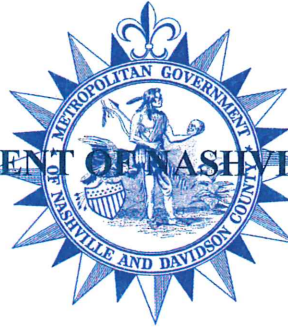


JOHN COOPER
MAYOR



METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY

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

August 19, 2020

Ms. Carol Kemker
Director, Enforcement and Compliance Assurance Division
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street
Atlanta, GA 30303-8960

Ms. Jennifer Dodd
Director, Division of Water Resources
Tennessee Department of Environment and Conservation
213 Rosa L. Parks Avenue
Nashville, TN 37243-1102

RE: *Addendum #2 to the LTCP*
Consent Decree 3:07-cv-01056
DOJ Case No. 90-5-1-1-09000

Dear Colleagues:

Subsequent to our discussions on the *Long Term Control Plan (LTCP)* on July 13, 2020, we hereby submit the enclosed *Addendum #2 to the LTCP*. The Addendum summarizes updates and modifications to projects described in the LTCP, specifically our decision to pursue sewer separation to address three CSO locations.

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,

A handwritten signature in blue ink that reads "Ron C. Taylor".

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



If you need assistance or an accommodation, please contact Metro Water Services,
at 615-862-4862, 1600 Second Avenue North, Nashville, Tennessee 37208.

Addendum #2 to the LTCP, Consent Decree 3:07-cv-01056
August 19, 2020
Page 2

cc: Mr. Dennis Sayre, EPA
Ms. Angela Jones, TDEC

Enclosure: *Addendum #2 to the LTCP*



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

Addendum

DATE: July 24, 2020

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

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

RE: Addendum #2 to the *Long Term Control Plan* for Metro Nashville Combined Sewer Overflows

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

No. of Pages: 8

On March 12, 2009, the Metropolitan Government of Nashville and Davidson County, Tennessee (Metro) entered into a Consent Decree with the United States of America and the State of Tennessee. Among other items, the Consent Decree required that Metro prepare and submit a *Long Term Control Plan* (LTCP) that illustrates how Metro Water Services (MWS) will bring its combined sewer overflows (CSOs) into compliance with water quality standards in a manner consistent with the CSO Control Policy.

In September 2011, MWS submitted the LTCP, fulfilling the intent of Section VII, Part D.2, of the Consent Decree. Since submittal of the LTCP in 2011, information from the *Central Wastewater Treatment Plant (WWTP) Optimization Study, 2014*; the *Central WWTP Optimization Basis of Design Report (BODR), 2016*; the *Central WWTP Capacity Improvements and CSO Reduction – Final BODR Update – Technical Memorandum No. 2: New Headworks Facility, 2018*; additional flow monitoring and hydraulic analyses; and the re-evaluation of proposed improvements has resulted in adjustments to several projects listed in the original LTCP.

In June 2018, MWS submitted an *Addendum to the Long Term Control Plan for Metro Nashville Combined Sewer Overflows* (Addendum #1) that documents the updates, modifications, and additions to the LTCP since 2011.

The purpose of this addendum (Addendum #2) is to present additional adjustments to the planned improvement projects and to provide a general updated summary of all current projects included under the LTCP.

