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CONSULTING SERVICES FEE INCREASE FOR ADDITIONAL SCOPE REQUIRED FOR KESWICK WATER POLLUTION CONTROL PLANT EXPANSION PROJECT

The Transportation and Works Committee recommends the adoption of the recommendation contained in the following report dated April 22, 2009, from the Commissioner of Environmental Services.

1. RECOMMENDATION

It is recommended that:

1. Blanket purchase order number B00009631 be increased from \$2,074,840.65 to \$2,539,863.00, excluding GST, for additional services outside the original scope of work and in excess of the 15% contingency and the 20% additional scope allowance provided for in the Purchasing By-law.

2. PURPOSE

This report provides background and an explanation to increase the upset fee for consulting and engineering services for the Keswick Water Pollution Control Plant (WPCP) expansion beyond the 15% contingency and the 20% additional scope allowance provision in the Purchasing By-law.

3. BACKGROUND

In May of 2006, Hatch Mott MacDonald was awarded the consultant assignment for detailed design and contract administration of the Keswick WPCP expansion and upgrades project. Purchase Order (PO) Number B00009631 was issued to Hatch Mott MacDonald for the assignment at an approved upset fee limit of \$1,119,731.00, plus GST.

The project was divided into two sub-projects – upgrades and expansion. The upgrades project was undertaken through a separate contract, which was successfully completed in 2008.

New Lake Simcoe regulation imposed stringent effluent discharge requirements for the Keswick Water Pollution Control Plant

In February of 2007, the PO was increased by \$223,946.00 for out-of-scope activities related to the design of a new headworks building, influent collection chamber, return activated sludge pumping station and secondary clarifier.

These changes were needed, because the peak flows were higher than estimated during the Environmental Assessment.

On May 9, 2007, due to Ministry of the Environment's (MOE) new effluent discharge policies for Lake Simcoe, the PO was increased further by \$417,188.00 to cover detailed design changes associated with the Membrane Pilot Study and detailed design of the Membrane Filtration System at the Keswick WPCP facility.

In October 2008, the following additional scope was identified:

- Operations, maintenance, and SCADA staff highlighted, through the internal QA/QC stakeholder review process, several out-of-scope items including: repairs to the existing administration building, design changes due to new SCADA tagging standards, replacement of old clarifier mechanisms, decommissioning of existing alum tanks and incorporating new alum tanks within the new Membrane building, incorporating a new polymer feed system, and provision of a heated pad at truck sludge loading bay.
- Additional construction administration and inspection service fees were required as a result of schedule extensions during the construction phase of the Keswick WPCP upgrades project.
- Unanticipated items became evident during the detailed design phase due to the impacts of the changes mentioned above. These items include: condition assessment of existing and design of new sub-station, pre-qualification of contractors, pre-selection of membrane equipment suppliers, decommissioning of existing filtration buildings, tree clearing and removal from the site, additional hydro-geological and geotechnical studies, and preparation of a Policy 2 Deviation Report as mandated by the MOE for acceptance of the Environmental Study Report for the expansion of the Keswick WPCP.

The PO was subsequently increased by \$313,975.65. As a result, the additional work and contingency allowances provided for in the Purchasing By-law were exhausted.

The total value of the current PO is \$ 2,074,840.65, exclusive of GST.

4. ANALYSIS AND OPTIONS

In efforts to comply with various regulatory requirements (detailed below) and finalize contract administration services during construction, the following additional scope of work has been identified:

- Response to standby power generator – Part II Order Request
- Design of emission control system for standby power generator
- Compliance to Permit to Take Water conditions
- Engineering services during construction
- Extra days contract administration services

Detailed investigation required to respond to a Part II Order Request for the Standby Power Schedule B Environmental Study

After filing the Environmental Study Report for the Standby Power Schedule B Environmental Assessment, a Part II Order was received in October 2008 with respect to investigating the possibility of modifying the proposed Standby Power Generator at the Keswick Water Pollution Control Plant to provide power to the power grid during peak consumption periods (Direct Response Program - DRP), and secondly, that the Region should invest in an emissions-reducing technology even if the proposed diesel generator meets Ministry of the Environment's standards.

In order to meet the project tender and construction schedules, Hatch Mott MacDonald was engaged within days of receiving the Part II Order Request to undertake a detailed investigation and cost benefit analysis to provide a response to the Part II Order Request from Ontario Clean Air Alliance. This process involved consultation with several stakeholders including the Ministry of Environment, which is currently developing new air emission policies for standby power generators, Enbridge Inc. (natural gas supplier) and, Rodan Energy, an expert in Energy Demand Response Systems. Hatch Mott MacDonald is in the process of finalizing the report.

