

*A companion document to the Primer
for Effective Utility Management*

Effective Water and Wastewater Utility Management Case Studies

Columbus Water Works (Georgia)

Green Bay Metropolitan Sewerage District (Wisconsin)

Gwinnett County Department of Water Resources (Georgia)

Massachusetts Water Resources Authority (Massachusetts)

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American Water Works
Association



NATIONAL ASSOCIATION
OF WATER COMPANIES



Water Environment
Federation

Foreword

In 2007, the U.S. Environmental Protection Agency (EPA), Water Environment Federation (WEF), American Water Works Association (AWWA), National Association of Clean Water Agencies (NACWA), Association of Metropolitan Water Agencies (AMWA), American Public Works Association (APWA), and National Association of Water Companies (NAWC) (the Collaborating Organizations), signed an historic agreement to promote effective utility management across the water sector based on a series of Ten Attributes of Effectively Managed Utilities (Attributes) and Five Keys to Management Success (Keys). In 2008, these partners produced “Effective Utility Management: A Primer for Water and Wastewater Utilities.” This Primer highlights the Attributes and Keys, example utility performance measures, and a simple utility self-assessment methodology.

Now, the Collaborating Organizations are pleased to present a series of case studies on four utilities (Columbus Water Works, Green Bay Metropolitan Sewerage District, Gwinnett County Department of Water Resources, and Massachusetts Water Resources Authority) that have applied all or part of the Primer concepts and tools. The case studies document is a companion to the Primer, providing concrete examples and “how to” assistance for utility managers applying the Primer concepts and tools.

*Effective Utility Management:
A Primer for Water and
Wastewater Utilities is available
at the following website:*

<http://watereum.org>

The case studies document the experiences of utilities applying the concepts and tools contained in the Primer and provide information on how other utility managers can best use the Primer in their own organizations. The case study examples demonstrate how the utilities used the Attributes, Keys, example measures, and self-assessment tool to ensure they were on the right track with managing improvement priorities and to make effective improvements in areas needing more attention. The utilities faced a range of challenges in their management improvement efforts, and found that the Primer concepts and tools significantly aided their efforts.

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Ten Attributes to Effectively Managed Water Sector Utilities and Five Keys to Management Success

Ten Attributes to Effectively Managed Water Sector Utilities

1. Product Quality
2. Customer Satisfaction
3. Employee and Leadership Development
4. Operational Optimization
5. Financial Viability
6. Infrastructure Stability
7. Operational Resiliency
8. Community Sustainability
9. Water Resource Adequacy
10. Stakeholder Understanding and Support

Five Keys to Management Success

1. Leadership
2. Strategic Business Planning
3. Organizational Approaches
4. Measurement
5. Continual Improvement Management Framework

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Effective Water and Wastewater Utility Management

Case Studies 2009

A Companion Document to the Primer for Effective Utility Management

Introduction

Water and wastewater utilities are confronted with many challenges as they strive to make organizational improvements. Water sector utility managers must consider a wide range of issues in their management improvement initiatives. General economic conditions, staff turnover, communication between internal management and external stakeholders, involvement of staff across the organization, aging infrastructure, rate issues, and limited staff resources are some of the issues managers address.

The Primer concepts and tools, which include the Attributes, Keys, examples of performance measures, and self-assessment tool, provides utility managers with straightforward tools for tackling management improvement efforts within the context of today's challenges. A group of utility advisors developed the Primer concepts and tools, which have been endorsed and released by the Collaborating Organizations. The Primer is available for use at the following website: <http://watereum.org/>.

The utilities in the case studies found that the Primer concepts and tools made a substantial contribution to their management improvement efforts, bringing a crisp and cost effective focus to their initiatives and aiding both their internal and external communications. The utility managers involved in these case studies reported a range of important benefits from using the Primer concepts and tools, including:

- External validation of utility management improvement priorities by using a nationally recognized framework for effective utility management endorsed by the Collaborating Organizations.
- Support to ensuring that management efforts focus on an effective balance between internally-oriented (e.g., operational optimization) and externally-oriented (e.g., stakeholder understanding and support) priorities.
- A timely means to initiate or update strategic planning (the self-assessment tool provided a simple, but not simplistic, means to identify high and low performing management areas and affirm existing or establish new goals and objectives for each).
- A coherent and comprehensive management improvement framework that acts to focus ongoing or planned efforts, enhance dialogue, and build consensus among utility management, oversight bodies, stakeholders, and staff across the organization.

- A flexible set of tools that apply to a range of utilities at different stages in the management improvement process.
- A cost free ready-to-use management improvement tool that utility managers can implement in as much or as little depth as they find appropriate for their organizations.

Overall, the experiences of these utilities indicate that the Primer provides a highly cost effective and easy-to-implement set of tools and concepts for undertaking and improving upon existing utility management improvement efforts. The remainder of this introduction provides further background on the case study utilities and their experiences drawing on the Primer concepts and tools. The individual case studies provide a more detailed depiction of each utility's experience and the application of the Primer concepts and tools.

Overview of Utilities

The Collaborating Organizations and Utility Advisory Group members selected four utilities from a list of sixteen nominees. The utilities were selected to represent a range of characteristics, including a variety of geographical locations, water and wastewater services, and population sizes served. The utilities have recent experience applying the Primer concepts and tools to new or existing management improvement initiatives. Senior managers and executives from each utility were interviewed for the case studies and provided background information on management initiatives, application of the Primer concepts and tools to the utility's management improvement efforts, results of the application, and lessons learned from the process.

"By using the Attributes you can develop a great strategic plan, goals, and measures, or you can very simply and inexpensively update your existing plan, as we did."

—Tyler Richards, Deputy Director of Operations and Environmental Services, Gwinnett County Dept. Water Resources

The utilities selected for case study profiling represent a range in size, budget, and approach to applying the Primer concepts and tools. Table 1 highlights some of the key characteristics among the four utilities.

Table 1: Characteristics of the Utilities

Utility	Geography	Water/ Wastewater	Average Wastewater Flow	Average Water Demand	Residential Population Served
Columbus Water Works	Southeast	Combined	70 – 84 mgd	27.5 mgd	227,000
Green Bay Metropolitan Sewerage District	Midwest	Wastewater	39 mgd	n/a	219,000
Gwinnett County Department of Water Resources	Southeast	Combined	45 mgd	86.9 mgd	750,000
Massachusetts Water Resources Authority	Northeast	Combined	320 mgd	214 mgd	2.5 million

Application of the Primer Concepts and Tools

The case studies provide a range of examples for utilities considering using the Primer concepts and tools, including the Attributes, Keys, example measures, and self-assessment method. Depending on the status of the utility management improvement initiatives, application of the Primer varied across the case study utilities.

Management Initiatives

The case study utilities applied the Primer concepts and tools to improvement initiatives at various stages in their management improvement initiatives. Columbus Water Works (CWW) and Massachusetts Water Resources Authority (MWRA) used the concepts and tools to support the review of existing strategic plans that had been in place for many years. These utilities had already invested substantial time and resources in their management improvement initiatives.

Gwinnett County Department of Water Resources (DWR) applied the Primer to the review of a two year old strategic plan. DWR used the Primer concepts and tools as a simple, cost effective framework for the strategic planning review process. Green Bay Metropolitan Sewerage District (GBMSD) applied the Primer to a new strategic planning process that for the first time involved a full range of managers and executive staff in addition to the District's Commissioners. This utility used the concepts and tools as a framework for developing goals, objectives, and strategic investments.

Approaches to the Primer Concepts and Tools

The case studies profile different approaches to applying the Primer concepts and tools. CWW, GBMSD, and MWRA utilized the concepts and tools as a framework for the planning process analysis and discussion that occurred in workshops and planning meetings. DWR applied the Primer concepts and tools to a strategic plan review process that did not involve workshops or meetings but instead used email and standing management team meetings. For each type of approach, the utilities found the Primer concepts easy to apply within the context of their existing management initiatives.

“During strategic planning, if you are not careful, you can get lost in the weeds where management tactics become the focus. Everyone needs to back up every once in a while and look at the big picture and the Attributes help you to do that.”

—Jim Patterson, V.P. Strategic Planning Implementation, Columbus Water Works

Self-Assessment Tool

Three utilities—CWW, DWR, and GBMSD—used the Primer self-assessment tool. This resulted in the identification of areas of achievement and growth, as well as areas needing more focus. Information from the self-assessment results was then used in their strategic planning processes, to help prioritize, develop, and revitalize management initiatives. The utilities took different approaches to the application of the self-assessment tool. CWW used a survey approach with a mathematical compilation of the results, using average scores. GBMSD used the results of manager responses as a consensus building exercise within a meeting context. Like CWW, DWR used a survey approach but took a slightly different approach to compile the results.

DWR also tracked the results of the self-assessment tool by division, finding similarities between participants across the organization. This approach provided reassurance that the participants were in agreement regarding priorities and achievements. This case study highlights the potential use of the self-assessment tool for tracking results across diverse groups, such as divisions or, in the future, possibly stakeholder interest areas. The approach can help to reveal disparities or similarities in the sense of priorities and achievement between participants. It can provide an effective basis for dialogue to explicitly reconcile differences or to offer reassurance about having a unified sense of utility priorities.

Performance Measures

All of the case study utilities used the list of example performance measures provided in the Primer. The utilities already had performance measurement systems in place and used the examples as a means to check for completeness relative to each of the Attribute areas. As a result of the comparison exercise, two utilities identified a need to further develop performance measures in certain areas. One utility validated the completeness of its existing measurement efforts, and the fourth utility will use the list of measures to support further development efforts later this year.

Table 2: Utility Application of Primer Concepts and Tools

Utility	Management Initiatives	Approach to Primer Concepts	Self-Assessment Tool	Performance Measures
Columbus Water Works	Reviewed existing long-term strategic plan	Used Primer as framework for strategic planning workshops	Completed the self-assessment; identified areas of achievement and importance	Compared list of example measures in Primer with existing measures
Green Bay Metropolitan Sewerage District	Reviewed existing short-term strategic plan	Used Primer as framework for strategic planning workshops	Completed the self-assessment; identified areas of achievement and importance	Compared list of example measures in Primer with existing measures
Gwinnett County Department of Water Resources	New strategic planning process involved full range of staff for the first time	Used Primer as framework for plan review by email and standing meetings	Completed the self-assessment; identified areas of achievement and importance	Compared list of example measures in Primer with existing measures
Massachusetts Water Resources Authority	Reviewed existing long-term strategic plan	Used Primer as framework for strategic planning workshops	Did not complete self-assessment. Considered results of a previous assessment	Compared list of example measures in Primer with existing measures

Lessons Learned

The utility managers and executives interviewed for the case studies shared lessons learned from their application of the Primer concepts and tools to their utilities' management improvement initiatives.

External Validation Lends Credibility to Utility Management Priorities: The case study utilities found that having a succinct management improvement framework endorsed by the Collaborating Organizations lent substantial credibility to their management improvement initiatives and helped validate their goals and strategies. For example, the MWRA management team operating in the context of relatively new Board members, found the nationally-recognized concepts and tools helped them to generate Board member support for their management improvement efforts.

A Simple Means to Identify Management Improvement Opportunities: The case study utilities found the Primer concepts and tools provided a simple approach to identifying areas needing more focus, as well as areas on the right track. The utilities mapped the Attributes to their management initiatives to identify where existing efforts needed improvement, and where initiatives were providing effective, overall management coverage. The utility managers found the mapping process fairly straightforward

and easy to introduce to management teams and into existing and new management initiatives. For example, CWW managers and strategy teams were easily able to correlate specific goals, objectives, and strategies from their existing strategic plan with each of the ten Attributes. During a strategic plan review workshop, CWW strategy teams discovered that they were not achieving the Employee and Leadership Development Attribute at a level they considered effective and made changes to the revised strategic plan to address this area more comprehensively.

Lower Cost Strategic Plan Updates: Utility managers found the Primer concepts and tools to provide a cost-effective, easy-to-implement approach. Their application helped the utilities to lower management improvement initiative costs and to focus resources more efficiently. For example, DWR lowered its costs for a strategic planning update by completing the plan review process without the use of workshops or strategy planning meetings. The Primer concepts and tools helped make it possible for DWR to conduct its review by email and standing management team meetings. Using the self-assessment tool in the Primer, DWR gathered input from managers in all divisions regarding the utility's level of achievement and priorities. The self-assessment tool proved to be a very low cost and timely means to establish a sense of management initiative priorities.

Maintaining a Focus on "The Big Picture" and Critical Outcomes: Managers in the case studies returned to the Primer concepts throughout the planning process as a way to direct the dialogue, focus on the "big picture" of overall management effectiveness, and take on a fresh way of viewing improvement initiatives. This helped the utilities maintain a balance among "inside the fence" and "outside the fence" management improvement initiatives.

For example, the Primer concepts provided a high-level framework for discussions between the GBMSD management team and its Commissioners. GBMSD reported that the self-assessment results substantially contributed to shifting management perception regarding the need for increasing emphasis on external-oriented management efforts. The self-assessment results provided a compact and clear depiction of where GBMSD had management strengths and where opportunities for improvement existed. This clear depiction contributed to a productive dialogue between GBMSD managers and Commissioners, and resulted in consensus on a balanced strategic plan.

Clear Illustration and More Focused Discussion of Management Improvement Opportunities: Managers found the Primer self-assessment tool provided a clear illustration of the utilities' level of current

"We were able to show our Board members that our management improvement priorities are fully consistent with a nationally recognized and endorsed utility management framework. That was validating and should help generate solid Board support for our efforts over the five-year timeframe of the Business Plan."

— Marian Orfeo, Director of
Planning and Coordination,
Massachusetts Water Resources
Authority

achievement and where improvement opportunities reside. The table and graphic, produced by the utilities using the self-assessment tool, were helpful for communicating with staff, managers, and Board members about where a utility was and where it wanted to be, in a format that was easy to understand.

Applicability Across a Range of Management

Improvement Experience and Sophistication: Utility managers found the Primer concepts and tools offer utilities flexibility in application. The tools can be applied by utilities with a range of experience and investment in utility management improvement initiatives. In the case studies, CWW and MWRA had gone through multiple strategic planning cycles. GBMSD recently completed its first, fully inclusive strategic planning effort, and DWR has a two year old strategic planning process and used the Attributes to review and update that process. Even with the diversity of experience, all of the utilities in the case studies were able to implement the tools easily and effectively.

“Another real benefit to using the Primer is the graphical illustration of the utility’s achievement rating for the Attributes and importance ranking. This is a good way for the management team and staff to understand where we are and where we want to be.”

— Tom Sigmund, Executive
Director, Green Bay Metropolitan
Sewerage District

Overall, the case study utilities found that the Primer concepts and tools provide a cost-effective, easy to implement approach to exploring utility management improvement opportunities, as well as identifying areas providing effective management. The case studies show how four successful utilities applied the Primer to improvement initiatives in a new and straightforward way, while addressing the current challenges common to water sector utilities across the country.

Case Study: Columbus Water Works (Georgia)

This case study profiles Columbus Water Works, in Columbus, Georgia, and its application of the Attributes and Keys based on interviews with the Vice President of Strategic Planning Implementation and the Manager of Communications and Continuous Improvement. The organization used the Effective Utility Management Primer for Water and Wastewater Utilities (Primer), as a guide for applying the Attributes and Keys.

Utility Overview

Columbus Water Works (CWW) is an enterprise operation serving a population of approximately 227,000 with drinking water treatment and distribution, and wastewater collection and treatment operations. CWW is an executive department of the consolidated governments of the City of Columbus and Muscogee County and is funded through ratepayer fees.

