



Office of the Auditor General

**AUDIT OF
DRINKING WATER SERVICES
2005 REPORT**

Chapter 2

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Executive Summary

The City of Ottawa (the City) provides drinking water services to almost 750,000 residents and businesses served by one central system and four communal wells. The Drinking Water Services (DWS) Division of the Utility Services Branch is responsible for the production and distribution of water and compliance with the federal and provincial regulations designed to ensure the safety and security of the water supply system and process. The Customer Services and Operational Support Division (CSOS) provides support to DWS, in particular, maintaining water meters and responding to customer complaints. The Revenue Division of Financial Services is responsible for meter reading, billing and collection.

Drinking water was a regional responsibility before amalgamation, so no integration of lower tier units was required. However, the structure of the new City is different than that of the Region, resulting in some changes in how the service is delivered. In particular, the billing and collection function was integrated with tax billing, and planning for growth requirements and related capital programs were moved to the Planning and Growth Management Department. The centres of expertise concept was also expanded.

DWS was selected for audit because it involves substantial expenditures and is an area of significant risks, particularly risks to public health. The recent Walkerton experience demonstrated the seriousness of those risks and has drawn attention to the importance of safe and secure operations of the water system. It has also resulted in substantial new legislative and regulatory requirements for water system operators. While the regulatory environment continues to evolve, the audit provides an opportunity to determine whether DWS is keeping pace with the regulatory changes.

In this context, the audit objectives were to determine:

1. Compliance with federal and provincial drinking water guidelines, standards, and regulations.
2. The extent to which the financial planning processes (rate setting and budgeting) contribute to efficient and effective operations of DWS.
3. Whether the key risks within the revenue billing and collection process have been mitigated by Financial Services to support DWS objectives and activities and are consistent with water volume accountability requirements.
4. The assessment of the DWS water distribution system water quality sampling program.
5. The assessment of the DWS programs to reduce water loss in the distribution system.
6. The City's status on meeting upcoming provincial regulatory requirements (Quality Management System & Sustainable Water and Sewage Systems Act).

The audit focused on DWS, but also included an examination of the billing and collection functions carried out by Financial Services, and the involvement of CSOS in the water system, particularly as it relates to water meter maintenance, billing and collection for flusher hydrant use and customer relationship management. The audit examined the water fund, but not the other groups that are charged to the water fund, either directly or indirectly.

Key Findings

- **DWS complies with the relevant federal and provincial regulations governing the safe supply of drinking water to Ottawa residents.**
 - The water sampling and testing program meets and in most cases exceeds established regulations. Although this program meets regulatory requirements, industry best practices are evolving, and other specific water quality programs should be implemented to further minimize water quality risks.
 - There remain risks associated with private water systems that are connected to the central system. The water sampling and testing program includes measures to reduce these risks, however, all private water systems with more than one connection to the City's distribution system should be required to have written maintenance procedures and to notify the City of any activities that may impact water quality.
 - A Quality Assurance/Quality Control program on positions that conduct the water sampling collection program is needed to regularly verify the completeness and accuracy of their tasks.
 - Anticipated regulations from the Sustainable Water and Sewage System Act and the Quality Management System requirements will necessitate some additional steps throughout departments within the City.
 - Although not required by legislation, the City should implement a proactive lead service replacement program.

- **The City has a program to reduce water loss in the distribution system, but it could be better coordinated.**
 - The tracking and control of water loss is an evolving field. The City has given significant attention to this field and recent results are consistent with industry expectations, however, these results are still preliminary and ongoing refinement must continue.
 - There is no clear centralized accountability for the program, and there are new initiatives the City should pursue in this area.

- The City has been monitoring the international approach to reducing water loss, and is currently adopting many of the water loss principles of the International Water Association best practice.
 - The recommendations include identifying a lead for the program and preparing a comprehensive report for Council identifying the initiatives to be pursued.
- **Accountability for the City water system is dispersed, with only the City Manager having overall responsibility.**
- The dispersion of responsibilities for the water system between organizational units in three different departments leaves no one below the City Manager with overall responsibility for the water system or the water fund.
 - The centres of expertise model is inconsistently and incompletely applied. This has resulted in sub-optimal coordination and difficulty in resolving differences of priority or direction.
 - It is recommended that overall responsibility for the water system be established below the level of the City Manager, that units not directly reporting to the lead organization be accountable to it via a Service Level Agreement, and that existing centre of expertise Service Level Agreements be updated to reflect current expectations.
- **Meter and remote sensor repair has been a problem, resulting in too many billings based on estimated readings.**
- Meter and sensor connection repair sometimes requires access to customer premises (sensors are the boxes outside buildings from which meters can be read). The current approach appears to be customer friendly to a fault, resulting in inefficiency and ineffectiveness in order to avoid inconveniencing or challenging customers. The result has been inadequate attention to meter and sensor repair and too many billings provided on the basis of estimated readings, primarily for residential customers.
 - The recommendations include use of by-law provisions to gain access to customer premises when required to ensure repairs can be conducted in a timely and efficient manner, clear allocation of responsibilities and consistent efforts to ensure meter readings can be conducted on a timely basis.

- **The computerized systems used to support billing and collection, and meter inventory and maintenance activities require improvement or replacement.**
 - The deficiencies impact the ability of the City to ensure all users are being billed (no specific unbilled customers were identified), and allow inadequately documented entries, including the closure of work orders which have not been completed. As such, the complete accuracy of current information cannot be assured.
 - It is recommended that the systems be analyzed to determine whether they should be upgraded or replaced; water accounts be reconciled with property tax records and the meter inventory; and improved procedures be put in place to ensure accounts are established for new connections on a timely basis.

Conclusion

The audit did not reveal any concerns related to the safety of the drinking water supply system in Ottawa, although there are steps that could be taken to further reduce risks. The water system is generally managed and operated in a manner consistent with best practices. No significant theft of water was identified, although some steps were identified that would reduce the risk that this is happening, or could happen. Better coordination could be achieved with some changes in the accountability structure, leading to improvements in efficiency and effectiveness. A complete list of the detailed recommendations follows.

Acknowledgement

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

List of Detailed Recommendations

The following is a list of all recommendations arising from the audit of Drinking Water Services. For complete details regarding the observations and findings which led to these recommendations, please refer to the full audit report.

Recommendation 1

DWS should evaluate options to modify the Carp Communal Well System in the event that regulations change with respect to the parameter Dibromochloromethane.

Management Response

Management agrees with the intent of this recommendation. Staff are continuing to follow the development of this water quality guideline. The actual imposition, level and compliance timeline are unknown at this time. Drinking Water Services will complete a Treatment Feasibility and Functional Design Report by Q4 2006. This information will be used to develop 2007 capital budget requirements for any required upgrades or improvements.

Recommendation 2

That representatives from DWS, the Financial Support Units (FSU) and Accounts Payable develop a mutually acceptable solution to address DWS' information requirements with respect to utility invoices such as Hydro Ottawa.

Management Response

Management agrees with this recommendation. The first priority for Hydro Ottawa invoices is that they be paid within the time limits established. Staff will work together to find a mechanism to provide the consumption information and other data required by DWS by Q3 2006.

Recommendation 3

That the service level agreements between DWS and centres of expertise be reviewed jointly by both parties on an annual basis as part of the budgeting cycle and adjusted to document actual or expected service levels.

Management Response

Management agrees with this recommendation. This review will be initiated in conjunction with the work related to Recommendation 24.

Recommendation 4

Responsibility and accountability for the maintenance program for water meters and remote receivers should be clearly defined and acceptable service levels established, with priority given to areas where the potential for lost revenue is greatest.

Management Response

Management agrees with this recommendation. Service standards need to be established for repair times and better communication introduced between the two work groups. Both groups need to understand the priority setting mechanism and look at the revenue loss and customer service when establishing work plans. A review will be undertaken in 2006.

Recommendation 5

The approach for gaining access to customer premises should be improved by placing more reliance on By-Law enforcement and/or service termination to ensure access to the premises on a timely and efficient basis.

Management Response

Management agrees with this recommendation. A review will be completed by Q3 2006.

Recommendation 6

The rationale for meter reading frequency should be reviewed as part of the study of meter reading technology, taking into account the benefits to customers and water volume accountability of frequent, accurate readings.

Management Response

Management agrees with this recommendation. A study of meter reading frequency will be undertaken to determine the most cost-effective frequency. The frequency issue could be improved dramatically through the introduction of Automatic Meter Reading technology. Consolidated management of all aspects of meter maintenance and meter reading may provide improved productivity, water accountability and information reports.

This initiative is not included in the 2006 work plan or budget and will be included in the 2007 Corporate Services Departmental work plan.

Recommendation 7

A formal assessment of the Aquacis system should be conducted to determine if the system can cost effectively meet user needs and ensure the achievement of divisional and strategic objectives.

Management Response

Management agrees with this recommendation. Once the new meters and reading technology are selected, a review of the Aquacis will be undertaken. This will form part of the 2007 Corporate Services Departmental work plan.

Recommendation 8

A formal assessment of the ITX/IIMS system should be conducted to assess the existence and appropriate design of controls and whether they are operating effectively and result in reliable reporting.

Management Response

Management agrees with this recommendation. The recommended assessment will be completed by Q2 2007 as part of the ITX/IIMS replacement project initiated by the Public Works & Services Department.

Recommendation 9

Communication regarding customer service requests and work orders between the Customer Accounts, Collections and Customer Services and Operational Support groups should be improved including agreement on narrative descriptions within a service request and the criteria for prioritization or cancellation of requests.

Management Response

Management agrees with this recommendation. All the tools to enable coordination and communication of work order and service request information are currently available in ITX. Improved training and process implementation will improve results. The review of consolidating management of the groups will also address the issue. This will be addressed in 2006.

Recommendation 10

A formal communication process for by-passes observed by meter readers, or Customer Services and Operational Support maintenance staff, should be developed

by the Customer Services and Operational Support group along with the associated action measures, including notification of By-Law Enforcement.

Management Response

Management agrees with this recommendation. A reporting process is already in place, and used by both Meter Maintenance staff and Meter Readers. Open bypasses are not in compliance with the Water By-law, and each reported offence is followed by issuance of a fine to the building owner. Although the process works and is used by both groups, formal and written documentation of the procedures is lacking. This will be resolved in Q1 2006.

Recommendation 11

Procedures to reconcile water accounts with property tax accounts (VTAX), meters installed (ITX/IIMS) and building permits issued should be developed to help mitigate the risk of incomplete billings.

Management Response

Management agrees with this recommendation. This initiative will assist in ensuring that all customers are being billed. Currently, this cannot be accommodated within existing resources. Additional resources will need to be identified as part of the 2007 Corporate Services Departmental work plan and budget.

Recommendation 12

Processes related to activating accounts for new development should be reviewed to facilitate identification of developers/contractors that may use water that should be billed or that turn on water without notifying the City.

Management Response

Management agrees with the intent of this recommendation. The Water By-law is very clear on that subject: only City staff are allowed to turn on or off water on the system. The By-law is enforced with fines on every reported infraction. Some water that is used in new developments is unauthorized and unbilled. A review, to be completed by Q1 2007, is currently underway to improve compliance on building construction related usage and a process to bill new developments using water.

Recommendation 13

Procedures should be developed to address the issues associated with new meter specifications, communication of new meter information, and potential By-Law impacts.

Management Response

Management agrees with the intent of this recommendation. We believe there are no issues with meter specifications. The meter specifications are part of the Water Specifications Guidelines that include all water related parts and materials. They are reviewed regularly following a process managed by the Infrastructure Services Branch. The communication of new meter information issue relates to the transfer of information between Customer Accounts and Meter Maintenance. The issue was addressed in Q4 2005.

Recommendation 14

That CSOS review options to improve compliance (reporting and payment) by flusher hydrant users including the cost-effectiveness of creating dispensing stations and the use of stronger By-Law enforcement.

Management Response

Management agrees with this recommendation. The Flusher Hydrant Program is an honour-based system, relying on the user to self-report water usage. It is expected that some users will not report some of their usage. Staff attempted to quantify theft, as reported in the Audit. Staff will be assessing the cost / benefit of constructing bulk water dispensing stations through the City to ensure full metering, regulated water withdrawal flow rates, surge protection and backflow safety features. This assessment will be completed by Q4 2006.

Recommendation 15

The internally established collection target should be re-evaluated by Revenue and Collections management.

Management Response

Management agrees with this recommendation. This target will be reviewed in 2006.

Recommendation 16

The data input and trending analysis of all tested parameters from the distribution system water quality sampling program should occur on a regular basis by dedicating staff time or by contracting out this service to the private sector.

Management Response

Management agrees with intent of this recommendation. With the implementation of the new WaterTrax Water Quality monitoring software, this functionality now allows staff to do this.

Recommendation 17

The City should implement a cross-connection control program in accordance with the InfraGuide's Best Practice of Methodologies for Implementing a Cross-Connection Control Program.

Management Response

Management agrees with the intent this recommendation. We do not believe this is a high risk item that would require it be a priority action item at this time. Staff if requested would bring a report forward in Q2 2007 outlining a proposed program and long term cost for Committee's consideration.

Recommendation 18

The City should implement a proactive lead services replacement program.

Management Response

Management agrees with intent of this recommendation. The Branch is fully aware of the recommendations contained in the Walkerton Report. The City currently treats drinking water so that it will remain in compliance with all federal and provincial guidelines for lead content in drinking water. Monitoring programs have confirmed the effectiveness of this approach. A report will be presented in Q3 2006 outlining a proposed strategy to Council for addressing lead services.

Recommendation 19

The City should develop a by-law that requires all private water systems with more than one connection to the City's distribution system to have written maintenance procedures and requires prior notification to the City of any activities on the private water system that may impact water quality.

Management Response

Management agrees with the intent of this recommendation. This initiative should be developed in conjunction with the Cross Connection Control Program referred to in Recommendation 17. A proposed by-law will be presented to Council in Q3 2007 addressing perimeter metering and back-flow prevention for private systems.

Recommendation 20

DWS should implement a Quality Assurance/Quality Control program on organizational positions that conduct the water sampling collection program to regularly verify the completeness of their tasks, including the sampling of all sites identified, and on the processes and procedures they must follow.

