Reducing Costs, Optimizing Performance:

An Environmental Management System (EMS) Compendium for Wastewater Utility Managers

Plan

Act

August 2006

This document, funded through a cooperative agreement between the Office of Wastewater Management (OWM) at the U. S. Environmental Protection Agency (EPA) and the Global Environment and Technology Foundation (GETF), is a compendium to the Environmental Management Systems (EMS) Handbook for Wastewater Utilities.

Improve Environmental Performance and Operational Efficiency

"We searched for viable solutions to overcome several environmental challenges confronting us. For example, our discharge permit was up for renewal, the Spring Chinook salmon in the Willamette River was listed as a threatened species under the Endangered Species Act, and the City Council passed a resolution to enforce sustainability of city operations. We were also exploring approaches to better organize the strategic management of our operations. We chose EMS to improve performance and efficiency, as well as to confront the challenges we faced."

Peter Ruffier
Wastewater Division Director
Eugene, Oregon

A. Executive Summary

Increased bond ratings

"Our organization's achievement to an EMS based on ISO 14001, has provided a level of confidence to credit rating agencies that the utility is being run as a business and as efficiently as possible. When we went to the market for a bond needed to rehabilitate decaying tunnels, this helped our utility to receive a favorable credit rating. The EMS has contributed to an improvement in our bond ratings and has allowed Charleston Water to save between $17,000 to $170,000 annually on a $170 million bond."

John B. Cook
Assistant General Manager/Engineer
Charleston Water

Managing Changing Business and Operational Conditions

"Based on Fitch's findings, sound and institutionalized management practices can often endure the most extreme stresses from economic downturns or unexpected system demand. Conversely, the lack thereof can exacerbate weakening conditions."

Fitch Ratings Revenue Criteria Report

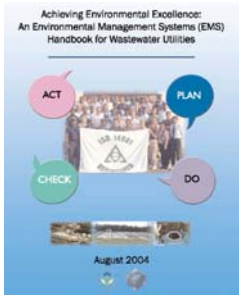
Improved public recognition and leadership

"In the past, if anyone mentioned odor complaints the comments would have been dismissed with little attention. Since the EMS process and associated organizational changes, employees react much differently because they understand the importance of addressing community issues".

Andy Kricun
Deputy Executive Director
Camden County Municipal Utilities Authority (CCMUA)

Water and wastewater utility managers across the nation have been utilizing Environmental Management Systems (EMS) to:

- Reduce operating costs
- Improve environmental performance
- Reduce vulnerability to environmental violations, fines and penalties
- Capture institutional knowledge to sustain successes



In August 2004, a group of these utility managers, having successfully implemented EMSs at their facilities, described the manner in which these types of results were achieved through development of a step by step *EMS Handbook for Wastewater Utilities* (http://www.peercenter.net/sector/wastewater/), completed in August 2004. This *EMS Compendium for Wastewater Utility Managers* was created as a direct follow up to the EMS *Handbook* to make the business case for top management by demonstrating, with detail and specificity, why implementing an EMS can result in significant benefits that far outweigh the cost and effort of implementation.

As you learn more about the benefits of EMS implementation, it is very likely that you will also be pleasantly surprised to see that your utility already has a number of the required EMS management elements and programs in place. An EMS does not reinvent the wheel, but rather creates a systematic framework to clearly identify an organization's most important goals and then better organize and enhance the management programs and corporate strategies that you already have in place to best meet those goals.

As fellow utility managers and Steering Committee members (Section L) directly involved with the development of this *Compendium*, we appreciate the opportunity to pass on what we have learned on the benefits of EMS, which is based on the direct experience of top management professionals in the wastewater industry. We hope that review of these experiences will encourage you to develop your own EMS and attain the same important benefits that the managers who helped develop this *Compendium* have already realized. Please use this resource to help your utility reach its most important organizational goals.

"EMS was really the first system that I saw where you have to back it up with results and you have to have it verified and I believe that it gave our senior managers some confidence."

