



**METROPOLITAN GOVERNMENT OF NASHVILLE
AND DAVIDSON COUNTY - METRO WATER SERVICES
PERFORMANCE AUDIT OF CLEAN WATER
NASHVILLE OVERFLOW ABATEMENT PROGRAM**

INTERIM REPORT – MAY 1, 2013 – JUNE 30, 2014

DATE ISSUED: SEPTEMBER 1, 2014



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INTRODUCTION

Performance Audit Initiation

Metro Water Services (“MWS”) engaged Crosslin & Associates, P.C. (“C&A”) in April 2014 to design and implement a performance audit for the Clean Water Nashville Overflow Abatement Program (the “Program”). The design phase of the engagement included three tasks as follows:

1. Identify specific objectives and strategies for achieving the performance engagement goals through discussion with Program personnel, review of available documentation, and review of both legal and internal control requirements.
2. Identify relevant operational and financial performance measures to attain Program goals and objectives.
3. Assist MWS by developing a program to report performance measurement information which will allow MWS to monitor progress toward achieving Program goals and objectives.

The implementation phase of the engagement included testing these determined performance measurement objectives and goals and issuing the results of the engagement procedures in an annual report that includes both observations and any related recommendations. An annual report will be issued throughout the duration of the Program. This is the second annual performance audit report for the Program.

Background

MWS began an aggressive improvement and rehabilitation program in 1990 through 2006 to reduce the number of combined sewer overflows (“CSOs”) and sanitary sewer overflows (“SSOs”), making tremendous progress toward improving water quality in the Cumberland River and its major tributaries. However, despite these improvements, a significant number of overflows still remained, prompting state and federal regulatory agencies to approach MWS in 2006 about the need for additional work within the sewer system.

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INTRODUCTION - Continued

Background - Continued

In March 2009, a Consent Decree between the United States of America, the State of Tennessee, and the Metropolitan Government of Nashville and Davidson County was approved and entered with the United States District Court for the Middle District of Tennessee. The Consent Decree was filed on behalf of the United States Environmental Protection Agency (“EPA”) and the Tennessee Department of Environment and Conservation (“TDEC”), requiring MWS to use its best efforts to achieve the following goals:

1. Full compliance with National Pollutant Discharge Elimination System (“NPDES”) permits, the Clean Water Act (“CWA”), the Tennessee Water Quality Control Act, and related regulations.
2. Elimination of SSOs, due to a later submitted design storm.
3. Compliance with EPA’s CSO Control Policy.

Under the Consent Decree, MWS is required to fully develop, in two years, a Corrective Action Plan/Engineering Report (“CAP/ER”) for its sanitary sewer system, a Long-term Control Plan (“LTCP”) for its combined sewer system to achieve the goals of the CWA, and meet water quality requirements in the Cumberland River. Due to the impacts of the May 2010 flood, MWS received a six month extension for the CAP/ER and the LTCP to be fully developed, and further a two year extension for final compliance. As such, these reports were developed and filed with the EPA, effective September 12, 2011. At a total estimated cost of \$1.0-\$1.5 billion, the Program represents a major investment in overflow abatement for the Nashville community. As of September 1, 2014, the EPA has not yet given final approval for either of the CAP/ER or LTCP plans.

See Appendix A for both the CAP/ER and LTCP Implementation Plans and Schedules submitted to the EPA.

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EXECUTIVE SUMMARY

Scope of Performance Audit

MWS engaged C&A to perform the second annual performance audit of the Clean Water Nashville Overflow Abatement Program (the “Program”) for interim period of May 1, 2013 through June 30, 2014. The performance audit was conducted over a five month period from April 2014 through August 2014. As of June 30, 2014, the Program had 20 active projects (each in various phases of the project) that are covered under the Consent Decree (see Appendix A for complete list of Consent Decree projects). As of August 6, 2014, a total of approximately \$120.6 million out of a budgeted \$1.5 billion had been incurred for projects (See detail of these expenditures by project at Appendix A).

