Strategic Asset Management Plan Update

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King County
Department of Natural Resources and Parks
Wastewater Treatment Division

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Executive Summary

King County collects and treats wastewater from 34 local sewer agencies in the central Puget Sound region. The county's Wastewater Treatment Division (WTD) serves about 1.5 million people within a 420-square-mile service area, which includes most urban areas of King County and parts of south Snohomish County and northeast Pierce County.

The daily round-the-clock collection, treatment, recycling, and disposal of wastewater and its byproducts are asset-intensive activities. These activities require management and maintenance of hundreds of miles of pipes; many pieces of equipment, instruments, and controls; and the land and buildings that house the equipment.

The primary objectives of WTD's asset management program are to manage the whole lifecycle of these wastewater capital assets in a manner that minimizes the total costs of owning, maintaining, and operating them; delivers a level of service that meets regulatory requirements and ratepayer expectations; and fulfills WTD's mission to protect public health and enhance the environment by treating and reclaiming water, recycling solids, and generating energy. As its assets have grown in number and have aged, WTD has been updating its plans and practices to keep pace.

WTD developed a Strategic Asset Management Plan in 2005 and plans to update it every three to five years. This 2009 Strategic Asset Management Plan Update is the first update to the 2005 plan. It is intended to serve as a blueprint for WTD management as it implements asset management strategies and as a means to inform others of WTD's asset management activities. The update describes WTD's current asset management process, reports on progress made to implement actions recommended in the 2005 plan, and presents the priorities for implementation in the next few years. These priorities, responsibilities for implementing them, and their status are shown in the following table. The information in the table is organized according to the groups in WTD responsible for implementation of specific actions: Management, Planning and Project Development, Maintenance, Operations, and Process Control.

Asset Management Implementation Recommendations

Action Item	Success Measure	Responsibility	Status	Implementation Order and Timeframe
Management				
Monitor key performance indicators (KPIs) for Maintenance Best Practices (MBP) program and capital project management process. Modify KPIs as needed to continue meeting asset management objectives.	Improvements in performance against KPIs are realized.	Asset Management Steering Committee (AMSC)	Maintenance Best Practices Steering Committee (MBPSC) has been formed and meets monthly to implement MBP. Capital Systems Team (CST) and Project Work Request (PWR) Committee are monitoring project management practices and progress. Project management and MBP teams have developed performance indicators that they are measuring as they continue implementing their programs. MBP quarterly reporting to AMSC has begun. MBP quarterly reports will be due May 1, August 1, November 1, and February 1 (the first day of the second month following the end of the quarter). Annual reports will go into more detail and address barriers such as resources. Reporting on capital project management KPIs will occur annually.	1 (2009)
Improve documentation of the steps required to develop and perform quality review of project risk registers and lifecycle cost.	Risk and lifecycle cost documentation are uniformly applied in capital replacement and new asset decision-making.	CST, PWR Committee, and Project Management unit	Risk identification, quantification and qualification, and lifecycle cost documentation procedures are in place and are being used by the CST and PWR Committee for decision-making.	3 (2010)
Ensure that risk management and lifecycle costing elements are integrated into WTD planning process.	Risk and lifecycle costing are included in all strategic planning project decisions.	Planning and Asset Management unit and Project Management unit	Need to review the project management processes for risk identification, quantification and qualification, and lifecycle costing, and then adapt them for application to the strategic planning process for asset replacement and decision-making.	3 (2009–2010)
Create communication tools for broad general awareness among staff on the asset management program and for disseminating asset management implementation progress including work flows, roles, and responsibilities.	Communication tools, such as newsletters, posters, and message boards, are used routinely to convey asset management goals and status.	AMSC	A poster titled “Everyone Is Part of Asset Management” has been completed and posted at all work sites. Planning and Asset Management unit will work with plant Maintenance supervisors to create a message board display tool for each plant by first quarter 2010.	3 (2009–2010)

