

CORE BUSINESS SYSTEMS

GROWTH & DEVELOPMENT • CONVEYANCE • TREATMENT

GROWTH & DEVELOPMENT

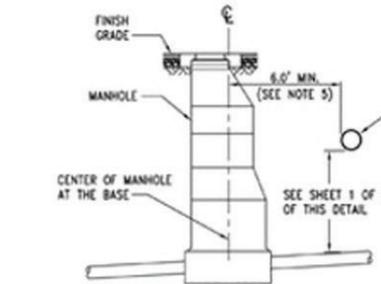
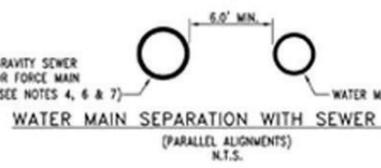
OUR GOAL

Provide planning and engineering solutions to help ensure safe, efficient and sustainable water reclamation infrastructure for our customers.

SEWER PE



HORIZONTAL SEPARATION



VISION FOR THE FUTURE

Continuous improvement is the road map for documenting processes, evaluating their strengths and weaknesses, and then mapping a path to improve their quality, efficiency, and effectiveness. The vision of the PCRWRD Growth and Development Business System is to create a highly automated, customer-focused, and streamlined set of planning and engineering processes that seamlessly and cost-effectively support the department's Conveyance and Treatment Divisions and the development community.

Processes that are clearly defined and consistently followed are essential elements of this vision. To this end, process owners and users must fully understand internal and external customer requirements for the timeliness and quality of services. In addition, customers must fully understand and have access to all departmental standards and requirements for building safe, effective, and sustainable infrastructure. Measurable goals for customer satisfaction, timeliness, and quality of processes are necessary for on-going continuous improvement.

Additionally, advancing this vision requires timely and regular forums for two-way communication with development stakeholders to keep them fully informed of current standards and requirements for the construction of sewer infrastructure. These on-going communication forums also will provide an opportunity for customer feedback to ensure the department understands and is responsive to the needs, values and concerns of the development community.

Other priorities for the future include improving the accuracy and reliability of the hydraulic model. This will not only support on-going compliance, but will enhance the department's ability to plan responsibly for growth. A state-of-the-art records management system that is linked to spatial data and made easily accessible to internal and external customers is also a high priority.

OPPORTUNITIES

Constant Change

PCRWRD is challenged with the need to continually change its development review processes and to expedite turnaround times in order to meet developer (stakeholder) expectations. Continuous improvement involves measuring all processes including timeliness and quality of service for stakeholders; timeliness is exceptionally critical to the development community. PCRWRD oversees the development of new sewer infrastructure that eventually becomes an asset that is owned and maintained by Pima County. As such, PCRWRD is concerned about balancing quality with speed of review. Simultaneously, the department cannot lose sight of its mandate to protect the environment, the public health and public safety while also meeting its fiduciary responsibility for Pima County assets. Building a streamlined development review process that has clear and logical steps for consistent application is a strategic objective for the PCRWRD Planning and Engineering Division over the next five years.

Capacity Projections

A well-calibrated hydraulic model is critical to meeting the ever-changing capacity needs of our system. Changing conditions including new sewer connections, changes in population, increased water conservation, implementation of water conservation technologies, drought management, etc. require constant adjustments and modifications to a hydraulic model that will ensure the needs of our stakeholders are met.

MAJOR PROJECTS AND PROGRAMS

Regional Planning

The update to the 2006 Metropolitan Facility Plan will incorporate the significant changes of the last eight years. Completion of the update is scheduled for June 2015. Other ongoing regional planning efforts include: Pima County Comprehensive Plan (Pima Prospers), Pima Association of Governments (PAG) Environmental Planning Advisory Committee, PAG Population Technical Advisory Committee, Sahuarita General Plan, and the Sahuarita East Conceptual Area Plan.

New Development Planning

Current conveyance capacity augmentation studies include the Southeast Interceptor Study and Design, the Aerospace Corridor Sewer Study and the UA Future Growth Analysis. Additionally, stakeholder workshops and meetings will be conducted to ensure requirements are understood and areas of new development are identified.

Development Capacity Tracking

The tracking of development capacity is achieved through the Wastewater Capacity Program (WCP). Once the hydraulic model is calibrated, the WCP will be updated.

Hydraulic Modeling

The hydraulic model provides critical capacity assessment which is required by ADEQ for planning purposes. The model is currently being calibrated and should be completed by December 2014. This is the third round of calibration since 2006. The first calibration was finalized in 2008 and relied on Transportation Analysis Zone data. The second calibration occurred in 2012 and relied on water data.

