

Audit

Follow-Up

Status as of February 28, 2015



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City Auditor

Audit of the Advanced Wastewater Treatment Project – Report 2

(Report #1312 issued April 19, 2013)

Report #1507

April 20, 2015

Summary

This is the third follow-up on the Audit of the Advanced Wastewater Treatment (AWT) Project – Report 2 (Report #1312 issued April 19, 2013). Nine action plan steps were established to address issues identified in that audit. Six of those nine steps were reported as completed in our prior follow-ups (reports #1406 and #1422). This follow-up addresses two of the three remaining steps. The third remaining action plan step will be addressed in a separate follow-up report. For the two steps addressed in this follow-up report, both were substantially completed. Accordingly, responsibility for following through to ensure completion of remaining items for those two action plan steps is turned over to management.

The AWT Project involved an intensive overhaul of the City’s TP Smith Water Reclamation Facility (TP Smith). The chief purpose of the AWT project was to lower the total nitrogen levels to under 3.0 milligrams (mg) per liter of treated liquids and improve the quality levels of the produced biosolids to “Class AA” as specified in the Florida

Department of Environmental Protection (DEP) permit and Court Administrative Order. Class AA biosolids are considered by DEP as the highest quality of biosolids and are distributed and marketed like other commercial fertilizers. The design changes to TP Smith involved structural, mechanical, electrical, and control improvements that upgraded the facility to meet required treatment levels and enable the plant’s future expansion of treatment capacity to 31.0 million gallons per day (MGD). Construction began in 2009 and as of February 28, 2015, construction was substantially complete. Remaining items outstanding, as identified during the project’s final inspection, are being addressed and resolved.

As of September 30, 2014, approximately 98% (\$223 million) of the budgeted \$227 million had been expended on the AWT Project.

In audit report #1312 we provided recommendations to assist management improve controls over project activities, enhance compliance with City policies, and implement project management best practices during the remainder of the City’s AWT project.

Nine action plan steps were developed by management to address our recommendations.

One of those nine steps pertained to separate actions to be taken regarding the TP Smith Supervisory Control and Data Acquisition (SCADA) system. Due to the sensitivity and confidentiality of key infrastructure resources, the SCADA-related action plan steps are being tracked separately and were not included in the scope of this follow-up engagement. Regarding the eight remaining action plan steps, six were previously reported as completed in our prior follow-up reports (#1406 and #1422). As explained in the following bullets, the last two action plan steps have been substantially completed, with responsibility for following through to ensure completion of remaining items for those two action plan steps turned over to management.

- Ensure project expenditures are reviewed for accuracy, compliance, timeliness, proper coding, and are accurately recorded. Management has taken appropriate steps to ensure project expenditures are correct; in compliance with governing laws, rules, and policies; properly coded; and accurately recorded. However, we again determined payments to vendors are not always timely as required by the City's prompt payment policy. Responsibility for following through to ensure future vendor payments are timely is turned over to management.
- All acceptance and performance test results will be obtained from the applicable contractor for retention in the City's records. As previously reported in our prior follow up report (#1422), the AWT Construction Manager has access to and reviews test documentation for completeness and adequacy within the design engineer's web based documentation/data management system. Upon project completion, the City plans to

obtain all applicable test and acceptance records from the design engineer for retention in the City's records. Responsibility for ensuring completion of that last remaining item is turned over to management.

In follow-up audit report #1422, we noted an additional issue where management was not obtaining "as-built" drawings of the completed components of the AWT project from the contractor. As-built drawings are important to the operation and future expansion of the TP Smith facility. During this follow-up period, management began obtaining and retaining "as-built" drawings of the AWT project from the contractor for future reference when needed.

We appreciate the cooperation and assistance provided by AWT Project management and staff from Accounting Services in completion of this audit follow-up.

Scope, Objectives, and Methodology

We conducted this audit follow-up in accordance with the International Standards for the Professional Practice of Internal Auditing and Generally Accepted Government Auditing Standards. Those standards require we plan and perform the audit follow-up to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit follow-up objectives.

