

Managerial Summary

A. Objectives, Scope, and Methodology

We have completed our review of the Public Utilities (PU) Department for the period July 1, 2013 to April 30, 2016. Our review was conducted for the purpose of determining whether the Department was providing services in an economical, efficient, and effective manner, whether its goals and objectives were being achieved, and whether it was complying with applicable Federal, State, City, and Department regulations and procedures related to their water and sewer operations, management oversight, contract management, cash handling, payment processing, safety, security, information technology, and facility operations.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusion based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The Department provided essential services to the City of Chesapeake (City). Its primary purpose was two-fold: 1) to provide treatment and distribution of quality drinking water for Chesapeake citizens which met or exceeded minimum quality standards and, 2) to maintain and operate sanitary sewer infrastructure within City Utility Franchise areas. In order to provide this service, the Department maintained thousands of miles of pipeline to deliver potable water and receive wastewater. The Department treated its own raw water and serviced the majority of Chesapeake with City water while several private firms supplied water to a small percentage of City residents. The Department did not treat its own wastewater; rather the sewer lines delivered the wastewater from City fed lines to larger mains owned and operated by the Hampton Roads Sanitation District (HRSD), which treated the wastewater.

For Fiscal Year (FY) 2014-2015, the Department had an operating budget of slightly over \$61 million and an authorized compliment of approximately 212 personnel with the majority located in either Maintenance and Operations or Water Production. The Department operated as an enterprise fund for the sale and resale of water. As such it reported just over \$69 million in Gross Revenue and just under \$16.5 million in Operating Income for FY 2014-2015. The Department occupied offices on the second floor of the City Hall Municipal Building and the Executive Drive Maintenance and Operations Center. In addition, Public Utilities operated two water treatment plants and 300 pump stations and other remote facilities.

To conduct this audit, we reviewed and evaluated City and Department policies and procedures, operations documents, and reports, both internal and external. We reviewed a consultant's evaluation of the Department's warehouse operation. We also reviewed standards and guidelines of the American Water Works Association (AWWA) and compared them to actual operations. We compared data in Maximo, the Department's inventory and time management system, against actual inventory and time data. We conducted tours of the various Department facilities. We discussed these audit areas and conducted interviews with the Director of Public Utilities, Fiscal Administrator, other Department administrators, superintendents, accounting staff, and various employees.

Major Observations and Conclusions

Based on our review, we determined the Department had accomplished its overall mission of providing the citizens of Chesapeake a reliable and sufficient supply of safe drinking water and a reliable wastewater collection system through responsive, efficient and cost effective operation. However, we did identify several areas of concern that needed to be addressed. Those areas included the pro rata program, contract administration, water production, inventory and warehouse operation, aging of meters, and policies and procedures.

This report, in draft, was provided to Department officials for review and response, and their comments have been considered in the preparation of this report. These comments have been included in the Managerial Summary, the Audit Report, and Appendix A. Department management, supervisors, and staffs were very helpful throughout the course of this audit. We appreciated their courtesy and cooperation on this assignment.

B. Performance Information

Most Chesapeake residents did not realize that when they turned on the tap to get a glass of water they were drinking award winning water. In April 2016, PU participated in the AWWA Water Service and Distribution Rodeo and won first place in the state for taste. Chesapeake's municipal tap water was declared the "Judge's Choice Tap Water" in a non-scientific taste test conducted by the Virginia Chapter of the American Water Works Association (AWWA). To achieve the "Judge's Choice" award, Chesapeake water was rated in four categories: Clarity, Odor, Flavor, and Aftertaste. With the award the Department more than met its goal of providing a reliable and sufficient supply of safe drinking water. In addition to providing safe drinking water that tasted great, the Department also operated a reliable wastewater collection system. The Department was working twenty four hours a day maintaining sufficient water pressure in the system, ensuring wastewater pump stations were operating, and detecting, and solving, bacterial irregularities in the drinking water. If the need to fight a fire occurred, PU was able to monitor the system to ensure that sufficient water pressure was available at the scene.

