Ocean Outfall Legislation Program

MIAMI-DADE WATER AND SEWER DEPARTMENT

Compliance Plan 2016 Update

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Executive Summary

Florida Statutes (F.S.) Title XXIX Section 403.086 contain the Ocean Outfall Legislation (OOL) that affects Miami-Dade Water and Sewer Department (WASD). This law requires southeast Florida utilities to eliminate the use of ocean outfalls by the end of 2025, except under certain defined conditions. The law also mandates a minimum amount of reclaimed water reuse and nutrients reductions prior to 2025. Part of the law requires specific reports be delivered to the Florida Department of Environmental Protection (FDEP), including a Compliance Plan that was submitted in 2013 and an update to be submitted in July 2016. This report is the Compliance Plan 2016 Update.

2016 Update

This Compliance Plan 2016 Update provides the information that Subsection 403.086(9)(e)2, F.S. requires. This report addresses the current list of projects, schedules, costs, financing, and an overview of the public outreach program.

This update is a summary of the current OOL Program that is still being refined. All projects will be subject to some level of refinement through additional conceptual design, the final design process, and up through construction. There is still significant coordination and planning being conducted to minimize stranded assets while addressing WASD's projected demands to the year 2035 in a cost-effective manner. Most of the projects have not entered the conceptual design phase yet.

There is substantial design and construction activity beginning between 2017 and 2018. Initial construction is already underway to divert nutrients in advance of 2025 and the pace of diversion will increase in 2018 with new industrial wells at the Central District Wastewater Treatment Plant (CDWWTP). Land acquisition for the new western wastewater plant is underway. Initial conceptual design work for new high-level disinfection and wet weather treatment will start at the existing wastewater plants soon.

WASD is committed to meeting all objectives and requirements of the OOL and will keep FDEP and the public informed of its progress through an active public outreach program.

OOL Project List Update

WASD's 2013 OOL Compliance Plan included the following major improvements under Alternative 2A-2-2 (WASD, 2013):

- Reduction of average daily inflows to North District Wastewater Treatment Plant (NDWWTP) and CDWWTP by redirecting flows to other wastewater treatment plants (WWTPs)
- A new West District Wastewater Treatment Plant (WDWWTP)
- A new booster pump station(WP-1) and force main connections (CL-7 and CL-9) in the Doral area to allow for increased influent flow diversion to and from the NDWWTP and increased flexibility with regard to flow transfer between WWTPs
- Upgrade to Pump Station 187 for improved wastewater flow transfers among WWTPs
- Increased capacity for the management of peak wet weather flows to the NDWWTP, CDWWTP, and South District Wastewater Treatment Plant (SDWWTP)
- Eliminate normal use of the ocean outfalls at NDWWTP and CDWWTP by utilizing injection wells at all WWTPs

- Divert nutrients from the outfalls prior to the end of 2025 by early use of injection wells at NDWWTP and CDWWTP

In addition, there were various collection system projects required to facilitate the new operating strategy.

This update provides the latest details on how the plan is progressing. The basic elements from the 2013 Compliance Plan are still intact, but there are significant differences in flow rates that need to be managed. This difference is primarily the result of the coordinated planning efforts with the Consent Decree program to derive new population-based wastewater projections, climate change impacts (including rising sea level impacts), and overall better planning for the many capital projects that WASD is committed to implement over the next 19 years.

The conveyance system projects (pipelines and pump stations) are being intensively studied because the movement of wastewater during both dry and wet conditions is a major factor in the success of the OOL program. Some projects have been redefined; some conveyance projects are under consideration of being eliminated or new ones added; some projects are under further consideration as to their place in the plan; and the previous planned recharge well projects were consolidated into one future reclaimed water reuse project. Table ES-1 provides the current list of projects that the OOL Program is tracking. This list includes projects directly associated with eliminating the outfall discharge and compliance plus essential work that is required to allow WASD to meet the capacity and operational needs of their wastewater system. CH2M HILL, Inc. (CH2M) (Owner's Representative) is coordinating the planning of these conveyance projects with the Consent Decree and WASD to confirm that the capital improvement programs are aligned.

Table ES-1. OOL Program Updated Project List
Compliance Plan 2016 Update

Project ID	Description	Compliance Plan 2016 Updated Projects (uCP)	Projects Needed for Capacity and Operations
CE-1	CDWWTP Municipal Wells Pump Station	uCP	
CE-2	CDWWTP Municipal Wells	uCP	
CE-3	CDWWTP Industrial Wells Pump Station	uCP	
CE-4	CDWWTP Industrial Wells	uCP	
CL-1	N. Biscayne FM Extension S. to PS 02 Discharge		Capacity
CL-2	Coral Gables Reroute		Capacity
CL-4	East/West FM Connection from PS 187 to WDWWTP	uCP	
CL-5	FM Connection in SW 137 Avenue to CL-4 in NW 6 Street	uCP	
CL-6	FM Connection in NW 74 Street from NW 97 to NW 107 Avenue – Doral		Capacity
CL-8	FM Connection to SW 8 Street from SW 152 Avenue to SW 177 Avenue – West Dade		Capacity
CL-9	FM from WP-1 (Doral) to WDWWTP	uCP	
CL-X	Flow Control Pipeline Interconnections	uCP	
CP-1	Downtown Booster Station		Capacity
CP-187E	Upgrades and Expansion of PS 187	uCP	
CT-2	CDWWTP HLD Filters	uCP	

Table ES-1. OOL Program Updated Project List
Compliance Plan 2016 Update

Project ID	Description	Compliance Plan 2016 Updated Projects (uCP)	Projects Needed for Capacity and Operations
CT-3	CDWWTP Peak Flow Treatment	uCP	
NE-1	NDWWTP Municipal Wells Pump Station	uCP	
NE-2	NDWWTP Municipal Wells	uCP	
NE-4	NDWWTP Industrial Wells	uCP	
NE-5	NDWWTP Industrial Wells Pump Station	uCP	
NL-1A	FM from Biscayne Blvd to North Miami Ave (Phase 1)		Capacity
NL-1B	FM from North Miami Ave to PS 306 (Phase 2)		Capacity
NL-1C	FM from PS 306 to Red Road (Phase 3)		Capacity
NL-2	FM Extension from NW 87 Avenue/W 76 Street to pipeline in NW 67 Avenue		Capacity
NL-3	FM in W 12 Avenue (NW 67 Avenue) from W 79 Street to W 84 Street (NW 138 Street)		Capacity
NL-6A	FM Connection from PS 0416 to NP-1 along NW 185 Street		Capacity
NL-7	FM to Allow PS 300 to Pump North to PS 1310 Discharge		Capacity
NP-416E	Upgrades to PS 416		Capacity
NT-2	NDWWTP HLD Filters	uCP	
NT-3	NDWWTP Peak Flow Treatment	uCP	
PS-306	PS 306		Capacity
PSOP	Pump Station Optimization Program		Management
PSPF	Pump Station Peak Flow Upgrades		Management
SE-1	SDWWTP Municipal Wells Pump Station Expansion	uCP	
SE-2	SDWWTP Municipal Wells	uCP	
SE-3	SDWWTP Industrial Wells	uCP	
SE-4	SDWWTP Industrial Wells Pump Station	uCP	
SL-1A	FM Connection in SW 232 Street from SW 127 Avenue to SDWWTP		Capacity
SL-1B	FM Connection in SW 248 Street from SW 112 Avenue to SDWWTP		Capacity
SL-2	FM Connection from SP-1 on SW 137 Avenue to SL-1B		Capacity
SL-3A	FM Connection from SP-1 to SW 137 Avenue and SW 136 Street (Phase 1)		Capacity
SL-3B	FM Connection in SW 137 Avenue from SW 136 Street to SW 104 Street (Phase 2)		Capacity
SL-3C	FM connection from SW 104 Street to SW 88 Street		Capacity
SL-4	FM Connection from PS 692 to SW 268 Street and SW 127 Avenue		Capacity
SL-5	FM Connection from PS 691 to PS 692		Capacity

Table ES-1. OOL Program Updated Project List
Compliance Plan 2016 Update

Project ID	Description	Compliance Plan 2016 Updated Projects (uCP)	Projects Needed for Capacity and Operations
SP-1	Southwest Dade Booster Station		Capacity
SP-1073E	Upgrades to PS 1073		Capacity
SP-522E	Upgrades to PS 522		Capacity
SP-692E	Upgrades to PS 692		Capacity
SR-2	SDWWTP Reclaimed Water Pipeline to Turkey Point	uCP	
ST-1	SDWWTP Treatment Upgrade to 121 mgd	uCP	
ST-2	SDWWTP Treatment Upgrade to 131 mgd	uCP	
WE-1	WDWWTP Municipal Wells Pump Station	uCP	
WE-2	WDWWTP Municipal Wells	uCP	
WP-1	Doral Booster Station	uCP	
WT-1	WDWWTP Phase 1	uCP	
WT-1L	WDWWTP Land Acquisition	uCP	Capacity
WT-2	WDWWTP Phase 2	uCP	
XL-1	Lining Pipeline from PS 300 to NDWWTP		Operations
XR-1	Future Reclaimed Water Reuse Projects	uCP	
XS-1	WWTP Storm Surge Protection		Resiliency

FM = force main
PS = Pump Station

There are projects originally in the 2013 Alternative 2A-2-2 under consideration for being deleted pending further review and investigation (Table ES-2). Preliminary peak flow conveyance system modeling results indicated that these projects may be unnecessary. However, these projects may be required for capacity or to improve operations based on considerations beyond the technical modeling results conducted to date. WASD will retain these potential projects in the plan until the conceptual design reports are completed.

Table ES-2. OOL Program Projects that May Be Redundant
Compliance Plan 2016 Update

Project ID	Description	Projects Needed for Capacity and Operations
NL-4	48-inch FM Connection in NW 67 Avenue from W 84 Street to NW 122 Street	Pending Deletion
NL-6	24-inch FM Connection from PS 0416 to 30-inch FM at NW 171 Street/67 Avenue	Pending Deletion
CL-3	48-inch FM Connection in NW 58 Street from NW 107 Avenue to 87 Avenue - Doral	Pending Deletion
SL-6	24-inch FM Connection from PS 1073 to PS 691	Pending Deletion

Similarly, there are projects under consideration for addition to the OOL Program (Table ES-3). Preliminary peak flow conveyance system modeling results indicated that these projects may be needed to facilitate the movement of flows in the system. WASD will add these projects as OOL projects during the conceptual design phase if they are validated as necessary.

Table ES-3. OOL Program Projects that May be Added
Compliance Plan 2016 Update

Project ID	Description	Projects Needed for Capacity and Operations
NP-1	North Dade Booster Station at 57 Avenue (NW 183 Street)	Pending Addition
CL-10A	48-inch FM Connection from CL-1 to Suction of CP-1	Pending Addition
CL-10B	48-inch FM Connection from Existing 48-inch Discharge of PS 01 and PS 02 to Discharge of CP-1	Pending Addition
CL-10C	48-inch FM Connection from Existing 48-inch Across River to Discharge of CP-1	Pending Addition
SP-559E	Upgrades to PS 559	Pending Addition

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Acronyms and Abbreviations

AADF	annual average day flow
AO	Administrative Order
CDWWTP	Central District Wastewater Treatment Plant
CH2M	CH2M HILL, Inc. (Owner's Representative)
CIP	Capital Improvement Program
EPA	U.S. Environmental Protection Agency
FDEP	Florida Department of Environmental Protection
FPL	Florida Power & Light
FM	force main
F.S.	Florida Statutes
gpd/sf	gallons per day per square feet
GLUMRB	Great Lakes - Upper Mississippi River Board
GWI	groundwater infiltration
Hazen	Hazen and Sawyer
HLD	high-level disinfection
kWh	kilowatt-hour
M	million
mgd	million gallons per day
mg/L	milligrams per liter
MYCIP	Multi-Year Capital Improvement Plan
NDWWTP	North District Wastewater Treatment Plant
NPDES	National Pollutant Discharge Elimination System
OOL	Ocean Outfall Legislation
PS	Pump Station
psi	pounds per square inch
RAS	return activated sludge
SDWWTP	South District Wastewater Treatment Plant
SLR	Sea level rise
SOR	surface overflow rate
TN	total nitrogen
TP	total phosphorus
TSS	total suspended solids
uCP	updated Compliance Plan project

WASD	Miami-Dade Water and Sewer Department
WDWWTP	West District Wastewater Treatment Plant
WWTP	wastewater treatment plant

SECTION 1

Introduction

1.1 Florida Statutes Requirements

As a result of revisions to the Florida Statutes (F.S.) Title XXIX, Section 403.086 in 2008 and 2013, (Chapters 2008-232 and 2013-31, respectively), herein termed the Ocean Outfall Legislation (OOL), the Miami-Dade Water and Sewer Department (WASD) was required to begin a process to eliminate the use of the North District Wastewater Treatment Plant (NDWWTP) and Central District Wastewater Treatment Plant (CDWWTP) ocean outfalls by the end of 2025, except under certain defined conditions. As part of this legislation, WASD is also required to:

- Implement 117.5 million gallons per day (mgd) of additional technically and economically feasible reuse capacity on an annual basis calculated as 60 percent of the average baseline flow rate of the NDWWTP and CDWWTP outfalls (baseline average flow from 2003 through 2007 is 195.8 mgd)
- Meet an equivalent advanced wastewater treatment goal for outfall discharges prior to the end of 2025; the OOL sets forth three alternatives by which nutrients discharged by the ocean outfalls could be reduced
- Perform various compliance reporting activities

A Progress Report was submitted as required in 2009. The 2009 Progress Report included information about the alternatives under consideration to comply with the OOL. In 2013, a detailed OOL Compliance Plan was submitted (WASD, 2013) that complied with Subsection 403.086(9)(e)(1), F.S. which states:

> "A detailed plan to meet the requirements of this subsection, including an identification of all land acquisition and facilities necessary to provide for reuse of the domestic wastewater; an analysis of the costs to meet the requirements; and a financing plan for meeting the requirements, including identifying any actions necessary to implement the financing plan, such as bond issuance or other borrowing, assessments, rate increases, fees, other charges, or other financing mechanisms. The plan shall include a detailed schedule for the completion of all necessary actions and shall be accompanied by supporting data and other documentation."