Report #1312

The Office of the City Auditor has provided periodic reviews of the City's Advanced Wastewater Treatment (AWT) Project to provide

assurance and advisory services related to project management activities for the purpose of assisting Underground Utilities management during the project’s construction phase. Audit report #1312 reflected the results of our second audit of the City’s AWT project. The objectives of the second audit were to:

- Report on the project status and accomplishments as of December 31, 2012.
- Determine compliance with City policies and procedures and contract requirements.
- Provide an independent assessment of project risk management, controls, goals, and expected deliverables.

The scope of that second audit included selected project management activities during the construction phase, with emphasis on financial oversight, acceptance and performance testing, and the implementation of the plant’s enhanced SCADA (supervisory control and data acquisition) network system.

The first audit of the AWT Project (report #1102) covered the period January 1, 2010, through August 31, 2010, and tested selected financial transactions between August 1, 2006, and June 30, 2010. The second audit (report #1312) covered the period January 1, 2011, through December 31, 2012, and tested selected financial transactions during the period January 1, 2011, through September 30, 2012.

The audit scope for these two audits did not include an evaluation of the adequacy and quality of the engineering design and/or construction of the AWT facilities (TP Smith Water Reclamation Facility, referred to as TP Smith). Since the planning and acquisition phases for the prime contractor and engineers had already been completed when we started the first audit, we focused our audit procedures on assessing project

management controls and controls over the acquisition activities related to project expenditures during the audit period, including payments to contractors and procurement of labor, materials, and equipment.

Report #1406 and #1422

Reports #1406 and #1422 were the first two follow-up reports addressing action plan steps due as of September 30, 2013, and March 31, 2014, respectively. The purpose of those follow-ups was to report on the progress and status of efforts to complete action plan steps due for completion as of as of those dates. To determine the status of the action plan steps, we interviewed staff, made observations, reviewed relevant documentation, and performed limited testing of financial transactions.

Report #1507

This is the third follow-up on action plan steps identified in audit report #1312. The purpose of this follow-up is to report on the progress and status of efforts to address the final two “non-SCADA” action plan steps as of February 28, 2015. To determine the status of those action plan steps, we interviewed staff, made observations, reviewed relevant documentation, and performed limited testing of financial transactions.

Background

Advanced Wastewater System Project

The City’s sanitary sewer collection system is comprised of approximately 900 miles of gravity pipe supported by 109 pumping stations using 140 miles of force main pipes. These pipes carry sewage (referred to as wastewater) completely separate from the stormwater system. Wastewater is transported from City homes and businesses to

be treated at TP Smith. Before the AWT project, TP Smith operated three treatment “trains,” i.e., separate processes that treat wastewater. Each train used a different aeration process based on the best-practices technology in place at the time of construction (1973, 1983, and 1991).

The AWT Project involved an intensive overhaul of the TP Smith facility to implement the most current technology in treating wastewater, “Bardenpho biological nutrient removal process.”

The chief purpose of the AWT project was to lower the total nitrogen levels to under 3.0 milligrams (mg) per liter of treated liquids and improve the quality levels of the produced biosolids to “Class AA” as specified in the Florida Department of Environmental Protection (DEP) permit and Court Administrative Order. Class AA biosolids are considered by DEP as the highest quality of biosolids and are distributed and marketed like other commercial fertilizers. The design changes to TP Smith involved structural, mechanical, electrical, and control improvements that would upgrade the facility to meet required treatment levels and enable the plant’s future expansion of treatment capacity to 31.0 million gallons per day (MGD), when needed. Currently the City treats an average of 17.7 MGD.

Construction began in 2009 and as of February 28, 2015, construction was substantially complete. Remaining items outstanding, as identified in the project’s final inspection, are being addressed and resolved. As construction phases were completed, the new or enhanced treatment facilities were put into service.