1. Proposed Combined Sewer System Projects

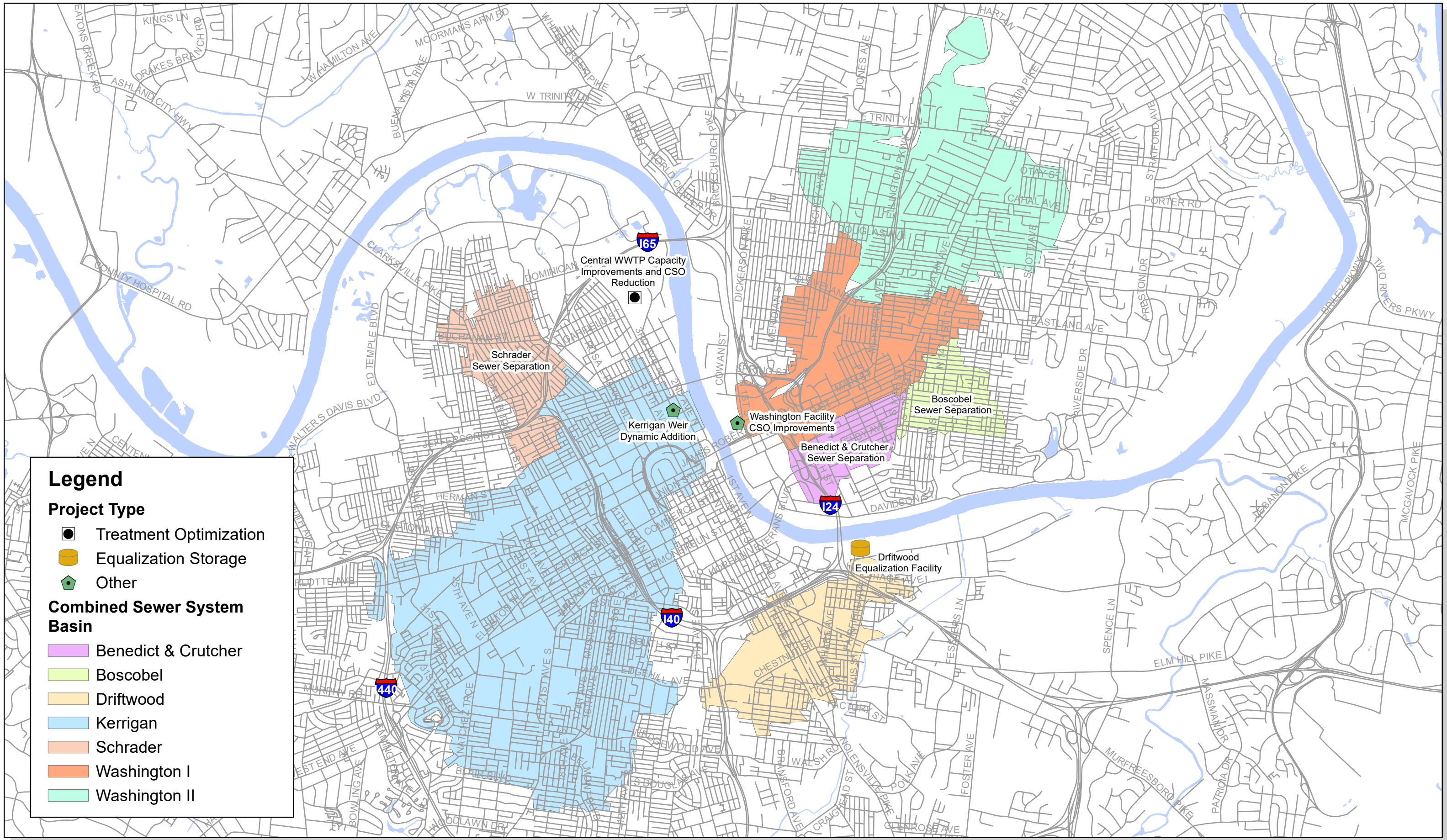
Following the elimination of the Broadway and Van Buren CSOs in 2011, MWS has six active, permitted CSO locations: Benedict & Crutcher, Boscobel, Driftwood, Kerrigan, Schrader, and Washington. For each CSO, proposed LTCP projects and associated status information is summarized in the following sections. Project locations are shown in **Figure 1-1**.

1.1 Benedict & Crutcher CSO

As presented in the LTCP, the proposed project to address the Benedict & Crutcher CSO consisted of construction of a new diversion structure, an 81 million gallons per day (mgd) CSO pumping station, and a 4 million gallons (MG) equalization storage tank. The proposed Benedict & Crutcher Equalization Facility was anticipated to provide a near 100 percent capture of wet-weather flows and reduce the CSO frequency to two events in the typical year.

Because the Benedict & Crutcher combined sewer system (CSS) basin has experienced significant redevelopment since submittal of the LTCP, MWS re-evaluated the Benedict & Crutcher Equalization Facility project considering life-cycle costs of that facility and the need to renew existing CSS infrastructure in the basin. As a result of that analysis, in February 2020, MWS elected to pursue sewer separation in the Benedict & Crutcher CSS basin. This approach, although costlier than the equalization facility, will allow MWS to address aging sewer infrastructure while eliminating the CSO discharge point.

The proposed Benedict & Crutcher Sewer Separation project is intended to fully separate the existing combined sewer system (approximately 250 acres) upstream of the Benedict & Crutcher regulator. Additional infrastructure improvements, such as water distribution system improvements, may also be conducted as part of this project. The project is anticipated to begin design by the 2nd Quarter of 2023. Construction is anticipated to be complete by the 3rd Quarter of 2028, although the timeframe for construction requires coordination with redevelopment activities by the Metropolitan Development and Housing Agency in the basin.



