



*Office of the Auditor General*

**AUDIT OF THE WASTEWATER AND  
DRAINAGE SERVICES DIVISION**

**2006 Report**

**Chapter 10**



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## EXECUTIVE SUMMARY

### *Introduction*

The Audit of the City of Ottawa's Wastewater and Drainage Services Division was initially included in the Auditor General's 2007 Audit Plan which was presented to City Council on December 15, 2004. At the request of City Council, this audit was brought forward to 2006.

### *Background*

Prior to amalgamation in 2001, the services currently provided by the Wastewater and Drainage Services Division (WDS) were split between the various municipalities and the different levels of municipal government (Region and local municipalities). The main wastewater treatment facility (R.O. Pickard Environmental Centre), trunk sanitary sewers and large sanitary pumping stations were operated and maintained at the regional level. All remaining infrastructure was essentially the responsibility of the local municipalities. As such, following amalgamation, WDS has experienced a high degree of change. This is different than the WDS "sister utility", the Drinking Water Services Division, a completely regional operation from the river to the customer's tap since 1969. As with most departments within the City, all areas of the WDS operations have been impacted by the City's 2001 amalgamation.

As a result of substantial new legislative and regulatory requirements, WDS was selected for an audit to determine whether it is in compliance with the regulatory changes.

The City of Ottawa operates under a "centres of expertise" model, with the result that WDS also relies on specialized groups to support its activities in such areas as real infrastructure services, property management, fleet services, financial services, information technology, public relations, legal services and human resources management.

### *Audit Objectives*

The audit included an examination of WDS regulatory compliance and performance as outlined and defined through the audit objectives, which were to determine:

- Compliance with applicable federal and provincial guidelines, standards, and regulations;
- The City's program to reduce inflow and infiltration into the sanitary sewer system;
- The Structure and overall efficiency of the Wastewater Collection Section within WDS;

- The overall operations of the WDSB with respect to best practices; and
- The City's status on meeting upcoming Provincial regulatory requirements (Quality Management System).

### ***Audit Scope***

The audit focused on WDSB, but also included an examination of the Customer Services and Operational Support Division, and other Infrastructure Services Branch Divisions, that have substantial impacts on customer service levels and on the operations and maintenance of the sewer infrastructure. The audit considered the adequacy of support WDSB receives from centres of expertise to support its basic functions, but did not examine the functioning of the centres of expertise or the activities of other groups that may be charged to the wastewater fund, either directly or indirectly.

While this audit focused on the operational activities of WDSB, it also reviewed the various other groups across the City that provide services to the wastewater and stormwater system infrastructure. The audit approach included:

- An initial document review and selected interviews;
- Development of audit objectives and criteria as part of an audit plan;
- Review of the audit plan with key management members;
- Review of the relevant legislation and regulations and reports expected to lead to changes in legislation and/or regulations;
- Collection, review and analysis of related documentation, reports and data from the City, industry associations and municipalities Canada-wide, comparing regulatory compliance and performance of wastewater system operations;
- Benchmarking comparisons with cities from across Canada;
- Extensive interviews within WDSB, Customer Services and Operational Support Division, and the Infrastructure Management and Construction Services - Development Divisions within the Infrastructure Services Branch; and
- Review of the report by management, and the inclusion of their comments.

### ***Key Findings***

#### **1. The WDSB meets all federal and provincial guidelines, standards and regulations, with the exception of operator training.**

- The City's wastewater system meets all guidelines and regulations with the exception of operator training required as defined under the provincial certification process. Licensed Wastewater Treatment and Wastewater Collection Operators in WDSB are required to undergo a minimum amount of training on an annual basis

as per provincial regulations. Over 55% of the WSDS Certified Operators did not meet the minimum of 40 hours of training in 2005.

**2. The City does not have an overall sewer inflow and infiltration reduction strategy.**

The City does not have a dedicated program or any dedicated resource to address inflow and infiltration into the sanitary sewer system. Large quantities of inflow and infiltration from surface runoff or groundwater go into the sewer conveyance system (sewers) and can have numerous detrimental consequences, including:

- reduce the available capacity in the sewers,
  - impacts the pumping capacity at pumping stations,
  - reduce the treatment capacity at the wastewater treatment facility,
  - increase operating costs,
  - generate sewer backups, and
  - generate sewer overflows to receiving streams.
- Although there is no dedicated inflow and infiltration reduction program, the City does address inflow and infiltration through a number of other capital infrastructure programs related to the sewer fund. Many individual inflow and infiltration problems are corrected through the integrated road/water/sewer infrastructure replacement or rehabilitation projects.
  - An overall wet weather flow management study should be undertaken for the City. An inflow and infiltration strategy should be a component of the wet weather flow management study.
  - Data collection related to inflow and infiltration has been focused on areas of highest concern, such as areas where basement flooding has occurred. There is no current strategy to collect the data needed to understand the overall inflow and infiltration impact on the City's sanitary sewer system.
  - Resources have been dedicated to try and meet known sewer backup problems. Recent sewer rate adjustments have provided capital investment for infrastructure improvements. The focus of sewer infrastructure improvements has been on large inflow problems or sewer capacity issues.
  - Current flow monitoring data is being tabulated more for system growth or storm flooding events as opposed to specific inflow and infiltration issues.
  - The City should gain a better understanding of the private sewer systems that discharge into the municipal system, including their impact on inflow and infiltration.

### **3. The City's R.O. Pickard Environmental Centre is an efficiently operated and maintained facility.**

- The R.O Pickard Environmental Centre is classified at a level 4 (highest level) facility by the provincial Ministry of the Environment and meets all treatment and environmental discharge regulatory requirements.
- The co-generation facility at the R.O. Pickard Centre is considered a "best-in-class" operation within the wastewater industry.
- The R.O. Pickard Environmental Centre is expanding (new digesters) to meet greater wastewater flow requirements in the immediate future.

### **4. The amalgamation of the City's 75+ sanitary and storm pumping stations has been efficient.**

- An inventory and condition assessment of all pumping station facilities and equipment was undertaken over the last four years and programs are in place to replace or rehabilitate equipment as required over the next ten plus years.
- The amalgamation of the sanitary and stormwater pumping stations across the City has proceeded with little impact to customers or the environment.
- The City has implemented a new Supervisory Control and Data Acquisition system for all pumping stations, allowing these facilities to be operated and maintained more efficiently.
- The fact that the WDSO has been able to centralize the operation of all of these pumping stations and implement a comprehensive operations and maintenance plan in such a short time frame is commendable.
- The Construction Services Division within the Infrastructure Services Branch has provided excellent engineering and construction management support to the WDSO during the program to consolidate the operations and maintenance of the pumping stations.

### **5. The City's combined sewer system requires upgrades to meet the provincial Ministry of the Environment Procedure F-5-5.**

- The Ontario Ministry of the Environment (MOE) implemented a procedure in the mid 1990's for municipalities to deal with combined sewer systems and their associated overflows to receiving streams.
- The City has a plan in place to meet key components of MOE Procedure F-5-5, referred to as the Real Time Control Program. This program is meant to replace the previous Somerset Street storage tunnel, at a lower overall cost, and in a shorter time period.

- The City still has to address a number of other components of MOE Procedure F-5-5, including a Pollution Prevention and Control Plan.

**6. The amalgamation of WSD Wastewater Collection Section is a continual improvement process.**

- During the past five years, sewer operations and maintenance staff of the Wastewater Collection Unit have undergone numerous changes, including: recentralizing their operations from the City's Bayview Yards to the R.O. Pickard Environmental Centre; restructuring from five groups to three groups to two groups (East & West split); and staff training on new systems for maintenance management, human resources, procurement and finance.
- Sewer maintenance activities in this unit continue to be more reactive than proactive as staffing levels cannot keep pace with workload. In 2005, City Council approved an additional 11 staff for the WSD, of which 6 are to be assigned to the Wastewater Collection Unit to meet workload issues. As of late summer 2006, some of the vacant supervisory positions had been filled internally, but eleven positions remain open. Management is actively working towards filling these positions.
- Maintenance activities on the sewer system are completed by various groups across the City.

**7. The City's stormwater management facilities and rural drainage responsibilities are well operated.**

- The amalgamation of all municipal drains into one section within the City was completed smoothly.
- The operations of the City's municipal drains meets all regulatory requirements, are well documented and are considered "best-in-class".
- The operations of the City's stormwater management facilities meet all regulatory requirements. The Stormwater Management Unit within WSD has a good inventory database of all 160+ public and private stormwater management facilities across the City. Design standards for new stormwater management facilities are in place. Approximately 10 new stormwater management facilities come on line each year.

**8. Accountability for the operation and maintenance of the City's wastewater system is dispersed, with only the Deputy City Manager of Public Works and Services having overall responsibility.**

- The operations and maintenance of the City's wastewater system is dispersed between various divisions in the Utility Services Branch and the Infrastructure Services Branch.

- Both Utility Services and Infrastructure Services claim overall responsibility for the sewer system. It is recommended that overall responsibility for the operations and maintenance of the wastewater system be clarified below the level of Deputy City Manager, and that units not directly reporting to the lead organization be accountable to it via service level agreements.

## ***Recommendations***

### **Recommendation 1**

**That WDSO continually update and closely monitor their staff training regulatory requirements to make certain these are met.**

#### **Management Response**

Management agrees with this recommendation. The Training Coordinator now meets with the Divisional Management Team on a monthly basis to review the training plan and monitor progress to ensure that all certified operators receive the required training.

### **Recommendation 2**

**That City-wide decisions with regards to reducing staff training or restriction on staff travel consider the regulatory training requirements of staff in both WDSO and the Drinking Water Services Division.**

#### **Management Response**

Management agrees with this recommendation. The Training Coordinator, through the Divisional management team, will ensure all regulatory requirements are satisfied and completed. Quarterly reports will be received to monitor the number of training hours to ensure full compliance with training requirements.

### **Recommendation 3**

**That the City develop a Wet Weather Flow Management Strategy.**

#### **Management Response**

Management agrees with this recommendation. This is an initiative that has been identified by the Infrastructure Services Branch as part of the overall asset management program for the wastewater and stormwater systems. Commencement of this project is anticipated in 2008. The cost of the project will be estimated once the scope has been defined.

### **Recommendation 4**

**That WDSO conduct an inflow and infiltration study of the overall sanitary sewer system to address sewer capacity and system integrity issues.**

**Management Response**

Management agrees with this recommendation. This initiative will be led by the Infrastructure Services Branch in close collaboration with the Wastewater and Drainage Services Division of the Utility Services Branch. The recommendation will be included in the Wet Weather Flow Management Strategy for 2008. Cost estimates will be determined once scope has been defined.

**Recommendation 5**

**That WDSB bring forward a report to City Council addressing all elements of their inflow and infiltration reduction strategies, including:**

- a) inflow and infiltration data capture and monitoring;**
- b) sewer system analysis;**
- c) sewer system remediation plan development; and**
- d) sewer system remediation plan implementation.**

**Management Response**

Management agrees with this recommendation. This initiative will be led by the Infrastructure Services Branch in close collaboration with the Wastewater and Drainage Services Division of the Utility Services Branch. These elements will be included in the Wet Weather Flow Management Strategy that will be initiated in 2008. Costs will be identified once the scope has been defined.

**Recommendation 6**

**That WDSB identify a specific group to lead and be responsible for all inflow and infiltration reduction programs.**

**Management Response**

Management disagrees with this recommendation. Responsibility for these programs rests with the Infrastructure Services Branch. Collaboration with the appropriate operating group is a well-established protocol.