Underground Utilities staff continued to operate the TP Smith facility throughout the construction process and continues to do so. Examples of project upgrades and renovations include:

- Renovation of the treatment “trains” to apply the Bardenpho biological nutrient removal process.
- Installation of a new anaerobic digestion system to stabilize biosolids before dewatering.
- Construction of additional clarifiers.
- Construction of new chlorine contact chambers to perform high-level disinfection. The use of chlorine gas was replaced with a commercial sodium hypochlorite system (placed in operation August 2011).
- Construction of a deep bed sand filter to meet the total suspended solids limits. Methanol is utilized as needed in the filter to reduce total nitrogen (placed in operation August 2011).
- Rehabilitation of the existing effluent pump station (completed August 2011).
- Replacement of dissolved air flotation structures with gravity belt thickeners to thicken biosolids.
- Installation of a new dryer to meet increased capacity needs and more reliably produce Class AA biosolids (installed January 2013).

The project was funded through utility rate increases and bond financing. The City implemented sewer rate increases in three phases to support the bond financing for the project. Rate increases were effective April 2008, January 2009, and October 2010. Additional funding for the project was provided by proceeds of bond issuances, not to exceed \$170 million, in 2007 and 2010.

Table 1 shows the amounts budgeted to the AWT Project from fiscal year 2007 through 2014.

Table 1
Budget for the AWT Project

Fiscal Year	Amount Budgeted during the Fiscal Year	Project Budget Running Total
2007	\$ 25,263,917	\$ 25,263,917
2008	\$ 43,205,000	\$ 68,468,917
2009	\$ 73,198,000	\$141,666,917
2010	\$ 29,560,000	\$171,226,917
2011	\$ 43,546,600	\$214,773,517
2012	\$ 9,195,000	\$223,968,517
2013	\$ 2,982,800	\$226,951,317
2014	\$ 600,000	\$227,551,317

Source: Audit report #1312 with original amounts amended based on budgetary changes as appropriate.

The City’s project team consisted of both City employees and consulting assistance led by the AWT Project Manager. City employees included the Construction Manager, wastewater program engineers and inspectors, and administrative staff. Consulting employees included engineers and construction management professionals. The project team was tasked to monitor and oversee construction activities to ensure design plans were followed and construction quality was maintained.

Executive oversight of the project was the responsibility of the City Manager, Assistant City Manager for Utility Services, and Underground Utilities General Manager (Executive Management Team). The AWT Project Manager submitted monthly project reports to the Executive Management Team to communicate the project status, successes, and challenges.

Since 2010, the AWT Project Manager continued to provide oversight of the Construction Manager and communicate with executive management. The Construction Manager performed the day-to-

day management of the project, including review and approval of invoices, and management of the project team.

In report #1312, we provided the project status and accomplishments as of December 31, 2012. As of December 31, 2012, approximately 85% (\$193 million) of the original budgeted \$227 million had been expended on the AWT Project and construction was estimated to be 85% complete.

Over 96% of expenditures incurred as of December 31, 2012, were recorded as construction, engineering, unclassified contractual services, and unclassified professional fees. The largest amount had been expended for the prime contractor for the AWT Project, MWH Constructors (70%), and ten (10%) percent had been expended for the prime engineering firm, Hazen & Sawyer.

We determined that as of December 31, 2012, the City had successfully achieved four of its six key project goals, including:

- ✓ There had been no major medical accidents or lost time due to accidents in over three years (1,235 days) of construction.
- ✓ The City was ahead of schedule for meeting the total nitrogen levels mandated by the DEP.
- ✓ The project was within the \$227 million budget and was projected to be completed within budget.
- ✓ The project had not incurred any permit violations.

In audit report #1312, we noted key areas where project management controls should be improved related to:

- Reviewing, tracking, approving, coding, and recording invoices (this issue was also reported in our first audit, report #1102).