Wesley Ropp
Chief Financial Officer
Charleston Water
Charleston, South Carolina

B. Why Develop an EMS for Your Wastewater Utility?

While the decision to develop and implement an EMS entails a commitment of time and monetary resources, EMS implementation experiences from wastewater utilities and other local government organizations have shown consistent short-term and long-term returns on investment. In addition to economic savings, wastewater facilities have realized a wide-range of other benefits, including improved relationships with regulators, neighbors and other external stakeholders, better public perception and image, and improved operational efficiency and control. As a manager, you should consider the following questions to assess whether an EMS is appropriate for your organization:

- Would you like to reduce inefficiencies and thereby reduce operations and maintenance costs?
- Would you like to manage risks and liabilities more effectively?
- Does your organization have a reliable and effective process for monitoring and complying with laws and regulations?
- Do you feel that your organization can make other environmental improvements?
- Would you like your wastewater utility to be a leader in environmental stewardship?
- Are you concerned about retirement, staff turnover and undocumented operational knowledge?
- Are you concerned about public image?
- Would improved communication and teamwork be useful in daily operations?
- Would you welcome more input from frontline staff on potential improvements?

If you answered "yes" to any of these questions, an EMS may provide tangible benefits to your organization. Wastewater utilities based their decisions to develop and implement an EMS on the issues presented above and they have realized positive benefits and returns on investment from pursuing EMS goals.

An EMS offers your wastewater utility the ability to change from a culture of reaction to one of proactive decision-making, where sound, operational practices are institutionalized and your employees are foreseeing opportunities for environmental and operational improvements.

Benefits from EMS Implementation

Improved Public Image and Leadership
Implementation of a community notification system provided the neighboring community with 24-hour telephone access for reporting odor concerns. The hotline provides real time community input to Camden County Municipal Utilities Authority's (CCMUA's) EMS. (Camden County, NJ)

In 1999, the City of San Diego became the first municipal wastewater treatment facility in the U.S. to certify to the ISO 14001 Standard. (San Diego, CA)

Reduced Rates
CCMUA customers received a 6% lower rate than in 1996, with three separate rate reductions in 10 years. (Camden County, NJ)

By establishing Fuel Reduction Teams for the Water and Wastewater Plants and by implementing Route-Smart Software as part of an EMS improvement program, Charleston Water is saving $48,000 per year on fuel costs. (Charleston, SC)

Key Message: What is an EMS

An EMS is based on a consistent management framework (plan, do, check, act) to reduce costs, improve environmental performance and minimize environmental risk.

C. What is an EMS?

What an EMS is and What an EMS is Not

An EMS
Establishes the internal framework that must be in place (e.g., policies, procedures, training, records) to have a proactive system to manage environmental issues.

Does not replace or act as a substitute for any applicable environmental legal requirement.

An EMS
Defines the critical elements and operational controls that must be in place and followed to control the impact an organization has on the environment.

Does not tell an organization how or what to manage. That is up to the organization.

An EMS
Can be tailored to all types of organizations and facilities: large and small companies and pubic organizations such as municipalities, federal facilities and wastewater treatment plants.

Is not designed for a particular kind or size of operation.

EMS Environmental Policy Commitments:

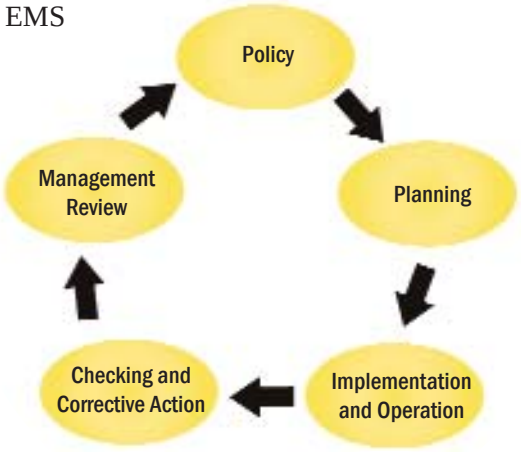
- Continual Improvement
- Pollution Prevention
- Compliance with Relevant Laws and Regulations

What is an Environmental Management System (EMS)?

