DAVID BRILEY
MAYOR

METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY

DEPARTMENT OF WATER AND SEWERAGE SERVICES
Engineering Division
1600 Second Avenue North
Nashville, Tennessee 37208-2206

June 18, 2018

Ms. Mary S. Walker
Deputy Regional Administrator
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street
Atlanta, GA 30303-8960

RE: *Addendum to the LTCP*
Consent Decree 3:07-cv-01056
DOJ Case No. 90-5-1-1-09000

Dear Ms. Walker:

Subsequent to our discussions on the *Long Term Control* Plan (LTCP) on April 23, 2018, we hereby submit the enclosed *Addendum to the LTCP*. The Addendum summarizes the updates, modifications, and additions to projects described in the LTCP. When a project begins design, the changes have been presented in the Quarterly Progress Reports, subject to public review and comment via the Public Document Repository.

Nashville remains committed to completing the projects as described in the *Addendum to the LTCP* no later than eleven years from approval.

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 ensure 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.

If you have any questions or would like to discuss this further, do not hesitate to contact me.

Sincerely,

Ron C. Taylor, P.E.
Clean Water Nashville Program Director

cc: Mr. David Apanian, EPA
Ms. Tisha Benton, TDEC
Ms. Jennifer Dodd, TDEC

Enclosure: *Addendum to the LTCP*

PROGRAM OFFICE
210 25th Avenue North, Suite 1104
Nashville, Tennessee 37203
Phone (615) 915-0384 • Fax (615) 891-2508

Addendum

DATE: June 12, 2018

TO: Ron Taylor, P.E., CWNOAP Director

FROM: Kimberly Martin, P.E., CWNOAP Deputy Manager
Paul Stonecipher, P.E., CWNOAP Design Manager
Heather Housel, EIT, CDM Smith

RE: Addendum to the *Long Term Control Plan* for Metro Nashville Combined Sewer Overflows

cc: Greg Ballard, P.E., CWNOAP Deputy Director
Janelle Rogers, Ph.D., P.E., BCEE, PMP, CWNOAP Manager
Michael Krabacher, P.E., CWNOAP Controls Manager

No. of Pages: 8

Attachments: None

Introduction

In September 2011, AECOM and Metro Water Services (MWS) submitted the *Long Term Control Plan* (LTCP) to fulfill the intent of Section VII, Part D.2 of the Consent Decree (CD) entered into on March 12, 2009, between the United States of America, the State of Tennessee, and the Metropolitan Government of Nashville and Davidson County, Tennessee (Metro). The goal of the LTCP is to bring MWS's combined sewer overflows (CSOs) into compliance with water quality standards in a manner consistent with the CSO Control Policy.

Since submittal of the LTCP in 2011, information from the *Central Wastewater Treatment Plant Optimization Study*, *2014;* the *Central Wastewater Treatment Plant Optimization Basis of Design Report* (BODR), *2016;* hydraulic analyses; and re-evaluation of proposed improvements has resulted in adjustments to several projects listed in the original LTCP. The purpose of this addendum is to present the adjustments to the originally planned improvement projects. A summary of the current improvement projects is described in the next section.

1.0 Overview of Current LTCP Projects

A complete list of the current projects to be completed as part of the LTCP, including their current project status, is summarized as **Table 1-1** and shown in **Figure 1-1**. All projects are located in the Central Wastewater Treatment Plant (WWTP) service area.

Table 1-1 Revised List of LTCP Projects

Project Name	Project Type	Project Status*
Apex Sewer Corrections	Conveyance, Rehabilitation	Complete
Benedict & Crutcher Equalization Facility	Equalization Storage	Future
Boscobel Equalization Facility	Equalization Storage	Future
Broadway Improvements	Conveyance	Complete
Central WWTP Capacity Improvements and CSO Reduction	Conveyance, Treatment Optimization	Underway
Driftwood Equalization Facility	Equalization Storage	Complete
Green Improvements (Annual)	Green Infrastructure	Underway
Kerrigan Trash Trap Replacement	Other	Future
Kerrigan Weir Dynamic Addition	Other	Future
Schrader Equalization Facility	Equalization Storage	Future
Van Buren Improvements	Conveyance	Complete
Washington CSO Facility Improvements	Storage, Solids & Floatables Control	Complete

*Projects marked as Underway are under design, under construction, and/or partially complete as of May 31, 2018.

