

Consolidated Clause in Policy and Finance Committee Report 8, which was considered by City Council on October 26, 27 and 28, 2004.

10

Costs and Benefits of Implementing an Environmental Management System in the City of Toronto

City Council on October 26, 27 and 28, 2004, amended this Clause by adding to Recommendation (2)(b) of the Policy and Finance Committee, the words “including all new Capital programs approved by City Council”, so that Recommendation (2)(b) now reads as follows:

“(2)(b) resources required in 2005 and beyond to further the environmental management systems in the City of Toronto, including all new Capital programs approved by City Council.”

This Clause, as amended, was adopted by City Council.

The Policy and Finance Committee recommends that City Council:

- (1) receive the report (September 24, 2004) from the Chief Administrative Officer; and**
- (2) request the Chief Administrative Officer, in consultation with the Agencies, Boards, Commissions and Departments, to expeditiously submit a separate report to the Policy and Finance Committee and the Budget Advisory Committee on:**
 - (a) an organizational structure; and**
 - (b) resources required in 2005 and beyond to further the environmental management systems in the City of Toronto.**

The Policy and Finance Committee submits the report (September 24, 2004) from the Chief Administrative Officer:

Purpose:

To respond to Recommendation (4) of the then City Auditor's report, Environmental Issues and Audit Plan (May 30, 2002), which recommended a review of the costs and benefits of a potential Environmental Management System.

Financial Implications and Impact Statement:

There are no financial implications resulting from this report.

Recommendation:

It is recommended that this report be received for information.

Background:

In April 2000, City Council adopted in principle The Environmental Plan - "Clean, Green and Healthy: A Plan for an Environmentally Sustainable Toronto". The plan consists of 66 recommendations and encompasses over 300 activities organized into nine major areas of environmental and organizational significance: land, water, air, sustainable transportation, sustainable energy use, green economic development, education and awareness, governance, and measuring and reporting progress. One of the recommendations of the Plan is that the City develop an Environmental Management System for the corporation.

In 2002, the then Audit Services conducted a review to assess how effectively City departments have met the Environmental Plan goals and to identify issues or barriers to implementing the Plan's recommendations. The results of the review are contained in a report from the then City Auditor entitled "Environmental Issues and Audit Plan" (May 30, 2002). Recommendation (4) of the report requests that:

"the Chief Administrative Officer and the Commissioner of Works and Emergency Services review the costs and benefits of implementing an Environmental Management System in the City of Toronto, taking into account the experiences of other Canadian municipalities and the Works and Emergency Services Department's current pilot project, and report to the Policy and Finance Committee by December 2003".

Comments:

Part A: What is an Environmental Management System?

An Environmental Management System (EMS) is a management framework that is used to implement environmental policies in business, industry, institutions and governments. An EMS establishes a set of management processes and procedures that allow an organization to analyze, control and reduce the environmental impact of its activities, products and services and operate with greater efficiency and control. An EMS also provides an auditable system for tracking, managing and improving environmental performance and regulatory compliance. As such, an EMS should be integrated within an organization's existing management processes, in much the same way as a financial management system.

The most widely recognized EMS globally is ISO 14001, an international framework for environmental management, measurement, evaluation and auditing. ISO 14001 is a voluntary standard, published in 1996 by ISO (International Organization for Standardization), with input

from business and government experts from 55 member countries worldwide. The standard contains 17 elements addressing such topics as environmental impacts, regulatory requirements, staff roles and responsibilities, operational controls, emergency preparedness and management review (Appendix 1). The standard requires that all policies, procedures, practices and roles be documented in an EMS manual.

Once the 17 EMS elements are in place, the organization has the option of hiring an independent accredited firm known as a “registrar” to conduct a registration audit of the EMS. If the audit shows compliance with ISO 14001 requirements, the organization receives ISO 14001 registration. Periodic audits are required to maintain registration. Self-declaration of conformance to ISO 14001 is another option, although in Canada this practice is rare.

Over 53,000 organizations are registered to ISO 14001 globally, including hundreds of businesses located in Toronto, and many more use the 14001 framework but do not take the final step of obtaining independent registration.

