



**STAFF REPORT  
Action Required**

**Amendment to Purchase Order 6029694  
Rehabilitation of Clarifiers at the Ashbridges Bay  
Treatment Plant**

<b>Date:</b>	June 8, 2011
<b>To:</b>	Public Works & Infrastructure Committee
<b>From:</b>	General Manager, Toronto Water Director, Purchasing and Materials Management Division
<b>Wards:</b>	All
<b>Reference Number:</b>	P:\2011\Cluster B\TW\pw11007

**SUMMARY**

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This report is to request authority to amend Purchase Order 6029694 for the rehabilitation of primary and secondary clarifiers at the Ashbridges Bay Treatment Plant (“ABTP”) and to reallocate the necessary funds from within the approved 2011 Toronto Water Capital Budget. The total amount requested is \$1,300,000.00 net of all taxes (\$1,322,880.00 net of HST Recoveries), revising the current contract value from \$5,710,476.19 to \$7,010,476.19 net of all taxes (\$7,133,860.57 net of HST Recoveries).

Due to the advanced deterioration of concrete in certain primary and secondary clarifier tanks at the ABTP, this amendment is needed to immediately address significant structural deficiencies, potential safety hazards and to ensure treatment performance remains compliant with regulatory discharge limits. Pricing for the work is based on competitively bid unit prices within an existing construction contract.

**RECOMMENDATION**

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The General Manager of Toronto Water and the Director of Purchasing and Materials Management recommend that City Council:

1. Authorize the reallocation of 2011 funding in the amount of \$630,000.00 from WBS Element CWW040-06 (Work Area 5 Rehab) to CWW019-15 (Secondary Treatment Upgrades) in the approved 2011 Toronto Water Capital Budget – ABTP Capital Works Program.

2. Grant authority to Amend Purchase Order 6029694 for the supply of all labour, equipment and materials necessary to perform the rehabilitation of the primary and secondary clarifiers at ABTP with New Resource General Contracting Inc. by an additional amount of \$1,300,000.00 net of all taxes (\$1,322,880.00 net of HST Recoveries), revising the current contract value from \$5,710,476.19 to \$7,010,476.19 net of all taxes (\$7,133,860.57 net of HST Recoveries).

## **FINANCIAL IMPACT**

The amendment amount identified in this report is \$1,300,000.00 exclusive of all taxes (\$1,322,880.00 net of HST Recoveries) and increases the current contract value from \$5,710,476.19 to \$7,010,476.19 net of all taxes (\$7,133,860.57 net of HST Recoveries).

Funding for the full amendment amount is available within the approved 2011 Toronto Water Capital Budget – ABTP Capital Works Program. Approximately \$670,000 is available within the existing project – CWW019-15 (Secondary Treatment Upgrades). The remaining funding requirement of \$630,000 will be reallocated from CWW040-06 (Work Area 5 Rehab) since the expected 2011 cash flow requirement in this account has been reduced due to project delays.

To accommodate the purchase order amendment, the original project scope for CWW019-15 (Secondary Treatment Upgrades) will be reduced, changing the anticipated project completion date from year end 2012 to year end 2011. Any additional costs to complete the Secondary Treatment Upgrades as per the original project scope and to complete the delayed Work Area 5 Rehab project will be considered during the 2012 Capital Budget process against other capital priorities within available capital funding.

The Deputy City Manager and Chief Financial Officer has reviewed this report and agrees with the financial impact information.