Management Response

Management agrees with the intent of this recommendation. While staff are confident of the information gathered by our current monitoring program and procedures, we will review our procedures to provide this additional level of security and confidence in our results. This review will be completed by Q4 2006.

Recommendation 21

The City should identify a specific group to lead and be responsible for all water loss reduction programs.

Management Response

Management agrees with this recommendation. A report came forward in Q1 2006, to outline the Water Loss Control program to reduce water losses. The Branch will coordinate a steering committee to improve overall water accountability. The DWS division will be responsible for water leakage reduction.

Recommendation 22

Utility Services should bring forward a report to Council addressing all elements of their water loss strategy.

Management Response

Management agrees with this recommendation. A report covering this program has been prepared and was tabled with Committee in Q1 2006.

Recommendation 23

Utility Services should implement a full Quality Management System for all environmental programs (Biosolids, Solid Waste, Water and Wastewater).

Management Response

Management agrees with the intent of this recommendation. This initiative is already well underway with the development of the Utility Services Quality Management System and is in place for the Bio-solids Program. Its implementation will be phased in the remaining programs. The Province has recently released the new Drinking Water Quality Management Standard. Staff are currently reviewing this new Standard and expect to report to Committee in Q1 2006 on this issue. Funds were approved in the 2006 Budget to address this likely regulatory requirement.

Recommendation 24

The governance structure of the delivery of water services should be reviewed and restructured to ensure accountability of an individual below the level of the City Manager for the water fund and services funded by the water fund.

Management Response

Management agrees with the intent of this recommendation. The first step should be to identify a specific individual to oversee the entire system. Whether to move to one distinct separate organization should be fully studied to determine the costs and benefits of doing so. This review will be initiated in Q3 2006.

Recommendation 25

That Financial Services re-examine the allocation of costs to the water fund and identify current costs for all elements.

Management Response

Management agrees with this recommendation. This review will be completed by Q4 2006 consistent with the rules of the report “Watertight: The case for change in Ontario’s water and wastewater sector” (if adopted) and allocation methodology adopted through OMBI.

Résumé

La Ville d'Ottawa (la Ville) alimente près de 750 000 résidents et entreprises en eau potable par l'entremise d'un réseau d'aqueduc centralisé et de quatre puits collectifs. Il incombe à la Division des services de gestion de l'eau potable (SGEP), de la Direction des services publics, de produire et de distribuer l'eau ainsi que de veiller au respect des mesures réglementaires fédérales et provinciales portant sur la sécurité du système et le processus d'approvisionnement en eau. La Division des services à la clientèle et soutien opérationnel (SCSO) offre un soutien à SGEP, notamment en s'occupant de l'entretien des compteurs d'eau et en intervenant en réponse aux plaintes de la clientèle. La Division des recettes de Services financiers est chargée du relevé des compteurs, de la facturation et de la perception.

Puisque, avant la fusion, l'eau potable relevait de la Région, aucune intégration n'a été nécessaire entre les diverses municipalités. Toutefois, comme l'organisation de la nouvelle Ville d'Ottawa diffère de celle de la Région, des changements ont été apportés à la prestation de services. Ainsi, la facturation et la perception ont été intégrées à celles des taxes foncières, et la planification des besoins liés à la croissance de même que les programmes d'immobilisations connexes ont été transférés au Service de l'urbanisme et de la gestion de la croissance. En outre, le concept des centres d'expertise a été élargi.

La décision de procéder à une vérification de SGEP a été prise parce que cette division a des dépenses substantielles et qu'il s'agit d'un domaine à risques élevés, notamment pour la santé publique. Les récents événements de Walkerton ont montré la gravité de ces risques et attiré l'attention sur l'importance d'avoir un réseau d'alimentation en eau qui soit sain et sûr. La catastrophe a entraîné l'instauration de nouvelles exigences législatives et réglementaires fondamentales considérables pour les exploitants d'un réseau. Même si le cadre réglementaire continue d'évoluer, la vérification donne l'occasion de déterminer si SGEP réussit à se tenir à jour de ces changements.

Dans ce contexte, la vérification avait pour objectif d'évaluer :

1. la conformité avec les lignes directrices, les normes et les règlements fédéraux et provinciaux relatifs à l'eau potable;
2. le degré auquel les processus de planification financière (établissement des taux d'imposition et des budgets) contribuent à l'exploitation efficace de SGEP;
3. la mesure dans laquelle la Direction des services financiers limite les risques principaux du processus de facturation et de recouvrement des recettes de façon à étayer les objectifs et les activités de SGEP, et la mesure dans laquelle ces risques correspondent aux exigences de comptabilisation du volume d'eau;
4. le programme d'échantillonnage de la qualité de l'eau dans le réseau d'aqueduc de SGEP;

5. les programmes établis par SGEP pour réduire les pertes en eau du réseau d'aqueduc;
6. la situation municipale actuelle pour ce qui est de respecter les exigences provinciales à venir en matière de réglementation (système de gestion de la qualité et *Loi sur la durabilité des réseaux d'eau et d'égouts*).

La vérification a porté principalement sur SGEP, mais a également inclus un examen des fonctions de facturation et de perception assumées par Services financiers et de la participation de SCSO dans le réseau d'aqueduc, notamment en ce qui a trait à l'entretien des compteurs d'eau, à la facturation et à la perception découlant de l'utilisation des bouches d'incendie ainsi qu'à la gestion des relations avec la clientèle. Les vérificateurs se sont penchés sur le fonds de réserve pour l'eau, mais non sur les autres groupes facturés en fonction de celui-ci, que ce soit de façon directe ou indirecte.

Principales constatations

- **SGEP se conforme aux mesures réglementaires fédérales et provinciales pertinentes qui régissent l'approvisionnement sécuritaire des résidents d'Ottawa en eau potable.**
 - Le programme d'échantillonnage et d'analyse de l'eau satisfait, et parfois même excède, les mesures réglementaires établies. Toutefois, comme les pratiques exemplaires de l'industrie évoluent constamment, d'autres programmes de vérification de la qualité de l'eau devraient être mis en oeuvre afin de réduire au minimum les risques à cet égard.
 - Les risques qui subsistent concernent les réseaux d'aqueduc privés reliés au réseau central. Le programme d'échantillonnage et d'analyse de l'eau comprend des mesures qui visent à atténuer ces risques, mais tout réseau privé qui comporte plus d'un raccordement au réseau municipal devrait être tenu d'avoir des procédures d'entretien écrites et d'aviser la Ville de toute activité pouvant avoir une incidence sur la qualité de l'eau.
 - Il est nécessaire d'instaurer un programme d'assurance et de contrôle de la qualité à l'intention des personnes chargées du programme de collecte d'échantillons d'eau, afin de vérifier régulièrement si leurs tâches sont accomplies de façon exhaustive et correcte.
 - Les règlements pris en application de la *Loi sur la durabilité des réseaux d'eau et d'égouts*, qui entreront en vigueur sous peu, et les exigences relatives au système de gestion de la qualité obligeront tous les services de la Ville à prendre des mesures additionnelles.
 - Bien qu'elle ne soit pas légiférée, la Ville devrait instaurer un programme proactif de remplacement des conduites de plomb.

- **La Ville dispose d'un programme de réduction des pertes en eau du réseau d'aqueduc, mais il pourrait être mieux coordonné.**
 - Le suivi et le contrôle des pertes en eau sont un domaine en évolution sur lequel la Ville s'est penchée sérieusement. Les résultats récents sont conformes aux attentes de l'industrie, mais comme il s'agit de résultats préliminaires, le programme doit continuer d'être perfectionné.
 - La responsabilité centrale du programme n'est pas clairement attribuée : la Ville devrait envisager de nouvelles initiatives à cet égard.
 - La Ville s'est intéressée aux approches adoptées à l'étranger en matière de réduction des pertes en eau et est en voie d'adopter nombre des principes sur lesquels se fondent les pratiques exemplaires de l'International Water Association à cet égard.
 - Parmi les recommandations, mentionnons la désignation d'une unité responsable du programme et la rédaction à l'intention du Conseil d'un rapport exhaustif concernant les initiatives à mettre en oeuvre.

- **Les responsabilités associées au réseau d'aqueduc sont dispersées, le directeur municipal en assumant seul la responsabilité globale.**
 - La dispersion des responsabilités associées au réseau d'aqueduc entre les unités organisationnelles de trois services fait que personne, outre le directeur municipal, n'est globalement responsable du réseau et du fonds de réserve pour l'eau.
 - Le modèle des centres d'expertise est mis en application de façon non uniforme et incomplète, menant à une coordination insuffisante et à des difficultés à trancher entre les diverses priorités et orientations.
 - On recommande que la responsabilité globale du réseau d'aqueduc soit confiée à des postes autres que celui de directeur municipal, que les unités qui ne relèvent pas directement de l'unité responsable y soient liées par une entente de niveau de service et que les ententes de niveau de service courantes des centres d'expertise soient mises à jour pour tenir compte des attentes actuelles.

- **La réparation des compteurs et des dispositifs de télérelevé posent problème et entraînent trop de facturation fondée sur des estimations.**
 - La réparation des compteurs et des dispositifs de télérelevé exigent parfois l'accès aux locaux du client (le dispositif de télérelevé est la boîte à l'extérieur du bâtiment à l'aide de laquelle il est possible de faire le relevé d'un compteur situé à l'intérieur). L'approche actuelle semble

trop avantager les consommateurs et finit par être inefficace pour éviter de les incommoder ou de les confronter. Il en résulte que l'entretien et la réparation des appareils sont négligés et que trop de factures sont fondées sur des estimations, surtout pour la clientèle résidentielle.

- On recommande notamment de recourir à des dispositions réglementaires pour obtenir l'accès aux installations des clients lorsque c'est nécessaire, afin de procéder rapidement et efficacement à des réparations, de répartir clairement les responsabilités et de veiller à relever régulièrement les compteurs.
- **Les systèmes informatisés utilisés pour la facturation et la perception ainsi que pour tenir l'inventaire et entretenir les compteurs doivent être mis à niveau ou remplacés.**
- Les lacunes des systèmes informatiques empêchent la Ville de veiller à ce que tous les consommateurs soient facturés (aucun cas de clientèle non facturée n'a été précisé) et laissent entrer des données mal documentées, par exemple indiquant comme terminés des ordres de travail non exécutés. Par conséquent, on ne peut présumer que l'information actuelle soit exacte.
 - On recommande que les systèmes soient analysés afin de déterminer s'ils doivent être mis à niveau ou remplacés, que les comptes d'eau soient rapprochés des comptes de taxes foncières et de l'inventaire des compteurs, et que des procédures améliorées soient mises en place pour s'assurer qu'un compte est créé rapidement pour tout nouveau branchement.

Conclusion

La vérification n'a pas révélé de problème touchant la salubrité du réseau d'approvisionnement en eau potable d'Ottawa, mais des mesures pourraient être prises afin de réduire davantage les risques à cet égard. Dans l'ensemble, le réseau d'aqueduc est géré et exploité conformément aux pratiques exemplaires du domaine. Aucun vol d'eau significatif n'a été relevé, mais des mesures ont cependant été proposées pour diminuer les risques qu'une telle situation se produise, présentement ou dans l'avenir. Une modification de la structure de reddition de comptes pourrait améliorer la coordination, ce qui renforcerait la rentabilité et l'efficacité. La liste complète des recommandations détaillées suit.

Remerciements

Nous remercions la gestion pour la courtoisie et l'assistance qu'ils nous ont offertes pendant cette vérification

Liste des recommandations détaillées

Voici la liste complète des recommandations qui découlent de la vérification des Services de gestion de l'eau potable. Pour prendre connaissance de l'ensemble des observations et des constatations qui ont mené à la formulation de ces recommandations, consultez le rapport de vérification intégral.

Recommandation 1

SGEP devrait étudier diverses options en vue de modifier le système de puits collectifs de Carp afin d'être prêt à tout changement dans la réglementation relativement au dibromochlorométhane.

Réponse de la direction

La direction est d'accord avec l'esprit de cette recommandation. Le personnel continue de suivre de près l'élaboration de cette ligne directrice sur la qualité de l'eau; on ne connaît pas encore quel sera le règlement imposé, son ampleur ni le calendrier de conformité qui y seront associés. Services de gestion de l'eau potable rédigera un rapport de faisabilité et de conception fonctionnelle d'ici au dernier trimestre de 2006. Cette information permettra d'établir les sommes nécessaires à inscrire au budget d'immobilisations de 2007 aux fins de mises à niveau ou d'autres améliorations.

Recommandation 2

Que des représentants de SGEP, de l'Unité de soutiens financier (USF) et de Comptes payables doivent trouver un moyen leur convenant à tous de satisfaire aux besoins de renseignements de SGEP relativement à des factures comme celles d'Hydro Ottawa.

Réponse de la direction

La direction est d'accord avec cette recommandation. En ce qui a trait aux factures d'Hydro Ottawa, la priorité absolue consiste à payer les factures dans les délais autorisés. Le personnel collaborera afin de trouver, d'ici au troisième trimestre de 2006, un mécanisme permettant de fournir les données relatives à la consommation et toute autre donnée exigée par SGEP.

Recommandation 3

Prévoir chaque année un examen conjoint des accords sur les niveaux de service entre SGEP et les centres d'expertise dans le cadre du cycle budgétaire, et les modifier pour tenir compte des niveaux de services actuels ou souhaitables.

Réponse de la direction

La direction est d'accord avec cette recommandation. Cet examen sera lancé de concert avec le travail découlant de la recommandation n° 24.

Recommandation 4

Définir clairement la responsabilité et la reddition de comptes relatives au programme d'entretien des compteurs d'eau et des dispositifs de télérelevé, et établir des niveaux de services acceptables en accordant la priorité aux endroits où les pertes potentielles de recettes sont les plus importantes.

Réponse de la direction

La direction est d'accord. Il faut définir des normes de services relativement aux délais de réparation et améliorer les communications entre les deux groupes de travail, ceux-ci devant comprendre le mécanisme d'établissement des priorités et considérer les pertes de recettes et le service à la clientèle lorsqu'ils dressent leur plan de travail. Un examen sera effectué en 2006.