Source water for CWW is provided by the Chattahoochee River and is treated at the North Columbus Water Resources Facility, which has a capacity of 90 million gallons per day (mgd). The plant averages 32 mgd, but during periods of high demand for water has hit a peak usage of 54.5 mgd. The treatment plant was originally built in 1915 and has been updated and modified numerous times to meet new regulations and accommodate technology advances.

CWW Wastewater Treatment Plant



Wastewater is treated at the South Columbus Water Resources Facility. Built in 1964, the plant has been through several upgrades to keep pace with advancing technology and new regulations. The plant originally operated using primary treatment, but added secondary treatment in 1974. During wet weather events, when stormwater may enter the system, the plant can treat up to 84 mgd.

The Columbus Water Board is responsible for the overall management of the utility, including hiring the President, approving the annual budget, setting legal, financial, and personnel policies, and approving rates. The Board is made up of five members, with the mayor of Columbus serving as an ex-officio member, and the remaining four seats appointed by the Columbus City Council.

Existing Management Initiative

Columbus Water Works' current internal management initiative program, or strategic plan, was created in 2005. This effort built off of an earlier strategic planning initiative begun in 1997. In response to the mixed success of the 1997 effort, the development of the 2005 strategic plan included a structural reorganization and the creation of the Strategic Planning Implementation Division (SPID). CWW's vision, as developed through the 2005 strategic planning process is "To be an outstanding provider of utility services, dedicated to protecting the environment, aspiring to new opportunities, and compelled to excel in service to our community." To support this vision, SPID works closely with six strategy teams providing support and guidance, one for each of the organization's major strategy areas (1: Enhance customer satisfaction, 2: Strengthen regional economic potential, 3: Leverage information technology, 4: Optimize infrastructure performance, 5: Develop sustainable workforce, and 6: Maintain financial stability).

"When we introduced the Primer, it was well received. The management team was excited to have a new approach to strategic planning."

– Beth Bickerstaff, Manager of Communications and Continuous Improvement, Columbus Water Works

The 2005 strategic plan and subsequent reorganization empowered the strategy teams to resolve issues directly and carry out the plan's action items. Because the strategy teams were given the authority to implement specific actions and resolve related problems, and to act directly without needing to delay for management approval, CWW was able to involve team leaders and staff across the organization in timely and effective management improvements. The structural support for strategy teams made a significant difference in the organization's ability to implement its strategic plan, reach its associated management goals, and move toward achieving its vision.

CWW conducted its first major review of the current strategic plan in 2007 and a second major review in 2008. The 2008 review took place during a Leadership Retreat workshop in which the Primer concepts and tools were first utilized as part of the strategic planning process. By mapping the relationship between the organization's strategies and the Primer concepts, senior managers and strategy team leaders were able to assess organization-wide performance for the strategic plan review.

Application of the Attributes

CWW's President first shared information on the Primer with the organization in 2008, just before the Leadership Retreat workshop. The organization's senior managers and strategy team leaders reviewed the primer in preparation for the workshop. The purpose of the workshop was to re-examine and update the organization's strategic plan. CWW used the Primer, including the Attributes, the Keys, and the self-assessment as the framework for this review process.

Prior to the workshop, management staff compared the organization's existing strategic plan (the six strategy areas and associated goals) with the Attributes, and found them to be highly correlated. Using the Primer as a reference, specific strategies, goals, and objectives were mapped from the existing strategic plan to each of the Attributes. During the workshop, the six CWW strategy teams were asked to identify what goals or objectives should be changed or added, based on the Attributes and current organizational challenges (See Appendix A: CWW 2008 Strategic Planning—Strategies, Goals, Objectives). The workshop participants developed action plans to address the changes, additions, and issues identified, and began work with the strategy teams immediately following the workshop to move the actions forward.

Utility Self Assessment

In preparation for their Leadership Retreat Workshop, CWW made use of the self-assessment tool provided in the Primer. Managers and team leaders individually completed the organizational self-assessment in the Primer before the workshop to identify CWW's level of achievement and importance ranking for each of the Attributes, in addition to identifying milestones that the teams had achieved. The self-assessment tool was completed and returned online through a website with the compiled results presented at the workshop (See Appendix B: CWW Self-Assessment Results Figure 1 and 2—Importance Ranking and Achievement Rating). Overall, the self-assessment results showed a correlation between what the participants thought CWW was doing well and what Attributes they thought were most important to the organization.

"With the limited time we had in the strategic planning workshop, we were able to quickly identify issues that needed to be addressed using the Primer. When we got back within our teams we were able to discuss how to address those issues."

—Jim Patterson, V.P. Strategic Planning Implementation, Columbus Water Works

At the workshop, the assessment results showed that participants ranked Product Quality as the most important Attribute, and Financial Viability as the second most important. Participants rated CWW very high in achievement of Product Quality (1 on a scale of 5) and high in the area of Financial Viability (2 out of 5). The results showed high to very high achievement ratings for most of the Attributes, with the lowest level of achievement (3 on a scale of 5), given to the Employee and Leadership Development Attribute. Employee and Leadership Development ranked 3-4 (very important), showing some inconsistency when compared to its relatively low achievement rating. The inconsistency was attributed to the expected retirement, within the next few years, of a number of CWW's senior managers, while having insufficient planning in place for workforce succession.

CWW Leadership Retreat Workshop 2008



The self-assessment results confirmed that CWW was heading in the right direction with its strategic planning approach, but also reinforced the need for more focus on the Employee and Leadership Development area in particular. As a result of the inconsistency in this area, CWW managers and strategy teams met to discuss the issue after the workshop. An employee training program and succession plan were developed to begin addressing the pending turn-over of the executive team.

Example Utility Measures

Senior managers also compared the example performance measures provided in the Primer with the existing ones that CWW has in place. The managers were able to correlate example measures with CWW measures and found each of the Attributes to be well supported by CWW's current performance measurement system. The managers evaluated measures from three sources in the organization: CWW's strategic plan, the strategy team objectives, and CWW's application of QualServe¹ indicators. The results of the comparison indicated that CWW has most of the Primer concepts well supported with existing performance measures, while the Community Sustainability Attribute needs further performance measure development. As a next step, CWW plans to examine its options for developing more robust performance measures for the Community Sustainability Attribute.

Overall, CWW managers found they have strong coverage and are getting good results from their current performance measurement system (see Appendix C: Columbus Water Works, 2008 Strategic Planning—Benchmarks). The managers concluded that the Primer would be a good tool for those utilities getting started in the measurement evaluation process, while it acted as a reasonable cross-check for their more fully developed measurement system. Rather than generating any significant changes, the Primer served to confirm that CWW was on track with its measures, having a highly developed performance measurement system already in place.

¹ QualServe is a tool offered jointly by the American Water Works Association and the Water Environment Federation. For more information visit the website at www.qualserve.org.

Association of Metropolitan Water Agencies Awards

The 2008 Association of Metropolitan Water Agencies' (AMWA) Awards for Utility Excellence were structured around the Attributes and Keys. The awards were given to utilities that systematically applied effective utility management approaches to improve their products and services, continuously working to improve product quality, customer satisfaction, employee leadership and development, operational optimization, financial viability, infrastructure stability, operational resiliency, community sustainability, water resource adequacy and stakeholder understanding and support.

CWW applied the Primer concepts to the 2008 AMWA Award application. In the award application the utility demonstrated that its activities were clearly associated with the Attributes and Keys. As a result, CWW earned the 2008 AMWA Platinum Award for Utility Excellence.

CWW 2008 AMWA Platinum Award



Keys to Management Success

Using the Primer, CWW's managers conducted an informal comparison of the organization's management approach with the Keys to Management Success. Consistent with the Leadership Key, CWW's management approach relies on leadership teams that have evolved over time to best serve the organization in implementing its strategic plan. CWW's implementation of the strategic plan also correlates with the Strategic Business Planning Key of the Primer, which calls for strategic planning to achieve balance and cohesion across the Attributes. In regard to the Organizational Approaches Key, CWW actively engages approximately 60 employees in improvement efforts using the strategy teams that reach across the organization to involve staff from all departments.

The Measurement Key calls for a system of measures to manage improvement efforts associated with the Attributes, and CWW has placed substantial emphasis on performance measurement, as described above. CWW has employed a “Scan-Plan-Do” model,² similar to the “Plan-Do-Check-Act” approach described in the Primer under the Continual Improvement Management Framework Key. In addition, CWW has Asset Management³ and National Biosolids Partnership⁴ strategies in place, which are anchored in a continual improvement management framework. The organization has also created a Continuous Improvement staff position for a manager to coordinate efforts in this area.

Table 1 Keys to Management Success and CWW Approach

Keys	CWW Approach	Results
Leadership	Leadership Teams	Implementing strategic plan
Strategic Business Planning	Strategic Plan Implementation	Working to achieve balance and cohesion across the Attributes
Organizational Approaches	Strategy Teams	Involving staff in improvement efforts
Measurement	Performance Measures	Using a system of measures to manage improvement efforts
Continuous Improvement “Plan-Do-Check-Act”	<ul style="list-style-type: none"> • “Scan-Plan-Do model” • Other management strategies • Continuous improvement Manager Position 	Providing a continual improvement management framework.

Overall, CWW found its management approach consistently matches the Keys to Management Success as outlined in the Primer. The managers did not see the need to formally work through the Keys in the workshop setting, but they did review them informally prior to the workshop in preparation for focusing on the Attributes. They found that the Keys are fundamental tools for applying the Attributes, and were useful for verifying that CWW is on track with effective management principles.

Lessons Learned

The two senior managers interviewed provided the following lessons learned from CWW’s application of the Primer concepts and tools:

- It was a straightforward exercise to map CWW’s existing strategic plan to the Attributes.

² The Scan-Plan-Do Model was developed in the American Water Works Research Foundation project, “Strategic Planning and Organizational Development for Water Utilities.”

³ <http://www.epa.gov/OWM/assetmanage/index.htm>

⁴ <http://www.biosolids.org/>

- The mapping exercise helped CWW to identify where their existing strategic plan goals and objectives could use improvement, and indicated, overall, that their strategic plan was providing the organization with effective, overall management coverage.
- Using the Primer as the overall framework for the strategic plan review helped keep workshop participants focused on the big picture of overall management effectiveness (and helped the managers to avoid becoming overly focused on specific tactics).
- The Primer provided a fresh way of examining CWW's strategic plan and conducting the strategic plan update. This helped managers be more engaged in the Leadership Workshop.
- The self-assessment tool provided an easy to implement, overall, high-level framework for evaluating organizational performance. It provided reassurance that CWW was effectively addressing most Attributes while highlighting one Attribute in need of further work.
- The example measures acted as an effective cross-check for CWW's existing measurement system if only to reassure the organization that it has a robust system in place.
- Although it has invested substantially in management systems over a several-year period, CWW found the Primer to be a helpful tool for characterizing its management improvement status and needs.
- Management improvements take time and evolve over several years. For example, CWW uncovered the need for strategy teams during its 2005 strategic planning process, several years before the Primer was published. The use of strategy teams was further refined during the 2007 plan revisions. In 2008, when the Primer was published, the strategy teams were able to implement the Primer concepts and tools during the next strategic planning process. CWW management improvements occurred in stages and application of the Primer was part of the ongoing progress made over time.

Overall, the CWW managers found that they had no difficulty introducing the Primer to an already functioning management team and into an existing strategic planning process. The managers found the Attributes and Keys, the self-assessment tool and example performance measures very useful and believed the tools helped CWW to identify areas it needed to focus on. The CWW managers would recommend the Primer concepts and tools to other utilities.

Conclusion

CWW is an excellent example of a utility that has used the Primer to apply the Attributes and Keys for reviewing and developing management strategies, goals, and objectives. The utility compared the Primer concepts to its existing strategic plan strategies and found a strong correlation. CWW utilized the Primer's self-assessment method and identified one Attribute that needed more focus, and other Attributes that were well supported. Areas needing a bit more focus in relation to CWW performance measures were identified through a comparison with the measurement strategies in the Primer. CWW successfully applied the Primer concepts and tools through its strategic planning workshop, followed by strategy team actions to implement the workshop findings.

For utilities such as CWW that have invested substantial time and resources in management systems, the Attributes, Keys, Measures, and Self-Assessment can act as effective tools for evaluating management strategies. According to the senior managers interviewed, the Primer can help the utility take a step back and effectively evaluate the big picture goals it is working to achieve.

More information about CWW is available on its website at <http://www.cwwga.org/default.asp>.

Case Study: Green Bay Metropolitan Sewerage District (Wisconsin)

This case study profiles Green Bay Metropolitan Sewerage District (GBMSD), in Green Bay, Wisconsin, and its application of the Ten Attributes to Effectively Managed Water Sector Utilities (Attributes) and Keys to Management Success (Keys). Based on interviews with the Executive Director, the case study describes the utility's use of the Effective Utility Management Primer for Water and Wastewater Utilities (Primer), as a guide for applying the Attributes and Keys.

Utility Overview

Green Bay Metropolitan Sewerage District (GBMSD) is an independent municipal district that provides district interceptor systems and wholesale wastewater treatment services from its two treatment facilities in Green Bay and De Pere, Wisconsin. GBMSD serves over 219,000 residents, through 17 village, town, and city customers.

GBMSD Green Bay Facility at the Mouth of the Fox River



GBMSD's original treatment plant began operations in 1935 and experienced several significant expansions over the following decades, including a major expansion in 1975 that allowed it to be the first plant in the nation to simultaneously treat municipal and pulp mill wastewater. During the 1990s the plant added aeration basins, secondary clarifiers, and an improved solids handling system, resulting in greatly improved ammonia removal efficiency. In 1999–2000, GBMSD experienced significant restructuring and downsizing. To keep municipal user rates low while continuing to maintain or improve performance, GBMSD reduced its workforce by 30 percent.

In December 2007, GBMSD and the City of De Pere's wastewater utility agreed to merge operations. The De Pere treatment facility and GBMSD facility, combined, on average treat approximately 39 mgd of

wastewater. The Green Bay facility is designed to treat up to 49 mgd and treats approximately 30 mgd on average. The De Pere facility can treat up to 14 mgd; on average the facility treats approximately 9 mgd. The maximum wet-weather design flow for the De Pere facility is 30 mgd; the maximum wet-weather design flow for the Green Bay facility is 160 mgd.

GBMSD is authorized as a special purpose municipality under Chapter 200 of the statutes of the State of Wisconsin and is funded by user fees. GBMSD has the authority to levy a property tax, but has never used that authority. GBMSD is directed by a five-member Commission that meets at least monthly. Commissioners are nominated by the Brown County Executive and approved by the Brown County Board to serve staggered five-year terms. GBMSD employs a highly skilled workforce of approximately 100 staff.

Existing Management Initiative

In 2002, before the Primer was published, the GBMSD Commission and Executive Staff updated the utility's 1999 strategic plan, focusing on risk and vulnerability assessment and asset management strategies. Implementation of that high-level plan did not translate to direct action by managers and staff. More recently, a new strategic planning process that involved not just commissioners, but a broad cross-section of staff was implemented with the purpose of driving performance across the entire organization. While the 2002 planning process was conducted by and for the GBMSD commissioners and executives, the 2008 process was a more fully inclusive strategic planning effort involving managers and staff. The 2008 process benefited from a design that encouraged more organization-wide participation in implementation strategies.

Green Bay Metropolitan Sewerage District Meeting



The process began with a kick-off meeting in May 2008, followed by a series of workshops through summer and fall of 2008. The planning process utilized the Primer concepts and tools as a framework for identifying goals, objectives, and investment strategies to achieve GBMSD's mission, "to promote public health and welfare through the collection, treatment and reclamation of wastewater while

assessing stable, competitive rates. In conjunction with others, the organization will encourage pollution prevention and support programs to help ensure that water contaminated by human activity is returned clean to the environment.” An implementation plan framed around the Primer concepts is currently being developed for completion in 2009.

