SUBJECT: Hamilton Water and Wastewater Operations Contract - Annual Report Card - (PW06041) - (City Wide)
Public Works, Infrastructure & Environment Committee Outstanding Business Item “C”

RECOMMENDATION:


(b) That Item C, “Hamilton Water and Wastewater Operations Contract” be removed from the Public Works, Infrastructure, and Environment Committee Outstanding Business List.

EXECUTIVE SUMMARY:

PW06041 is the 2005 annual report card respecting the operation and maintenance of the City of Hamilton’s water and wastewater treatment facilities. Various qualitative and quantitative objectives and performance targets were identified in the ‘Draft Service Agreement’ (DSA) that was provided to private operators for bidding. The operations of 2005 are compared with those objectives and performance targets and it is apparent that the facilities have generally been operated within the guidelines laid out in the DSA.
The contract rating criteria is divided into two primary categories. There is a mandatory ‘compliance criteria’ for water quality and wastewater treatment, for which penalties are assessed for not achieving these minimum quality criteria and there is also a much more stringent ‘performance criteria’ for which the DSA awards incentive payments based on monthly achievement of those criteria.

Although the treatment facilities were operated generally in line with the DSA, the Woodward Wastewater Treatment Plant (WWTP) did have various upset conditions and failed to meet the MOE’s compliance criteria during November and December 2005 due to the numerous repairs and upgrade projects, which reduced the South Plant capacity by 50% resulting in excessive stressful conditions at the plant. Penalties to an operator would not have been assessed during this period due to the capital construction.

If the last two months (during which construction activities reduced the capacity of the plant) are not considered, the cumulative treatment performance at the Woodward WWTP could be considered better than the previous fifteen (15) years, despite the fact that the incoming average sewage flows were the highest ever and are closely approaching the rated capacity of the plant.

The DSA proposed separate water quality and wastewater treatment incentive payments of $10,000 and $15,000 per month respectively to the contractor for achieving certain performance criteria. Based on the performance that is described in this report for 2005, a contractor would have been entitled to an incentive payment of $195,000.

Staff have been able to achieve this higher level of performance at the treatment facilities, while at the same time coming in approximately $1.2M below the approved budget of $27.7 million. In short, the in-house model has been a success and is bringing benefits to the City in terms of improved performance and cost effectiveness.

Looking forward, staff will continue to build on the momentum and complete the various programs and initiatives to further optimize the processes and achieve improved standards and 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/RATIONALE:

In 2005, 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 is divided into two primary categories. There is a mandatory ‘compliance criteria’ for water quality and wastewater treatment, for which penalties are assessed for not achieving these minimum quality criteria and there is 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 are 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 2005. 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 2005, staff have 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 management, the Water and Wastewater Division is developing a Beyond Compliance Operation System (BCOS). The final structure of the system is being developed and will be consistent with the proposed regulatory management system being developed by the MOE under the Safe Drinking Water Act.

(b) To ensure long-term sustainability, staff are developing an Asset Management Plan for the facilities with the help of outside professional services. The plan will help in setting up short- and long-term priorities.

(c) To ensure proactive maintenance and long-term sustainability of the facilities, a Computerized Maintenance Management System (CMMS) is also being developed and implemented. The system will assist the plant’s maintenance staff to effectively respond to maintenance issues, while assisting management with asset replacement decisions.

(d) A SCADA master plan and optimization plan is also being developed, which will ensure that current and future operational and regulatory needs are
consistently achieved. In addition, various upgrades and modifications are being completed to improve data communication and storage.

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 CofAs.

1.4 The DSA required development and implementation of employee training and certification programs, and health and safety programs and plans.

(a) Water and Wastewater Division is developing a staff training matrix to ensure that the training and certification programs are met. The matrix is being modified to meet the requirements of the new Regulation 128/05 under the Safe Drinking Water Act.

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

(c) An active health and safety program is also being developed at the facilities. The various procedures are being updated to make them consistent with the various City standards and polices.

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

Staff are updating the Operation and Maintenance Manuals and finalizing new Standard Operating Procedures (SOPs). Efforts are also underway to develop a web-based SOP system so that staff will be able to access up-to-date information at all times.

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) During 2005, staff were able to consistently achieve all the water quality compliance requirements 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 aluminium, pH, fluoride, residual, Trihalomethanes, taste and odours, and microbiological concentrations.

Staff were able to achieve the performance criteria for nine (9) months during the year with the exception of aluminium at the Woodward WTP and turbidity at the Lynden well system. In order to achieve the aluminium performance target a capital upgrade was required and the Lynden Turbidity performance target needed the MOE's approval for the optimization/corrective program. This work has now been completed.
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 2005 would have entitled the contractor to a water quality incentive payment of $90,000.

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

The GAC loss on some filters was more than the 25 mm during the period. However, this was because one quadrant in the water plant has been out of service for the upgrades and that is resulting in extra loading on the in-service filters.

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 wastewater treatment plant operated better than the 12-year average for 10 months of the year. The treatment performance at the Woodward WWTP was significantly improved starting in March 2005 up to September 2005. In October, the upgrades and repairs in the South Plant resulted in the loss of 50% treatment capacity, which significantly stressed the plant and resulted in process upsets during November and December. As a result of the upset conditions, the compliance criteria were not achieved for the months of November and December 2005. The MOE was made aware of the non-compliance and the MOE understands that there are times during construction when the WWTP could have potential upset conditions. City staff are working with the MOE staff to ensure there are no future upsets.