Recommandation 5

Rendre plus rapide et plus efficace l'accès aux bâtiments des clients en recourant davantage à l'application des règlements municipaux et à l'interruption de service.

Réponse de la direction

La direction est d'accord avec cette recommandation. Un examen sera effectué d'ici au troisième trimestre de 2006.

Recommandation 6

Réévaluer la fréquence de relevé des compteurs dans le cadre de l'étude des technologies correspondantes afin de tenir compte des avantages de relevés plus fréquents et plus exacts pour la clientèle et pour la comptabilisation des volumes d'eau.

Réponse de la direction

La direction est d'accord avec cette recommandation. Une étude de la fréquence des relevés de consommation d'eau sera entreprise afin de déterminer laquelle est la plus rentable. Cette question pourrait être simplifiée considérablement par le recours à une technologie de relevé automatique. Le regroupement de la gestion des diverses facettes de l'entretien et du relevé des compteurs pourrait améliorer la productivité, la comptabilisation de l'eau et la rédaction de rapports d'information.

Cette initiative ne fait pas partie du programme de travaux ni du budget de 2006, mais sera incluse dans le plan de travail de Services généraux pour 2007.

Recommandation 7

Procéder à une évaluation officielle du système Aquacis afin de déterminer s'il peut satisfaire de façon économique aux besoins des usagers et favoriser l'atteinte des objectifs stratégiques et de ceux de la Division.

Réponse de la direction

La direction est d'accord avec cette recommandation. Lorsque les nouveaux compteurs et la technologie de relevé auront été choisis, un examen du système Aquacis sera réalisé dans le cadre du plan de travail de Services généraux de 2007

Recommandation 8

Procéder à un examen officiel du système ITX/IIMS afin d'évaluer s'il dispose de contrôles et si ceux-ci sont conçus de façon appropriée, et déterminer si ces contrôles fonctionnent efficacement et permettent une reddition de comptes fiable.

Réponse de la direction

La direction est d'accord avec cette recommandation. L'examen recommandé sera terminé d'ici au deuxième trimestre de 2007 dans le cadre du projet de remplacement du système ITX/IIMS lancé par Services et Travaux publics.

Recommandation 9

Améliorer les communications entre les groupes du Bureau des comptes, de Recouvrements et de Services à la clientèle et soutien opérationnel relativement aux demandes de service à la clientèle et aux bons de travail, notamment en uniformisant les descriptions narratives des demandes de service ainsi que les critères régissant la priorisation ou l'annulation des demandes.

Réponse de la direction

La direction est d'accord avec cette recommandation. ITX offre actuellement tous les outils nécessaires à la coordination et à la communication de l'information relative aux bons de travail et aux demandes de service. L'amélioration de la formation et de la mise en oeuvre du processus devrait donner de bons résultats. L'examen du regroupement de la gestion des groupes se penchera également sur cette question. Tout ce travail sera fait en 2006.

Recommandation 10

La Division des services à la clientèle et du soutien opérationnel doit élaborer un processus officiel de signalement des dérivations observées par les releveurs de compteurs ou par son personnel d'entretien, et établir les mesures à prendre dans une telle situation, y compris l'envoi d'un avis de mise en application du règlement municipal.

Réponse de la direction

La direction est d'accord avec cette recommandation. Le personnel d'entretien des compteurs et les releveurs de compteurs utilisent déjà un processus de signalement. Les dérivations ouvertes ne sont pas conformes au Règlement sur les aqueducs, et chaque infraction rapportée mène à l'imposition d'une amende au propriétaire du bâtiment. Même si ce processus est efficace et est appliqué par les deux groupes, il n'existe aucune documentation écrite officielle à son sujet. On remédiera à cette situation au cours du premier trimestre de 2006.

Recommandation 11

Établir des procédures pour le rapprochement des comptes d'eau, d'une part, et des comptes de taxes foncières (VTAX), de l'inventaire des compteurs d'eau (ITX/IIMS) et des permis de construction délivrés, d'autre part, afin d'atténuer les risques de facturation incomplète.

Réponse de la direction

La direction est d'accord avec cette recommandation. Cette initiative aidera à veiller à ce que chaque client se voie facturer sa consommation réelle, ce que ne permettent pas les ressources actuelles. Des ressources supplémentaires devront être inscrites en 2007 au budget et au programme de travaux de Services et travaux publics.

Recommandation 12

Revoir les processus de création de comptes pour les nouveaux lotissements afin de repérer plus facilement les promoteurs et les entrepreneurs qui pourraient utiliser de l'eau non facturée ou qui activent un branchement sans en aviser la Ville.

Réponse de la direction

La direction est d'accord avec l'esprit de cette recommandation. Le Règlement sur les aqueducs est clair à ce sujet : seul le personnel municipal est autorisé à activer ou à supprimer un branchement. Ce règlement est appliqué en imposant une amende pour chaque infraction rapportée. Une partie de l'eau utilisée dans les nouveaux lotissements constitue une consommation non autorisée et non facturée. Un examen, qui se terminera d'ici au premier trimestre de 2007, est en cours afin d'améliorer le respect des règlements concernant la consommation d'eau dans la construction de bâtiments ainsi que d'élaborer un processus permettant de facturer ce type de consommation.

Recommandation 13

Élaborer des procédures afin de traiter les problèmes associés aux nouvelles caractéristiques des compteurs, à la communication de l'information relative aux nouveaux compteurs ainsi qu'aux répercussions des règlements municipaux.

Réponse de la direction

La direction est d'accord avec l'esprit de cette recommandation. On n'envisage aucun problème au sujet des caractéristiques des nouveaux compteurs. Ces caractéristiques sont prévues par les lignes directrices connexes qui régissent l'ensemble des pièces et du matériel associés à l'eau potable et qui sont revues à intervalles réguliers selon un processus géré par la Direction des services d'infrastructure. La communication de renseignements sur les nouveaux compteurs concerne la transmission d'information entre le Bureau des comptes et la Section de l'entretien des compteurs d'eau; cette question a été réglée au dernier trimestre de 2005.

Recommandation 14

Que SCSO étudie diverses façons d'améliorer la conformité (déclarations et paiements) des usagers des bouches d'incendie, y compris la rentabilité de créer des postes de distribution d'eau et de recourir à une application plus sévère des règlements municipaux.

Réponse de la direction

La direction est d'accord avec cette recommandation. Le programme relatif aux bouches d'incendie est fondé sur l'honnêteté des usagers, qui doivent rapporter leur consommation d'eau; on s'attend, évidemment, à ce que certains omettent de le faire. Comme le révèle la vérification, le personnel a cherché à quantifier ce type de vol. Par ailleurs, le personnel évaluera le rapport coût-avantages de l'aménagement de postes de distribution de gros volumes d'eau dans toute la ville qui permettraient de comptabiliser toute l'eau consommée, de régir le débit de l'eau distribuée et de mettre en place des dispositifs de protection des surtensions et des antirefouleurs; ce rapport sera terminé d'ici au dernier trimestre de 2006.

Recommandation 15

La direction de Recettes et de Recouvrement doit réévaluer l'objectif de recouvrement fixé à l'interne.

Réponse de la direction

La direction est d'accord avec cette recommandation. L'objectif sera revu en 2006.

Recommandation 16

À intervalles réguliers, saisir les données et analyser les tendances touchant tous les paramètres du programme d'échantillonnage de la qualité de l'eau du réseau d'aqueduc qui ont été testés, en y affectant le personnel ou en signant un contrat de sous-traitance à cet effet avec le secteur privé.

Réponse de la direction

La direction est d'accord avec l'esprit de cette recommandation. Le nouveau logiciel WaterTrax de suivi de la qualité de l'eau permet désormais au personnel de le faire.

Recommandation 17

La Ville devrait mettre en oeuvre un programme de prévention des retours d'eau polluée, conformément aux règles de l'art d'InfraGuide intitulées Méthodes d'implantation d'un programme de prévention des retours d'eau polluée.

Réponse de la direction

La direction est d'accord avec l'esprit de cette recommandation. Nous considérons qu'il ne s'agit pas là d'une question à risque élevé exigeant la prise de mesures prioritaires pour le moment. Sur demande, le personnel pourrait soumettre à l'étude du Comité, au cours du deuxième trimestre de 2007, un rapport traçant les grandes lignes d'un programme proposé et estimant ses coûts à long terme.

Recommandation 18

La Ville devrait instaurer un programme proactif de remplacement des conduites de plomb.

Réponse de la direction

La direction est d'accord avec l'esprit de cette recommandation. La Direction connaît bien les recommandations formulées dans le rapport sur l'incident de Walkerton. La Ville traite actuellement l'eau potable afin qu'elle demeure conforme à toutes les lignes directrices fédérales et provinciales relatives à la teneur en plomb, approche dont l'efficacité a été confirmée par des programmes de suivi. Un rapport proposant une stratégie pour le remplacement des conduites de plomb sera présenté au Conseil au troisième trimestre de 2006.

Recommandation 19

La Ville devrait se doter d'un règlement municipal exigeant que tout réseau d'aqueduc privé qui comporte plus d'un raccordement au réseau municipal dispose de procédures d'entretien écrites et avise au préalable la Ville de toute intervention sur le réseau privé pouvant avoir une incidence sur la qualité de l'eau.

Réponse de la direction

La direction est d'accord avec l'esprit de cette recommandation. Cette initiative devrait être instaurée en liaison avec le programme de prévention des retours d'eau polluée mentionné à la recommandation n° 17. Un règlement modifié, traitant de l'installation d'antirefouleurs et compteurs d'eau sur le périmètre des réseaux privés, sera présenté au Conseil au troisième trimestre de 2007.

Recommandation 20

SGEP doit mettre en oeuvre un programme d'assurance et de contrôle de la qualité visant les postes chargés du programme de collecte d'échantillons d'eau afin de vérifier à intervalles réguliers que ces personnes accomplissent leurs tâches de façon

exhaustive, notamment pour ce qui est de la collecte d'échantillons à tous les sites désignés et du respect des processus et des procédures.

Réponse de la direction

La direction est d'accord avec l'esprit de cette recommandation. Même si le personnel a confiance dans les données obtenues grâce aux procédures et au programme de suivi actuels, les procédures seront passées en revue d'ici au dernier trimestre de 2006 afin de rehausser les niveaux de sécurité et de confiance dans les résultats.

Recommandation 21

La Ville devrait assigner à un groupe précis la direction et la responsabilité de tous les programmes de contrôle des pertes en eau.

Réponse de la direction

La direction est d'accord avec cette recommandation. Un rapport a été présenté au cours du premier trimestre de 2006. Il tracera les grandes lignes d'un programme de contrôle des pertes en eau, qui appliquera des pratiques de gestion optimales à la réduction de ces pertes. La Direction coordonnera les travaux d'un comité directeur afin de rehausser globalement l'exploitation responsable de l'eau. Il incombera à SGEP de veiller au contrôle des fuites.

Recommandation 22

Services publics devrait soumettre au Conseil un rapport décrivant tous les éléments de sa stratégie de contrôle des pertes en eau.

Réponse de la direction

La direction est d'accord avec cette recommandation. Un rapport sur ce programme a été préparé et sera soumis au Comité au cours du premier trimestre de 2006.

Recommandation 23

Services publics doit mettre en oeuvre un système exhaustif de contrôle de la qualité pour tous les programmes environnementaux (biosolides, déchets solides, eau et eaux usées).

Réponse de la direction

La direction est d'accord avec l'esprit de cette recommandation. Cette initiative est bien enclenchée pour ce qui est de l'élaboration du système de contrôle de la qualité de Services publics et est déjà instaurée pour le programme relatif aux biosolides; elle sera mise en oeuvre graduellement dans les autres programmes. La Province a rendu publique depuis peu sa nouvelle norme de gestion de la qualité de l'eau potable; le personnel l'étudie actuellement et devrait soumettre un rapport au Comité au cours du premier trimestre de 2006. Des fonds ont été prévus dans le budget de 2006 afin de satisfaire à cette exigence qui sera bientôt réglementaire.

Recommandation 24

Examiner et réorganiser la structure de gestion des services d'approvisionnement en eau afin qu'une autre personne, outre le directeur municipal, soit responsable du fonds de réserve d'eau et des services financés par ce dernier.

Réponse de la direction

La direction est d'accord avec l'esprit de cette recommandation. La première étape consisterait à affecter une personne à la supervision de l'ensemble du réseau. La possibilité de créer une entité distincte à cet effet doit être étudiée avec soin afin d'établir les coûts et les avantages d'une telle mesure. L'examen sera entrepris pendant le troisième trimestre de 2006.

Recommandation 25

Que Services financiers revoit l'attribution des coûts au fonds de réserve d'eau et déterminer les coûts actuels de chaque élément.

Réponse de la direction

La direction est d'accord avec cette recommandation. Cet examen sera terminé d'ici au dernier trimestre de 2006, ce qui est conforme aux règles établies dans le rapport À TOUTE ÉPREUVE: : L'importance d'améliorer le secteur ontarien de l'eau (s'il est adopté) de même qu'aux méthodes d'attribution retenues par l'OMBI.

1. Background on Drinking Water Services

The City of Ottawa's Drinking Water Services (DWS) Division is responsible for managing, producing and distributing water to close to 750,000 residents and businesses in Ottawa. This includes the Central System and four communal well systems.

