To: Chair and Members
   Committee of the Whole

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Re: Hamilton Water and Wastewater Operations Contract
    Annual Report Card (PW08134)

Council Direction:
N/A

Information:
Summary
PW08134 is the 2008 annual report card respecting the operation and maintenance of the City of Hamilton’s water and wastewater treatment facilities from January 1 to September 30, 2008. Various qualitative and quantitative objectives and performance targets were identified in the ‘Draft Service Agreement’ (DSA) that were provided to private operators for bidding. The operations of 2008 (9 months) are compared with those objectives and performance targets and it is apparent that the facilities have been operated within the guidelines laid out in the DSA.

The contract rating criteria was divided into two primary categories. There was a mandatory ‘compliance criteria’ for water quality and wastewater treatment, for which penalties were assessed for not achieving these minimum quality criteria. There was also a much more stringent ‘performance criteria’ for which the DSA awarded incentive payments based on monthly achievement of those criteria.

The treatment facilities were operated in line with the DSA during 2008. The Woodward Wastewater Treatment Plant (WWTP) performance was comparable to the average performance over the previous 12 years, even though plant flows were higher than the previous 12-year average. In addition, the plant performance still managed to achieve the “initial RAP” loading targets based on 2008 flows to date.

The DSA proposed separate water quality and wastewater treatment incentive payments of $10,000 and $15,000 respectively per month to the contractor for achieving certain performance criteria. Based on the performance that is described in this Report...
for 2008, a contractor would have been entitled to an incentive payment of $75,000 for the 9-month period.

Staff have been able to achieve this higher level of performance at the treatment facilities, while at the same time are forecasted to come in approximately $0.5M below the approved 2008 budget of $30.201M. In short, the in-house model continues to be a success and is bringing benefits to the City in terms of improved performance and cost effectiveness.

Moving forward, staff endeavor to sustain and build upon the momentum and work towards the completion of various programs and initiatives to further optimize the processes and achieve improved standards and continued cost effectiveness.

Background

At the September 15, 2004 Council meeting, Council directed staff to implement an “In-house Model” with respect to the operation and maintenance of the water and wastewater treatment facilities. As part of the report respecting “Hamilton’s Water and Wastewater Operations Contract (PW04001(a))”, Council directed that Item 5 of Public Works, Infrastructure, and Environment Committee Report 04-015 be amended by adding the following as sub-section (d):

(d) That the Director of Water and Wastewater bring forward an annual report card with respect to the operations and maintenance of the water and wastewater treatment systems, and that this report will be an update on how staff are performing financially with respect to compliance issues, including the impact of pay equity.

Staff were directed to operate and maintain the water and wastewater treatment facilities as closely as possible to the terms and conditions of the DSA and report annually on their performance with respect to the DSA.

Analysis

In 2004, the City prepared a ‘Draft Service Agreement’ (DSA) for contract operators to bid on for the operation and maintenance of the water and wastewater treatment facilities. The DSA outlined a higher standard of performance than had been present in the previous 10 years and identified wide-ranging qualitative and quantitative performance indicators and objectives, such as water quality targets and wastewater effluent targets. The contract rating criteria was divided into two primary categories. There was a mandatory ‘compliance criteria’ for water quality and wastewater treatment, for which penalties are assessed for not achieving these minimum quality criteria. There was also a much more stringent ‘performance criteria’ for which the DSA awards incentive payments based on monthly achievement of those criteria.

The various performance indicators and overall operation and maintenance objectives were described in detail throughout various sections of the DSA. To determine how the City’s staff managed and operated the facilities, a detailed assessment was carried out and a comparison undertaken of these performance indicators and the objectives listed in the DSA with the actual operations during 2008. An overview of this comparison is provided below.
1. General Operations and Maintenance of Facilities

1.1 The DSA required that the facilities be operated and maintained in a cost-effective and professional manner and in accordance with Best Management Practices, the Certificates of Approval (CofAs), and the requirements of other applicable laws.

During 2008, staff successfully operated and maintained the water and wastewater treatment facilities in a professional manner and were consistent with the requirements of the various CofAs and other applicable laws.