Public Utilities was divided into five functional divisions and eight service areas: Administration; Water Production (Lake Gaston and Northwest River); Engineering; Maintenance and Operations (which was subdivided into M&O – Sewer and M&O – Water); and Billing and Customer Service, which handled the meter reading service. Each division carried out an essential function independent from the others. A new Department Director started in January 2014. Since that time, the new Director has filled the following direct report positions: Assistant Director (January 2015), Fiscal Administrator (April 2015), Utility Engineer (April 2015), Water/Wastewater Administrator (August 2015), and Safety Inspector II (November 2015).

Water Treatment Plant staff received several recognitions:

- On June 11, 2014, the Lake Gaston WTP changed the coagulant it used from ferric chloride to aluminum chlorohydrate to improve water treatment processes and extend the life of the membrane filters. On October 9, 2014, a presentation on the successful coagulant conversion at the Lake Gaston WTP was made at the AWWA Senior Operators Conference. The change in the coagulant was expected to extend the life of the membrane filters from about two years to an expected 8-10 years with a potential savings of \$6 million.
- On October 25, 2013, PU staff designed and constructed a chlorine booster station at the Western Branch Ground Tank. The station allowed the City to maintain high water quality in the area of the City that received Portsmouth water. In September, PU's Water Quality staff discussed the success of this project at the AWWA state conference on Nitrification in Consecutive Systems.
- On April 6, 2016, the Center for Disease Control and Prevention presented PU's Northwest River WTP the Water Fluoridation Quality Award for consistent and professional adjustment of the water fluoride content to the optimum level for oral health for 12 consistent months for 2013 and 2014

C. Pro Rata Program

The pro rata program was implemented in 1984 by PU. The pro rata program apportioned the cost of major infrastructure to the developers using the improvements. The intent was to encourage continued development in Chesapeake and equitably allocate those costs to the parties who received the benefit. In the early stages of the program, there were only a small number of pro rata projects. By 2016, the number of projects had grown to approximately 200 projects. Over the years, the engineering staff had not grown in proportion to the volume increase in the number of pro rata projects. The calculation process required to determine the amount of pro rata for first developers was a time consuming process. The engineering staff could not maintain the volume of pro rata calculations in addition to their normal project oversight responsibilities.

In addition, engineering management made the decision to make pro rata projects a low priority unless development was delayed (project pro rata work was escalated in those cases). Management also did not provide adequate oversight and monitoring to determine the impact of their decisions on the effectiveness of the pro rata program. Therefore, pro rata calculations were not completed timely, documentation was not complete, and receipt and disbursements of payments to developers were not made timely. PU was aware of the issues and requested that Audit Services examine them.

1. Pro Rata Engineering

Finding - The process in place for the handling of pro rata development projects was inefficient, labor intensive, and time consuming. The engineering staffing levels were not sufficient to handle the volume of pro rata projects approved by PU. In addition, pro rata projects were not a priority for PU Engineering. Therefore there was a lack of management review, monitoring, and oversight over these projects for many years. Further, pro rata policies and procedures lacked sufficient detailed information for the handling of pro rata projects and had not been substantially updated since the inception of the program.

Recommendation – The Engineering Division should strongly consider reevaluating their process for handling pro rata projects. The pro rata calculation process should be streamlined to become less time consuming. In addition, Engineering should provide additional oversight and monitoring over pro rata projects. Further, policies and procedures should be updated.

Response - As a result of internal actions relating to the pro-rata program, working with the City Attorney's office, DPU staff committed in 2015 to fully evaluating and modifying the pro-rata program. It was recognized at that time that:

- the engineering portion of the process was very labor intensive and time consuming;
- there was insufficient involvement from DPU's Accounting staff;
- the program had become difficult, if not impossible, to properly manage as it was currently structured; and
- the program objectives are excellent, it is the mechanisms that need to be modified.

As a result of this realization, I specifically requested the Internal Audit team conduct a thorough review of the pro-rata program in our opening meeting. Having now received the evaluation from the Auditor, DPU is working on proposed revisions to the pro rata policy and procedure. Pro-rata is a City Council policy, and any changes must be formally approved by the City Council. The procedure may be revised by the DPU Director. (Note: The full text of the response is included in the audit report.)