**Recommendation 7**

**That WDSB proceed with the Real Time Control Program to bring the City into compliance with key components of Ministry of the Environment (MOE) Procedure F-5-5.**

**Management Response**

Management agrees with the recommendation. This initiative will be led by the Infrastructure Services Branch in close collaboration with the Wastewater and Drainage Services Division of the Utility Services Branch. Detailed design work is underway with construction planned for 2007 and 2008. It is estimated it will cost \$18M for implementation of this program with \$13M identified in the 2007 budget and \$5M in 2008.

**Recommendation 8**

**That WDSO provide yearly combined Ssewer overflow monitoring reports to City Council and the MOE.**

**Management Response**

Management agrees with this recommendation. Wastewater and Drainage Services will comply with all mandatory reporting requirements, which have not yet been established. Commencement of this report is anticipated for 2008 and annually thereafter.

**Recommendation 9**

**That WDSO develop a Pollution Prevention and Control Plan that meets the needs of the City and the requirements of MOE Procedure F-5-5.**

**Management Response**

Management agrees with this recommendation. Preparation of the plan and required infrastructure is actively in development with ISB as the lead and support from the operating branches. This initiative is anticipated to be completed in 2008.

**Recommendation 10**

**That Wastewater Collection Unit fill vacant positions as soon as possible.**

**Management Response**

Management agrees with this recommendation. All vacancies within the Wastewater Collection Unit have been filled.

**Recommendation 11**

**That WDSO complete a condition assessment of all access holes and catch basins to allow maintenance, rehabilitation or replacement prioritization.**

**Management Response**

Management agrees with this recommendation. However, it is noted that the assessment is completed by the Infrastructure Management Division of the Infrastructure Services Branch, as part of their overall asset management mandate.

The condition of manholes is assessed as part of the ongoing closed circuit television surveys of the wastewater and stormwater systems. The system inspection is undertaken as part of the development of annual infrastructure rehabilitation projects and the frequency is targeted for a 10 to 15 year inspection cycle.

**Recommendation 12**

**That Public Works and Services conduct periodic audits on newly commissioned sewer and drinking water infrastructure to provide appropriate feedback to the**

**Construction Services - Development Division for their role in commissioning of infrastructure.**

**Management Response**

Management agrees with this recommendation. A periodic inspection of some newly commissioned systems will provide constructive support to Construction Services starting in 2007.

**Recommendation 13**

**That staff training within the Wastewater Collection Unit continue to be a priority to satisfy regulatory requirement and the WSDS goals for appropriate cross-training.**

**Management Response**

Management agrees with this recommendation. Currently, the Training Coordinator is collaboratively developing a strategic training plan within the USB divisions.

**Recommendation 14**

**That WSDS provide the minimum amount of yearly training to all provincially certified operators within the Division.**

**Management Response**

Management agrees with this recommendation. The Training Coordinator now meets with the Divisional management team on a monthly basis to review the training plan and monitor progress to ensure that all certified operators receive the required training.

**Recommendation 15**

**That Corporate Occupational Health and Safety monitor changes to the Occupational Health and Safety Act, and provide all operating groups with possible impacts on their facilities and operations.**

**Management Response**

Management agrees with this recommendation. Roles will be defined with the Corporate Occupational Health and Safety and USB to develop Service Level Agreements to facilitate USB needs, which will be lead by the Training Coordinator in 2007.

**Recommendation 16**

**That the Utility Services Branch consider a full Quality Management System (QMS) for all environmental programs (Water, Wastewater, Biosolids, and Solid Waste).**

**Management Response**

Management agrees with this recommendation. A Quality Management System (QMS) was implemented for Biosolids management in 2005. Drinking Water Services is implementing a QMS starting in 2007 for completion by Q4 2008. Wastewater and Drainage Services and, Solid Waste be will considered for a Quality Management System in 2009 once the QMS for Drinking Water Services has been completed including identifying the required resources to implement and maintain.

**Recommendation 17**

**That the Utility Services Branch keep City Council informed on the status of regulatory QMS requirements, and on internal QMS programs that are not required through regulations.**

**Management Response**

Management agrees with this recommendation. The Branch management team will review requirements on the regulatory QMS programs and will report as required including non-regulated programs.

**Recommendation 18**

**That the overall operations and maintenance of the wastewater system be reviewed to ensure accountability of an individual below the level of Deputy City Manager.**

**Management Response**

Management disagrees with this recommendation. USB and ISB understand their respective responsibilities and accountability. USB through the Wastewater and Drainage Services Division is accountable for the operation and maintenance of the sewer system. The Infrastructure Management Division of ISB is responsible for the asset management of the linear pipe network. Both groups work cooperatively to ensure that overall services are delivered effectively under the general direction of the Deputy City Manager of PWS.

**Recommendation 19**

**That the City ensure the allocation of costs to the sewer are consistent with current costs and are in compliance with provincial requirements.**

**Management Response**

Management agrees with this recommendation. Through the budget and long range financial planning processes the department advises City Council on the cost allocations associated with the sewer systems and compliance for provincial requirements. The substantiation of proposed cost allocations will be tabled with City Council as part of the 2007 budget process.

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## ***Conclusion***

The audit revealed that all regulations are being met with the exception of the operator training requirements. Regulatory training requirements must be addressed immediately. Due to the nature of the operations and the lack of staff resources, the amalgamation of the sewer operations and maintenance activities has proceeded slowly.

The City's combined sewer system requires upgrades to meet the provincial Ministry of the Environment Procedure F-5-5. The Real Time Control Program budgeted for in 2007 along with a Pollution Prevention and Control Plan is required to bring the City into compliance with key components of this procedure. Finally, the City requires a wet weather flow management strategy, a component of which should deal with inflow and infiltration reductions into the sanitary sewer system.

## ***Acknowledgement***

We wish to express our appreciation for the cooperation and assistance afforded the audit team by Management.

## SOMMAIRE

### *Introduction*

La vérification de la Division des services de drainage et d'épuration des eaux usées (DSDEEU) de la Ville d'Ottawa a été à l'origine incluse dans le plan de vérification 2007 du vérificateur général, qui a été présenté au Conseil municipal le 15 décembre 2004. À la demande du Conseil municipal, cette vérification a été avancée à 2006.

### *Contexte*

Avant la fusion, en 2001, les services actuellement fournis par la DSDEEU étaient répartis entre les diverses municipalités et les différents niveaux administratifs municipale (Région et municipalités locales). La principale installation de traitement des eaux usées (Centre environnemental R.-O.-Pickard), les réseaux d'égouts collecteurs et les grandes stations de pompage des eaux usées étaient exploités et entretenus au niveau régional. Toutes les autres infrastructures relevaient essentiellement des municipalités locales. Par conséquent, après la fusion, la DSDEEU a connu de profonds changements. La situation est différente pour sa division sœur, soit la Division des services de gestion de l'eau potable, qui constituait une activité entièrement régionale de la rivière au robinet du client depuis 1969. Comme pour la plupart des services de la Ville, tous les secteurs des activités de la DSDEEU ont été touchés par la fusion de la Ville en 2001.

À la suite de nouvelles exigences législatives et réglementaires importantes, la DSDEEU a été sélectionnée pour faire l'objet d'une vérification afin de déterminer sa conformité par rapport aux changements réglementaires.

La Ville d'Ottawa fonctionne à partir d'un modèle axé sur les centres d'expertise, si bien que la DSDEEU dépend aussi de groupes spécialisés pour soutenir ses activités dans des domaines tels que les services d'infrastructure réelle, la gestion immobilière, le parc automobile, les services financiers, la technologie de l'information, les relations publiques, les services juridiques et la gestion des ressources humaines.

### *Objectifs de la vérification*

La vérification comprenait un examen de la conformité réglementaire et du rendement de la DSDEEU, tel qu'il est décrit et défini par les objectifs de la vérification, qui consistaient à déterminer :

- la conformité aux lignes directrices, aux normes et aux règlements fédéraux et provinciaux pertinents;
- le programme de la Ville pour réduire le captage et l'infiltration dans le réseau d'égouts sanitaire;

- la structure et l'efficacité générale de l'Unité de la collecte des eaux usées au sein de la DSDEEU;
- les activités générales de la DSDEEU relativement aux pratiques exemplaires; et
- la situation de la Ville en ce qui concerne le respect des prochaines exigences réglementaires provinciales (Système de gestion de la qualité).

### ***Portée de la vérification***

La vérification a porté sur la DSDEEU, mais comprenait un examen de la Division des services à la clientèle et du soutien opérationnel et d'autres divisions de la Direction des services d'infrastructure qui ont une incidence considérable sur les niveaux de services à la clientèle et sur le fonctionnement et l'entretien de l'infrastructure d'égouts. La vérification a évalué la pertinence du soutien que reçoit la DSDEEU des centres d'expertise pour remplir ses fonctions de base, mais n'a pas examiné le fonctionnement des centres d'expertise ou les activités d'autres groupes qui sont peut-être imputées au fonds pour le traitement des eaux usées, directement ou indirectement.

Bien que la vérification ait porté principalement sur les activités opérationnelles de la DSDEEU, elle comprenait également un examen des divers groupes au sein de la Ville qui fournissent des services liés à l'infrastructure des systèmes de traitement des eaux usées et des eaux pluviales. L'approche de vérification incluait :

- un examen initial des documents et des entrevues sélectionnées;
- la définition des objectifs et des critères de la vérification dans le cadre d'un plan de vérification;
- un examen du plan de vérification avec les membres clés de la gestion;
- un examen des lois/règlements et des rapports pertinents qui devraient entraîner des changements aux lois et/ou aux règlements;
- une collecte, un examen et une analyse des documents, des rapports et des données connexes provenant de la Ville, des associations de l'industrie et des municipalités à la grandeur du pays qui comparent les niveaux de conformité aux règlements et le rendement des systèmes de traitement des eaux usées;
- des études comparatives entre les villes à la grandeur du Canada;
- des entrevues exhaustives au sein de la DSDEEU, de la Division des services à la clientèle et du soutien opérationnel et de la Division de la gestion de l'infrastructure et de la Division des services du bâtiment – Aménagement au sein de la Direction des services d'infrastructure; et
- un examen du rapport présenté par la direction et l'inclusion de ses commentaires.

## ***Principales constatations***

### **1. La DSDEEU se conforme à l'ensemble des lignes directrices, des normes et des règlements fédéraux et provinciaux, à l'exception de ceux concernant la formation des opérateurs.**

- Le système de traitement des eaux usées de la Ville est conforme à l'ensemble des lignes directrices et des règlements, à l'exception de ceux concernant la formation des opérateurs qui est requise conformément au processus d'accréditation provincial. Les opérateurs autorisés du traitement des eaux usées et de la collecte des eaux usées de la DSDEEU doivent suivre une formation minimale chaque année, conformément à la réglementation provinciale. Plus de 55 p. 100 des opérateurs accrédités de la DSDEEU n'ont pas suivi le minimum de 40 heures de formation obligatoire en 2005.

### **2. La Ville n'a pas de stratégie globale de réduction du captage et de l'infiltration dans le réseau d'égouts.**

- La Ville n'a pas de programme précis ni de ressources précises pour agir sur le captage et l'infiltration dans le réseau d'égouts sanitaires. D'importantes quantités de captage et d'infiltration provoquées par les eaux de ruissellement ou l'eau souterraine se déversent dans les systèmes d'adduction des eaux usées (égouts) et peuvent entraîner de nombreuses conséquences néfastes, y compris :
  - une réduction de la capacité disponible dans les égouts;
  - une incidence sur la capacité de pompage des stations de pompage;
  - une réduction de la capacité de traitement à l'installation de traitement des eaux usées;
  - une augmentation des coûts de fonctionnement;
  - des refoulements; et
  - des débordements d'égouts dans les milieux récepteurs.
- Bien qu'il n'y ait pas de programme précis de réduction du captage et de l'infiltration, la Ville s'attaque à ce problème par l'intermédiaire d'un certain nombre d'autres programmes d'immobilisations relatifs au fonds consacré au réseau d'égouts. Un grand nombre de problèmes de captage et d'infiltration sont corrigés dans le cadre de projets de réhabilitation/remplacement des infrastructures routières, hydrauliques et d'égouts.
- Une étude générale sur la gestion des débits de temps de pluie devrait être entreprise pour la Ville. Une stratégie de réduction du captage et de l'infiltration devrait faire partie de cette étude.
- La collecte de données sur le captage et l'infiltration a porté sur des secteurs suscitant de très grandes préoccupations, comme les secteurs où des inondations de sous-sol se sont produites. Il n'existe actuellement aucune stratégie pour la collecte

de données permettant de comprendre l'incidence générale du captage et de l'infiltration sur le réseau d'égouts sanitaire de la Ville.

