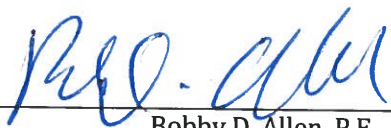


# City of Memphis

## Semi-Annual Report October 1, 2016 through March 31, 2017

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering such information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



Bobby D. Allen, P.E.

5-1-17

Date

# Section 1

## Introduction

On September 20, 2012, the United States District Court for the Western District of Tennessee entered a Consent Decree between the City of Memphis (the City) and the United States, the State of Tennessee, and the Tennessee Clean Water Network.

To fulfill the reporting requirements defined in Paragraph VIII.25. of the Consent Decree, the City has prepared this Semi-Annual Report, which includes the following information:

- A description of projects and activities completed and milestones achieved during the previous six month period pursuant to the requirements of the Consent Decree.
- A summary of significant projects and activities anticipated to be performed, and milestones anticipated to be achieved, in the next six month period pursuant to the requirements of the Consent Decree.
- Any additional information determined to be appropriate to demonstrate implementation of the remedial actions required under the Consent Decree.

This report is organized into four sections:

- **Section 1** provides an introduction.
- **Section 2** documents recent progress and anticipated continuing activities related to development and implementation of the Management, Operations, and Maintenance (MOM) Programs noted in the Consent Decree.
- **Section 3** identifies recent progress and anticipated continuing activities related to the Priority Rehabilitation Projects noted in the Consent Decree.
- **Sections 4 and 5** provide a summary of additional actions that the City has recently completed and anticipates completing over the next six months to maintain compliance with the Consent Decree.
- **Sections 6** identifies past Consent Decree projects and non-CD projects performed.

## Section 2

# Management, Operations, and Maintenance Programs

As defined in Paragraph V.10 of the Consent Decree, the City shall develop and implement specific Management, Operations, and Maintenance (MOM) Programs. These MOM Programs are listed below along with a summary of activities completed in the previous six months and activities anticipated to be performed during the upcoming six months. A chart showing the status of compliance is presented as **Figure 2-1**.

All MOM Programs activities are currently in compliance.

## 2.1 Sewer Overflow Response Plan

### Activities Completed During Previous Reporting Periods

The City submitted a Sewer Overflow Response Plan (SORP) to the U.S. Environmental Protection Agency (EPA) and Tennessee Department of Environment and Conservation (TDEC) on March 11, 2011, before the Consent Decree was entered. A copy of the SORP is included in Appendix B of the Consent Decree. The City updated Section 3 of the document and submitted to EPA on March 30, 2016. The City deemed these updates as “form” and not of “substance.” A copy of the document was submitted to the public document repository.

### Activities Completed During This Reporting Period

The City continued to operate under the processes described in the SORP as updated on March 30, 2016, during the reporting period.

### Activities Anticipated to be Performed During the Next Reporting Period

The City will continue to operate under the approved SORP as modified on March 30, 2016. .

## 2.2 Fats, Oil, and Grease Management Program

### Activities Completed During Previous Reporting Periods

The City submitted a Fats, Oils and Grease (FOG) Management Program (Program) to the U.S. Environmental Protection Agency (EPA) and Tennessee Department of Environment and Conservation (TDEC) on March 11, 2011, before the Consent Decree was entered. A copy of the FOG Management Program is included in Appendix C of the Consent Decree. In 2013 the City made minor changes in form, not substance, to the FOG and submitted to EPA. Subsequently, on April 22, 2014 EPA approved the updated FOG Management Program submitted by the City on October 30, 2013.

### Activities Completed During This Reporting Period

The City reviewed the October 2013 Program and made minor changes to form and not substance (as was the case with the October 2013 revision) and provided these proposed revisions to EPA on January 18, 2017. During the current reporting period, the City continued to operate under the

processes described in the Program updated October 30, 2013, and subsequently updated January 18, 2017, as applicable. In addition to conducting inspection and reporting activities, the City has continued public outreach efforts, such as the use of billboard and bus stop advertising and the distribution of “Can the Grease” door hangers and can lids to discourage residents from discarding cooking oils and other FOG in the sewer system. As part of the workforce development aspect of the Consent Decree, the City has engaged the “Green Team” (Section 4.3) to distribute “Can the Grease” door hangers ahead of condition assessment work.