- Recording of project assets and equipment in a timely manner (this issue was also reported in our first audit). In March 2013, adjustments were made to record \$124 million in completed AWT assets in the City's financial report as the result of this issue.
- Ensuring results of acceptance and performance testing are collected and maintained.
- Improving system controls over the network housing the TP Smith SCADA system.
- Ensuring there are processes in place to better monitor and verify the minority business enterprise (MBE) participation in construction projects and track local business participation.
- Ensuring there are project staff with adequate administrative capabilities to assist in overseeing the project's financial activities.

SCADA System

The TP Smith SCADA system is a central system that monitors data from various sensors located at strategic valve equipment and locations. One of the key processes of a SCADA is the ability to monitor an entire system in real time. Data collected is recorded and stored for historical and compliance reporting. In audit report #1312, we reported that a new network and SCADA system had been implemented and was operating in approximately 85% of the constructed facilities and operations.

A sewer treatment plant can be considered a key resource in the President's National Strategy for

Homeland Security related to Critical Infrastructure, and therefore we did not include sensitive information and issues about this SCADA system in our audit report (#1312). Identified management and security issues related to the network and SCADA systems and applicable detailed information were instead provided to City management for their attention and resolution. City management developed a separate detailed action plan to address those SCADA issues.

Due to the sensitivity and confidentiality of key infrastructure resources, the SCADA-related action plan steps are being tracked separately and were not included in the scope of this follow-up engagement. We will follow up on those action plan steps accordingly and will report periodically on their status to the City's Information Technology Steering Committee and executive management.

Current Project Expenditures

Table 2, on the next page, provides the total project expenditures as of February 28, 2015. As of that date, approximately 98% (\$223 million) of the budgeted \$227 million had been expended on the AWT Project. The majority (97%) of expenditures were recorded as construction services, construction engineering services, unclassified contractual services, and unclassified professional fees.

**Table 2
Project Expenditures by Account as of February 28, 2015**

Account Description	Amount	Percent of Total
Construction services (see note below)	\$114,400,313	51.3%
Contract engineering services	\$30,466,035	13.7%
Unclassified contractual services	\$24,043,407	10.8%
Unclassified professional fees	\$44,597,825	20%
Salaries, wages, overtime and other salary items	\$3,087,453	1.4%
Direct overhead	\$2,084,995	.9%
Unclassified supplies	\$1,264,477	.6%
Property insurance premiums	\$1,254,697	.6%
Miscellaneous (office related expenses and supplies)	\$1,854,339	.7%
Totals	\$223,053,541	100%
Percent of Total Project budget of \$227,551,317	98%	

97%

Source: City Financial System

Note: Construction services decreased from \$115,015,875 as of 3/31/2014 to \$114,400,313 as of 2/28/2015 (as shown above) due to insurance recovery of losses incurred during acceptance testing of the digester.

***Previous Conditions
and Current Status***

In audit report #1312, we reported that our assessment of project controls indicated the majority of appropriate controls were in place to minimize project risks. We reported some areas were identified where improvements should be made. Recommendations were made to assist management in addressing those areas. As previously noted in the background section of this report, those areas related to:

- Reviewing, tracking, approving, coding, and recording vendor invoices.
- Recording project assets and equipment in a timely manner.

- Ensuring results of acceptance and performance testing are collected and maintained.
- Ensuring there are processes in place to better monitor and verify MBE participation in construction projects and to better track local business participation.
- Ensuring there are project staff with adequate administrative capabilities to assist in overseeing the project’s financial activities.
- Improving the system controls over the network housing the TP Smith SCADA system.

To address those areas (issues), management established nine action plan steps. One of those nine steps pertained to separate actions to be taken regarding the TP Smith SCADA system;

as previously noted in this follow-up report, that action plan step is not addressed in this follow-up engagement.

The other eight action plan steps were initially due for completion as of September 30, 2013. As shown in Table 3 below, six of those eight

steps have been completed and the other two steps substantially completed, with responsibility for following through to ensure completion of remaining items for those two action plan steps turned over to management.

