$167,884. Breakdown of the requested fees for the additional scope is shown in Table 1.

Table 1
Additional scope and fee summary for fulfilling Ministry of the Environment's
conditions on Certificate of Approval

	Value (\$)
Prepare implementation plan for membrane process testing	13,488
Allowance for assistance in membrane facility operation under simulated condition (1 year)	99,916
Complete performance Testing Report for the membrane system and submit to the Ministry of the Environment	54,480
Total	167,884

Hatch Mott MacDonald Ltd.'s proposed fee for applying for Ministry of the Environment's long-term Permit to Take Water equals \$50,000

The Permit to Take Water was received from the Ministry of the Environment on February 2, 2009 for the plant expansion construction.

A condition on the Permit to Take Water for construction requires the Region to provide a post-construction summary of dewatering activities carried out by the contractor and use this information to apply for a long-term ongoing Permit to Take Water for the plant. This long-term dewatering is required to protect the plant's underground facilities due to the elevated groundwater table under the plant.

Hatch Mott MacDonald Ltd. has requested an allowance of \$50,000 for the completion of this new additional work scope.

Hatch Mott MacDonald Ltd.'s proposed fee for incorporating latest Regional design and operating standards equals \$179,982

The design prepared by Hatch Mott MacDonald Ltd. was based on the latest available Regional design standards as well as operational needs. After commencement of construction the Supervisory Control and Data Acquisition network, building security and operation/maintenance manual standards were updated. It is prudent that these updated standards now be incorporated into the current expansion project as the capital cost impacts associated with these updated standards are minimal at the initial installation stage.

Hatch Mott MacDonald Ltd. has provided a quote for completing the necessary design work of \$179,982. Breakdown of the requested fees for the additional scope is shown in Table 2.

Table 2
Additional scope and fee summary to incorporate latest Regional design and operating standards

	Value (\$)
Updated SCADA and instrumentation standards	72,666
Updated building security standards	8,104
Additional scope for Operation and Maintenance Manuals	52,892
Physical asset inventory and tagging	16,288
Membrane filter tanks maintenance platform	11,872
Additional scope for as-built drawings	18,160
Total	179,982

Hatch Mott MacDonald Ltd.'s proposed fee for addressing changed site conditions equals \$196,133

The existing plant was originally constructed by the Ministry of Environment in early 1980s and transferred to the Region in 1997. Given that as-constructed information for the existing Water Pollution Control Plant, especially for the underground facilities, was not fully documented, the expansion design prepared by Hatch Mott MacDonald Ltd. was based on the existing plant's as-tendered drawings. Efforts have now been made to verify the as-constructed information for above-ground facilities.

Ground excavations completed by the contractor recently identified several existing plant features that differed from information used in the expansion design. These changed site conditions require modifications to the design of various elements of the plant expansion. The additional design work identified below will help the Region avoid or minimize construction cost increases due to the changed site conditions.

Hatch Mott MacDonald Ltd. has provided quotes for completing this additional design work of \$196,133. Breakdown of the requested fees is shown in Table 3.

Table 3
Additional scope and fee summary to address changed site conditions

	Value (\$)
Modifications to bio-filter and Ultra Violet systems	21,672
Modifications to clarifiers and piping system	23,970
Modifications to sludge pumping station	15,100
Modifications to flow distribution chamber and channel	14,674
Modifications to high voltage line to comply with new Hydro One requirements	9,312
Additional shop drawings review and construction re-sequencing	61,405
Allowance to address other anticipated design changes	50,000
Total	196,133

Hatch Mott MacDonald Ltd.'s proposed fee for providing additional contract administration and site supervision services equals \$278,666

In its original proposal in 2006, Hatch Mott MacDonald Ltd. proposed one full time site inspector which was adequate for the original project scope. In light of the significant scope changes during design due to the addition of a membrane filtration system and associated works required by the new Lake Simcoe Protection Plan, an additional part-time inspector is required to adequately cover the entire construction site of this complex project for 92 weeks of the remaining construction period.