2. Pro Rata Accounting

Finding - PU revenue reflected on the City's Comprehensive Annual Financial Report (CAFR) had been overstated and liabilities understated for numerous years. Subsidiary records for pro rata projects had not been kept up to date and had not been reconciled to the general ledger. Also, the Accounting Division did not have a complete understanding of the pro rata project process. Communication between the Engineering and Accounting Divisions was limited even though the divisions were dependent on each other to ensure proper accounting for pro rata projects. Further, accounting policies and procedures for the handling of pro rata payments and disbursements needed to be updated.

Recommendation – Incoming pro rata payments should be posted to liability accounts verses revenue accounts. Subsidiary records should be kept up to date and be periodically reconciled to the general ledger. The Accounting Division should have a complete understanding of the pro rata process. The lines of communication between the Accounting and Engineering divisions should remain open at all times. In addition, pro rata policies and procedures for the Accounting Division should be updated and followed.

Response - PU Engineering and Accounting have worked together a great deal to increase the combined teams' understanding of the pro rata process. Whereas Accounting was minimally involved in the program since its inception, that has changed, and they are now integrally involved in the process. (Note: The full text of the response is included in the audit report.)

D. Maintenance and Operations (M&O)

Our review of the M&O Division noted that the water meter section of the M&O Division had not tested all large meters once each year as required. Also, water meters over 15 years old had not been replaced as recommended. In addition, refurbished meters were not being returned into Maximo inventory records after repairs were completed. Further, documented policies and procedures were lacking in all three of the areas addressed. The underlying cause for meter testing and replacement not being performed as required was insufficient staffing.

1. Aging Meters

Finding – The M&O Division had not replaced all aging residential (5/8" to 2") water meters which were over fifteen (15) years old as recommended. In addition, the fifteen (15) year guideline was not documented in the division's policy and procedures.

Recommendation – PU should develop and implement a realistic residential meter replacement program. Additionally, PU should consult with Human Resources to evaluate the cause of the continual vacant positions in the Water Service Section of the M&O Division and develop a plan to mitigate the continual vacancy issue. Further, meter replacement policies and procedures need to be documented.

Response - Public Utilities concurs on the need for a realistic residential water meter replacement program and such documented policies and procedures. Public Utilities is requesting several additional positions over the next three year budget cycle to assist with the meter replacement program. As resources become available, PU will continue to replace broken water meters and those over 25 years old as first priorities. Expansion of the Automatic Meter Reading (AMR) program throughout the City may also dictate the order in which meters are replaced. (Note: The full text of the response is included in the audit report.)

2. Large Meter Testing

Finding – The M&O Division had not consistently performed annual testing of large (3” to 10”) water meters. In addition, the annual testing process was not documented in the division’s policy and procedures.

Recommendation – PU should develop and implement a large meter testing program that can be accomplished with the staffing level of the Water Service section. Additionally, the Department should consult with Human Resources to evaluate the cause of the continual vacant positions in the Water Service Section and develop a plan to mitigate this issue. Further, large meter testing policies and procedures need to be documented.

Response – Currently Public Utilities has over 800 large meters (> 2”) that are tested by two staff members in Water Services. These two staff members also perform other duties including large meters repairs, register or touchpad repairs, 1½” - 2” meter change-outs, special meter tests, and numerous large meter re-reads. With current staffing, and as commercial development continues to grow, PU will be unable to meet the goal of testing large meters annually. Public Utilities is requesting an additional two positions over the next three year budget cycle specifically to assist with large meter testing. To annually test approximately 800 large water meters, two 2 man crews would be needed. (Note: The full text of the response is included in the audit report.)

3. Meter Tracking

Finding – The Meter Shop did not have written procedures for tracking new and refurbished meters.

Recommendation – The Meter Shop should develop written procedures for tracking new and refurbished meters.