Part B: EMS Experiences of Other Canadian Municipalities:

Over 125 municipal entities in North America, including approximately 26 Canadian municipalities, are active with some form of EMS (Appendix 2). Nine Canadian municipalities have registered at least one business unit or facility to ISO 14001, primarily in Water/Wastewater. Nine more cities are in progress towards completing an EMS, although not necessarily with the intention of obtaining ISO 14001 registration. Eight municipalities are in the planning phase but have not yet identified a specific business unit or facility for implementation.

EMS Benchmarking Survey:

In order to assess the scope of EMS activities in other municipalities, Works and Emergency Services, Environmental Services staff conducted an EMS benchmarking study in early 2004 which analysed information from 11 Canadian and nine American cities, known to be active with EMS.

Survey Findings:

An EMS can be implemented across an entire organization or in parts thereof. Municipalities most often commit first to implementing ISO 14001 in Water/Wastewater and Solid Waste because of the environmental significance of these operations. Of the 20 municipalities surveyed:

- (i) 13 were active with an EMS for Wastewater;
- (ii) 9 were active with an EMS for Water Supply;
- (iii) 8 were active with both Water and Wastewater; and
- (iv) 9 were active with an EMS for Solid Waste.

Other selected areas of implementation include Facilities, Fire, Fleet, Golf Courses, Parks and Recreation, Planning, Port Authority, Roads and Transit (Appendix 3). EMS implementation at a single facility such as a municipal building, maintenance garage, yard or transfer station is an alternative to implementation across an entire business unit.

Two municipalities in the survey, Calgary, Alberta and Scottsdale, Arizona, have implemented and registered all operations to ISO 14001, thus becoming municipal EMS leaders in North America. Over three years, the City of Calgary (pop. 930,000) implemented and registered 11 major business units individually, followed by office-based activities, in order to achieve registration of the entire corporation (12,000 staff) to ISO 14001 in 2003.

Another practice amongst municipalities is to have a selective EMS that follows some, but not all, of the elements of ISO 14001. Key elements implemented are typically related to regulatory compliance, emergency preparedness and documenting roles and responsibilities, in order to better manage risks and evidence due diligence.

EMS activities in most municipalities has occurred in the last two to three years. Staff in approximately half of the municipalities have purchased or developed specialized software to assist with the EMS documentation.

Costs of Implementing an EMS:

From the survey, the best available cost data is from four municipalities which have fully implemented and registered ISO 14001 in a single business unit (Table 1). Cost information for city-wide implementation was not available.

Table 1: Cost of Implementing ISO 14001 in a Single Operation/Business Unit

Municipality	Year of Registration	Area Covered	Approximate Cost (CDN \$)
Halifax, Nova Scotia (pop. 300,000)	2003	2 water supply plants (25 staff)	\$150,000
York Region, Ontario (pop. 800,000)	2000/2001	1 EMS for York-Durham Sewage System and 1 EMS for 5 wastewater plants (25 staff for both)	\$241,000
Waterloo Region, Ontario (pop. 470,000)	1998	Solid waste business unit (100 staff)	\$210,000
San Diego, California (pop. 1,300,000)	2002	Solid waste business unit (100 staff)	\$280,000
Average cost			\$220,000

Source: City of Toronto EMS Benchmarking Survey. Costs are in Canadian dollars and not adjusted for inflation.

The cost of implementing an EMS includes staffing and consultant costs and registration fees. The largest costs by far are associated with staff time in first implementing and to a lesser extent maintaining the EMS. Municipalities lacking EMS expertise hire consultants to train existing staff on EMS practices. Consultants may also be retained to assist with specific ISO 14001 elements such as: tracking regulatory requirements, identifying the activities that have the potential to impact on the environment, and developing the EMS manual. For large scale or complex EMS projects, new staff may be required. Registration fees vary depending on the scope of the EMS. The cost to register a typical operation employing up to 100 staff is estimated to be in the range of \$20,000 to \$30,000, for a three year period.