The City's central water distribution system has the following characteristics:

- Two water purification plants
- 2,700 km of watermains
- 13 pressure zones
- 22 pumping stations
- 16,800 fire hydrants
- 37,000 valves
- 195,000 water meters
- 195,000 water services

Over 99% of the drinking water supplied by the City is through the central water distribution system. The remaining water supplied by the City (<1%) is through 4 communal water systems, namely;

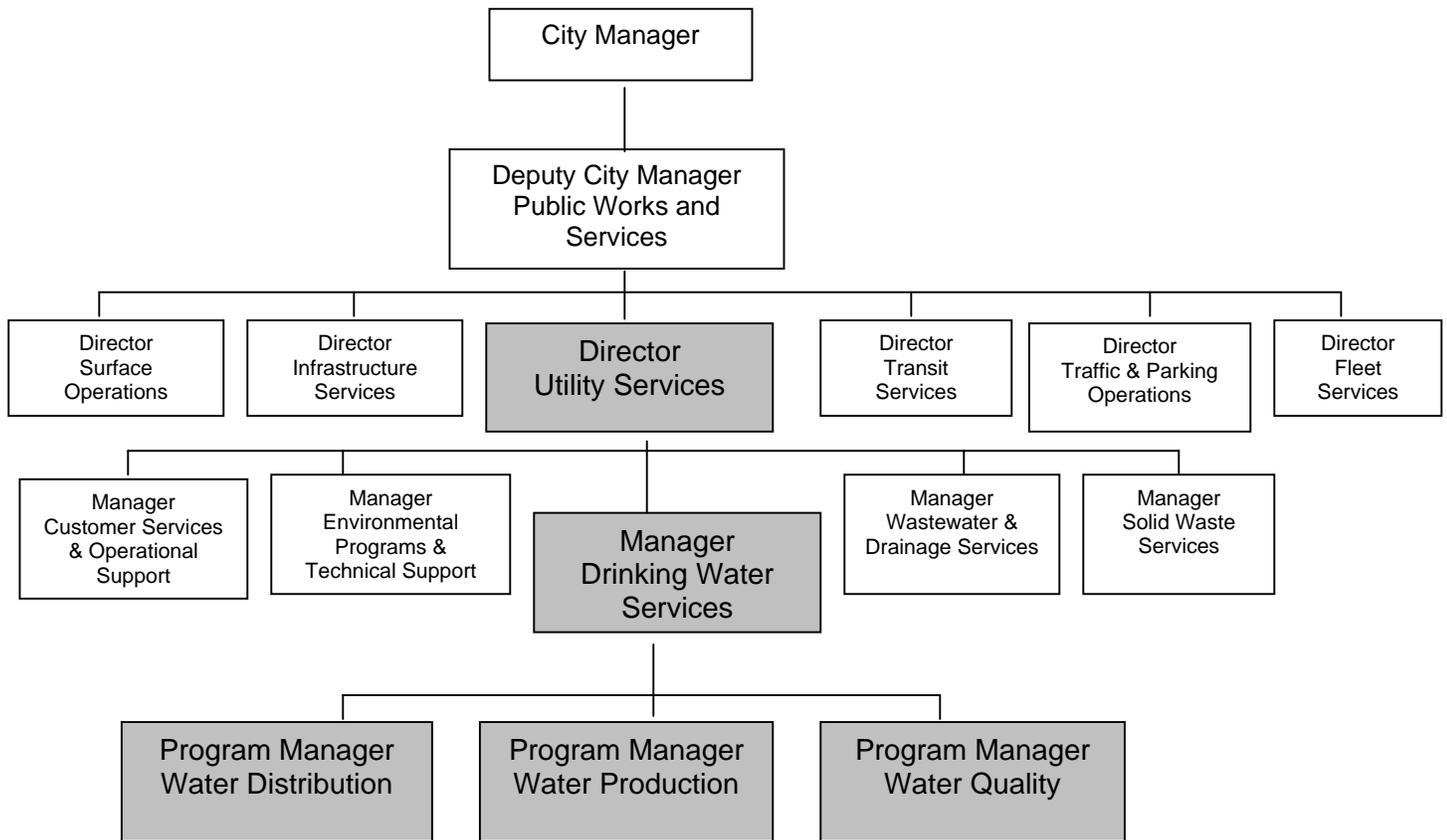
1. The Carp Communal Water System
2. The Vars Communal Water System
3. The Munster Communal Water System
4. The Richmond (King's Park Subdivision) Communal Water System

The City is responsible for the water system up to the property line. There are many locations in the City where property owners are responsible for significant water systems within private property that are connected to the City system (e.g. shopping centres, condominiums, Federal government property, such as Parliament Hill, Tunney's Pasture, etc.). There are also between 50,000 and 60,000 private wells in the City's rural area and another 150 to 180 small private well systems, which do not fall under the responsibility of the DWS Division.

The Drinking Water Services Division is part of the Utility Services Branch in the Public Works and Services Department (PWS) and its main activities consist of the following:

- Water treatment, reservoirs and pumping stations operation & maintenance
- Water distribution system operation & maintenance
- Water quality assurance
- Communal water system operation and maintenance
- Direct operational technical support

The overall organizational structure of the Division is presented below.



A number of other groups within the City of Ottawa are responsible for other aspects of the water system. These include:

- The Customer Services and Operational Support (CSOS) Division of Utility Services is responsible for customer complaints, maintenance of water meters and general support to DWS.
- The Revenue Division of Financial Services (within Corporate Services Department) is responsible for meter reading, billing and collection, and related customer inquiries.
- The Planning and Growth Management Department is responsible for new or expanded water infrastructure
- The Infrastructure Services Branch within PWS 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 DWS 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 resource management.

The drinking water system is “rate supported”, with water bills paid by customers covering the costs of DWS and the contributions of the other groups involved, in some cases by direct allocation of the costs to the water fund, and in other cases through a general allocation of corporate overhead.

Drinking water services was a purely regional function before amalgamation in 2001. As a consequence it did not experience the same range of changes other activities experienced when the activities of a variety of former organizations were combined. However the organizational structure of the new City is different than that of the former Region of Ottawa-Carleton, with the result that the structure did change significantly. In particular, the centres of expertise model has resulted in many activities formerly carried out by the water department being provided now as services to DWS by the various centres of expertise. Similarly, the water billing and collection activities were merged with tax collection to gain efficiencies of scope and the planning for expansion of the water system was relocated within the Planning and Growth Management Department.

While this audit focuses on the activities of DWS, it also reviews the revenue and collection activities of the Revenue Division, and the water accountability activities (including meter maintenance) of CSOS, and the governance of the City water services as a whole.

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 the Auditor General and the 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 London, Ontario and Halifax, Nova Scotia
- Extensive interviews within DWS, CSOS and the Revenue Division
- Interviews with Legal Services, the Public Health Branch
- Collection and analysis of related documentation and reports from the City, industry associations, the Province of Ontario, the Government of Canada
- 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 DWS regulatory compliance, financial management, and performance as outlined and defined through the audit objectives which were to determine:

1. Compliance with federal and provincial drinking water guidelines, standards, and regulations.
2. The extent to which the financial planning processes (rate setting and budgeting) contribute to efficient and effective operations of DWS.
3. Whether the key risks within the revenue billing and collection process have been mitigated by Financial Services to support DWS objectives and activities and are consistent with water volume accountability requirements.
4. The assessment of the DWS water distribution system water quality sampling program.
5. The assessment of the DWS programs to reduce water loss in the distribution system.
6. The City's status on meeting upcoming Provincial regulatory requirements (Quality Management System & Sustainable Water and Sewage Act).

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 DWS, but also included an examination of the billing and collection functions carried out by Financial Services, and the involvement of CSOS in the water system, particularly as it relates to water meter maintenance, billing and collection for flusher hydrant use and customer relationship management. The audit considered the adequacy of support DWS 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 water fund, either directly or indirectly, however the audit did consider the approach used to allocate costs and revenues to the water fund.

3. Detailed Observations, Findings and Recommendations

This chapter 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 4.7

3.1 Compliance with federal and provincial drinking water 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. 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 on. The federal government also monitored the Walkerton Inquiry closely and considered many of Justice O'Connor's recommendations that were relevant at the federal level.

New regulations began to be imposed on Ontario drinking water providers in late 2000, and since then, new Acts and Bills have been passed, regulations have been imposed, amended, and even revoked, and new regulations are still forthcoming. Many of these regulations are directly related to the recommendations in Justice O'Connor's Part 2 report, while others are updates and amendments based on best practices, recent changes to technology or new data. Water providers must monitor the Provincial Environmental Bill of Rights on a regular basis to make certain nothing is being overlooked.

As well, following the Walkerton tragedy, the Water Industry has focused attention on the implementation of a number of "Best Practices" that are not required by regulations, but that can reduce the risk of possible water quality contamination within a water distribution system.

Focus of Audit

The audit focused on the compliance of the City's Drinking Water Services with respect to existing Federal 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 was communicated within the City (e.g. Impact on budgets, general communication to staff and Council, etc.). The audit also reviewed possible future water quality guidelines and their impact, if any, on the City.

It should be noted that pending provincial regulations related to the requirement of a Quality Management System, and the Sustainable Water and Sewage Act are discussed as a separate audit objective (see section 4.6).

Audit Criteria

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

Federal Guidelines

- Guidelines for Canadian Drinking Water Quality
- New recently released guidelines
 - Turbidity
 - Protozoa
 - Chlorite/Chlorate (comment period ends Oct./05)

Provincial Standards and Regulations

- Drinking Water Systems Regulation (Reg. 170/03)
 - Reg. 249/03 (amendment to Reg. 170/03)
 - Reg. 269/03 (amendment to Reg. 170/03)
 - Reg. 408/04 (amendment to Reg. 170/03)
- Drinking Water Quality Standards (Reg. 169/03)
 - Reg. 268/03 (amendment to Reg. 169/03)
- Certification of Drinking Water System Operators (Reg. 128/04)
- Drinking Water Testing Services (Reg. 248/03)
- Water Taking and Transfer (Reg. 387/04)
- Definitions of Words and Expressions (Reg. 171/03)
- Definition of Deficiency and Municipal Drinking Water System (Reg. 172/03)
- Schools and Private Nurseries (Reg. 173/03)

Findings/Observations of Audit

1. The City's drinking water system meets all guidelines and regulations.
2. New regulations, ongoing amendments and regulatory monitoring have impacted staff resourcing since 2001. This includes the actual monitoring of new or amended regulations, and the specific reporting requirements imposed by the province.
3. DWS has clear lines of staff accountability for regulatory compliance (Manager – DWS).
4. Most of the impact and responsibility rests with the DWS group, but both the Legal and Health Branches have important roles. Communication between the Health Branch and the DWS group, with respect to drinking water quality issues and overall community

health concerns related to drinking water, is excellent. Both groups understand their roles, both have excellent written procedures that meet provincial requirements and both communicate on a regular basis (not only when issues arise).

5. The review of regulations when posted on the Environmental Bill of Rights is completed by both the City's Legal Branch and by DWS (normally initiated by DWS), and a joint response is sent to the province when required. Responses are frequently shared with other provincial municipalities and others (various associations in Ontario, such as the Ontario Water and Wastewater Association and the Association of Municipalities of Ontario).
6. The City of Ottawa should continue its focus on monitoring and commenting on the provincial Environmental Bill of Rights and the federal Environmental Bill of Rights. DWS must continue to allocate appropriate resources to meeting all regulatory requirements, and continue to be involved in Associations that comment on regulatory impacts.
7. The review of the Federal Environmental Bill of Rights is monitored by the Canadian Water and Wastewater Association on behalf of its members, and any issues related to drinking water are brought to the attention of the DWS group. Canadian Water and Wastewater Association also has a Water Quality Committee that comments on guideline changes being proposed by Health Canada. The comments are circulated to the Canadian Water and Wastewater Association members for input prior to submission. The Chair of the Canadian Water and Wastewater Association Water Quality Committee is a Program Manager in the DWS.
8. The province has not imposed any charges on Ottawa, but the City has received a few orders. All orders were complied with (most prior to the order actually being received). This is typical of most large municipalities across Ontario (i.e. no charges, and a few orders). Many medium to small municipalities across Ontario are being charged for regulatory infractions.
9. The DWS has an excellent rapport with the local provincial office of the Ministry of the Environment.
10. Both the Planning and Growth Management Department and DWS continue to monitor the province's position and pending future regulation on Source Water Protection (17 of the 93 recommendations in Justice O'Connor's Walkerton Part 2 report dealt with Source Water issues). It is not known how this will impact the Ottawa River (a boundary river for Ontario and Québec). Regulatory impacts are expected on the City communal well systems (well head protection, recharge area, etc.).
11. The possible future drinking water guideline for *Dibromochloromethane* (a member of the Trihalomethane family of disinfection by-products) may require changes at the Carp Water System. The Central Water System and all other communal well systems operated by the City continue to meet or exceed all guidelines and standards and all expected changes to the regulations.

12. The structure of the City has no detrimental impact on how DWS meets their regulatory requirement, or on how the City responds to Environmental Bill of Rights postings.
13. Regulatory impacts on operating or capital budgets are accommodated through the City budget approval process.

Recommendation 1

DWS should evaluate options to modify the Carp Communal Well System in the event regulations change with respect to the parameter Dibromochloromethane.

Management Response

Management agrees with the intent of this recommendation. Staff are continuing to follow the development of this water quality guideline. The actual imposition, level and compliance timeline are unknown at this time. Drinking Water Services will complete a Treatment Feasibility and Functional Design Report by Q4 2006. This information will be used to develop 2007 capital budget requirements for any required upgrades or improvements.

3.2 The extent to which the financial planning processes (rate setting and budgeting) contribute to efficient and effective operations of DWS.

Background

The City of Ottawa has a combined sewer fund and a water fund, although both activities are separately accounted for. The water fund receives revenue from the water rate and the fire supply charge. Direct costs, such as those of DWS, are charged to the water fund. Certain services provided by centres of expertise, such as the Revenue Division, RPAM and Fleet Services are also charged directly to the water fund. Other costs such as information technology, secretariat, council, legal, and finance are allocated to the water fund as part of a corporate overhead charge.

The Sustainable Water and Sewage Systems Act 2002 requires that water and wastewater systems be self-sustaining, covering all associated costs. However, the regulations providing details of the process to be followed have not yet been promulgated.

Focus of the Audit

Our audit focused on the budget and rate-setting processes related to the water fund.