Projects that have been adjusted or added/removed since development of the LTCP are discussed in **Sections 2.1** through **2.3**.

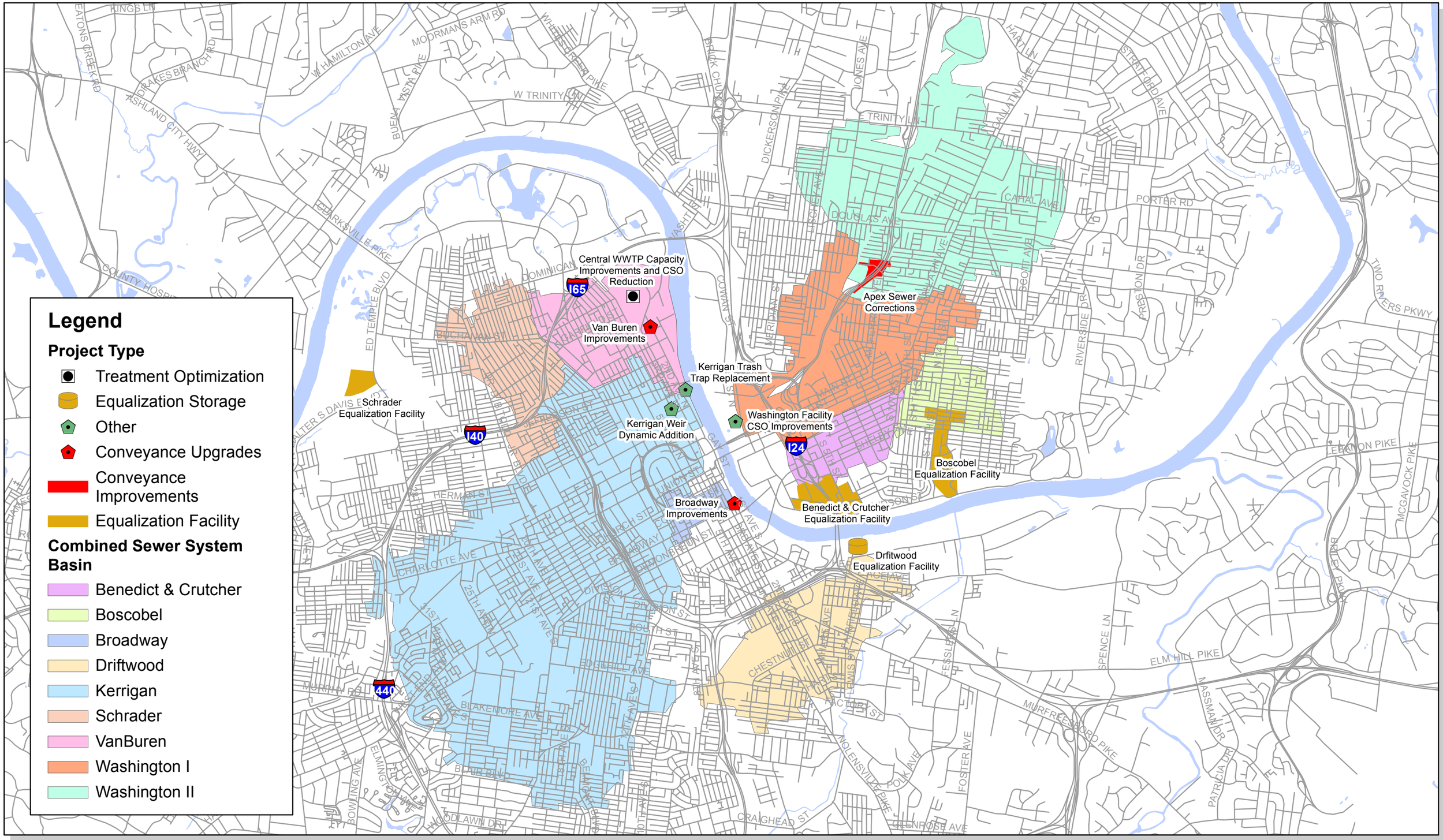

Figure 1-1 Overview of Current LTCP Projects

2.0 Revised Project Extents

The goal of the LTCP is to bring MWS's CSOs into compliance with water quality standards in a manner consistent with the CSO Control Policy. Projects identified in the LTCP include reduction of flow by removing a portion of the stormwater from the combined sewer system (CSS), conveyance improvements to transport additional flow (including pump station improvements), treatment improvements to treat additional flow, or storage facilities to temporarily store excess flow during rainfall events.

Improvement projects that have been redefined or added/removed since submittal of the LTCP are summarized as **Table 2-1**.

Table 2-1 Planned Improvement Projects with Revised Scope

Project Name	Improvements as Defined in LTCP	Current Revised Improvements
Central WWTP Capacity Improvements and CSO Reduction	N/A	Plant Optimization Pump Station: additional 80 mgd CSS Screening: 440 mgd Equalization Storage: 5 MG
Central WWTP Equalization Storage Phase I	Equalization Storage: 13 MG	Replaced by Central WWTP Capacity Improvements and CSO Reduction
Central WWTP Equalization Storage Phase II[1]	Equalization Storage	Replaced by Central WWTP Capacity Improvements and CSO Reduction
Central WWTP Equalization Storage Phase III[1]	Equalization Storage	Replaced by Central WWTP Capacity Improvements and CSO Reduction
Central WWTP Optimization and Equalization Conversion	Plant Optimization Equalization Storage: 5 MG	Replaced by Central WWTP Capacity Improvements and CSO Reduction
Central WWTP Pumps/Equalization Grit Equipment	Plant Optimization Pump Station: additional 80 mgd CSS Screening: 240 mgd	Replaced by Central WWTP Capacity Improvements and CSO Reduction
First Avenue Tunnel (FAT) Access	Other (Tunnel Access)	None