System Flow Metering

Between 2008 and 2010, the flow metering section underwent a comprehensive evaluation by an outside consultant. New Operations and Maintenance procedures were developed for metering equipment and Quality Assurance/Quality Control procedures for the flow data were established. The current calibration will use the refined flow data for the first time. The flow metering section is now fully staffed, and it is anticipated that meters will be deployed in Green Valley during the fall of 2014 in preparation for a calibration effort of this system in early 2015. In addition, the Kino Inflow/Infiltration study area will continue to be assessed to determine the



GROWTH & DEVELOPMENT

effectiveness of manhole inserts in preventing excessive infiltration of rainwater into the sanitary sewerage conveyance system.

Continuous Improvement

In 2014, development processes were defined and evaluated, and opportunities for improvement were identified. These efforts have provided a foundation for the implementation of process improvements over the next five years to decrease review times and increase customer satisfaction. Internal and external stakeholders will enjoy the benefits of the department's continuous process improvement activities, and will encourage ongoing efforts in this area.

Connection Fee Collection

This process was changed dramatically in 2012, and a more defined, transparent process is being honed as additional changes are implemented as needed.

Design Standards

In December 2012, the Planning and Engineering Division produced the Standard Specifications and Details for Construction and the Engineering Design Standards. A committee of staff and external stakeholders is participating in the annual update of the manual. The newest update will be completed by June 2015 and will include formatting standards for development-financed sewer plans as well as other minor improvements to PCRWRD standards.

Inspection of Construction

The Field Engineering Section provides inspection services for private development and utility-funded construction projects. This section also provides construction management services in conjunction with the CIP project management personnel. By January 2015, the Field Engineering Section anticipates completion of at least two internal training programs to educate and promote consistency among the inspection staff. Inspection services will also be expanded to water reclamation facility projects while maintaining our level of service to our existing customers.

Engineering Evaluations

Recently, PCRWRD engineers and planners have prepared numerous assessments and analyses including pump station assessments, design variance reviews, low flow sewer studies, and possible sewer alignments. Engineering and Planning will continue to support all aspects of PCRWRD operations and new development.

Records Management

The initiation of an electronic Document Management System (eDMS) using digitized PCRWRD Treatment and Conveyance documents has completed Phase I implementation. The scope of documents included in Phase I were Treatment and Conveyance construction as-builts, surveys, and real property records. Phase II of this project is currently underway and will include additional document integration for ROMP construction as-builts and sewer connection cards.



Geographic Information Systems Mapping Support

Several Geographic Information Systems (GIS) products have undergone initial development to support PCRWRD Capital Improvement Project, Engineering Service Unit, and the Development Liaison Unit sections. A web-based map project (ArcOnline) has been developed to indicate the status and location of CIP and Job Order Contract (JOC) work. These PCRWRD CIP/JOC layers are combined with project data from other jurisdictions' transportation departments CIP project data. This data will be used by Utility Coordination staff to cross reference and coordinate multi-agency CIP activities.

Real property documents will be used to develop a GIS layer indicating the location of easements which correspond to or are dedicated to PCRWRD. Two GIS layers are also under development to indicate and correlate the locations of parcel property rezonings and sewer capacity request allocations for the purpose of planning support

The Seven-Step Model for Continuous Improvement

The Seven-Step Model for Continuous Improvement is a tool for ensuring quality assurance in all development processes. This methodology will be applied on an on-going basis. Focus will be placed on the assessment of newly developed and existing processes; assurance that the processes are being implemented and improved; and that established metrics are providing meaningful information and measurements. Monitoring of Metrics will take place on a regular basis.

Process and System Improvement Plans

Plans for process and system improvements will be developed and implemented in the Engineering Division.

Land and Permit Management Project

The Land and Permit Project is a public works software integration project being led by ITD and Development Services. All PCRWRD development-related processes will be represented in the software. Staff is now involved in an 18-month development process to convert our work processes into a more efficient electronic tool.

Ordinance Revisions and Updates

Ordinances will be revised and updated as needed to meet the changing needs of the development community and the community at large.

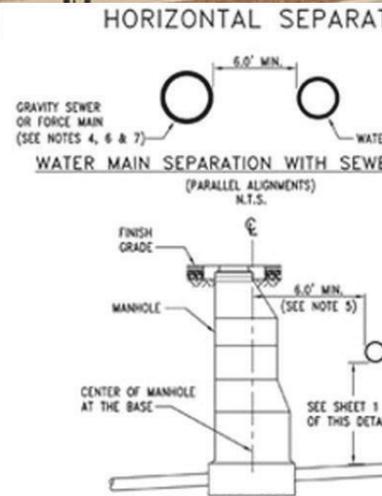
BENEFITS

- Enhancement of the department's functions;
- Increased efficiency of employees' efforts; and
- Increased resources to launch new programs and projects.