The construction schedule was severely impacted by dewatering issues in 2010. As part of the dewatering issue resolution the Region granted the contractor a contract extension of 82 working days. This requires extended project management, contract administration and site inspection services by Hatch Mott MacDonald Ltd.

Hatch Mott MacDonald Ltd. has provided quotes for these requirements of \$278,666. Breakdown of the requested fees is shown in Table 4.

Table 4
Breakdown of fee for providing additional contract administration and site supervision services

	Value (\$)
Allowance for an additional part-time inspector: (92 weeks x 4 days/week x \$544/day)	200,192
Contract Administration and Site Inspection for 82 working days extension: (82 days x \$750/day)	61,500
Project Management for 82 working days extension: (82 days x \$207/day)	16,974
Total	278,666

5. FINANCIAL IMPLICATIONS

Sufficient funding available in the approved Total Project Budget Authority

The total requested engineering services fee, as summarized above, is \$872,665, exclusive of HST.

Funding for this additional work scope is included in the approved Total Project Budget Authority for the Keswick Water Pollution Control Plant Expansion project.

Extensive scope changes during the course of the project to address new regulatory project requirements including the new Lake Simcoe Protection Plan resulted in a very significant increase of capital costs. The tender price of the project is \$52.3 million, excluding taxes, including the additional scope of work outlined in this report. The proposed engineering fee of \$3,575,225.40 is 6.8% of construction cost, which is within the lower end of the range for this type of complex sewage treatment plant retrofit/expansion work.

The weekly site inspection and contract administration fee in the original financial proposal submitted by Hatch Mott MacDonald Ltd. is \$3,750. Should the actual duration of construction require adjustment, it is recommended that the Commissioner of

Environmental Services be authorized to amend the contract to reflect the actual construction duration using the previously submitted construction administration and site inspection fees.

Since 2002, a little over 700 purchase orders with a total value of approximately \$1.3 billion have been issued to secure engineering, consulting and construction services on water and wastewater projects. Of these, approximately 75 or just over 10% of the purchase orders have required increases beyond the increases allowed in the Regional Purchasing By-law. The total value of such increases is approximately \$45 million or 3.5% of the total original value of the purchase orders.

It should be noted that the Keswick Water Pollution Control Plant project was the subject of a report submitted to Environmental Services Committee for adoption at its meeting of January 19, 2011. The purpose of this previous report was to award a consultant assignment related to the necessary works on the plant's effluent outfall. Given that the additional scope of work outlined in this report had not been fully developed at the time of the previous report, the opportunity to include these recommendations was not available.

6. LOCAL MUNICIPAL IMPACT

The Keswick Water Pollution Control Plant provides tertiary level wastewater treatment for the community of Keswick in the Town of Georgina. The Keswick Water Pollution Control Plant, which was constructed in 1984, currently services approximately 23,400 people, operating at over 70% of its existing rated capacity. The plant is being expanded to fulfil the commitment of meeting planned growth requirements of the Keswick community. It is expected that the treatment process of the expanded facility will be operational by the end of 2012.

7. CONCLUSION

The new Lake Simcoe Protection Plan imposed significant impacts during the course of the project and dramatically changed the scope of the plant expansion work.

The additional scope of work and associated fees outlined in this report are essential to meet regulatory requirements such as Certificate of Approval and Permit to Take Water conditions as well as engineering and contract administration services requirements during construction for the Keswick Water Pollution Control Plant Expansion.

It is recommended that Blanket Purchase Order Number B00009631 issued to Hatch Mott MacDonald Ltd. for the detailed design, contract administration and site inspection services for the Keswick Water Pollution Control Plant expansion be increased from \$2,702,560.40 to \$3,575,225.40, excluding HST, to provide adequate engineering and

construction administration services to the plant expansion due to the construction cost increase from \$12.3 million to \$52.3 million.

For more information on this report, please contact Daniel Kostopoulos, Director, Capital Planning and Delivery, Environmental Services at extension 5070.

The Senior Management Group has reviewed this report.