#### **Activities Anticipated to be Performed During the Next Reporting Period**

The City will continue to operate under the January 18, 2017, updated FOG Management Program.

## **2.3 Lift Station and Force Main O&M Program**

#### **Activities Completed During Previous Reporting Periods**

On February 5, 2015, the City received comments from EPA on the Lift Station and Force Main Operations and Maintenance (O&M) Program. The City revised the Lift Station and Force Main O&M Program to address these comments and submitted the revised version to EPA and TDEC on April 8, 2015.

#### **Activities Completed During This Reporting Period**

The City continued to operate and maintain the lift station and force main systems. The City received approval of the April 8, 2015, Lift Station and Force Main O&M Program in a letter from EPA dated March 13, 2017 and commenced to formally implement the Program.

#### **Activities Anticipated to be Performed During the Next Reporting Period**

The City will continue to operate under the revised plan approved March 13, 2017.

## **2.4 Gravity Sewer System O&M Program**

#### **Activities Completed During Previous Reporting Periods**

During a previous reporting period, on February 4, 2015, the City received comments from EPA on the Gravity Sewer Operations and Maintenance (O&M) Program. The City revised the Gravity Sewer O&M Program to address these comments and submitted the revised version to EPA and TDEC on April 8, 2015.

#### **Activities Completed During This Reporting Period**

The City continued to operate and maintain the gravity sewer system. The City received comments on the April 8, 2015 Gravity Sewer O&M Program on March 13, 2017. The City received a time extension to respond to the comments and is currently developing responses to the comments.

#### **Activities Anticipated to be Performed During the Next Reporting Period**

It is anticipated during the next reporting period that the City will submit responses to the EPA’s March 13, 2017, comments.

## **2.5 Inter-Jurisdictional Agreement Program**

#### **Activities Completed During Previous Reporting Periods**

During a previous reporting period, on February 5, 2015, the City received comments from EPA on the Inter-Jurisdictional Agreement Program. The City revised the Inter-Jurisdictional Agreement

Program to address these comments and submitted the revised version to EPA and TDEC on April 8, 2015.

#### **Activities Completed During This Reporting Period**

No issues occurred during this reporting period that would have been addressed by the IJAP.

#### **Activities Anticipated to be Performed During the Next Reporting Period**

It is anticipated during the next reporting period that EPA, after consultation with TDEC, will approve the IJAP submitted on April 8, 2015, or provide additional comments. The City will respond to additional comments received from EPA, if any, and will revise the IJAP, as appropriate. Once approved, the City will follow the IJAP for new agreements and renewal of existing agreements related to the collection, conveyance, and treatment of sewage by the City from municipal satellite sewer systems.

## **2.6 Continuing Sewer Assessment Program**

#### **Activities Completed During Previous Reporting Periods**

The Continuing Sewer Assessment Program (CSAP) was approved on September 10, 2014, and outlined priority areas to receive condition assessment in Year 1 and Year 2 after CSAP approval. The Year 1 area received condition assessment beginning with the Cane Creek Pilot Assessment area (Section 4.5) before the September 10, 2014, CSAP approval. Through GIS efforts to digitize the entire WCTS, discussed further in Section 4.2.2, the City now estimates the system to contain approximately 2,808 miles of gravity sewer and associated manholes. The Year 1 and Year 2 areas were completed during previous reporting periods in accordance with the CSAP Year 1 and Year 2 deadlines.

#### **Activities Completed During This Reporting Period**

The City continued to implement the CSAP in accordance with the Consent Decree.

#### **Activities Anticipated to be Performed During the Next Reporting Period**

During the next reporting period, the City will continue implementation of the CSAP in accordance with the timeframes presented in the Consent Decree.