KEY PERFORMANCE INDICATORS

- Connection Fee Revenue
- Average Review Times for Preliminary Sewer Layout, Type III Capacity, and Sewer Improvement Plan
- Reduction of Red Cloud* total count

**Business opportunity*



CONVEYANCE

OUR GOAL

Provide quality service, pollution prevention, and public health and safety protection for current and future generations of Pima County residents.

Enhance the sustainability of our community and our associated lifestyle through operations and maintenance of the Conveyance System.

VISION FOR THE FUTURE

The vision for the Conveyance Business System includes maintaining its current status as an industry leader in low sanitary sewer overflow incident rates. This single indicator of success is a measurable result of the commitment to seamless customer service, regulatory compliance, and a proactive sewer maintenance program.

Staff is committed to working together to ensure coordinated, flexible, timely, and innovative responses to changing needs. Integrating the Conveyance Capital Improvement Program (CIP) functions into the Conveyance Business System in 2013 provided a critical step forward enabling a more cohesive approach to project delivery. Project managers are now involved at the outset in project prioritization, scoping and scheduling to ensure the timely allocation of resources according to projects' needs. The vision for the future involves further evolution of this kind of integrated approach to conveyance system maintenance and management. For example, partnering with the county's central Project Management Office will foster a more balanced and cross-departmental allocation of resources for timely CIP project delivery.

With the completion of all major components of the ROMP, the department is focusing its attention on the repair and rehabilitation of the conveyance system. Just as aging treatment facilities required repair and rehabilitation, reaches of the aging sanitary sewer system also are in need of repair and rehabilitation. The extensive Conveyance Rehabilitation Program planned over the next five years will support the community's capacity for economic development and growth and PCRWRD's vision to be an industry leader. The Conveyance Business System will build upon this momentum to ensure adequate annual revenue streams for on-going, proactive system maintenance and rehabilitation. This vision for infrastructure investment also includes the incorporation of state-of-the-art odor control and safety and environmentally-friendly features.

Finally, advancements in Closed Circuit Television (CCTV) technology will be used to identify hot spots in need of repair, improved prioritization, and scheduling of rehabilitation projects before failures occur. This in turn, will reduce budget allocation for emergencies.

OPPORTUNITIES

Equipment Downtime and Proactive Equipment Replacement

Equipment downtime is a major challenge to the efficient and effective maintenance of the sewer system. There is an opportunity to work in partnership with the Pima County Fleet Services Department to improve understanding of PCRWRD's need for timely and cost-effective repairs, reliability of service, and a "green" equipment replacement program.

Added Capacity

Additional capacity is needed to serve future customers and fix bottlenecks in the system. Projected population growth in the southeast area and urban infill in central areas of Tucson are examples of locations where system capacity augmentation is needed.



Repair and Replacement of Aging Infrastructure

To avoid system failure, the department must meet the challenge of repairing and replacing aging infrastructure. There is an opportunity to build on the momentum created with the ROMP to adequately fund the CIP and O&M budgets and to close the funding gap that has previously resulted in a lack of adequate investment in infrastructure maintenance and rehabilitation.

Capacity Management Operations and Maintenance

Maintaining compliance with Capacity Management Operations and Maintenance (CMOM) regulations will remain a priority and an on-going opportunity.

Facility Renovation and Expansion of Old Facilities

The renovation and expansion of the work space for the Conveyance Division's field crews and pump station staff are needed to provide adequate and appropriate workspace for these employees.

MAJOR PROJECTS AND PROGRAMS

Closed Circuit Television Assessment

Closed-Circuit Television (CCTV) Services provide a sub-surface assessment of sewer pipes. On a daily basis, CCTV activities provide data on existing conditions and maintenance needs of the community's sewer infrastructure. The department is on track to complete the state-mandated televised recording of the entire conveyance infrastructure by December 2016. Following that, the CCTV program will continue to televise the entire system over the next 10 years in compliance with ADEQ's Capacity Management Operations and Maintenance (CMOM) requirements. This data feeds the annual development of the CIP and Sewer Maintenance Programs fostering proactive and cost-effective maintenance of Pima County's wastewater conveyance system. The use of CCTV decreases disruptions to sewer service and traffic flow that would occur if other types of assessment had to be used.

Continuous Improvement

Since 2007, the Conveyance Business System has implemented a rigorous, systematic and collaborative continuous improvement program that is consistent with national best management practices, including but not limited to ISO 9001 standards. In 2013, the CIP functions were incorporated into the Conveyance Business System's organizational structure, and a major continuous improvement effort to define and improve the efficiency and effectiveness of the CIP processes was implemented. Over the next five years, the comprehensive continuous improvement methods implemented to date (and now embedded in the CIP subsystem) will be continued and enhanced. Key activities will include conducting annual reviews of all processes; maintaining up-to-date process maps that define work flows and requirements; training staff on the use of the process maps to ensure consistency; identifying and resolving opportunities for improvement; and monitoring performance metrics for the timeliness, quality and cost effectiveness of all processes.