- Des ressources ont été affectées pour tenter de régler les problèmes de refoulement d'égouts connus. De récentes révisions apportées à la surtaxe d'égout ont permis d'engager des dépenses en immobilisations pour améliorer les infrastructures. Les travaux d'amélioration des infrastructures ont été axés sur les importants problèmes de captage ou de capacité du réseau d'égouts.
- Les données de contrôle du débit actuelles sont calculées plus en vue de l'expansion du réseau ou des inondations à la suite d'orages qu'en vue de la résolution de problèmes précis de captage et d'infiltration.
- La Ville devrait chercher à mieux comprendre les réseaux d'égouts privés qui déversent des eaux dans le réseau municipal, y compris leur incidence sur le captage et l'infiltration.

### **3. Le Centre environnemental R.-O.-Pickard de la Ville est une installation qui est exploitée et entretenue efficacement.**

- Le Centre environnemental R.-O.-Pickard est classé comme une installation de niveau 4 (niveau le plus élevé) par le ministère provincial de l'Environnement et est conforme à toutes les exigences réglementaires relatives au traitement et aux rejets dans l'environnement.
- L'installation de cogénération de l'installation du Centre environnemental R.-O.-Pickard est considérée comme la meilleure de sa catégorie dans l'industrie du traitement des eaux usées.
- Le Centre environnemental R.-O.-Pickard s'agrandit (nouveaux digesteurs) pour répondre à un débit plus important d'eaux usées dans l'immédiat.

### **4. La fusion de plus de 75 stations de pompage des eaux usées et pluviales de la Ville a été efficace.**

- Un inventaire et une évaluation de l'état de l'ensemble des installations et de l'équipement des stations de pompage ont été effectués au cours des quatre dernières années, et des programmes sont en place pour remplacer ou réhabiliter l'équipement, au besoin, au cours des 10 plus prochaines années .
- La fusion des stations de pompage des eaux usées et pluviales de toute la ville s'est faite sans grande incidence sur les clients ou l'environnement.
- La Ville a mis en place un nouveau système d'acquisition et de contrôle des données (système SCADA) pour toutes les stations de pompage, afin de permettre un fonctionnement et un entretien plus efficaces de ces installations.

- Le fait que la DSDEEU a réussi à centraliser le fonctionnement de toutes ces stations de pompage et à mettre en œuvre un plan détaillé de fonctionnement et d'entretien dans un délai aussi court est louable.
- La Division des services du bâtiment de la Direction des services d'infrastructure a fourni un excellent soutien en matière de gestion de l'ingénierie et de la construction à la DSDEEU durant le programme visant à regrouper les activités de fonctionnement et d'entretien des stations de pompage.

#### **5. Le réseau d'égout unitaire de la Ville nécessite des améliorations pour être conforme à la procédure F-5-5 du ministère provincial de l'Environnement.**

- Au milieu des années 1990, le ministère de l'Environnement de l'Ontario (MEO) a mis en œuvre une procédure pour que les municipalités prennent des mesures quant aux réseaux d'égouts unitaires et à leurs trop-pleins connexes vers les milieux récepteurs.
- La Ville a en place un plan pour se conformer à des éléments essentiels de la procédure F-5-5 du MEO, que l'on appelle le programme de contrôle en temps réel. Ce dernier vise à remplacer l'ancien tunnel de stockage de la rue Somerset, à un coût global inférieur et dans un délai écourté.
- La Ville doit toujours se pencher sur d'autres éléments de la procédure F-5-5 du MEO, y compris le plan de prévention et de contrôle de la pollution.

#### **6. La fusion de l'Unité de la collecte des eaux usées de la DSDEEU est un processus d'amélioration continue.**

- Au cours des cinq dernières années, les employés responsables du fonctionnement et de l'entretien des réseaux d'égouts de l'Unité de la collecte des eaux usées ont subi de nombreux changements, y compris : le déplacement de leurs activités, soit des cours Bayview au Centre environnemental R.-O.-Pickard; la restructuration qui a fait en sorte que cinq groupes sont devenus trois groupes puis deux groupes (sections Est et Ouest); la formation des employés sur les nouveaux systèmes de gestion de l'entretien, des ressources humaines, de l'approvisionnement et des finances.
- On continue d'agir de façon plus réactive que proactive en ce qui concerne les activités d'entretien des réseaux d'égouts dans cette section, puisque le personnel, avec son effectif actuel, ne peut pas assumer la charge de travail. En 2005, le Conseil municipal a approuvé onze employés supplémentaires pour la DSDEEU, dont six seront affectés à l'Unité de la collecte des eaux usées pour régler les problèmes liés à la charge de travail. Depuis la fin de l'été 2006, certains des postes de supervision vacants ont été dotés à l'interne, mais onze postes restent inoccupés. La direction travaille activement à la dotation de ces postes.

- Les travaux d'entretien concernant le réseau d'égouts ont été réalisés par divers groupes à la grandeur de la Ville.

### **7. Les installations de gestion des eaux usées de la Ville et les responsabilités de drainage rurale sont gérées efficacement.**

- Le regroupement des responsabilités liées à tous les drains municipaux dans une section au sein de la Ville s'est déroulé sans heurts.
- Le fonctionnement des drains municipaux de la Ville répond à toutes les exigences réglementaires, est bien documenté et est considéré comme le meilleur de sa catégorie.
- Le fonctionnement des installations de gestion des eaux pluviales de la Ville répond à toutes les exigences réglementaires. L'Unité de gestion des eaux pluviales au sein de la DSDEEU possède une bonne base de données d'inventaire sur plus de 160 installations de gestion des eaux pluviales publiques et privées de la Ville. Les normes de conception pour les nouvelles installations de gestion des eaux pluviales sont en place. Environ 10 nouvelles installations de gestion des eaux pluviales sont mises en service chaque année.

### **8. L'obligation redditionnelle pour ce qui est du fonctionnement et de l'entretien du système d'égouts de la Ville est répartie, le directeur municipal adjoint, Services et Travaux publics, en assumant seul l'entière responsabilité.**

- Le fonctionnement et l'entretien du réseau d'égouts de la Ville sont répartis entre les diverses divisions de la Direction des services publics (DSP) et de la Direction des services d'infrastructure (DSI).
- Tant la DSP que la DSI affirment assumer la responsabilité générale du réseau d'égouts. Il est recommandé que la responsabilité générale du fonctionnement et de l'entretien du réseau d'égouts soit précisée sous le directeur municipal adjoint et que les unités ne relevant pas directement de l'organisme responsable rendent des comptes à ce dernier par l'intermédiaire d'accords de niveau de service.

## ***Recommandations***

### **Recommandation 1**

**Que la DSDEEU mette à jour de manière continue et surveille de près ses exigences réglementaires liées à la formation des employés afin d'assurer qu'on y satisfait.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation. Le coordonnateur de la formation rencontre maintenant chaque mois l'équipe de gestion de la Division pour

examiner le plan de formation et surveiller les progrès accomplis, afin de s'assurer que tous les opérateurs accrédités obtiennent la formation requise.

### **Recommandation 2**

**Que, dans le cadre des décisions municipales prises sur la réduction de la formation des employés ou la limitation des déplacements des employés, l'on tienne compte des exigences réglementaires relatives à la formation des employés de la DSDEEU et de la Division des services de gestion de l'eau potable.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation. Le coordonnateur de la formation, par l'intermédiaire de l'équipe de gestion de la Division, s'assurera que l'on satisfait aux exigences réglementaires et qu'on les relève. Des rapports trimestriels seront reçus pour contrôler le nombre d'heures de formation pour assurer que l'on satisfait aux exigences relatives à formation.

### **Recommandation 3**

**Que la Ville élabore une stratégie de gestion des débits de temps de pluie.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation. Il s'agit d'un projet qui a été défini par la DSI dans le cadre du programme général de gestion des actifs pour les réseaux des eaux usées et pluviales. Ce projet devrait commencer en 2008. On estimera le coût du projet une fois sa portée définie.

### **Recommandation 4**

**Que la DSDEEU réalise une étude sur l'eau de captage et l'infiltration dans tout le réseau d'égout sanitaire pour régler les questions de capacité et d'intégrité du réseau d'égout.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation. Cette initiative sera dirigée par la DSI en étroite collaboration avec la DSDEEU de la DSP. La recommandation sera incluse dans la stratégie de gestion des débits de temps de pluie pour 2008. Les estimations de coûts seront déterminées une fois la portée définie.

### **Recommandation 5**

**Que la DSDEEU présente un rapport au Conseil municipal portant sur tous les éléments de ses stratégies de réduction du captage et de l'infiltration, y compris :**

- a) la saisie et le contrôle des données sur le captage et l'infiltration;
- b) l'analyse du réseau d'égouts;
- c) l'élaboration du plan de mesures correctives visant le réseau d'égout;
- d) la mise en œuvre du plan de mesures correctives visant le réseau d'égout.

### **Réponse de la direction**

La direction est d'accord avec cette recommandation. Cette initiative sera dirigée par la DSI en étroite collaboration avec la DSDEEU de la DSP. Ces éléments seront inclus dans la stratégie de gestion des débits de temps de pluie qui sera lancée en 2008. Les coûts seront déterminés une fois la portée définie.

### **Recommandation 6**

**Que la DSDEEU désigne un groupe précis pour diriger tous les programmes de réduction du captage et de l'infiltration et en assumer la responsabilité.**

### **Réponse de la direction**

La direction n'est pas d'accord avec cette recommandation. La responsabilité de ces programmes relève de la DSI. La collaboration avec le groupe opérationnel compétent est un protocole bien établi.

### **Recommandation 7**

**Que la DSDEEU aille de l'avant avec le programme de contrôle en temps réel pour faire en sorte que la Ville se conforme aux éléments essentiels de la procédure F-5-5 du ministère de l'Environnement de l'Ontario (MEO).**

### **Réponse de la direction**

La direction accepte cette recommandation. Cette initiative sera dirigée par la DSI en étroite collaboration avec la DSDEEU de la DSP. Des travaux de conception détaillés sont en cours, et la construction est prévue pour 2007 et 2008. On estime que la mise en œuvre de ce programme coûtera 18 millions de dollars, 13 et 5 millions de dollars ayant été réservés respectivement dans le budget de 2007 et le budget de 2008.

### **Recommandation 8**

**Que la DSDEEU présente des rapports de contrôle annuels des débordements du réseau d'égout unitaire au Conseil municipal et au MEO.**

### **Réponse de la direction**

La direction est d'accord avec cette recommandation. La Division des services de drainage et d'épuration des eaux usées se conformera à toutes les exigences obligatoires en matière de rapports, qui n'ont pas encore été établies. La présentation du rapport devrait commencer en 2008 et se faire chaque année par la suite.