## **2.7 Infrastructure Rehabilitation Program**

#### **Activities Completed During Previous Reporting Periods**

The City completed the development of the Infrastructure Rehabilitation Program (IRP), as required in Paragraph V.10.g of the Consent Decree, and submitted the document to EPA and TDEC for review on February 25, 2015. The EPA approved the IRP on July 13, 2016.

#### **Activities Completed During This Reporting Period**

With the approval of the IRP, the City continued to prioritize rehabilitation in accordance with the IRP.

#### **Activities Anticipated to be Performed During the Next Reporting Period**

With the approval of the IRP, the City will continue to prioritize rehabilitation in accordance with the IRP and will implement rehabilitation in the North and South Priority Rehabilitation Areas as designated in Appendix G of the Consent Decree within six years and seven months after IRP

approval. The City will use the prioritization criteria set out in the IRP to determine which assets in appendix G will be rehabilitated.

**Figure 2-1  
MOM Programs Progress**

Program	CD Reference	CD Milestone	Progress Last Six Months						Anticipated Activities Next Six Months					
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Sewer Overflow Response Program	V.10.a	-	Continuing to implement program.						Continue to implement program.					
Fats, Oils, and Grease Management Program	V.10.b	-	Continuing to implement program. FOG Management Plan review was completed by the City and modified FOG Program submitted to EPA.						Continue to implement January 18, 2017 modified Program.					
Lift Station & Force Main O&M Program	V.10.c	9/19/2013	Received approval of Lift Station and Force Main O&M Program on March 13, 2017, and began implementation.						Operate under the approved Program.					
SCADA installation at lift stations	V.10.c.iii	3/19/2013	Previously completed. SCADA is operational.											
Gravity Sewer System O&M Program	V.10.d	9/19/2013	Received comments on the O&M Program on March 13, 2017.						Respond to comments received, revise program as appropriate, and implement approved program.					
Inter-Jurisdictional Agreement Program	V.10.e	3/19/2013	Awaiting EPA response.						Respond to any comments received, revise program as appropriate, and implement approved program.					
Continuing Sewer Assessment Program	V.10.f	9/19/2013	Continued to implement Program.						Continue to implement Program.					
Infrastructure Rehabilitation Program	V.10.g	3/9/2015	Continued prioritizing issues and rehabilitation.						Implement approved program, including continuing to perform rehabilitation on Priority Areas.					

## Section 3

### Priority Rehabilitation Projects

As defined in Paragraph V.11 of the Consent Decree, the City shall complete various Priority Rehabilitation Projects. These projects are listed below along with a summary of activities completed in the previous six months and activities anticipated to be performed during the upcoming six months. A chart showing the status of compliance is presented as **Figure 3-1\***.

All Priority Rehabilitation Project activities are currently in compliance.

#### 3.1 Priority Areas Projects

Paragraphs V.10.f and V.11.a of the Consent Decree identify several areas of the City's Wastewater Collection and Transmission System (WCTS) that are to be assessed during the first and second years following approval of the CSAP. These areas are shown in Appendix E and F of the Consent Decree, respectively. Additionally, Appendix G identifies North and South Priority Rehabilitation Areas that will be completed within six years and seven months of the IRP approval on July 13, 2016 (i.e., February 13, 2023).

##### **Activities Completed During Previous Reporting Periods**

During previous reporting periods, required condition assessment was completed in accordance with the deadlines specified in the CSAP and Consent Decree, and their progress was discussed in detail in previous Semi-Annual Reports.

##### **Activities Completed During This Reporting Period**

During this reporting period, no condition assessment was completed as all was completed during previous reporting periods however, we note that during this period 7 point repairs were completed in the Year 1 and Year 2 areas to address critical sewer line defects (i.e. those determined to have high risk factors for contributing to or causing SSO events).

With the Year 1 and Year 2 condition assessment completed, the results were used to develop an initial rehabilitation schedule in the areas identified as the North and South Priority Rehab Areas in accordance with the priorities specified in the IRP.

##### **Activities Anticipated to be Performed During the Next Reporting Period**

The initial rehabilitation schedule for the North and South Rehabilitation Priority Areas will be used to develop a scope of work consisting of various rehabilitation methods prioritized in accordance with the IRP.