CONVEYANCE

KEY PERFORMANCE INDICATORS

- SSO Incident Rate
- Rodder / Vector Production
- Budget Tracking
- Work Order Rates
- Odor Complaints
- Vector Complaints

Conveyance CIP: Rehabilitation Program

The purpose of the Conveyance Rehabilitation Program is to manage system assets through repairs, linings or replacements to mitigate expensive and potentially catastrophic events that could result in public exposure to raw sewage and sewer service disruption. Over the next five years, approximately \$109 million will be expended on projects system wide. Examples of major conveyance rehabilitation projects include the North Rillito Interceptor, the South Rillito West Central Interceptor, and the Continental Ranch Regional Pump Station. Additionally, a large number of smaller JOC projects also will be completed over the five-year planning horizon.

Conveyance CIP Augmentation Program

The purpose of the Conveyance CIP Augmentation Program is to provide needed capacity to serve future customers and fix bottlenecks in the system. Several major projects are planned over the next five years: Southeast Interceptor Project, Aerospace Corridor and Speedway/UA Augmentation Project. Implementation of these projects will enhance the overall reliability of the conveyance system, provide service to new customers, and ensure PCRWRD's compliance with federal guidelines for CMOM.

Wastewater Pumping Systems Rehabilitation Program

Over the next five years, approximately eight pump station projects will be completed at a cost of about \$9.2 million. Some pump stations will be rehabilitated while others will be taken off line after conversion to a gravity-feed system. Efforts to bring old systems up to current design standards will incorporate advanced odor control and energy efficient technologies. Many safety features, such as improving safe access (self-opening hatches) and installing safety equipment (safety nets, rails, and eye wash stations) will be included. Force main route studies are a major component of these projects and minimization of environmental impacts will play a critical role in decision making.

Sewer Maintenance Program

The purpose of this program is to implement preventative maintenance protocols to support a fully functional and efficiently maintained conveyance system. A well-maintained system ensures regulatory compliance and the protection of the public health, protection of PCRWRD workers, and protection of the environment. To this end, investments will be made in new combo trucks to replace ones that have exceeded their useful life. A growing partnership with Pima County's Fleet Services Department will result in proactive and timely vehicle maintenance. On average, in the next five years, 350 miles of sewer pipes will be cleaned annually.

BENEFITS

- Reduce Sanitary Sewer Overflow (SSO) incident rates;
- Maintain compliance;
- Increase energy efficiency;
- Reduce odor complaints;
- Increase safety of Conveyance Division employees;
- Contribute to PCRWRD's vision to be an industry leader; and
- Support Pima County's goals to sustain community growth and economic vitality.



TREATMENT

VISION FOR THE FUTURE

As a result of the Regional Optimization Master Plan (ROMP), Pima County is now an industry leader in using state-of-the-art technology to produce exceptionally high-quality reclaimed water and other treatment byproducts that can be beneficially reused.

As the population grows, PCRWRD is now poised to not only meet future capacity demands and regulatory requirements, but to produce a growing renewable water resource. This improved resource is better suited for a number of applications, including: outdoor irrigation via the City of Tucson's reclaimed water system, recharge of depleted underground aquifers, and use in environmental restoration purposes. As a result, over the next five years, the Treatment Business System will contribute to community-wide water resource sustainability by offsetting the demand for limited potable water resources through the production of high quality reclaimed water.

Treatment operations also result in other resources that can be recovered for beneficial reuse. Over the next five years, PCRWRD will optimize its ability to recover byproducts from its treatment operations. Plans are in place to partner with the private sector to capture and sell biogas to regional and national markets for beneficial reuse. This project will be economically beneficial to the county and will help reduce the carbon footprint of wastewater treatment processes. The department also will continue to use biosolids in land applications. A side stream treatment program to recover nutrients and use them for agricultural purposes, and an Energy Management Program to address the rise in energy usage associated with the new innovative treatment technology, are also on the horizon.

Additionally, the Treatment Business System's vision will continue to use advancements in technology to foster system reliability at the lowest cost in the context of continually changing regulatory requirements. This vision includes zero non-compliance events over the next five years leading to receipt of the highest possible recognition – the "Platinum Award" – for regulatory compliance. It also includes developing systems, processes and standard operating procedures that support consistency and process optimization throughout the treatment system.

OPPORTUNITIES

Repurposing Roger Road WRF

There is an opportunity to repurpose the 46- acre Roger Road WRF which has been decommissioned as part of the ROMP. This facility is located on prime real estate close to the center of Tucson and could become a valuable asset to Pima County and the community. Opportunities to repurpose the site in conjunction with achieving other Pima County goals, such as expansion of linear parks and green open spaces, and utilizing renewable resources for multi-beneficial purposes, need to be researched. The challenge will be to repurpose this site in a cost-effective manner.