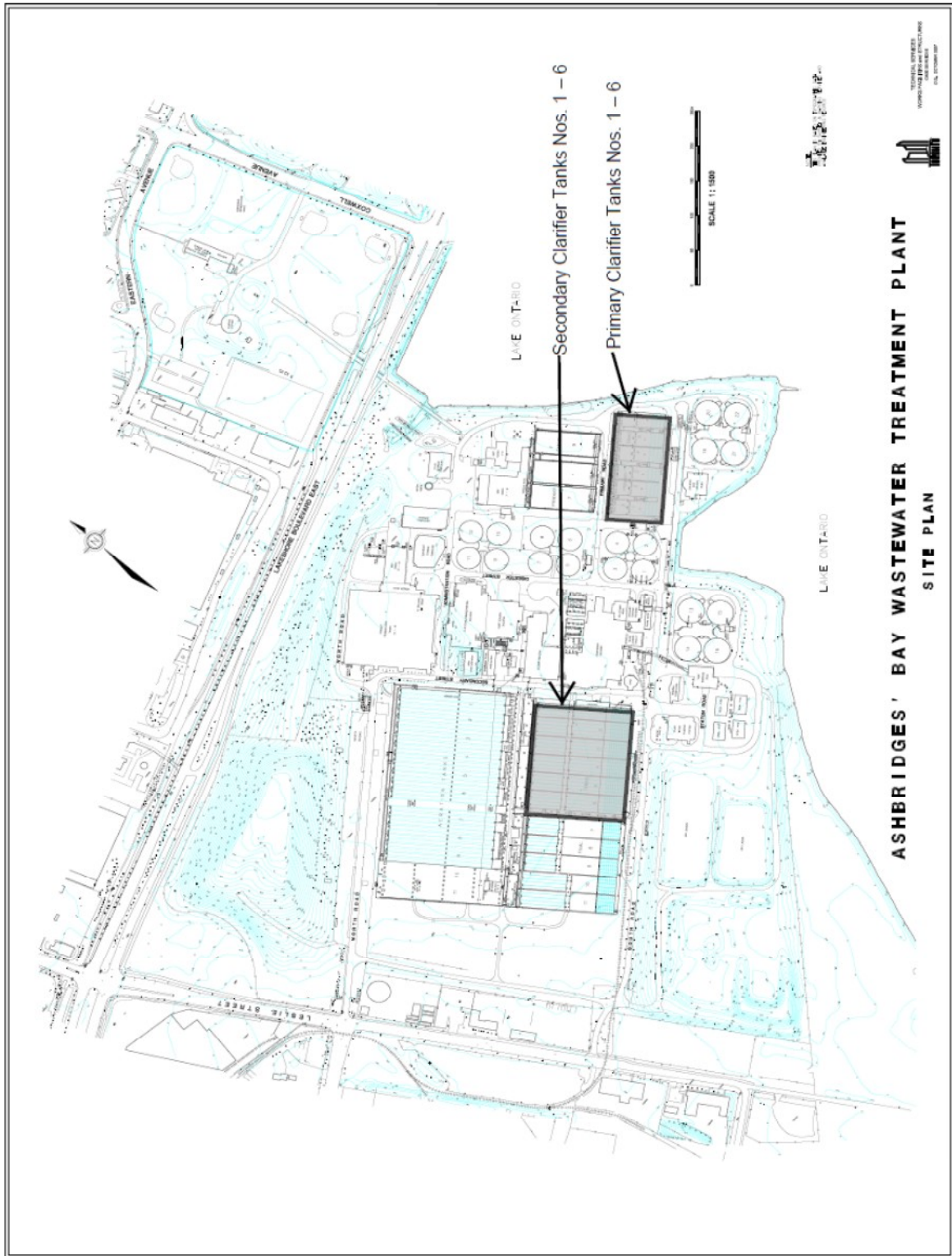
## **ISSUE BACKGROUND**

Tender Call 176-2009 was awarded to New Resource General Contracting Inc. by authority of Bid Committee, Item 5, on December 23, 2009.

<http://www.toronto.ca/legdocs/mmis/2009/bd/bgrd/backgroundfile-25877.pdf>

The contract is to supply all labour, equipment and materials necessary to rehabilitate six covered primary clarifiers and six secondary clarifiers at ABTP (see Figure 1 for a Site Plan identifying the areas to be repaired). The scope of this contract primarily includes the removal and replacement of certain critical equipment, piping systems and valves. Some of the equipment needed for this contract has been pre-purchased by the City under a separate contract and will be installed by New Resources General Contracting Inc.

**FIGURE 1 – LOCATION OF REPAIR WORK**



### **Purpose of Primary Clarifiers**

Primary Clarifiers are used in the wastewater treatment process to remove organic suspended solids from sewage. They are also known as sedimentation tanks as the process detains the flow of sewage for a defined period of time allowing for gravity settling to take place. As the sewage flows through slowly, the solids gradually sink to the bottom. The settled solids – known as raw or primary sludge – are moved along to other stages of the wastewater treatment plant. These tanks are an integral part of the wastewater treatment process and must function properly for the plant to remain compliant with regulatory requirements as defined by the Ministry of the Environment in Certificate of Approval issued for the ABTP.

### **History of the Design and Construction of Primary Clarifiers Tanks Nos. 1 to 6**

Primary Clarifier Tanks Nos. 1 to 6 were designed and constructed in 1941 as the first set of primary clarifiers for the Ashbridges Bay Treatment Plant. The tanks are constructed of reinforced concrete, partially in-ground, covered with a concrete flat roof, which is bare, without any protective finish or membrane. The top of the roof is set at about 1.9m above the surrounding grade.