A management system is a set of tools, policies and procedures, training and expertise that can be used to create programs and plans tailored to meet the resources and goals of an organization. An EMS is built around the framework of "plan, do, check, act" that uses a standard process to identify organizational goals, implement them, determine progress, and make improvements to ensure that environmental considerations are fully integrated into the organization's mission and operations. Key elements of an EMS include:

- Defining roles and responsibilities
- Identifying and prioritizing environmental impacts
- Setting measurable objectives and targets
- Verifying and establishing operational controls
- Monitoring and measuring activities and progress
- Aiming for continual improvement as part of a review (feedback) cycle

An EMS provides a systematic way to review and improve operations for better organizational control and environmental performance. It can enable an organization to: 1) Reduce operating costs; 2) Improve environmental performance; 3) Reduce vulnerability to environmental violations, fines and penalties; and 4) Capture institutional knowledge and plan for succession. Because an EMS provides a continual improvement management framework, it can be adapted to particular industries through programs such as the National Biosolids Partnership (NBP) and Responsible Care^{sm}, helping to transform an organization from reactive to proactive (eliminating problems before they occur). Organizations with an EMS no longer apply quick fixes to issues, but provide a systematic ("find, fix, and prevent") approach to managing environmental responsibilities through strategic planning and decision making.



"Like many wastewater agencies throughout the U.S., Kent County has several operators that have been on staff for over 30 years. The County estimates that one-third of the workforce, with decades of practical experience, will retire in the next five years. The EMS ensures regular training, transfer of "tribal" knowledge from seasoned staff to new employees, and consistency in best management practices."

Jim Newton
Kent County Public Works
Milford, Delaware

D. How Can an EMS Benefit You as a Utility Manager?

An EMS (Plan, Do, Check, Act) Approach Adds Value by

- Focusing on environmental management practices rather than only on regulated activities.
- Investing in continual systems approaches leading to effective investments in human and technical resources.
- Making use of a strong check and act structure for business and environmental priorities.
- Utilizing a continual improvement framework to achieve performance across multiple areas.
- Supporting an organizational culture that embraces change and has a forward focus.

Wastewater utilities with an EMS have found it to be a valuable tool that provides a structure for strategic goal setting, improved decision making and efficient resource allocation across management priorities, balancing the management of operations throughout the value chain. A management system framework also provides an organization the ability to adapt more effectively in response to changing circumstances, allowing for management flexibility and incorporating change management into day-to-day operations. Missions, budgets, and priorities will continue to change, but the basic principles and structure of a management systems approach will help your utility deal with change through a framework of plan, do, check and act.

How Can an EMS help Manage Change?

As you move forward with your EMS, you'll realize that the challenge is not going to be with technical issues, but rather with organizational change. Most organizations don't like change and are comfortable with the status quo.

Continual improvement management systems like an EMS require change management to ensure the system remains important and effective as operations and processes change and evolve. Examples of changes that typically require a management system response include: additions/deletions to a procedure or process and changes in the general administrative operating environment of your organization (e.g., internal reorganizations, capacity reductions, shifts in public acceptance, changes in roles and responsibilities, retirements).

"Change is good...but you go first!"

Demographic studies show that turnover from retirement in public agencies could be as high as 50% over the next 10 years. An EMS can be a valuable tool to managing employee succession concerns by providing a utility with a continual planning framework that captures institutional knowledge before experienced employees retire.

Managing change is an important factor in EMS implementation and your entire wastewater utility leadership must be involved and communicate the EMS as a priority. Top management and department managers facilitate change by communicating clearly and frequently and through their involvement early on in EMS awareness activities.

Key Message: Senior Management Roles and Responsibilities

Every organization implementing an EMS has come to the same conclusion about management support-visibility, commitment, and involvement are the #1 keys to success. Be sure your EMS plans include regular and frequent dialogue with management.

E. What's My Role in Implementing an EMS?

As a senior manager, your role includes having a good understanding of what's involved in EMS implementation, including financial obligations and committing additional time for staff, including EMS Teams (as necessary) and designating an EMS Representative, a champion and identified leader of your utility's EMS who has the responsibility and management authority for implementing the EMS from start to finish.

An EMS is not a program that one person can put in place. In fact, an effective management system will involve every employee-becoming business as usual.

For more in depth information on EMS implementation in your industry, review *An Environmental Management Systems (EMS) Handbook for Wastewater Utilities*, available at: *www.peercenter.net.*

If wastewater senior and mid-level managers do not understand the potential benefits of an EMS, they probably will not have the incentive to follow through with implementation. During your preliminary discussions about the EMS, you'll want to clarify management's specific goals for the EMS at your facility. You'll also want to confirm that managers understand the EMS implementation strategy and schedule you are using, the estimated direct labor commitment involved, and when, how, and what to communicate to employees on a regular basis. As a senior manager, make sure you are direct and delegate when necessary to communicate the importance of the EMS.