Legend

Project Type

- Treatment Optimization
- Equalization Storage
- ◆ Other

Combined Sewer System Basin

- Benedict & Crutcher
- Boscobel
- Driftwood
- Kerrigan
- Schrader
- Washington I
- Washington II

Figure 1-1 Overview of Current LTCP Projects



All improvements shown are for planning purposes and will be reviewed during design.



1.2 Boscobel CSO

As presented in the LTCP, the proposed project to address the Boscobel CSO consisted of construction of a new diversion structure, a 23 mgd CSO pumping station, and a 1 MG equalization storage tank. The proposed Boscobel Equalization Facility was anticipated to capture all events in the typical year, reducing the CSO frequency to zero in the typical year.

Similar to the Benedict & Crutcher CSS basin, MWS re-evaluated the Boscobel Equalization Facility project considering life-cycle costs of that facility and the need to renew existing CSS infrastructure in the basin. As a result of that analysis, in February 2020, MWS elected to pursue sewer separation in the Boscobel CSS basin. This approach, although costlier than the equalization facility, will allow MWS to address aging sewer infrastructure while eliminating the CSO discharge point.

The proposed Boscobel Sewer Separation project is intended to fully separate the existing combined sewer system (approximately 250 acres) upstream of the Boscobel regulator. Additional infrastructure improvements, such as water distribution system improvements, may also be conducted as part of this project. The project is anticipated to begin design by the 4th Quarter of 2023, and construction is anticipated to be complete by the 2nd Quarter of 2029.

1.3 Driftwood CSO

Completed in November 2013, the Driftwood Equalization Facility project consisted of adding an additional 3.2 MG of equalization storage at the existing Driftwood Facility, along with the correction of operational electrical defects observed at the site. This improvement is anticipated to reduce the CSO frequency to zero in the typical year.

1.4 Kerrigan CSO

The following subsections describe the two projects proposed to address the Kerrigan CSO.

1.4.1 Central WWTP Capacity Improvements and CSO Reduction

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 the Central WWTP. Site improvements at Kerrigan were not considered to be the most cost-effective alternative during development of the LTCP, and they 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 mgd with up to 40 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: 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.

As detailed in Addendum #1, following completion of the *Central Wastewater Treatment Plant Optimization Study (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, primary treatment, secondary aeration, and final clarification systems. 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, and the Central WWTP Capacity Improvements and CSO Reduction project replaced the five original projects outlined in the LTCP.

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

- Central Pumping Station – Add new pumps to raise the capacity to 240 mgd at operating level 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, new 6 mm fine screens, and associated solids removal and disposal support systems.
- Primary Clarifiers – Install new influent flow 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 to secondary treatment systems
- 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 and piping to convey the split flow to each upgraded 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 the existing disinfection facility for treating peak flow from the combined sewer system from chlorination to liquid sodium hypochlorite. Utilization of sodium hypochlorite in lieu of gaseous chlorination will reduce disinfection byproducts generated when treating combined sewer flows with trace amounts of organic material and will allow for faster system startup. The rated capacity of the Excess Flow Treatment Unit will also be increased from 80 mgd to 120 mgd.
- 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 flows from the Browns Creek Pump Station and the 28th Avenue Pump Station to the new headworks.

More information about the elements and locations of the Central WWTP Optimization and CSO Reduction project can be found on the Clean Water Nashville Program's website (<http://www.cleanwaternashville.org/content/projects/central-wwtp-capacity-improvements-and-cso-reduction>).

The *Central WWTP Optimization Basis of Design Report (BODR), 2016*, was approved by the Tennessee Department of Environment and Conservation (TDEC) on May 16, 2017, under project No. 17.0228. Additional refinements to the 2016 BODR were continued as part of the design phase of the project. The consolidation of the proposed CSS screening and grit headworks into one headworks facility for both the CSS and SSS is described in the *Central WWTP Capacity Improvements and CSO Reduction – Final BODR Update – Technical Memorandum No. 2: New Headworks Facility, 2018*. That document was approved by TDEC on December 3, 2019, under project No. 19.0739.

The Central WWTP Capacity Improvements and CSO Reduction project began construction in June 2020 and is anticipated to complete construction by the 1st Quarter of 2025. This project, along with the Kerrigan Dynamic Weir Addition detailed in **Section 1.4.2**, is anticipated to achieve a 91 percent capture of wet-weather flows and reduce the frequency of CSOs to nine events in the typical year at Kerrigan.