In considering the above, and taking into account that Toronto’s operations are significantly larger than cities in the benchmarking study, it is estimated that the cost of implementing and registering ISO 14001 in a small (less than 50 staff) to medium sized operation (less than 100 staff) in Toronto is between \$200,000 and \$300,000, which includes staff and consultant costs and registration fees. Ongoing maintenance of the system will be an additional annual cost. ISO 14001 implementation across all major city operations is estimated to be in the range of \$8 million to \$10 million, taking between five to eight years to complete. The reallocation of existing staff to EMS activities could account for a significant portion of this cost.

An alternate approach for Toronto, in keeping with the practices of many other North American municipalities, is a risk based approach involving partial EMS implementation in the more environmentally significant City operations, rather than full EMS implementation across all major city operations. This less costly approach would achieve many of the benefits of EMS including reducing risk, and allow for a more extensive EMS program in future years.

Benefits of Implementing an EMS:

The benefits most often identified by municipalities resulting from implementing an EMS are listed in Table 2, and the most significant benefits are discussed below.

Table 2: Top Benefits of Implementing an EMS:

1	Improved performance / improved operations / reduction of environmental impacts
2	Increased employee environmental awareness
3	Due diligence / legal compliance / reduced risk and liability
4	Cost savings / cost avoidance
5	Enhanced public image
6	Improved documentation
7	Improved communication
8	Improved emergency response

Source: City of Toronto EMS Benchmarking Survey

Improved Performance/Improved Operations/Reduction of Environmental Impacts:

An EMS is based on the common business management framework “plan, do, check and act”, which embodies the concept of continual improvement. Seventy (70) percent of the municipalities surveyed improved their environmental performance in specific operations or business units, most notably through resource and material conservation and increased operational and management controls.

ISO 14001 requires general EMS awareness training and job-specific training for employees whose jobs can have a significant environmental impact. This training helps staff become more aware of their responsibilities for emergency, operational and environmental procedures leading to improved operational performance within the organization.

Due Diligence/Legal Compliance/Reduced Risk and Liability:

An EMS helps organizations identify and communicate the many complex regulatory requirements that apply to their operations. It also involves assessing regulatory compliance on a periodic basis. Failure to comply with relevant legislation can result in significant fines, court costs, lawsuits, disruption of staff, personal liability for staff of the corporation and negative publicity, with potential impacts in the millions of dollars. Several municipalities across Canada have been charged/fined or had lawsuits filed against them as the result of environmental incidents associated with their operations. One municipality in Western Canada, found guilty of a chemical spill, negotiated a sentence that included implementing an EMS. Another municipality in Ontario decided to implement ISO 14001 as a result of a significant fine imposed by a sewage spill.

ISO 14001 is increasingly being viewed by the courts as the benchmark for due diligence. This trend is likely to continue given the increased uptake of EMS principles in Canadian municipalities in the last three years. If environmental charges were to arise and relevant elements of an EMS were in place, then a defence of due diligence might be available.

Cost Savings/Cost Avoidance:

An EMS can often uncover cost savings by reviewing environmental impacts and identifying potential reductions in energy, fuel and water consumption and waste disposal costs. For example, York Region-Ontario was able to eliminate the use of a wastewater treatment chemical for an annual savings of \$80,000.00.

An EMS can also result in cost avoidance. With stronger compliance and emergency prevention and preparedness plans, the incidence and impacts of negative environmental occurrences such as chemical spills, can be minimized or avoided, and costs such as fines, court costs and disruption of staff productivity associated with non-compliance can be avoided.

Part C: City of Toronto EMS Experience:

In developing an EMS, the City of Toronto is not starting from scratch. At the corporate level, many of the components of an EMS have already been developed. For example, the City’s

Environmental Plan contains recommendations for environmental action, many of which have been implemented. The Toronto Inter-departmental Environment (TIE) team has developed an inventory of corporate environmental initiatives underway and is able to track, monitor and report on progress on an annual basis. The next progress report is scheduled for fall 2004. An Environment Roundtable has been established to advise the Mayor and City Council on current and emerging environmental sustainability issues affecting the City of Toronto.