When senior managers maintain interest and commitment, employees also stay focused. There will be some frustrations as implementation progresses and previously unforeseen issues arise. Managers should accept these as opportunities to facilitate and focus on continual improvement to address existing issues and prevent future hurdles.

Remember that organizational attitude reflects leadership!

Key Management Roles and Responsibilities

- Be an active participant and be consistently involved.
- Be visible and positive about the message (e.g., "walk the talk" by your words and actions).
- Be up front and honest about the effort needed for successful implementation.
- Provide for resources (financial, staff).
- Support for a facility EMS Representative to champion and drive your EMS.
- Provide moral support, encourage your EMS teams, and create a leadership environment that ensures success. The staff should feel that you are in it with them and committed to success.
- Promote EMS goals and provide a strategic vision.
- Share performance results with the workforce.
- Communicate with external stakeholders (e.g., citizens, elected officials, regulators) to share experiences and to learn from others.
- Celebrate EMS achievements and recognize environmental improvements.

Key Message: Management Program Integration

Your wastewater utility already has programs and initiatives in place to manage and reduce its impact on the environment. Some of these could include:

- Compliance programs (e.g., pretreatment, Capacity, Management, Operations, and Maintenance (CMOM), hazardous waste regulations, stormwater, fuel storage)
- Pollution prevention programs and sustainability initiatives (e.g., improving energy and resource efficiency, addressing product stewardship responsibilities, alternative fuels)
- Other management systems/programs (e.g., National Biosolids Partnership, Six Sigma, QualServe)

F. Does an EMS Integrate With and Build on Other Wastewater Utility Management Programs?

Yes. Wastewater utilities that currently have other management systems and programs (e.g., Asset Management, QualServe, Six Sigma, Biosolids EMS) in place have effectively integrated an EMS in their organizations. Most wastewater utilities have business planning tools, policies, plans and standard operating procedures, training programs and other similar operating and administrative processes. An EMS approach can help integrate your current management programs and systems, as well as institutionalize your operating and business plans and procedures by providing an umbrella of continual improvement in a framework of plan, do, check and act to manage, measure, review, and reduce environmental impacts. For example, wastewater utilities can use their EMS to integrate with asset management programs because an EMS is designed to reduce the environmental impacts of various activities, including the impacts caused by aging or inadequate capital assets.

Keep in mind that in many cases, managing through an EMS is not a drastic change from the way you are conducting business now. An EMS is a framework rather than a set of instructions and activities. By providing a continual check and improvement framework, a management systems (EMS) approach allows an organization to focus, build on what you would like to do better and balance organizational initiatives and programs already in place, including health and safety, quality, asset management and financial and environmental performance initiatives.

Remember, an EMS should not be developed in a vacuum—it should be coordinated or integrated with other policies, plans, strategies, and budgets. For example, if you are planning a major expansion in one of your wastewater treatment operations, then it makes sense to look at the possible environmental impacts associated with the operational expansion at the beginning, in the planning stage.

Typical Benefits of Integrating an EMS with Wastewater Utility Management Programs

- Leverage existing infrastructure
- Continual improvement in strategically targeted areas
- Enhance operational consistency and reliability
- Improve teamwork, coordination and employeeawareness
- Leverage integration of multiple management programs and initiatives
- Coordinate resources (human and financial)
- Streamline communications
- Realize environmental improvements

"The NBP is working with small agencies in a demonstration program to assure that the EMS Blueprint is applicable to small organizations, not just the large and medium size facilities."

Pete Machno
National Biosolids Partnership

Examples of Management Systems/Programs at Wastewater Utilities

Camden County, NJ
ISO 14001, NBP, CMOM (in development)
Andy Kricun; 856-541-3700

Charleston, SC
ISO 14001, CMOM, Partnership for Safe Water
Rick Bickerstaff; 843-308-8201

Eugene, OR
ISO 14001, APWA Accreditation, Balanced Scorecard
Donna Adams; 541-682-8613

Kent County, DE
ISO 14001, NBP, OHSAS 18001
Jim Newton; 302-335-6000

Madison, WI
NBP EMS, Strategic Planning Initiatives, Asset Management
Jon Schellfeffer; 608-222-1201

Oakland County, MI
ISO 14001, ISO 9001
Sherri Gee; 248-858-0108

Orange County, CA
NBP EMS, Asset Management, Unifying Strategies
Doug Stewart; 714-962-2411

San Diego, CA
ISO 14001, Strategic Business Plan, Bid-to-Goal, Pay-to-Performance
Chris Toth; 858-654-4161

Santa Clara, CA
ISO 14001, Asset Management, Balanced Scorecard/Strategic Planning, Malcolm Baldrige National Quality Program
Stan Williams; 408-265-2600

What are the Benefits of Integrating an EMS with your Current Management Programs?