The 2013 Compliance Plan was estimated to have an approximate total project cost (design, construction, and management) of $3,300,000,000 ($3.3B) in 2012. The costs were reviewed and updated as part of the overall OOL Plan for the current update (this report). A 2014 Progress Report also described WASD's efforts for compliance with the OOL in accordance with Subsection 403.086(9)(f), F.S.

Subsection 403.086(9)(e)2, F.S. requires that WASD submit an updated Compliance Plan by July 1, 2016. This Updated Compliance Plan must document:

> "…any refinements or changes in the costs, actions, or financing necessary to eliminate the ocean outfall discharge in accordance with this subsection or a written statement that the plan is current and accurate."

This report constitutes the Compliance Plan 2016 Update.

WASD hired CH2M HILL, Inc. (CH2M) (Owner's Representative) who began work in October 2014 to manage the OOL Program and coordinate work with the other ongoing WASD projects. Task teams were formed, and the OOL 2013 Compliance Plan was reviewed (CH2M and Hazen and Sawyer (Hazen), 2015a). Updated information, such as new flow projections and the impact of climate change, are being addressed programmatically. Coordination with the Consent Decree program is ongoing.

The OOL Compliance Plan is under regular review and revision as the individual projects are developed. Some level of change will occur through the end of the OOL Program and until construction is complete. Therefore, the Owner's Representative and WASD will provide updates to the OOL Compliance Plan through regular progress reports. WASD intends to comply with all requirements in its Administrative Orders (AOs) attached to their National Pollutant Discharge Elimination System (NPDES) permits to meet Section 403.086(9), F.S. (FDEP 2012a, 2012b, 2012c, and 2016).

1.1.1 OOL Coordination with Consent Decree Programs and Other Capital Project Requirements

The OOL Program is being conducted in conjunction with other programs that address maintenance and regulatory requirements. For example, the federal court-approved Consent Decree will require a minimum of $1.5B in capital improvements. WASD's substantial compliance- and capital improvement-related programs must be carefully coordinated to ensure its compliance with all local, state, and federal regulatory requirements. If there are conflicts between certain programs, particularly those with regulatory obligations, they must be resolved among the affected parties quickly and in a cost-effective manner for the utility's customers. A summary of the Consent Decree Program is provided herein because of potential overlap in projects, especially related to conveyance projects and existing wastewater treatment plants (WWTPs). Other ongoing programs or subprograms that could be impacted by the OOL Program implementation include the Pump Station Improvement Program, water system projects, and the utility's ongoing Capital Improvement Program (CIP).

On January 13, 1994 and September 11, 1995 respectively, the First Partial and Second/Final Partial Consent Decrees were entered into with the U.S. Environmental Protection Agency (EPA). WASD complied with all of the provisions of these Consent Decrees. Subsequently, the peak flow criteria prescribed in Second/Final Partial Consent Decree, paragraph 17, were used to derive peak flow projections for the analyses of the collection and transmission system alternatives, including computerized hydraulics modeling to evaluate the ability of each pump station to manage peak flows, identify peak design flow rates for each pump station, and identify pump stations that fail to meet the criteria and propose improvements. At the end of 2011, EPA and WASD entered into discussions regarding the closing of the remaining items in the original partial Consent Decrees and replacing them with a new Consent Decree (and the resulting Consent Decree Program) which would emphasize the rehabilitation of the existing system. This new Consent Decree was approved by the Miami-Dade Board of County Commissioners on May 21, 2013, lodged on June 6, 2013, and approved by the Court on April 9, 2014. Rehabilitation projects with a total project cost of $1,550,634,370 are part of the obligations under the new Consent Decree. These projects are separate from those which are required for compliance with the OOL, as described in Section 8 of the 2013 Compliance Plan, and include significant WWTP improvements at the same facilities that are the major focus of the OOL, specifically the North and the Central District plants. The major conveyance system improvements for the Consent Decree Program must also align with the OOL flow diversions from the existing service districts to the proposed new West District WWTP (WDWWTP) that is part of the OOL Program.

Figure 1-1 illustrates the relative magnitude of the capital programs currently under development by WASD. Because of the complexity and interactions of the wastewater collection and treatment systems, a careful approach is required to develop, prioritize, and deliver all parts of the capital improvements. Planning is essential to manage and coordinate the projects' complexity/duration to limit stranded assets, manage cash flow, and have flexibility to deal with changed conditions and unforeseen events. Because of the duration of the OOL, year 2035 is the planning horizon used to estimate flow capacity. There will be continued refinement of peak flow modeling to reduce unknowns related to design specifications for system components. Another major concern with all capital programs under development is the availability of contractors and design consultants to deliver projects on schedule and at cost.

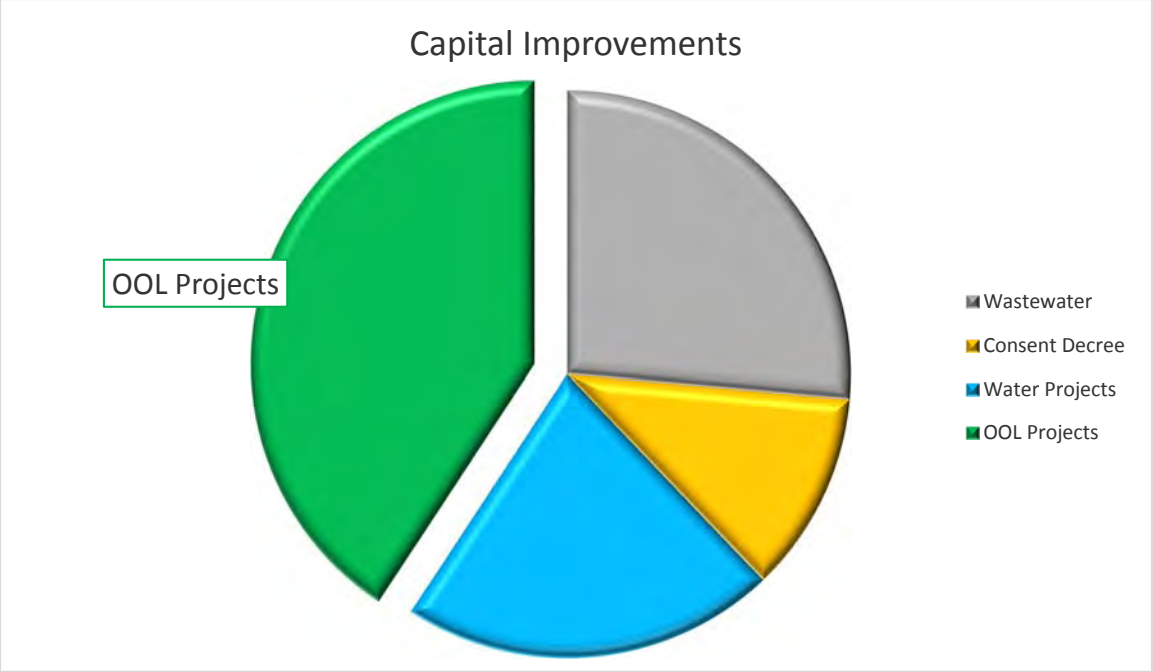


Figure 1-1. WASD is Managing Several Overlapping Capital Programs for its Wastewater System
Compliance Plan 2016 Update

1.1.2 OOL Reuse and Nutrient Load Reduction Requirements

WASD submitted a white paper entitled *Ocean Outfall Statute and Reuse Requirements* to the Florida Department of Environmental Protection (FDEP) in November 2014, developed in coordination with other OOL-impacted utilities. Significant questions have been raised about the OOL's reuse provisions, which have become outdated given changed conditions that have occurred since the OOL's passage. The white paper explained that the OOL-mandated reclaimed water reuse is not economically feasible considering that water demand for the region is being met now and is forecasted to be met in 2035 without the need for reuse (WASD, 2014). At this time, there are numerous external, unresolved factors related to the future use of reclaimed water. For the Compliance Plan 2016 Update, WASD's plans for reuse remain unchanged for the Florida Power & Light (FPL) project and WASD will continue to evaluate further environmentally, technically, and financially feasible reuse opportunities.

Recent FPL disclosures indicate that the expansion of Units 6 and 7 will be paused until after certification is received from the Nuclear Regulatory Commission, which is expected in 2017. After this approval, FPL will re-evaluate the feasibility of the whole project. They have requested a waiver from the Public Service Commission to delay the feasibility analysis until no later than 2020 (request is pending) (FPL, 2016).

WASD selected the OOL option to reduce cumulative outfall loadings of total nitrogen (TN) and total phosphorus (TP) between December 31, 2008 and December 31, 2025 equivalent to that which would be achieved if the advanced waste treatment requirements were fully implemented beginning December 31, 2018 and continued through 2025. WASD has reduced its nutrient loading to the ocean to date by increasing the diversion of effluent into deep injection wells at the NDWWTP. The status of these nutrient reductions is discussed in Section 2. Additional reductions before 2025 will be achieved by diversions to these existing and new injection wells.

1.2 Sea Level Rise and Climate Change Impacts

Sea level rise (SLR) and climate change have two impacts to the wastewater flow projections. SLR will increase the groundwater levels, which increases the infiltration into the collection system, especially in the pipes and pump stations closer to the ocean. This, in turn, increases the annual average day flow (AADF) and marginally reduces the incremental system capacity to accept wet weather flow. Climate change affects the intensity of the design storm used to size the collection system during wet weather. The 2013 Compliance Plan did not account for projected impacts from SLR or climate change because the analysis of projections had not been conducted. Miami-Dade County participated in the Southeast Florida Regional Climate Change Compact, which worked together to develop a unified SLR projection for use in planning purposes (Figure 1-2, Compact, 2015).

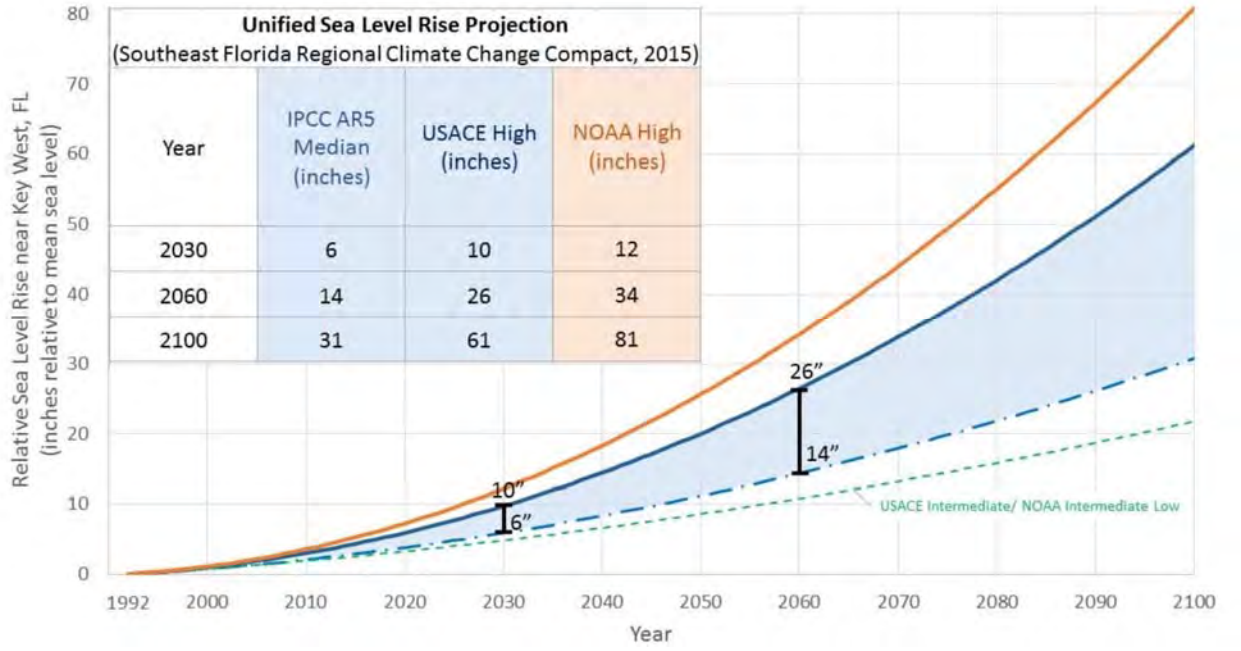


Figure 1-2. Sea Level Rise Predictions in Southeast Florida
Compliance Plan 2016 Update
Source: Compact, 2015

SLR affects the groundwater infiltration (GWI) component of the flow. The Owner's Representative calculated this impact of SLR on average and peak flows using the data collected by the WASD Collection Division to monitor the night-time flows throughout the county during dry and wet seasons. Data from groundwater well elevation changes during the dry and wet seasons were used to calculate the correlation in GWI per change in groundwater level. The Owner's Representative used the recent SLR projections and assumed that a 1-foot rise will occur by 2035 (CH2M, 2015b). The water table SLR elevation distribution among the different basins in the county was obtained from a U.S. Geological Survey (Hughes and White, 2014) report and applied accordingly. The additional GWI derived from SLR was then estimated based on the correlation of the existing GWI and groundwater table. The analysis showed that SLR impacted the peak flows by approximately 57 mgd across the entire system.