1.4.2 Kerrigan Weir Dynamic Addition

As discussed in the LTCP, the hydraulics for the Kerrigan CSO were re-evaluated for opportunities to convey additional flows from the Kerrigan CSS to the Central WWTP. The proposed Kerrigan Weir Dynamic Addition project optimizes the overflow structure by the addition of a dynamic

weir that will raise the effective diversion weir height during some storm events while allowing a lower position to be utilized during large storm events to reduce the likelihood of upstream flooding. This dynamic addition to the weir, along with the improvements detailed in **Section 1.4.1** for the Central WWTP, is anticipated to achieve a 91 percent capture of wet-weather flows and reduce the frequency of CSOs to nine events in the typical year at Kerrigan. The project is anticipated to begin design by the 4th Quarter of 2027, and construction is anticipated to be complete by the 3rd Quarter of 2030.

1.5 Schrader CSO

As presented in the LTCP, the proposed project to address the Schrader CSO consisted of construction of a new diversion structure, a 32 mgd CSO pumping station, and a 3.2 MG equalization storage tank. The proposed Schrader Equalization Facility was anticipated to provide a near 100 percent capture of wet-weather flows and reduce the CSO frequency to two events in the typical year.

Similar to the Benedict & Crutcher CSS basin, MWS re-evaluated the Schrader Equalization Facility project considering life-cycle costs of that facility and the need to renew existing CSS infrastructure in the basin. As a result of that analysis, in February 2020, MWS elected to pursue sewer separation in the Schrader CSS basin. This approach, although costlier than the equalization facility, will allow MWS to address aging sewer infrastructure while eliminating the CSO discharge point.

The proposed Schrader Sewer Separation project is intended to fully separate the existing combined sewer system (approximately 450 acres) upstream of the Schrader regulator. Additional infrastructure improvements, such as water distribution system improvements, may also be conducted as part of this project. The project is anticipated to begin design by the 3rd Quarter of 2022, and construction is anticipated to be complete by the 1st Quarter of 2028.

1.6 Washington CSO

As defined in the *Nine Minimum Controls Plan* and LTCP, the Washington CSO Facility Improvements project consisted of the construction of a large screening and floatables facility to remove materials from the CSO discharge prior to conveyance to the Cumberland River. In addition to providing screening and trapping of solids and floatable debris, the structure provides in-line system storage to reduce the frequency of the Washington CSO. With the project in place, the Washington CSO is anticipated to achieve a 90 percent capture of wet-weather flows and result in approximately 15 CSO events in the typical year.

The Washington CSO Facility Improvements project was completed in April 2012.

1.7 Green Improvements

As noted in the LTCP, MWS continues to look for opportunities to incorporate Green Infrastructure and Low Impact Development (GI/LID) projects in the CSS to improve water quality and reduce peak rates of stormwater runoff. This includes establishing requirements for developers to incorporate GI/LID practices as well as evaluating locations on MWS or other

Metro-owned properties where GI/LID projects may be implemented. When considered individually, these GI/LID projects are not expected to change the volume or frequency of CSO discharges; however, the cumulative effect over time may lead to significant improvements. In the short-term, these projects may address local drainage and flooding issues. GI/LID projects are anticipated to continue throughout implementation of the LTCP.

2. Summary of Proposed LTCP Projects

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 Consent Decree 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 2-1. The schedule for projects underway and those upcoming is provided in Table 2-2. Schedule dates assume that approval of the LTCP is received no later than October 1, 2020. As provided in the Consent Decree, MWS is allowed eleven years to complete implementation of the LTCP, following approval.

Table 2-1 Predicted Typical Year CSO Results following LTCP Implementation

CSO Site	Overflow Frequency	Percent Capture
Benedict & Crutcher	0	100
Boscobel	0	100
Driftwood	0	100
Kerrigan	9	91
Schrader	0	100
Washington	15*	90

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

Table 2-2 LTCP Project Schedule

Project Name	Construction Complete Assuming LTCP Approval by October 1, 2020
Benedict & Crutcher Sewer Separation	3rd Quarter of 2028
Boscobel Sewer Separation	2nd Quarter of 2029
Central WWTP Capacity Improvements and CSO Reduction	1st Quarter of 2025
Kerrigan Weir Dynamic Addition	3rd Quarter of 2030
Schrader Sewer Separation	1st Quarter of 2028