C&A selected 9 active projects for testing performance measurement objectives. As of June 30, 2014, the following projects were active and selected for testing:

<u>Project Name</u>	<u>Escalated Budget</u>	<u>Project Phase</u>
Apex Sewer Corrections	\$3.0 million	Construction
Cowan Riverside Rehabilitation – Area 1	\$7.9 million	Construction
Cowan Riverside Rehabilitation – Area 2	\$7.9 million	Construction
Dodson Chapel Equalization Facility	\$25.1 million	Closeout
Lakewood Rehabilitation	\$8.8 million	Construction
Mill Creek Opry land Equalization Facility – Phase II	\$17.6 million	Construction
Neely’s Bend Rehabilitation	\$2.2 million	Construction
Shelby Park Rehabilitation	\$9.1 million	Construction
Whites Creek Pump Station Improvements	\$21.7 million	Construction

Key Recommendation

- Perform a monthly reconciliation of Program costs by project between the PMIS database and the EBS system (general ledger database) to ensure Program costs are entered timely, accurately and closely monitored for potential budget overruns.

See the Performance Audit Observations, Recommendations and Management Responses section of the report for detailed observations, recommendations and management responses for each performance measurement tested.

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**PERFORMANCE AUDIT OBSERVATIONS, RECOMMENDATIONS
AND MANAGEMENT RESPONSES**

CONFLICTS OF INTEREST

Observation

During fieldwork, C&A noted that conflict of interest disclosures had been disseminated to all key individuals and the signed copies were properly filed in the Program Management Information System (“PMIS”). Signed conflict of interest disclosures are now required to be obtained annually for all key individuals. Any disclosures are reviewed for potential conflicts and controls have been put into place for any potential ethics violations. Signed conflict of interest disclosures and related controls are being monitored regularly for compliance.

Recommendation

None.

Management’s Response

No response necessary.

**PROGRAM AND RELATED PROJECT BUDGET COSTS VS. ACTUAL RESULTS
AND FINANCIAL DATA TRACKING WITHIN THE PMIS DATABASE AND
METRO FINANCE**

Observations

While performing our procedures during the prior period, C&A noted that Consent Decree projects, not overseen by the contracted Program Management Team (“PMT”), were not included in the actual cost data within the PMIS database. The PMIS database had captured only approximately \$12 million of the total approximate \$74 million spent as of April 30, 2013. Most of these projects were started several years before developing the contracted Program Management Team and implementing the PMIS database. By including all costs to date, this would allow Program management to closely monitor and analyze budget and actual costs for all projects covered under the Consent Decree from inception and to disseminate to MWS management any cost overruns being incurred for the overall Program.

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**PERFORMANCE AUDIT OBSERVATIONS, RECOMMENDATIONS
AND MANAGEMENT RESPONSES - Continued**

**PROGRAM AND RELATED PROJECT BUDGET COSTS VS. ACTUAL RESULTS
AND FINANCIAL DATA TRACKING WITHIN THE PMIS DATABASE AND
METRO FINANCE - Continued**

During the current period procedures, the PMT coordinated with MWS to reconcile the costs from MWS Accounting's Access database with those in EBS prior to entry into PMIS. Once the reconciliation was complete, the PMT entered the actual historical costs totaling approximately \$74 million into PMIS for the completed EAP projects. C&A verified that the amounts entered into PMIS agreed to MWS Accounting's Access database with no exceptions noted.

Recommendations

None.

Management's Response

No response necessary.

PROCESS FOR CHANGING PROJECT BUDGET COSTS

Observation

C&A reviewed certain project budget cost changes to verify that the changes were made with proper approvals, had a justification document properly completed, and appeared reasonable in nature. During our testing, we observed that all projects had a significant budget change. There was a transition from allocating Program-level costs directly to projects to the use of Program-level cost accounts within PMIS. The term "Program-level costs" is defined as those costs that are attributed to the Program, but not to individual projects. Sources of these costs include the following: Program Management Consultant ("PMC"), Construction Management Consultant ("CMC"), closed circuit television inspection ("CCTV"), flow monitoring, and Metro Water Services ("MWS") labor.

There were two primary reasons for altering the approach originally established in the spring of 2012 for assigning Program-level costs. First, it was difficult to implement an allocation approach that was equitable given the different types of projects and varying durations. Second, there was a need to align the source of costs with those directly responsible for managing them. For instance, the allocation of Program-level costs to projects meant that Project Managers, who are responsible for project budgets, had very little management control over those costs. The direction by MWS to implement a change was made based on numerous conversations between the Program Management Consultant and Metro Water Services in August 2013.