The City has also developed targets for environmental performance such as a 60 percent waste diversion target for 2006 and a 20 percent carbon dioxide reduction target for 2005. In addition, the City has many positive environmental practices, emergency procedures, and management structures in place that contribute to evidencing due diligence. However, a more formalized system across all departments would pull these pieces together and enhance the City's management of environmental issues. Inter-departmental discussions are underway to review these issues and determine which critical EMS elements could be used corporately to further manage environmental risk and liability.

At the divisional level, EMS activities are planned or underway in Works and Emergency Services and Corporate Services.

EMS Activities in Works and Emergency Services:

In 2002, Solid Waste Management Services and Environmental Services launched a pilot project using existing resources to pursue ISO 14001 at a single facility, Ingram Transfer Station. To date approximately 60 percent of the EMS documentation has been developed. Significant environmental impacts and all associated regulations have been identified and documented, and improvements have been made to the emergency response plan. In addition, there has been a consolidation of written operating procedures, which are not only environmentally relevant, but also useful in succession planning.

In March 2004, Environmental Services staff conducted an ISO 14001 gap analysis at Castlefield Yard (Transportation Services) to determine what work would need to be done to meet the ISO 14001 standard. The gap analysis report is currently under review to determine next steps.

Toronto Water staff have been active in moving towards a formalized Quality Management System (QMS)/ Environmental Management System. The Director of Water Supply for the City of Toronto is an active member of the Core Team with the Province of Ontario (Ministry of Environment) in the development of the soon to be "Ontario Drinking Water Quality Management Standard" for Water Treatment throughout the Province. The standard being developed is based upon ISO 14001/9001 and "Hazard Analysis Critical Control Point" (HACCP) standard and is expected to capture Wastewater Treatment at a later date.

Toronto Water is in the process of recruiting an individual to lead the development and implementation of a fully formalized Quality and Environmental Management System (QMS/EMS) throughout their operations. Through the Works Best Practices and District Services Improvement Programs a number of EMS components are already in place. Toronto Water is proposing to begin the process at the Water and Wastewater treatment facilities and then migrate across the remainder of the unit. It is anticipated that the process will take

approximately 4 to 5 years to complete for the entire unit and be in a position for registration if required by law. (The Provincial Regulation requiring the new standard for water treatment is anticipated to be enacted in the spring of 2005). Toronto Water will be finalizing the recruitment of staff resources to oversee the QMS/EMS development, implementation and maintenance.

The cost to develop, implement and maintain the appropriate Quality/Environmental Management System will be provided for in the Toronto Water annual budget submissions for 2005 and beyond.

EMS Activities in Corporate Services:

Environmental Services staff conducted an ISO 14001 gap analysis in spring 2004 at the Central Garage (Fleet Services), and a gap analysis is currently underway at City Hall (Facilities and Real Estate). Work is currently underway using existing resources in Fleet Services and Environmental Services to implement four priority elements of ISO 14001 at the Central Garage. The elements focus on reducing environmental impacts of operations, identifying staff environmental responsibilities, and improving regulatory compliance and emergency response plans.

Environmental Services has 1.5 staff dedicated to support the EMS projects outlined in this report. Additional resources would be required for an accelerated EMS program for the City.

The Toronto Transit Commission (TTC), Toronto Region Conservation Authority (TRCA) and Toronto Hydro have implemented an ISO 14001-style EMS but are not currently registered. As with any EMS, the systems are under continual improvement and development.

Conclusions:

This report reviews the costs and benefits of implementing an EMS in the City of Toronto, taking into account the experiences of other Canadian municipalities.

Results of an EMS benchmarking survey of 11 Canadian and nine American cities, indicate that municipalities most often commit first to implementing ISO 14001 in Water and Wastewater and Solid Waste due to the environmental significance of these operations. City-wide EMS implementation is less common. Many municipalities use the 14001 framework but do not take the final step of obtaining independent registration. Another practice amongst municipalities is to take a risk based approach that follows some, but not all, of the elements of ISO 14001.

