

Presented To:	Operations Committee
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## Request for Decision

### Valley East Wastewater Treatment Plant - Dechlorination Project: Full Plant Trial

#### Recommendation

That the City of Greater Sudbury accept the report dated March 8, 2013 from the General Manager of Infrastructure Services regarding the Valley East Wastewater Treatment Plant - Dechlorination Project: Full Plant Trail; and

THAT the City of Greater Sudbury approve the recommendation by staff to continue with the full plant trial, including consulting engineering services to be provided by AECOM, for Paracetic Acid as an effluent disinfectant to meet Environment Canada regulations for the elimination of toxic effluent from the Valley East Wastewater Treatment Plant in accordance with the said report.

#### Finance Implications

To date, the project cost, which includes lab testing, temporary equipment, chemical purchases, and consultant fees, totals approximately \$180,000. The anticipated additional cost to complete the full plant trial, including: meetings with the MOE, chemicals, equipment, sampling, and consultant services is approximately \$150,000. Funding for the full plant trial will come from the capital funds previously committed to the dechlorination project.

## INTRODUCTION

In October of 2006, the City of Greater Sudbury (CGS) received notice from Environment Canada of a new requirement to prepare, by June 15, 2007, a Pollution Prevention (P2) Plan for the elimination of toxic effluent from all CGS wastewater treatment plants discharging flows in excess of 5,000 cubic metres per day. Chlorinated effluent is considered as a toxin under this rule. Legislation required that implementation of the P2 Plan was to be completed by July 15, 2010. The rule only applied to the Sudbury Wastewater Treatment Plant (Sudbury WWTP) and the Valley East Wastewater Treatment

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**Recommended by the Department**

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Plant (Valley East WWTP). The Sudbury WWTP dechlorination project was completed in 2010. The process to eliminate toxic effluent from the Valley East WWTP is continuing to move forward, with Environment Canada's approval.

A new chemical process technology, using Peracetic Acid (PAA) for wastewater effluent disinfection, has emerged since the completion of the P2 Plan. Initial review of this technology suggested it had potential at the Valley East WWTP, and at significantly lower capital cost than the conventional disinfection technologies identified in the P2 Plan. The capital savings by implementing this technology is estimated at approximately \$2,000,000.

Staff are recommending a full plant trial to prove that:

- the desired results can be achieved;
- to better estimate the life cycle costs of the product; and
- to determine the long term process parameters required for successful operation.

Based on the success of this technology, it may have the potential to be utilized at other CGS wastewater treatment plants during future disinfection process upgrades, thereby significantly reducing future related capital costs.

## **BACKGROUND**

Earth Tech, now AECOM, who was the most knowledgeable of the local consultants about the Valley East WWTP, was retained under a Blanket Order, as per the CGS Purchasing Policy, to complete the P2 Plan. The resulting Plan identified two potentially viable technologies, ultraviolet (UV) light disinfection and chlorination/dechlorination, and recommended further study of these technologies. The P2 Plan, along with a request to extend the project completion deadline to July of 2011, was submitted to Environment Canada. Environment Canada had initially denied this request, which meant that a recommended technology needed to be selected and implemented immediately. Since the time frame for implementation was short AECOM was, again, retained under a Blanket Order to further investigate the two technologies; recommend the appropriate technology; and provide a preliminary design report.

The effluent characteristics at the Valley East WWTP and the existing process layout presented challenges for both technologies. A preliminary capital cost for each alternative was estimated at over \$3,000,000, with significant annual operating costs. Operational concerns were also raised about the complexity and safety of the proposed systems. During this review phase a new chemical process technology, using Peracetic Acid (PAA) for wastewater effluent disinfection, emerged. Initial review of this technology suggested it had potential at the Valley East WWTP, and at significantly lower capital cost (a capital cost savings of approximately \$2,000,000), than the conventional disinfection technologies identified in the P2 Plan.

PAA has been widely used in the food industry and health services industry as a disinfectant. It has not been used widely in the municipal wastewater industry due to its relatively high chemical purchase price. However, its use as a disinfectant in the municipal wastewater sector has recently attracted interest due to the potential low capital cost and minimal operating requirements. It is also of interest to government authorities because it is, essentially, biodegradable and therefore not toxic to the environment.

Positive test results from initial testing of the product in laboratory simulations provided enough confidence in the product for staff to approach Ontario's approval authority, the Ministry of the Environment (MOE), and ask them to consider the use of PAA at the Valley East WWTP. With the assistance of the consultant, the chemical supplier and some significant discussions with the MOE, we obtained MOE approval for a side stream trial at the plant. Environment Canada also granted the City an additional extension to December 31, 2013. This side stream trial commenced in the Fall of 2011 and continued through to the Spring of 2012. The results of the testing clearly indicated that PAA is a viable and cost-effective disinfection technology worthy of further study. Initial capital costs are estimated at \$1,200,000.

Staff, the consultant, and the chemical supplier are presently working with the MOE to develop a protocol for completing a virus inactivation study, after which a full plant trial can be conducted. The purpose of the full plant trial is:

- to prove that the desired results can be achieved;
- to better estimate the life cycle costs of the product; and
- to determine the long term process parameters required for successful operation.

The full plant trial is a common next-step for a introducing a new process technology prior to starting detailed design of a facility.

Although we are confident that this innovation will lead to a new way of doing business for the City, and that it is a more sustainable solution for the Valley East WWTP, and possibly for other CGS wastewater treatment plants, it is evident that the implementation process will be somewhat more complex than conventional engineering projects. It is possible that further testing will not support the economic viability. However, if the full plant trial shows that the product is viable, the next steps include detailed design followed by construction procurement, construction, commissioning and training. If the product is not viable, a similar detailed design phase and construction phase would be required for one of the alternative conventional technologies. A request to Environment Canada for an extension to our implementation deadline would also be required.

Due to the substantive capital cost savings (approximately \$2,000,000) identified by implementing this technology, staff supports the recommendation to continue with the full plant trial. This new direction and the pending deadline for implementation of the PAA disinfection process requires that we retain AECOM at a value in excess of the Blanket Order limit of \$25,000 and requires staff to seek Council's approval to continue with the

services of AECOM, at least to the completion of the full-plant trial and subsequent report, which is estimated to take approximately one year. This does not include the review and comment period(s) required by the MOE, which may add more time. Successful operation of the full plant trial will also allow the City to continue to use the temporary facility to ensure compliance with the federal regulation until the permanent system can be constructed. Staff will issue a request for proposals to retain a consultant for detailed design, contract administration and inspection of the permanent PAA disinfection system.

In the event that the MOE does not approve the use of PAA as a disinfectant at the Valley East WWTP or if the volume of chemical required to meet the MOE's requirements is more than practical, staff will either request an extension to Environment Canada to give time to implement an alternative solution or operate the temporary PAA disinfection system until another solution can be implemented. This will also involve the development of a preliminary design report; issuing a request for proposals for detailed design; and construction of the alternative solution. Staff will provide Council with an update on the project at the conclusion of the full plant trial.