Utility Self Assessment

In 2008, GBMSD’s Executive Director distributed the Primer and reviewed it with 16 managers and executive staff on the management team, who then individually completed the utility self-assessment. The management team was asked to rank the Attributes according to level of importance and to rate GBMSD on its level of achievement for each Attribute. The team decided to treat the assessment results as an internal document, to enable managers to be more fully candid. The management team as a group reviewed the self-assessment results at its first strategic planning meeting, condensed the individual assessments into a single group assessment and used the results of the assessment to reach consensus on priority focus areas for the strategic plan.

“The Primer helped identify that change was needed and helped us develop strategies aligned with our goal of becoming a more effective utility.”

—Tom Sigmund, Executive Director,
Green Bay Metropolitan Sewerage
District

The individual importance ranking and achievement rating from the self-assessment tool first revealed that the management team was primarily focused on the utility’s services “inside the fence,” such as product quality and plant maintenance. The results showed that externally-focused strategies, such as communicating with customers, environmental stewardship, seeking stakeholder support, and other activities “outside the fence,” were not considered by the management team to be high priority areas or GBMSD strengths. At the same time, the Commission found external strategies lacking in the existing management priorities and was focusing on the need for externally-focused activities in the 2008 plan. Going into the strategic planning process, the focus of the management team and that of the Commissioners were significantly different.

As the management team and Commissioners discussed the Primer concepts and tools, the need for investment in externally-focused management initiatives became more apparent; these were eventually seen by the management team as priority focus areas for the strategic plan, in addition to the internally-focused activities. The Primer and the self-assessment tool, in particular, were credited with giving the management team the opportunity to see external strategies in a different light, in balance with internally-focused goals.

Because the Primer provided nationally-recognized principles endorsed by EPA and six national water sector associations, it enabled the management team to see the need for change within GBMSD to be in

step with industry peers. In addition, the table and graph created by GBMSD as part of the self-assessment tool, clearly illustrated to managers and staff the organization's current status and its future goals in a way that was easy to understand. By demonstrating the need for change, the self-assessment tool helped participants to overcome resistance to viewing externally-focused goals on par with internally-focused ones. The Primer, and the self-assessment tool in the Primer, created a strong basis for the management team to focus externally, played a critical role in validating the "outside the fence" interests of the Commissioners, and helped GBMSD to reach consensus on strategic planning goals.

Application of the Attributes

The utility's Executive Director first learned about the Primer concepts and tools from his involvement in the Effective Utility Management Advisory Committee, in addition to the EUM website and industry conferences. He shared copies of the Primer with the GBMSD Commissioners and management team in preparation for the 2008 strategic planning process. The management team completed the self-assessment exercise, which provided a high-level sense of strategic planning focus areas, both internally- and externally-focused. During strategic planning workshops, the management team then identified specific goals, objectives and investment strategies for the new strategic plan, based on the focus areas identified.

"It was tough for people to change their focus and the Primer helped them to understand the need to change. The Primer helped them evaluate and prioritize a diverse set of alternatives."

*—Tom Sigmund, Executive Director,
Green Bay Metropolitan Sewerage
District*

The 2008 process utilized the self-assessment results as a framework for identifying four major GBMSD goals (1: Support economic development, 2: Offer exceptional career development opportunities, 3: Promote environmental stewardship/education, 4: Provide diverse, quality services). Each goal was weighted based on the results of the self-assessment exercise and management preferences to establish a priority order. The goals were then associated with a set of objectives, which were again weighted to reflect the results of the self-assessment and management preferences. The objectives were listed in priority order and were then associated with a list of 14 potential strategic investment option activities. GBMSD then evaluated each investment option, considering how much it would serve GBMSD in meeting the identified objectives and how it would address the Attributes. As a result of the analysis, four final strategic investment strategies were selected for implementation in the strategic plan (See Appendix D: Green Bay Metropolitan Sewerage District Goals, Objectives, and Investment Strategies).

The strategic investments provided specific actions for managers and staff to take to address the goals and objectives in the plan. The four strategic investments for moving the goals and objectives forward and the associated Attributes were confirmed for the strategic plan (see Table 2: Strategic Investments and the Attributes). By prioritizing the investments and selecting four, GBMSD will be able to focus its staff resources on the most important strategic activities, while maintaining its core business operations.

Table 2: Strategic Investments and the Attributes

2008 Strategic Investments	Correlation with Attributes
1.Services to other municipalities: Provision of wastewater treatment and collection services to other municipalities in region including operations (by contract), technical services, and/or system acquisitions.	Stakeholder understanding and support; Operational optimization; Financial viability
2. Watershed planning/credit trading: In collaboration with other major WI wastewater utilities and DNR, develop whole watershed planning framework (including establishing credit trading protocols).	Community Sustainability; Stakeholder Understanding and Support; Financial Viability
3.Asset management: Develop an asset (including IT assets) renewal and replacement program using condition assessments, life-cycle costing and risk-based decision making protocols.	Financial Viability; Infrastructure Stability; Community sustainability; Stakeholder understanding and support
4. In-district sustainability projects: Develop projects (or project components) that yield sustainability benefits including limiting GHG emissions, achieving LEED compliance, etc. Develop environmental impact reporting.	Financial viability; Infrastructure stability; Product quality; Community Sustainability; Stakeholder understanding and support

In the final step of the strategic planning process, the utility will review its current set of performance measures in the context of the 2008 objectives and investments, using the list of measures in the Primer as a guide. The management team is currently finalizing the implementation plan and performance measures for completion in spring 2009.

Attribute-Related Utility Measures

GBMSD developed performance measures in 2004, before the Primer was published, in relation to the strategic plan goals that were in place at the time. During its current strategic planning process, GBMSD is revisiting its measures using the examples in the Primer. The management team is in the process of correlating its measures with the objectives and strategic investments in the new plan and revisions will be made where needed.

GBMSD currently measures product quality for regulatory compliance, workforce succession preparedness, bond rating, worker safety, partnership projects, and annual rate increases compared to consumer price index. All of these measures will be reviewed in light of the 2008 goals and objectives

and the four strategic investments, and will be implemented in 2009. GBMSD plans to develop annual reports that convey the results of its performance measures.

Keys to Management Success

Using the Primer, the Executive Director conducted an informal assessment of the Keys to Management Success and GBMSD's management approach (see Table 2: Keys to Management Success and GBMSD Approach). In relation to the "Leadership" Key, GBMSD has established a Leadership Development strategy for training staff. The utility has partnered with a technical school and will graduate its first set of staff from the program in 2009. In addition, the management team continues to implement succession planning strategies for GBMSD. GBMSD's 2008 strategic planning process using the Primer framework correlates with the "Strategic Business Planning" Key, and will be implemented in 2009. Regarding the "Organizational Approaches" Key, GBMSD has actively engaged the management team and Commission in its strategic planning process and implementation strategy. It is currently in the process of chartering management and staff teams to implement the strategic investments. GBMSD regularly uses work teams to evaluate issues and implement projects.

The "Measurement" Key calls for measurement of improvement efforts associated with the Primer concepts. GBMSD is currently evaluating its measurement strategies in relation to its 2008 strategic plan goals, objectives, and investment options, using the list of example measures in the Primer. With regard to the "Continual Improvement" Key, GBMSD is in the process of evaluating its improvement management strategies. The management team is striving to document institutional knowledge and to learn from past experiences. GBMSD has had an asset management strategy in place for many years, and is currently evaluating its usefulness in terms of the 2008 strategic plan.

Table 2: Keys to Management Success and GBMSD Approach

Keys	GBMSD Approach	Results
Leadership	Leadership Development	Partnering with local technical college to train current staff.
Strategic Business Planning	Strategic Planning Process	Developing implementation strategy for 2008 Strategic Plan.
Organizational Approaches	Management and Staff Teams	Implementing the 2008 strategic plan investments.
Measurement	Performance Measures	Evaluating current measures in relation to the 2008 strategic plan.
Continual Improvement Management Framework	Evaluation of Improvement Management Strategies	Documenting institutional knowledge and learning from past experience. Asset management strategy.

Overall, GBMSD's management approaches match the Keys to Management Success model, as outlined in the Primer. The management team continues to evaluate GBMSD's management efforts and to improve its performance. Although GBMSD did not implement a formal analysis of the Keys, the

Executive Director did find them useful as a guide for applying the Primer and ensuring that GBMSD is on track with nationally recognized effective utility principles.

Lessons Learned

The Executive Director provided the following lessons learned, in regard to applying the Primer concepts and tools to its strategic management initiatives:

- The Primer reinforced the need for focusing on activities “outside the fence” of the utility’s internal operations. Because they provided a respected industry perspective on effective utility management, the Primer reinforced the Commissioners’ interest in better balancing internally and externally-focused strategic investments. The Primer concepts and tools provided a fresh way to evaluate the strategic plan, enabling managers to view focus areas in a way that was not previously considered.
- Managers found that mapping the Attributes and Keys with the management goals, objectives, and investments was a fairly straightforward and useful exercise particularly for identifying areas needing improvement.
- The Primer provided a high-level framework upon which to base planning discussions and structure strategic planning processes. GBMSD managers returned to the Primer in each stage of the planning process.
- The Primer, including the self-assessment tool provided simple and easy-to-implement guidance that managers found beneficial for moving GBMSD’s process forward. The table and graphic developed using the self-assessment tool were especially helpful for communicating the utility’s current status and future goals. It enabled effective communication and understanding between the management team and the Commission. By demonstrating the need for change, the self-assessment tool helped participants to overcome resistance to change.
- The decision to hold the self-assessment results as an internal document allowed the managers and executives to be more fully candid in the self-assessment process.
- The Primer will enable GBMSD to cross-check its measurement system with the example list of measures, applying the Primer concepts to its performance measures.

“The Primer and Attributes gave staff the opportunity to look at goals in a different manner. This turned their thinking from only looking ‘inside the fence’ to seeing that goals ‘outside the fence’ are also needed.”

— Tom Sigmund, Executive Director, Green Bay Metropolitan Sewerage District

Overall, the Executive Director did not have any difficulty introducing the Primer to the management team and Commission and integrating them into the 2008 strategic planning process. The management team found the Primer to be a useful tool for identifying the level of importance managers and staff placed on internal and external management strategies. The Primer concepts and tools provided

guidance on industry norms for effective management, and helped the management team and Commission to reach consensus on the 2008 strategic planning approach.

Conclusion

GBMSD is an example of a utility that has used the Primer in a strategic planning process that involved managers and staff across the organization for the first time. The utility used the Primer to establish new goals and objectives, as well as investment strategies for implementation. GBMSD utilized the Primer's self-assessment tool to identify strengths and weaknesses. The self-assessment revealed that strategies "outside the fence" needed more focus and helped to bring the management team and Commission into agreement on priority focus areas. GBMSD successfully used the Primer through its strategic planning process, and will complete its implementation plan and performance measures this year.

GBMSD found that the self-assessment in the Primer provided a simple, easy-to-implement tool for beginning the strategic planning process, and the Primer provided a framework that the management team could follow throughout the process. The Primer was useful for a utility that wanted to make significant changes in its management strategies and served to close the gap between the managers' and the Commissioners' views on externally-focused activities. The self-assessment tool in the Primer provided a clear illustration of the utility's current status and future priorities. GBMSD will use the Primer concepts and tools in the future, and the Executive Director recommends it for other utilities that are implementing strategic planning in a way that fully involves managers, staff and Commissioners in the process.

More information about GBMSD is available on its website at <http://www.gbmsd.org/>.

Case Study: Gwinnett County Department of Water Resources (Georgia)

This case study profiles Gwinnett County Department of Water Resources (DWR), in Lawrenceville, Georgia, and its application of the Ten Attributes to Effectively Managed Water Sector Utilities (Attributes) and Keys to Management Success (Keys). Based on interviews with the Deputy Director of Operations and Environmental Services (Deputy Director OES), the case study describes how DWR used the Effective Utility Management Primer for Water and Wastewater Utilities (Primer), as a guide for applying the Attributes, Keys, self-assessment tool, and example list of performance measures.

Utility Overview

DWR is a publicly-owned utility providing water, wastewater, and stormwater services for over 750,000 residents. It is governed by the Gwinnett County Board of Commissioners, advised by a Water and Sewerage Authority.

Gwinnett County Department of Water Resources



The Water Production Division operates and maintains two separate intake and pump facilities at Lake Lanier. Water is processed at two water filtration plants. The Lanier Filtration Plant can produce 150 mgd, and the Shoal Creek Filtration Plant can produce 75 mgd, for a total of 225 million gallons per peak day water production capacity. In 2007, Gwinnett County residents and businesses consumed nearly 32 billion gallons of water, averaging 86.9 mgd. In 2008, consumption averaged 72.1 mgd. The highest historical peak-day demand has been 143 mgd.

- The Water Reclamation Division currently operates five wastewater treatment facilities with a total permitted capacity of 98 mgd as a monthly average. The Wayne Hill Water Resources Center has a 60 mgd capacity, with the highest monthly flow of 48.3 mgd in 2007-2008.
- Yellow River basin reclamation facilities are currently being consolidated, with a combined capacity of 22 mgd. The highest monthly flow at these facilities in 2007 through 2008 was 16.59 mgd.
- Crooked Creek WRF has a current capacity of 16 mgd, with the highest monthly flow of 13.7 mgd in 2007-2008.

The reclaimed water from the F. Wayne Hill Water Resources Center is conveyed through two long pipelines either to the Chattahoochee River upstream of other metro area intakes or to Lake Lanier in the vicinity of Gwinnett County's newest water supply intake.

Management Planning Initiatives

Since 1992 DWR has had a facility master plan that focuses mainly on permit capacity and growth. That master plan was revised on five-year intervals. Located northeast of Atlanta, Gwinnett County was a rapidly urbanizing area, and prior to 2007 the utility concentrated on new capital and intensive growth. For example, from 1997 to 2007 the population increased over by 25,000 per year. More recently, growth in the county has slowed markedly. In addition, ongoing drought has prompted an outdoor watering ban. As a result of these changes, DWR is transitioning from a growth-focused utility to a more deliberative rehabilitation and replacement organization. In 2007, before the Primer was published, DWR implemented its first strategic planning process, conducting a series of workshops involving all levels of management and field staff. Five strategic objectives were developed through the process: 1) Effective Asset Management, 2) Customer Service, 3) Workforce Development, 4) Financial Viability, and 5) Enhanced Communication.

"The Primer is about as simple and easily understood as anything I have yet seen. In fact, it is only 44 pages including appendices and figures. Best of all, it is free!"

—Tyler Richards, Deputy Director of Operations and Environmental Services, Gwinnett County Dept. Water Resources

After the strategic plan was developed in 2007, DWR generated performance measures in 2008, based on strategic plan goals. In 2009, the utility revisited its strategic plan through a low cost planning process using the Primer concepts and tools. Due to a freeze in hiring and a plan to cut spending, DWR did not conduct strategic planning workshops, but carried out the strategic planning process through email and standing management team meetings, possibly saving up to \$36,000. The Primer provided a cost-effective approach that was easy to implement by managers and staff. Because the 2007 strategic plan was developed only eighteen months earlier, the process was possible without scheduling strategic planning workshops. With the Primer framework, DWR was able to revitalize its strategic plan and review its performance measures through a process involving all levels of management and staff.