In Toronto, initial EMS activities using existing resources have taken place in Works and Emergency Services and Corporate Services. Toronto Water in WES has plans to address legislation that will mandate a "management systems" approach for drinking water operations. The approach includes continued efforts at the operational level, beginning with ISO 14001/9001 and HACCP gap analysis, and moving towards limited implementation of EMS elements on a risk priority basis. Implementation of four priority elements of ISO 14001 is currently underway in Fleet Services. An ISO 14001 gap analysis is in progress at City Hall (Facilities and Real Estate).

The benefits of implementing ISO 14001 in Toronto operations are to: improve operational performance; ensure due diligence and legal compliance; reduce risk/liability; and achieve cost savings.

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List of Attachments:

Appendix 1: Table - "17 Elements of ISO 14001"

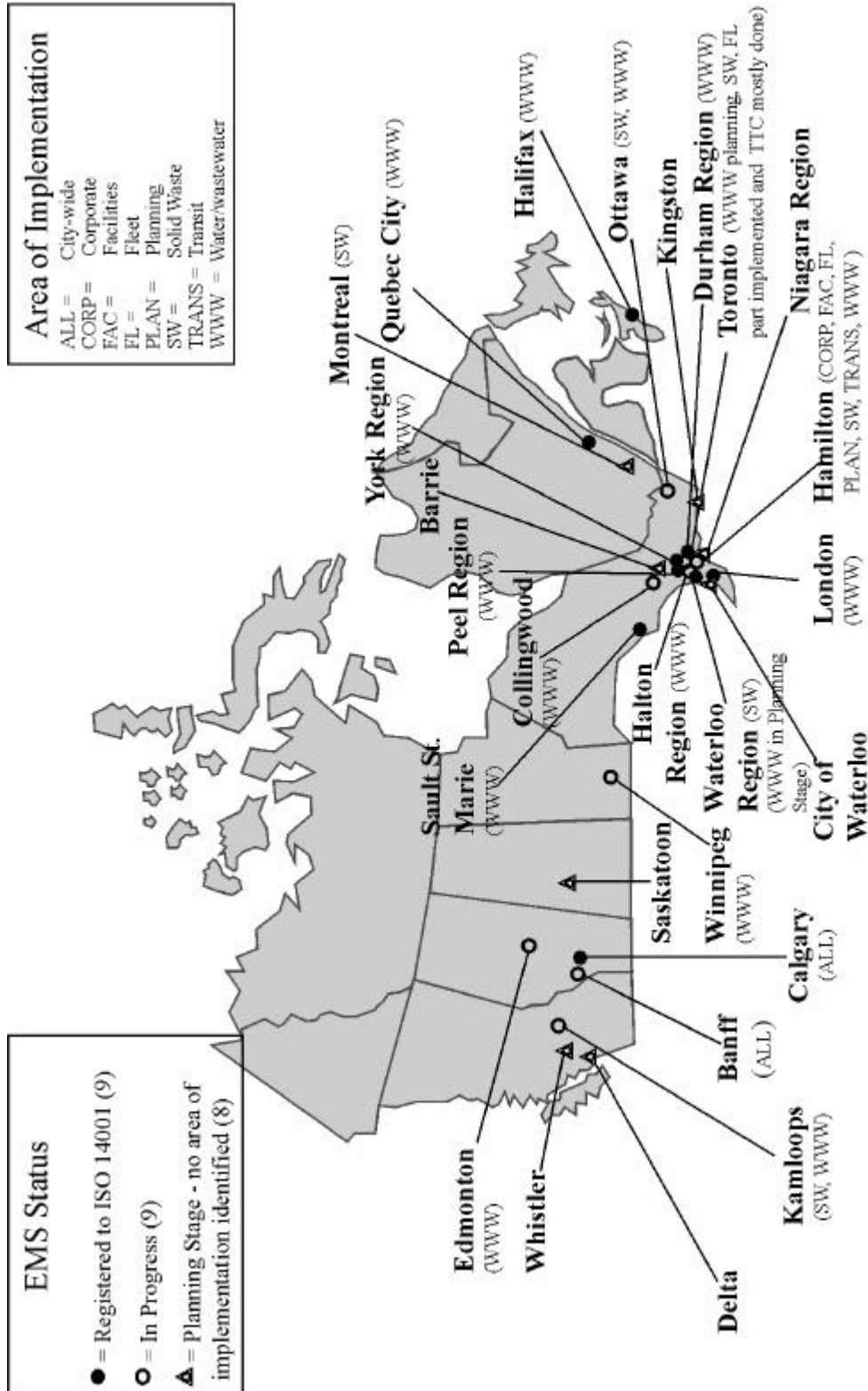
Appendix 2: Map - "Canadian Municipalities Active with EMS"