Wastewater utilities that integrate EMS into their current management programs have realized significant benefits, such as reduced operational costs, improved environmental performance, streamlined operations and decision-making, integrated employee training, versatility in the ability to address a variety of performance needs, and a more efficient use of resources, thereby creating efficiencies. In addition, alignment of wastewater management systems and programs under a continual improvement framework ensures that resource allocations are not in competition, but are coordinated to meet overall management goals.

The integration of an EMS with wastewater utility management programs and initiatives can bring a number of benefits and alignment/leveraging opportunities. Examples include:

Strategic Business Planning: Operational and Financial Efficiencies
The Eugene, Oregon Wastewater Division increased transparency of their operations and capital budgeting process by integrating EMS and Balanced Scorecard (BSC). Performance measures are now being identified for each program area and are subsequently fed into the annual budgeting process. Eugene has been able to leverage the existing management infrastructure of the EMS to support the BSC. The development of duplicate document control systems, for example, has been avoided. In addition, the same measuring and monitoring system will be used to track progress on all objectives and targets derived from the EMS and BSC. (http://www.eugene-or.gov/portal/server.pt)

Improvement Plans
The Santa Clara Valley Water District, CA combined their asset management program with an EMS to provide a way to balance and prioritize competing objectives. (http://www.valleywater.org/)

Customer Responsiveness and Recognition
The Western Carolina Regional Sewer Authority found that by integrating and combining their NBP EMS and CMOM efforts, its public education program more effectively informs the public of all its programs. (http://www.wcrsa.org/)

Key Message: EMS Applicability

An EMS can be implemented for any size organization and does not have to be adopted for an entire facility at once—an EMS can be developed for a single unit or division. Your EMS can then be expanded to other operations and divisions based on staff experience, lessons learned and resource availability.

As you integrate EMS with your current systems and programs, consider the following questions:

- Are there business or management reasons to keep the programs and systems separate?
- Do you have the resources (human and financial) to have two or more separate management programs/systems?
- What is the optimal approach from a strategic and operational standpoint?
- Which approach is best suited for the facility's change and growth?

From: EMS Implementation Guides for EPA Sectors (Appendix B-Integration of Environmental Management Systems and Quality Management Systems)

Is an EMS applicable to both small and large organizations?

Yes. An EMS can bring significant benefits to any organization, of any size, that wants to improve its environmental performance and/or improve its cost effectiveness. EMSs are being adopted by organizations of all sizes and types, including small and large organizations and local governments. An EMS should become part of the organization's overall management structure; including strategic planning, roles and responsibilities, performance measurement and implementation of overarching policies as a part of an organization's short- and long-term objectives. Therefore, small and large and public or private wastewater utilities will have an EMS with the same elements and framework, but the level of detail and level of documentation will reflect the nature and scale of each utility's or department's activities. For example, the San Diego Operations and Maintenance Division, which manages approximately 180 million gallons of water a day (MGD), and Gastonia, North Carolina's Wastewater Facility, managing approximately 22 MGD, have very similar EMS procedures and policies in place for their respective EMSs because the framework or structure of a plan, do, check, and act management systems approach remains the same.

Benefits from EMS Implementation

Reduced Environmental Impact

Kent County Wastewater switched from Fuel Oil No. 2 to B20 biodiesel as a fuel source for its emergency generators and is considering a switch to B20 for all of its diesel fleet and potentially as the primary fuel for biosolids production. Expected to reduce air pollution by 5 million pounds of CO2/year; hydrocarbon emissions by 20%; carbon monoxide by 12%; and particulates by 12%. (Kent County, DE)

We greatly exceeded our target and actually reduced paper use by 50% total. We reduced janitorial paper use by 48%, and office paper use by 37%. (Eugene, OR)

Employee Awareness and Communication

Employees have enthusiastically supported the EMS, which has helped make their jobs easier and has increased their awareness of how their actions, and the actions of those they serve, impact the environment. This is important, as they are ambassadors to the public, our rate payers. (Oakland County, MI)