DWR's strategic planning efforts were framed by the County's use of the Balanced Scorecard⁵ for business planning. The organizations governed by the County are required to use the Balanced Scorecard for planning strategic goals and objectives. DWR will integrate its revised strategic plan under

⁵ The Balanced Scorecard was developed by Dr. Robert Kaplan and Dr. David Norton as a performance measurement framework that added strategic non-financial performance measures to traditional financial metrics to provide a more "balanced" view of organizational performance.

the Primer framework with the County's broader Balanced Scorecard context later this year. Plan initiatives will be assigned to individual managers and staff for implementation.

Utility Self Assessment

The Deputy Director OES distributed the Primer electronically to 44 managers in all divisions of the utility using a survey format. Managers completed the self-assessment survey, ranking achievement areas and importance levels for the utility. Within a few weeks the self-assessment responses from 34 employees were available for analysis. The Deputy Director applied a mathematical compilation of the responses and plotted the aggregated results in a graph to show ranking trends for each Attribute (see Appendix E: Gwinnett County Department of Water Resources Achievement of Attributes and Importance of Attributes Ranking).

Gwinnett County Department of Water Resources



DWR did encounter some difficulty completing the self-assessment as an individual survey. When asked to rank order the Attributes from higher to lower importance, respondents assumed “1” to indicate least important and “10” to indicate most important (the respondents found the Primer scale approach–“1” is most important, “10” least important– to be counterintuitive). The Deputy Director OES commented that, in light of this confusion, it is important for utility executives distributing the tool to reinforce that 1 is a high ranking and 10 is a low ranking rather than relying only on the directions provided with the Primer. DWR provided further explanation to staff regarding the order of the ranking scale and responses were resubmitted with corrections.

The Deputy Director OES tried various methods for compiling the self-assessment responses, which proved challenging. Since she was analyzing independent survey results outside of the consensus-building workshop setting, it was difficult to represent the responses clearly. Using a method of averaging the results gave a meaningless ranking, with all scores in the middle of the ranking scale. In consultation with the management team, the Deputy Director tried grouping the aggregate responses into levels of importance or achievement, which proved to be successful and provided the information GCWDR needed for its planning process.

For this method, DWR took the full range of available responses—1 to 10 for the importance ranking and 1 to 5 for the achievement rating—and categorized them into levels. An Attribute that ranked 1 to 5 in importance, for example, was considered to be at a high importance level, and if it ranked 6 to 10, it was considered to be at a low importance ranking. For the achievement ratings, if DWR was rated 1 to 2 for achievement of an Attribute, the Attribute was considered highly achieved, and if it was rated 3 to 5 it was considered less achieved. The percent of total responses for a given score were also provided. For example, if 90 percent of the responses fell within the high level of importance ranking, that was indicated on the graph. Overall, the method developed by DWR for compiling the aggregate results of the survey successfully represented the responses in a way that was useful for the strategic plan review process. Once the survey responses were compiled and displayed graphically, DWR was able to quickly identify areas needing improvement.

“As a result of the Primer concepts we are a more focused utility. Managers and staff are working toward common goals and can see their place in achieving them.”

— Tyler Richards, Deputy Director of Operations and Environmental Services, Gwinnett County Dept. Water Resources

The results of the self-assessment process indicated that DWR was achieving expectations for Product Quality and Customer Satisfaction, which were also ranked as highly important Attributes. This indicated that DWR's existing strategies for these areas were being well communicated and successfully implemented. The Financial Viability and Infrastructure Stability Attributes, on the other hand, received a low achievement rating, but a high to moderately high level of importance ranking. This indicated that DWR needed to focus its 2009 revised strategic plan in these two areas in particular. The management team decided to focus on developing strategies for understanding the full life-cycle cost of the utility, to improve on the Financial Viability Attribute and the Infrastructure Stability Attribute.

DWR tracked the self-assessment results by division, which provided interesting results showing similarities across the organization. The responses from each division, including the Engineering, Finance, Lab, Management, Operations, and Planning Divisions, were color coded on a graph (see Appendix F: Gwinnett County Department of Water Resources Strategic Planning Achievement and Importance Graph). The results indicated that staff members from across the divisions shared a similar sense of organizational priorities and level of achievement. The similarities between division responses indicated that individuals in different areas of the organization had incorporated a unified perspective on priorities and performance, rather than a more division-centric focus, and that the 2007 strategic plan had created a cohesive sense of goals and objectives across the organization.

Once the self-assessment results were analyzed and graphed, they were reviewed by the management team and sent by email to participants for comment. The final results were then used by the management team in the strategic planning review process. The Deputy Director is interested in inviting

additional participants, such as field staff and outside stakeholders to the self-assessment process in the future, for a broader set of responses to the Attributes ranking.

Gwinnett County Department of Water Resources



Application of the Primer Concepts and Tools

The Deputy Director OES introduced the Primer self-assessment survey to DWR managers in January 2009. In addition to providing the self-assessment tool, she mapped the existing strategic plan initiatives with the Attributes, to help managers refocus and consider new areas for the revised plan. Managers found that the ongoing DWR initiatives were consistent with the Attributes, which validated the existing strategic plan focus. For example, DWR is designing a LEED certified⁶ building at one of its facilities, and a system for using energy from digester gas at another facility. Through the process of mapping the Attributes with current initiatives, DWR was able to recognize that these projects were addressing the Community Sustainability Attribute. For Attributes not aligned with the existing strategic plan, such as Financial Viability and Infrastructure Stability, new draft initiatives were created for consideration.

Based on the results of the self-assessment tool and the basic mapping of initiatives with the Attributes, the management team reviewed its goals and objectives, and developed new initiatives to address areas needing more focus. The next step for DWR is to develop strategies for implementing the goals, objectives, and initiatives in the revised plan. The management team is currently in the process of developing an improvement plan and performance measures for the 2010 strategic plan implementation.

⁶ U.S. Green Building Council LEED Certification Program: <http://www.usgbc.org/Default.aspx>

The strategic plan as revised according to the Primer concepts and tools will be integrated into Gwinnett County's balanced scorecard framework, which is part of a county-wide approach to management planning (For an example of the Balanced Scorecard approach, see Appendix G: Gwinnett County Department of Water Resources Balanced Scorecard Perspectives.)

A balanced scorecard allows flexibility in selecting strategic objectives. Associated with each objective are one or more key performance indicators (KPIs) or measures, and under each KPI there are one or more strategic initiatives which drive improvements in the KPI. A vibrant and responsive strategic plan will focus on those Attributes needing the most energetic attention in any given planning horizon, without abandoning emphasis on those performance metrics that are central to accomplishing DWR's mission. As these weaker Attributes are thus strengthened by improvement initiatives, successor iterations of the strategic plan will focus on other Attributes deemed to be low achievers according to subsequent surveys.

"The Primer stressed the importance of concentrating our efforts in areas needing improvement and showed where we excelled. It also caused us to consider areas that we may not have otherwise considered."

— Tyler Richards, Deputy Director of Operations and Environmental Services, Gwinnett County Dept. Water Resources

For 2010 strategic plan development, those Attributes which received high scores on importance but low scores on achievement on the most recent survey will not only be identified as objectives on the scorecard, but will be supported by multiple KPIs with multiple initiatives per KPI. Some of these performance measures may be newly conceived as a means of gaining additional managerial control over these areas of the enterprise, and initiatives will be crafted which will improve performance on those particular KPIs. Each initiative will specify scope and resources, detail the action-plan tasks, set milestone dates, and assign responsible individuals. A multiplicity of initiatives on the weaker Attributes, recast as objectives on the balanced scorecard, will concentrate the organization's attention on those areas needing the most improvement.

Although a balanced scorecard provides an effective vehicle for converting the Primer concepts and tools to action, any strategic planning instrument that delves into detailed action plans (programs and projects aligned to support the strategic plan) will serve to integrate the Attributes into effective utility management.

Attribute-Related Utility Measures

After the 2007 strategic plan was developed, DWR identified performance measures for assessing its achievement of plan goals and objectives. In the 2009 strategic planning review process, managers used the list of example measures in the Primer to evaluate the measures it had in place against the new plan

objectives and Primer framework. The examples in the Primer helped the management team to choose standard and meaningful measures that could enable DWR to chart improvements over time.

With the hiring freeze and cost cutting measures taking place, the management team became aware of the need to use staff resources as efficiently as possible. Managers understood that resources should not be spent on “measuring the unimportant.” Through the strategic planning process using the Primer as a guide, DWR was able to identify the most essential measures and eliminate those that were not needed. The new set of measures will be implemented by the field staff and results will be reported on a regular basis.

To improve its achievement of the Financial Viability Attribute, DWR will develop measures to track full life cycle costing. To improve on the Infrastructure Stability Attribute, it will develop strategic asset management plans to look at the condition of critical assets. The final set of performance measures and the improvement plan will be developed by summer 2009 as an input to the 2010 operating and capital budgets.

Keys to Management Success

The Deputy Director OES conducted an informal analysis of the Keys to Management Success, using the Primer. The “Leadership” Key is consistent with DWR’s strategy to focus on workforce development, including employee development and training programs, as well as succession plans. The “Strategic Business Planning” Key matches DWR’s strategic planning review process using the Primer concepts and tools as a framework.

Table 1 Keys to Management Success and DWR Approach

Keys	DWR Approach	Results
Leadership	Workforce Development	Providing an integrated Employee Development and Training Program
Strategic Business Planning	Strategic Planning Process	Revitalizing the strategic plan using the Attributes
Organizational Approaches	Strategic Planning	Involve all levels of management and staff in self-assessment process and implementation
Measurement	Performance Measures	Reviewing set of measures in context of new strategic plan using the Primer
Continual Improvement Management Framework	Key Performance Indicators	County-wide improvement in outputs, efficiency, and outcomes using the Balanced Scorecard

The “Organizational Approaches” Key was addressed in DWR’s strategic planning process that involved all levels of management, as well as field staff. The utility is also consistent with the “Measurement” Key, as it reviews the measures already in place, in the context of the new strategic plan. With regard to

the “Continual Improvement” Key, DWR is using county-wide performance indicators to report monthly on improvements using the Balanced Scorecard approach.

DWR’s management approach is consistent with the Keys to Management Success as outlined in the Primer. The Deputy Director OES found that the Keys are helpful for tracking progress, and were useful for verifying that the utility is on track with established effective management principles.

Lessons Learned

The Deputy Director OES provided the following lessons learned from DWR’s application of the Primer concepts and tools:

- The Primer concepts were useful for validating the strategic plan initiatives already in place, by providing a framework endorsed by The Collaborating Organizations for effective utility management. The process of mapping the Attributes with DWR strategies was fairly straightforward and provided a useful method for identifying areas needing improvement.
- The Primer concepts and tools gave DWR an approach for getting all levels of management and staff to agree on the focus for the revised strategic plan. The self-assessment tool in the Primer was an easy, cost-effective approach for the management staff to review and update the utility’s existing strategic plan. The tool in particular provided a way to conduct a strategic planning update through email and regular staff meetings without the use of workshops or a costly process.
- DWR needed to develop an in-house methodology for compiling and displaying the responses received from the self-assessment tool survey. The responses, once compiled and displayed graphically, allowed the utility to quickly identify areas needing improvement.
- The benefits of the self-assessment approach have left DWR inclined to expand the use of the self-assessment survey to include additional participants (including outside stakeholders) in future strategic planning update cycles.
- Tracking self-assessment responses by division confirmed that participants across the organization had similar views, regardless of their work area. Results indicated that the individual divisions had incorporated a utility-wide sense of management priorities and performance.
- The list of performance measures in the Primer was a useful reference for reviewing DWR’s measurement system in the context of the Primer concepts. Using the examples, DWR identified a need for further development of performance measures in two areas associated with the Financial Viability and Infrastructure Stability Attributes.

“I would encourage other utilities to download the Primer. Then use the attributes, self assessment tool and other approaches in the Primer as a simple way toward utility improvement.”

*—Tyler Richards, Deputy Director
OES, Gwinnett County Dept. Water
Resources*

Conclusion

DWR is an excellent example of a utility that has used the Primer concepts and tools for revising an existing strategic plan. The utility compared the Attributes to its existing strategies and found a strong correlation. The utility applied the self-assessment tool to identify areas for further improvement and isolated two particular Attributes needing more focus. The utility also used the self-assessment tool to evaluate responses across the organization's divisions and found that staff across the organization had similar views of the organization's achievement level and priorities. DWR used the examples of measures in the Primer to review its performance measures in the context of the new strategic plan and Primer framework. DWR successfully accomplished these tasks through a cost-effective strategic planning effort.

DWR identified many benefits from using the Primer concepts and tools. By applying the Primer to its management improvement initiatives, DWR was able to implement a cost-effective, easy-to-implement process. Cost was particularly important to DWR, due to its existing hiring freeze and need to cut costs. DWR was able to bring all levels of management and staff into agreement on priorities and goals without a costly strategic planning process and to target its resources most efficiently. DWR benefited from a nationally-recognized straightforward framework that helped the utility to identify areas needing improvement and areas that are on the right track. The graphic and tool provided a clear illustration of the utility's current status and future goals. As a result of applying the Primer concepts and tools, DWR's Deputy Director OES reports that it is a more focused utility with all staff working toward common goals.

For utilities such as DWR that have had a strategic plan in place for only a couple of years, the Primer concepts and tools can be very effective for revitalizing management strategies and anchoring the plan review process. According to the Deputy Director OES, the Primer provides simple tools that are easy for utilities to implement, bringing all levels of management and staff together in an efficient and cost-effective strategic planning process.

More information about DWR is available on its website: <http://www.gwinnettcounty.com/cgi-bin/gwincty/egov/ep/gcbrowse.do?channelId=-536881961&pageTypeId=536880236>.

Case Study: Massachusetts Water Resources Authority (Massachusetts)

This case study profiles Massachusetts Water Resources Authority (MWRA), in Boston, Massachusetts, and its application of the Ten Attributes to Effectively Managed Water Sector Utilities (Attributes) and Keys to Management Success (Keys), and the Effective Utility Management Primer for Water and Wastewater Utilities (Primer), used as a guide to applying the Attributes and Keys. Based on interviews with MWRA's Director of Planning and Coordination, the case study describes the utility's use of the Primer concepts and tools in its strategic initiatives and application for Association of Metropolitan Water Agencies' Platinum Award for Utility Excellence.

Utility Overview

MWRA is an independent public authority in Boston, serving a population of approximately 2.5 million individuals and 5,500 industrial users with wholesale water and sewer services. MWRA supplies an average of 215 mgd of drinking water to local water departments in 48 communities. MWRA's sewer services include wastewater facilities which serve 43 communities and treat 350 mgd of sewage.

MWRA Quabbin Reservoir



Water supply is provided by the Quabbin and Wachusett Reservoirs, with capacities of 412 billion gallons and 65 billion gallons, respectively. Water from the reservoirs is treated at the Ware Water Treatment Plant and the John J. Carroll Water Treatment Plant. The John J. Carroll Plant uses ozone as a primary disinfectant and chloramines for residual disinfection. It has capacity to treat up to 405 mgd of water from the Wachusett Reservoir. Water enters the Ware Plant directly from the Quabbin Reservoir and is treated with chlorine for primary disinfection. The Ware Plant provides water to approximately 75,000 people and in 2008 treated 7.9 mgd on average. Treated water is distributed through a system of over 300 miles of pipe.