\*In the last Semi-Annual Report, the description of the progress for "Complete Appendix H rehabilitation projects" in Figure 3.1 was inadvertently stated incorrectly. However, the verbiage in the body of the document correctly stated the progress made on these projects.



## 3.2 Critical Infrastructure Areas Projects

### Activities Completed During Previous Reporting Periods

As discussed in Paragraph V.11.b of the Consent Decree, three areas within the WCTS were identified to receive prioritized rehabilitation due to the critical nature of the infrastructure and the potential consequences of large sanitary sewer overflow volumes in the event of a failure. A map showing the locations of these areas is included as Appendix H of the Consent Decree. These three projects are to be completed within five years after the Effective Date of the Consent Decree (September 20, 2012). As stated in previous Semi-Annual Reports, the first critical area on the 42-inch through 48-inch Wolf River Interceptor and the third critical area on the 84-inch interceptor located where McLean Boulevard crosses the Wolf River and Interstate 40 have already been completed. Preliminary work on the second critical area, a portion of the 96-inch interceptor at the entrance/exit ramp located at mile 51 of Interstate 240, continued during the previous reporting period which included researching various rehabilitation methods for the project.

### Activities Completed During This Reporting Period

During this reporting period, a Request for Bid for the second critical area (segment of 96-inch Wolf River interceptor) was advertised and a Notice of Intent to Award was issued on March 1, 2017.

### Activities Anticipated to be Performed During the Next Reporting Period

It is anticipated that rehabilitation of the second critical area will begin in April of 2017 and be completed within the timeframe established in the Consent Decree. Inasmuch as the first and third critical infrastructure areas projects have been completed, the Final Critical Areas Project Report is anticipated to be submitted within six months of completion of the second critical area, consistent with the terms of the Consent Decree.

## 3.3 Prior Assessment Areas Projects

As discussed in Paragraph V.11.c of the Consent Decree, four additional rehabilitation projects have been identified based on previous inspection and assessment activities. These projects were to be completed by September 20, 2016, i.e., four years after the Effective Date of the Consent Decree. The four projects were completed in previous reporting periods and prior to the September 20, 2016 date established in the Consent Decree. As such, these projects are now included in Section 6.1 Projects Completed in Previous Reporting Periods.

**Figure 3-1  
Priority Rehabilitation Projects Progress**

Project	CD Reference	CD Milestone	Progress Last Six Months						Anticipated Activities Next Six Months									
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep				
Priority Area Projects	V.11.a	9/9/2015																
Assess Year 1 areas identified in Appendix E		9/9/2016																
Assess Year 2 areas (including Appendix F)		Via implementation of IRP																
Prioritize areas identified in Appendix G		2/13/2023																
Complete Appendix G rehabilitation projects		10/13/2018																
Interim Priority Areas Project Report		Within six months of rehabilitation projects completion																
Final Priority Areas Project Report																		
Critical Infrastructure Areas Projects	V.11.b	9/19/2017																
Complete Appendix H rehabilitation projects		Within six months of rehabilitation projects completion																
Final Critical Areas Project Report																		
Priority Assessment Area Projects																		
Nonconnah Interceptor	V.11.c (i)	9/19/2016																
Mud Island Manholes	V.11.c (ii)	9/19/2016																
Burchart-Horn Manholes	V.11.c (iii)	9/19/2016																
Wolf River Interceptor	V.11.c (iv)	9/19/2016																

## Section 4

# Additional Measures to Maintain Compliance

In addition to the projects and activities described in the previous sections, the measures described below are related to the City's ongoing Consent Decree compliance.

### 4.1 M.C. Stiles WWTP Foam Study and Outfall Improvements

As described in Paragraph V.12 of the Consent Decree, the City is required to implement the M.C. Stiles Wastewater Treatment Plant (WWTP) Foam Study and Outfall Improvements Work Plan that was included as Appendix I of the Consent Decree. On May 19, 2014, the first amendment of the Consent Decree, which identified a preferred alternative design consisting of a vortex structure and which included a revised construction schedule, was approved and filed with the court.