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**PERFORMANCE AUDIT OBSERVATIONS, RECOMMENDATIONS
AND MANAGEMENT RESPONSES - Continued**

PROCESS FOR CHANGING PROJECT BUDGET COSTS - Continued

As a result, the PMT agreed to apply these expenses at the OAP level instead of the project level. This allows for the costs to still be captured in PMIS, but it is for the entire OAP project, instead of each individual project. The allocation process for assigning Program-level costs to projects ceased on June 30, 2013, which coincides with the end of Metro's fiscal year 2013. Going forward, the expenses will be applied at the OAP level and not at the project level.

During our testing, we noted that this significant change to each of the project budgets was supported by source documents, approved by appropriate Program management, and noted in meeting minutes.

Recommendation

None.

Management's Response

No response necessary.

**PROGRAM MANAGEMENT INTERNAL CONTROLS FOR
PAYMENT PROCESSING**

Observations

During fieldwork, payments were tested for evidence of proper review of documentation, accuracy and timeliness. It was noted that items paid directly by MWS did not have invoices included in the PMIS database (i.e. flow monitoring, labor costs). A service invoice checklist was implemented in 2012 and is being utilized by the team. However, the construction pay application checklist is not being utilized consistently. We also observed occasions when invoices were properly sent back through the review process for questions related to cost and support.

Recommendation

Although the service invoice and construction pay application checklists are not required to be submitted with the invoices to MWS, the Program is utilizing them for internal purposes. Therefore, C&A recommends that the construction pay application checklist should be completed and scanned into PMIS with the final invoices for consistency.

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**PERFORMANCE AUDIT OBSERVATIONS, RECOMMENDATIONS
AND MANAGEMENT RESPONSES - Continued**

**PROGRAM MANAGEMENT INTERNAL CONTROLS FOR
PAYMENT PROCESSING**

Management's Response

The Program Management Team will begin filing checklists for the construction pay applications in PMIS in a manner consistent with the service invoices.

**PROJECT COST RECONCILIATION BETWEEN PMIS DATABASE
AND METRO FINANCE**

Observation

While performing our procedures during the prior period, C&A noted that the PMT matches the invoices submitted to MWS to the access database report, provided by MWS Finance each week. The access database is a project management program used by MWS Finance for internal projects. This process began when the Program Management Team was formed and began operating in 2012. MWS Finance reconciles each payment request received to EBS (both on the vendor payment side and the encumbrance side) verifying the accuracy of their access database to the general ledger. However, the Program Management Team does not perform a reconciliation between the PMIS database and EBS. The Program Management Team verifies that the current week's invoices are included in the access database report and verifies with the vendors that they have been paid, but the Team does not verify that all access database information matches what is currently in the PMIS system. As such, there is no reconciliation between the PMIS database and EBS, which is the primary source for payments. Without the full reconciliation process to EBS, duplicate payments, inappropriate paid amounts or other errors could potentially be missed. In addition, total Program cost overruns may not be detected on a timely basis.

Recommendation

C&A recommends a complete reconciliation between the invoicing data in the PMIS database and EBS for all projects listed in the consent decree. The reconciliation should be performed going forward on a monthly basis within 30 days after each month end.

Management's Response

The Program Management Team is currently working with MWS Accounting to obtain necessary reports from EBS that will facilitate reconciliation with PMIS. In accordance with the current version of the PMP, a memorandum will be submitted quarterly from the Program Management Team to MWS Accounting that documents the reconciliation and notes any inconsistencies.

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**PERFORMANCE AUDIT OBSERVATIONS, RECOMMENDATIONS
AND MANAGEMENT RESPONSES - Continued**

COMPLIANCE WITH METRO PROCUREMENT REGULATIONS

Observation

C&A reviewed selected projects to ensure proper procurement procedures were followed and to confirm whether relevant data was entered correctly in the project cost sheets within PMIS, consistent with each individual contract. We also reviewed change orders to confirm that proper signatures were obtained. We compared the contracted amounts with the budgets to see if there were any unsupported variations. No unexplained deviations were noted. We noted that, in certain circumstances, only limited procurement documentation existed. We inquired about the limited documentation as it related to the procurement process. It was noted that the procurement process is handled by the Metro Procurement Department and communicated to the PMT through a liaison and that management did not think that it is prudent to place sensitive documents within the file that is viewed by various contractors and subcontractors. Due to the sensitive nature of the information, C&A contacted both the MWS Finance Department and Procurement Department to request the items noted that was not included within PMIS in order to ensure that the proper procurement procedures were followed. C&A reviewed all documents noting no exceptions.