MWRA operates two wastewater treatment facilities, Deer Island Wastewater Treatment Plant and Clinton Wastewater Treatment Plant. The Deer Island plant removes human, household, business and industrial pollutants from wastewater that originates in homes and businesses in 43 greater Boston communities. Deer Island's North Main Pump Station has a capacity of 910 mgd while the Lydia Goodhue Pump Station has a capacity 360 mgd. The Clinton Wastewater Treatment Plant provides

advanced sewage treatment services to the town of Clinton and the Lancaster Sewer District. The Clinton Plant's three influent lift pumps have a total capacity of 3 mgd at slow speed (24 rpm) and 6 mgd at fast speed (48 rpm). MWRA's wastewater treatment system also includes Nut Island Headworks, a sewage screening facility where sewage passes through screens and grit chambers that remove large objects, sand and gravel. After screening, the sewage is conveyed through the Inter-Island Tunnel to Deer Island. Nut Island Headworks serves 21 sewer system communities. Treated water is discharged through a 9.5 mile-long outfall tunnel into Massachusetts Bay.

MWRA is governed by an 11-member board of directors, 8 of whom are directly or indirectly appointed by its 61 customer communities. Three members are appointed by the Governor of Massachusetts. MWRA receives input from three advisory groups: the MWRA Advisory Board, the Water Supply Citizen's Advisory Committee, and the Wastewater Advisory Committee.

- The MWRA Advisory Board reviews and comments on MWRA capital and current expense budgets, as well as MWRA practices and policies. Its members include the chief elected official and a designee from each of the cities and towns serviced by the MWRA, along with a member of the Metropolitan Area Planning Council (MAPC), and six gubernatorial appointees representing various interests. The Advisory Board appoints three members to the MWRA Board of Directors and serves as a liaison between the communities and the MWRA.
- The Water Supply Citizen's Advisory Committee (WSCAC) advises the MWRA and the Department of Conservation and Recreation on water conservation and watershed protection strategies. WSCAC's membership is balanced geographically and by interest, representing source watershed communities, watershed associations, water utilities, environmental groups, business, water users, and other interested parties.
- The Wastewater Advisory Committee (WAC) offers independent recommendations on wastewater policies and programs. WAC's mission is to be a citizen's advisory committee to the MWRA providing an independent public forum for holistic discussion of wastewater issues. Membership is designed to reflect the knowledge and interest of major affected constituencies: engineering and construction, environmental advocacy, planning, academic research, and business.

Existing Management Initiative

Since the early 1990s, MWRA has conducted strategic business planning to implement its Mission, "To promote reliable, cost effective, high quality water and sewer services that protect public health, promote environmental stewardship, maintain customer confidence and support a prosperous economy." The utility completed updates of its business plan in 1997, 1999, 2000, 2003 and 2008. In the period between the 2003 and 2008 Business Plan updates, MWRA focused its management planning efforts on long-term infrastructure planning. Managers identified key infrastructure focus areas that would be reflected in its next Business Plan revision. In 2006, MWRA completed its Wastewater System Master Plan and Water System Master Plan, which identified and prioritized all infrastructure needs.

In May 2008, MWRA completed a full revision of its business plan using the Primer concepts as a framework. Managers developed new or renewed goals, objectives and strategies for all major business areas. A total of 28 strategies were identified and compared with the Attributes using a “crosswalk” format (see Appendix H: MWRA Business Plan Fiscal Years 2009–2013). The strategies under consideration for the updated Business Plan, and the Primer concepts and tools, were discussed during senior staff meetings, MWRA Board meetings, Board subcommittee meetings, and project meetings involving management and staff.

Several strategies in the revised business plan are related to environmental sustainability and energy conservation, which is consistent with the state’s goals for energy efficiency. The state of Massachusetts will request federal economic stimulus funds for these MWRA activities as part of its energy efficiency program. The strategic planning process using the Primer concepts and tools helped MWRA to prepare these projects for consideration by the state for its stimulus funds program.

Application of the Attributes

The Planning and Coordination Division launched the 2008 Business Plan revision process by distributing an updated draft schematic of the strategies to senior managers using the Primer concepts as a frame of reference. The schematic highlighted strategies that remained relevant and/or were still being implemented, and recommended new strategies consistent with emerging priorities. The senior managers then developed approaches for producing the strategy write-up, using the Primer as a guide, and received input from the management team that would implement it.

“Some managers had been through a management improvement process and some had not. The strategy template based on the Primer concepts gave them a frame of reference for the business plan review.”

– Marian Orfeo, Director of Planning and Coordination, Massachusetts Water Resources Authority

Once the strategies were drafted, the Director of Planning and Coordination conducted a “crosswalk” of the strategies with the Attributes, adding an explanatory section at the end of each strategy write-up (For an example of the strategy write-ups, see Appendix I: MWRA Business Plan Strategy #2). The Director found a strong correlation between the strategies and Attributes, which served to validate the approach that MWRA was taking with its strategic planning initiatives. The Attribute crosswalk exercise provided an opportunity for MWRA to compare its management strategies to a list of principles endorsed by the Collaborating Organizations, and confirm that it was on the right track. The external validation provided the managers with the comfort level and leverage needed to communicate with the Board of Directors about their strategic planning focus areas.

Through the crosswalk exercise, MWRA was also able to identify its strengths and weaknesses in relation to the Attributes, with some strategies being credited with addressing multiple Attributes. For example,

MWRA has been providing a program to assist communities with loans for improving local distribution systems for several years. This program was consistent with the Stakeholder Understanding and Support, Infrastructure Stability, and Product Quality Attributes, providing multi-dimensional benefits for the organization. With regard to areas needing more focus, MWRA found that one of its centers that had succeeded in maintenance excellence could make management changes to provide maintenance leadership in other centers that needed improvement. The utility identified this strategy as an opportunity to focus on the Employee and Leadership Development, Operational Optimization, and Operational Resiliency Attributes by shifting its staff in its maintenance programs.

Overall, the Attributes were easily correlated with the utility's management approaches and provided a helpful framework for identifying strengths and weaknesses. In addition, the Primer provided a tool for validating that MWRA's management approach and strategic planning initiatives were on target with nationally recognized effective utility management principles.

Association of Metropolitan Water Agencies Awards

MWRA completed another application of the Primer concepts, applying for the Association of Metropolitan Water Agencies' (AMWA) Platinum Award for Utility Excellence. The 2008 AMWA awards for exceptional performance were structured around the Attributes and Keys.

For the awards application, MWRA categorized its management initiatives and performance outcomes in the context of the Attributes and Keys. The utility provided a straightforward mapping of the Attributes and Keys with its own initiatives in the awards application document. As an example of how MWRA correlated its strategies with the Attributes and Keys in the application, under the Product Quality Attribute, MWRA reported on how it was meeting all current standards and regulations, making treatment decisions, soliciting input from customers, and using an extensive process of goal setting, measurement, reporting, review, and feedback. The utility also reported on its data collection and measurement processes, reporting, and communication procedures, and how it was fostering organization-wide involvement.

In addition to this example, MWRA reported on activities related to the other 9 Attributes, and several Keys. The extensive information in the awards application, which demonstrated that MWRA's activities were clearly associated with the Attributes and Keys, resulted in MWRA earning a 2008 Platinum Award for Utility Excellence.

Utility Self Assessment

During the start of the 2008 Business Plan revision process, the self assessment tool in the Primer was not yet published. The utility had completed a QualServe⁷ Self-Assessment and Peer Review process and was therefore familiar with the self-assessment process. According to the Director of Planning and Coordination, the utility's 2008 revised Strategic Business Plan recognized the results of its previous self-assessment process, rather than applying the achievement and importance ranking tool in the Primer.

MWRA Deer Island Wastewater Treatment Plant



Attribute-Related Utility Measures

MWRA developed a formal performance measurement system in 1995. In 1996, MWRA began issuing monthly water quality benchmark performance reports to local officials and community agencies. Over time the performance measurement system has grown to include all aspects of operations, regulatory compliance, and support areas. A full set of measures is compiled into "Yellow Notebook" reports that are distributed to senior staff monthly. A shorter version of the report, the "Orange Notebook," is presented to the Board each quarter. MWRA measures its performance against national and state regulatory standards, other national standards, and internally set targets. Performance targets are reviewed and re-set at least once per year.

After the strategies were developed from the 2008 Business Plan review process, MWRA evaluated its performance measures within the context of the Primer example measures. Managers reviewed the MWRA measures in the 2008 Business Plan and found them to be consistent with the list of performance measures in the Primer. The Planning and Coordination Division will continue to evaluate measures in the future and plans to revisit the Primer as a guide for connecting the MWRA performance measurement system to an Attribute framework.

⁷ QualServe is a tool offered jointly by the American Water Works Association and the Water Environment Federation. For more information visit the website at www.qualserve.org.

Keys to Management Success

For the AMWA awards application, MWRA completed an assessment of the utility's achievement of the Keys to Management Success. In relation to the "Leadership" Key, MWRA has an annual management and operations training program. In its 2008 Business Plan, MWRA established a strategy for succession planning. The business planning process correlated with the "Strategic Business Planning" Key. With regard to the "Organizational Approaches" Key, MWRA has involved all levels of management and staff in its work process improvement initiatives, and has elicited input on its Business Plan from Advisory Board staff members.

MWRA has had a performance measurement system in place since 1995, which correlates with the "Measurement" Key. The utility continues to evaluate and update its measures in relation to the updated business plan. With regard to the "Continual Improvement" Key, MWRA has a Plan-Do-Check-Act program in place to evaluate improvements in performance. In addition, the utility has utilized third-party assessments, such as the QualServe Self-Assessment and Peer Review process, and a competitiveness study to review staffing targets.

Table 1 Keys to Management Success and MWRA Approach

Keys	MWRA Approach	Results
Leadership	Employee Training, and Succession Planning Programs	Setting strategy in the Business plan to develop succession planning
Strategic Business Planning	2008 Business Planning Process	Reviewing the Strategic Business Plan in the context of the Attributes and Keys
Organizational Approaches	Cross-functional Teams	Involving all levels of management and staff in work process improvement
Measurement	Performance Measurement System	Measuring operations, compliance and support; monthly and quarterly reports
Continual Improvement Management Framework	Plan-Do-Check-Act Model, Third-Party Assessments	QualServe Self Assessment and Peer Review Process, Competitiveness Study

MWRA's management approach is consistent with the Keys to Management Success as outlined in the Primer. The Director of Planning and Coordination found that the Keys are helpful for tracking progress, and were useful for verifying that the utility is on track with established effective management principles.

Lessons Learned

The Director of Planning and Coordination provided the following lessons learned from MWRA's application of the Primer concepts and tools:

- The correlation of MWRA strategies with the Primer concepts and tools lends credibility to the business planning and performance measurement processes. The Primer is a nationally recognized framework that validates the utility's goals and strategies.
- The Primer provides a high-level approach that is useful for strategic planning discussions with senior managers and Board members. It gave participants a new way to review an existing strategic plan and performance measurement system.
- The Primer concepts provided a crisp method for bringing focus to all managers and Board members on strategies for moving forward. The Primer takes broad principles and presents them in a way that is easy to understand and implement across the organization.
- The MWRA strategies could be correlated with multiple Attributes, in ways that were not previously considered. The mapping exercise was useful for correlating the Attributes and Keys with management strategies for the strategic plan review process, as well as for the AMWA Awards application.
- The example measures in the Primer were beneficial for reviewing MWRA's measurement system, ensuring that it has a robust system in place.

Overall, the Director of Planning and Coordination had no difficulty introducing the Primer concepts and tools to an already functioning management team for the strategic planning review process. The management team found the Primer to be a useful framework for organizing Business Plan strategies and performance measures, as well as the AMWA awards application, which is structured around the Attributes and Keys. The MWRA Director of Planning and Coordination would recommend the Primer to other utilities that have established strategic business planning processes and is inclined to continue portraying management strategies in the Attribute and Keys framework in the future.

"The Primer concepts and tools helped us to show the Board we were consistent with best management practices recognized by EPA and national water sector associations."

—Marian Orfeo, Director of Planning and Coordination, Massachusetts Water Resources Authority

Conclusion

MWRA is an example of a utility that has successfully applied the Primer concepts and tools for reviewing its Business Plan and developing management strategies and performance measures. The utility compared the Attributes and Keys to its existing and new strategies and found a strong correlation. MWRA successfully applied the Primer concepts through its strategic planning meetings, involving all levels of management and the Board.

MWRA found multiple benefits from applying the Primer concepts to its business planning process. The Primer validated MWRA's initiatives and provided a high-level framework for effective discussions between managers and Board members and a fresh approach to reviewing improvement initiatives. The Primer helped to focus discussions in a straightforward way. Using the Attribute and Keys framework

MWRA won the AMWA Platinum Award for excellence, and successfully renewed its business plan and performance measures.

For utilities such as MWRA that have invested substantial time and resources in management systems, the Attributes, Keys, and Measures can act as effective tools for evaluating management initiatives. According to the Director of Planning and Coordination, the Primer concepts and tools can provide a nationally-recognized framework, endorsed by the Collaborating Organizations that validate management improvement initiatives.

More information about MWRA is available on its website: <http://www.mwra.com/>.

Appendix A: Columbus Water Works

2008 Strategic Planning—Strategies, Goals, Objectives



Note:

Font in blue were changes from Scan/Plan/Do Workshop November 2006

Font in green are changes from Management Retreat September 2008

STRATEGY 1: Enhance Customer Satisfaction

Goal 1: Respond to customer requests at the point of contact.

Objective 1: Respond to and resolve routine customer requests within established service standards.

Objective 2: Enhance a culture that all employees are customer service providers.

Objective 3: Broaden external points of contact for customer service capabilities.

Objective 4: Enhance and strive for maximum utilization of technology-based customer service capabilities.

Objective 5: Evaluate procedures for customer satisfaction with regional customers.

Goal 2: Understand customer and stakeholder perceptions and expectations.

Objective 1: Regularly collect, analyze and act on customer and stakeholder feedback on a periodic basis.

Objective 2: Explore provision of alternative services.

Objective 3: Communicate effectively results of Focus Groups / Stakeholder feedback.

Objective 4: Improve customer feedback by coordinating with other strategy teams to prioritize customer communication needs.

Goal 3: Community understands CWW mission.

Objective 1: Public is educated about CWW products and services.

Objective 2: Maximize the effective reach and efficiency of all available communication channels to better inform our customers.

Objective 3: Enhance environmental stewardship communication to increase awareness and understanding.

STRATEGY 2: Strengthen Regional Economic Potential

Goal 1: Position CWW as a trusted source on water issues.

Objective 1: Demonstrate and present successful utility solutions.

Objective 2: Achieve industry/business credentials and certifications.

Objective 3: Collaborate with organizations and institutions to advance knowledge.

Objective 4: Gain Respect and Trust of Surrounding Counties.

Objective 5: Develop and demonstrate CWW environmental leadership (as related to green programs, climate change and community sustainability) to the region.

Goal 2: Increase regional water services.

Objective 1: Expand customer base.

Objective 2: Expand service and product offerings.

Objective 3: Retain current commercial and industrial customer base.

Objective 4: Maximize customer and stakeholder benefits

Objective 5: Identify and impact pending legislation and regulations related to regional growth

Goal 3: Leverage new Fort Benning facilities for regional growth

[Objective 1](#): Improve working relationships with Fort Benning to help CWW meet Fort Benning Mission.

STRATEGY 3: Leverage Information Technology

Goal 1: Deliver IT capabilities efficiently and effectively.

[Objective 1](#): Regularly adjust plans based on changing business requirements.

[Objective 2](#): Meet or exceed defined IT implementation criteria.

[Objective3](#): Regularly identify emerging technology trends.

Goal 2: Minimize IT costs while meeting business requirements.

[Objective 1](#): Justify significant IT investments based on business case.

[Objective 2](#): Maintain optimal IT life-cycle expenditures.

Goal 3: Support users and maintain secure and reliable technology to realize benefits.

[Objective 1](#): Monitor IT training for users and IT Staff to ensure ongoing user support.

[Objective 2](#): Insure operational availability of IT network and applications.