#### **Activities Completed During Previous Reporting Periods**

During the previous reporting period, the contractor continued construction on the Stiles outfall improvements, including pouring grout columns to address soil stabilization and preparing the site to install the vortex structure and outfall pipe.

#### **Activities Completed During This Reporting Period**

During this reporting period, the outfall pipe from the vortex structure to the Mississippi River was bored and the forms for the vortex were installed.

#### **Activities Anticipated to be Performed During the Next Reporting Period**

It is anticipated that the City will complete the project during the next reporting period.

### 4.2 State Projects

As stated in the previous Semi-Annual Report, the two State Projects, the Color Study and the Geographic Information System, have already been completed and therefore have been moved to Section 6.1 Projects Completed in Previous Reporting Periods.

### 4.3 Program Administration Activities

Since entering into the Consent Decree, the City has conducted several administrative activities for the implementation of the Consent Decree program, known as the Sewer Assessment and Rehabilitation Program (SARP10).

#### **Activities Completed During Past and This Reporting Period**

- **Coordination with Emergency Personnel:** Through the condition assessment process, the City and SARP10 staff coordinated weekly with fire and police departments' leadership to keep them abreast of on-going activities and work locations.
- **Coordination with Special Projects:** The SARP10 Team has been working closely with City personnel to identify upcoming City special projects that may require coordination with future sewer improvements. The sewer lines associated with the projects are assessed in advance using CCTV inspection to identify areas in need of repair. The repairs are

subsequently conducted to avoid disrupting future construction activities and to avoid patching associated paved areas.

- **Street Paving Projects:** The SARP10 Team has been working closely with City and State personnel to identify upcoming street paving projects. The sewer lines associated with these streets are assessed in advance using CCTV inspection to identify areas in need of repair, and required repairs are subsequently made to avoid patching newly paved areas.
- **Workforce Development:** The City continued to implement its workforce development program. The program is comprised of five-stages: assess, recruit, train, place, and retain. The assessment phase identifies the types of jobs that will be needed to complete the Consent Decree-related work and that could be filled by local personnel. Subsequently, potential candidates are identified and screened. These personnel are provided training as necessary to avail them for potential employment by contractors working on Consent Decree-related projects. As candidates are placed, their progress is monitored.

During this reporting period, 7 new candidates were provided public engagement training as part of the “Green Team,” previously mentioned in Section 2.2. As members of the Green Team, the individuals provided a key piece of the SARP10 public engagement project by going door-to-door in the neighborhoods scheduled for condition assessment work to be completed. The Green Team distributed door hangers providing information about smoke testing and proper grease disposal as well as interacted with homeowners whenever possible. The team provided information to over 19,000 homes during this reporting period, bringing the total homes to date to 109,000 that have been visited.

Also as a result of this program and other initiatives, a total of 120 local personnel have obtained full-time employment with SARP10 program companies or assessment and rehabilitation contractors working on the program for the City.

- **Public Relations:** The program continues to conduct public meetings in the assessment areas and will continue these efforts in the future, as appropriate. However, no public meetings were conducted during this reporting period since no new Phases were kicked off. More public meetings are anticipated to be conducted as Phase 5 gets underway. SARP10 continues to utilize a website to provide current information, tentative schedules for work, and all assessment and rehabilitation contracts.
- Point repair and manhole adjustment contracts are ongoing and are detailed in Section 5: Infrastructure and Rehabilitation Projects.

#### **Activities Anticipated to be Performed During the Next Reporting Period**

Implementation of the activities described above will continue through the upcoming reporting period.

## **4.4 Loosahatchie Interceptor Assessment**

The City undertook condition assessment and survey of approximately 48,000 linear feet of the Old Loosahatchie Interceptor and 61,600 linear feet of the New Loosahatchie Interceptor to further understand its structural condition, causes and contributions to SSOs, and to evaluate the need for cleaning and rehabilitation.