Resource Recovery

There is an enormous opportunity to contribute to a cleaner environment through

OUR GOAL

Provide clean and safe water for beneficial use in the reclaimed water cycle, generate biosolids products that can be beneficially utilized, and beneficially use a renewable gas product, while protecting the public health, safety and the environment, while also meeting all regulatory requirements mandated by state and federal agencies.

TREATMENT



recovery and reuse of treatment byproducts in a cost effective manner. For example, biogas byproducts generated during wastewater sludge treatment include methane and carbon dioxide. When these greenhouse gases are released to the atmosphere they contribute to climate change and other environmental issues. Since the 1970s, PCRWRD has beneficially used a significant portion of the biomethane produced at the Tres Ríos and the old Roger Road facilities by generating electricity through on-site combined heat and power (CHP) cogeneration facilities. These CHP facilities were closed during the ROMP implementation due to their ages, inefficiencies, high air pollutant emissions, and high operational and maintenance costs.

Meaningful Performance Indicators

To validate the effectiveness and efficiency of operations, meaningful performance indicators are necessary. Such indicators result in the identification of areas needing improvements. In addition to establishing meaningful performance indicators, the department must collect and report data that can identify baselines, establish performance improvement goals, track progress, and identify opportunities for improvement.

Training

The move to modern, highly-automated technology has created a critical need to re-train the workforce to successfully operate and monitor the new processes. Additionally, staff acceptance of new processes and cultivation of attitudes and capacity for continuous improvement are needed.

Succession Planning

In the Treatment Division, 90% of employees in leadership roles are eligible to retire. As such, knowledge management will be a significant challenge over the next five years.

Uncertainty

Various socio-economic and political factors may affect how PCRWRD operates its business in the future. For example, the energy market is evolving and rate structures are multi-dimensional. As a result, energy costs are changing and unpredictable. The challenge will be to find the best rates and the right mix of energy resources to optimize our operations. In addition, the Biosolids Management Program may be vulnerable to potential losses of agricultural lands to urbanization. Changes in public acceptance, loss of a viable contractor, and/or loss of political support for the current disposal method are other variables that may affect the long term reliability of the existing Biosolids Management Program.

Treatment Byproducts

Struvite is a byproduct of the treatment process that creates an extremely hard chemical compound which can interfere with equipment operation. It is currently being treated with Ferric Chloride which is expensive and requires special handling. An opportunity to harvest nutrients from the side stream and avoid the need for use of this chemical is being explored.

Optimizing Technology

The ever changing nature of technology results in the challenge to evaluate solutions and manage change in the most cost effective manner. There is an opportunity, for example, to optimize technology to advance Reliability Centered Maintenance (RCM). RCM ensures the replacement of equipment and parts before they fail, by ensuring they are available in advance. To this end, PCRWRD needs to improve its ability to identify critical assets, prioritize repairs, and manage its equipment maintenance program more efficiently. The challenge is to integrate the county's asset management tool (Maximo); the county's financial management tool (Advantage Management System [AMS]) and the department's facilities management system (Supervisory Control and Data Acquisition [SCADA]) so the three systems interface smoothly and efficiently. The successful interface of these tools can enable PCRWRD to shift from a manual and paper-based system, to a more efficient electronic system for tracking and documenting equipment repairs, labor spent, warranty, and life cycle costs. RCM also affects inventory control and the department's ability to optimize its spare parts inventory to support leaner, "just-in-time" operations.

MAJOR PROJECTS AND PROGRAMS

Biogas Sale and Utilization Project

PCRWRD is developing a Biogas Sales and Utilization Project to clean biogas to pipeline quality; inject it into a commercial natural gas pipeline; and sell it to a premium market through a third-party Design, Build, Finance, Own and Operate arrangement. Plans are underway to put biogas in a pipeline for external companies to market. Ultimately, the external companies will want all of our gas and more. To this end, they would like to add technology to our digesters to enhance gas production for economic viability. PCRWRD staff has made great progress in bringing together the UA, local community experts, multi-government stakeholders, authorities at the national level, and other interested parties to investigate reuse options for other biogas byproducts, including carbon dioxide.

Biosolids Management Program

The Tres Ríos WRF is the centralized biosolids treatment location. All the Class B biosolids generated by the department is currently used in local agricultural land applications. The current program is one of the most cost-effective programs in the nation. However, to avoid dependency on one outlet and/or contractor, and to achieve long-term reliability, PCRWRD is looking at ways to diversify its biosolids products and outlets. Over the next five years, the department will evaluate technology options, develop a marketing plan and launch a pilot project to produce Class A biosolids. Regulatory changes will be monitored and opportunities to diversify biosolids products through Class A treatment may become a viable option for the department in the future.