Our planning has improved considerably. Prior to EMS establishment, no formal, consistent structure was available for planning. Also, our planning is much more focused, with drivers in place, and our associates (employees) have a better understanding of the reasons behind the planning initiatives. Additionally, knowledge of our company's impact on the environment has been heightened. (Charleston, SC)

"CCMUA's EMS goals correspond completely with the organization's overall goals; therefore, it is nearly impossible to differentiate general operations and maintenance costs from direct labor resources for an EMS. CCMUA views EMS as a means to improve progress towards meeting organizational goals, so the labor resources used for EMS are "sunk" costs (i.e., would expend these resources regardless), not a marginal cost."

Andy Kricun
Deputy Executive Director
CCMUA
Camden, New Jersey

The majority of time committed during EMS implementation is the responsibility of the Environmental Management Representative and the EMS Core Team. Based on data tracked from 8 wastewater and drinking water utilities, average resource commitments included:

- Total Staff Time to Implement (Project Start to 1st Management Review): 2,900 hours;
- Time (from Project Start to 1st Management Review) to Implement an EMS: 24 months; and
- Staff Time to Maintain an EMS after Initial Implementation: 10-12 hours/year for each employee.

For more information, visit: www.peercenter.net/sector/wastewater/

G. What is the Typical Cost of an EMS?

The main cost of an EMS is the investment of direct employee labor time and consultant time that an organization spends in order to establish the EMS. However, EMS programs and goals typically correspond directly with a utility's overall business and operational programs and goals and therefore, EMS costs are largely part of what you are already doing at your utility. In addition, many utilities have found that EMS costs have been offset by the subsequent time efficiencies and financial cost savings realized through EMS implementation. In the sidebars throughout this Compendium, you can read about the EMS benefits achieved by wastewater utilities that have implemented an EMS, including increased operational efficiencies and cost savings.

Developing and maintaining an EMS does entail certain costs. However, wastewater utilities that have implemented an EMS have seen significant cost savings that often far exceed the costs of the EMS. The following table summarizes the costs and savings from several utilities.

Wastewater Organization	Total Costs to Implement an EMS (In-House Labor, Consulting, Travel, Materials)	EMS as a % of O&M Budget*	Wastewater Average Staff Time in Hours (EMS Project Start to 1st Management Review)	Example of EMS Cost Savings
Natick, Massachusetts Springvale Water (8 MGD)	$50,000	4.0%	1,000	$40,000 avoided annually by documenting EMS procedures
Charleston, South Carolina Wastewater (40 - 74 MGD)	$57,000	0.10%	1,675	Annual operating costs reduced by $175,000
Kent County, Delaware Wastewater (16 MGD)	$140,000	2.00%	2,985	85% reduction in SSOs; annual indirect cost savings of $20,000
Lowell, Massachusetts Regional Wastewater (32 MGD)	$42,000	0.64%	1,424	Annual cost savings of $180,000 through recycling and energy reduction efforts
Camden, New Jersey CCMUA (80 MGD)	$60,000	3.00%	2,000	$5M reduced in annual operations costs

* Based on publically available operations and maintenance annual budgets (2005-2006)

"EMS has become so ingrained in our business and what we do that it is not seen as a separate system, but as part of normal operations."

John B. Cook
Assistant General Manager/Engineer
Charleston Water
Charleston, South Carolina

H. How Can I Get Started Developing an EMS and Where Can I Find More Information?

There are a number of key organizations and resources that can help you as a wastewater utility manager get information on and develop an effective EMS.

Organizational support is available through the Public Entity EMS Resource (PEER) Center (www.peercenter.net) and 11 EMS Local Resource Centers (www.peercenter.net/whocanhelp/lrc.cfm) around the country. These organizations have been designated to assist local governments, including wastewater utilities, understand and develop EMSs that can help you meet your organizational and environmental goals. In addition, the following references and resources are available for your review.