1.2 The DSA required that a quality management system and other operational plans be developed to improve operations and to ensure long-term sustainability of the facilities.

(a) To ensure quality, environmental, health and safety management, the Water and Wastewater Division developed a Beyond Compliance Operating System (BCOS). The structure of this system is consistent with the Drinking Water Quality Management System mandated by the Ministry of Environment under the Safe Drinking Water Act and the DWQMS operational plan development will be completed by year end.

(b) The Asset Management Plan for the facilities is being implemented, as part of this plan a risk assessment of the water and wastewater systems was completed earlier this year. The plan will help establish short- and long-term priorities for treatment process and facility infrastructure upgrades.

(c) A Computerized Maintenance Management System is being utilized and further configured to ensure the efficient and reliable functioning of equipment and to maintain the integrity of the facility assets. This system enables the plant maintenance staff to effectively implement preventive maintenance programs, while assisting management with asset replacement decisions.

(d) A SCADA system master plan is being developed and will be implemented over the course of the next 3 years to review the existing SCADA technology platforms, data collection and reporting, and alarming and control automation to ensure that current and future operational and regulatory needs are consistently achieved at all water and wastewater facilities. An integral part of this SCADA master plan is the development of management information systems necessary to operate the facilities in a coordinated and cost-effective manner to adequately meet the community needs.

1.3 The DSA required preparation of quarterly and yearly reports as required under the various regulations and CofAs.

Staff produced all quarterly and annual reports as required under the various regulations and Certificates of Approval.
1.4 The DSA required development and implementation of employee training and certification programs, and health and safety programs and plans.

(a) The Water and Wastewater Division training committee has been established to ensure the development and retention of qualified staff to effectively operate the water and wastewater systems. Integral to this plan is the establishment of training matrixes to ensure that the training and certification programs are met in accordance with the requirements of Regulation 128/04 under the Safe Drinking Water Act.

(b) A cross-training program is being implemented at the plant to cross train operators in both water and wastewater systems.

(c) An active health and safety program is also being implemented at the facilities, which is continually improving the safety at the City’s water and wastewater facilities.

1.5 The DSA required the revision and update of operations and maintenance manuals.

Staff updated the various Operation and Maintenance Manuals and finalized many new Standard Operating Procedures (SOPs). Staff are also working towards establishing the framework for manuals and SOP document control under the Beyond Compliance Operating System (BCOS).

2. Water Quality

2.1 The DSA required that water facilities be appropriately operated to ensure adequate production, transmission, and storage of water to meet water quality compliance and performance criteria while maintaining appropriate main pressures and emergency and fire storage volumes.

(a) Staff were able to consistently meet all the drinking water quality requirements at the Woodward Water Treatment Plant under the Safe Drinking Water Act.

(b) Staff were able to ensure adequate production, transmission, and storage of water to maintain appropriate pressure and emergency and fire storage.

2.2 The DSA proposed ‘Performance Criteria’ for water quality in respect of turbidity, total aluminum, pH, fluoride, residual, Trihalomethanes, taste and odours, and microbiological concentrations.

(a) Staff were able to consistently achieve the performance criteria for the Woodward Water Treatment Plant throughout the report period with exception of aluminum and fluoride, which have been achieved for 4 out of the 9 months. In order to achieve the aluminum performance target a capital upgrade project is being implemented and construction will be completed by year end. The fluoride performance target will also be addressed via a capital upgrade in 2009.

(b) Maintaining of chlorine residual above the minimum levels was achieved at the extremities of the distribution system at all times during the 9-month period and the performance criteria were consistently achieved by the Woodward-based system.
c) Staff were able to consistently achieve the performance criteria for the various well-based systems during the entire 9-month period.

(d) The performance criteria for the well water Turbidity target was achieved at the Carlisle wells. For the Greensville well, the performance criteria doesn't apply due to recent upgrades to the treatment process and the associated SCADA data collection approaches.

2.3 The DSA proposed a drinking water quality incentive payment of $10,000 per month to the contractor for achieving the water quality performance criteria.