To calculate the effect of climate change on the peak flows, the Owner's Representative utilized the predicted change in the rainfall depth for the 2-year, 24-hour storm event in 2040 and 2075. The design storm that was initially considered to be a 4.5-inch rainfall in 2015, is now a 4.69-inch rainfall event in 2015 based on new calculations of recent rainfall data (CH2M, 2015b). This current design storm volume was projected to increase to a 5.42-inch rainfall event in 2040. These rainfall depth projections were

used to scale the wet weather portion of the inflow hydrographs. The impact of this additional rainfall is estimated to have an impact of an approximately 151 mgd of additional peak flow system wide by 2035.

These two changes had a large effect on the peak and average flows that WASD must plan to process in the future. On top of these climate related impacts, WASD also undertook a new flow forecasting process as part of the Consent Decree Program. This new process was based on revised population projections, including updates from several large volume customers. These customer-based changes also altered the geographic distribution of the supply of wastewater in WASD's service area.

WASD has adjusted its Compliance Plan to react to the changes in SLR, climate change, and flow forecasting, as well as other new information described in this report.

1.3 Summary of Plan and Report Organization

As presented in the 2013 Compliance Plan, WASD analyzed several alternatives for the treatment and disposal of wastewater beyond the year 2025 wherein utilization of the outfalls was limited to use as a backup discharge. The recommended alternative includes the following major improvements (WASD, 2013):

- Reduction of average daily inflows to NDWWTP and CDWWTP by redirecting flows to other WWTPs
- A new WDWWTP with an average daily flow of 102 mgd and peak hour flow of 215 mgd
- A new booster pump station (WP-1) and force main connections (CL-7 and CL-9) in the Doral area to allow for increased influent flow diversion to and from the NDWWTP and increased flexibility with regard to flow transfer between WWTPs
- Major upgrade to Pump Station 187 for improved wastewater flow transfers among WWTPs
- Increased capacity for the management of peak weather flows to the NDWWTP, CDWWTP, and South District Wastewater Treatment Plant (SDWWTP)
- Eliminate normal use of the ocean outfalls at NDWWTP and CDWWTP by utilizing injection wells at all WWTPs
- Divert nutrients from the outfalls prior to the end of 2025 by early use of injection wells at NDWWTP and CDWWTP

The updated Compliance Plan recommended at this time is mostly unchanged in the basic strategy and approaches. There will be a new WDWWTP, re-allocation of flows between WWTPs, treated effluent disposal primarily by injection wells, and improved wet weather and high-level disinfection (HLD) treatment at the existing WWTPs. Individual projects to implement the OOL Program have changed or may be altered, especially in the conveyance projects and wet weather treatment approach at the WWTPs. The 2014 Progress Report outlined some of the conveyance projects but this list has been modified since. As discussed above, the Compliance Plan is adapting to react to new information. The Consent Decree Program and other capital projects must be carefully planned to address the updated future conditions. WASD and the Owner Representatives have worked to improve the Compliance Plan so the Compliance Plan 2016 Update can be implemented on time and at cost.

1.3.1 Report Objective

The Compliance Plan 2016 Update represents a new reference point to use as the projects move into the conceptual design phase. This report fulfills WASD's regulatory requirement to update the Compliance Plan by July 1, 2016 (Subsection 403.086(9)(e)2, F.S.).

1.3.2 Report Organization

This report is divided into 8 sections as follow:

1. Introduction
2. Diversions of nutrient loads from outfall
3. Revised flow projections
4. Compliance Plant 2016 Update
5. Updated OOL Program Schedule
6. Financial plan
7. Public outreach
8. References

This introduction provided the regulatory references and basis for the updates (new information). Section 2 will update and elaborate on the OOL requirement to divert loading away from the outfalls prior to 2025. Section 3 discusses the update to the flow projection. Compliance with the reclaimed water reuse is addressed under the updated Compliance Plan to eliminate the discharge to the ocean (Section 4). The remaining sections provide information on other important elements of the OOL Program, including scheduling, financing, and public involvement.

SECTION 2

Diversions of Nutrient Loads from Outfall

The following are the available options for reducing nutrients discharged to the outfall, as quoted in the NDWWTP's AO (FDEP, 2012a):

"As provided in the new legislation, Section 403.086(9)(b), F.S. defines the term "advanced wastewater treatment and management requirements" as either of the following four options:

- *the advanced waste treatment requirements set forth in subsection Section 403.086 (4), F.S.;*
- *a reduction in outfall baseline loadings of total nitrogen and total phosphorus which is equivalent to that which would be achieved by the advanced waste treatment requirements;*
- *a reduction in cumulative outfall loadings of total nitrogen and total phosphorus occurring between December 31, 2008, and December 31, 2025, which is equivalent to that which would be achieved if the advanced waste treatment requirements were fully implemented beginning December 31, 2018, and continued through December 31, 2025; or*
- *install no later than December 31, 2018, a fully operational reuse system comprising 100 percent of the facility's annual average daily flow for reuse activities authorized by the Department."*

WASD selected the approach outlined in the third bullet as described in the 2013 Compliance Plan. As stated in the 2013 Compliance Plan, the goal is to comply by reducing future cumulative loads by an equivalent of approximately 59.9M pounds of TN and approximately 2.9M pounds of TP. WASD selected this option because it provided a specific cumulative target allowing a planned approach to nutrient reduction to the outfalls with minimum disruptions to critical Consent Decree and OOL work at the NDWWTP and CDWWTP.

On February 17, 2014, the FDEP requested additional information and a potential adjustment to the load reduction estimate. WASD recomputed the amount of nutrients being diverted to the NDWWTP injection wells by subtracting load equivalent to the load discharged to the wells during the baseline period. This reduction to the annual diverted load is 230,393 pounds of TN and 28,197 pounds of TP.

2.1 Short-Term Outfall Nutrient Reduction Plan Element

WASD will meet the advanced wastewater treatment and management requirements of the OOL (403.086(9)(d), F.S.) by a reduction in cumulative loadings discharged to the outfall between December 31, 2008 and December 31, 2025. WASD selected the reduction option because of the uncertainty in predicting future flows and concentrations and the difficulty of achieving nutrient reduction by treatment at the CDWWTP, which is undergoing a major transformation as part of the OOL and Consent Decree programs. WASD selected this equivalent reduction option because it would provide a fixed number that could be planned for and allow the extensive CIP to proceed with certainty.

Initially, this reduction has been attained primarily by using the deep injection wells at the NDWWTP. Although the wells were installed while the OOL was being crafted, they were not fully operational (including the appropriate permitting) until 2009. As noted above, FDEP requires an adjustment to the annual diversion load because of this intermittent use during the baseline period. Between 2009 and now, the load reductions from the outfall are estimated entirely from the amount of nutrients diverted to the deep wells at NDWWTP. The total NDWWTP effluent peak flows to both the outfall and the injection wells have not exceeded the outfall permitted discharge capacity of 100 mgd; therefore, the injection wells have been used only for flow diversion and not to address growth.

The Compliance Plan to reduce the nutrient loads to the outfalls before the end of 2025 is to:

- Continue to divert flow from the NDWWTP ocean outfall by maximizing flow to the existing deep injection well system
- Continue to divert influent flows away from both the NDWWTP and CDWWTP to the extent possible to the existing SDWWTP for treatment and disposal
- Install industrial wells at the three WWTPs (NDWWTP, CDWWTP, and SDWWTP) for the disposal of air scrubber wastewater, landfill leachate, and sludge dewatering centrate to significantly reduce the nutrient concentrations in the effluent disposed of through the outfalls

On October 30, 2013, FDEP issued a permit to WASD to install an exploratory/test deep injection well at the CDWWTP for potential disposal of air scrubber wastewater, landfill leachate, and sludge dewatering centrate. The first exploratory/test injection well was completed and the rig moved to the second injection well site. The industrial injection well pump station is in the final design phase and construction bids are planned to be solicited by the end of the year.

2.2 Diversions to Date

Table 2-1 presents the total annual cumulative loading reductions of total nitrogen and total phosphorous as reported to FDEP in March 2016. The TN and TP goals in tons is 29,950 and 1,450 tons, respectively.

Table 2-1. Total Annual and Cumulative Loads Diverted from the Ocean Outfalls
Compliance Plan 2016 Update

Year	TN Diverted from Outfalls (pounds)	TP Diverted from Outfalls (pounds)
2009	853,958	47,396
2010	1,258,929	71,306
2011	1,617,704	106,768
2012	1,485,727	89,935
2013	1,832,420	76,411
2014	2,284,511	257,141
2015	1,939,796	219,322
Cumulative Total 2009 through 2015	11,273,045	868,279

Future diversions will increase in pace after the CDWWTP industrial wells are completed and put into use. The industrial wells have two immediate advantages:

- Industrial wells do not require HLD and can therefore be utilized immediately without waiting for additional facilities to be designed and built at the WWTPs
- Diverting centrifuge centrate, which has very high nutrient concentrations, and the scrubber wastewater from the WWTP process flow significantly reduces nutrient loads discharged to the outfall.

The main disadvantage to implementing the industrial well approach is that the wells are more expensive to construct because they have a higher design standard, which provides higher protection to the underground sources of drinking water.

2.3 Projected Diversions

Project schedules affect the ability to construct, permit, and utilize the future disposal wells (beyond the industrial wells). The updated schedules are provided in Section 5. The impact of the current schedule on the diversion rate was estimated using the best available information about future concentrations being discharged from the WWTPs. As shown in Figures 2-1 and 2-2, the Compliance Plan 2016 Update will meet the end of 2025 deadline because the rate of diversions increase after the industrial wells are placed in operation at the CDWWTP. The computations to generate these charts are provided in Appendix A. TN is the most challenging nutrient to divert before 2025 and it is projected that the diversion goal will be met 1 year before required. The TP nutrient reduction goal will be met approximately 4 years before the TN diverted load goal is attained.

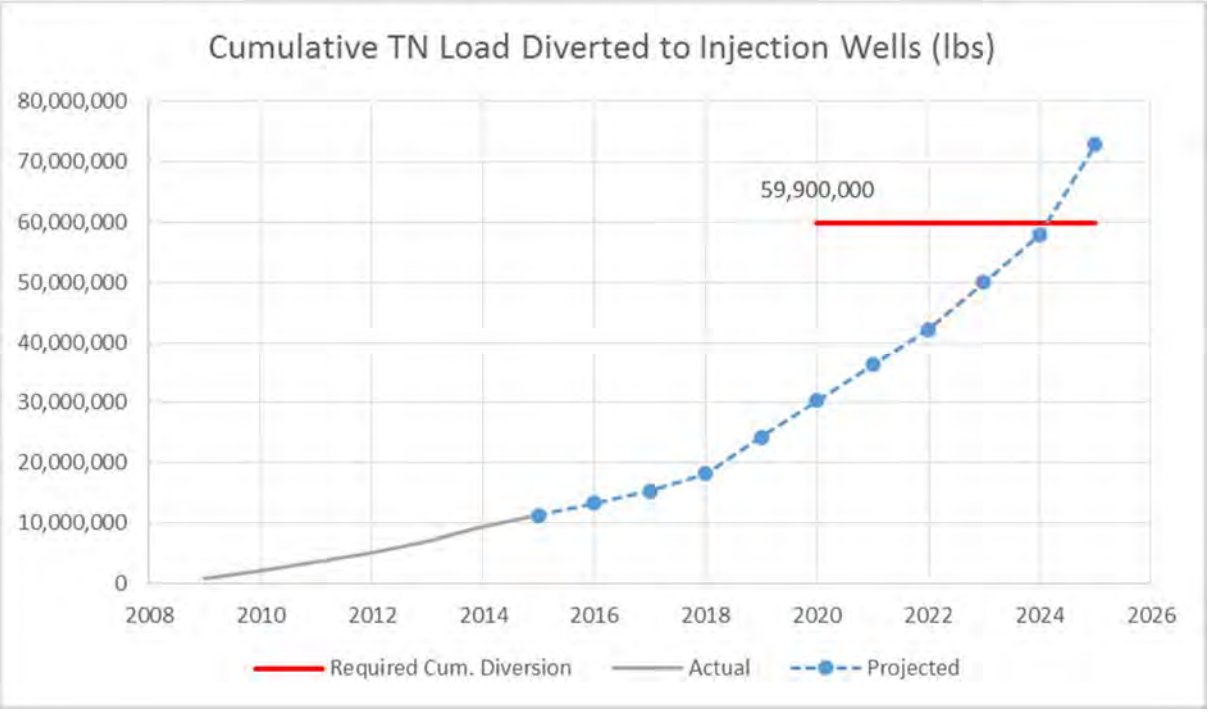


Figure 2-1. Anticipated Schedule of Total Nitrogen Diversions from Outfalls
Compliance Plan 2016 Update