Response – PU currently does not have a specific written procedure for tracking meters, but meters are tracked. All new meters purchased by the City are entered into the Customer Information System (CIS), which maintains the key meter information by individual meter number. The physical location of meters are also documented within CIS, as well as the meter number tied to that location. Large

batch purchases are entered into CIS by the IT department. Meter purchases for meter sizes larger than residential meters are entered manually in CIS by the Meter Shop Supervisor. Maximo, which is used for work orders, contains meter location and number, but requires a search by address, as meter information in Maximo is not updated due to limited staffing and the fact that it is not absolutely necessary. (Note: The full text of the response is included in the audit report.)

4. Inventory Process

Finding – PU’s inventory process was cumbersome, lacked adequate segregation of functions, and inventory counts in Maximo were not always accurate.

Recommendation – PU should take steps to streamline inventory processes, improve segregation of functions, and improve inventory accuracy.

Response - In March 2016, PU added a new Accountant I position to compliment staff, specifically to improve the separation of duties with M&O purchasing and warehousing functions. The position has been filled and the selected candidate works at the M&O facility adjacent to the storeroom and yard storage areas. A Separation of Duties matrix was developed and initiated in late March 2016 to differentiate storeroom and accounting responsibilities. (Note: The full text of the response is included in the audit report.)

5. Data Entry

Finding – The Water Services and Water Distribution Superintendents spent significant time performing data entry work.

Recommendation – PU should take steps to reduce the time necessary for performing data entry work.

Response - A new Data Control Tech II position for data entry is proposed in the FY18 budget cycle. So far, other operational needs have outweighed the needs for the data entry position. Other changes have been made with existing personnel to reduce the burden on the superintendents. A meter technician position was converted to an Office Assistant I, who performs significant data entry. Additionally, Crew Leaders and General Supervisors have been equipped with field laptops with data connections to be used in the field to input information into the Maximo asset management system. (Note: The full text of the response is included in the audit report.)

6. Work Orders

Finding – PU’s Water Service did not utilize Maximo to track all elements of work order completion.

Recommendation – PU should contact Public Works and Information Technology to determine whether the “workaround” solution they were using could be used by the Water Service.

Response - Public Utilities Water Service section does not utilize all the functionality of Maximo with regard to tracking temporary employee time for work orders. Although this information is helpful, it is not critical unless we are performing a job for which we will send an invoice for reimbursement. With very limited staff (currently 8 vacancies), tracking this information for non-bill jobs is not worth the time it takes. (Note: The full text of the response is included in the audit report.)

7. GIS

Finding – PU was not optimizing its use of GIS to consistently record reliable and complete information of the water distribution piping and components.

Recommendation – PU should optimize its use of GIS to consistently record reliable and complete information of the water distribution piping and components.

Response - While we do not currently use our GIS system to its full capacity, we are making progress on getting our data more up to date in the GIS. This will start with getting accurate GPS data (6 inch accuracy) for all surface hardware- manholes, fire hydrants, meter boxes, cleanouts, valves, etc. This will provide a 90% solution for the physical location of all of our buried assets, excluding depth information. To facilitate this process, we purchased one field GPS units this year and plan to purchase one more in FY17 to capture more data. This effort involves GPS’ing more than 150,000 unique surface assets; this is a 20-year data gathering effort. (Note: The full text of the response is included in the audit report.)

8. Warehouse Conditions

Finding – Physical conditions at the PU warehouse and outside storage area needed improvement.

Recommendation – PU should work with Facilities Management to make necessary repairs.

Response – A new combined Public Works (PW) Public Utilities Operations facility has been planned for several years. Because it has been in and out of the planning and design phases, it has not seemed prudent to spend funds maintaining facilities that will soon be razed and removed. As a result, only minimal funds have been spent maintaining the physical features at the M&O facility on Executive Drive. While the new facility location is being determined, PU will work with Facilities Management to make suggested essential repairs. (Note: The full text of the response is included in the audit report.)

E. Customer Information System (CIS)

We noted that reconciling differences between PU's Customer Information system and the Hampton Roads Sanitation District system were not researched and cleared in a timely fashion. Thus, the accuracy of some customer accounts was placed at risk.