Parthenon Area Improvements	Rehabilitation: 90 acres Green Infrastructure	None
CSS and FAT Rehabilitation	Rehabilitation	None

[1]Amount of equalization storage was to be determined following completion of the *Central Wastewater Treatment Plant Optimization Study, 2014.*

As can be observed from **Table 2-1**, nine projects have been adjusted or added/removed since submittal of the LTCP. The following subsections, **Sections 2.1** through **2.4**, summarize the scope revisions for each of these projects.

2.1 Improvements at the Central WWTP

The Kerrigan CSO, located south of the Central WWTP, is the largest CSO in the MWS CSS. During development of the LTCP, it was determined through hydraulic model analysis that the Kerrigan CSO is highly dependent on the operation of both the Central Pumping Station and Central

WWTP. Site improvements at Kerrigan were not considered to be the most cost-effective alternative during development of the LTCP and would be difficult/prohibitive to implement due to existing and anticipated development in the area. To address the Kerrigan CSO, it was determined that a combination of improvements at the Central WWTP would be a cost-effective means to control discharges. These included increasing the capacity of the Central Pumping Station to 240 million gallons per day (mgd) and up to 40 million gallons (MG) of equalization storage. The LTCP also discussed the possibility that additional operational upgrades and enhancements may be considered for substitution of the detention-based CSO controls proposed at the Central WWTP. As defined in the LTCP, the following five projects were proposed for implementation of these improvements: Central WWTP Equalization Storage Phase I, Central WWTP Equalization Storage Phase II, Central WWTP Equalization Storage Phase III, Central WWTP Optimization and Equalization Conversion, and Central WWTP Pumps/Equalization Grit Equipment.