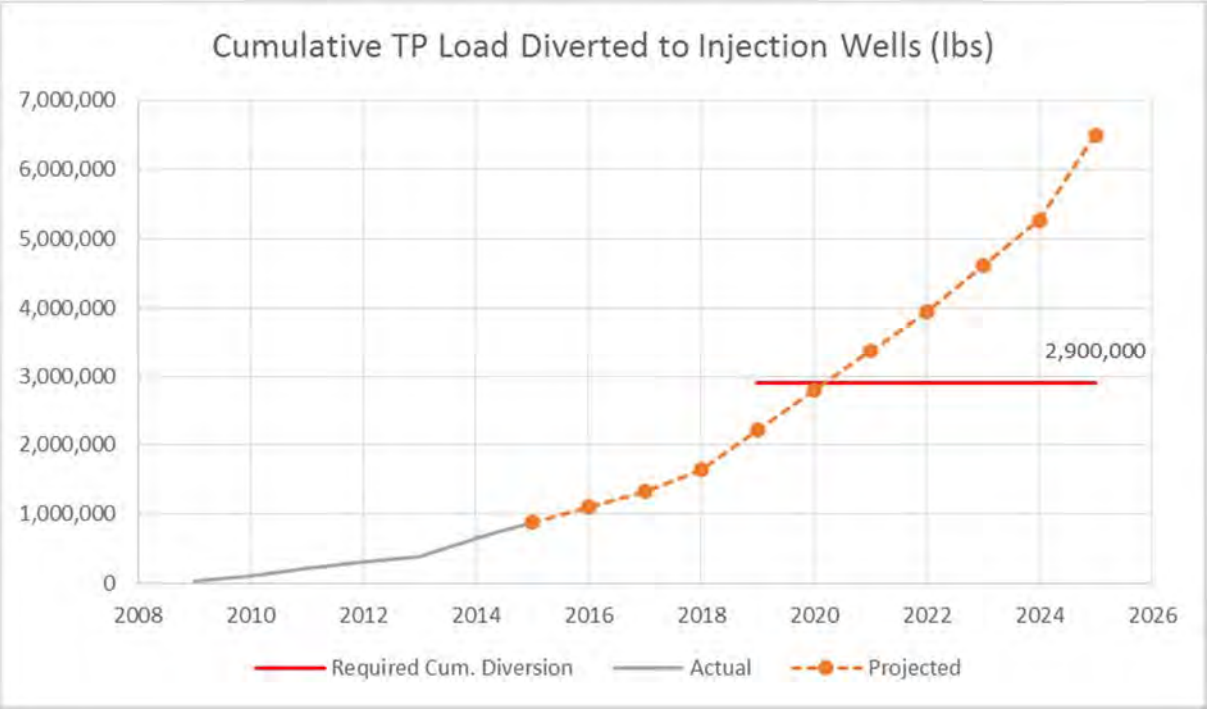


Figure 2-2. Anticipated Schedule of Total Phosphorus Diversions from Outfalls
Compliance Plan 2016 Update

SECTION 3

Revised Flow Projections

The preferred 2013 Compliance Plan Alternative 2A-2-2 was developed to convey future peak hour flows for the 2035 condition during a 2-year, 24-hour storm event (WASD, 2013). The 2-year, 24-hour design storm hydrographs that represent the collection system design storm conditions for the OOL were developed using pump operational data and flow meter data from the WASD supervisory and control data acquisition system. The future flows were estimated in 2013 using population projections and service area additions to WASD from the Traffic Analysis Zones obtained from the Miami-Dade Planning and Zoning Department. Table 3-1 lists the flows used in the 2013 Compliance Plan. These flows have been revised, and are still under refinement as projects are reprioritized based on improvements to the underlying data and flow projections.

Table 3-1. 2035 Projected Flows from OOL 2013 Compliance Plan Alternative 2A-2-2[a]
Compliance Plan 2016 Update

WWTP District	2013 Compliance Plan 2A-2-2 AADF (mgd)	2013 Compliance Plan 2A-2-2 Peak Flows (mgd)
NDWWTP	85	327
CDWWTP	83	333
SDWWTP	131	305
WDWWTP	102	215
Total	**401**	**1,180**

Notes:
[a] *Ocean Outfall Legislation Compliance Plan* (WASD, 2013)

The flow projections have been revised significantly since the 2013 Compliance Plan. The Consent Decree Program has worked to update wastewater flow projections (sources) across WASD's service area. The revised population-based wastewater flows are assumed to be 75 percent residential and 25 percent from commercial businesses. The base sanitary flow was the sum of these two sources. Industrial and large point source customers are added separately as line items for the collection basins. For future conditions, residential flow was based on county per capita wastewater rates derived from existing basins, with a 25 percent reduction due to a water conservation program in the county. The employee flow was based on county per capita wastewater rates derived for the employees, with a 5 percent reduction in flow due to a water conservation program by the county. GWI for the future basins was calculated as 50 percent of the total wastewater flow projections. Wet weather flows were derived from a design storm condition utilizing peak flow conditions during an observed storm. Adjustments to the source flows were made for SLR and climate change (see Section 1). The source flows were derived for 2020, 2025, and 2035 conditions.

Once the source flows were determined, InfoWorks computer simulations of the collection system were conducted to route discharges among the WWTPs. This was an iterative process because the collection system could be modified to reallocate flows. This combination of conveyance capacity (pump stations and pipelines) and anticipated WWTP treatment capability were used to define the conveyance-related projects discussed in Section 4. The peak flow rates were set based upon a reasonable expectation of maximum treatment capacity of the existing WWTPs with excess flows directed to the new WDWWTP and SDWWTP. The average flow rates sent to each existing WWTP also considered future treatment capacity by considering proposed changes at the plants to maximize average flow treatment capacity at the existing WWTPs.

Table 3-2 lists the updated 2035 peak flow rates to the four WWTPs. The flows treated at the WWTPs during the interim conditions, will vary until all phasing of the construction projects are completed. For example, the existing plants will have to treat all wastewater until the WDWWTP is constructed. The peak hour flows provided in Table 3-2 were used as the basis for the Compliance Plan 2016 Update. There may be some deviations from these planning numbers as projects are conceptualized further and designed.

Table 3-2. Revised 2035 Peak Flow Projections Adopted in the Compliance Plan 2016 Update
Compliance Plan 2016 Update

WWTP District	Compliance Plan 2016 Update Peak Flows[a] (mgd)
NDWWTP	300
CDWWTP	368
SDWWTP	368
WDWWTP	254
Total	**1,290**

Notes:
[a](CH2M, 2016)

SECTION 4

Compliance Plan 2016 Update

The 2013 Compliance Plan was prepared in response to the OOL schedule without the benefit of all the studies and evaluations needed to make decisions. The Compliance Plan included projects directly related to eliminating the normal use of the ocean outfalls plus additional projects that need to occur to facilitate the overall OOL Program (WASD, 2013). Since 2013, WASD has been working to improve the initial Compliance Plan and to account for new information. In 2015, the Owner's Representative validated the Compliance Plan and confirmed the overall concept as being viable but in need of additional work to incorporate new information and eliminate overlaps between capital programs (CH2M and Hazen and Sawyer (Hazen), 2015a). This updated Compliance Plan is also mandated by regulation at a fixed date, and there is still planning work being conducted to determine how to best implement the OOL Program. As such, this Compliance Plan 2016 Update is a current description of the OOL Program as it is at this point in time. As discussed in Section 1, the Compliance Plan is adapting to react to new information.

Overall, the basic strategy behind the 2013 Compliance Plan is unchanged. The selected alternative for the 2013 Compliance Plan was not the least cost, but was selected because it provided WASD the best long-term path forward for managing wastewater. Creating the WDWWTP allows WASD to change to state-of-art wastewater and biosolids treatment processes, with room to grow to accept higher peak flow rates from population growth and climate change in the future (beyond 2035). Expanding the existing WWTPs' capacity to meet all future demands would require more land and leave the treatment plants in their vulnerable locations near the coast. This new WDWWTP strategy provides a level of redundancy and flexibility that other options did not provide. The existing WWTPs will be retained and modified to utilize the existing infrastructure. New injection wells and treatment upgrades will manage normal flows and peak rates up to the plants' potential capacity without using the ocean outfalls except as a limited wet weather discharge. The new pump stations and conveyance projects would be able to direct wet weather flows both south and west depending on the available capacity at the plants.

The details in how to improve peak flow treatment at the existing WWTPs, treatment process selection for the WDWWTP, and many of the conveyance projects have been updated. Similar to the original 2013 plan, this update also groups the projects into two categories:

- Compliance Plan
- Required Capacity

For the most part, the project identifications have remained the same but the names and project details may have been altered. Some projects have been dropped, modified, or are still under consideration as to their need, particularly the capacity-related projects. Because the peak flow rates have changed, the number of wells and HLD capacity have changed. However, the strategy of maximizing the use of the existing facilities to preserve customer assets remains an objective. The OOL Program is a major strategic capital investment into the future of wastewater management for Miami-Dade County, and the scope and magnitude is reflected in these projects.

Table 4-1 provides the projects that are under evaluation in the Compliance Plan 2016 Update. These projects address the OOL mandate to eliminate the regular use of the ocean outfalls, include impacts of future climate change and higher sea levels on collected wastewater flows, increase reclaimed water use, and include the major conveyance projects that provide the capacity to redirect wastewater during peak times. Thirty-one (31) projects were considered part of the 2013 Compliance Plan, and the updated list includes additional capacity projects that are essential parts of the Compliance Plan because they are required to enable the wastewater system to operate under the proposed future configuration. Figure 4-1 illustrates how these projects stretch across the entire county (Appendix B provides a larger map).

The entire number of projects are being tracked and managed by the OOL Program, and this list may be modified as projects go into conceptual and detailed design phases. WASD will report any significant changes in future OOL Program updates to FDEP.

The remainder of this section provides a summary of the projects as they currently stand. Nearly all of these projects are still in the planning phase and are subject to modification as the design process proceeds. Section 5 discusses the schedules.

Table 4-1. Original Project List and 2016 Updated List Changes

Compliance Plan 2016 Update

Project ID	Description	2013 Compliance Plan (CP)	Compliance Plan 2016 Update (uCP)	Projects Needed for Capacity and Operations	Changes from 2013
NE-1	NDWWTP - BZ Disposal Effluent Pump Station	CP	uCP		Redefined
NE-2	NDWWTP - BZ Deep Injection Wells	CP	uCP		Redefined
NE-3	Injection Wells for Disposal 5 and 6				Removed, Duplicate
NE-4	NDWWTP - Pump Station for Industrial Wells		uCP		Added
NE-5	NDWWTP - Industrial Wastewater Injection Wells		uCP		Added
NL-1	72-inch FM from PS 300 to NDWWTP				Replaced with Three New Projects Below
NL-1A	60-inch FM at Biscayne Blvd to NW 2 Avenue (Phase I)			Capacity	
NL-1B	48-inch FM at NW 2 Avenue to PS 306 and 36-inch FM from PS 0306 to NW 32 AVE (Phase II)			Capacity	
NL-1C	36-inch FM at PS 306 to NP-1 (Phase III)			Capacity	
NL-2	24-inch FM ext at 87 Avenue/W 76 Street to NW 67 Avenue			Capacity	None
NL-3	24-inch FM at NW 67 Avenue/W 76 Street to PS 307			Capacity	None
NL-4	48-inch FM Connection in NW 67 Avenue from W 84 Street to NW 122 Street				Potential Deletion, Pending Further Review
NL-5	24-inch FM ext in NW 167 from NW 57 to 47 Avenue in NW 156 Street				Removed
NL-6	24-inch FM Connection from PS 0416 to 30-inch FM at NW 171 Street/67 Avenue				Potential Deletion, Pending Further Review
NL-6A	20- inch FM Connection from PS 0416 to NP-1 along NW 185 Street			Capacity	Redefined
NL-7	48-inch FM for PS 300 to Pump North to PS 1310			Capacity	None

Table 4-1. Original Project List and 2016 Updated List Changes

Compliance Plan 2016 Update

Project ID	Description	2013 Compliance Plan (CP)	Compliance Plan 2016 Update (uCP)	Projects Needed for Capacity and Operations	Changes from 2013
NP-1	North Dade Booster Station at NW 183 Street/57 Avenue				Deleted, Pending Re-evaluation
NP-416E	Upgrades to PS 0416			Capacity	None
NT-2	NDWWTP - HLD Treatment	CP	uCP		Redefined
NT-3	NDWWTP - Peak Flow Treatment	CP	uCP		Redefined
PS-306	Convert PS 306 to Booster PS			Capacity	Addition
CE-1	CDWWTP - BZ Disposal Effluent Pump Station	CP	uCP		None
CE-2	CDWWTP - BZ Deep Injection Wells	CP	uCP		None
CE-3	CDWWTP - Pump Station for Industrial Wells	CP	uCP		None
CE-4	CDWWTP - Industrial Wastewater Injection Wells (Centrate Injection Well)	CP	uCP		None
CL-1	North Biscayne 42-inch FM ext S to PS 2 discharge 48-inch in NW 4 Street			Capacity	Redefined to be all 48-inch Diameter
CL-10A	48-inch FM Connection from CL-1 to suction of CP-1			Capacity	Potential Addition
CL-10B	48-inch FM Connection from Existing 48-inch Discharge of PS 01 and PS 02 to Discharge of CP-1			Capacity	Potential Addition
CL-10C	48-inch FM Connection from Existing 48-inch Across River to Discharge of CP-1			Capacity	Potential Addition
CL-2	Coral Gables 48-inch FM from SW 22 Terrace to 102-inch FM SW 15 Road			Capacity	None
CL-3	48-inch FM Connection in NW 58 Street from NW 107 Avenue to 87 Avenue - Doral	CP			Potential Deletion, Pending Further Review
CL-4	East/West 72/84-inch FM Connection from PS 187 to WDWWTP	CP	uCP		Redefined