**Activities Completed During Previous Reporting Periods**

The City had previously identified 22,000 linear feet of the Old Loosahatchie Interceptor for CCTV and sonar inspections to assess the condition of this interceptor but expanded the project to include both the Old and New Loosahatchie Interceptors. The expanded project includes the assessment of 109,600 linear feet of interceptor and surveying manhole rim and pipe invert elevations. During the previous reporting period, all remaining assessment, cleaning, and surveying on the Old Loosahatchie interceptor was completed. On May 20, 2016, flow monitors were installed and flow measurements were completed on September 12, 2016.

**Activities Completed During This Reporting Period**

During this reporting period, the assessment and flow monitoring data was used to supplement the Master Plan effort further described in Section 4.6.

**Activities Anticipated to be Performed During the Next Reporting Period**

During the next reporting period, the flow monitoring and assessment data will continue to be used to supplement the Master Plan effort.

## 4.5 Ongoing CSAP Activities

As per the Consent Decree, the CSAP schedule and priority provided for the assessment of approximately 10% of the WCTS on average per year following EPA approval of the CSAP.

**Activities Completed During This Reporting Period**

Condition assessment work continued in the Phase 4 area which consists of approximately 2.15 million LF of gravity mains and associated manholes. During this reporting period, approximately 412,650 LF was assessed. The Phase 5 contracts were executed and work began in February 2017. Phase 5 consists of approximately 1.15 million LF of smaller-diameter assessment and 110,000 LF of large diameter sewer assessment.

At the end of this reporting period, the Program has assessed 1,150 miles (41% of the 2,808 mile system) of gravity mains and associated manholes. This exceeds the 10% assessment per year outlined in the CSAP. Additionally, 25 lift stations have been assessed to date. No lift stations were assessed during this reporting period.

**Activities Anticipated to be Performed During the Next Reporting Period**

During the next reporting period, Phase 5 work will continue and additional lift stations are anticipated to be assessed.

## 4.6 City-Wide Master Plan

The City decided to undertake a wastewater master plan for the key sewersheds within the WCTS. This work will enable the City to identify potential upgrades of the WCTS.

**Activities Completed During This Reporting Period**

Basic flow projections were developed and the hydraulic model for the Loosahatchie interceptors was completed. Surveying of manholes in the Front Street and Wolf River sewersheds was completed.

**Activities Anticipated to be Performed During the Next Reporting Period**

Work will continue on developing the Front Street, Wolf River and Cypress Creek systems.

## Section 5

# Infrastructure Rehabilitation Projects

### 5.1 Priority Rehabilitation Areas

Pursuant to the Consent Decree and IRP requirements, the City shall complete the rehabilitation projects within the priority areas identified in Appendix G of the Consent Decree by February 13, 2023, i.e., within six years and seven months after EPA's approval of the IRP which occurred on July 13, 2016.

#### **Activities Completed During This Reporting Period**

The City has continued rehabilitation projects by completing manhole adjustments for buried or inaccessible manholes, and point repairs for critical sewer defects (i.e., those determined to have high risk factors for contributing to or causing SSO events). During this reporting period, no additional manholes were adjusted leaving the total at 174 and 1 point repairs were completed bringing the total to 20 for the North and South Priority Rehabilitation Areas.

During this reporting period, the City continued to prioritize rehabilitation projects in the North and South Priority Areas in accordance with the IRP.

#### **Activities Anticipated to be Performed During the Next Reporting Period**

It is anticipated that during the next reporting period the City will continue to prioritize projects in accordance with the IRP.

### 5.2 Other Rehabilitation Projects

Although not required by the Consent Decree, the City has started rehabilitation projects in areas of the WCTS outside of the Priority Rehabilitation Areas.

#### **5.2.1 Point Repairs and Manhole Adjustments**

Point repair and manhole adjustment contracts have been procured in order for the City to address critical sewer line defects and buried manholes in real-time so as to address defects that could be causing or that are likely to cause SSOs and to also facilitate access for condition assessment field testing activities.

#### **Activities Completed During This Reporting Period**

- **Point Repair Contract:** During the current reporting period, one point repair contractor continued to complete high priority point repairs identified as part of the condition assessment program. During this reporting period, approximately 55 point repairs were completed.
- **Manhole Adjustment Contract:** During the current reporting period, a new manhole adjustment contractor began work and adjusted approximately 185 manholes during the reporting period.