Following completion of the *Central Wastewater Treatment Plant Optimization Study* in 2014, it was determined that the peak wet-weather secondary treatment capacity of the Central WWTP could be significantly increased through upgrades to the existing headworks, secondary aeration, and final clarification systems without building new tankage. These improvements would reduce the overflow frequency and volume from the Kerrigan CSO by increasing the conveyance capacity of the Central Pumping Station, the wet-weather treatment capacity of the Central WWTP, and the overall capacity of the Central WWTP. Therefore, the scope of work at the Central WWTP was redefined with the Central WWTP Capacity Improvements and CSO Reduction project replacing the five original projects outlined in the LTCP.

The Central WWTP Capacity Improvements and CSO Reduction project consists of the following elements:

- Central Pumping Station – Add new pumps to raise the capacity to 240 mgd at operating level for the pumping station with the ability to pump up to 300 mgd with the wet well surcharged prior to overflowing at the Kerrigan CSO
- Equalization Storage – Convert existing, unused tanks that were formerly aeration basins to on-site storage to assist in managing rapidly changing flows during the transition from dry-weather flows to wet-weather flows
- Headworks – Construct a new, combined headworks facility for flow from both the separate sanitary sewer system (SSS) and the CSS. The new headworks structure will have a peak influent capacity of 440 mgd, and it will include new ½-inch coarse screens, new grit removal facilities, and new 6 mm fine screens.
- Primary Clarifiers – Install new baffles to enhance the peak hydraulic capacity of the primary clarifiers
- Intermediate Pumping Station – Supplement the capacity of the existing screw lift pumps by adding new vertical axial flow pumps to achieve a firm capacity of 350 mgd

- Aeration – Remove the existing draft tube aeration system and replace it with fine bubble diffusers. Re-configure the existing aeration basins to include an anaerobic selector and plug flow zones to have the ability to achieve biological nutrient removal. Modify the inlet to each of the eight aeration basins to allow passive flow splitting by using a zero-loss influent channel and cut-throat flumes.
- Secondary Clarifiers – Modify the inlet zones to the circular clarifiers to maximize peak hydraulic capacity
- Return Activated Sludge (RAS) System – Add a new passive splitter box to evenly divide RAS among the eight aeration basins, along with piping to convey the split flow to each aeration basin
- UV Disinfection – Convert the existing north chlorine contact chamber to a new UV disinfection facility with a peak capacity of 350 mgd
- Excess Flow Treatment Unit - Convert existing disinfection facility for treating peak flow from the combined sewer system from chlorination to peracetic acid (PAA). Utilization of PAA in lieu of chlorination will reduce disinfection byproducts generated when treating combined sewer flows with trace amounts of organic material.
- Piping Improvements – Construct substantial piping improvements, as required, to convey flow from the Central Pumping Station to the new headworks, from the new headworks to the primary influent channel, and from the south secondary clarifiers to the new UV disinfection system. Substantial piping modifications will also be necessary to route Browns Creek and 28th Avenue Pump Station flows to the new headworks.

More information about the elements and locations of the Central WWTP Optimization and CSO Reduction project is detailed in the BODR, located on the program website (http://www.cleanwaternashville.org/content/projects/central-wwtp-capacity-improvements-and-cso-reduction). The BODR was approved by the Tennessee Department of Environment and Conservation (TDEC) on May 16, 2017, under project No. 17.0228. Refinements to the BODR, such as the consolidation of the proposed CSS screening and grit headworks into one headworks facility for both the CSS and SSS, will continue as design is developed for construction.

2.2 FAT Access

As defined in the LTCP, the FAT Access project consisted of the construction of three access shafts to the 72-inch diameter tunnel along First Avenue to facilitate inspection, improve cleaning opportunities, and to allow for flow monitoring.

With recent extensive redevelopment in the project area, such as the Ascend Amphitheatre and multiple mixed-use and residential developments in the Germantown and Rolling Mills areas, adding access locations for FAT will prove challenging and costly. Additionally, current

technologies for cleaning and inspection allow for greater distances between access points, as evidenced by the cleaning of FAT that was completed following the May 2010 flood.