Table 4-1. Original Project List and 2016 Updated List Changes

Compliance Plan 2016 Update

Project ID	Description	2013 Compliance Plan (CP)	Compliance Plan 2016 Update (uCP)	Projects Needed for Capacity and Operations	Changes from 2013
CL-5	72-inch FM Connection in SW 137 Ave to CL-4 FM in NW 6th St	CP	uCP		None
CL-6	16-inch FM Connection in NW 74 ST from NW 97 to NW 107 Avenue – Doral			Capacity	Redefined
CL-7	48-inch FM Connection from NW 53 Street from PS 14 to NW 72 Avenue - Doral	CP			Paused, Added to CL-3
CL-8	24-inch FM Connection in SW 8 Street from SW 152 to 177 Avenue - WEST DADE				None
CL-9	36-inch FM from WP-1 (Doral) to WDWWTP	CP	uCP		Redefined
CL-X	Flow Control - Pipeline Interconnections	CP	uCP		None
CP-1	Central East Booster Station at A D Barnes Park			Capacity	Added
CP-187E	Upgrade of PS 187	CP	uCP		Redefined
CR-1P	CDWWTP - Floridan Aquifer Recharge Pump Station	CP			Replaced with XR-1
CR-1W	CDWWTP - Floridan Aquifer Injection Wells	CP			Replaced with XR-1
CT-2	CDWWTP - HLD Filters	CP	uCP		Redefined
CT-3	CDWWTP - Peak Flow Treatment	CP	uCP		Redefined
SE-1	SDWWTP - BZ Effluent Disposal Pump Station Expansion	CP	uCP		Redefined
SE-2	SDWWTP - BZ Deep Injection Wells	CP	uCP		Redefined
SE-3	PS for Industrial Wells		uCP		Added
SE-4	Industrial Wells		uCP		Added
SL-1A	Under Construction in 2016			Capacity	None

Table 4-1. Original Project List and 2016 Updated List Changes

Compliance Plan 2016 Update

Project ID	Description	2013 Compliance Plan (CP)	Compliance Plan 2016 Update (uCP)	Projects Needed for Capacity and Operations	Changes from 2013
SL-1B	54/64-inch FM Connection in SW 248 Street from SW 112 Avenue to SDWWTP			Capacity	None
SL-2	54-inch FM Connection from SW 176 Street on SW 137 Avenue to SW 216 Street and 112 Avenue			Capacity	None
SL-3A	42/48-inch FM Connection from SL-2 to SP-1			Capacity	Redefined
SL-3B	42-inch FM Connection in SW from SP-1 along SW 136 Street to SW 104 Street (Phase II)			Capacity	Redefined
SL-3C	36-inch FM Connection from SW 104 Street to SW 88 Street			Capacity	Redefined
SL-4	42-inch FM Connection from PS 692 to SW 268 Street and SW 127 Avenue			Capacity	Redefined
SL-5	30-inch FM Connection from intersection at SW 304 Street and SW 157 Avenue to PS 692			Capacity	Redefined
SL-6	24-inch FM Connection from PS 1073 to PS 691				Potential Deletion, Pending Further Review
SP-1	Southwest Dade Booster Station on SW 137 Avenue and SW 176 Street			Capacity	None
SP-1073E	Upgrade to PS 1073			Capacity	None
SP-522E	Upgrade to PS 522			Capacity	None
SP-559E	Upgrade to PS 559			Capacity	Added
SP-692E	Upgrade to PS 692			Capacity	None
SR-1P	SDWWTP - Floridan Aquifer Reuse Pump Station	CP			Replaced with XR-1
SR-1W	SDWWTP - Floridan Aquifer Reuse Injection Wells	CP			Replaced with XR-1
SR-2	SDWWTP-FPL Reclaimed Water Pipeline	CP	uCP		None

Table 4-1. Original Project List and 2016 Updated List Changes

Compliance Plan 2016 Update

Project ID	Description	2013 Compliance Plan (CP)	Compliance Plan 2016 Update (uCP)	Projects Needed for Capacity and Operations	Changes from 2013
ST-1	Phase I Upgrade Treatment to 121/305 AADF/PHF		uCP		Added, Part of Off-loading Other WWTPs
ST-2	Phase II Upgrade Treatment to 131/368 AADF/PHF		uCP		Added, Part of Off-loading Other WWTPs
WE-1	WDWWTP - Injection Well Pump Station	CP	uCP		Redefined
WE-2	WDWWTP - Injection Wells	CP	uCP		Redefined
WP-1	Doral Booster Station	CP	uCP		Redefined
WR-1	WDWWTP - Floridan Aquifer Reuse Pump Station	CP			Replaced with XR-1
WT-1	WDWWTP - West District Wastewater Treatment Plant	CP	uCP		Redefined
WT-1L	WDWWTP Land Acquisition		uCP	Capacity	Added
WT-2	WDWWTP - Peak Flow Treatment	CP	uCP		Redefined
XR-1	Future Reuse		uCP		Added as One Project, Supplemental Reuse Projects (in excess of SR-2)
PSOP	Pump Station Optimization Program			Management	Part of Wet Weather Management Needs
PSPF	PS Peak Flow Assessment			Management	Coordination with Consent Decree Program
XL-1	Lining FM from PS0300 to NDWWTP			Operations	Added
XS-1	Storm Surge Hardening			Resiliency	Redefined, New Surge Projections

Note:
All projects may be refined during the design phases. Pump stations are also being evaluated for better operations.

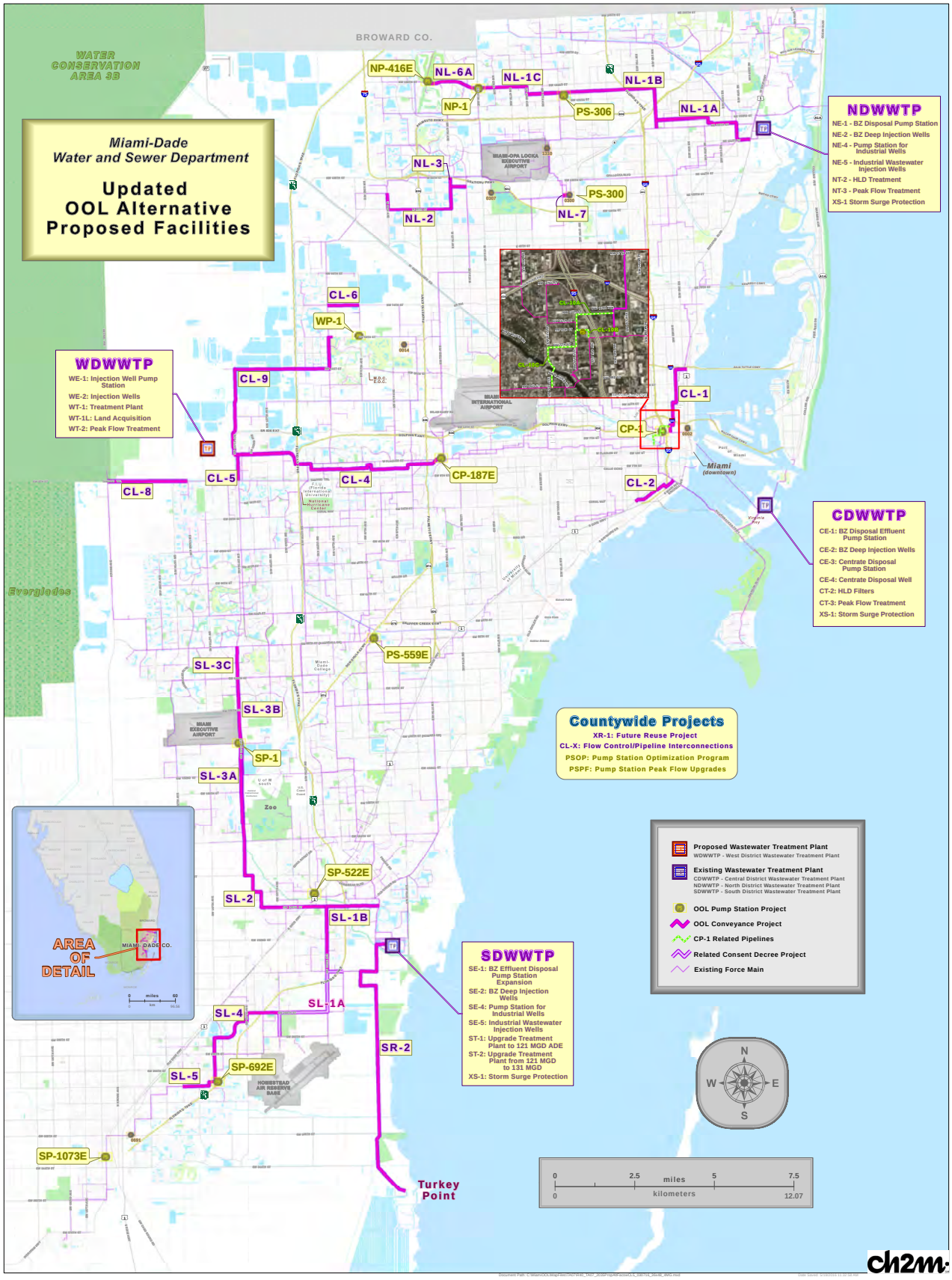


Figure 4-1. OOL Project Locations (Appendix B contains larger map)
Compliance Plan 2016 Update

4.1 Summary of the Updated Projects

The 2013 Compliance Plan listed peak treatment improvements at each existing WWTP. However, the plan suggested that an enhanced treatment unit would be added at each plant. The Owner's Representative and WASD have conducted further evaluations to better utilize the existing infrastructure at each plant to refine the treatment to include more than just add-on units. Similarly, WASD's collection system computer model is being extensively updated by the Consent Decree Program. A preliminary model of the peak flow rates was used to estimate the upgrades needed to account for the revised flow estimates, including future climate change and SLR impacts (CH2M, 2016). This summary describes the basis for the changes to the WWTPs and collection system conducted since the 2013 Compliance Plan.

4.1.1 Wastewater Treatment Plants

Changes at the WDWWTP to accommodate the updated 2035 flow rates should include an increase in peak capacity from 215 mgd to 254 mgd through a combination of increased treatment capability and/or flow equalization including associated unit processes such as HLD and revision to the number of injection wells.

The existing treatment plants were evaluated for their current peak flow capacity. Since the existing injection wells at the NDWWTP do not require HLD, the analysis considered flows that discharge to the existing injection wells. It was assumed that existing WWTPs would have some minimum improvements implemented (WWTP future condition baseline), including step feed alterations, secondary clarifier mechanism and baffle improvements, and return activated sludge (RAS) improvements. Wet weather treatment capacity was added to the baseline condition.

The conceptual level improvements needed at the existing WWTPs, assuming that the secondary clarifier surface overflow rates (SORs) are unchanged from existing SORs (see discussion below), include:

- NDWWTP (300 mgd): Implementation of step feed + 7 MG of equalization volume + 75 mgd of HLD + 4 new injection wells
- CDWWTP (368 mgd): Implementation of step feed + 7 secondary clarifiers + 8 mgd of headworks capacity + 131 mgd of HLD + 9 injection wells
- SDWWTP (368 mgd): Implementation of step feed + 3 secondary clarifiers + 1 oxygenation train + 89 mgd of headworks capacity + 89 mgd of HLD + 5 injection wells

The plan for the NDWWTP initially included 57 mgd of HLD capacity but a preliminary analysis of the annual hydrographs indicated that the plant may discharge more than its future wet weather discharge limit to the outfall. Therefore, the peak treatment rate was increased to 75 mgd with another injection well added.

Clarifier effluent total suspended solids (TSS) quality was assumed to be acceptable up to 25 milligrams per liter (mg/L) before filtration, HLD, and subsequent injection well discharge. Acceptable clarifier effluent TSS quality for wet weather discharge to an outfall was assumed to be up to 45 mg/L. A key assumption in the WWTP treatment analysis includes using an acceptable peak SOR for primary and secondary clarification. FDEP generally refers to the *Ten State Standards* (Great Lakes - Upper Mississippi River Board [GLUMRB], 2014) for allowable clarifier SOR. However, clarifier capacity is affected by the SOR and the associated solids loading rate, which is influenced by the mixed liquor suspended solids concentration, sludge volume index, and RAS rate. Several key assumptions related to the sludge treatment at CDWWTP were made for analysis of the peak flow capacity of the existing WWTPs (CH2M, 2016). Taking these factors into account as well as conducting a dynamic analysis of effluent quality using computational fluid dynamics simulations, higher SORs were determined to be technically feasible but would need to be discussed with FDEP for consideration.