**Activities Anticipated to be Performed During the Next Reporting Period**

During the next reporting period, the manhole adjustment contract will continue. The existing point repair contract is anticipated to be closed and a new contract will be procured and implemented.

**5.2.2 John's Creek Interceptor Repair and Evaluation**

During condition assessment of the John's Creek Interceptor, a partial collapse was discovered on the 30" interceptor and an emergency point repair was completed. Since then, large diameter sewer cleaning equipment has been used to clean the line upstream of the collapse.

**Activities Completed During This Reporting Period**

During this reporting period, approximately 9,750 LF of interceptor was cleaned and 200 tons of debris were removed from the line.

**Activities Anticipated to be Performed During the Next Reporting Period**

During the next reporting period, the cleaning is anticipated to continue and additional condition assessment will be undertaken to determine if further rehabilitation needs to be completed.

**5.2.3 Black Bayou Stream Crossing Rehabilitation**

During the City's routine assessment of sewer lines adjacent to streams and stream crossings, crews discovered that sheet piles around the structure built to protect the 60" gravity sewer pipe from erosion where Black Bayou feeds into Nonconnah Creek were partially collapsing into the channel.

**Activities Completed During This Reporting Period**

The City collected water samples from three storm pipes in the structure as well as ran a CCTV camera through the 60" line and determined that the pipe was structurally sound and not leaking into Black Bayou. A local engineering firm was selected to redesign the structure and a contractor began reinforcing the concrete structure surrounding the 60" sewer line by grouting voids inside the structure and by replacing portions of the concrete slab. Work was also done to replace the sheet piling stabilizing the bank.

**Activities Anticipated to be Performed During the Next Reporting Period**

It is anticipated that during the next reporting period the reinforcement around the concrete structure and sheetpiling will be completed.

## Section 6

### Past CD Projects and Non-CD Projects

#### 6.1 Projects Completed in Previous Reporting Periods

The following projects have been completed during previous reporting periods and included in previous Semi-Annual Reports:

- Cane Creek and Hickory Hill Pilot Assessment Area (last included in April 2015 – Sept 2015 Semi-Annual Report)
- Prior Assessment Areas Projects (last included in April 2016 – September 2016 Semi-Annual Report):
  - Cured-in-Place Pipe (CIPP) lining of the Nonconnah Interceptor Between Manholes Numbered N06-119 and N06-127
  - Rehabilitation or replacement of manholes on Mud Island that include manhole number M10-005 plus the two (2) manholes immediately downstream and repair of the liner in the corresponding portion of the 60-inch interceptor near these manholes
  - Rehabilitation of approximately sixty-four (64) manholes identified as having heavy or medium corrosion in Appendix B of a June 6, 2006 study report prepared by Buchart-Horn on behalf of Memphis
  - CIPP lining on segments of the Wolf River Interceptor between demarcation points W05-120 and W05-130
- State Projects (last included in April 2016 – Sept 2016 Semi-Annual Report):
  - Color Study
  - Geographic Information System (GIS)
- Snowden Assessment and Rehabilitation (last included in April 2016 – Sept 2016 Semi-Annual Report)
- Woodview Subdivision Rehabilitation (last included in April 2016 – Sept 2016 Semi-Annual Report)
- Lick Creek Interceptor CIPP (last included in April 2016 – Sept 2016 Semi-Annual Report)
- Loosahatchie Interceptor Replacement (last included in April 2016 – Sept 2016 Semi-Annual Report)
- St. Elmo Pipe Bursting (last included in April 2016 – Sept 2016 Semi-Annual Report)



## 6.2 Other Rehabilitation Projects Completed by City of Memphis

In addition to projects completed under the CD program, the City routinely completes improvement projects to the WCTS. During this reporting period, the City estimates that it has rehabbed 2,200 linear feet of pipe with CIPP. Since September 2012 (effective date of CD), the City has installed approximately 72,000 linear feet of CIPP and rehabbed 6 lift stations (Gayoso, Big Orange, Genyth, N. Watkins, Jack Carley, and Valero).