Although included in the LTCP, the FAT Access project does not have a direct impact on overflows in the CSS, and it may be pursued as an operational / maintenance project in the future, if needed. Therefore, the FAT Access project was cancelled in February 2017.

2.3 Parthenon Area Improvements

As presented in the LTCP, the Parthenon Area Improvements project consisted of rehabilitation and green infrastructure improvements to address drainage issues in a localized CSS area upstream of Centennial Park. The project was to consist of rehabilitation of existing gravity sewer, bioswales, pervious pavement, roadway reconstruction, and detention of local street runoff. As outlined in the LTCP, the Parthenon Area Improvements project was to be integrated with the 28th Avenue Connector roadway project (completed in 2012) and renovation work in Centennial Park (Phase I completed in 2015).

Following several discussions with MWS's Engineering and Stormwater Divisions and a reduction of surface flooding impacts and customer complaints in the project area as the area has redeveloped, the Parthenon Area Improvements project was cancelled in October 2016. Cancellation of this project is not anticipated to have an adverse effect on the proposed reduction of CSOs as presented in the LTCP.

2.4 CSS and FAT Rehabilitation

As defined in the LTCP, the CSS and FAT Rehabilitation project was identified to provide a funding source for rehabilitation of FAT and other locations within the combined sewer system, as they are identified.

Although included in the LTCP, the CSS and FAT Rehabilitation project does not have a direct impact on overflows in the CSS and may be pursued as an operational/maintenance project in the future, if needed. Therefore, the CSS and FAT Rehabilitation project was cancelled in May 2018.

3.0 Additional Consideration of CSS Separation

Although partial or full sewer separation was not recommended for any CSS basins, MWS continues to evaluate this as an option for the Benedict & Crutcher, Boscobel, and Schrader basins. This evaluation will be conducted from a total system-renewal and life-cycle standpoint. In some locations, the cost of addressing structural and maintenance issues with the existing CSS basin combined with the capital and long-term costs of pumping and storage may exceed the cost of separation. Full separation, if pursued, would eliminate the CSO, thus exceeding the CSO control level proposed in the LTCP. Partial separation of the CSS basin may also be considered, although that approach would likely require an equalization facility (although smaller than currently planned) to be constructed to meet the proposed level of CSO control. It should be noted that separation in one, or all, of the three smaller basins is not anticipated to result in

appreciable changes to water quality due to the predicted small pathogen contributions of each of the three CSS basins, following the detention-based solutions proposed in the LTCP.

4.0 Conclusion

As stated in the LTCP, although approximate sizing and extents of each project are/were provided for planning level purposes, the final sizing, extent, and layout of each project has been, or will be, determined during design. If project scopes are modified, the project will continue to be designed to meet or exceed the proposed level of CSO control presented in the LTCP and in this addendum. These modifications, if identified, will be explained in the progress reports submitted as part of the CD requirements. Following completion of the listed projects, post-construction monitoring and modeling will be conducted to confirm the performance of the constructed control measures.

For each remaining CSO discharge site, the overflow frequencies predicted for the typical year are summarized in **Table 4-1**.

Table 4-1 Predicted CSO Frequencies

CSO Site	Overflow Frequency for Typical Year
Benedict & Crutcher	2
Boscobel	0
Driftwood	0
Kerrigan	9
Schrader	2
Washington	15*

*Analyses following construction of the conveyance and storage improvements have revised the overflow frequency relative to that presented in the *Long Term Control Plan*.

As provided in the CD, MWS is allowed eleven years to complete implementation of the LTCP, following approval. However, through recent discussions among MWS, the Environmental Protection Agency, and TDEC, the current projects identified, which are considered Phase I, are anticipated to be completed no later than eight years following approval of the LTCP. Additional projects, comprising Phase II, may be identified by MWS if water quality standards are not met following completion of the Phase I work. Phase II work, if identified, is anticipated to be completed within eleven years from approval of the LTCP.