### **Recommandation 9**

**Que la DSDEEU élabore un plan de contrôle et de prévention de la pollution qui répond aux besoins de la Ville et aux exigences de la procédure F-5-5 du MEO.**

### **Réponse de la direction**

La direction est d'accord avec cette recommandation. La préparation du plan et de l'infrastructure nécessaire est activement en cours. La DSI en assume la direction avec le soutien des directions opérationnelles. Cette initiative devrait se terminer en 2008.

### **Recommandation 10**

**Que l'Unité de la collecte des eaux usées dote les postes vacants dès que possible.**

### **Réponse de la direction**

La direction est d'accord avec cette recommandation. Tous les postes vacants au sein de l'Unité de la collecte des eaux usées ont été dotés.

### **Recommandation 11**

**Que la DSDEEU réalise une évaluation complète de tous les puits d'accès et bassins collecteurs, afin de permettre l'établissement des priorités en matière d'entretien, de réhabilitation ou de remplacement.**

### **Réponse de la direction**

La direction est d'accord avec cette recommandation. Cependant, il est noté que l'évaluation est effectuée par la Division de la gestion de l'infrastructure de la DSI dans le cadre de son mandat général de gestion des actifs.

L'état des regards est évalué dans le cadre des inspections continues par télévision en circuit fermé des réseaux des eaux usées et des eaux pluviales. L'inspection des réseaux est réalisée dans le cadre de l'élaboration de projets annuels de réhabilitation de l'infrastructure. La fréquence visée correspond à un cycle d'inspection de 10 à 15 ans.

### **Recommandation 12**

**Que Services et Travaux publics réalise des vérifications périodiques de l'infrastructure du réseau d'égouts et d'eau potable récemment mise en service, afin de fournir des renseignements pertinents à la Division des services du bâtiment – Aménagement pour la soutenir dans ses fonctions de mise en service de l'infrastructure.**

### **Réponse de la direction**

La direction est d'accord avec cette recommandation. Une inspection périodique de certains réseaux récemment mis en service permettra d'apporter un soutien constructif aux Services du bâtiment à compter de 2007.

### **Recommandation 13**

**Que la formation des employés au sein de l'Unité de la collecte des eaux usées reste prioritaire, afin de répondre aux exigences réglementaires et aux objectifs de la DSDEEU en matière de transfert d'apprentissage approprié.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation. Le coordonnateur de la formation élabore actuellement un plan de formation stratégique en collaboration avec les divisions de la DSP.

### **Recommandation 14**

**Que la DSDEEU fournisse la formation minimale annuelle à tous les opérateurs accrédités par la Province au sein de la Division.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation. Le coordonnateur de la formation rencontre maintenant chaque mois l'équipe de gestion de la Division pour examiner le plan de formation et surveiller les progrès accomplis, afin de s'assurer que tous les opérateurs accrédités obtiennent la formation requise.

### **Recommandation 15**

**Que Santé et Sécurité au travail surveille les changements apportés à la *Loi sur la santé et la sécurité au travail* et informe tous les groupes opérationnels des répercussions possibles sur leurs installations et leurs activités.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation. Les rôles seront définis en collaboration avec Santé et Sécurité au travail et la DSP pour établir des accords de niveau de service (ANS) qui permettront de répondre aux besoins de la DSP. Ces ANS seront la responsabilité du coordonnateur de la formation en 2007.

### **Recommandation 16**

**Que la DSP envisage la mise en place d'un système de gestion de la qualité (SGQ) complet pour tous les programmes environnementaux (eau, eaux usées, biosolides et déchets solides).**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation. Un SGQ a été mis en place pour la gestion des biosolides en 2005. Les Services de gestion de l'eau potable commenceront en 2007 la mise en place d'un SGQ, laquelle se terminera d'ici le quatrième trimestre de 2008. On envisagera la mise en place, en 2009, d'un SGQ à la Division des services de drainage et d'épuration des eaux usées et aux Services de gestion des déchets solides, après l'instauration d'un SGQ aux Services de gestion de

l'eau potable, notamment la détermination des ressources nécessaires pour la mise en place et l'entretien.

### **Recommandation 17**

**Que la DSP tienne le Conseil municipal informé de la situation concernant les exigences réglementaires relatives au SGQ et les programmes internes de SGQ qui ne sont pas prescrits par règlements.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation. L'équipe de gestion de la Division examinera les exigences concernant les programmes réglementaires de SGQ et fera rapport sur ces programmes au besoin, y compris les programmes non réglementés.

### **Recommandation 18**

**Que le fonctionnement et l'entretien généraux du réseau des eaux usées soient examinés pour assurer la responsabilisation d'une personne sous le directeur municipal adjoint.**

#### **Réponse de la direction**

La direction n'est pas d'accord avec cette recommandation. La DSP et la DSI comprennent leurs responsabilités et leurs obligations redditionnelles respectives. La DSP, par l'intermédiaire de la DSDEEU, est responsable du fonctionnement et de l'entretien du réseau d'égouts. La Division de la gestion de l'infrastructure de la DSI est responsable de la gestion des actifs du réseau de conduites linéaires. Les deux groupes collaborent pour s'assurer que l'ensemble des services sont fournis efficacement sous la direction générale du directeur municipal adjoint de Services et Travaux publics.

### **Recommandation 19**

**Que la Ville s'assure que les répartitions de coûts visant le réseau d'égouts concordent avec les coûts actuels et sont conformes aux exigences provinciales.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation. Par l'intermédiaire du processus budgétaire et du processus de planification financière à long terme, le Service recommande au Conseil municipal les répartitions de coûts associées aux réseaux d'égouts et à la conformité aux exigences provinciales. La justification des répartitions de coûts proposées sera présentée au Conseil municipal dans le cadre du processus budgétaire 2007.

## ***Conclusion***

La vérification a permis d'établir que tous les règlements sont respectés, à l'exception des exigences relatives à la formation des opérateurs. Les exigences de formation réglementaires doivent être abordées immédiatement. En raison de la nature des activités et du manque de personnel, la fusion des activités de gestion du réseau d'égouts et d'entretien a progressé lentement.

Le réseau d'égouts unitaire de la Ville nécessite des améliorations pour être conforme à la procédure F-5-5 du MEO. Le programme de contrôle en temps réel inscrit au budget en 2007 et un plan de prévention et de contrôle de la pollution sont nécessaires pour faire en sorte que la Ville respecte les éléments essentiels de cette procédure. Enfin, la Ville a besoin d'une stratégie de gestion des débits de temps de pluie, qui doit comprendre un volet consacré à la réduction du captage et de l'infiltration dans le réseau d'égouts sanitaire.

## ***Remerciement***

Nous aimerions remercier la direction du soutien et de l'aide qu'elle a offerts à l'équipe de vérification.

## 1 BACKGROUND

The Audit of the City of Ottawa's Wastewater and Drainage Services Division was initially included in the Auditor General's 2007 Audit Plan. At the request of City Council, it was brought forward to 2006.

The City of Ottawa's Wastewater and Drainage Services Division (WSD) is responsible for operating and maintaining the overall urban wastewater collection and treatment systems serving close to 750,000 residents and businesses in Ottawa. The Division is also responsible for the operation of the stormwater sewer system, the City-owned stormwater management facilities, and for management of all municipal drains in the rural areas. There are 50,000 to 60,000 private septic systems in the City's rural area, which do not fall under the responsibility of the WSD.

The WSD is part of the Utility Services Branch, Public Works and Services Department and its main activities consist of the following:

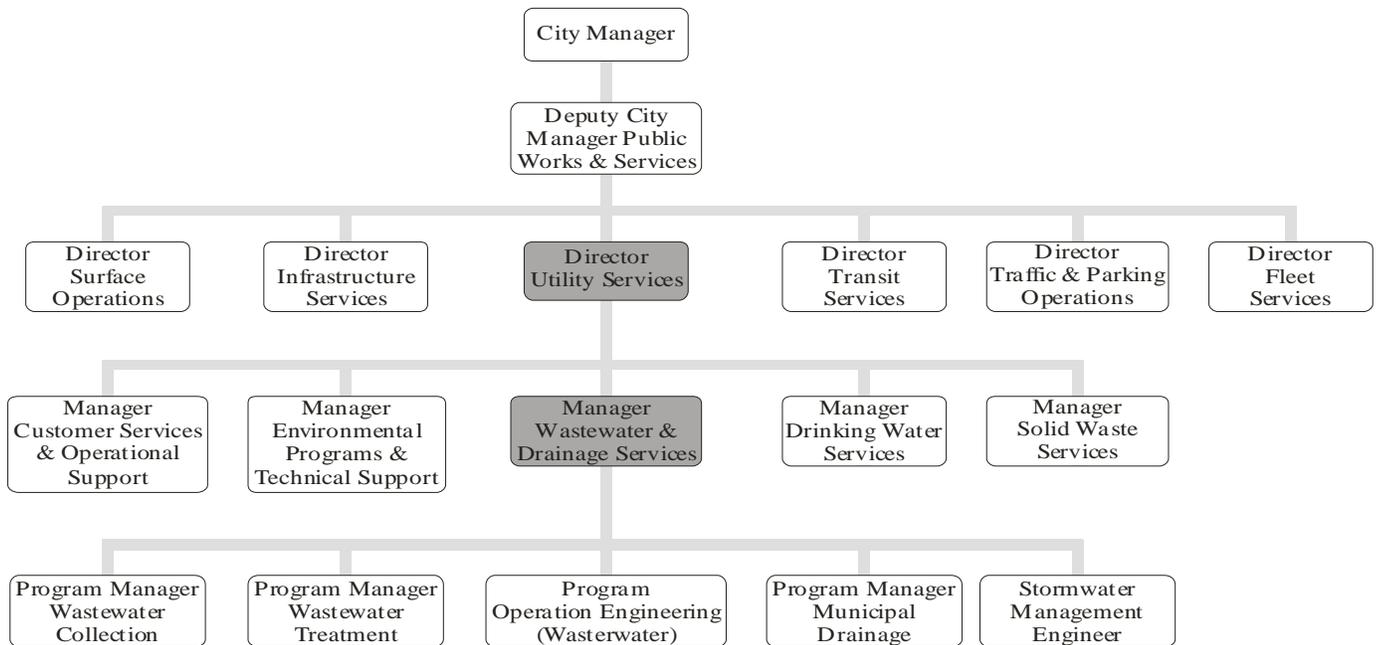
- Wastewater collection system operation and maintenance
- R.O. Pickard Environmental Centre operation and maintenance
- Biosolids management
- Wastewater pumping stations operation and maintenance
- Stormwater collection system operations and maintenance
- Stormwater Management Facilities operation and maintenance
- Municipal Drains program
- Customer inquiries
- Direct operational technical support

WSD is not responsible for private septic tanks, private sewer systems, or sewer laterals from the home to the property line. There are many locations in the City where private property owners are responsible for a significant quantity of sewer system infrastructure that is connected to the City's storm and sanitary sewer systems. These include shopping centres, condominiums, federal government property, etc.

The Province is responsible for approving the installation of septic systems, however, the City has no oversight role here. The City's Health Branch can be called if it is found that one of these systems has contaminated a groundwater source from which private wells draw water. In such cases, the City and the Province work in concert to resolve the issue.

## Organization Chart

Figure 1-1: Wastewater and Drainage Services Organizational Chart



### ***Wastewater Collection***

The wastewater collection system covers an area of 2,767 square km and extends from West-Carleton to Cumberland. The system includes:

- 2,500 km of sanitary and combined sewers (approximately)
- 230 km of combined sewers
- more than 75 pumping stations
- 55,000 maintenance holes
- 150,000 sanitary service connections

### ***Wastewater Treatment***

The Robert O. Pickard Environmental Centre treats all industrial, commercial and residential wastewater produced in Ottawa. Approximately 430 million litres of wastewater are treated per day. The treated water is returned to the Ottawa River.