(b) The rated capacity of the Woodward WWTP is 409 MLD and during 2005, the average flow to the plant was 384 MLD, which is the highest recorded average flow in the past 15 years. The plant was able to effectively deal with the extreme storms that occurred during the year. On two occasions the plant received its highest ever flows and was able to pump out the approximately 1450 MLD, but this is not sustainable. The plant can only run at this level for very short durations to avoid flooding of homes. The higher flows and wet weather events were effectively managed during the year and there were fewer bypass events in 2005 than in any of the previous five (5) years.

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 seven (7) months, 11 months and 12 months at the Woodward WWTP, King Street WWTP, and Main Street WWTP respectively during 2005.

(b) The DSA proposed wastewater treatment incentive payment of $15,000 per month to the contractor for achieving the effluent performance criteria. Treatment performance similar to that of 2005 would have entitled the contractor to an incentive payment of $105,000.

(c) During 2005, significant treatment improvements were achieved at the Woodward WWTP for seven (7) months resulting in significantly improved treatment performance. The treatment in the last two months was significantly impacted by the construction/repair activities which reduced the South Plant capacity to 50% of the designed rated capacity. The following is an assessment and comparison of the last year’s performance with the historic data:

(i) In the case of effluent TSS, the compliance targets were achieved for 10 months and the performance targets were achieved for seven (7) months. If the results of the last two (2) months are not considered, the effluent TSS would have been the lowest in the previous nine (9) years.

(ii) Even with the upset conditions of November and December, the average annual effluent ammonia concentration during 2005 was the lowest in the previous 14 years.

(iii) In the case of effluent Total Phosphorous (TP), the compliance and performance targets were achieved for 10 months. If the results of the last two (2) months are not considered, the effluent TSS would have been the lowest in the previous seven (7) years. Removal of TP is achieved by optimal dosage of pickle liquor, which the plant received from Stelwire/Stelco as part of a long-standing agreement. During 2005, due to significant uncertain condition and production issues at Stelwire, it was extremely difficult to receive appropriate quality and quantity of the chemical and time sensitive and last minute arrangements would have to be made with other suppliers. Due to bankruptcy protection of Stelco/Stelwire, it was not possible to negotiate any performance standards or alternate arrangements for the supply of chemicals.

(iv) In the case of effluent Biological Oxygen Demand (BOD), the compliance targets were achieved throughout the year, while the performance targets were achieved for 11 months. Even with the upset conditions of November and December, the average annual effluent BOD during 2005 was the lowest in the previous 10 years. If the results of the last two months are not considered, the effluent BOD would have been the lowest in the previous 15 years.

(d) The upgrades at the South Plant are partially complete and as soon as the upgraded components were made available, the plant recovered from the upset conditions of November and December 2005. The remaining upgrades to the South Plant will be completed in the near future and efforts will be made to avoid any plant upset conditions.
3.3 The biosolids from all the three plants were to be effectively managed and treated to the compliance targets.

Staff were able to effectively manage and treat the biosolids from all three plants to meet the compliance targets. As well, a Biosolids Master Plan and Biosolids Environmental Management System (EMS) are being developed.

**ALTERNATIVES FOR CONSIDERATION:**

N/A

**FINANCIAL/STAFFING/LEGAL IMPLICATIONS:**

Financial Implications:

At the start of 2005, $27.7 million was budgeted for the in-house model. The significant improvements in operations and the transition to the in-house model were achieved for a budget of $26.5 million with a savings of $1.2M in the original anticipated budget. In addition to a savings of approximately $1.2M dollars, the City avoided incentive payments to a potential contract operator of over $195,000.

Staff Implications

Throughout the year, significant efforts were made to fill in the various vacant positions. The response to the advertisements was not good 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.

While with the private operator, the treatment operators were in the International Union of Operating Engineers (IUOE) Local 772. To make them consistent with the other operators in the City, the City moved them to CUPE Local 5167, which created tensions between the two Locals and the City. The issue was subsequently resolved through arbitration at the Labour Board, where a compromised solution was reached wherein the treatment operators will remain in the IUOE Local 772 until 2010 and will then be moved to CUPE Local 5167 after that.

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.

Legal Implications:

N/A

**POLICIES AFFECTING PROPOSAL:**

N/A

**RELEVANT 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 Human Resources Department with respect to Pay Equity and they were in agreement with the fact that there was no notable link to increase in staff compensation and the migration of the Treatment Facilities to an “in-house” model.

Staff also consulted with the Budgets and Finance Division of the Corporate Services Department and they are in agreement that the Treatment Facilities were operated by more than $1.2 million under budget.

**CITY STRATEGIC COMMITMENT:**

By evaluating the “Triple Bottom Line”, (community, environment, economic implications) we can make choices that create value across all three bottom lines, moving us closer to our vision for a sustainable community, and Provincial interests.

**Community Well-Being is enhanced.**  Yes  No
Improvements in water quality create greater confidence in the City’s ability to provide clean, safe, drinking water and is evidence that the community well-being is enhanced.

**Environmental Well-Being is enhanced.**  Yes  No
The improvement to the effluent quality going out into Hamilton Harbour is a significant improvement to the environment and will assist Hamilton in reaching the HHRAP targets and de-listing the Harbour by 2014.

**Economic Well-Being is enhanced.**  Yes  No
The in-house model has avoided over $195,000 dollars in incentive payments that would have been paid to a contractor operator for similar performance and staff have operated the facilities for $1,200,000 less than the 2005 allocated budget.

**Does the option you are recommending create value across all three bottom lines?**  Yes  No
Water quality improvements, environmental improvements, and economic savings are evidence of value across all three bottom lines.

**Do the options you are recommending make Hamilton a City of choice for high performance public servants?**  Yes  No
N/A