[Objective 3](#): Protect IT system and data integrity to insure business continuity.

STRATEGY 4: Optimize Infrastructure Performance

Goal 1: Meet or exceed environmental compliance and customer requirements with consistent/reliable performance.

[Objective 1](#): Comply with all applicable local, state, federal regulations.

[Objective 2](#): Deliver products and services to meet or exceed quality standards

[Objective 3](#): Evaluate water use alternatives

[Objective 4](#): Contribute to the reduction of particulate matter to help insure the city meets air quality standards

Goal 2: Minimize asset life-cycle costs while meeting customer demands.

[Objective 1](#): Identify and prioritize critical assets for repair/replacement.

[Objective 2](#): Ensure capacity to meet future customer demand.

[Objective 3](#): Minimize critical asset failures.

Goal 3: Maintain competitive position and advantage.

Objective 1: Operate efficiently to maintain competitive advantage.

Objective 2: Review performance periodically to monitor continuous improvement.

Objective 3: Evaluate Energy and Chemical Alternatives

Goal 4: Minimize the effects of man-made and natural disasters

Objective 1: Operate to minimize adverse impacts

Objective 2: Provide systems and services to meet security needs

STRATEGY 5: Develop Sustainable Workforce

Goal 1: Facilitate the development of employees by creating an environment that encourages personal and professional growth.

Objective1: Develop/increase pool of leadership talent.

Objective 2: Continually improve the effectiveness of the employee development program.

Objective 3: Evaluate and make recommendations to improve workplace environment and increase employment engagement and commitment.

Objective 4: Retain essential intellectual knowledge of employees.

Goal 2: Recruit, retain and engage a dynamic and motivated workforce.

Objective 1: Monitor workforce trends.

Objective 2: Facilitate and create positive relationships with community and educational resources to recruit a qualified workforce.

Goal 3: Optimize the overall employee benefit, compensation, wellness and safety program.

Objective 1: Maintain a safe and healthy workplace.

Objective 2: Total compensation (salary and benefits) is competitive while balancing costs.

Objective 3: Provide improved process for retirement planning.

STRATEGY 6: Maintain Financial Stability

Goal 1: Operate on a balanced budget.

Objective 1: Develop and maintain revenue while effectively controlling the cost using sound planning and management.

Objective 2: Forecast accurate expenditures.

Objective 3: **Maintain** judicious use of reserves.

Goal 2: Use sound financial planning and management practices.

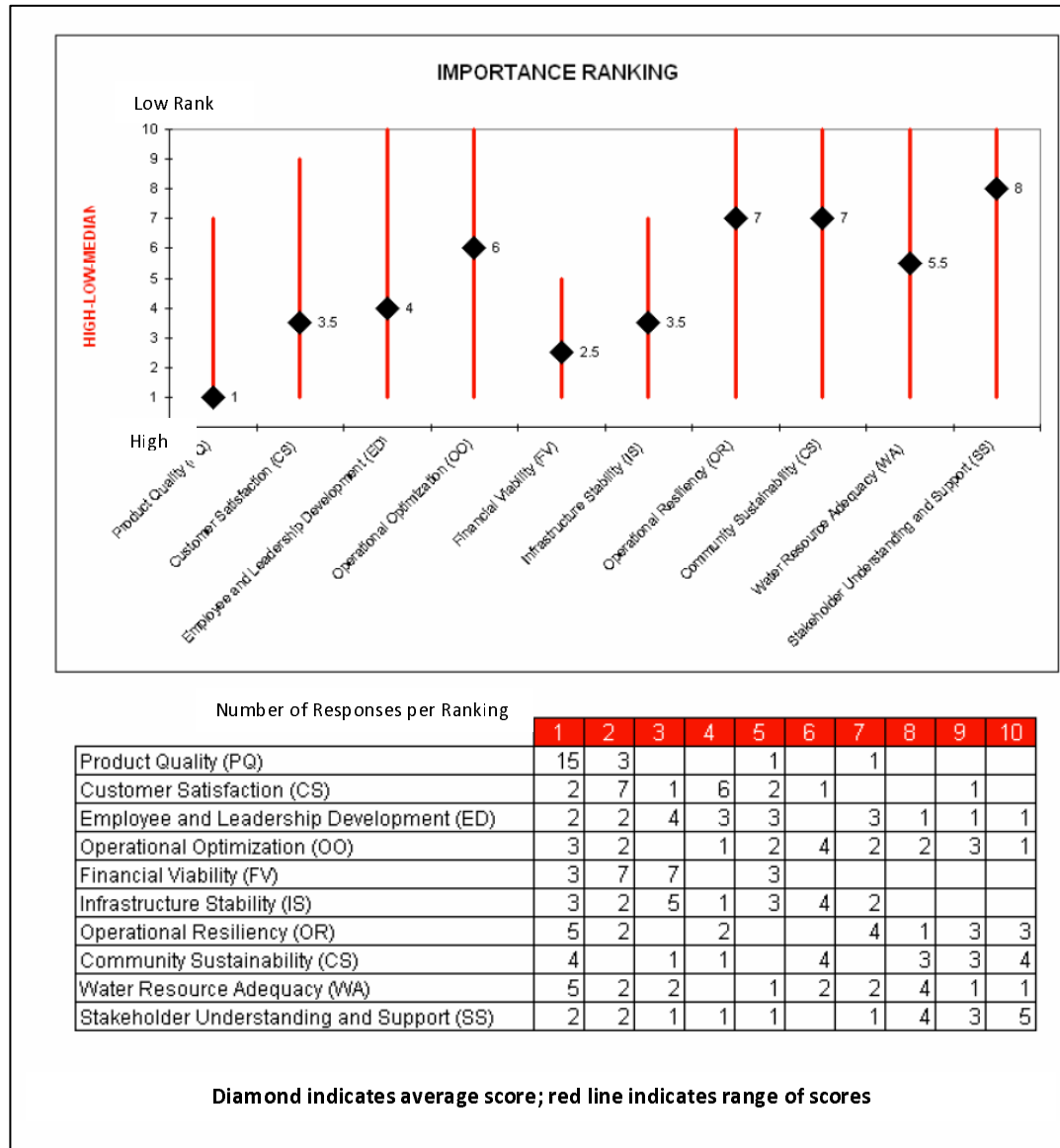
Objective 1: Regularly adjust plans based on trends (history/projection).

Objective 2: Market competitively funds for investment.

Objective 3: Identify potential financial impacts based on global economic changes and aging infrastructure.

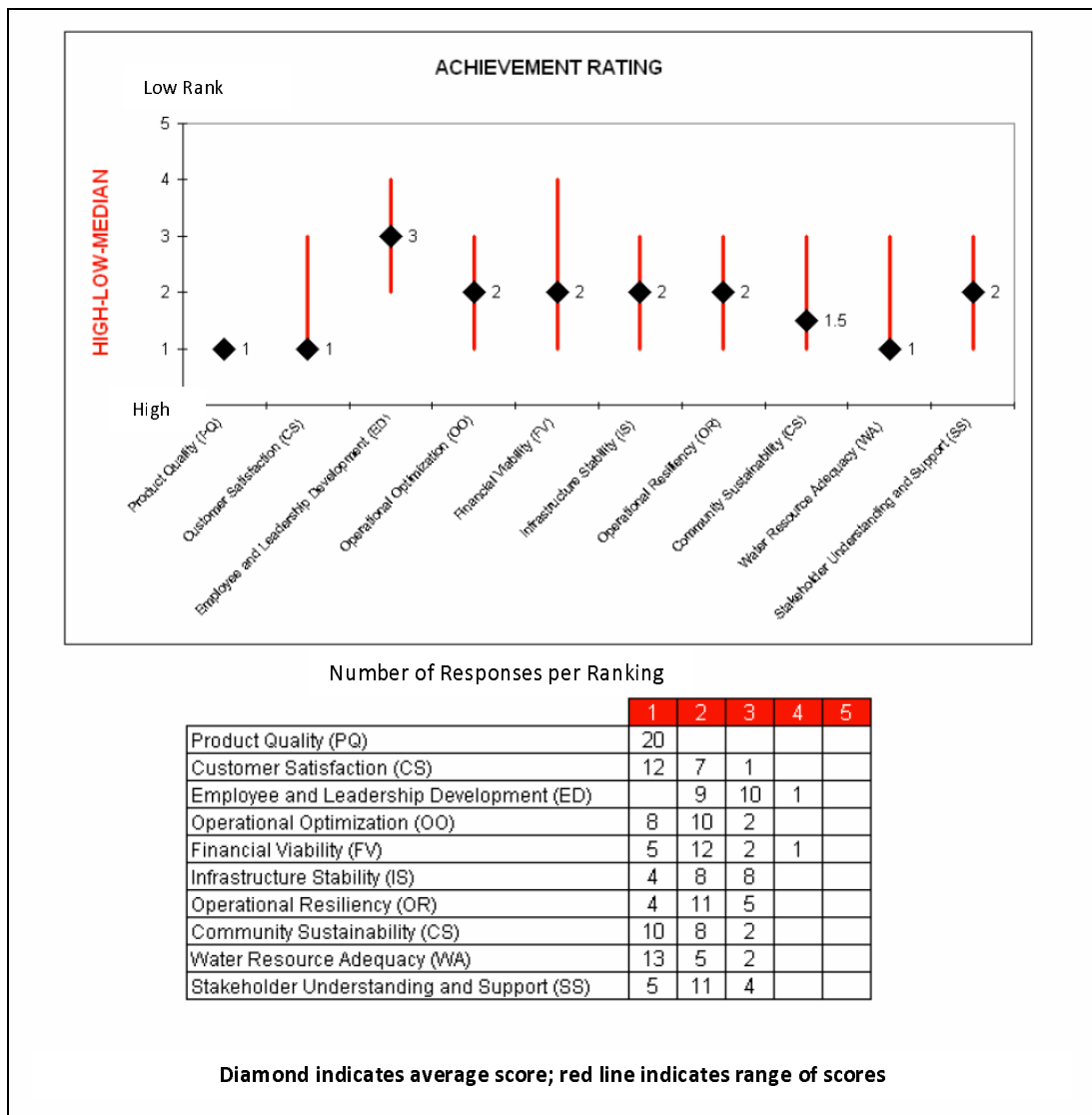
Appendix B: Columbus Water Works Self-Assessment Results

Figure 1 CWW Self-Assessment: Importance Ranking⁸



⁸ Columbus Water Works Leadership Retreat Workshop Summary, September 26-29, 2008, Appendix.

Figure 2 CWW Self-Assessment: Achievement Rating⁹



⁹ Columbus Water Works Leadership Retreat Workshop Summary, September 26-29, 2008, Appendix.

Appendix C: Columbus Water Works

2008 Strategic Planning – Benchmarks



Benchmarks:

1. To Remain Below 13 QualServe top quartile for Water Quality Complaints per Month
2. The Average for the Year will Meet or Exceed the Customer Satisfaction Target of 785 for all Customers.
3. Achieve or exceed 27 percent of Customers that Pay by the Web, IVR and EFT.
4. Maintain an average annual score of 50 points for awards won per fiscal year.
5. To present 10 technical presentations per fiscal year.
6. Participate in 10 business presentations and regional development meetings per fiscal year.
7. Participate in 10 public education presentations per fiscal year.
8. The 12 month running average percent of uptime of the network will be ≥ 99 percent.
9. The 12 month running average percent of uptime of the internet will be ≥ 99 percent.
10. To have 5 or less virus incidents that infect greater than 5 users per year.
11. Maintain a monthly average below 0.1 NTU on filtered water turbidity.
12. Maintain below NPDES permit limit on Suspended Solids for compliance monitoring.
13. Maintain below NPDES permit limit on CBOD for compliance monitoring.

14. Disruptions of water service for customers will not exceed the Qualserve median quartile for unplanned outages between 4 and 12 hours.
15. Disruptions of water service for customers will not exceed the QualServe median quartile for unplanned outages greater than 12 hours.
16. Sewer backup will not exceed 19 annually.
17. To remain below the QualServe median quartile for collection system failures.
18. Training hours per employee to meet or exceed the QualServe median quartile.
19. Workers compensation expenses remain less than 1 percent of base salaries budgeted amount.
20. To achieve below industry standards for total accident incident rates.
21. Not to exceed the industry standard for the lost time accidents incidence rate.
22. To remain below the QualServe median performance measure for the severity rate.
23. To achieve below industry standard for vehicle accidents per 1 million miles.
24. To remain below the industry standard on turnover rate.
25. Actual expenditures as a percent of budget to maintain a target range between 95 percent and 105 percent.
26. Revenue meets or exceeds expenditures ≥ 1 .
27. Actual water demand as a percent of projected to maintain a target range between 98.5 percent and 101.5 percent.
28. Remain below 1 percent of active billable stopped meters.
29. Maintain meter change out program meeting manufactures life expectancy of 12 years.

Appendix D: Green Bay Metropolitan Sewerage District

2008 Strategic Plan Goals, Objectives, and Investment Strategies

Strategic Investment Options Selected for Strategic Plan		
Investment Option	Description	Attributes and Goals Addressed
1. SERVICES TO OTHER MUNICIPALITIES	Provision of wastewater treatment and collection services to other municipalities in region including operations (by contract), technical services, and/or system acquisitions.	Stakeholder understanding and support; Operational optimization; Financial viability Goal 1: Support Economic Development; Goal 4: Diverse, Quality Service
2. WATERSHED PLANNING / CREDIT TRADING	In collaboration with other major WI wastewater utilities and DNR, develop whole watershed planning framework (including establishing credit trading protocols).	Community Sustainability; Stakeholder Understanding and Support Goal 3: Environmental Stewardship/ Education
3. ASSET MANAGEMENT	Develop an asset (including IT assets) renewal and replacement program using condition assessments, life-cycle costing and risk-based decision making protocols.	Financial Viability; Infrastructure Stability; Community sustainability; Stakeholder understanding and support Goal 1: Support Economic Development
4. IN-DISTRICT	Develop projects (or project components) that yield sustainability benefits including limiting GHG emissions, achieving LEED compliance, etc. Develop environmental impact reporting.	Financial viability; Infrastructure stability; Product quality; Community Sustainability; Stakeholder understanding and support Goal 3: Environmental Stewardship/ Education; Goal 4: Diverse, Quality Service

Green Bay Metropolitan Sewerage District Goals, Objectives, and Strategic Investment Performance Scales

Goal 1: Support Economic Development

A fundamental goal of GBMSD is to continue to support economic development (and diversification) in the region. This support requires recognition of the evolving nature of the industrial and commercial base of the region, and participation in regional economic development initiatives.

Objective: Partner with Regional Interests

GBMSD will proactively engage major regional economic interests (e.g., industries, Chamber of Commerce, educational institutions, other utilities) to support regional economic development and diversification. (Region informally defined as Fox River Watershed and/or Brown County)

Scoring Criteria for Investment Selection

Score	Description of Performance
0	No regional partnering. Investment is conducted without support or cooperation of potentially impacted parties in region.
3	GBMSD investment is made with acquiescence of potentially impacted parties in region but without active participation or support. Regional interests participate in investment activities without dedicated resources beyond attendance at coordination events.
5	Engagement. Regional interests participate in regional investment activities and facilitate implementation of investment options (without dedication of material (financial) resources.
7	Active partnering. Investment involves increasingly significant dedication of resources for GBMSD sponsored and coordinated regional investments.
10	Full regional partnering. Investment involves significant dedication of resources (e.g., financial, labor) with shared interests in economic / environmental returns.

Objective: Available Capacity

Ensuring that growth in service demands may be accommodated with adequate system capacity (e.g., conveyance, treatment) able to deliver high quality services.