### ***Municipal Drainage***

The Municipal Drainage Unit,

- is responsible for the Municipal Drains Program and the Tile Drain Loan Program;
- coordinates and administers the maintenance, repair and construction of over 700 municipal drains (the most for any one municipality in Ontario) totaling more than 1200 km in length; and
- administers the Tile Drain Loan Program and assists landowners with obtaining loans.

### ***Stormwater Management Facilities***

WSDS maintains a stormwater drainage system comprised of the following:

- 1,870 km of storm sewers,
- 178 facilities including 69 wet ponds, 57 dry ponds, 13 pipe storage and 8 infiltration basins,
- 56,000 catchbasins, and
- 125,000 storm service connections.

A number of other groups within the City of Ottawa are responsible for other aspects of the wastewater and drainage systems. These include:

- The Customer Services and Operational Support Division of Utility Services is responsible for customer complaints, and are the first response for sewer lateral backups, and are a general support to WSDS.
- The Environmental Programs and Technical Support Division of Utility Services is responsible for the Sewer Use By-law and surface water quality monitoring program, among other general support.
- Planning, Transit and the Environment Department is responsible for new or expanded sewer infrastructure.
- The Infrastructure Services Branch within Public Works and Services is responsible for the project management of the design of new or expanded facilities and the construction supervision for most capital projects.

The City of Ottawa operates under a “centres of expertise” model, with the result that WSDS also relies on specialized groups to support its activities in such areas as real property management, fleet services, financial services, information technology, public relations, legal services and human resources management.

The wastewater system is “rate supported”, with revenue generated as a surcharge to the water bills paid by customers covering the costs of WSDS and the contributions of the other groups involved; in some cases by direct allocation of the costs to the

wastewater fund, and in other cases through a general allocation of corporate overhead. A further discussion of these financial aspects is presented later in this report.

Prior to amalgamation in 2001, the services currently provided by WSD were split between the various municipalities and the different levels of municipal government (Region and local municipalities). The main wastewater treatment facility (R.O. Pickard Environmental Centre), trunk sanitary sewers and large sanitary pumping stations were operated and maintained at the regional level. All remaining infrastructure was essentially the responsibility of the local municipalities. As such, this Division has experienced a high degree of change over the last five plus years. This is somewhat different than the WSD "sister utility", the Drinking Water Services Division, a completely regional operation from the Ottawa River to the customer's tap since 1969. As with most departments within the City, all areas of the WSD operations have been impacted by the City's 2001 amalgamation.

While this audit focused on the operational activities of WSD, it also reviewed the various other groups, across the City, that provide services to the wastewater and stormwater system infrastructure.

The audit approach included:

- An initial document review and selected interviews;
- Development of audit objectives and criteria as part of an audit plan;
- Review of the audit plan with key management members;
- Review of the relevant legislation and regulations and reports expected to lead to changes in legislation and/or regulations;
- Review of industry association and Province of Ontario data comparing regulatory compliance and performance of water system operators;
- Benchmarking comparisons with cities across Canada;
- Extensive interviews within WSD, Customer Services and Operational Support Division, and the Infrastructure Management Division and Construction Services - Development Division in the Infrastructure Services Branch;
- Collection and analysis of related documentation and reports from the City, industry associations, the Province of Ontario, and federal department/agencies;
- Preparation of a draft report and recommendations; and
- Review of the report by management, and the inclusion of their comments.

## 2 AUDIT OBJECTIVES AND SCOPE

The audit included an examination of WSDS regulatory compliance, and performance as outlined and defined through the audit objectives which were to determine:

1. Compliance with applicable federal and provincial guidelines, standards, and regulations;
2. The City's program to reduce inflow and infiltration into the sanitary sewer system;
3. The Structure and overall efficiency of the Wastewater Collection Unit within WSDS;
4. The City's status on meeting upcoming provincial regulatory requirements (Quality Management System);

Criteria for the measurement of each of these objectives were established and are listed in detail in the section that follows.

The audit focused on WSDS, but also included an examination of the Customer Services and Operational Support Division, and other Infrastructure Services Branch Divisions, that have substantial impacts on customer service levels and on the operations and maintenance of the sewer infrastructure. The audit considered the adequacy of support WSDS receives from centres of expertise to support its basic functions, but did not examine the functioning of the centres of expertise or the activities of other groups that may be charged to the wastewater fund, either directly or indirectly.

## 3 DETAILED OBSERVATIONS, FINDINGS AND RECOMMENDATIONS

This section outlines the detailed findings related to each of the audit objectives. Under each objective, the criteria employed are listed and the findings are identified. Where appropriate, related recommendations are provided and explained. In some cases, findings related to a number of objectives contribute to a single recommendation. These recommendations and the related explanations are provided in section 3.6

### ***3.1 Compliance with Federal and Provincial Guidelines, Standards, and Regulations***

#### **Background**

Since the tragedy of the drinking water contamination in Walkerton, Ontario, in May of 2000, the Ontario provincial government has been regularly imposing new regulations and standards on water and wastewater systems. In May of 2002, Justice Dennis O'Connor released Part 2 of the Report of the Walkerton Inquiry "A Strategy for Safe Drinking Water", which included 93 specific recommendations. The Ontario provincial

government stated that all 93 recommendations would be acted upon. Although the Walkerton Inquiry focused on drinking water systems, many of the recommendations in the O'Connor Part 2 report had direct implications on wastewater systems in Ontario. In fact, 17 recommendations are directly related to "source water protection" and many of the recommendations, although focused on water systems, have a direct impact on wastewater systems. Both the Nutrient Management Act (2002) and the Sustainable Water and Sewage Systems Act (2002) arose out of the Walkerton Inquiry recommendations.

New provincial regulations began to be imposed on Ontario wastewater systems in 2002, and since then, new Acts and Bills have been passed, regulations have been imposed, amended, and even revoked, and new regulations are still forthcoming. Although the Ontario government is primarily focused on implementing all of the 93 O'Connor Part 2 recommendations related to drinking water systems, it is expected that similar implications will be forthcoming with regard to municipal wastewater systems. Aside from the Nutrient Management Act and the Sustainable Water and Sewage Act, other areas of wastewater systems that have been impacted since 2002 include laboratory standards and operator training and certification. Expected future wastewater regulations will include requirements for operational plans, wastewater systems accreditation, and a greater level of provincial inspection.

Wastewater service providers must monitor the provincial Environmental Bill of Rights on a regular basis to make certain nothing is being overlooked.

As well, over the last ten plus years, the water and wastewater industry has focused attention on the implementation of a number of "best practices" that are not required by regulation, but are intended to reduce the risk of environmental damage and water quality contamination arising from the operation of both water and wastewater systems.

### **Focus of Audit**

The audit focused on the compliance of the City's Wastewater and Drainage Services Division with respect to existing federal and provincial guidelines, standards and regulations. The audit also focused on the City's process to monitor the provincial Environmental Bill of Rights, how the City responded to Environmental Bill of Rights issues (i.e. comment period), and how the impact of regulations is communicated within the City (e.g. impact on budgets, general communication to staff and City Council, etc.).

### **Audit Criteria**

The audit reviewed compliance with the guidelines, standards and regulations that are directly related to the wastewater system and those related to the licensing of the facilities and staff.

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**Federal Guidelines/Regulations**

- Canadian Environmental Protection Act (1999)
- Fisheries Act (1985)

**Provincial Standards and Regulations**

- Environmental Protection Act (1990)
- Ontario Water Resources Act (1990)
- Sustainable Water and Sewage Act (2002)
- Nutrient Management Act (2002)
- Drainage Act (1990)
- Conservation Authorities Act (1990)

**Findings/Observations of Audit**

1. The City's wastewater system meets all guidelines and regulations with the exception of operator training required as defined under the provincial certification process. Licensed operators in WSD are required to undergo a minimum of 40 hours of training on an annual basis as per provincial regulations and according to documentation, 52 of 95 Operators (55%) did not meet this minimum requirement in 2005. Failure to meet the regulatory training requirements of certified operators can lead to provincial orders and possible fines.
2. Appropriate staff training for WSD certified operators is increasingly difficult to obtain in eastern Ontario, and travel to southern Ontario or elsewhere is frequently required. City policies that restrict staff travel impede the capability of specialized certified operators to receive timely training.
3. WSD has clear lines of staff accountability for regulatory compliance (Manager - WSD).
4. New regulations, ongoing amendments and regulatory monitoring have impacted staff resourcing by requiring more documentation and reporting.
5. With regard to monitoring regulations (Federal and Provincial Gazettes), most of the impact and responsibility rests with WSD, with the Legal Services Branch also having an important role. The review of regulations when posted on the Environmental Bill of Rights<sup>1</sup> is completed by both the City's Legal Services Branch and by WSD (normally initiated by WSD), and a joint response is sent to the province when required.

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<sup>1</sup> A web posting for Acts, Bills and Regulations by both Provincial and Federal governments. The City comments on these on a regular basis.

6. The City should continue to focus on monitoring and commenting on the federal and provincial Environmental Bill of Rights. WSDS must continue to allocate appropriate resources to meet all regulatory requirements, and continue to be involved in associations that comment on municipal regulatory impacts.
7. The review of the federal Environmental Bill of Rights is monitored by the Canadian Water and Wastewater Association (CWWA) on behalf of its members, and any issues related to wastewater services are brought to the attention of their member municipalities (Ottawa is a member of CWWA). The CWWA also has number of committees (Wastewater and Stormwater Committee; Water Protection Information Committee; Biosolids Committee; National Pollutant Release Information [NPRI] Committee; and Training and Education Committee) that monitor and comment on regulations on behalf of all Canadian municipalities.
8. Regulatory items that may impact staffing or resourcing requirements are brought forward to City Council through the budget process.
9. In the last five years, the Province has not charged the City's WSDS with a regulatory offence, but Provincial Director's orders have been imposed in the past – the last being a requirement to meet phosphorus removal objectives, in 2002. The City immediately met this order to the satisfaction of the Ministry of the Environment.
10. The WSDS has an excellent rapport with the local provincial office of the Ministry of the Environment.
11. Both the Planning, Transit and Environment Department, and the three divisions in the Utility Services Branch (Drinking Water Services, Environmental Programs and Technical Support and Wastewater and Drainage Services), continue to monitor the Province's position and pending future regulations on Source Water Protection (17 of the 93 recommendations in Justice O'Connor's Walkerton Part 2 report dealt with source water issues). Although some information is now being disseminated by the Province, the impact on the Ottawa and Rideau Rivers is still not known. Regulatory impacts may also affect septic systems and holding tanks. These in turn could have an impact on the quantity and frequency of trucked loadings to the R.O. Pickard Environmental Centre. Continued regular monitoring of the Environmental Bill of Rights will be key to ensuring that any legislative or regulatory changes are responded to by the City in a timely manner.
12. The structure of the City has no detrimental impact on how WSDS meets their regulatory requirements, or on how the City responds to postings on the Environmental Bill of Rights. A further discussion of structural issues is presented later in this report.
13. The WSDS and the Environmental Programs and Technical Support Division work closely with the Health Department with regards to surface water monitoring and the impacts on local beaches.

**Recommendation 1**

That WSDS continually update and closely monitor their staff training regulatory requirements to make certain these are met.

**Management Response**

Management agrees with this recommendation. The Training Coordinator now meets with the Divisional Management Team on a monthly basis to review the training plan and monitor progress to ensure that all certified operators receive the required training.

**Recommendation 2**

That City-wide decisions with regards to reducing staff training or restriction on staff travel consider the regulatory training requirements of staff in both WSDS and the Drinking Water Services Division.

**Management Response**

Management agrees with this recommendation. The Training Coordinator, through the Divisional management team, will ensure all regulatory requirements are satisfied and completed. Quarterly reports will be received to monitor the number of training hours to ensure full compliance with training requirements.