**Table 3
Action Plan Steps from Audit Report #1312
Due as of September 30, 2014, and Current Status**

Action Plan Steps Due as of September 30, 2014	Status as of February 28, 2015
<p align="center">To ensure transactions and events relating to processing deliverables and contract payments are properly executed, classified, and recorded in a timely manner.</p>	
<ul style="list-style-type: none"> • Project management will coordinate with Underground Utilities Administrative staff to implement processes to ensure that project expenditures are reviewed for accuracy, compliance, timeliness, proper coding, and are accurately recorded (correct account and department). [Report #1312 Action Plan Step A.1] 	<ul style="list-style-type: none"> ❖ Turned over to Management. As noted in follow-up audit report #1422, the Project Construction Manager is reviewing invoices for accuracy, compliance, timeliness, and coding, and is monitoring the project expenditures. However, during this follow-up engagement we again noted issues with processing and paying vendor invoices in a timely manner. Specifically, we selected four transactions to determine if payments to vendors were being made in a timely manner. Our review of those payments showed the payment periods for three of the four transactions were not made in accordance with the City’s prompt pay policy. For those three payments the payment periods ranged from 34 to 45 days subsequent to the receipt of the respective invoice by the City. The City’s prompt pay policy requires payment for construction services to be made within 25 days of receipt of the vendor/contractor invoice. In response to our inquiry on this matter, management acknowledged the continued late payment of vendor invoices and described

	<p>actions being taken to ensure timely payment of future invoices. We <u>recommend</u> those efforts be completed. Due to the substantial completion of the AWT project, we have turned responsibility for following through to ensure completion of those efforts over to management.</p>
<ul style="list-style-type: none"> • Project management will assess the administrative needs of the AWT project financial activities and staff capabilities. <i>[Report #1312 Action Plan Step A.2]</i> 	<p>✓ Completed/Resolved in prior period.</p>
<p>To ensure project capital assets are properly recorded in the City’s records.</p>	
<ul style="list-style-type: none"> • Project staff will continue working with Accounting Services and Treatment Plant staff to implement a process to record constructed assets properly and timely in the City’s financial system and plant’s asset maintenance system. All assets currently in service will be recorded by August 31, 2013. Future assets will be recorded within 60 days upon being placed in service. <i>[Report #1312 Action Plan Step B.1]</i> 	<p>✓ Completed/Resolved in prior period.</p>
<ul style="list-style-type: none"> • Project staff should periodically reconcile the asset information recorded in the City’s financial system and in the plant’s asset maintenance system to ensure each is complete and accurate. <i>[Report #1312 Action Plan Step B.2]</i> 	<p>✓ Completed/Resolved in prior period.</p>

To ensure test results and documentation are collected and retained.	
<ul style="list-style-type: none"> • Construction Manager will work with the Design Engineer, per the contract with Hazen and Sawyer, to collect, organize, and maintain all acceptance and performance test results for the City’s records. All testing completed to date will be provided by Hazen and Sawyer by June 28, 2013. All future testing will be provided within 45 days upon completion. <i>[Report #1312 Action Plan Step C.1]</i> 	<ul style="list-style-type: none"> ❖ Turned over to Management. As noted in follow-up audit report #1422, the AWT Construction Manager has access to and is reviewing test documentation for completeness and adequacy within the Design Engineer’s web based documentation/data management system. Upon completion, management plans to obtain all applicable test and acceptance records from the Design Engineer for retention in the City’s records. Responsibility for ensuring completion of that plan is turned over to management.
To measure MBE and local participation in projects.	
<ul style="list-style-type: none"> • The City will request that MWHC provide the monthly reports for MBE participation and the post-completion MBE affidavits for each Task Order. <i>[Note: The prime contractor is only obligated to provide MBE affidavits for payments to their subcontractors, not the subcontractors’ payments to their sub-subcontractors.] [Report #1312 Action Plan Step D.1]</i> 	<ul style="list-style-type: none"> ✓ Completed/Resolved in prior period.
<ul style="list-style-type: none"> • On the basis of the reports, the City MBE Office and Underground Utilities will follow up and coordinate efforts to conduct a cross sampling of MBE companies for documentation or confirmation that they were paid the reported amounts. Since the current Work Packages 2C and 3B do not include MBE goals on the basis of specialty construction, there is no need for future tracking and measurement of MBE work. <i>[Report #1312 Action Plan Step D.2]</i> 	<ul style="list-style-type: none"> ✓ Completed/Resolved in prior period.