Scoring Criteria for Investment Selection

Score	Description of Performance
0	Investments consume available capacity without enabling expansion of services; may prompt moratorium on sewer connections.
3	Investment has no significant impact on treatment capacity; investments do not provide capacity for new environmental services.
5	Investments maintain the current capacity and maintain current reliability
7	Investments increase the reliability of the available capacity and provide services for normal growth needs
10	Investment enables economical delivery of services (current and prospective) to new users in an expanded regional customer base.

Objective: System Reliability

System performance will consistently meet permit requirements and deliver desired service levels, serving not only to enhance quality of life for community residents but also as an asset for business attraction / retention.

Scoring Criteria for Investment Selection

Score	Description of Performance
0	Investments increase the potential for service outages and/or major equipment failures. Critical systems are compromised.
3	Investments do not address inadequacies of critical systems and/or install redundancy.
5	Investments maintain the accepted standard of reliability and maintain the status quo.
7	Investments are based on sound asset management principles and allow for predicting of decreased reliability.
10	Investments enhance system reliability and increase capability to meet current and prospective demands for both traditional and new environmental services.

Objective: Environmental Cost Management

GBMSD will help ensure its rates for environmental services (potentially not only wastewater conveyance and treatment) are reasonable, predictable, and convey significant value to GBMSD customers and the community.

(Costs include not only wastewater treatment but all costs for environmental management)

Scoring Criteria for Investment Selection

Score	Description of Performance
0	Investments increase basic costs of services and do not mitigate overall environmental costs for regional customers.
3	Investment has no material impact on regional customers' environmental costs.
5	Investments manage current costs and have the ability to maintain at this level as other costs increase.
7	Investments support progressive environmental management systems that properly account for increase in costs.
10	Investments provide customers with economic benefits by either mitigating traditional costs for wastewater treatment and/or delivering relatively lower cost non-traditional services.

Goal 2: Exceptional Career Development Opportunities

A fundamental goal of GBMSD is to preserve and enhance its culture of learning, innovation, cooperation, and mutual respect. GBMSD strives to be an 'employer of choice', offering opportunities for advancement in chosen fields of interest.

Objective: Staff Training & Development

GBMSD will provide opportunities for staff advancement by investing in training (including formal, on-the-job) and leadership development programs - establishing a foundation for effective succession planning and knowledge management initiatives.

(Indicated, in part, by employee surveys that address training on current/emerging issues, certifications, and employee perceptions related to development opportunities).

Scoring Criteria for Investment Selection

Score	Description of Performance
0	Investments provide no material opportunities for staff training and development.
3	Investments provide training and development to meet the basic needs of the job.
5	Investments provide opportunities for staff training and development within the context of their current job responsibilities, facilitate retention of certifications, and/or continue participation in professional societies / national organizations.
7	Investments promote and support internal and external training opportunities for self initiated individuals to prepare for future opportunities.
10	Investments provide expanded opportunities for staff training and development that provide qualifications for staff to assume new, expanded and/or innovative job responsibilities, facilitate acquisition of new (and new forms of) certifications, and/or enable GBMSD to demonstrate leadership in professional societies / national organizations.

Objective: Workforce Diversity

GBMSD will promote diversity (e.g., ethnic, gender, age) in its workforce by actively recruiting broad-based candidate pools, promoting a welcoming climate, and partnering with educational and ethnic communities in the region.

(Workforce diversity relates to the distribution of the employee population in terms of gender, race, age, and cultural backgrounds of employees, and to its engagement with communities it serves – in terms of stakeholder information and service delivery, recruitment, and partnering.)

Scoring Criteria for Investment Selection

Score	Description of Performance
0	Investments perpetuate status quo and/or provide no opportunities for.
3	Investments provide limited opportunities to maintain employee diversity through standard measures to attract, retain, and develop a diverse employee population in traditional roles.
5	Investments provide new opportunities to increase employee diversity through targeted measures to attract, retain, and develop a diverse employee population in traditional roles.
7	Investments provide expanded opportunities to broaden employee diversity through specific measures to attract, retain, and develop a diverse employee population in both the traditional and non-traditional definitions of diversity.
10	Investments provide significant opportunities to attract, retain, and develop employees that will enhance workforce diversity and help establish/affirm engagement practices that embrace and celebrate cultural diversity.

Objective: Transition of Positions

GBMSD will actively work to transition the nature of jobs in which employees ensure positions continue to afford challenging work experiences, leverage technology advances, and maintain the vitality of GBMSD's learning culture.

(Character and nature of job responsibility change over time, rewarding)

Scoring Criteria for Investment Selection

Score	Description of Performance
0	Investments do not provide new or expanded job responsibilities or material advancement opportunities.
3	Investment enables limited evolution of existing job responsibilities and staff advancement opportunities in traditional roles.
5	Investments encourage individual positional growth driven by an individual's initiative to improve in the position.
7	Investments promote and support positional growth that is driven by the growth of the organization and the services offered.
10	Investments directly and substantively establish opportunities for employees (within general boundaries) to define new position responsibilities and job development opportunities.

Objective: Employment Environment/Culture

GBMSD will promote an employment environment and organizational culture featuring overall employee compensation structures (e.g., salaries, work schedules, diversity of assignments) that will facilitate assumption of regional leadership roles and promote attraction and retention of qualified, motivated staff.

Scoring Criteria for Investment Selection

Score	Description of Performance
0	Investments serve to preserve the status quo and/or further entrench unprogressive attributes of existing GBMSD culture.
3	Investment will likely be implemented using traditional analysis and decision-making processes with limited opportunities for innovation and non-traditional team building.
5	Investments will promote and sustain the existing culture with limited opportunities for innovation and non-traditional team building.
7	Investments will drive the existing environment / culture to expand in a deliberate and traditional manner as facilitated by Management.
10	Investments facilitate / promote a collaborative, team oriented culture where diversity of opinions and perspectives are celebrated and used to foster innovation.

Goal 3: Environmental Stewardship/Education

A fundamental goal of GBMSD is to promote environmental stewardship (including water resources, air quality, land and wetlands management, etc.) through a broad range of environmental management services and educational activities.

Objective: Enhance Regional Water Quality

Beyond wastewater system discharge permit compliance, GBMSD will work towards enhancing water quality throughout the region, addressing both point source and non-point sources of pollutant loadings.

Scoring Criteria for Investment Selection

Score	Description of Performance
0	Investments provide no significant advance in GBMSD environmental performance nor facilitate / promote non-traditional, regional measures.
3	Investment provides limited improvement in GBMSD point source pollutant loadings to regional receiving waters and/or contributes marginally to regional water quality initiatives.
5	Investment provides improvement in GBMSD point source discharge loadings as measured by traditional cost / benefit measures.
7	Investment provides improvement in GBMSD point source discharge loadings as measured by use of Environmental Management Systems (EMS) measures which take into account more than cost/benefit.
10	Investments provide significant whole watershed management contribution enabling pollutant reductions / water quality improvements beyond existing regulatory requirements and are driven by the sustainability principles of economics, social, and regulatory.

Objective: Promote Sustainable Operations

Recognizing the significance of sustainability factors in resource management activities, GBMSD will look to ways to mitigate adverse environmental and social impacts associated with services - evaluating infrastructure and technology options employing environmental and social as well as cost criteria.

Scoring Criteria for Investment Selection

Score	Description of Performance
0	Investment may increase GBMSD environmental impacts (e.g., green house gas emissions, pollutant loadings, etc.)
3	Investment does not provide for any material improvement in GBMSD environmental impacts (e.g., green house gas emissions, pollutant loadings, etc.) nor support regional sustainability initiatives.
5	Investment provides for limited reduction from base line of GBMSD environmental impacts and/or offers limited support for regional sustainability initiatives.
7	Investments provide significant opportunity for environmental (water, air, and watershed) improvements beyond regulatory requirements and are driven by the sustainability principles of economics, social impact, and regulatory.
10	Investment significantly reduces GBMSD environmental impacts and/or provides for principal leadership of regional sustainability initiatives.

Objective: Education, Research & Development

GBMSD will continue to promote education, research and development activities to further understanding of processes impacting GBMSD operations and, more generally, water resource issues and opportunities to enhance GBMSD's environmental performance.

Score	Description of Performance
0	Investment provides no benefit to sustainability initiatives or general stakeholder education on regional water quality or environmental issues.
3	Investment provides limited, traditional opportunities for education, research & development on regional water quality impacts of GBMSD.

5	Investment provides limited opportunities for innovative, regional oriented education, research & development activities on environmental sustainability issues.
7	Investment provides expanded opportunities for innovative, regional oriented education, research & development activities on environmental sustainability issues (e.g., viewed holistically in terms of water quality, GHG, and other impacts).
10	Investments provide significant opportunities for innovative, regional oriented education, research & development activities on environmental sustainability issues promoted and supported by stakeholder request and needs.

Goal 4: Diverse, Quality Services

A fundamental goal of GBMSD is disciplined expansion of its environmental services - building on its foundation of delivery of exceptionally high quality, appropriately priced, wastewater conveyance, treatment and reclamation services.

Objective: Meet/Exceed Regulatory Requirements

GBMSD will not only continue to deliver services that meet all applicable regulatory requirements, but will also proactively monitor (and collaborate on development of) pending regulatory requirements to ensure that GBMSD is well positioned to maintain and further its outstanding performance record.

Scoring Criteria for Investment Selection

Score	Description of Performance
0	Investment will endanger GBMSD ability to continue to meet permit requirements and compromise eligibility for NACWA Peak Performance Award.
3	Investment provides limited support for compliance with current or expected regulatory requirements.
5	Investment provides means to maintain current level of regulatory compliance.
7	Investment will enhance GBMSD ability to meet future environmental / regulatory performance as measured against prospective permit requirements.
10	Investment will significantly enhance environmental performance as measured against current and prospective permit requirements. Facilitate achievement of NACWA Peak Performance Awards and other national recognition.

Objective: Efficient Customer Services

GBMSD will maintain and enhance its customer focus by continuing to pursue efficiencies in GBMSD operations (e.g. automation), strengthening relationships with major users, and responding timely and effectively to problems and/or expressed customer concerns.

Scoring Criteria for Investment Selection

Score	Description of Performance
0	Investment could compromise efficient delivery of existing customer services.
3	Investment will enhance timeliness and/or efficiency of delivery of existing customer services.
5	Investment will increase timeliness and efficiency of delivery of existing customer services and will allow delivery of new customer services as requested.
7	Investment will enhance timeliness and efficiency of delivery of existing customer services and will promote market driven delivery of new customer services.

10	Investment will significantly enhance delivery of existing customer services and/or provide for highly efficient, market-competitive delivery of new services.
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Objective: Develop/Expand Environmental Services

GBMSD will maintain its financial strength while establishing a resource pool to foster the expansion or development of new environmental services. These services will enable diversification of GBMSD's revenue base and reflect perspective of wastewater and biosolids as assets with intrinsic value.

Scoring Criteria for Investment Selection

Score	Description of Performance
0	Investment will not develop new or expand menu of existing environmental services provided by GBMSD.
3	Investment will facilitate paced expansion of environmental services provided by GBMSD.
5	Investment will promote and support expansion of environmental services provided by GBMSD with limited growth in size and diversity of net revenue stream.
7	Investment will encourage market driven expansion of environmental services provided by GBMSD with growth and diversity of net revenue stream.
10	Investment will provide for a significant expansion of environmental services provided GBMSD, yielding material increases in magnitude and diversity of revenue streams.

Appendix E: Gwinnett County Department of Water Resources

Achievement of Attributes and Importance of Attributes Ranking

Figure 1: Achievement of Attributes

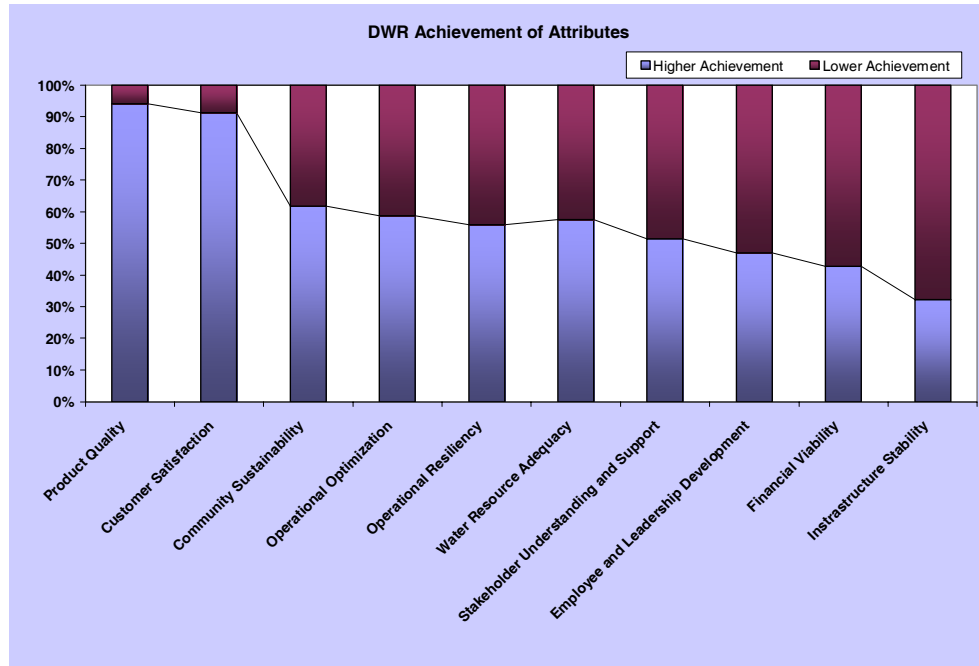
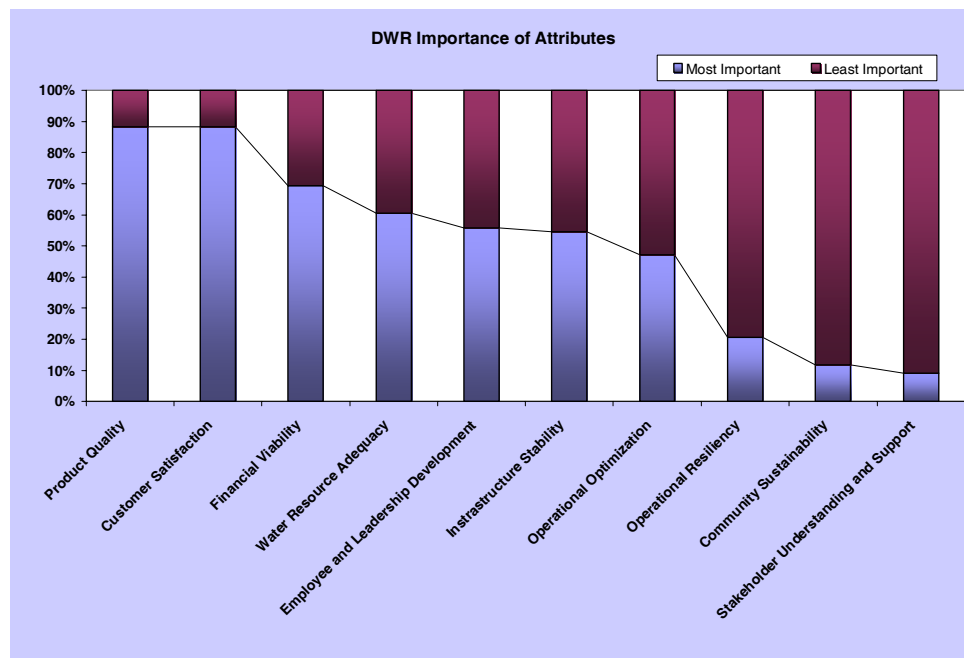