1. CIS Reconciliation

Finding – Reconciling differences between the Customer Information System (CIS) and the Hampton Roads District system (HRSD) were not researched and cleared in a timely manner.

Recommendation – The CIS and HRSD systems should be reconciled daily and all reconciling items be researched and cleared in a timely manner.

Response - The issues cited for the audit have been resolved, and systems established to ensure that any future issues are quickly identified. CIS and HRSD systems are reconciled daily and any differences are identified, researched, and cleared in a timely manner. The PU IT Systems Analyst is much more comfortable with the system, and Accounting and Customer Service are working together when problems are identified. We have established a much better understanding of each of our software systems, the interfaces between them, and the interaction required between departmental teams.

F. Customer Service – Cash & Settlement - Billing

Customer billing experienced a significant backlog during 2015, resulting initially in skipped bills and later in enlarged bills to customers. Also cash handling and settlement procedures needed to be enhanced.

1. Billing

Finding – Customer billing was behind by over 2,500 service orders for several months during 2015. This created multiple instances where customers' bills were skipped and then "caught up" by being billed for four months on their next cycle.

Recommendation – PU should ensure that service orders, "rereads," and other exceptions are handled in as expeditious a manner as possible.

Response - The difference between the number of Tab Rereads (internally generated) and the reported 2,500 open service orders may be from two separate reports. The numbers are measuring different things. There is a Smartlist (CIS generated report) that identifies the total number of open service orders in CIS. This includes customer requested rereads, Tab Rereads, and all other types of service

orders. This report has exceeded 2,500 open service orders that the division is placing great emphasis in completing. (Note: The full text of the response is included in the audit report.)

2. Cash Handling and Settlement

Finding - The cashiering process in place for PU Customer Service was inefficient and was not designed to promote good customer service. In addition, procedures for cash handling, petty cash (p/c) and settlement processes did not sufficiently address cash handling, petty cash, settlement, internal controls, and the safeguards over assets needs to be enhanced.

Recommendation – PU Customer Service should develop and document cash handling, cash settlement and petty cash processes so that cash is adequately safeguarded. In addition, PU customer service should develop an ongoing oversight and monitoring process to ensure adherence to cash handling and cash control procedures.

Response - During this review period we have taken steps to increase our internal controls. Acknowledgment of this concern was evident when the decision was made to add a position to this area in customer service. In October 2015, we hired a former bank manager to further drive changes needed to our internal controls. Since her arrival, we have made many changes. (Note: The full text of the response is included in the audit report.)

G. Water Production

Our review of the water production and distribution areas identified an issue related to nuisance birds. The design and operation of the water treatment plants attracted these birds, and their presence created facility and health risks.

1. Nuisance Birds

Finding – The Water Treatment Plants' (WTP) design and operation attracted nuisance birds that caused corrosion and potential spread of disease to workers and visitors around the facilities.

Recommendation – Public Utilities should work with the appropriate federal and state agencies to address the issue.

Response - Many forms of goose control were deemed to not be appropriate for our water treatment facilities on Battlefield Blvd. or Western Military Highway. Earlier this year, DPU purchased decoy coyotes which function to scare away geese and other nuisance birds from our water treatment facilities. To date, it appears these coyotes have been effective. We are currently evaluating bird netting and other

systems to reduce or eliminate pigeon access to the water treatment area. (Note: The full text of the response is included in the audit report.)

H. Contracts

We noted several areas where contracting practices could be enhanced. Some contracts lacked some technical information, applicable inflation indices were not always specified.

1. Contracts

Finding – Contracting practices for Public Utilities could be enhanced.

Recommendation – PU should work with Purchasing to enhance its contracting practices.

Response - Public Utilities requested and was approved to hire a new senior engineer to serve as a Capital Project Manager as part of the FY17 budget. This individual will bring management of our capital program under one supervisor. Standardizing and improving our contracts is one of this individual's specific objectives. This individual will also provide quality control over our capital contracting process. Most of the identified situations and recommendations are relevant to capital contracts, and will be under this individual's purview.