Capital Improvement Program or Smaller Projects/Equipment and Machinery Purchases

The Treatment Business System's CIP program is focused on proactive equipment



TREATMENT



replacement to prevent equipment failures and maintain compliance. Over the next five years, approximately \$5 million will be invested in small projects and equipment purchases. These investments will address regulatory compliance commitments and safety improvements, such as fall prevention, confined space entry, job safety analyses, and equipment-related needs. Key projects include sludge screening, ARC Flash Study/Compliance, lighting protection, process piping improvement, and replacement of aging electrical equipment and improvements to process water. Additionally, a potential project to expand the Green Valley WRF may also be implemented.

Dynamic Wastewater Treatment Modeling Program

Process modeling is one of the most powerful tools available for use in optimization of a facility. A well-calibrated model can be used to evaluate process capacities, operational changes and process changes. In addition to being used for optimization projects, dynamic wastewater treatment modeling is well suited for: 1) Investigating the impacts of changing to a different operational strategy prior to implementation; 2) Studying the impact of internal recycle rates, anoxic zones, and anaerobic zones on nitrification, denitrification and overall treatment levels; 3) Evaluating the effects of taking specific unit processes out of service with the goal of minimizing energy usage while maintaining treatment levels; and 4) Determining the effect on plant performance if a rain event occurs while aeration tanks or clarifiers are taken out of service.

Electronic Rounds Using IntelTrac

Implementation of electronic rounds is a major project in the Process Control Program. The Process Control Program has two primary purposes: 1) To ensure that operations are performed according to plan; and 2) To continuously monitor, evaluate, and improve our processes in order to efficiently meet safety, environmental and cost objectives. IntelTrac will enable stranded assets to be linked to our SCADA system replacing the current manual (paper) method. IntelTrac hand-held devices will digitally log data that is currently documented on paper. This digital data can then be added to SCADA. This will increase identification of problems and our capacity to respond to them in a timely manner. Data collected on our stranded assets also will feed into the Reliability Centered Maintenance System.

Job Hazard Analyses

The Treatment Division Safety Program is designed to promote safe work practices and to prevent workers from accidents and illnesses. The program includes four basic elements: 1) Management and employee involvement; 2) Worksite Job Safety Analysis; 3) Hazard Prevention and Control; and 4) Safety and Health Training. A project to conduct Job Hazard Analyses will include the identification of hazards and related mitigation measures for all assets. This information will then be uploaded into Maximo. This project will be implemented over the next five years, will increase safety performance and efficiency, and will result in a measurable standard.

Managing Work Orders Using Maximo

Managing work orders with Maximo is a major effort of the ongoing RCM program. This effort focuses on systematic, cost-effective maintenance strategies to address dominant causes of equipment failure. The Maximo Asset Management System is used to manage work orders, assets and inventory and to reduce down-time while minimizing repair costs. To improve this process, Maximo Work Orders will be enhanced by using two additional systems: EZMaxMobile for field mobile applications and SCADA/Maximo interface for live reliability-based data. Through EZMaxMobile, field staff will have access to bar code scanning and picture uploads. In addition, generation/management of work orders, asset inventory, and purchasing-related transactions will be available to staff in the field. Some of the many benefits of this multi-faceted project will include reduced equipment down-time, improved operational efficiency, planned maintenance schedules, and extended equipment life cycle.

Inventory Control, Purchasing and Asset Management Project

Through the RCM, inventory control, purchasing and asset management will be optimized by using Maximo data to calculate reorder points. This process will be supported by real-time inventory transactions using EZMaxMobile and barcode scanning. Asset management will be enhanced by using EZMaxMobile for asset data collection in the field. This process will be augmented by using Maximo asset tags with barcodes for easier asset identification. Benefits will include improved recordkeeping, lower on-hand inventory costs, improved spare parts inventory, and enhanced accuracy of information.

Research and Technologies

Ongoing projects in the area of Research and Technologies are:

- Collaboration with the UA for the new lab expansion;
- Trihalomethane control using centrate to reduce chemical use; and
- Grant-funded research with the Water Energy Research Foundation and the City of Chicago. The research project is entitled “Sustainable Struvite Control Using Residual Gas from Digester Gas Cleaning Process.”