**3.2 Assessment of the City's Program to Reduce Inflow and Infiltration into the Sanitary Sewer System****Background**

Inflow and infiltration into the sanitary sewer system occurs when the physical integrity of the system deteriorates due to such factors as physical defects, design flaws, illicit connections, poor initial construction, root penetrations, poorly adjusted access holes, infrastructure corrosion, soil conditions, and aggressive waters. Large quantities of inflow and infiltration from surface runoff or groundwater go into the sewer conveyance system (sewers) and can have numerous detrimental consequences, including:

- reduce the available capacity in the sewers
- impacts the pumping capacity at pumping stations
- reduce the treatment capacity at the wastewater treatment facility
- increase operating costs
- generate sewer backups
- generate sewer overflows to receiving streams.

Although sanitary system infrastructure inflow and infiltration is often related to “older” infrastructure, many newer subdivisions across North America (including Ottawa) have substantial inflow and infiltration issues.

Prior to the amalgamation of all of the sewer systems and associated infrastructure in 2001, different levels of operations and maintenance were occurring throughout the various municipal sewer systems. Some municipalities were dealing with inflow and infiltration issues while others were not. As well, in the older parts of the City, combined sewers (sewers that have both storm and sanitary sewers combined) play a role in the quantity of stormwater that enters the sanitary sewer system. Approximately 10% of the wastewater collection system consists of combined sewers, which contributes substantial peak flows during wet weather events.

The assessment of sewer systems presents special difficulties due to the fact that this buried infrastructure cannot be easily inspected visually, and the fact that many excessive flow events often happen during short periods of time or in parts of the year where access to the system can be more difficult (thawing periods, flooding, etc.).

With increased storm intensities in North America over the last ten plus years, the reduction of inflow and infiltration into sanitary sewer systems has been a major focus of municipalities. The wastewater industry continues to make strides in technologies to better assess this infrastructure asset through new tools, and by implementing new best practices to minimize inflow and infiltration into sewers.

Weather changes in the Ottawa area over the past ten plus years has produced many “flash floods” where existing storm and sanitary sewer systems are affected and sewer backups have occurred. These are being addressed on an ad-hoc basis to meet customer needs. The required Wet Weather Flow management strategy discussed below should also deal with this issue.

The 2001 amalgamation in Ottawa allowed for a more strategic look at the overall sewer infrastructure across the City. Changes in roles and responsibilities occurred at all staff levels and existing programs did suffer for a few years. Currently, City sewer infrastructure programs are primarily focused on customer service levels (sewer backups) and environmental regulations (sewer overflows, pumping station upgrades and treatment plant upgrades).

Data collection is a key requirement to the understanding of inflow and infiltration into the sanitary system, and the City still does not have good reliable data from across the system.

The Planning, Transit and Environment Department along with the Public Works and Services Department both have major roles to play in reducing inflow and infiltration

into the sanitary sewer system. An overall “Wet Weather” management strategy is required by the City, of which inflow and infiltration into the sanitary sewer system would be a component. The wet weather management strategy would primarily address overall impacts on the City’s stormwater infrastructure and their receiving streams, but this strategy would also have an impact on the sanitary sewer system, and specifically the inflow and infiltration into this system. The Planning, Transit and Environment Department should lead this study with close involvement from the Utility Services Branch and the Infrastructure Services Branch.

An inflow and infiltration strategy is then required that would address the overall sanitary sewer system. The strategy must be staged to allow for;

- inflow and infiltration monitoring;
- sewer system analysis;
- sewer system remediation plan development; and
- sewer system remediation plan implementation.

### **Focus of Audit**

The audit focused on the City’s overall program to reduce inflow and infiltration into the sanitary sewer system. This included the review of the responsibilities of various groups within the City that have an impact on the overall integrity of the sewer system.

### **Audit Criteria**

The audit reviewed the City’s programs to reduce inflow and infiltration into the sanitary sewer system and compared them to current best management practices.

### **Findings/Observations of Audit**

1. The City has undertaken many ongoing proactive inflow and infiltration reduction related projects over the years, many of which are typically used by leading municipalities. These include:
  - Wastewater collection rehabilitation and upgrade program
  - Sanitary sewer rehabilitation program
  - Stormwater collection rehabilitation program
  - Stormwater management program
  - Combined sewer area management program

None of these programs are aimed directly at inflow and infiltration, but it is a component of many of them.

2. Although the City's priority is to deal with inflow that result in impacts to service levels, such as basement flooding, there is no overall inflow and infiltration reduction strategy. The City does not have a dedicated program or any dedicated

resource to address inflow and infiltration. Individual problems are corrected only through the integrated road/water/sewer infrastructure replacement or rehabilitation projects. An inflow and infiltration reduction strategy should be developed as part of a broader wet weather management strategy.

3. Data collection related to inflow and infiltration has been focused on areas of highest concern, such as areas where flooding has occurred. There is no current strategy to collect the data needed to understand the overall inflow and infiltration situation in the City.
4. Resources have been dedicated to try and meet current sewer backup problems. Recent sewer rate adjustments have provided capital investment for infrastructure improvements. The focus of sewer infrastructure improvements has been on large inflow problems or sewer capacity issues.
5. Staff know of specific areas of high inflow and infiltration, but no action has been taken to quantify the extent of the problem or its rectification.
6. Responsibility for sewer system operations lies in WSD. Responsibility for sewer system maintenance is split between WSD and the Infrastructure Management Division (IMD) in the Infrastructure Services Branch.
7. Regular communication occurs between WSD and the IMD, including regularly scheduled quarterly meetings to prioritize maintenance and rehabilitation of sewer infrastructure.
8. The City's Planning, Transit and Environment Department is focused on the overall sewer system performance to accommodate infill and growth.
9. The City's water resource group in IMD is focused on the performance of the sewer (and drinking water) system, dealing with existing operational issues as well as long-term system operations.
10. The City's wastewater and drainage infrastructure group in IMD is focused on capital rehabilitation, including condition assessment, and on the integrated component of the road/water/sewer capital program.
11. The City has adopted a policy of continued use of most combined sewers, rather than separation. This approach is not contrary to current best practice in high-density urban areas.
12. Staff consider inflow and infiltration to be a major concern in the catchment area of west Nepean.
13. Current flow monitoring data is being tabulated more for growth or storm flooding events as opposed to inflow and infiltration issues. Neighborhood flow monitoring programs are required to gain a better understanding of the local sewer systems, including inflow and infiltration issues.

14. The City should gain a better understanding of the private sewer systems that discharge into the municipal system, including their impact on inflow and infiltration.

### **Recommendation 3**

**That the City develop a Wet Weather Flow Management Strategy.**

#### **Management Response**

Management agrees with this recommendation. This is an initiative that has been identified by the Infrastructure Services Branch as part of the overall asset management program for the wastewater and stormwater systems. Commencement of this project is anticipated in 2008. The cost of the project will be estimated once the scope has been defined.

### **Recommendation 4**

**That WDSO conduct an inflow and infiltration study of the overall sanitary sewer system to address sewer capacity and system integrity issues.**

#### **Management Response**

Management agrees with this recommendation. This initiative will be led by the Infrastructure Services Branch in close collaboration with the Wastewater and Drainage Services Division of the Utility Services Branch. The recommendation will be included in the Wet Weather Flow Management Strategy for 2008. Cost estimates will be determined once scope has been defined.

### **Recommendation 5**

**That WDSO bring forward a report to City Council addressing all elements of their inflow and infiltration reduction strategies, including:**

- a) **inflow and infiltration data capture and monitoring;**
- b) **sewer system analysis;**
- c) **sewer system remediation plan development; and**
- d) **sewer system remediation plan implementation.**

#### **Management Response**

Management agrees with this recommendation. This initiative will be led by the Infrastructure Services Branch in close collaboration with the Wastewater and Drainage Services Division of the Utility Services Branch. These elements will be included in the Wet Weather Flow Management Strategy that will be initiated in 2008. Costs will be identified once the scope has been defined.

### **Recommendation 6**

**That WDSO identify a specific group to lead and be responsible for all inflow and infiltration reduction programs.**

### **Management Response**

Management disagrees with this recommendation. Responsibility for these programs rests with the Infrastructure Services Branch. Collaboration with the appropriate operating group is a well-established protocol.

## ***3.3 Assessment of the City's Wastewater Collection Section within WSD, Focused on Structure and Overall Efficiency***

### **Background**

With the amalgamation of the City in 2001, the Wastewater Collection Unit within the Wastewater and Drainage Service Division has undergone major structural and staff changes. Programs and policies have been unified, procedures have been put in place and maintenance activities have been adopted. Of all the units within WSD, this unit has undergone the greatest change due to the nature of their work (i.e. sewer operations and maintenance). This unit is responsible for the overall operation of the sanitary and storm sewer systems, which comprise approximately 75 pumping stations, 55,000 access holes, 85,000 catchbasins, 150,000 sewer laterals and 2,500 km of sanitary sewers. Management, supervisors and staff at all levels are certified wastewater collection operators (at various levels, from level 1 to 4), as per provincial regulations. The City's wastewater collection system is a level 4 system (highest level) as determined by the provincial Ministry of the Environment.

### **Focus of Audit**

The audit focused on the City's overall structure and efficiency of this section in relation to their mandate to operate and maintain the sewer system.

### **Audit Criteria**

The audit reviewed the Wastewater Collection Unit's structure and its ability to maintain the sewer system based on best management practices.

### **Findings/Observations of Audit**

1. Early in 2001, following the initial amalgamation of the City, the sewer operations groups maintained their ongoing operations as individual entities until they were unified into one section in the fall of 2001. By 2002, the section had three different groups working across the City, and by 2004 this was restructured into two groups, referred to as the east and west groups. As well in 2004, the Wastewater Collection Unit moved to the R.O. Pickard Centre as their primary satellite location, from the previous Bayview Yard location.
2. A review of all combined sewer overflows and their impact on the environment is currently being addressed with the local office of the Ontario Ministry of the Environment (MOE).

3. The MOE, in the mid 1990's implemented a procedure (referred to as "Procedure F-5-5") to deal with combined sewers in municipalities across Ontario. The primary items addressed in Procedure F-5-5 are;
  - All new sewers being constructed must be "separated" sewers;
  - Municipalities must develop a Pollution Prevention and Control Plan to meet the requirements of Procedure F-5-5;
  - Municipalities must eliminate combined sewer overflows during dry weather periods, except under emergency situations;
  - Municipalities must establish and implement pollution prevention programs that focus on pollutant reduction activities at the source;
  - Municipalities must establish and implement proper operation and regular inspection and maintenance programs for combined sewer system;
  - Municipalities must establish and implement a floatables control program to control coarse solids and floatable materials;
  - Municipalities should maximize the use of the collection system for the storage of wet weather flow; and
  - Municipalities should maximize the flow to the sewage treatment plant for the treatment of wet weather flows.
4. During a seven-month period (starting within 15 days of April 1), the sewer system should capture and treat, for an average year, all the dry weather flow plus 90% of the volume resulting from wet weather flow that is above the dry weather flow.
5. Prior to amalgamation, the Region and the municipalities of Ottawa, Vanier and Rockcliffe all had some combined sewers and/or combined sewer overflows under their jurisdiction, creating a mixed responsibility in dealing with the MOE regarding Procedure F-5-5.
6. The amalgamated City of Ottawa has been working with the local MOE office to come into compliance with Procedure F-5-5. The MOE has accepted in principle the City's current approach to meeting specific components of Procedure F-5-5.
7. The City continues to work with the MOE to meet all of the requirements of Procedure F-5-5.
8. The City has 18 combined sewer overflow sites in their sewer system.
9. On average, each overflow operates 11 times per year (this ranges from 0 to 33 occurrences per year depending on the site).
10. On average, 5 of the 18 overflow sites generate approximately 95% of the volume of combined sewer discharges on a yearly basis.
11. During dry weather events, the City does not have any overflows events.
12. Of all of the flow in the City's combined sewer system, 99% of the flow is captured and treated at the R.O. Pickard Environmental Centre.