A performance similar to that achieved in 2008 would have entitled the contractor to a water quality incentive payment of $30,000 for the 9-month period.

2.4 Further, the DSA required optimum filter performance to prevent loss of granular activated carbon (GAC) and not to exceed more than a 25 mm depth during a 12-month period.

Preliminary estimates suggest that there was no GAC loss of more than 25 mm during the 9-month period.

3. Treatment of Wastewater

3.1 The DSA required that the wastewater facilities be operated to consistently achieve all compliance and performance criteria, while reducing bypass events and working towards achievement of Hamilton Harbour Remedial Action Plan targets.

(a) The Woodward WWTP performance for the 9 months in 2008 was better or equal to the average performance over the previous 12 years and the “initial RAP” loading targets for final ammonia based on 2008 flows has been achieved to date. During 2008 the plant flows have been greater than the previous 12-year average for 6 out of the 9 months.

3.2 The DSA proposed ‘Performance Criteria’ for wastewater treatment at the Woodward WWTP in respect of Biological Oxygen Demand (BOD), Total Suspended Solids (TSS), Total Phosphorous, Faecal Coliform, and pH. Similarly performance criteria were also proposed for the King Street WWTP and the Main Street WWTP.

(a) Staff were able to achieve the performance criteria for 5 months at the Woodward WWTP, 5 months at the King Street WWTP, and 7 months at the Main Street WWTP during the first 9 months of 2008.

(b) The DSA proposed a wastewater treatment incentive payment of $15,000 per month to the contractor for achieving the effluent performance criteria. A treatment performance similar to what staff achieved in 2008 would have entitled the contractor to an incentive payment of $45,000 for the 9-month period.

(c) During 2008, significant treatment improvements were achieved at the Woodward WWTP throughout the year. The following is an assessment and comparison of this year’s performance with the historic data:
(i) In the case of effluent Total Suspended Solids (TSS), the compliance targets were achieved throughout the first 9 months of the year. The average annual effluent TSS concentration during 2008 was lower than the previous 12 years’ averages for 8 of the 9 months.

(ii) The average annual effluent ammonia concentration during 2008 to date was lower than the previous 12 years’ averages for 6 out of 9 months and the yearly average “initial RAP” target was achieved.

(iii) In the case of effluent Total Phosphorous (TP), both the compliance and performance targets were achieved throughout the year. The average annual effluent TP concentration during 2008 was similar to the previous 12 years’ averages.

(iv) In the case of effluent Biological Oxygen Demand (BOD), the compliance targets were achieved throughout the year and the average annual effluent BOD concentration during 2008 was inline with the previous 12 years’ averages.

3.3 The biosolids from all three plants were to be effectively managed and treated to the compliance targets.

Staff were able to effectively manage the Biosolids Land Applications program for all three wastewater treatment plants. As well, a Biosolids Master Plan and Biosolids Environmental Management System (EMS) are being implemented.

Financial Implications

At the start of 2008, $30.201M was budgeted for the in-house model. The transition to the in-house model and continued improvements in operations that have been achieved in the first 9 months of this year are resulting in a forecasted 2008 cost of $29.701M, for a savings of $0.5M from the original maintenance budget. In addition to these savings, the City avoided incentive payments to a potential contract operator of over $75,000.

Staff Implications

Throughout 2008, significant efforts were made to fill various vacant positions. The response to the advertised postings continues to be less than favorable and not many qualified and certified operators applied for the positions. This is reflective of the overall shortage of skilled and certified operators within the industry. Going forward, the City will have to undertake more aggressive marketing to attract skilled and well-trained operators.

With respect to pay equity, there has been no notable link to increase in staff compensation throughout the corporation due to the migration of the treatment facilities to an “in-house” model.

Consultation

As directed by Council, Water and Wastewater staff held three Public Information Centres (PICs) at various locations throughout the City. The majority of comments were positive with respect to the performance of the treatment facilities and the overall “in-house” model to date.
Staff also consulted with the Budgets and Finance Division of the Corporate Services Department and they are in agreement that the treatment facilities are being operated such that they are forecasted to be under budget by $0.5M in 2008.

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