Supervisory Control and Data Acquisition

Supervisory Control and Data Acquisition (SCADA) systems are computerized/ electronic systems that enhance automation at the wastewater treatment facilities and monitor flows in the sanitary sewer system. Over the next five years, upgrades will be completed at the Tres Ríos, Avra Valley, Corona de Tucson, and Green Valley WRFs. New construction will also be completed at the Agua Nueva WRF. A robust SCADA system permits efficient operations, automation, and process control to enhance management and day-to-day maintenance routines for improved equipment and system life-cycle performance. The SCADA system replaces manual collection of data and log books with electronic records. The new SCADA system allows the plants to be operated and maintained efficiently and effectively. It also provides monitoring of security conditions 24/7 via centralized monitoring and



KEY PERFORMANCE INDICATORS

- Total influent flows per month by facility
- Amount/cost of chemicals and electricity used in treatment process
- Cost / man hours for maintenance
- Beneficial utilization of biogas and biosolids (renewable resources)
- Inventory and asset control
- Energy Usage of the WRFs
- Energy Usage of PCRWRD Pump Stations
- Energy Usage of PCRWRD buildings
- Energy Supplies from Different Sources
- Unit energy consumptions at each WRF
- Dry tons of biosolids beneficially used
- Biogas produced versus beneficially utilized

control of the entire PCRWRD wastewater system, including treatment plants and pump stations. In addition to promoting the goals of crime prevention and security awareness, the SCADA and security program advance PCRWRD goals for excellent customer service and the protection of employees and visitors.

Security Master Plan Implementation Program

The Security Master Plan is a blueprint for developing a robust security program and constructing security enhancements to protect PCRWRD staff and assets, and provide continuity of service to our customers. Over the next five years, PCRWRD will be implementing physical security enhancements at the Avra Valley WRF, the Water Energy and Sustainability Center (WESC), Tres Ríos WRF, Green Valley WRF, Corona De Tucson WRF, and Sub-Regional Facilities Administrative Office. While all the upgrades are being implemented, the Security Office will be mobilizing security training, developing procedures, performing on-site investigations of security incidents, and monitoring dispatch and security activities for PCRWRD facilities, (e.g. security alarms and video). Implementing physical security enhancements at PCRWRD facilities will help to achieve a strong “culture of security” in which the entire staff takes active roles in safeguarding against external or internal threats.

Side Stream Treatment Project

Side stream flows in wastewater treatment processes contain high concentrations of nutrients that are 30-40 times stronger than constituents in raw wastewater influent. Currently, side stream flows are returned to the headworks where they are mixed with influent and are sent back through the wastewater treatment process. They increase the amount of energy needed to treat wastewater. However side streams can be treated separately, and nutrient recovery from side stream treatment can result in the recovery of phosphate-rich nutrients. These nutrients can then be turned into agricultural fertilizers. A feasibility study was conducted to evaluate side stream treatment options including struvite recovery based on economic, environmental and social criteria. As a result, PCRWRD is pursuing a sustainable and cost-effective way to manage and recover phosphate-rich nutrients from the side stream. Upon completion, this effort will reduce energy costs at the Tres Ríos WRF and will result in a marketable, reusable product that will generate revenue for PCRWRD.

BENEFITS

- Automated processes;
- Optimization of energy usage;
- Increased employee productivity through reduced costs; and
- Beneficial use of the renewable resources generated in treatment process.

GROWTH & DEVELOPMENT MILESTONES

PROJECT/PROGRAM	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19
SYSTEM GROWTH PLANNING <ul style="list-style-type: none"> Regional Growth Planning New Development Planning Development Capacity Tracking Hydraulic Modeling System Flow Metering 	Master Plan Update Completed Southeast Interceptor Study Completed	Hydraulic Model Calibration Completed			
NEW DEVELOPMENT MANAGEMENT <ul style="list-style-type: none"> Fee Ordinance Update Project Land and Permit Management (LPM) Project 	Fee Study Completed (Raffelis) for Fee Ordinance Update	Public Input Process Completed for Fee Ordinance Update LPM Conversion Completed	Fee Ordinance Update Completed		
SEWERAGE ENGINEERING <ul style="list-style-type: none"> Standards Development Inspection Services Engineering Services 	Design Manual Updated		Inspection Program Expanded to Treatment		
GIS MAPS AND RECORDS <ul style="list-style-type: none"> Records Management GIS Support 	Launch eDMS Phase I; Prepare for eDMS Phase II				
CONTINUOUS IMPROVEMENT	Streamline Development Capacity Tracking	95% of Process Control and Boundary Issues Resolved	Red Cloud Resolution (on-going)		
	Annual Verifications Conducted for All Processes				
	Regular Monitoring of Metrics Established	New Process Improvement Plans Developed			
	Release and Control All Processes	Implement Land and Permit Management	Process Maps Updated		
	Evaluate Maps Relative to Each Pillar and Update Red Clouds, Metrics, Process Improvement Plans	Streamline System			