13. During storm events, the fraction of combined sewer flow above the dry weather flow that is captured and treated is approximately 74%, while the MOE's Procedure F-5-5 requires 90%. The City has implemented a plan (assuming 2007 capital program budget approval) to bring this figure to 90% or better. The City's project to address this issue is referred to as the "Real Time Control Program", also referred to as the "Regulator Upgrade Program".
14. Through a planned and aggressive implementation, the Real Time Control Program could be operating by the end of 2008, bringing the City into compliance for this part of Procedure F-5-5. Once the Real Time Control Program is operational, the City will be one of the first Ontario municipalities to meet this component of MOE Procedure F-5-5.
15. The implementation of the Real Time Control Program will add operational (energy) costs to the current operations at the R.O. Pickard Environmental Centre.
16. The City has a combined sewer overflow monitoring plan that will be provided to the MOE as a report to meet a component of Procedure F-5-5. The report will be finalized in early 2007 (reporting on 2006 data). The City will then regularly provide updated monitoring reports to the MOE in the future.
17. The City still has to finalize a Pollution Prevention and Control Plan with the MOE, as per the requirements of Procedure F-5-5.
18. Rainfall in Ottawa for September, October and November 2006 was much greater than normal. In this time period, the City had 48 days with rain (34% above the average of the last 30 years), and 378.1 millimetres of rain (72% more rain than the average for this same period)
19. All pumping stations began to be operated under the Wastewater Collection Unit's Pumping Station and Process Control group in 2001. An immediate review of the level of automation and control was undertaken for all pumping stations.
20. A standard supervisory control and data acquisition system was selected and design and construction of the new system began in 2002. Completion of all 75+ pumping stations is scheduled to be completed by the end of 2007.
21. An inventory and condition assessment of all pumping station facilities and equipment was undertaken over the last 2 years and programs are in place to replace or rehabilitate equipment as required over the next 10+ years.
22. The amalgamation of the sanitary and stormwater pumping stations across the City has proceeded with little impact to customers or the environment.
23. The fact that the WSDS has been able to centralize the operation of all of these pumping stations and implement a comprehensive operations and maintenance plan in such a short time frame is impressive. This may be attributable to the fact that almost all decision making with respect to pumping stations operational and maintenance issues was within the WSDS.

24. The Construction Services Division within the Infrastructure Services Branch also provided excellent engineering and construction management support to the WDSD during the program to consolidate the operations of the pumping stations.
25. The Wastewater Collection Unit staff undertakes commissioning of all new pumping stations.
26. Sewer maintenance activities in this Unit continue to be more reactive than proactive in the last five years since amalgamation. Staffing levels cannot keep pace with workload; a report was taken to City Council in 2005 to allow for an additional eleven staff in the WDSD, six of which were to be assigned to the Wastewater Collection Unit. As of late summer 2006, some of the supervisory positions had been filled internally, but eleven positions remain open. Management is actively working towards filling these positions.
27. During the past five years, staff in the Wastewater Collection Unit have undergone training on new systems for maintenance management, human resources, procurement and finance. A unified sewer maintenance management system was acquired and implemented, despite being short-staffed. Most staff are also Certified Operators under the provincial regulations and are required to undergo a prescribed level of training (a minimum of 40 hours of training per year per operator). See Section 3.1 for a discussion of issues related to mandatory training requirements.
28. Operator training to meet provincial regulatory requirements was not met for 31 of the 56 certified operators in the Wastewater Collection Unit.
29. A new Manager for this unit was hired in 2002, but was absent due to health problems for a prolonged period in 2004 and 2005, compounding the ongoing implementation of organization changes, new policy development and staff hires.
30. Maintenance activities on the sewer system are completed by various groups across the City. Much of the maintenance activities are contracted out to the private sector. Private sector maintenance activities are primarily "batch" activities that allow for competitive work and pricing from contractors (catch basin cleaning, closed circuit television [CCTV] sewer inspection, cleaning of laterals, etc.) that can be well documented and easily supervised. Maintenance of access holes is the responsibility of the Roads, Surface Operations for the first 0.3 m of depth. Any maintenance that is more than 0.3 metres in depth becomes the responsibility of the Wastewater Collection Unit.
31. To help prioritize maintenance activities, the City should undertake a condition assessment on major sewer infrastructure (access holes, catch basins). Maintenance of this infrastructure continues to be reactive rather than proactive.
32. Data input into the sewer maintenance management system is occurring, but not to the level of detail required. Staff have been trained on the operation of the sewer maintenance management system and how to input information, but this is still a

new process for many of them. The benefits of the system have not yet been fully realized.

33. Staff training is progressive with cross-training being one of the keys to efficiency gains.
34. Frequent organizational changes continue to be made. One of the most recent in 2006 being the transfer of “first response” of customer inquiries regarding sewer issues to the Customer Services and Operational Support (CSOS) Division from the Wastewater Collection Unit staff. Customers now have a single point of contact for “first calls” for both drinking water and sewer issues. If the problem is a local property issue, the CSOS Division will normally deal with it, and document the outcome through the appropriate maintenance management system. This should free up the Wastewater Collection Unit to focus on sewer system maintenance. To be effective, CSOS Division staff should undergo training on sewer system issues and operations.
35. There is a sanitary sewer cleaning program in place for all sanitary and combined sewers 450 mm in diameter and smaller (on a 5-year rotation).
36. There is no formal storm sewer cleaning program in place, except when storm sewers are to be video-taped by close circuit television, in which case the sewers are cleaned prior to videotaping.
37. The Wastewater Collection Unit assumes responsibility of new sewer infrastructure once constructed (new subdivisions). There is the perception in the unit that some of this infrastructure is being turned over to the City without appropriate commissioning.
38. Communications and working relationships between the Wastewater Collection Unit and the Infrastructure Management Division are good.
39. All new sewers are video-taped (CCTV) and deficiencies are identified by the design consultant. New sewers are video-taped a second time and reviewed by the Construction Services - Development Division within the Infrastructure Services Division.
40. New sewer design standards are now in place. Previous design standards varied from municipality to municipality.
41. The operations of the sewer system fall under both the Wastewater Collection Unit and the Infrastructure Management Division.

### **Recommendation 7**

**That WDSO proceed with the Real Time Control Program to bring the City into compliance with key components of the MOE Procedure F-5-5.**

**Management Response**

Management agrees with the recommendation. This initiative will be led by the Infrastructure Services Branch in close collaboration with the Wastewater and Drainage Services Division of the Utility Services Branch. Detailed design work is underway with construction planned for 2007 and 2008. It is estimated it will cost \$18M for implementation of this program with \$13M identified in the 2007 budget and \$5M in 2008.

**Recommendation 8**

**That WDSO provide yearly combined sewer overflow monitoring reports to City Council and the MOE.**

**Management Response**

Management agrees with this recommendation. Wastewater and Drainage Services will comply with all mandatory reporting requirements, which have not yet been established. Commencement of this report is anticipated for 2008 and annually thereafter.

**Recommendation 9**

**That WDSO develop a Pollution Prevention and Control Plan that meets the needs of the City and the requirements of MOE Procedure F-5-5.**

**Management Response**

Management agrees with this recommendation. Preparation of the plan and required infrastructure is actively in development with ISB as the lead and support from the operating branches. This initiative is anticipated to be completed in 2008.

**Recommendation 10**

**That Wastewater Collection Unit fill vacant positions as soon as possible.**

**Management Response**

Management agrees with this recommendation. All vacancies within the Wastewater Collection Unit have been filled.

**Recommendation 11**

**That WDSO complete a condition assessment of all access holes and catch basins to allow maintenance, rehabilitation or replacement prioritization.**

**Management Response**

Management agrees with this recommendation. However, it is noted that the assessment is completed by the Infrastructure Management Division of the Infrastructure Services Branch, as part of their overall asset management mandate.

The condition of manholes is assessed as part of the ongoing closed circuit television surveys of the wastewater and stormwater systems. The system inspection is undertaken as part of the development of annual infrastructure rehabilitation projects and the frequency is targeted for a 10 to 15 year inspection cycle.

### **Recommendation 12**

**That Public Works and Services conduct periodic audits on newly commissioned sewer and drinking water infrastructure to provide appropriate feedback to the Construction Services - Development Division for their role in commissioning of infrastructure.**

#### **Management Response**

Management agrees with this recommendation. A periodic inspection of some newly commissioned systems will provide constructive support to Construction Services starting in 2007.

### **Recommendation 13**

**That staff training within the Wastewater Collection Unit continue to be a priority to satisfy regulatory requirement and the WSDS goals for appropriate cross training.**

#### **Management Response**

Management agrees with this recommendation. Currently, the Training Coordinator is collaboratively developing a strategic training plan within the USB divisions.

## ***3.4 Assessment of the City's Wastewater Treatment Unit, Municipal Drainage Unit, Operational Engineering Unit and Stormwater Management Unit within WSDS, focused on Overall Efficiency***

### **Background**

The WSDS has five different units within the Division, each with specific responsibilities under the WSDS mandate. The Wastewater Treatment Unit is responsible for the overall operations of the R. O. Pickard Environmental Centre. The Municipal Drainage Unit is responsible for the management of all municipal drains within the City. The Operational Engineering Unit is responsible for engineering support to the other units within the WSDS. The Stormwater Management Unit is responsible for the operation of all City-owned stormwater facilities.

### **Focus of Audit**

The audit focused on the overall structure and efficiency of each of these groups within the WSDS in regards to meeting their mandate.

## **Audit Criteria**

The audit reviewed the various WSD unit's structure and their ability to meet regulatory requirements and complete their mandate based on benchmarked data and best management practices.

## **Findings/Observations of Audit**

1. The R.O Pickard Environmental Centre meets all regulatory requirements.
2. The Wastewater Treatment Unit continues to monitor regulatory issues that may affect their operations or their reporting requirements, in association with the City's Legal Services Branch.
3. The co-generation facility at the R.O. Pickard Centre is considered a "best-in-class" operation within the wastewater industry.
4. The changes proposed in the provincial Occupational Health and Safety Act with regards to confined space entry may have an impact on operations and maintenance activities.
5. The R.O. Pickard Environmental Centre is expanding (new digesters) to meet greater wastewater flow requirements in the immediate future.
6. The R.O. Pickard Environmental Centre is classified a level 4 (highest level) facility by the provincial Ministry of the Environment.
7. Plant staff are certified operators as per the provincial regulatory requirements and are required to receive a minimum of 40 hours of training each year.
8. Of the 39 staff in the Wastewater Treatment Unit, 21 did not receive their required 40 hours of training in 2005, leaving the City open to provincial orders.
9. Overall sick leave and absenteeism is slightly below the average for wastewater services groups across Canada.
10. All City-owned stormwater management facilities are meeting regulatory requirements.
11. The Environmental Programs and Technical Support Division of the USB provide excellent laboratory services to both the Wastewater Treatment Unit and the Stormwater Management Unit.
12. There are approximately 165 stormwater facilities across the City, but they are not all City owned. Growth over the last few years has resulted in an increase of approximately 10 new stormwater facilities every year. The City maintains a database on all facilities.
13. The City has adopted a common standard for all new stormwater management facilities, and these are being imposed on new facilities by the Planning, Transit and Environment Department with periodic review by the Stormwater Management Unit.