<ul style="list-style-type: none"> • AWT Project Management Team staff will coordinate with MWHC to implement processes to track local contracts and spending to allow the local participation goal to be measured. <i>[Note: The contractor is not contractually required to track the local participation. It was a program goal, but not a contractual requirement.] [Report #1312 Action Plan Step D.3]</i> 	<ul style="list-style-type: none"> ✓ Completed/Resolved in prior period.
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Table Legend:

- Issue to be addressed from the original audit.

- ✓ Action item addressed and resolved.
- ❖ Substantially completed; responsibility for ensuring completion of remaining items turned over to management.

Additional Issue

In the prior follow-up audit report, #1422, we noted the City had not obtained “as-built” drawings for the AWT project components that had been completed and placed in operation. As-built drawings depict all changes made to the TP Smith facility as a result of the AWT project. The as-built drawings are important to the City’s future operation of TP Smith for two primary reasons.

First, they are a record from which future system changes and/or additions can be designed. Future renovation projects will be more efficient and less disruptive if the as-built drawing is available to show critical information such as pipe/duct routing and sizing and control system sensor locations. Second, the as-built drawings can be a valuable tool for staff during the course of regular operations and maintenance. For example, it provides the specific location of shut off valves, which is considered critical for operations as well as emergency preparedness.

During this follow-up review we determined as-built drawings for AWT project components that

have been completed to date have been obtained and are being retained for use in the future as needed. Accordingly, this issue has been resolved. We commend management for addressing this matter in a timely manner.

Conclusion

Table 3 above shows six of the eight action plan steps addressed in this report have been completed and the two other steps substantially completed, with responsibility for following through to ensure completion of remaining items for those two action plan steps turned over to management. This follow up report also shows the additional issue identified during our previous follow-up engagement (report #1422) regarding obtaining as-built drawings for City records has been resolved.

[NOTE: While all action plan steps addressed in this follow up engagement are now completed or turned over to management to ensure final completion, this report is not reflected as a “final” follow-up engagement, as other action plan steps resulting from the “Audit of the Advanced Wastewater Treatment Project – Report 2,” which

pertain to the TP Smith SCADA system, are being addressed in a separate, confidential report. Until those steps are completed and/or resolved, our follow up the “Audit of the Advanced Wastewater Treatment Project – Report 2” will not be considered completed (e.g., “final”).].

We appreciate the cooperation and assistance provided by AWT Project management and staff from Accounting Services in completion of this audit follow-up.

Appointed Official’s Response

City Manager:

I am pleased to see that the Advanced Wastewater Treatment Project audit action plan has been substantially completed and has resulted in a positive impact for the AWT project as a whole. The results indicate that the Underground Utilities department is continuing to provide efficient and effective wastewater treatment services to our community and is seeking continuous improvement in providing those services. I would like to thank the audit team for the professional analysis and detailed process. I would also like to thank the Underground Utilities staff for the commitment to providing the best possible services to our residents.

Copies of this audit follow-up, #1507 or audit report #1312 may be obtained from the City Auditor’s website (<http://www.talgov.com/auditing/auditing-auditreports.aspx>) or via request by telephone (850 / 891-8397), by FAX (850 / 891-0912), by mail or in person (Office of the City Auditor, 300 S. Adams Street, Mail Box A-22, Tallahassee, FL 32301-1731), or by e-mail (auditors@talgov.com).

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