Limitations of existing WWTP capacities were reviewed including best case and worst case assumptions with respect to clarifier SORs. The *Ten State Standards* (GLUMRB, 2014) SOR values and the proposed higher SOR values used in the analysis are summarized in Table 4-2. Of these, the secondary clarifier SORs are considered a more critical assumption to the overall analysis considering that many treatment plants in Florida have permitted primary clarifier SORs greater than 2,500 gallons per day per square feet (gpd/sf) for peak flow conditions. The proposed WWTP improvements listed above and currently retained in the Compliance Plan 2016 Update are based on the lower SORs.

Table 4-2. Clarifier Surface Overflow Rates Applied to Update Analyses
Compliance Plan 2016 Update

Parameter	Proposed Assumption	***Ten State Standards*** **(GLUMRB, 2014)**
Maximum Primary Clarifier SOR (gpd/sf)	2,500	2,000
Maximum HLD Secondary Clarifier SOR (gpd/sf)	1,100	1,000
Maximum Outfall Secondary Clarifier SOR (gpd/sf)	1,400	1,200

Note:
gpd/sf = gallon per day per square foot

The conceptual level improvements needed at the existing WWTPs, if approval of higher secondary clarifier SORs could be attained from FDEP include:

- NDWWTP (300 mgd): Implementation of step feed + 75 mgd of HLD + 4 injection wells
- CDWWTP (368 mgd): Implementation of step feed + 3 secondary clarifiers + 8 mgd of headworks capacity + 131 mgd of HLD + 9 injection wells
- SDWWTP (368 mgd): Implementation of step feed + 2 secondary clarifiers +1 oxygenation train + 89 mgd of headworks capacity + 89 mgd of HLD + 5 injection wells

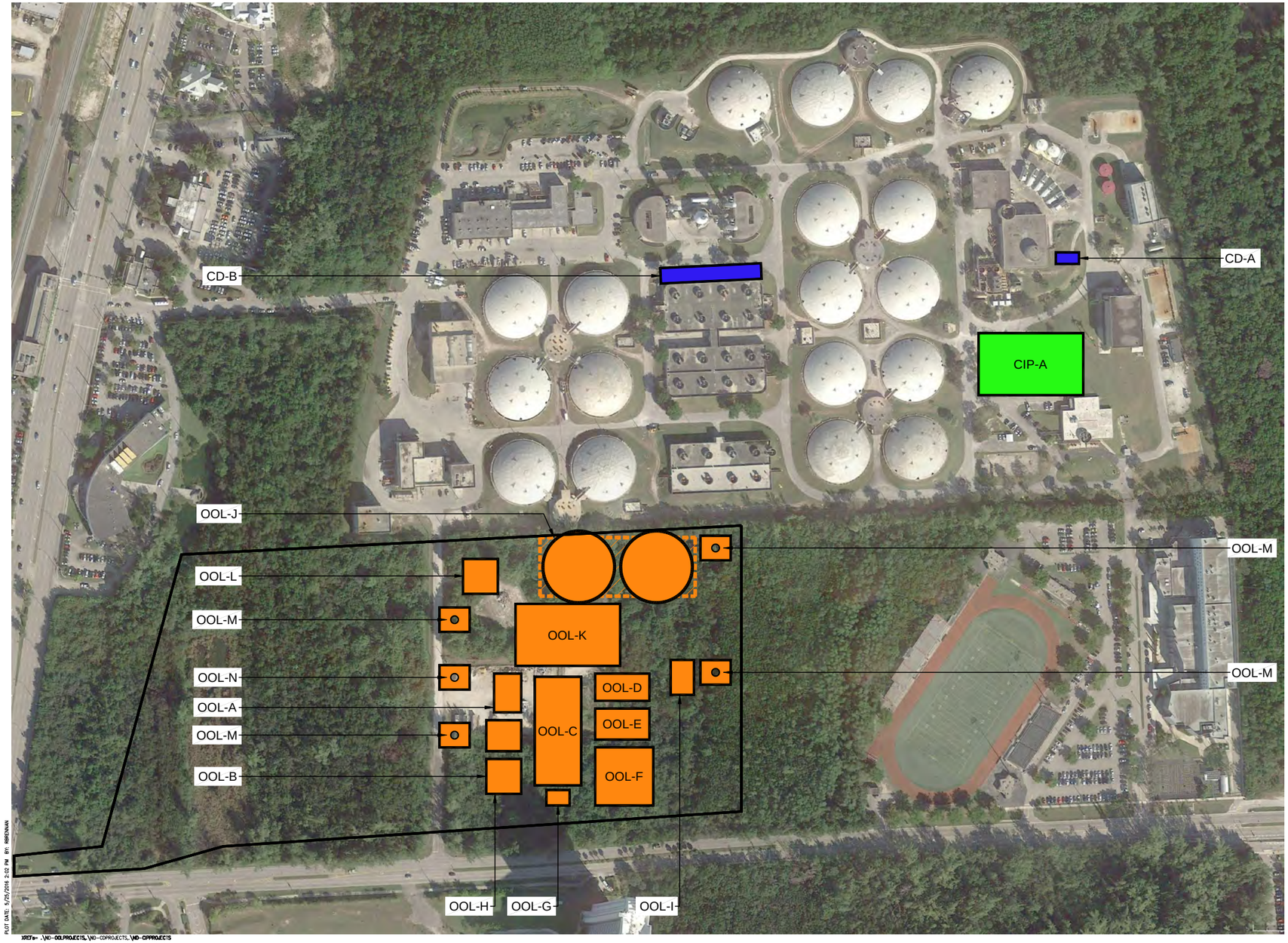
This preliminary list of required improvements was developed for planning purposes. Figures 4-2 through 4-5 show the current site layout of the improvements. More detailed analysis of the best approach to attain the treatment requirements is necessary and will be conducted through the development of conceptual design reports for each facility. For example, updated peak flow hydrographs for each facility will be used to refine the preliminary estimate of equalization volume, and the trade-offs of additional peak flow treatment capacity versus equalization may be explored.

4.1.2 Force Mains and Pump Stations

The 2013 Compliance Plan had a list of force main and pump station projects required for the previous 2035 peak flow conditions. The list of wastewater collection and transmission system projects was revised to meet the updated capacities evaluated for the each WWTP. The Owner's Representative received feedback from WASD on the intent of the original project list and the revisions were selected to provide enough capacity in each district to handle unconstrained peak flows for 2035 conditions. Table 4-3 lists the updated projects that are based on the revisions to date. This list was developed primarily for peak flow management and it may be altered further because the conveyance system is being evaluated to better plan the movement of wastewater for both wet and dry conditions.

MIAMI-DADE WATER AND SEWER DEPARTMENT

NORTH DISTRICT WASTEWATER TREATMENT PLANT



CONSENT DECREE

ITEM No.	PROJECT ID	DESCRIPTION
CD-A	CD 3.06	CHLORINATION ELECTRICAL BUILDING - 60L x 30W
CD-B	CD 3.03	O_2 TRAINS ELECTRICAL BUILDING - 260L x 40W

OCEAN OUTFALL LEGISLATION

ITEM No.	PROJECT ID	DESCRIPTION
OOL--A	NT-2	TRANSFER PUMP STATION - 100L x 70W
OOL--B	NT-2	FLOCCULATION TANK - 90L x 80W
OOL--C	NT-2	TERTIARY FILTER - 280L x 120W
OOL--D	NT-2	CHLORINE CONTACT BASINS - 140L x 70W
OOL--E	NT-2	BACKWASH PUMP STATION - 140L x 80W
OOL--F	NT-2	FILTER BACKWASH EQUALIZATION TANK - 150L x 150W
OOL--G	NT-2	FILTER BACKWASH EQUALIZATION PUMP STATION - 60L x 40W
OOL--H	NT-2	CHEMICAL FACILITY FOR TERTIARY FILTRATION SYS. - 90L x 90W
OOL--I	NE-1	INJECTION WELL PUMP STATION - 90L x 60W
OOL--J	NT-3	EXCESS PEAK FLOW STORAGE AREA
OOL--K	NT-2	ELECTRICAL BUILDING - 270L x 160W
OOL--L	NE-4	INDUSTRIAL WELL PUMP STATION - 90L x 90W
OOL--M	NE-2	BOULDER ZONE INJECTION WELL
OOL--N	NE-2	DUAL ZONE MONITORING WELL

CAPITAL IMPROVEMENT PLAN

ITEM No.	DESCRIPTION
CIP-A	ELECTRICAL BUILDING - 270L x 160W

N

200 100 0 200'

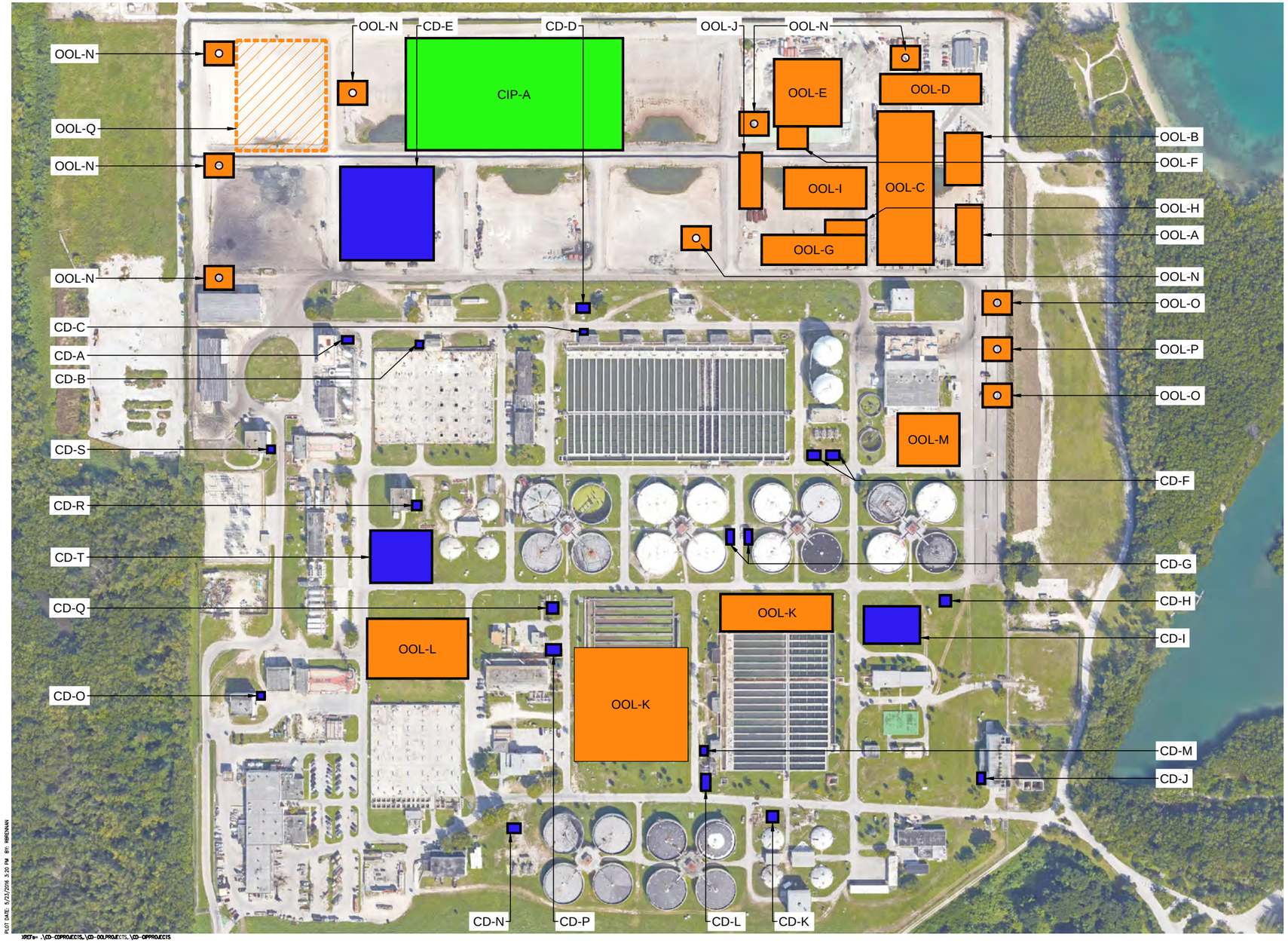
ch2m: with Hazen

Figure 4-2. Planning Level Layout of OOL and Consent Decree Projects at NDWWTP

Compliance Plan 2016 Update

MIAMI-DADE WATER AND SEWER DEPARTMENT

CENTRAL DISTRICT WASTEWATER TREATMENT PLANT



CONSENT DECREE

ITEM NO.		DESCRIPTION
CD-A	CD 2.27	ELECTRICAL BUILDING - 30L x 20W
CD-B	CD 2.06	ELECTRICAL BUILDING - 15L x 15W
CD-C	CD 2.10	BLOWER BUILDING - 20L x 15W
CD-D	CD 2.17	CHLORINATION DAY TANK - 35L x 25W
CD-E	CD 2.16	THICKENING/DEWATERING BUILDING - 250L x 250W
CD-F	CD 2.17	CHLORINATION DAY TANKS - 35L x 25W
CD-G	CD 2.15	ELECTRICAL SUBSTATIONS - 40L x 20W
CD-H	CD 2.15(4)	GAS FLARES - 30L x 30W
CD-I	CD 2.17	CHLORINATION MAIN STORAGE BUILDING - 150L x 100W
CD-J	CD 2.11	ELECTRICAL BUILDING - 30L x 20W
CD-K	CD 2.14	GAS FLARES - 30L x 30W
CD-L	CD 2.14	ELECTRICAL SUBSTATIONS - 40L x 20W
CD-M	CD 2.09	BLOWER BUILDING - 20L x 15W
CD-N	CD 2.17	CHLORINATION DAY TANK - 35L x 25W
CD-O	CD 2.18	ELECTRICAL BUILDING - 20L x 20W
CD-P	CD 2.19(2)	COGEN GAS DRYERS - 40L x 30W
CD-Q	CD 2.15(1)	GAS FLARES - 30L x 30W
CD-R	CD 2.18	ELECTRICAL BUILDING - 20L x 20W
CD-S	CD 2.18	ELECTRICAL BUILDING - 20L x 20W
CD-T	CD 2.27	VPSA BUILDING - 140L x 165W