Figure 2: Importance of Attributes



Appendix G: Gwinnett County Department of Water Resources

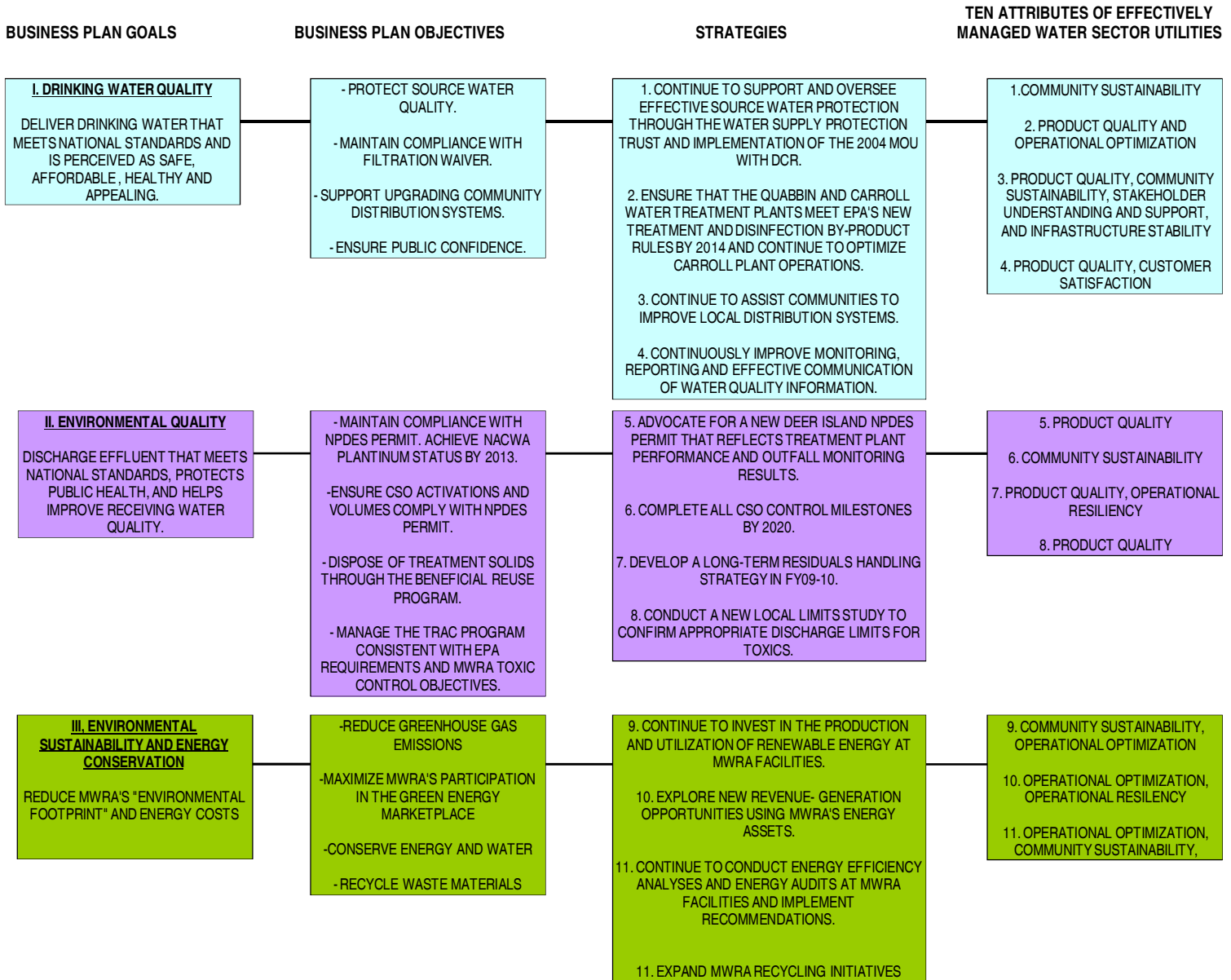
Example of Balanced Scorecard Perspectives

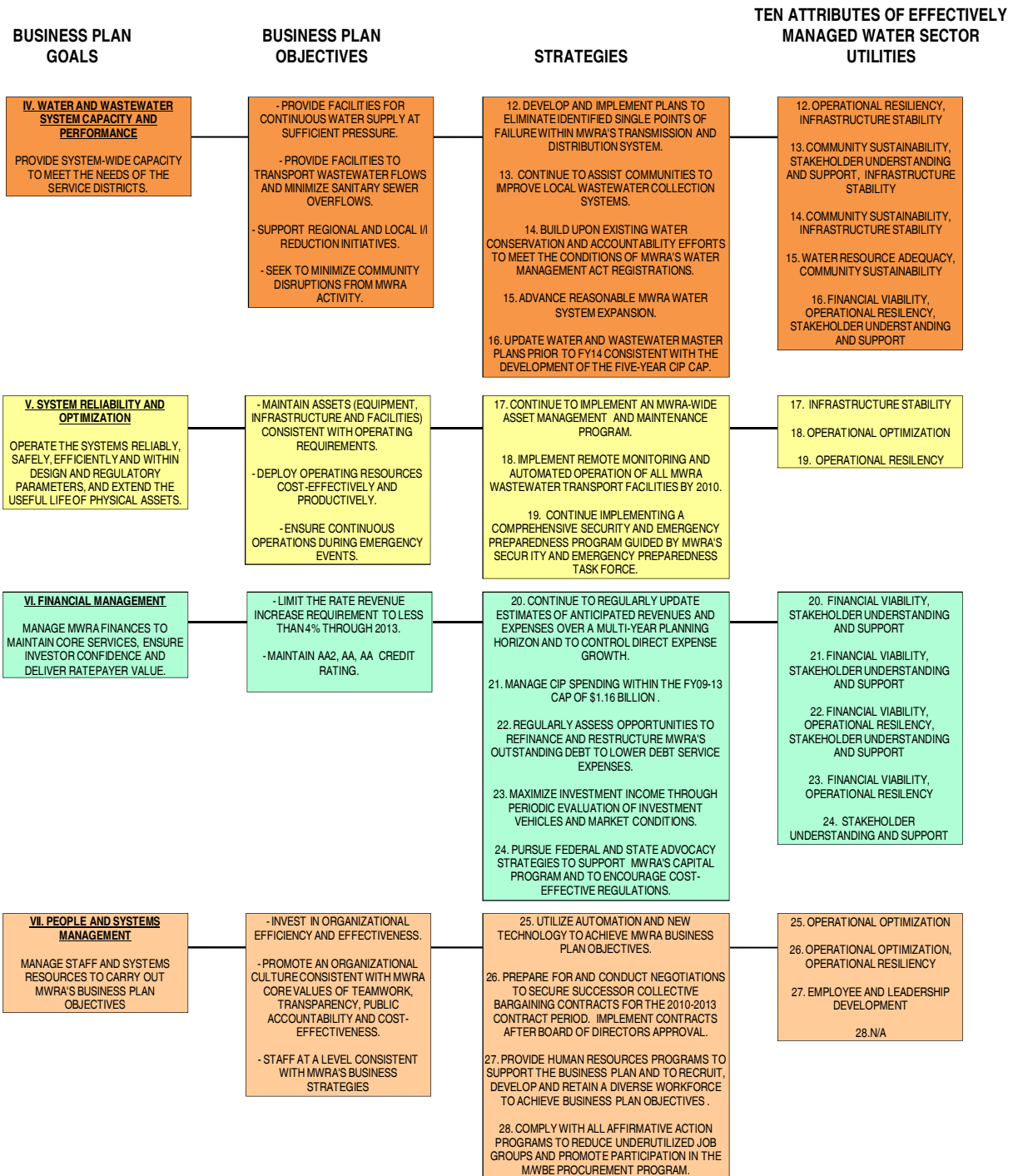


Appendix H: MWRA BUSINESS PLAN FISCAL YEARS 2009 TO 2013

MWRA MISSION: TO PROMOTE RELIABLE, COST EFFECTIVE, HIGH QUALITY WATER AND SEWER SERVICES THAT PROTECT PUBLIC HEALTH, PROMOTE ENVIRONMENTAL STEWARDSHIP, MAINTAIN CUSTOMER CONFIDENCE AND SUPPORT A PROSPEROUS ECONOMY

MWRA VALUES: PUBLIC ACCOUNTABILITY - COST-EFFECTIVENESS - TRANSPARENCY - TEAMWORK - PROMOTE ENVIRONMENTAL STEWARDSHIP, MAINTAIN CUSTOMER CONFIDENCE AND SUPPORT A PROSPEROUS ECONOMY





Appendix I: MWRA Business Plan Strategy #2

Draft: May 8, 2008	
MWRA Business Plan Strategy #2	Ensure that Quabbin and Carroll Water Treatment Plants meet EPA's new treatment and Disinfection Byproducts Rules by 2014 and continue to optimize Carroll Plant operations.
Division Director(s): Michael Hornbrook	Strategy Manager(s): Jae Kim, Stephen Estes-Smargiassi, Dave Coppes
<p><i>Properly designed and operated water treatment facilities are one of the keys to the protection of public health and compliance with EPA drinking water regulations. MWRA's recently completed Carroll Water Treatment Plant (CWTP) is still in the process of being optimized, and new regulations issued by EPA in 2006 will require upgrades by 2014 to provide a second primary disinfection step capable of inactivating cryptosporidium at both the CWTP and at the Ware Disinfection Facility (WDF) that serves Quabbin water to the CVA communities. Based on a review of MWRA's continued compliance with the EPA requirements for avoiding filtration, results of source water quality monitoring, and the technologies available to provide the required stringent Cryptosporidium inactivation, staff are proceeding with the addition of ultraviolet light disinfection at both the WDF and the CWTP.</i></p>	
<p>Description: The Long Term 2 Enhanced Surface Water Treatment Rule (LT2) and the Stage 2 Disinfection/Disinfection Byproducts Rule (Stage 2) require new source water monitoring and substantial changes to treatment for unfiltered systems based on that monitoring, including a second primary disinfection step and new more stringent monitoring programs for disinfection byproducts (DBPs). Conceptual designs for new treatment facilities at both plants are complete, and design will begin shortly. Initial stages of newly required monitoring efforts are also complete.</p> <p>Because MWRA had anticipated the requirements of the new LT2 rule, MWRA was able to “grandfather” existing <i>Cryptosporidium</i> data: low levels at both reservoirs qualify both plants for 2-log inactivation rather than 3-log. The new Stage 2 rule required an elaborate and costly “initial distribution system evaluation” monitoring program to help the system and regulators design appropriate DBP compliance monitoring locations representative of likely worst case conditions. Because of the success of CWTP ozonation at dramatically reducing DBP levels throughout the metro Boston distribution system (by about 80 to 90 percent), MWRA qualified for a waiver of these monitoring requirements. The Ware Disinfection Facility still uses chlorine, and while DBP levels in the CVA system meet current requirements, levels were not low enough to qualify for the IDSE waiver. MWRA staff assisted the three CVA communities in designing the monitoring program and will help in conducting it.</p> <p>MWRA and the communities will need to develop and implement new long term DBP compliance monitoring programs in both</p>	

systems by 2012: these will be somewhat more costly than current programs as roughly twice as many samples will be required in the metro Boston system. Based on current data, the metro Boston systems should be able to easily comply with the new Stage 2 DBP requirements. The CVA system should also be able to comply, but the IDSE monitoring data will determine if any additional changes in disinfection technology are needed; the conceptual design for the treatment upgrade is conservatively laid out and budgeted to accommodate any needed additions.

Construction and start-up of a new complex treatment facility is the end of one process, but also the beginning of a process of evaluating performance and optimizing operations and adjusting the processes. The CWTP plant was placed into service in July 2005. It is producing water which meets all regulatory requirements, meets MWRA targets for inactivation of *Cryptosporidium*, has reduced DBP levels dramatically, and improved the clarity of the water, and its taste and odor. Lead levels at high risk homes continue to decline. Measures of water quality within the MWRA and community distribution system are as good as or better than before the new plant went on line, with improved levels of chloramine residuals and reduced levels of total coliform in community pipes.

While levels of bacteria in the distribution system are low, levels of total coliform bacteria in water leaving the plant have been higher than anticipated each summer, and while not causing compliance problems for MWRA, have caused a risk of non-compliance with the Total Coliform Rule for our first customer community, Marlborough. This does not appear to be a health concern, but should be resolved. An extensive monitoring and research effort has been undertaken, and both maintenance activities and plant process modifications have been made as of Winter 2007/2008. Staff will be reviewing performance data during the summer of 2008, and developing recommendations for any needed further actions.

Staff also continues to review and optimize or modify plant operations to extend the useful life of components and reduce operating costs as opportunities arise.

Milestones:	
Date	Description
LT2 Milestones	
May 2008	Design notice to proceed for CWTP UV upgrade
August 2008	Design notice to proceed for WDF UV upgrade
April 2011	Construction NTP for CWTP
August 2011	Construction NTP for WDF
October 2013	Substantial Completion for CWTP

October 2012	Substantial Completion for WDF						
Stage 2 Milestones							
March 17, 2009	Complete IDSE monitoring for CVA system						
January 1, 2009	Complete negotiation of long term compliance monitoring program for Metro Boston						
July 1, 2009	Complete negotiation of long term compliance monitoring program for CVA						
April 1, 2012	Begin new required monitoring for metro Boston						
October 1, 2012	Begin new required monitoring for CVA						
Plant Optimization Milestones							
October 2008	Review of summer 2008 WQ data and recommendations for any required actions						
Measurement:							
Meet 2-log crypto inactivation under new rule by 2014	<table> <tr> <td>Measure: Target:</td><td>Percentage of water treated in month that is outside of EPA required specification Less Than 5 percent of water falls below required dose</td></tr> <tr> <td>Measure: Target:</td><td>Running annual average of quarterly samples at each location Running annual average at every sample location is Less Than MCL</td></tr> <tr> <td>Measure: Target:</td><td>Percentage of Samples at Plant Outlet that are total coliform positive Less Than 5 % of finished water samples are TC positive in any month</td></tr> </table>	Measure: Target:	Percentage of water treated in month that is outside of EPA required specification Less Than 5 percent of water falls below required dose	Measure: Target:	Running annual average of quarterly samples at each location Running annual average at every sample location is Less Than MCL	Measure: Target:	Percentage of Samples at Plant Outlet that are total coliform positive Less Than 5 % of finished water samples are TC positive in any month
Measure: Target:	Percentage of water treated in month that is outside of EPA required specification Less Than 5 percent of water falls below required dose						
Measure: Target:	Running annual average of quarterly samples at each location Running annual average at every sample location is Less Than MCL						
Measure: Target:	Percentage of Samples at Plant Outlet that are total coliform positive Less Than 5 % of finished water samples are TC positive in any month						
Meet DBP requirements							
Minimize Total Coliform at CWTP							
Budget/Fiscal Impact: Design and Construction UV Improvements and Ancillary Modifications to CWTP: \$54.7 million Design and Construction of UV Improvements to Ware Disinfection Facility: \$6.4 million							
<i>This strategy is consistent with the “Product Quality” and “Operational Optimization” management attribute, two of the nationally-recognized “Ten Attributes of Effectively Managed Water Sector Utilities” endorsed by EPA. Specifically, the strategy includes the following Attribute characteristics:</i> <ul style="list-style-type: none"> • <i>Product Quality: “Produces potable water...in full compliance with regulatory and reliability requirements and consistent with customer, public health, and ecological needs”.</i> • <i>Operational Optimization: “Ensures ongoing, timely, cost-effective, reliable, and sustainable performance improvements in all facets of its operations”.</i> 							



Effective Water and Wastewater Utility Management Case Studies 2009