Audit Criteria

The audit was directed to determine the extent to which:

- DWS receives timely, adequate, and reliable information from Financial Services
- Financial plans are linked to strategic objectives of DWS

- The Financial Services water rate setting model supports long-term viability of DWS
 - Cost recovery methodology identifies and allocates the appropriate costs to the water fund
 - Water rates and resulting revenue forecasts achieve full cost recovery
- Budget is effective in providing suitable operational guidance
 - Budget inputs from DWS, centers of expertise, and other relevant groups are complete, accurate, and received on a timely basis
 - Operating and capital budgets are analyzed against actual results
 - Management understands the budget rationale and implications for activities under their control

Findings/Observations of Audit

1. DWS management is very satisfied with the service provided by the Financial Support Unit (FSU), a group of Finance staff assigned to work directly with management on an ongoing basis. In addition to the scheduled monthly reporting, DWS requests reports from the FSU on an ad hoc basis and are satisfied with the accuracy and timeliness of the information received.
2. The consolidation of the City of Ottawa's two laboratory testing groups into one should lead to an increase in timeliness of information and responsiveness to DWS' operational requirements.
3. The only crucial financial information DWS has difficulty accessing on a timely basis are the hydro bills. DWS only has access to Hydro Ottawa's portal service for information related to the two plants. Although SAP includes consumption data that is input manually, DWS requires more detailed information such as consumption by time period to manage their demand for electricity more effectively. DWS would like to receive Hydro Ottawa invoices directly to enable them to make a copy for themselves before the invoice is processed by Accounts Payable. Currently, DWS is obtaining copies of the invoices directly from their Hydro Ottawa representative as it cannot obtain copies on a timely basis from Accounts Payable. The lack of timely information affects DWS' business decisions.
4. DWS senior management does not receive revenue or related volume reporting from the Revenue, Financial Services group on a pre-determined basis. However, they are able to obtain information when requested. Furthermore, there is no formal process for DWS to input into the revenue group's decisions such as the frequency of meter reading.
5. Senior management of DWS and their dedicated FSU have been working on developing and implementing more meaningful performance measures. These would be used at the beginning of the budgeting process to set operational funding requirements in relation to performance measures such as resources required (work crews) per kilometer of watermains. The performance measures would also serve as triggers to review funding

levels and/or to explain variances throughout the year. The City of Ottawa has been looking to performance measures developed by the Ontario Municipal CAO's Benchmarking Initiative and the National Benchmarking Initiative.

6. DWS has not been linking financial plans to its strategic objectives. It is currently undergoing a Business Review Process which will look at the services being delivered. The review is expected to identify DWS' strategic objectives and enable the linking of the financial planning function to strategic objectives. The Business Review Process was expected to be completed in July/August 2005.
7. The Long Range Financial Plan 2 – Rate Supported Programs (LRFP-2) endorsed by City Council on December 8, 2004, included the following principles to improve the financial sustainability of the water and sewer rate supported programs:

- a) That the annual Pay-as-you-go contributions be indexed in accordance with the Infrastructure Price Index as published by StatsCan, consistent with the approved policy contained in the tax supported Long Range Financial Plan;*
- b) That long term debt financing be limited to specific project types – growth, development charge financed, regulatory and major projects with long term benefits, consistent with the approved policy contained in the tax supported Long Range Financial Plan;*
- c) That the balances in the Water and Sewer Reserve Funds be combined into one reserve fund;*
- d) That the combined Water & Sewer Reserve Fund retain a minimum balance of \$20 million;*
- e) That the 2005 net water and sewer rate be increased by 9%, comprised of a 12% water rate increase and a 4% reduction in the sewer surcharge;*
- f) That for longer term sustainability of rate supported programs, City Council endorse net annual water and sewer rate increases of 9% for 2006 and 2007, and 5% for 2008 to 2014, subject to annual budget approval.”*

While these principles are generally consistent with the directions taken in new provincial legislation, the legislation would appear to suggest separate accounting for water and wastewater. The recommended rate increases are based on 2004 figures including a corporate overhead allocation of \$12.7M for water and \$22.9M for sewer. The LRFP-2 does not include guidance as to the calculation of this allocation.

8. On amalgamation, corporate overhead was allocated to the water fund on a proportionate basis. That is, the formula was based on direct spending on water as a percentage of total spending at the City of Ottawa. Since then, the total amount has been rolled forward with specific adjustments made to reflect changes in organizational structure, but not for budget cuts. It is our understanding that the formula for allocating corporate overhead to the water fund has not been re-documented since amalgamation.

9. Some costs that are very directly tied to the water fund, such as the cost of the Financial Services group responsible for billings and collections are not directly allocated, but only covered through the corporate overhead allocation.
10. A contributing factor to the delay in reviewing the allocation of indirect costs to the water fund has been the time lag between the Province of Ontario's passage of Sustainable Water and Sewage System Act and the promulgation of its associated regulations. These regulations will most likely deal with indirect costs and identify what costs must, should or can be allocated to the water fund. The City of Ottawa's review of their allocation method will have to meet future provincial requirements. Please refer to section 4.6 for a further discussion of upcoming provincial regulatory requirements.
11. The budgeting cycle appears to be clearly communicated to and understood by DWS management. The deadlines are tight, a factor compounded by the Universal Program Review exercise in 2004 and by the short timelines for the identification of budget pressures in May/June 2005. The FSU tries to alleviate the time pressures by making estimates and assumptions where they can, i.e. inflation, but ultimately must ensure that DWS staff are sufficiently involved in the preparation of their budgets.
12. Changes, such as locating the FSU with the Director's office, are underway to improve the flow of financial reporting information.
13. There are service level agreements between DWS and some centres of expertise. However, it appears that these agreements have not been updated since they were initially put in place following amalgamation.
14. In certain cases, the service level agreements cover activities formerly carried out by the water department and now provided as services to DWS by the various centres of expertise. Losing control over these activities has frustrated DWS management who feel that, while they are held accountable for the level of service they provide to their customers by regulatory agencies, customers and councillors, they no longer have control over activities, for example RPAM's services, that impact on the level of service they are able to provide.
15. There is also a perception, on the part of DWS management, that they are subject to service level cuts within the centres of expertise even though DWS need to maintain a certain level of service due to regulatory requirements and pay for the services with revenue from the water rate. Financial Services has indicated that this is generally not the case and that the service level cuts within the centres of expertise would mostly affect non-rate activities. A review of service level agreements and annual monitoring of these agreements would clarify the issue of cuts in services.
16. All of the fleet reserves are combined except for those of police and transit. This would appear to be a breach of the principle of allocating water costs (and only water costs) to the water rate. New future regulations related to the Sustainable Water and Sewage Act may impact how these funds are allocated in the future.

17. Operating and capital budgets are analyzed against actual results on a monthly basis by the FSU. Explanations are obtained from DWS managers for significant variances. On a quarterly basis, variances are reviewed with the Director, DWS. Budget versus actual results are reported to Council on a quarterly basis.
18. SAP, the financial reporting system used by the City of Ottawa, has the capability to incorporate seasonality in the monthly profiling of budgets. DWS is working on using this functionality with operating costs that fluctuate on a seasonal basis, such as overtime.

Recommendation 2

That representatives from DWS, the Financial Support Units (FSU) and Accounts Payable develop a mutually acceptable solution to address DWS' information requirements with respect to utility invoices such as Hydro Ottawa.

Management Response

Management agrees with this recommendation. The first priority for Hydro Ottawa invoices is that they be paid within the time limits established. Staff will work together to find a mechanism to provide the consumption information and other data required by DWS by Q3 2006.

Recommendation 3

That the service level agreements between DWS and centres of expertise be reviewed jointly by both parties on an annual basis as part of the budgeting cycle and adjusted to document actual or expected service levels.

See section 4.7 for recommendations related to multiple audit objectives.

Management Response

Management agrees with this recommendation. This review will be initiated in conjunction with the work related to Recommendation 24

- 3.3 Whether the key risks within the revenue billing and collection process have been mitigated by Financial Services to support DWS objectives and activities and are consistent with water volume accountability requirements.**

Background

The main revenue billing and collection process is carried out by the Revenue Division of Financial Services, a group which is also responsible for billing and collecting property

taxes. Financial Services staff also carries out the meter readings which are planned to occur three times a year for residential accounts and every other month for commercial and large consumption accounts. Billings occur every two months for residential accounts, and monthly for commercial and large consumption accounts. Meter reading generally involves visiting each property and connecting a reader to a remote receiver outside the building, which in turn is connected by a wire to the meter itself, which is generally inside the building. CSOS is responsible for maintenance of the meters and remote receivers.

The billing and collection activity is supported by a computerized billing and collection system called Aquacis. CSOS uses an information system known as ITX/IIMS to manage service requests and the maintenance and repair of the water connections and meters. For metered connections, CSOS is responsible for ensuring that the meter information required for customer account set up is obtained and entered in the ITX/IIMS system daily, and Revenue is responsible for uploading it to Aquacis along with information from other sources to set up the customer account for billing purposes

CSOS is responsible for billing the small number of accounts that require water permits to obtain water from flusher hydrants. These customers are on an honor system and are to notify CSOS of the amount they take within 24 hours of the occurrence. Billings are based on the volumes reported.

Focus of the Audit

The scope of our enquiries and documentation review was limited to the Revenue Division's Billing, Customer Accounts, and Collections groups, as well as the Customer Services and Operational Support Division (CSOS) group that is responsible for meter maintenance.

Audit Criteria

The audit was directed to determine the extent to which:

- Mitigation/controls exist to address the following key risk areas:
 - a) Accuracy of water billed rates and volumes (estimated and actual)
 - b) Completeness of water billings (all billable water usage is billed)
 - c) Collections are appropriately accounted for.
 - d) Appropriate segregation of duties between meter reading, billings and collections exists.
- Operating procedures and related controls on initiating, processing, and recording water billings and collections exist and are monitored and evaluated periodically
- Practices are consistent with water volume accountability requirements

Findings/Observations of Audit

1. There are a number of issues related to the accuracy and timelines of the volume of water billed.
 - Residential water meter repairs are a continuing problem area, inhibiting the ability to bill in an accurate and timely manner.
 - Obtaining actual meter reads from functioning meters is a key practice to ensure that the water volume being billed is accurate, to provide customers with timely feedback on their water use, to encourage appropriate water use efficiency, and to ensure the accuracy of water loss calculations.
 - Despite recent improvements, there were still approximately 3,300, or approximately 2% of all accounts as at March 31, 2005 where at least the last four consecutive billings had been based on estimated consumption. The vast majority of these are residential connections.
 - The ineffective operation of remote receivers on the outside of buildings and the failure of the wire connecting the remote receivers to the meter is a significant cause of the missed readings.
 - Ensuring that external meter reading devices and meters are functioning is the responsibility of CSOS.
 - Revenue has been seeking a faster response from CSOS on requests for repairs of residential meters and/or remote receivers. Current practices relying on the co-operation of homeowners or building occupants to gain access to meters have made the repair process difficult and expensive relative to the risk to revenues.
 - CSOS indicated that it adjusted its priority in 2004 to the large meter change-out program. However, despite priority placed on calibration of high-volume meters, CSOS has been unable to calibrate all meters on a timely basis. In 2004, 954 large meters were not changed out as scheduled, with management estimating a potential lost annual revenue of \$316,537 (based on a combined 2004 water/sewer rate of \$1.58/m³). The cost to repair these meters would be approximately \$240,000.
 - The responsibility for fixing the remote sensors along with two staff person resources was temporarily transferred from CSOS to the Billings group to address the backlog. These additional staff helped to increase the number of meter readers during the period of February to September 2004. The meter readers were able to spend more time to get a difficult remote to read or get inside to read the meter. Also, the Billing group purchased new probes which worked better on the remotes. Meter readers changed or repaired 1500 remotes for all the 'quick fixes' from outside and CSOS continued their repairs. This reduced the number of accounts repeatedly billed based on estimates from approximately 7,000 to the current level of approximately 3000.
 - For customers who repeatedly refuse access to correct faulty meters, some estimated water bills have been manually adjusted (up) to attract the attention of the client and encourage granting access.

- CSOS has considered other approaches, such as enforcement of the right to access granted under the By-Law including issuing fines or potentially terminating service, but has not taken such action to date.
2. Recent changes have resolved some issues related to water volume reporting as a part of water loss calculation for water volume accountability requirements.
- The volume of water consumed by customers is a key input to the calculation of water loss in the distribution system.
 - The reported consumption amount can be affected by billing adjustments that impact the volume billed, by inaccurate meters, and by reporting inaccuracies.
 - The formula used to estimate consumption for bills not based on actual readings is generally accurate, but subject to errors in some specific instances. For example, events such as leaks, or the Let Water Run program which is used during the winter time for water services that may freeze, may affect the consumption amount in a period that the formula uses to estimate consumption. There is no built-in adjustment in the formula for such one-off events.
 - Manual adjustments to the volume billed are made in such instances as the “Let Water Run” program, to adjust for faulty or broken meters, the discovery of meter by-passes and to attract customer attention to gain access for repairs.
 - An appropriate formal manual approval process exists for water consumption adjustments. As well, there are procedures in place to deal with water volume issues such as, for example, imperial unit meters and meter digit inconsistencies
 - In mid-June 2005, the process for manual water volume adjustments was modified to better monitor volume adjustment activity, and ensure billing adjustments do not impact reported consumption except where appropriate.
 - The timing of reported usage is impacted by the underlying reliability of the estimation formula, the frequency of meter reads (and hence degree of reliance on estimates) and by manual adjustments for past errors or those knowingly overestimating consumption, however the net effect is negligible.
 - Water meters will eventually provide incorrect readings, generally reading low due to component deterioration over time. CSOS have been prioritizing their Large Meter Changeout program, providing assurance major customers are billed based on accurate volumes.
 - The Monthly Revenue Billing report contained a consumption billed figure that did not agree to the Aquacis system, hindering efforts to reconcile water loss. This programming fault was corrected in May 2005. The report had historically been approximately 2.5% different from the Aquacis system.
 - Billings management has represented to us that any monetary related transactions or adjustments do not result in an adjustment to the volume recorded.
 - The frequency of meter reading, which is currently every four months for residential accounts and every other month for commercial and large water consumption accounts, was known to be “established some time ago” and no formal policy on meter reading currently exists. London reads all meters monthly, and, based on their

past structure as a “Public Utilities Commission”, that meters are read by London Hydro. Halifax reads residential meters every three months and all other meters that are 3” or more monthly, and meters that are less than 3” quarterly. The benefits of recording actual consumption on a more frequent basis were discussed in the March 23, 2005 report to the Corporate Services and Economic Development Committee and included allowing customers to see the impact of their behaviours on consumption, identify leaks or other water loss events more quickly and encourage appropriate water use efficiency based behaviours.