OCEAN OUTFALL LEGISLATION

ITEM NO.	PROJECT ID	DESCRIPTION
OOL--A	CT-2	TRANSFER PUMP STATION - 160L x 70W
OOL--B	CT-2	FLOCCULATION TANK - 140L x 100W
OOL--C	CT-2	TERTIARY FILTERS - 410L x 150W
OOL--D	CT-2	BACKWASH PUMP STATION - 270L x 80W
OOL--E	CT-2	FILTER BACKWASH EQUALIZATION TANK - 180L x 180W
OOL--F	CT-2	FILTER BACKWASH EQUAL. TANK PUMP STA - 80L x 60W
OOL--G	CT-2	SODIUM HYPOCHLORITE GENERATION - 280L x 80W
OOL--H	CT-2	SODIUM HYPOCHLORITE STORAGE - 110L x 40W
OOL--I	CT-2	CHLORINE CONTACT BASIN - 220L x 110W
OOL--J	CE-1	INJECTION WELL PUMP STATION - 150L x 60W
OOL--K	CT-2	SECONDARY CLARIFIERS - 300L x 100W
OOL--L	CT-2	ELECTRICAL BUILDING - 270L x 160W
OOL--M	CE-3	INDUSTRIAL WELL PUMP STATION - 165L x 140W
OOL--N	CE-2	NEW BOULDER ZONE INJECTION WELLS
OOL--0	CE-4	CENTRATE DISPOSAL WELLS
OOL--P	CE-2	DUAL ZONE MONITORING WELL
OOL--Q	CT-3	EXCESS PEAK FLOW STORAGE AND HEADWORKS AREA

CAPITAL IMPROVEMENT PLAN

ITEM NO.	DESCRIPTION
CIP-A	BIOSOLIDS DRYER AREA - 4 ACRES

N

150 75 0 150'

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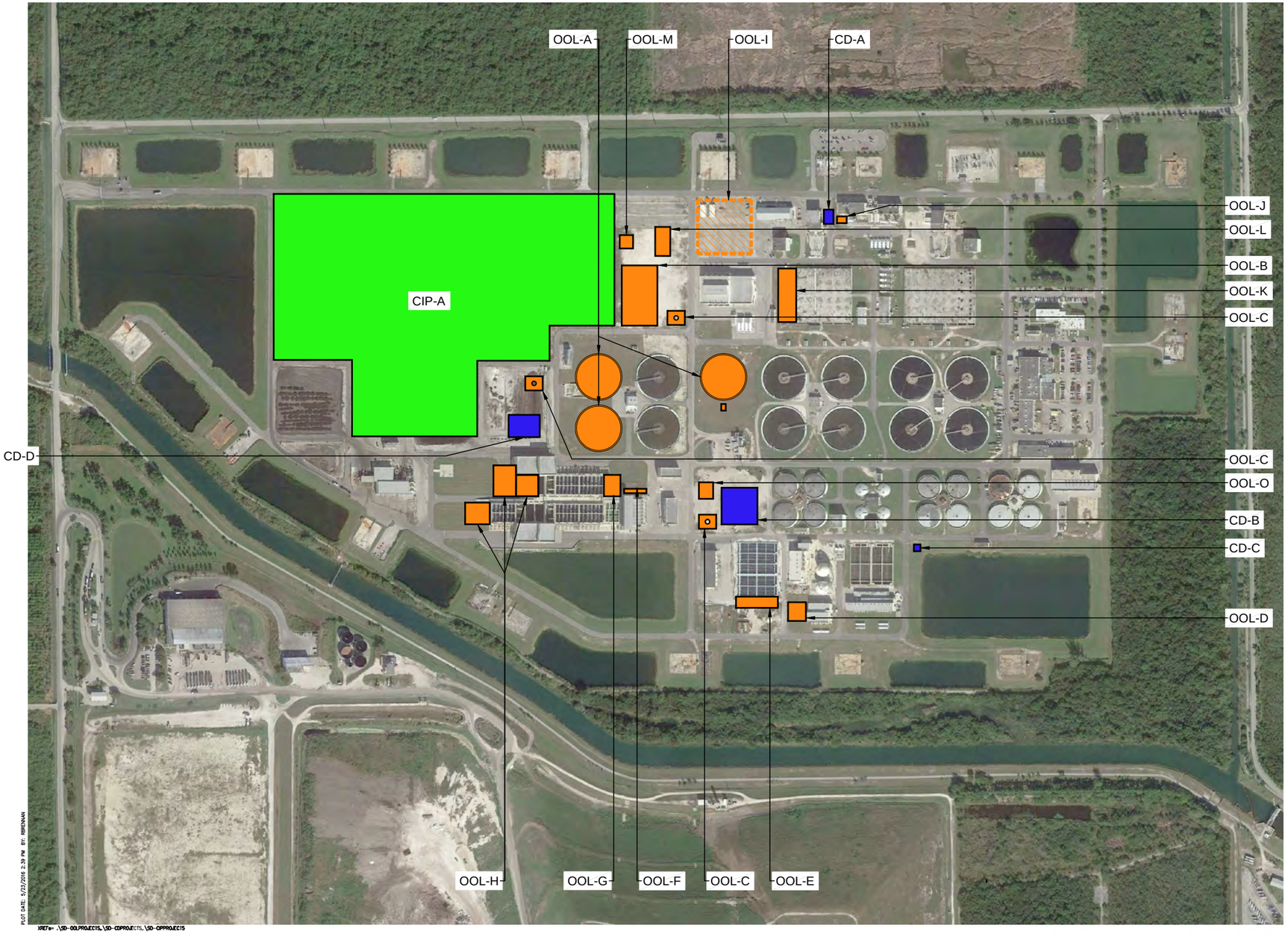
Figure 4-3. Planning Level Layout of OOL and Consent Decree Projects at CDWWTP
Compliance Plan 2016 Update

MIAMI-DADE WATER AND SEWER DEPARTMENT

SOUTH DISTRICT WASTEWATER TREATMENT PLANT



CONSENT DECREE

ITEM NO.		DESCRIPTION
CD-A	CD 1.02	ELECTRICAL BUILDING - 64L x 43W
CD-B	CD 1.07	ACID PHASE DIGESTERS - 150L x 150W
CD-C	CD 1.07	GAS FLARES - 30L x 30W
CD-D	CD 1.06/1.08	THICKENING/DEWATERING BUILDING - 140L x 100W

OCEAN OUTFALL LEGISLATION

ITEM NO.	PROJECT ID	DESCRIPTION
OOL--A	ST-1	SECONDARY CLARIFIERS - 204 DIA.
OOL--B	ST-1	ELECTRICAL BUILDING - 270L x 160W
OOL--C	SE-2	BOULDER ZONE INJECTION WELLS
OOL--D	SE-1	INJECTION WELL PUMP STATION - 84L x 80W
OOL--E	ST-2	CHLORINE CONTACT BASIN - 188L x 50W
OOL--F	ST-2	TRANSFER PUMP STATION - 20L x 100W
OOL--G	ST-1	FLOCCULATION TANK - 96L x 74W
OOL--H	ST-2	HLD - TERTIARY FILTERS - 110L x 97W
OOL--I	ST-2	EQUALIZATION STORAGE AREA
OOL--J	ST-1	OXYGEN PLANT No. 4 - 43L x 30W
OOL--K	ST-1	OXYGENATION TRAIN No. 8 - 240L x 80W
OOL--L	ST-1	HEADWORKS - 130L x 68W
OOL--M	ST-1	ODOR CONTROL - 60L x 60W
OOL--0	SE-4	INDUSTRIAL WELL PUMP STATION

CAPITAL IMPROVEMENT PLAN

ITEM NO.	DESCRIPTION
CIP-A	BIOSOLIDS P3 PROJECT

N

150 75 0 150'

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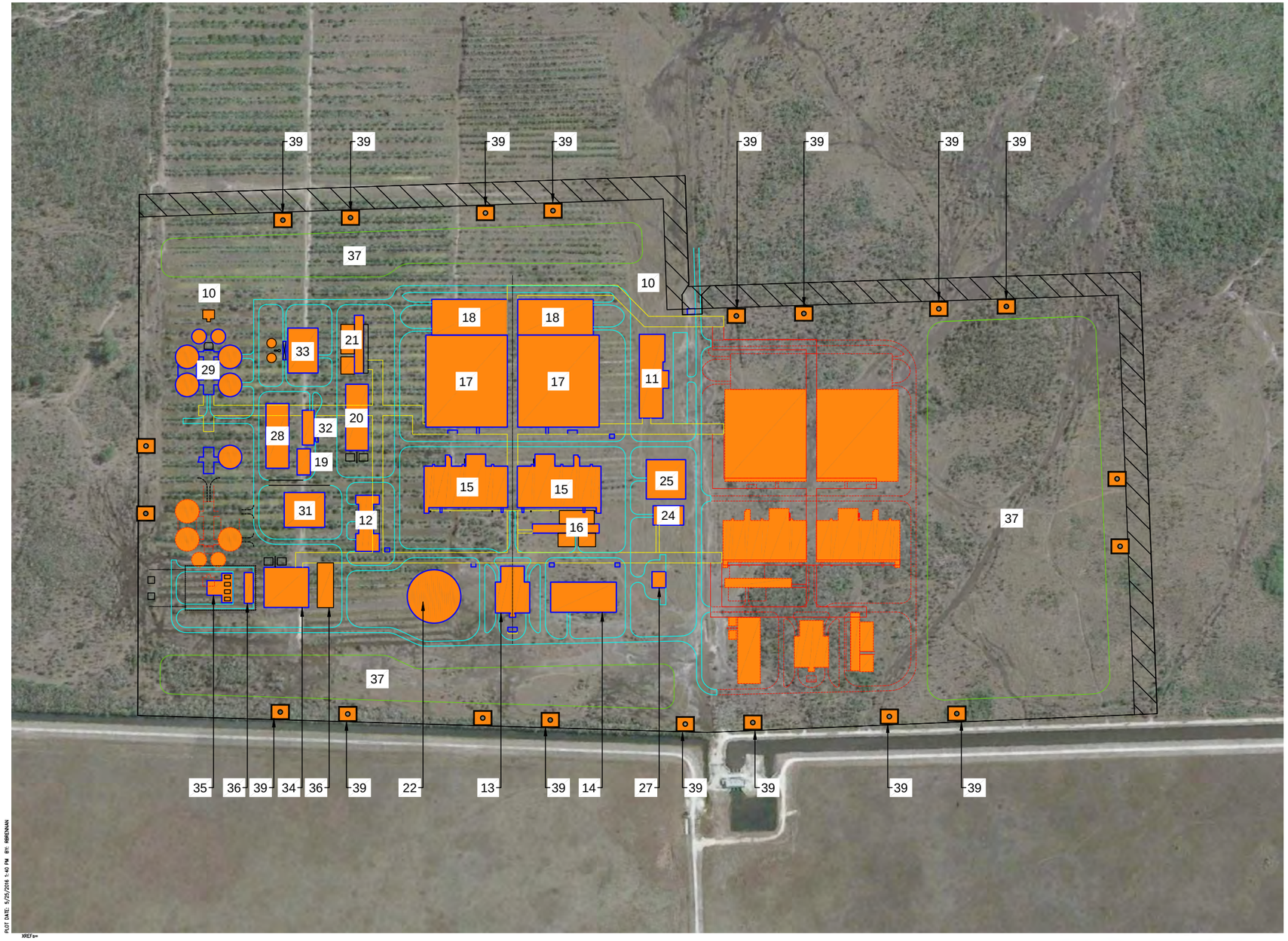
Figure 4-4. Planning Level Layout of OOL and Consent Decree Projects at SDWWTP
Compliance Plan 2016 Update