Recommendation

None.

Management's Response

No response necessary.

**PROGRAM MANAGEMENT PROCESSES FOR QUALITY CONTROLS
AND RISK ASSESSMENT**

Observation

C&A conducted an assessment of quality control documents that are required to be prepared, reviewed and signed by designated responsible parties at various phases of the projects. While most documentation was properly filed, there were several instances of missing documents. There were also instances where the documentation was found, but not in the files.

Recommendation

We recommend that quality control documents consistently be prepared, reviewed, and signed in the future, and a system be put in place to ensure that the documents are properly and timely maintained within PMIS.

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**PERFORMANCE AUDIT OBSERVATIONS, RECOMMENDATIONS
AND MANAGEMENT RESPONSES - Continued**

**PROGRAM MANAGEMENT PROCESSES FOR QUALITY CONTROLS
AND RISK ASSESSMENT - Continued**

Management's Response

The requirements for the preparation, review and filing of the quality documentation is described in the Quality Management Plan which went through a significant revision in April 2014. The Program Management Team will review the updated procedures with involved staff with a focus on improving the timeliness and accuracy of the quality documentation.

Observation

The Program Management Plan ("PMP") - vol. I, section 6, states that risk assessment should be performed at the project level with a defined set of documentation (risk assessment matrix including consequence ratings and likelihood of occurrence rating). As recommended by C&A during the prior period procedures, formal project specific risk assessments were prepared and placed into PMIS in order to comply with the PMP.

Recommendation

None.

Management's Response

No response necessary.

Observation

The PMIS database is designed in such a way that it can be utilized by all members of the Project Management Team, and all contractors and subcontractors at a level appropriate for their needs. We noted in the PMP that training for individuals at various levels should be provided to allow for full utilization of the resources provided and for consistency in documentation placed in the file. While the Project Management Team maintains that training has been provided, C&A noted that there was still missing documentation in the system to support this assertion. This observation was carried forward from the prior period procedures.

Recommendation

We recommend a training log be developed and maintained for not only the primary project team members, but also for contractors, subcontractors, and others who utilize the system.

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**PERFORMANCE AUDIT OBSERVATIONS, RECOMMENDATIONS
AND MANAGEMENT RESPONSES - Continued**

**PROGRAM MANAGEMENT PROCESSES FOR QUALITY CONTROLS
AND RISK ASSESSMENT - Continued**

Management's Response

The recommended training log was established in the spring of 2014 and loaded with all prior training sessions held by PMC staff, CMC staff, Metro staff, designers and contractors. The training log had not been fully updated with recent training sessions at the time of the C&A audit in July 2014. Going forward the Program Management Team will update the training log at the time training sessions are completed so that it is up-to-date.

Observation

The PMP states that periodic audits are to be performed internally. C&A noted that the annual internal audit was conducted by the PMC Quality Manager as described in the Quality Management Plan during the period covered by our procedures.

Recommendation

None.

Management's Response

No response necessary.

PROGRAM AND RELATED PROJECTS TIMELINE PERFORMANCE

Observation

C&A reviewed the timeline for tested projects to determine if any significant changes had been made, and if so, we obtained support for the justification and approval of these timeline changes. For any significant delays, we found that there was documentation to support that the proper members of management (both Program Management and MWS) had been informed.

Recommendation

None.

Management's Response

No response necessary.

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**PERFORMANCE AUDIT OBSERVATIONS, RECOMMENDATIONS
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PROJECT PERFORMANCE IN ACCORDANCE WITH DESIGN

Observation

C&A noted that there were several projects in the construction phase that had been processed through the PMP. Of the projects reviewed, the designs submitted appeared to represent the RFPs. Reviews of the designs at various milestones were being performed by management and the engineers of record were monitoring changes that may impact the intent of the design for maximizing resources to resolve problems. We also noted field visits are being performed by the Construction Managers with cross-references to the expectations.

Recommendation

None.

Management's Response

No response necessary.