1. An Environmental Management Systems (EMS) Handbook for Wastewater Utilities: Achieving Environmental Excellence, August 2004 (www.peercenter.net/sector/wastewater)

2. EMS Aspects Identification and Prioritization Workbook, May 2006 (www.peercenter.net/sector/wastewater)

3. EMS Case Studies in the Public Water Sector (http://www.peercenter.net/sector/wastewater/CaseStudies.cfm)

4. Managing for Excellence: Analysis of Water and Wastewater Utility Management Systems, August 2005

5. Continual Improvement in Utility Management: A Framework for Integration, August 2004

6. Moving Towards Comprehensive Utility Management Systems: Report of the Environmental Management Systems (EMS) for Public Utilities Integration Project, September 2002

7. Meeting with Utility Leaders on Sustainable Management: Meeting Summary, July 27-28, 2005

8. Environmental Management Systems As A Cost-Effective Alternative to Privatization, Presentation by Andrew Kricun, Deputy Executive Director, Camden County Municipal Utilities Authority and Tom Pedersen, Vice President, Camp Dresser & McKee Inc.

Benefits from EMS Implementation

Improved Compliance
The legal and other requirement elements of an EMS allowed Natick to consolidate their requirements into a single list, develop a procedure for identifying and monitoring applicable requirements, delegate roles and responsibilities, and ensure that requisite personnel are provided with knowledge and training. Collectively, this has provided Natick with enhanced confidence that they are operating within statutory and regulatory requirements. (Natick, MA)

Regularly discharging effluent that ranges from 12-18ppm, having struggled in the late 1990's to meet 30 ppm limits on a consistent basis. (Camden County, NJ)

Employee Awareness and Communication
The actual planning and implementation of an EMS has resulted in section leaders within the WWCD communicating between sections in a more organized and frequent manner. (San Diego, CA)

Employees have enthusiastically supported the EMS, which has helped make their jobs easier and has increased their awareness of how their actions, and the actions of those they serve, impact the environment. This is important, as they are ambassadors to the public, our rate payers. (Oakland County, MI)

"Division management directed that an ISO 14001 EMS be established and provided the economic resources to obtain necessary consultant support. Management created an environmental management representative position within the division and made the position comparable to other senior staff positions."

Chris Toth
Wastewater Collection Division
San Diego, California

Benefits from EMS Implementation

Reduced Costs
Expect to reduce electric costs by $200,000 - $300,000 per year through installing a renewable energy system and/or an on-site bio-gas facility. (Kent County, DE)

25% reduction in operations and maintenance costs (includes treatment plant and collection system) from $21.2 million in 1996 to $16 million in 2000. (Camden County, NY)

Increased Operational Consistency and Efficiency
Reduction of wet weather bypasses from 24 in 1999 to 2 over the last 6 years. (Camden County, NJ)

Charleston Water's Preventive to Corrective Maintenance ratio (PM:CM) has increased by over 70% (85:75) from the industry baseline (15:25) as a result of implementing environmental improvement programs as part of their EMS, saving Charleston $52,000 per year on maintenance of operations. (Charleston, SC)

Sanitary Sewer Overflow Reductions
For 2004, an 85% reduction in SSOs from 2002 levels has occurred, including the successful roll-out of a fats, oils and grease (FOG) reduction program for food service provider. (Kent Count, DE)

The EMS process allowed us to justify a major capital expenditure targeting the reduction of inflow and infiltration. Not only does this represent a significant financial commitment, it shows that our commitment to environmental protection goes far beyond mere hype by addressing a major residential complaint. (Oakland County, MI)

I. Steering Committee

This EMS Compendium for Wastewater Utility Managers, supported by the U.S. EPA Office of Water in cooperation with the Global Environment and Technology Foundation (GETF), was specifically written to encourage wastewater utility managers to consider an EMS as a business management tool as they make important decisions on resource allocation and on the long-term viability of their wastewater operations. To accomplish these objectives, wastewater and local government colleagues who and other public sector managers that have successfully implemented an EMS at their utilities played a major role in developing this Compendium, serving as a Steering Committee members for this project. Their introductory comments are contained in the Executive Summary, with practical insights and experiences integrated throughout this document. The Steering Committee for this effort included the following wastewater and local government practitioners:

Bill Engel
Director
TREEO Center
Gainesville, Florida

Larry Falkin
Deputy Director of Natural Resources
Jackson County Parks & Recreation
Blue Springs, Missouri

Andy Kricun
Deputy Executive Director
CCMUA
Camden, New Jersey

Kristel Riddervold
Environmental Administrator
Public Works Department
Charlottesville, Virginia

Beth Shonts
Business Development Manager
Metro Waste Authority
Des Moines, Iowa

Chris Toth
Deputy Director
Metropolitan Wastewater Department
San Diego, California