- The business case for a meter/receiver replacement program that would involve an Automated Meter Reading (AMR) system, using a drive-by Radio Frequency (RF) system is currently under review. Such a program would significantly improve the capacity to obtain accurate and timely meter reads and may make it more economical to read meters more frequently; however, the implementation costs of such a program need to be clearly identified and considered.
3. The accountability trail and reporting capabilities of the Aquacis system are deficient.
 - Although significant improvements have been made to maintain the integrity of data within Aquacis, the accountability trail to ensure the integrity of water volume consumption and other information is not complete. There is no formal or journalized approval process within Aquacis, no ability to track all overrides, and there exists the ability to by-pass use of the fixed memo pad accounts that are supposed to be used to document what was done to the account.
 - The existing reporting capabilities of Aquacis do not allow or do not easily allow for a manual reconciliation or review of entries, overrides, or by-passes.
 - Existing reports do not respond to specific requirements of the Billing, Customer Accounts, and Collections groups or report on the basis of the security profiles that were developed for Aquacis in February 2005. For ad hoc reports or inquiries, the information that could be available is too labor intensive to retrieve, and therefore not used.
 - The error in reporting of water volumes noted above was detected, and although management was not aware of any other errors, it is not confirmed that other similar errors do not exist.
 4. A formal assessment of the Aquacis system is required.
 - It is necessary to determine if the Aquacis system can cost effectively meet user needs and ensure the achievement of divisional and strategic objectives.
 - A comprehensive formal user needs assessment should be conducted in line with the divisional and strategic objectives and that the resulting outcomes be compared against the current Aquacis system capabilities.
 - A review of the system is needed to ensure it calculates and retains information as expected, that reports provide timely accurate information, that the security profiles design and associated control policies and procedures are appropriate and that controls are operating effectively.

- If Aquacis is retained, the reporting and investigative analysis capabilities will require improvement.
 - Specific attention should be given to the existing key control weaknesses, and the reporting and analysis capability weaknesses as discussed above. Consideration should also be given to the controls over changes to the system itself (e.g. patches). Any such changes should be independently verified to ensure that no other facets of the system are inadvertently impacted.
5. Reporting capabilities of ITX/IIMS and ITX/IIMS related communication and control processes are deficient.
- The number of meters recorded in the ITX/IIMS system could not be obtained with accuracy. CSOS expressed concern that the ITX/IIMS meter inventory information was not providing reliable data due to recent changes in reporting scripts and has requested IT support to investigate the matter.
 - Service requests entered into the ITX/IIMS system by Customer Accounts staff are reviewed and prioritized into work orders as deemed necessary by the CSOS Maintenance Planner. Service requests can be cancelled and this history appears to be tracked within the system, although it requires an experienced system user to identify who cancelled the request. Any service request that has been turned into a work order cannot be cancelled or closed until the work order attached to it is cancelled or completed.
 - Customer complaints have been received by Customer Accounts regarding work orders that had been “completed” in the system, but the work itself had not been performed. Specific concern was also raised by Collections that service requests to shut-off water service did not always occur as expected. Verbal follow up between Customer Accounts, Collections and CSOS occurs in lieu of consistent, formal documentation in either the ITX/IIMS or Aquacis systems. As well, the level of detail of information to support the service request is not always sufficient to ensure proper prioritization or appropriate cancellation. There is no comprehensive, periodic reporting of outstanding or cancelled service requests and work orders and the reasons therein.
 - CSOS management, as part of its six-part continuous improvement process, will be identifying and analyzing the nature of service request and work order activities in order to implement performance measures for such activities. It is our understanding that all outstanding service requests will be reviewed by the Billings group during Fall 2005 as a step to address such issues.
 - This has increased the risk of lost revenues as it increases the amount of time to resolve issues which may overlap changes of ownership and reduce the ability of Customer Accounts to defend billings and maintain customer relationships. It also makes it more difficult to prioritize service requests to ensure the best use of available resources.
6. A formal assessment of the ITX/IIMS system should be conducted.

- An assessment of the existence and appropriate design of controls and whether they are operating effectively and result in reliable reporting is required.
 - Given the concerns regarding reliability of information reported by the ITX/IIMS system, users may be inclined to believe that the information in any reports they receive or enquiries they make are inaccurate and may reduce any reliance on such reporting. This is why the controls to ensure data integrity need to be in place and confirmed to be operating effectively before any analysis or performance measurement standard setting can occur. This would also facilitate an understanding of how the deletion of a work order without verification of the work being performed occurred.
7. Communication regarding customer service requests and work orders between the Customer Accounts, Collections and CSOS groups needs to be improved.
- An agreement is required between Billings, Customer Accounts, Collections and CSOS on the nature and extent of narrative description to include in a service request and the criteria for prioritization or cancellation and how it should be documented in the ITX/IIMS and Aquacis systems.
 - An outstanding service request listing should be made available to Customer Accounts and Collections for their review to facilitate billing processes and monitor and maintain customer relationships.
 - The Billings group should continue with its review of outstanding service requests and Customer Accounts, Collections and CSOS should also be involved throughout the process.
8. Overall, procedures generally exist to address the risk of incomplete water billings and Revenue and CSOS management are aware of the controls that should exist regarding their responsibilities for the completeness of water billings.
- Key reconciliation controls and preventative activities that would help mitigate the risk of incomplete water billings do not exist. There is no formal or comprehensive reconciliation or comparison between the water accounts in Aquacis and the property tax accounts in VTAX or the ITX/IIMS meter inventory. Unexplained and unreconciled discrepancies between the systems have been identified by Revenue, Utility Services and CSOS.
 - A number of steps have been taken or are being taken to help identify instances where there may be incomplete water billings including, route re-sequencing, improved communication between meter readers and Billing staff regarding items/activities observed by meter readers, tracking of accounts not yet set up, verification of inactive accounts, daily review of the number of bills generated against the number of active and inactive accounts, and ad-hoc comparisons between the water accounts in Aquacis and the property tax accounts in VTAX when a customer calls, or when water or tax certificates are being requested by a lawyer.
 - Further difficulties may arise when initially obtaining information from developers and other contractors to set up billing accounts and charge other fees (e.g. meter

verification/installation). For example, it is possible that a sub-division is split and the civic numbers change without adequate notification by other City departments or by the developer/contractor to CSOS, Billing or Customer Accounts. Although developers/contractors are required to obtain water meter permits from CSOS, if they do not, then it is expected that the account trail will be found again with the building permits. However, there is no cross-reference or reconciliation of building permits to either CSOS or Revenue data which means that billing accounts may be incomplete.

- When developers/contractors are found to be using water or have turned on water without properly notifying the City, a letter explaining why the activity is inappropriate is sent to the company/individual. At this time, water consumption is not necessarily recorded or billed. Fines are issued if inappropriate water usage is found.
- Building permits are issued once an inspection occurs and that currently, there is no formal or informal verification that the meter on the premises has been inspected by CSOS or that it meets meter By-Law specifications.
- The Customer Accounts group relies on their customers to notify them of moving in/out of their premises. As such, this information may not be accurate, timely, or complete. As well, concern was expressed that because overrides of move dates and other move related information may occur in Aquacis without a trail, (unless a 'memo pad' entry is done), there is no way to verify such information even if it is obtained. In Aquacis, when accounts are overridden, Customer Accounts staff will not be able to effect an ownership data change, request a final meter read, and affect the associated billings. There are no completeness and accuracy checks with other City departments or property tax information to verify that all move ins/outs are identified so that final meter reads and associated billings can be performed
- Two summer students monitor flusher hydrant use to ensure permit holders report the water taken; however a test study on one flusher hydrant was performed to help identify underreported consumption by the permit holders. It was found that approximately 50% of consumption was unreported. Although the test was conducted on only one flusher hydrant, if this is representative, the foregone revenue may amount to \$150,000 per year. It is not clear if there is a cost-effective approach to improving compliance. CSOS management stated it was not cost-effective to obtain actual consumption from flusher hydrants through installation of meters, surveillance, additional inspection, or automatic shut-off devices.
- Neither London nor Halifax allow the tanker trucks to use fire hydrants to fill their tanks. Each city has designated, secured and metered dispensing stations for tanker trucks. Secure dispensing stations are used primarily to ensure water quality integrity. For example, back flow that intentionally or inadvertently introduces contaminants into the water that could occur at a flusher hydrant will not occur with a secure dispensing station. They also facilitate accounting for water volume and ensuring completeness of billings. Recognizing that there are significant costs and other factors involved in implementing secure dispensing stations (e.g. power

supply, land, ease of access for the water tankers), consideration should be given to stronger By-Law enforcement and/or an increase in the consequences associated with non-compliance. Consideration should also be given to performing an analysis of available data on permit holder customers to estimate the volume of expected use and compare to reported use.

- There is no pro-active or formal program to detect meter by-passes. CSOS management considered metering by-passes and/or removing/closing by-passes for non-essential services as a means to prevent water theft. Meter by-passes observed by meter readers are communicated to CSOS on an ad-hoc basis, but this is infrequent, as meter readers rarely need to access a building to register the water volume consumed.
9. Overall, it appears that an appropriate segregation of duties between meter reading, billings and collections exists.
- Prior to February 2005, the segregation of duties was not robust enough in that anyone with access to Aquacis essentially had the ability to perform all functions. No inappropriate activity was identified as a consequence.
 - In February 2005, security profiles and associated functionalities to support this segregation were developed by IT staff and Revenue management and reviewed and approved by Revenue's senior management. Our cursory review of one of the security profiles supports an appropriate segregation. CSOS has read-only access to Aquacis. There has not been an independent full assessment of the security profile design, their operating effectiveness, or of the procedures in place to ensure that they are properly maintained.
10. The internally established collection target is too low.
- The collection target for both water and sewer receivables is 95%. This is considered by Collections management to be in line with other receivables, such as taxes. However, bad debts expense is less than 1% and the fiscal 2004 write-offs were less than 1%, suggesting that the current target should be reconsidered. Halifax currently has bad debt write-offs of less than 0.4% of metered revenue.
 - The debt that is currently not secured is the tenant-lease receivables and these are perceived by Collections management to be their highest collection risk area. Total tenant-lease receivable billings for fiscal 2004 were \$4,472,128 or approximately 2.9% of total billings. As at December 31, 2004, water and sewer receivables were \$5,595,131 of which \$264,812 or 4.7% represented tenant-lease receivables. The tenant-lease receivables outstanding at the 2004 year-end are therefore approximately 5.9% of 2004 tenant-lease billings, suggests that a collection target of 95% may be appropriate for this group of accounts.
 - Collections are in the process of submitting a proposal to the City to allow securing the debt of tenant-lease receivable accounts, which would support a higher collection target.

Recommendation 4

Responsibility and accountability for the maintenance program for water meters and remote receivers should be clearly defined and acceptable service levels established, with priority given to areas where the potential for lost revenue is greatest.

Management Response

Management agrees with this recommendation. Service Standards need to be established for repair times and better communication introduced between the two work groups. Both groups need to understand the priority setting mechanism and look at the revenue loss and customer service when establishing work plans. A review will be undertaken in 2006.

Recommendation 5

The approach for gaining access to customer premises should be improved by placing more reliance on By-Law enforcement and/or service termination to ensure access to the premises on a timely and efficient basis.

Management Response

Management agrees with this recommendation. A review will be completed by Q3 2006.

Recommendation 6

The rationale for meter reading frequency should be reviewed as part of the study of meter reading technology, taking into account the benefits to customers and water volume accountability of frequent, accurate readings.

Management Response

Management agrees with this recommendation. A study of meter reading frequency will be undertaken to determine the most cost-effective frequency. The frequency issue could be improved dramatically through the introduction of Automatic Meter Reading technology. Consolidated management of all aspects of meter maintenance and meter reading may provide improved productivity, water accountability and information reports.

This initiative is not included in the 2006 work plan or budget and will be included in the 2007 Corporate Services Departmental work plan.

Recommendation 7

A formal assessment of the Aquacis system should be conducted to determine if the system can cost effectively meet user needs and ensure the achievement of divisional and strategic objectives.

Management Response

Management agrees with this recommendation. Once the new meters and reading technology are selected, a review of the Aquacis will be undertaken. This will form part of the 2007 Corporate Services Departmental work plan.

Recommendation 8

A formal assessment of the ITX/IIMS system should be conducted to assess the existence and appropriate design of controls and whether they are operating effectively and result in reliable reporting

Management Response

Management agrees with this recommendation. The recommended assessment will be completed by Q2 2007 as part of the ITX/IIMS replacement project initiated by the Public Works & Services Department.

Recommendation 9

Communication regarding customer service requests and work orders between the Customer Accounts, Collections and Customer Services and Operational Support groups should be improved including agreement on narrative descriptions within a service request and the criteria for prioritization or cancellation of requests.

Management Response

Management agrees with this recommendation. All the tools to enable coordination and communication of work order and service request information are currently available in ITX. Improved training and process implementation will improve results. The review of consolidating management of the groups will also address the issue. This will be addressed in 2006.

Recommendation 10

A formal communication process for by-passes observed by meter readers, or Customer Services and Operational Support maintenance staff, should be developed

by the Customer Services and Operational Support group along with the associated action measures, including notification of By-Law Enforcement.

Management Response

Management agrees with this recommendation. A reporting process is already in place, and used by both Meter Maintenance staff and Meter Readers. Open bypasses are not in compliance with the Water By-law, and each reported offence is followed by issuance of a fine to the building owner. Although the process works and is used by both groups, formal and written documentation of the procedures is lacking. This will be resolved in Q1 2006.

Recommendation 11

Procedures to reconcile water accounts with property tax accounts (VTAX), meters installed (ITX/IIMS) and building permits issued should be developed to help mitigate the risk of incomplete billings.

Management Response

Management agrees with this recommendation. This initiative will assist in ensuring that all customers are being billed. Currently, this cannot be accommodated within existing resources. Additional resources will need to be identified as part of the 2007 Corporate Services Departmental work plan and budget.

Recommendation 12

Processes related to activating accounts for new development should be reviewed to facilitate identification of developers/contractors that may use water that should be billed or that turn on water without notifying the City.

Management Response

Management agrees with the intent of this recommendation. The Water By-law is very clear on that subject: only City staff are allowed to turn on or off water on the system. The By-law is enforced with fines on every reported infraction. Some water that is used in new developments is unauthorized and unbilled. A review, to be completed by Q1 2007, is currently underway to improve compliance on building construction related usage and a process to bill new developments using water.