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Maintenance				
Complete MBP initiatives in work management improvements, training, computerized maintenance management system (CMMS) improvements, criticality assessment and reliability, KPI development, and material management. Evaluate reliability-centered maintenance (RCM) analysis as a potential tool to be used by WTD for developing preventive maintenance strategies and identifying opportunities to improve safety and maintainability.	Integration between CMMS and IBIS databases for parts procurement is completed. Criticality values are established for all eligible plant assets. Standard procedures for capturing asset data for existing equipment that has not been captured in the CMMS are written and implemented. A method similar to that used to capture asset data for equipment provided by capital projects is developed and implemented to capture asset data for equipment that is installed by Maintenance outside of capital projects. Comprehensive KPIs are developed, automated, and implemented across WTD for all levels of management review. Predictive maintenance program is established and supports reliability strategy for all critical assets.	MBPSC	Initial pilot for establishing connectivity between CMMS and IBIS is complete. Addressing issues found in the final phase of the ordering cycle that is preventing purchase order release. Consequence criticality reviewed and assigned for 30% of assets. Adopted asset capture form for data collection. Need to combine West Point and South plant forms into a single document. KPIs have been developed for schedule attainment and scheduling accuracy. PWR has been authorized for a condition monitoring pilot project on two offsite pump stations. Plant reliability engineers (REs) will request monitoring connections be included in design specifications for Interbay and Kirkland Pump Station replacements. Broader integration into WTD is subject to positive return-on-investment review.	1 (2009–2010)
Operations				
Establish operator tasks/recording methodologies that will provide data on equipment performance ("operator-driven reliability"). Establish communication process for Operations to send equipment performance data to OPS or the CMMS and to Maintenance personnel on a regular basis.	Operations staff input and log essential operational/startup parameter data of Criticality Level 1 and 2 assets to a system with shared access to Maintenance staff. This database will facilitate troubleshooting and provide complete asset information.	Plant managers, REs	At West Point plant: • Updated T^2OPS training has been implemented. • Log Book improvement program started—improving information gathering, setting standards for expectations, moving some log books to electronic format. • Reviewing preventive maintenance (PM) tasks to add to OPS checklists and moving some PM tasks to OPS.	2 (2010–2011)

Action Item	Success Measure	Responsibility	Status	Implementation Order and Timeframe
Train Operations staff on the importance of collecting and recording information and data to support the MBP program. Ensure that operational data and information on all equipment are recorded and communicated properly to Maintenance staff for warranty purposes and timely detection of failure symptoms.			At West Point and South plants: • Developing a framework for operator-driven reliability to expand operator involvement at both plants. • Need to develop tools for supervisors to audit operator performance of operator-driven reliability practices. • Need electronic means to communicate and store equipment condition data recorded by operators. Mainsaver data collection must be completed in order for these actions to be fully implemented.	
Process Control				
Include Process Control Analysts in the MBP program. Establish a process for Analysts to communicate with the REs on equipment performance and to actively give input to condition assessments (failure modes, effects, and criticality analyses, in particular).	Process parameters are established that can be linked to equipment performance. Values are established for these parameters that can be used as early indicators of equipment problems.	Plant managers, REs	Met with South Plant Process Control/Process Information (PI) database staff on July 15, 2009. RE has correlated PI tags with relevant assets; will work with Process Control staff to use additional tags for monitoring equipment performance. Met with West Point Process Control/PI to launch a similar PI tag effort. Some equipment monitoring through PI data is already done by West Point Process Control staff.	2 (2010)
Planning and Project Development				
Develop long-term restoration and replacement plans for existing assets. Develop a forecast model based on factors such as condition and repair. Incorporate replacement planning into long-term capital forecast model.	Asset plans are developed for critical assets. Replacement planning based on condition, asset age, and obsolescence is incorporated into the capital planning and forecast process. Replacement forecast model is developed and used for planning.	Planning and Asset Management unit, REs	A framework for the asset restoration/replacement strategy has been drafted at an overview level. The framework will include the following: • Methodology to calculate cost of deferred maintenance • Required level of service, which will drive restoration/replacement decisions • Gap analysis to identify tools and data required to make restoration/replacement decisions Mainsaver data collection must be completed in order for these actions to be fully implemented.	1 (2009–2011)

Action Item	Success Measure	Responsibility	Status	Implementation Order and Timeframe
Ensure that asset data and information on newly acquired equipment are collected and populated into WTD information systems. Develop KPIs that track this process throughout project delivery.	Asset data, including operation and maintenance manuals and preventive maintenance, are collected and integrated into WTD systems prior to commissioning. As-built drawings are available within 60 days of substantial project completion.	Project Planning and Delivery, East, West, and Finance Sections,	Initial process is in place; formal review and ongoing improvement based on lessons learned. A work group has been assigned to resolve current date collection issues (Section 01720/30).	1 (2009–2010)
Ensure effective use of CMMS data in the design process. Use REs to evaluate the performance of equipment at the plants and make recommendations regarding the maintainability and reliability of proposed equipment installations. Establish a standard for including involvement of the REs on technical project teams.	Processes are documented and implemented to ensure CMMS data and RE recommendations are considered in project alternatives analysis and designs. The Technical Standards Web site is updated annually. The Technical Standards Committee (TSC) delivers quarterly reports to AMSC.	TSC, Engineering and Technical Resources unit, Project Management unit, REs	Accomplishments—Held first TSC meeting on July 19, 2009, to discuss the committee's goals, processes, and membership; developed a TSC charter; delivered second quarterly report to AMSC on November 6, 2009; developed TSC success measures; developed a TSC communications plan. Planned activities—Update the Technical Standards Web site to reflect WTD's current organizational structure and to address the incorporation of CMMS data, learned from the data decision process for specific equipment and RE input into project planning and delivery; include REs in capital project teams. Mainsaver data collection must be completed in order for these actions to be fully implemented.	2 (2009–2011)