EPA AND TDEC REPORTING REQUIREMENTS COMPLIANCE

Observation

C&A reviewed MWS's compliance with the various reporting requirements as it relates to the Consent Decree with particular attention to the Project Management Team's maintenance of documentation, content, and deadlines. C&A did not note any non-compliance.

Recommendation

None.

Management's Response

No response necessary.

Clean Water Nashville Overflow Abatement Program

CAP/ER & LTCP Implementation Plans & Schedules

CD Name	Sub-Program	Expended Amount	Start	End
Early Action Projects (EAP)				
Barker Road Omohundro Equalization Storage Phase I	CAP-ER	\$12,310,818	5/15/2006	5/14/2008
Broadway Improvements	LTCP	\$646,794	7/1/2010	11/1/2011
Dodson Chapel Equalization Facility	CAP-ER	\$15,336,639	12/6/2010	11/25/2013
Driftwood Equalization Facility	LTCP	\$2,576,563	1/4/2011	11/27/2013
Dry Creek Waste Water Treatment Plant Optimization	CAP-ER	\$0	7/1/2003	12/31/2007
Holiday Travel Park Gravity Conversion	CAP-ER	\$114,638	6/2/2007	9/1/2012
Lakewood Rehabilitation (EAP)	CAP-ER	\$1,359,203	1/10/2011	9/18/2015
Mill Creek 36 in Trunk Sewer System Rehabilitation	CAP-ER	\$1,682,251	1/2/2008	9/30/2011
Rockwood Conveyance Improvement	CAP-ER	\$1,215,193	12/1/2011	5/1/2012
Smith Springs Equalization Storage	CAP-ER	\$0	7/11/2005	4/7/2006
Van Buren Improvements	LTCP	\$646,794	7/1/2010	11/1/2011
Washington CSO Facility Improvements	LTCP	\$19,613,899	7/1/2010	4/27/2012
West Park Equalization Storage Phase I	CAP-ER	\$9,366,031	1/2/2006	6/29/2011
Whites Creek Pump Station Improvements	CAP-ER	\$21,832,738	7/1/2009	11/10/2013
Whites Creek WWTP Disinfection & Optimization	CAP-ER	\$6,492,185	7/1/2008	12/21/2012
Subtotal:		\$93,193,746		
Overflow Abatement Program (OAP)				
28th Avenue Rehabilitation	CAP-ER	\$258,131	3/1/2012	11/20/2021
Apex Sewer Corrections	LTCP	\$1,125,898	7/5/2012	7/1/2014
Bandywood - Green Hills Rehabilitation (SU03A)	CAP-ER	\$0	1/2/2016	10/16/2018
Benedict & Crutcher Equalization Facility	LTCP	\$0	4/27/2016	11/27/2019
Berwick Trail Pipe Improvements	CAP-ER	\$0	4/1/2015	1/24/2019
Berwick Trail Pump Station Upgrades	CAP-ER	\$111,288	5/7/2012	10/19/2018
Boscobel Equalization Facility	LTCP	\$0	2/1/2017	10/27/2020
Brick Church Pike Equalization Facility	CAP-ER	\$343,467	5/7/2012	8/16/2017
Brick Church Pike Pipe Improvements	CAP-ER	\$907,184	4/12/2012	4/19/2017
Central Wastewater Treatment Plant Equalization - Phase I	LTCP	\$0	1/28/2014	8/7/2019
Central Wastewater Treatment Plant Equalization - Phase II	LTCP	\$0	4/8/2015	11/4/2020
Central Wastewater Treatment Plant Equalization - Phase III	LTCP	\$0	6/4/2018	3/7/2023
Central Wastewater Treatment Plant Grit and Pump Station Upgrades	LTCP	\$0	1/28/2014	5/7/2020
Central Wastewater Treatment Plant Improvements	LTCP	\$1,007	6/11/2014	11/9/2020
Cleece Ferry Rehabilitation	CAP-ER	\$0	1/31/2017	12/17/2021
Combined Sewer System and First Avenue Tunnel Rehabilitation	LTCP	\$0	9/2/2019	12/4/2022
Cowan Riverside Rehabilitation	CAP-ER	\$1,709,242	12/30/2011	8/8/2017
Cowan Street Pipe Improvements	CAP-ER	\$0	8/3/2017	3/16/2022
Cowan Street Pump Station Upgrades	CAP-ER	\$0	8/9/2017	9/20/2020
Davidson Branch Equalization Facility	CAP-ER	\$313,372	5/7/2012	8/12/2017
Davidson and Brook Hollow Sewer Improvements	CAP-ER	\$150,054	12/28/2012	12/31/2015
Dodson Chapel Pipe Improvements	CAP-ER	\$777,568	11/30/2011	11/1/2015
Dry Creek Pipe Improvements	CAP-ER	\$69,175	8/31/2012	1/8/2019
First Avenue Tunnel Access	LTCP	\$0	3/29/2017	1/21/2021
Foster Avenue Rehabilitation GL01	CAP-ER	\$0	2/1/2019	11/5/2021