Recommendation 13

Procedures should be developed to address the issues associated with new meter specifications, communication of new meter information, and potential By-Law impacts

Management Response

Management agrees with the intent of this recommendation. We believe there are no issues with meter specifications. The meter specifications are part of the Water Specifications Guidelines that include all water related parts and materials. They are reviewed regularly following a process managed by the Infrastructure Services Branch. The communication of new meter information issue relates to the transfer of information between Customer Accounts and Meter Maintenance. The issue was addressed in Q4 2005.

Recommendation 14

That CSOS review options to improve compliance (reporting and payment) by flusher hydrant users including the cost-effectiveness of creating dispensing stations and the use of stronger By-Law enforcement

Management Response

Management agrees with this recommendation. The Flusher Hydrant Program is an honour-based system, relying on the user to self-report water usage. It is expected that some users will not report some of their usage. Staff attempted to quantify theft, as reported in the Audit. Staff will be assessing the cost / benefit of constructing bulk water dispensing stations through the City to ensure full metering, regulated water withdrawal flow rates, surge protection and backflow safety features. This assessment will be completed by Q4 2006.

Recommendation 15

The internally established collection target should be re-evaluated by Revenue and Collections management.

Management Response

Management agrees with this recommendation. This target will be reviewed in 2006.

3.4 The assessment of the DWS water distribution system water quality sampling program.

Background

The new drinking water regulations (since 2000) have specific water quality sampling requirements for all water distribution systems in all municipalities across Ontario. These requirements include numerous parameters that must be monitored at specified frequencies. All parameters must be tested by accredited laboratories. The province has specific requirements for notification when specific parameters do not meet regulatory requirements, referred to as an Adverse Water Quality Incident. The notification requirement is imposed on both the Laboratory performing the analysis, and on the operating authority (the DWS in the City). Notification must be immediate and the laboratory must notify the following groups;

- Local health department
- Provincial Ministry of the Environment
- Operating authority (DWS at the City)

The Operating authority must also notify the health department and the Ministry of the Environment, and inform them of the corrective action that is taking place to rectify the Adverse Water Quality Incident.

All Adverse Water Quality Incidents must be documented and summarized in a yearly summary report.

Although the current regulations identify the parameters to be monitored, and the minimum frequency for each parameter, this requirement is not related to the size of the distribution system, or the actual location where various parameters should be tested. Only bacteria sampling, turbidity and chlorine (or chloramines) residual have monitoring frequencies that are based on the size of the population served by a distribution system.

Current best practices suggest that the location of all parameters being sampled, and their frequency, should be considered in any water distribution system water quality sampling program, such that the parameters being monitored appropriately reflect the quality of the water being consumed by water customers at various locations in the system, and also based on the possible seasonal variation of water quality. The United States Environmental Protection Agency is currently imposing the “Initial Distribution System Evaluation” on water purveyors across the United States. This evaluation will most likely lead to future United States Environmental Protection Agency regulations. Ontario will not be far behind in this regard.

With respect to drinking water quality impact on consumers, there are two primary categories; Acute and Chronic drinking water quality concerns. Acute water quality problems essentially mean that there could be an immediate health impact on the consumer if they consume the water, such as what occurred in Walkerton in 2000. This includes harmful bacteria, poisons, etc. The DWS group and the Health Branch have written protocols to follow should an acute parameter be discovered in the drinking water supply.

Chronic water quality problems are long-term health concerns. These could include high concentration of metals, chlorine by-products or other parameters that are above the drinking water guidelines. The guidelines, for chronic parameters that may be in drinking water, are based on a human drinking two litres of water everyday over a 70-year period. Again, both the DWS and the Health Branch have protocols that they follow should a chronic parameter be discovered in the drinking water supply that is above the regulated standard.

Over the last 30 years, technology has progressed where the scientific and medical communities have been able to monitor parameters in drinking water that were not possible in the past. And, not only are they now able to monitor parameters that were unknown in the past, they are also able to monitor these at extremely low concentration levels (parts per billion and parts per quadrillion). With the discovery of this accuracy capability, the health community has been researching the impacts of these parameters on human health through the consumption of drinking water (as well as through other means, such as food and air).

In the case of drinking water, as technology allows the monitoring of parameters that were not possible in the past (or the monitoring of a parameter at a substantial lower concentration), the health community assesses the possible impact on human health and the possible method of transmission to the body. For possible drinking water concerns, the Federal Health Department reviews the scientific evidence, and if required imposes new drinking water guidelines and the Province of Ontario in turn imposes these as standards.

This is one of the main reasons why drinking water quality standards change and water purveyors must make water treatment process changes to their drinking water facilities to meet these new standards.

Focus of Audit

The audit's main focus with respect to this objective was the DWS compliance to the regulatory requirements and the evaluation of the DWS with current best practices related to the distribution system water quality monitoring program. Documented best practices include the United States Environmental Protection Agency Initial Distribution System Evaluation requirements, and the following best practice documents prepared by the InfraGuide (National Guide to Sustainable Municipal Infrastructure);

1. Water Quality in Distribution Systems

2. Monitoring Water Quality in the Distribution System
3. Methodologies for Setting up a Cross-Connection Control Program

The audit also reviewed the City's 2004 Drinking Water Summary Report to confirm that all items were included in this report to Council.

Audit Criteria

Provincial regulations require specific parameters to be sampled, at various frequencies. The audit reviewed general water quality concerns in the distribution system, reviewed the sampling locations in the system, reviewed the annual summary report to Council and compared the City's water quality sampling practices with respect to industry best practices to ensure:

- Sampling is occurring at appropriate locations across the City's system and is representative of the water quality throughout the system
- City's annual water quality report represents the results of the water quality sampling program and meets regulatory requirements
- Distribution system sampling program meets current best practices (based on new United States Environmental Protection Agency Reg. of (i) number of sampling sites, (ii) location of sites, (iii) rational for site selection and (iv) sampling schedule)
- Sampling is in line with current Best Practices (InfraGuide)

Findings/Observations of Audit

1. The City's water quality monitoring program meets all regulations. In most respects the quality sampling program goes far beyond the regulatory requirements, as required by best practices.
2. The City's 2004 Drinking Water Summary Report appropriately reflected the water quality sampling program undertaken throughout that year.
3. The quality of the water entering the Water Distribution System from both the Lemieux Island and Britannia Water Purification Plants is consistently of very high quality.
4. DWS has clear lines of staff accountability for water quality issues (Program Manager – Water Quality).
5. The quantity of Adverse Water Quality Incident in 2004 is considered high (51), but 34 of those incidents were related to one situation that was appropriately dealt with, including a post-mortem on the situation, and changes to procedures to alleviate similar situations in the future. Aside from this one situation, the quantity of Adverse Water Quality Incidents is in line with other large municipal water systems across Ontario.
6. The City (both the DWS and the Health Branch) has clear and strict procedures in place to deal with an Adverse Water Quality Incident, which meet regulatory requirements.

7. The City's water quality sampling program is considered a best-in-class program, based on the method of determining where water quality samples should be taken, the number of samples taken and the chronological pattern of collecting the samples. This program appears to appropriately reflect the water quality that customers are consuming across the water distribution system.
8. The water quality sampling program is regularly changed to meet the expansion of the water distribution system, ongoing improvements within the system, and construction activities that may impact water quality.
9. Water quality sampling in the distribution system is taken at specified locations on a daily basis. The staff performing this task have specific locations to sample from and specific procedures to follow, however, staff have complete autonomy over their work on a daily basis, especially over the weekend and holidays when plant supervisory staff are off.
10. The method of analysis of the data trends from the water quality sampling program, including customer inquiries analysis, is ad-hoc.
11. The City uses simple spreadsheets to analyze water quality trends. This requires regular data input that is frequently delayed due to other pressing workload issues. Industry best practices suggest that the data input and trending should occur regularly by in-house staff or be contracted out to the private sector (DWS are considering this at this time). Halifax and many other municipalities across Canada currently contract out this service.
12. The City does not have a cross-connection control program in place. Both London and Halifax have cross-connection control programs in place. Various City departments will require involvement in such a program, including planning, building inspectors, and DWS. A cross-connection control program reduces the risk of an industrial or commercial building from possibly contaminating a water system by imposing backflow prevention devices on the water service that enters the private facility. Equipment and plumbing configurations inside of industrial and commercial facilities can be complex, and a cross-connection control program educates these facility owners on the possible impact of their plumbing and equipment on the water system, and provides a barrier through the addition of a backflow preventor to stop any industrial or commercial product from entering the central water system should equipment or plumbing be inadvertently misconfigured. Meeting the InfraGuide's best practice "*Methodology for Setting a Cross-Connection Control Program*" would be appropriate. It should be noted that such a program requires stakeholder involvement, substantial cross departmental involvement across the City, staff training and financial support. The program should be phased in over a 3 to 5 year period.
13. The City does not have a proactive lead services change out program. While no program is required by regulation, there are current lead service replacement requirements in the United States, and Justice O'Connor's Part 2 Walkerton Report also recommends lead services lines should be located and replaced over time with safer

materials (recommendation No. 35). Through the City's Water System Rehabilitation Program, lead water services are currently being replaced from the water main to the property line. The City still has between 15,000 and 25,000 lead water services within the water distribution system. The City does have an information letter that is provided to residents with lead water services, informing them on the concerns of lead in drinking water, and on how to minimize any health impacts. When residents follow the recommendations of the information letter, the concentration of lead in the drinking water due to the lead water service meets or is better than drinking water standards.

14. The City is concerned that there is no method of knowing the quality of repairs that are completed on private water distribution systems connected to the City water system. Since some of these systems are "looped", with more than one connection to the City's water distribution system, improper maintenance activity in a private system that may impact water quality could become a water quality issue within the City's public water system. A by-law that requires all private water systems with more than one connection to the City's distribution system to have written maintenance procedures to maintain and repair their private water system is needed. The by-law should also require prior notification to the City of any activities on the private water system that may impact water quality. The City may want to consider offering maintenance and repair services to the private systems on a cost recovery basis. The City should develop this by-law with appropriate consultation with the Private water system owners.
15. The City reports their water quality results to the public through an annual report to Council, and in response to requests from the public. The results are also available on the City's Internet web page. The water quality report is a thorough report addressing all drinking water quality concerns that occurred throughout the year.
16. The City performs Quality Assurance and Quality Control on water samples tested by the laboratories. However, the City does not perform Quality Assurance and Quality Control on the staff that collect the water samples, to ensure they follow the prescribed routine.

Recommendation 16

The data input and trending analysis of all parameters from the distribution system water quality sampling program should occur on a regular basis by dedicating staff time or by contracting out this service to the private sector.

Management Response

Management agrees with intent of this recommendation. With the implementation of the new WaterTrax Water Quality monitoring software, this functionality now allows staff to do this.

Recommendation 17

The City should implement a cross-connection control program, in accordance with the InfraGuide's Best Practice of Methodologies for Implementing a Cross-Connection Control Program.

Management Response

Management agrees with the intent this recommendation. We do not believe this is a high risk item that would require it be a priority action item at this time. Staff if requested would bring a report forward in Q2 2007 outlining a proposed program and long term cost for Committee's consideration.

Recommendation 18

The City should implement a proactive lead services replacement program.

Management Response

Management agrees with intent of this recommendation. The Branch is fully aware of the recommendations contained in the Walkerton Report. The City currently treats drinking water so that it will remain in compliance with all federal and provincial guidelines for lead content in drinking water. Monitoring programs have confirmed the effectiveness of this approach. A report will be presented in Q3 2006 outlining a proposed strategy to Council for addressing lead services.

Recommendation 19

The City should develop a by-law that requires all private water systems with more than one connection to the City's distribution system to have written maintenance procedures and requires prior notification to the City of any activities on the private water system that may impact water quality.

Management Response

Management agrees with the intent of this recommendation. This initiative should be developed in conjunction with the Cross Connection Control Program referred to in Recommendation 17. A proposed by-law will be presented to Council in Q3 2007 addressing perimeter metering and back-flow prevention for private systems.

Recommendation 20

DWS should implement a Quality Assurance/Quality Control program on organizational positions that conduct the water sampling collection program to regularly verify the completeness of their tasks, including the sampling of all sites identified, and on the processes and procedures they must follow.

Management Response

Management agrees with the intent of this recommendation. While staff are confident of the information gathered by our current monitoring program and procedures, we will review our procedures to provide this additional level of security and confidence in our results. This review will be completed by Q4 2006.

3.5 The assessment of the DWS programs to reduce water loss in the distribution system.

Background

The City of Ottawa took proactive measures in the mid 1900's to become a 100% metered water system. The City also meters all water that enters the water distribution system from the two water purification plants. For years, the City has monitored the Unaccounted-For-Water in the system, by calculating the actual water entering the distribution system (from the two plants), less the actual metered consumption (only water that was actually metered – the City, and previously the Region of Ottawa-Carleton, were aware of various unmetered water uses, but estimated unmetered water use was not removed from the total). As such, over the last decade, the City has had an Unaccounted-For-Water figure of between 16.5% and 28%, on a yearly basis. Best practices suggested that a municipality should be in the 10% to 15% range, however this assumes all known uses of water are accounted for, whether metered or not. The method by which municipalities calculate Unaccounted-For-Water is very subjective, and has made comparisons difficult.

The use of the Unaccounted-For-Water value for benchmarking purposes has been used across North America for decades. In the past 5 years, the international water community has adopted a more appropriate method of benchmarking water distribution systems with respect to water loss. The Infrastructure Loss Index is now considered the best practice to determine the state of water system infrastructure with respect to water loss. The Infrastructure Loss Index is determined by following the international approach to water loss management, developed by the International Water Association.

The American Water Works Association (primarily a North American association) has been the leader in setting standards for water utilities around the world. The American Water Works Association is currently in the process of adopting the International Water Association water loss method.

The International Water Association approach to water loss management not only addresses how to determine a water systems Infrastructure Loss Index factor, it also provides detailed strategies on how to reduce real water losses in a water system. The City of Ottawa has been monitoring the international approach to reducing water loss, and is currently focused on adopting many of the water loss principles of the International Water Association best practice.