The tanks are rectangular and are 61 metres long, 20 metres wide and about 5 metres deep, holding approximately 4.4 metres of water depth while in operation. The tanks are completely separated from each other (no common walls) by 1.2 and 5 metre distances respectively for the pairs of tanks Nos. 1 & 2, Nos. 3 & 4, and Nos. 5 & 6. The wider spacing between the tanks accommodates sludge pumping stations, scum pumping stations and pipe galleries.

Each tank is subdivided longitudinally with full height concrete walls into four 4.9m wide cells for sludge collecting. There is a single door size opening in each divider wall to allow for passage during inspections. There are also several troughs that run across the tanks to allow water to flow into and out of the clarifier tanks.

### **COMMENTS**

During the planning phase for this repair project, the covered primary clarifier tanks were in service and could not be shut down and drained to perform a full structural inspection. As a result, it was not possible to view the interior of the tanks to assess the full structural condition prior to tendering. Due to the age of these tanks (constructed in 1941), some structural repair work was anticipated and accounted for in the tender documents.

Bidders were required to provide unit prices for concrete repairs, crack injection and joint replacement as provisional items. The unit prices were based on estimated quantities that were expected to be sufficient to deal with a reasonable level of structural degradation based on what could be observed prior to contract tendering.

The contract was awarded to New Resources General Contracting Inc. and they started the contract in 2010 by emptying tanks Nos. 5 & 6. As part of the cleaning and preparation of the tanks, concrete surfaces were power washed prior to commencing the

structural rehabilitation work. It became immediately evident that the condition of the existing concrete was much worse than anticipated, particularly the underside of the tank covers. The extensive deterioration of the concrete in these areas required a full review by a structural engineer to assess the degree of damage and to recommend the appropriate methods and materials to effect the repair.

### **Structural Assessment**

In May 2010, a structural evaluation prepared by an external consulting engineering firm concluded that for tanks Nos. 5 & 6 there was extensive concrete damage, mostly related to non structural issues. However, the noted deficiencies found in certain parts of the tanks could have seriously compromised the structural integrity of the tanks and ultimately lead to a deterioration of treatment performance of the clarifiers and potential regulatory non-compliance if not addressed promptly.

In May 2011, a structural evaluation of tank No. 4 was completed. The consulting engineering firm again concluded there was extensive concrete damage that needed to be addressed immediately. Attachment 1 is a memo from the Structural Engineer recommending that the deficiencies should be addressed as soon as possible.

To properly restore the structural integrity of the concrete and to address safety hazards, the quantity of concrete repair will far exceed the quantity assumed in the contract documents. Now that a detailed assessment of the structural conditions has been completed for three of the six tanks, it is expected that all of the remaining tanks covered under the scope of this contract will require extensive remediation.

### **Review of Options**

All available options have been analyzed. The analysis considered factors such as the urgency of the work, expected costs, operational impacts, impact on other project schedules and alternate approaches for completing the original scope of work. After weighing all the factors, staff are recommending to reduce the overall project scope by having the contractor complete only those primary and secondary clarifier tanks that are already in progress.

This would result in four (4) primary and three (3) secondary clarifiers being fully rehabilitated by the end of this year. The remaining two (2) primary and three (3) secondary clarifiers would be deleted from this contract and be re-tendered later this year so that the work can be completed by the end of 2013. The resulting tender quantities and prices should more accurately reflect the value of the work to be performed with less reliance on estimated provisional items.

A cost and risk analysis of the recommendation to delete five clarifier tanks from the scope of work to fund the repair of the newly discovered structural problems was assessed. If this recommendation is approved, the work completed under this current contract will immediately address the exposed safety concerns, and allow a sufficient number of rehabilitated primary and secondary clarifiers to return to service as quickly as possible thereby minimizing the extent of time these tanks are out of service.

The disadvantage of deferring the work on the five remaining clarifiers is that this will impact the schedule for other major capital projects currently planned or under construction at ABTP. These other separate capital projects will require access to some of the current primary clarifiers for construction activities beginning in 2012. However, this impact can be mitigated by modifying the scope of work of the re-tendered contract to repair the remaining five clarifiers.

### **Summary**

The City has been working with the contractor to effectively address the structural safety issues while maintaining the current project schedule. The unit pricing related to the additional structural repair work was obtained as part of the competitive bidding process and is therefore fair and reasonable and representative of the work required.

Amending the current contract is the best option to resolve the safety issues in a timely manner and complete the required rehabilitation work in the clarifier tanks that are already in progress. This approach will also minimize the risks associated with potential delays in the ABTP Capital Works Program and assist in reducing potential non-compliance issues related to the regulated effluent quality.

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### **SIGNATURE**

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