CONVEYANCE MILESTONES

PROJECT/PROGRAM	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19
CCTV SERVICES	550 Miles Televised	550 Miles Televised	350 Miles Televised	350 Miles Televised	350 Miles Televised
CONTINUOUS IMPROVEMENT	Release and Control CIP Maps				
	Training of Other Internal Users (in Other Divisions) Linked to Process Maps				
	Training of External Departments Linked to Process Maps				
	Monthly Metrics Review Meetings and System and Process Owners				
	Semi-Annual Process Improvement Plan Implementation Review				
	Semi-Annual Business Review (System and Process Owners)				
CONVEYANCE CIP: REHABILITATION (\$109M OVER 5 YEARS) • JOC: Job Order Contracts	\$15 M estimated JOC expenditures				
		South Rillito West Central Interceptor Completed	North Rillito Interceptor Completed		Continental Ranch Regional Pump Station Completed
CONVEYANCE CIP: AUGMENTATION (\$41M OVER 5 YEARS)	Southeast Interceptor (SEI) Design; Planning Studies Initiated for Aerospace Corridor and Speedway/UA Augmentation	SEI Construction Begins			SEI Completed
WASTEWATER PUMPING SYSTEMS REHABILITATION	Arivaca, Cardinal and Principal Pump Stations Scheduled for Construction	Silverbell and La Tierra Pump Stations Scheduled for Construction	State Prison Pump Station Scheduled for Construction		Silverado Pump Station Scheduled for Construction
SEWER MAINTENANCE PROGRAM	Rod / Vactor 200 Miles Per Month of Sewer Cleaning				

TREATMENT MILESTONES

PROJECT/PROGRAM	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19
BIOGAS SALE AND UTILIZATION PROJECT	Award Contract	Start Construction	Complete Project		
BIOSOLIDS MANAGEMENT	Technology & Market Research Progress Report Developed		Marketing Plan Developed	Acquire and Implement Technology	Class A Production
	Complete Land Inventory Study for Biosolids Land Application		Acquire Agricultural Land (1000 acres)		
CIP - SMALLER PROJECTS	Sludge Screening Complete	Process Piping Improvement Complete	Possible Green Valley WRF Expansion		
	ARC Study / Compliance	Replacement of Old Electrical Equipment			
	Lightning Protection	Process Water Improvement			
CONTINUOUS IMPROVEMENT	Participate in Process Mapping of Global Processes	Start Process Mapping of 3.04 Production System	Analyze Opportunities for Improvement	TBD	TBD
		Monitor Metrics	Release and Control maps		
		Release and Control Maps	Resolve 95% of Process Control & Boundary Red Clouds		
		Annual Verifications Conducted for All Processes			
DYNAMIC WASTEWATER TREATMENT MODELING	Model of Tres Ríos WRF Implemented / Staff Trained Using a Simulator	Use a Model to Develop Scenarios for Energy Management, Staffing, Cost Reductions, Enhanced Treatment, etc. and Implement Continuous Improvement Based on Model Results	Continue to Monitor and Continuously Improve		
SIDESTREAM TREATMENT PROJECT	Start Procurement	Award Contract		Complete Project	

TREATMENT MILESTONES

PROJECT/PROGRAM	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19
ELECTRONIC ROUNDS USING INTELTRAC PROJECT	Complete Tres Ríos WRF & Sub-Regional Facilities (Paperless)	Analyze Other Mobile Devices and Wireless Opportunities (e.g. Use of Tablets)	Continuously Improve Based on New Technology		
INVENTORY CONTROL, PURCHASING AND ASSET MANAGEMENT PROJECT	Develop Standard Operating Procedures for Inventory Control	Asset's Spare Parts Identification	JIT (Just In Time) Inventory Implementation	On-hand Inventory Optimization	Monitor KPIs and Make Adjustments
			Consignment Inventory Implemented		
JOB HAZARD ANALYSES (JHA)	Start Collecting Data	Complete Data Collection	Upload JHA into Maximo to Attach to Work Orders		
MANAGING WORK ORDERS USING MAXIMO PROJECT	Deploy EZ Max Mobile	Load Job Plans for Preventative Maintenance	Implement RCM	Job Hazard Analyses Loaded into Maximo	Monitor KPIs and Make Adjustments
		Launch SCADA / Maximo Interface			
SCADA MASTER PLAN IMPLEMENTATION PROGRAM	Tres Ríos WRF/ Avra Valley WRF Implemented	Corona de Tucson WRF and Green Valley WRF Implemented	Mt. Lemmon WRF Implemented		
SECURITY MASTER PLAN IMPLEMENTATION PROGRAM	Physical Security Completed at Green Valley WRF, Corona de Tucson WRF and Sub-Regional Facilities Administrative Offices, Conveyance Facility and Continental Ranch Regional Pump Station	Initiate and Complete Physical Security Expansion at WESC for Agua Nueva WRF and Mt. Lemmon WRF	Continuous Improvement on Physical Security at All PCRWRD Facilities		