Clean Water Nashville Overflow Abatement Program

CAP/ER & LTCP Implementation Plans & Schedules

CD Name	Sub-Program	Expended Amount	Start	End
Gibson Creek Equalization Facility	CAP-ER	\$0	2/3/2013	12/15/2018
Gibson Creek Rehabilitation	CAP-ER	\$5,127	12/3/2012	1/16/2017
Green Improvements	LTCP	\$116,604	7/31/2012	9/28/2023
Henry Ford Drive Pipe Improvements	CAP-ER	\$0	12/3/2017	2/24/2022
Hidden Acres Pump Station Upgrades	CAP-ER	\$0	6/3/2015	3/17/2020
Highway 100 Tyne Boulevard Pipe Improvements	CAP-ER	\$994,386	12/1/2011	4/15/2022
Hurricane Creek Pipe Improvements	CAP-ER	\$0	9/2/2014	11/24/2018
Joelton Rehabilitation	CAP-ER	\$769,567	3/6/2012	6/25/2014
Kerrigan Trash Trap Replacement	LTCP	\$0	11/20/2019	9/13/2023
Kerrigan Weir Dynamic Addition	LTCP	\$0	6/1/2016	8/9/2019
Lakewood Rehabilitation	CAP-ER	\$130,706	1/10/2011	12/6/2017
Langford Farms Rehabilitation	CAP-ER	\$0	12/30/2014	4/7/2017
Loves Branch Pump Station Upgrades	CAP-ER	\$235,353	5/7/2012	3/18/2019
Madison Heights Rainbow Terrace Rehabilitation	CAP-ER	\$0	1/31/2015	2/28/2017
Mill Creek Opryland Equalization Facility - Phase II	CAP-ER	\$5,176,552	2/2/2012	3/3/2015
Mill Creek Opryland Equalization Facility - Phase III	CAP-ER	\$0	12/11/2013	7/25/2020
Mill Creek Trunk Improvements	CAP-ER	\$333	3/6/2015	1/17/2021
Neely's Bend Pump Station Upgrades	CAP-ER	\$273,144	5/7/2012	6/10/2020
Neely's Bend Rehabilitation	CAP-ER	\$1,045,460	12/30/2011	9/5/2014
Norman Drive Pipe Improvements GC14	CAP-ER	\$0	9/2/2014	11/24/2018
Parthenon Area Improvements	LTCP	\$254,606	3/26/2012	11/13/2017
Program Cross-Phase	N/A	\$8,671,002	8/6/2014	8/6/2014
River Drive Rehabilitation	CAP-ER	\$0	1/31/2018	11/25/2020
Riverside Drive Pump Station Upgrades	CAP-ER	\$0	8/9/2017	4/12/2021
Schrader Equalization Facility	LTCP	\$0	2/12/2018	5/6/2021
Shelby Park Rehabilitation	CAP-ER	\$1,996,342	2/1/2012	12/26/2021
Smith Springs Rehabilitation	CAP-ER	\$216,816	4/3/2012	10/26/2020
Vandiver Pump Station Upgrades	CAP-ER	\$134,922	5/7/2012	11/29/2018
West Park Equalization Facility Phase II	CAP-ER	\$1,632,494	1/3/2012	11/13/2016

Subtotal: \$27,419,800

Total: \$120,613,546

Count: 69

Total for LTCP:	\$24,982,165
Total for CAP-ER:	\$86,960,379
Total for Program Cross-Phase:	\$8,671,002
Total:	\$120,613,546