Total requested fees for Part II Order associated services: \$69,873.35

Note: In January 2009, the Ministry of the Environment advised York Region that the Part II Order Request was denied.

Part II Order investigation recommends an emission control system for standby power generator

The recommendation from the detailed study was that the Region should proceed to install the proposed diesel generator since a natural gas supply of sufficient capacity is not available. In addition, based on a detailed cost-benefit analysis undertaken by Hatch Mott MacDonald, it was determined that the construction of a gas supply pipeline for that

purpose would not be economically feasible. The proposed diesel generator has the potential to supply power back to the grid if the Ministry of the Environment reverses its policy and allows diesel generators to participate in the Direct Response Program.

However, to participate in the Direct Response Program, the diesel generator will require further treatment to reduce nitrous oxides from the emissions. Given the benefits of NO₂ reduction the Region decided to include an emissions control system for the Keswick WPCP diesel generator.

The emissions control system must be designed and incorporated into the already-completed tender package for the WPCP expansion, which will be tendered in spring 2009. The scope of work involves structural, electrical, mechanical, and instrumentation modifications to the WPCP design to incorporate the new equipment.

Total requested fees for Emission Control System design: \$50,545.00

Ministry of Environment imposes conditions in Permit to Take Water (PTTW)

The Permit to Take Water was received from the Ministry of the Environment on February 2, 2009. As part of the monitoring program stipulated in the permit, the Region must install and maintain flow meters on each discharge line serving five relief wells on the property by July 31, 2009.

The water metering system requires design and construction of related infrastructure such as meters, meter chambers, associated instrumentation and electrical components. Implementation of this requirement will be a critical milestone for the contractor.

Total requested fees for Monitoring System design: \$45,000.00

Additional contract administration services required due to extended construction schedule

Hatch Mott MacDonald's proposed schedule for administration/construction inspection, based on the original project scope, was estimated at 270 working days, which was increased to 390 working days to account for the membrane system addition and other associated works.

In 2007, the Region undertook an independent Value Engineering / Constructability Review to address the complexity of the project, the continued operational requirements, and construction site limitations. As a result, the construction schedule was adjusted from 390 working days to 600 working days. This resulted in 210 additional working days for contract administration and construction inspection services.

Total additional requested fees for contract administration services
(210 days x \$750/day): \$157, 500.00

Additional engineering services anticipated during construction due to the added complexity of the project

Not only has the duration of construction increased but also project scope and complexity has significantly increased the level of effort required for shop drawing review, specialist visits to site and input during construction of the new headworks; upgraded administration and membrane buildings; membrane system, gas heating, and cooling and sludge handling equipment.

Further, increased efforts are required during the 600 working day construction schedule for coordinating commissioning, operator training, maintaining operation and maintenance manuals, and completing record drawings. The consultant indicated that this effort was not included in the original scope of work for services during construction provided in 2006.

Total requested fees for Engineering Services Allowance: \$142,104.00

5. FINANCIAL IMPLICATIONS

The total requested engineering services fee, as summarized above, is \$465,022.35, exclusive of GST.

Extensive scope changes during the course of the project resulted in significant increase of capital costs. The cost estimate of the project is 30 million dollars, excluding taxes. The engineering fee as a percentage of construction is 8.5%, which is well within industry standards for this type of facility.

Funding is available in the approved 2009 10-year Capital Wastewater Budget. Since 2002, 686 purchase orders with a total value of \$1,257,887,574 have been issued to secure engineering, consulting and construction services on water and wastewater projects. Of these, 64 or 9% of the purchase orders have required increases beyond the increases allowed in the Regional Purchasing By-law. The total value of such increases is \$36,197,666 or 3% of the total original value of the purchase orders.

6. LOCAL MUNICIPAL IMPACT

The Keswick Water Pollution Control Plant (WPCP) provides tertiary level wastewater treatment for the community of Keswick in the Town of Georgina. The Keswick WPCP, which was constructed in 1984, currently services approximately 23,400 people, operating at 70% of its existing rated capacity. Based on projected population growth in

the Town of Georgina, the servicing capacity of the WPCP is forecasted to be reached by late 2011. To this end, it is critical that the plant be expanded to fulfil the commitment of meeting the 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 2011.

7. CONCLUSION

The additional scope of work and associated fees explained in the report are essential to meet regulatory requirements such as Part II Order Request for the Standby Generator Schedule B Class Environmental Assessment, Permit to Take Water conditions as well as contract administration services during construction for the Keswick WPCP Expansion.

An approval for this increase is required to minimize tender and construction schedule delays of the project for which completion is required by 2011 due to capacity constraints.

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.