14. The amalgamation of all municipal drains into one section within the City was completed smoothly.
15. There are approximately 700 municipal drains in the City of Ottawa covering an estimated distance of 1,200 km.
16. Almost all work on municipal drains is cost recovered by those that use the drains (user pay) or through provincial support for municipal drains.
17. The Municipal Drainage Unit has good working relationships with all local conservation authorities (Rideau River Valley Conservation Authority, South Nations Conservation Authority, and Mississippi Valley Conservation Authority).
18. The Municipal Drainage Unit has good working relationships with the provincial Ministry of Agriculture, Food and Rural Affairs, and the federal Department of Fisheries and Oceans.
19. The operations of the Municipal Drainage Unit are well documented and are considered "best-in-class".

#### **Recommendation 14**

**That WSD provide the minimum amount of yearly training to all provincially certified operators within the Division.**

#### **Management Response**

Management agrees with this recommendation. The Training Coordinator now meets with the Divisional management team on a monthly basis to review the training plan and monitor progress to ensure that all certified operators receive the required training.

#### **Recommendation 15**

**That Corporate Occupational Health and Safety monitor changes to the Occupational Health and Safety Act, and provide all operating groups with possible impacts on their facilities and operations.**

#### **Management Response**

Management agrees with this recommendation. Roles will be defined with the Corporate Occupational Health and Safety and USB to develop Service Level Agreements to facilitate USB needs, which will be lead by the Training Coordinator in 2007.

### ***3.5 Assessment of the WSD's ability to meet future provincially regulated quality management system (QMS) requirements.***

#### **Background**

The Province, through the Safe Drinking Water Act, has stated that all drinking water systems will be required to have a QMS in place. The QMS will follow the "Plan - Do - Check - Improve" cycle, similar to the various ISO QMS systems. The Province has also made it clear that once the QMS regulations are in force and the QMS across all water systems are rolled out, they will be imposing similar regulations on the municipally owned wastewater systems.

#### **Focus of Audit**

The audit reviewed the status of the WSD with respect to meeting the possible future regulatory requirements of a QMS system.

#### **Audit Criteria**

New regulations have now been imposed on municipal drinking water systems to meet a QMS for their systems. The audit reviewed the status of the WSD with respect to being able to implement/accommodate possible future regulations that will be imposed by the province on wastewater systems.

#### **Findings/Observations of Audit**

1. The Utility Services Branch has been leading the QMS review for the City and has been monitoring the Province's approach to the QMS regulations.
2. The Drinking Water Services Division has initiated a project to bring the drinking water system into compliance with the new QMS regulation.
3. Any QMS implications for the WSD are still a number of years away as the province rolls out the QMS for the drinking water system.
4. The WSD will monitor the QMS that will be required by the drinking water system to be better prepared when it is imposed on the wastewater system.
5. It is expected that the Province will make a number of changes to the drinking water QMS regulations as the system is rolled out. The Utility Service Branch should monitor this to allow for a more efficient implementation of the wastewater QMS when it becomes a regulatory requirement.
6. The WSD has many of the basic QMS requirements currently in place, which should allow for a fairly smooth transition when it is imposed on the City.
7. Depending on how the regulations are imposed by the Province, there may be an opportunity to have both the drinking water system QMS and the wastewater system QMS managed by a single division within the Utility Services Branch.
8. The WSD has a QMS system in place for their biosolids program.

**Recommendation 16**

**That the Utility Services Branch consider a full QMS for all environmental programs (Water, Wastewater, Biosolids, and Solid Waste).**

**Management Response**

Management agrees with this recommendation. A Quality Management System (QMS) was implemented for Biosolids management in 2005. Drinking Water Services is implementing a QMS starting in 2007 for completion by Q4 2008. Wastewater and Drainage Services and, Solid Waste be will considered for a Quality Management System in 2009 once the QMS for Drinking Water Services has been completed including identifying the required resources to implement and maintain.

**Recommendation 17**

**That the Utility Services Branch keep City Council informed on the status of regulatory QMS requirements, and on internal QMS programs that are not required through regulations.**

**Management Response**

Management agrees with this recommendation. The Branch management team will review requirements on the regulatory QMS programs and will report as required including non-regulated programs.

***3.6 General Observations of Overall WDS*****Communications across various City Departments**

The WDS has incorporated many best management practices. These include a state-of-the-art wastewater treatment facility, a supervisory control and data acquisition system to operate their pumping stations, a co-generation facility, and many other operational and maintenance activities. From staff interviews, communication across the groups responsible for the sewer system as a whole is one area requiring additional effort. This is not surprising, considering amalgamation, with all its inherent structural and operational changes is only five years old, however, opportunities to share expertise and identify potential efficiencies may be missed as a result.

By comparison, the Drinking Water System was amalgamated under the regional structure in 1969. This put all responsibility for drinking water (from the river, to treatment, to distribution to metering and into the home) under one group over 25 years ago. During the audit of the Drinking Water Services group in 2005, it was apparent that the City amalgamation did not have as large an impact on this group, which was to be expected, as it had already been operating as a single entity (see Auditor General's Office report, Chapter 2, released to City Council in May 2006).

The wastewater system is complex infrastructure and five years is a relatively short period of time for newly amalgamated staff to become familiar with its overall operation. The WDSO has made significant strides in the amalgamation of all of the various sewer systems in the new City, although Management acknowledges that there is still much work to be done. A systematic approach is being taken with an initial focus on the Wastewater treatment plant and the 75+ pumping stations. Controlling flows within the sewers to maximize its capacity is a current and major focus of the City. Data on the condition of buried infrastructure is limited and more work is required to assist in defining improvements to its operation, maintenance and rehabilitation and/or replacement as it ages and deteriorates.

In terms of operation, the newly amalgamated wastewater system is not as mature as the drinking water system, but this is to be expected because the latter was effectively amalgamated under regional government over 25 years ago. City Council, management and staff must continue to work together on understanding the issues that impact the sewer system, the customers served by the system, and the environment that the system is meant to protect. Improved communication among all groups must remain a focus to ensure efficient operation.

### **User Pay of Wastewater System**

Construction of new facilities designed for the use of untreated surface water or “grey water” to be used for non-potable devices (urinals, toilets) is becoming more common in North America (for example at the new Canadian War Museum). This practice is gaining momentum, especially with facilities located adjacent to accessible surface waters (lakes and rivers); avoiding the use of potable water in these circumstances has clear environmental benefits. Although these new and modern facilities use less potable water, they still discharge the same quantity of wastewater. Since the revenue to the City’s wastewater fund is based on a percentage of the potable water metered into these facilities, the City does not receive appropriate revenues for the wastewater services that are provided to these facilities. Since the City does not have jurisdiction over the piping in of untreated water, metering of the incoming water is problematic. In addition, the particulate matter in untreated water can damage the meters, making their use in this regard impractical. As such, this issue should be addressed on a case-by-case basis through surcharge agreements.

### **Sustainable Water And Sewage Systems Act**

The Province is moving forward on Bill 175, the Sustainable Water and Sewage Systems Act. Although no regulations have yet been released with respect to this Bill that was initiated in 2002, the Province has suggested that a full cost of service report on water and sewage systems will be required, that cost recovery reports will be required, that specific financial management reports will be required, and that enforcement of the future regulations can be expected.

## **Cost Allocations**

Although this audit did not include a full evaluation of cost allocations, benchmarking data on financial information was compared to other municipalities and utilities across Canada. Of 18 municipalities that reported data in 2004, Ottawa had the highest (38%) indirect costs as a percentage of total operating costs for wastewater treatment facilities that operate facilities of greater than 50 million litres of wastewater per day (National Water and Wastewater Benchmarking Initiative – 2006 report). It should be emphasized that this “metric benchmark” percentage was based the wastewater treatment operations only. It should also be noted that metric benchmark data is frequently misinterpreted and that there may be very good explanations for this perceived high percentage value. Metric benchmarks are a first step at comparing utility information, allowing a municipality or utility to look further into why they are average, below average or above average for hundreds of metric benchmarks on water and wastewater system operations.

The Province of Ontario's impending Sustainable Water and Sewage System Act and its associated regulations, will most likely deal with indirect costs to the water and sewer funds, and will identify what costs must, should or can be allocated to these separate funds. The City should review the current overhead and indirect cost allocation method for the sewer fund to ensure they are consistent with current costs and are in compliance with future provincial requirements.

## **Operations and Maintenance of the Sewer Systems**

The audit of the various groups involved in the operations and maintenance activities of the wastewater and stormwater collection systems revealed that there are many different divisions within the City that have major roles to play in keeping this system operational. There are many resources allocated to the operations and maintenance of these systems in both the Infrastructure Services Branch and the Utility Services Branch. Overlapping of sewer system maintenance activities is taking place with confusion occurring on who is actually responsible for certain activities. This is not the case with respect to the operations and maintenance of the R.O. Pickard Environmental Centre, the 75+ wastewater and stormwater pumping stations or the approximate 700 municipal drains, which are all clearly the responsibility of the WDSO.

Since both the Wastewater Treatment facility (R.O. Pickard Environmental Centre) and the Wastewater collection system have been designated Level 4 facilities by the Province, licensed operators are required by regulations to operate these facilities. However, licensed operators are currently found only in the WDSO. This does not mean that the operations and maintenance of the overall sewer system should also be under the direct operations of the WDSO. In fact, based on feedback from all divisions, the level of maintenance provided by the Infrastructure Management Division has been considered very good.

While the current structure has not created issues in meeting regulatory requirements, the issue becomes one of accountability. Currently, both Utility Services and Infrastructure Services claim overall responsibility for the sewer system. As such, no one below the level of Deputy City Manager of Public Works and Services has clear accountability for the operations and maintenance of the wastewater infrastructure and there is a lack of clarity below that level as to who has ultimate responsibility for the entire wastewater system. The overall operations and maintenance of the wastewater system should be reviewed to ensure accountability to an individual below the level of Deputy City Manager. This could be accomplished by the creation of a corporate utility, or by establishing accountability for the various activities to a single source, whether through direct reporting or through effective service level agreements, giving the “client” manager the authority to provide direction to the service providers. If the City is considering a corporate utility structure, it could also encompass the drinking water system, as outlined in the May 2006 Auditor General’s Office report to City Council.

### **Recommendation 18**

**That the overall operations and maintenance of the wastewater system be reviewed to ensure accountability of an individual below the level of Deputy City Manager.**

#### **Management Response**

Management disagrees with this recommendation. USB and ISB understand their respective responsibilities and accountability. USB through the Wastewater and Drainage Services Division is accountable for the operation and maintenance of the sewer system. The Infrastructure Management Division of ISB is responsible for the asset management of the linear pipe network. Both groups work cooperatively to ensure that overall services are delivered effectively under the general direction of the Deputy City Manager of PWS.

### **Recommendation 19**

**That the City ensure the allocation of costs to the sewer are consistent with current costs and are in compliance with provincial requirements.**

#### **Management Response**

Management agrees with this recommendation. Through the budget and long range financial planning processes the department advises City Council on the cost allocations associated with the sewer systems and compliance for provincial requirements. The substantiation of proposed cost allocations will be tabled with City Council as part of the 2007 budget process.

## **4 CONCLUSION**

The audit revealed that all regulations are being met with the exception of the Operator Training requirements. Regulatory training requirements must be addressed

immediately. Due to the nature of the operations and the lack of staff resources, the amalgamation of the sewer operations and maintenance activities has proceeded slowly.

The City's combined sewer system requires upgrades to meet the provincial Ministry of the Environments Procedure F-5-5. The Real Time Control Program budgeted for in 2007 along with a Pollution Prevention and Control Plan is required to bring the City into compliance with key components of this procedure. Finally, the City requires a wet weather flow management strategy, a component of which should deal with inflow and infiltration reductions into the sanitary sewer system.

## **5 ACKNOWLEDGEMENT**

We wish to express our appreciation for the cooperation and assistance afforded the audit team by Management.