The Public Works and Services 2006 Departmental Business Plan forwarded to the City's Joint Committees (Corporate Services, Planning and Environment and Transportation) on September 12, 2005, and to Council on September 28, 2005, identified a few water loss topics. Specifically, the Utility Services Branch (USB) states that it will “develop a water audit tool and infrastructure leakage index” and “update the water loss reduction action plans...” (Environmental *Actions*, p. 30) in 2006.

Focus of Audit

The audit's main focus with respect to this objective was the review of the City programs with respect to water loss and comparing the City's programs to current best practices. The documented best practices reviewed include the International Water Association method, and the best practice documents prepared by the InfraGuide.

Audit Criteria

The City's water distribution system is 100% metered and when water production figures are compared to metered consumption figures, there is the perception of a large quantity of loss water within the distribution system. The audit reviewed the City's approach to dealing with identifying and reducing the actual loss water, and compared the findings with current best practices. The audit reviewed whether:

- DWS has implementation strategies to reduce water loss Unaccounted-For-Water
- DWS has specific monitoring programs to monitor water use and loss
- DWS has implemented past recommendations of Unaccounted-For-Water studies
- DWS strategies and programs meet current best practices (International Water Association water balance for water distribution systems)

Findings/Observations of Audit

1. The City has undertaken many ongoing proactive water loss improvement programs over the years, many of which are typically used by leading water utilities. These include;
 - Water System Rehabilitation Program
 - Water system leak detection program
 - Water meter replacement program

- Service post rehabilitation program
 - Water system cathodic protection program
 - Proactive service connection repairs program
 - Unaccounted-for water program
 - Water efficiency strategy program
2. The City has also monitored the frequency of watermain breaks from year to year, and benchmarking data compiled by the National Research Council of Canada has shown that Ottawa has a relatively low quantity of water main breaks per kilometer of watermain (the lower the value, the better) when compared to other cities.
 3. The City currently has on staff one of the worldwide leading authorities on the International Water Association water loss process.
 4. The City has been implementing some of the management strategies to reduce water loss.
 5. The various water loss implementation strategies are spread out across various groups within the City with no group having clear overall responsibility.
 6. The Utility Services Branch is undergoing a structural review. Management and group responsibilities may shift in the immediate future and overall responsibility for the water loss reduction program may be determined following the structure review.
 7. Although capital and operating programs are in place to address water loss, priority setting by program varies and the programs are not being implemented in a timely fashion.
 8. The Customer Services & Operational Support group has 4 staff that have water loss responsibilities, as well as other duties. The percentage of time they spend on water loss issues is estimated to range from 10% to 25% of their daily duties, based on a yearly average.
 9. Ottawa is currently a North American “Beta” site (test site) for the review and development of an American Water Works Association Water Loss Reduction Program.
 10. Halifax has implemented the International Water Association water loss reduction strategies. London completed the International Water Association water audit in May, 2005.
 11. Public Works and Services acknowledge that water loss in the water distribution system is a departmental priority and have addressed this through the 2006 Department Business Plan. Staff are planning to bring a report to Council in late fall 2005 describing their proposed program.
 12. The City’s Infrastructure Loss Index for 2004 is 5.8, which is in the average Infrastructure Loss Index target for North American systems of similar nature to Ottawa, based on a recent American Water Works Association Water Audit Software

- tool. The City's current 5.8 Infrastructure Loss Index still requires refinement, as estimates are currently being considered for some of the input data.
13. Initial findings in the United States note that the major issue with respect to being able to determine a system's Infrastructure Loss Index is the timely accounting of the water at the customers end (meter reads).
 14. Ottawa does not normally have any water restrictions imposed on their water customers. Halifax also does not impose any water restrictions on customers. London imposes an odd/even lawn watering restriction during June, July and August.
 15. The City has approximately 500 km of watermains located on private property. Maintenance of these systems is the responsibility of the property owner. Very few of these private water systems in Ottawa have perimeter metering. Without perimeter metering, private water systems have no incentive to locate and reduce leaks in their distribution system.
 16. The City had approx. 10 private systems with perimeter meters in 2000, and now has 24 private systems with perimeter meters. Staff believe that there are hundreds of private water systems in Ottawa.
 17. As outlined in section 4.3, the Utility Services Branch and the Revenue Branch of Finance have different priorities with respect to water meters. Utility Services strive to have accurate operating meters for water accounting and reporting, whereas Revenue strives to have a higher quantity of "actual readings" (as opposed to estimated water meter readings) for billing purposes. As such, Revenue focuses more on getting more residential water meters repaired (188,000 of the 195,000 total). The focus of the Utility Services group is to repair/calibrate the industrial, commercial and institutional sector water meters regularly, as they are the largest water consumers.
 18. Large water meters in the City (7,000 of the 195,000) account for over 50% of the water consumed.
 19. Water meters tend to under register consumption as they wear out and lose accuracy.
 20. No specific group had been assigned to lead and be responsible for all water loss reduction programs.
 - This group should be provided with the appropriate authority to implement the programs.
 - The implementation of the International Water Association's water loss reduction strategies should be the basis of the program.
 - The program should address all water loss issues and should address the water use of private systems connected to the City system, including the appropriate use of perimeter meters of those systems.
 21. A comprehensive report to Council is needed to outline all aspects of the City's water loss strategy.

- This report should address staffing resource and budget requirements, the intended target Infrastructure Loss Index and any proposed by-law changes.
- The report should also address the issue of private water systems connected to the City water system, including the need for perimeter metering, repairs and maintenance on private water systems, and the strategy of monitoring water loss on private water systems.

Recommendation 21

The City should identify a specific group to lead and be responsible for all water loss reduction programs.

Management Response

Management agrees with this recommendation. A report came forward in Q1 2006, to outline the Water Loss Control program to reduce water losses. The Branch will coordinate a steering committee to improve overall water accountability. The DWS division will be responsible for water leakage reduction.

Recommendation 22

Utility Services should bring forward a report to Council addressing all elements of their water loss strategy.

Management Response

Management agrees with this recommendation. A report covering this program has been prepared and was tabled with Committee in Q1 2006.

3.6 DWS' status on meeting upcoming Provincial regulatory requirements (Quality Management System & Sustainable Water and Sewage Systems Act).

Background

The Province through the Safe Drinking Water Act has stated that all water systems will be required to have a Quality Management System in place. Such a system would follow the standard "Plan – Do – Check – Improve" cycle, similar to the various ISO Quality Management Systems. Justice O'Connor's Walkerton Inquiry Part 2 report had specific timelines for the province to implement a mandatory Quality Management System (target date for municipalities to be required to have an accredited operating authority: 2006). The province is having difficulty meeting the time frame outlined in the Walkerton Inquiry Part 2 report, but the requirement is imminent. It is expected that submission to the province of Operational Plans will be a requirement of the Quality Management System. It is also

expected that a third party auditing agency will also be a requirement of the approval process.

The province is also 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. The release of any regulations associated with Bill 175 is pending the results of the Province's Water Strategy Expert Panel. The Expert Panel released their report in July 2005, with 51 recommendations.

Focus of Audit

The audit reviewed the status of the DWS with respect to meeting the requirement of a Quality Management System, and with respect to meeting the requirements of the Water and Sewage System Act.

Audit Criteria

The Ontario provincial government is expected to bring in new regulations related to a Quality Management System for drinking water systems and related to Bill 175, the Sustainable Water and Sewage Systems Act. The audit reviewed the status of the City with respect to being able to implement/accommodate these future regulations, and in particular to ensure:

For the upcoming Quality Management System regulations

- DWS has established procedures to meet the future provincial Quality Management System requirements
- DWS achieves conformance with the established procedures
- DWS demonstrates the conformance of the established procedures

For the upcoming regulations associated with the Sustainable Water & Sewage Systems Act

- DWS is preparing for the regulatory reporting requirements
- Management has formally assessed implications
- Dedicated reserves are in place
- City can provide a complete water fund breakdown of costs
- Potential changes in accounting systems, policies, and procedures have been considered

Findings/Observations of Audit

1. The Utility Services Branch (USB) has been leading the Quality Management System review for the City. USB has been monitoring the province's approach to the future Quality Management System.
2. DWS provided a Quality Management System background information report to the Planning and Environment Committee on February 22, 2005.
3. With the movement of staff and the ongoing organization review within the USB, momentum has been reduced with regards to the implementation of the Quality Management System.
4. The City has not identified any staffing or funding requirements to meet the requirements of the future Quality Management System. The USB intends to request any resourcing needs (if required), only when the province imposes the Quality Management System and once the City understands the full scope of the provincial requirements.
5. The USB is currently implementing a Quality Management System for the Biosolids program.
6. Neither the City of London nor the Halifax Regional Water Commission has a formal Quality Management System in place.
7. Once the Quality Management System is imposed on the drinking water system, it can be expected that a similar provincial requirement will be forthcoming on wastewater systems. To be proactive, the City should identify a specific group within the organization to be responsible for all Quality Management System requirements. The group responsible for implementing and monitoring the Quality Management System program should be closely linked to the groups that must implement the Provincial requirements of the program(s).
8. The City is reviewing the recently released recommendations of the province's Water Strategy Expert Panel.
9. The City does not expect any major business practices changes with respect to the Sustainable Water and Sewage System Act, as most current practices follow good business principles.
10. As noted in section 4.2, the City does not have a current breakdown of actual costs for providing water services as the overhead allocation has not been updated to reflect budget changes and some direct costs are simply factored into the overhead allocation. A more detailed breakdown is expected to be required by the sustainable Water and Sewage Systems Act.

Recommendation 23

The Utility Services Branch should implement a full Quality Management System for all environmental programs (Biosolids, Solid Waste, Water and Wastewater).

Management Response

Management agrees with the intent of this recommendation. This initiative is already well underway with the development of the Utility Services Quality Management System and is in place for the Bio-solids Program. Its implementation will be phased in the remaining programs. The Province has recently released the new Drinking Water Quality Management Standard. Staff are currently reviewing this new Standard and expect to report to Committee in Q1 2006 on this issue. Funds were approved in the 2006 Budget to address this likely regulatory requirement.

3.7 Issues Related to Multiple Audit Objectives

Background

A number of our lines of inquiry raised questions about the approach to governance of the water system in Ottawa. The recent report of the Water Strategy Expert Panel in Ontario also identified governance as a key issue. The report recommends that all water utilities be required to develop a business plan for submission to an Ontario Water Board that will outline a governance, financial and accountability model and proposed rate structure for the water service. The report also favours the creation of municipal corporations to manage water services (drinking water and wastewater management). The report recommends that water services should have responsibility for metering, billing and collecting arrangements and should maintain separate accounts from those of the municipality, with transactions between water services (whether established in a separate corporation or not), including allocation of overhead or administrative charges, priced at market value.

In addition, audit objectives 2 and 6 (upcoming regulations) both raised issues concerning the allocation of costs to the water system. Under objective 2 it was noted that some direct water-related costs are not directly charged to the water fund, but rather included in a general overhead allocation. It also noted that the overhead allocation is not based on the City's current cost structure. Under objective 6, it was noted that upcoming regulations are almost certain to require a full cost of service report on water (and sewer) services

Findings/Observations of Audit

1. Important elements of the drinking water system with their own independent mandates are located in different departments, and report through different chains of command to the City Manager. As such, no one below the level of the City Manager has a comprehensive view of drinking water service delivery.

2. This has resulted in some issues that have not yet been addressed, notably the meter and external sensor maintenance program.
3. The independent mandate of the Financial Services group in particular is inconsistent with the “centres of expertise” model as practiced elsewhere in the corporation. Generally service providers are subject to a Service Level Agreement and take direction from the operating departments as “clients”. Financial Services does not take direction from DWS, or from Utility Services.
4. The Service Level Agreements that do exist with centres of expertise such as RPAM and Fleet Services have not been updated to reflect changes resulting from budget directions and resulting changes in service levels.
5. Future programs related to Water Quality and Water Loss will have impacts across various City departments. A City staff inspecting an industrial, commercial, or institutional facility in the future could review backflow prevention devices (for a cross-connection control program), could review the internal plumbing arrangements (for improper water plumbing connections as part of the water loss reduction program) and could be reading the water meter as part of the billing cycle. These services cross many departments at this time.
6. The Expert Panel has discussed the creation of a separate corporate utility for water services. Establishing accountability for the various units involved 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 are also options. Any review of the governance structure should consider the implications of new programs, such as a cross-connection control program, the Quality Management System program and the various programs related to the reduction of water loss.
7. Observations related to the allocation of costs to the Water fund were discussed in section 4.2 of this report. Direct costs such as those in the Revenue Division should be allocated to the water fund directly, and over-head costs should be allocated to the water fund based on current expenditure levels. While new regulations under the Sustainable Water and Sewage System Act may influence final calculations, they are likely to be consistent with these principles and will require current data in any case.

Recommendation 24

The governance structure of the delivery of water services should be reviewed and restructured to ensure accountability of an individual below the level of the City Manager for the water fund and services funded by the water fund.

Management Response

Management agrees with the intent of this recommendation. The first step should be to identify a specific individual to oversee the entire system. Whether to move to one distinct separate organization should be fully studied to determine the costs and benefits of doing so. This review will be initiated in Q3 2006.

Recommendation 25

That Financial Services re-examine the allocation of costs to the water fund and identify current costs for all elements.

Management Response

Management agrees with this recommendation. This review will be completed by Q4 2006 consistent with the rules of the report “Watertight: The case for change in Ontario’s water and wastewater sector” (if adopted) and allocation methodology adopted through OMBI.

4. Audit Report Conclusions

DWS complies with the relevant federal and provincial regulations governing the safe supply of drinking water to Ottawa residents. In many areas, current operations meet best practices. However the fit within the City's organizational structure is not entirely comfortable, resulting in sub-optimal co-ordination and difficulty in resolving differences of priority or direction. It also appears to be customer friendly to a fault, resulting in some inefficiency and ineffectiveness in order to avoid inconveniencing or challenging customers. There are also inadequacies in the computerized systems used to support billing and collection, and meter inventory and maintenance activities. This report provides recommendation to deal with these concerns.

4.1 Acknowledgments

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