Appendix 3: Table - "Municipalities Surveyed and Operations Where EMS is Active"

Appendix 1
17 Elements of ISO 14001

No.	Element
(1)	Environmental Policy
(2)	Environmental Aspects - Consider emissions to air, releases to water, waste management, contamination of land, use of raw materials and natural resources, and other local environmental and community issues.
(3)	Legal and Other Requirements
(4)	Objectives and Targets
(5)	Environmental Management Programs
(6)	Structure and Responsibility
(7)	Training: Awareness and Competence
(8)	Communication
(9)	EMS Documentation
(10)	Document Control
(11)	Operational Control
(12)	Emergency Preparedness and Response
(13)	Monitoring and Measurement
(14)	Nonconformance and Corrective and Preventative Action
(15)	Records
(16)	EMS Audit
(17)	Management Review

Appendix 2
 Canadian Municipalities Active with EMS



Notes: 1. In 2005, a provincial law will require a basic management system approach for all municipal water supply utilities.
 2. Approximately 100 municipalities in U.S.A. are active with EMS.

Appendix 3
 Municipalities Surveyed and Operations Where EMS is Active

City/Town	All Operations	Head Office Functions	Facilities	Fire	Fleet	Golf Courses	Parks & Recreation	Planning	Port Authority	Roads	Solid Waste	Transit	Water/Wastewater
Canadian Municipalities													
<i>Calgary, Alberta - Pop. 930,000</i>	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Durham Region, Ontario - Pop. 575,000													✓
<i>Halifax, Nova Scotia - Pop. 300,000</i>													✓
Hamilton, Ontario - Pop. 490,270		✓	✓		✓			✓			✓	✓	✓
Kamloops, British Columbia - Pop. 72,000											✓		✓
Ottawa, Ontario - Pop. 700,000											✓		✓
<i>Quebec City, Quebec - Pop. 515,000</i>													✓
Toronto, Ontario - Pop. 2,500,000											✓		
<i>Waterloo Region, Ontario - Pop. 470,000</i>											✓		
Winnipeg, Manitoba - Pop. 750,000													✓
<i>York Region, Ontario - Pop. 800,000</i>													✓
US Municipalities													
Berkeley, California - Pop. 102,000											✓		
<i>Charleston, South Carolina - Pop. 400,000</i>													✓
<i>Eugene, Oregon - Pop. 144,000</i>													✓
Houston, Texas - Pop. N/A					✓				✓				
Jefferson, Alabama - Pop. 662,000		✓	✓		✓								
King County, Washington - Pop. 1,100,000											✓		
San Diego, California - Pop. 1,300,000											✓		✓

City/Town	All Operations	Head Office	Functions	Facilities	Fire	Fleet	Golf Courses	Parks & Recreation	Planning	Port Authority	Roads	Solid Waste	Transit	Water/Wastewater
Canadian Municipalities														
<i>Scottsdale, Arizona - Pop. 220,000</i>	✓											✓		
Seattle, Washington - 565,000		✓					✓				✓	✓		✓
Total: 20	2	4	3	1	4	1	2	2	1	2	11	2	13	

Notes:

- (1) The check mark indicates that the EMS is either in place or in progress.
- (2) Municipalities listed in italics are known to have operation(s) registered to the ISO 14001 standard.