MIAMI-DADE WATER AND SEWER DEPARTMENT

WEST DISTRICT WASTEWATER TREATMENT PLANT



OCEAN OUTFALL LEGISLATION

ITEM NO.	PROJECT ID	DESCRIPTION
10	WT-1	SECURITY STATION
11	WT-1	ADMINISTRATION AND OPERATIONS
12	WT-1	MAINTENANCE AND WAREHOUSE
13	WT-1	PRELIMINARY TREATMENT WORK
14	WT-1	PRELIMINARY TREATMENT ODOR CONTROL
15	WT-1	PRIMARY TREATMENT FACILITY
16	WT-1	PRIMARY TREATMENT ODOR CONTROL
17	WT-1	MEMBRANE BIOREACTORS
18	WT-1	MEMBRANE TANKS
20	WT-1	BLOWERS AND ELECTRICAL BUILDING
21	WT-1	SECONDARY ODOR CONTROL FACILITY
22	WT-2	EQUALIZATION TANK
24	WT-1	SODIUM HYPOCHLORITE STORAGE/FEED
26	WT-1	CHLORINE CONTACT BASIN
27	WE-1	EFFLUENT PUMPING STATION
28	WT-1	SLUDGE THICKENING AND DEWATERING
29	WT-1	ANAEROBIC DIGESTER
30	WT-1	WASTE GAS BURNING
31	WB-1	BIOSOLIDS DRYING FACILITY
32	WT-1	SIDE STREAM DEAMMONIFICATION
33	WT-1	SOLID ODOR CONTROL
34	WT-1	POWER GENERATION AND COOLING
35	WT-1	SITE SUBSTATION
36	WT-2	STANDBY POWER GENERATOR
37	WT-1	RETENTION POND
38	WT-1	STRUVITE RECOVERY
39	WE-2	INJECTION WELLS

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200 100 0 200'

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Figure 4-5. Planning Level Layout of Proposed WDWWTP
Compliance Plan 2016 Update

Table 4-3. Conveyance Related Projects in the Updated Project List
Compliance Plan 2016 Update

Project ID	Description	Diameter (inches)	Length (feet)
NL-1A	60-inch FM at Biscayne Blvd to NW 2 Avenue (Phase I)	60	20,730
		48	21,148
NL-1B	48-inch FM at NW 2 Avenue to PS 306 and 36-inch FM from PS 0306 to NW 32 Avenue (Phase II)	36	1,423
NL-1C	36-inch FM at PS 306 to NP-1 (Phase III)	36	14,664
NL-2	24-inch FM Extension at 87 Avenue/W 76 Street to NW 67 Avenue	24	19,543
NL-3	24-inch FM at NW 67/W 76 STAVE to PS 307	24	1,582
NL-6A	20- inch FM Connection from PS 0416 to NP-1 along NW 185 Street	20	8,667
NL-7	48-inch FM Allows PS 300 to Pump North to PS 1310	48	1,176
NP-1	North Dade Booster Station at NW 183 Street/57 Avenue		
NP-416E	Upgrade to PS 0416	10	65
PS 306	PS 306 to Expand	50	52
CL-1	North Biscayne 48-inch FM Ext. S to PS 2	48	13,492
CL-2	Coral Gables 48-inch FM from SW 22 Terrace to 102-inch FM SW 15 Road	48	7,910
CL-4	East/West 84/90-inch FM Connection from PS 187 to WDWWTP	84	20,951
		90	18,331
CL-5	72-inch FM Connection in SW 137 AVE to CL-4 FM in NW 6 Street	72	6,963
CL-6	16-inch FM Connection in NW 74 Street from NW 97 to NW 107 Avenue - Doral	16	5,245
CL-7	NA		
CL-8	24-inch FM Connection in SW 8 Street from SW 152 to 177 Avenue - West Dade	24	13,252
CL-9	36-inch FM from WP-1 (Doral) to WDWWTP	36	36,239
CL-10A	48-inch FM Connection from CL-1 to suction OF CP-1	48	2,628
CL-10B	48-inch FM Connection from Existing 48-inch Discharge of PS 01 and PS 02 to Discharge of CP-1	48	538
CL-10C	48-inch FM Connection from Existing 48-inch across the River to Discharge of CP-1	48	3,740
CL-X	Flow Control – Pipeline Interconnections		
WP-1	Doral Booster Station		
CP-187E	Upgrade to PS 187		
CP-1	Central East Booster Station at A D Barnes Park		
SL-1A	54-inch FM Connection in SW 232 Street from SW 127 Avenue to SDWWTP	54	21,401
SL-1B	54/64-inch FM Connection in SW 248 Street from SW 112 Avenue to SDWWTP	54	10,696
		64	8,692

Table 4-3. Conveyance Related Projects in the Updated Project List
Compliance Plan 2016 Update

Project ID	Description	Diameter (inches)	Length (feet)
SL-2	54-inch FM Connection from SW 176 Street on SW 137 Avenue to SW 216 Street and 112 Avenue	54	27,391
SL-3A	42/48-inch FM Connection from SL-2 to SP-1	48	8,086
		42	5,353
SL-3B	42-inch FM Connection in SW from SP-1 along SW 136 Street to SW 104 Street (Phase II)	42	10,819
SL-3C	36-inch FM Connection from SW 104 Street to SW 88 Street	36	5,285
SL-4	42-inch FM Connection from PS 692 to SW 268 Street and SW 127 Avenue	42	21,588
SL-5	30-inch FM Connection from the Intersection at SW 304 Street and SW 157 Avenue to PS 692	30	6,032
SP-522E	Upgrade to PS 522		
SP-692E	Upgrade to PS 692		
SP-1073E	Upgrade to PS 1073		
SP-1	Southwest Dade Booster Station on SW 137 Avenue and SW 176 Street		
SP-559E	Upgrade to PS 559		

The evaluation of routing the peak flows through the system resulted in a number of revisions to the conveyance system projects as follows:

North District Service Area:

1. The original NL-1 project was determined to be not required as originally defined. This change was directed by WASD and was made in conjunction with the Consent Decree Program. WASD requested an alternative route for the flow generated in the western North District service area to be delivered to the NDWWTP. The new route was conceptualized to direct flow away from the existing tandem boosters Pump Station 0300 and Pump Station 1310, and relieve some pressure issues observed at the boosters during peak flow events. The new project was identified as NL-1A, NL-1B, and NL-1C, segmented into three phases to meet different system requirements. These projects would provide an additional route to send flow from the northwest area of the NDWWTP service area.
    a. NL-1A consists of installing a 60-inch pipe between Biscayne Boulevard and NW 2 Avenue to provide the capacity that will be lost due to rehabilitation of the 72-inch force main.
    b. NL-1B is a 48-inch force main between NW 2 Avenue (Connects to NL-1A) and Pump Station 0306.
    c. NL-1C is a 36-inch force main between Pump Station 0306 and NP-1.
2. During the assessment of the NL-1A, NL-1B, and NL-1C projects, it was determined that Pump Station 0306 needed to be expanded into a booster pump station. This booster will manage the flow delivered by NL-1C and will help offload the pressure from Pump Station 1310 and will send flow through the new NL-1A and NL-1B force mains.
3. The route and diameter of the original NL-6 project was changed based on the routing of the new NL-1A, NL-1B and NL-1C projects. The original NL-6 project was a 24-inch force main connecting Pump Station 0416 to 30-inch force main at NW 171 Street/67 Avenue. The routing of NL-6A was refined to be a 20-inch force main and connect from Pump Station 0416 to NP-1 (North Dade

Booster station at NW 183 Street/57 Avenue) pump station to be consistent with collecting flow from the north-west area and routing it to the NDWWTP through the new NL-1 force mains.

4. Projects NP-1 and NL-7 were determined to not require modifications.
5. NL-4 and NL-5 projects were determined as not needed for adequate peak flow capacity of existing lines due to the updates to the flow allocations and rerouting of flows. However, these projects may be implemented for reasons other than peak flow capacity, which will be evaluated during conceptual design.

South District Service Area:

1. Projects SL-1 and SL-3 defined in the 2013 Compliance Plan were revised by WASD during the evaluation of a rehabilitation project under the Consent Decree Program. The SL-1 project was split into SL-1A and SL-1B, and SL-3 was split into SL-3A and SL-3B.
2. Project SL-3C (36-inch force main connection from SW 104 Street to SW 88 Street) was recommended to be added to the project list to route additional flows to SP-1 (Southwest Dade Booster Station at SW 137 Avenue) and relieve some of the pressure issues at the existing tandem booster pump stations (PS 559 and 536).
3. SP-1 (Southwest Dade Booster Station at SW 137 Avenue) was relocated approximately 0.5 mile north from the previously proposed location.
4. The booster Pump Station 0559 was determined to require upgrades to meet the pressure conditions in 2035. The need to upgrade Pump Station 559 is dependent on the final configuration of SL-3 Segments and the final design of SP-1.
5. Projects including upgrades to existing Pump Station 0522, Pump Station 0692, Pump Station 1073, and, and force main projects SL-2 (48-inch force main connection from SP-1 on SW 137 Avenue to SL-1B) and SL-4 (48-inch force main connection from Pump Station 0692 to SW 268 Street and SW 127 Avenue), were determined to not require major modifications based on the updated flows and routing.
6. Project SL-6 (24-inch force main connection from Pump Station 1073 to Pump Station 691) was determined as not likely required because the flow projections from Florida City were revised and the existing force main was evaluated to have enough capacity to handle peak flows.

Central and West District Service Areas:

1. The scope of project CL-1 (North Biscayne 42-inch force main extension south to Pump Station 0002 discharge 48-inch in NW 4 Street) was incorporated from WASD's original Compliance Plan analysis. The collection system model used for the alternative refinement doesn't include enough detail of this area, so this project was not evaluated as part of the refinement. For purposes of this assessment, the diameter of the force main was assumed to be 48 inches for the entire length.
2. Project CL-2 (Coral Gables 48-inch force main from SW 22 Terrace to 102-inch force main from SW 15 Road) was not evaluated as part of the refinement. The intent for this segment in the Compliance Plan was to provide for reliable transfer of flows from Coral Gables.
3. Project CL-8 (24-inch force main connection in SW 8 Street from SW 152 to 177 Avenue) was determined to not require major modifications.
4. CL-3 (48-inch force main connection in NW 58 Street from NW 107 Avenue to 87 Avenue) and CL-7 (48-inch force main connection in NW 53 Street from Pump Station 14 to NW 72 Avenue) were determined as not likely required based on the evaluation of the pressures and flows. CL-3 and CL-7 were conceptualized to send flow from Doral Booster to the NDWWTP, but the evaluation of the updated flows resulted in routing most flows generated in the Doral area to WDWWTP.

5. CL-5 (72-inch force main connection in SW 137 Avenue to CL-4 force main in NW 6 Street), was determined to not require major modifications.
6. Project CL-4 (east-west 72/84-inch force main connection from Pump Station 187 to WDWWTP) was revised to an 84/90-inch force main connection as part of this evaluation. The force main was upsized to carry more flow and maintain the peak velocity in the force main below 8 feet per second.
7. CL-9 (54-inch force main from WP-1 [Doral Booster Station] to WDWWTP) was downsized from a 54-inch to a 36-inch force main. This force main will covey less flow that anticipated and downsizing was required to meet the minimum velocity desired for force mains.
8. Pump station upgrade project at CP-187E and new booster pump stations, CP-1 (Central East Booster Pump Station in Downtown Miami) and WP-1 (Doral Booster Station) were recommended to meet the Compliance Plan objectives. The improvements proposed for CP-187E will maintain the existing operational flexibility.
9. CL-10A (48-inch force main connection from CL-1 to the suction of CP-1), CL-10B (48-inch force main connection from existing 48-inch discharge of PS-001 and PS-002 to the discharge of CP-1), and CL-10C (48-inch force main connection from existing 48-inch across the Miami River to discharge of CP-1) were recommended to be added to route flows into the new pump station CP-1 and discharge them to either the CDWWTP or WDWWTP.

Additional Projects:

Workshops were held with WASD during refinement of the projects with the revised peak flows. Based on feedback, inter-basin transfer was identified as an operational need for reliability during peak weather events. To facilitate this operational flexibility, potential projects were identified for CIP. These projects are not required to meet the intent of the OOL but are being managed under this capital program. These potential projects include:

1. Pipeline project from Pump Station 416, approximately located on NW 73 Avenue to NW 97th Avenue, continuing south from approximately NW 186 Street to NW 58th Street at the connection of the proposed Doral Booster to facilitate transfer of flows from North and West Districts.
2. Pipeline project to allow transfer of flow between Central and North Districts. This project would extend from Pump Station 0187 to the NDWWTP. This segment would extend east along NW 58 Avenue from approximately NW 107 Avenue to NW 67 Avenue.
3. XL-1 is to reline a pipeline segment to increase longevity. This project would rehabilitate the existing segment from approximately NW 27 Avenue to NE 26 Avenue.
4. Pipeline project to relieve flows from the South District during instances of high flow conditions by conveying flows generated in the south to the WDWWTP. The proposed project would extend north on 137 Avenue from approximately SW 88 Street to NW 8 Street.

The above projects were identified during the workshops and are different from the projects required for the OOL peak flow conveyance and are under further assessment.

4.1.3 Reclaimed Water Reuse Projects

The multiple recharge injection well projects in the 2013 Compliance Plan were replaced with one project in the updated list of projects (XR-1). The scope of the XR-1 project is not fully defined at this time. FPL has agreed to use up to 90 mgd (SR-2) and WASD will make up the remaining 27.5 mgd through other alternative reuse projects that are environmentally, technically, and economically feasible. FPL has delayed the Turkey Point nuclear project, but SR-2's schedule has not been updated yet because of the uncertainty in the construction timing (probably after 2025).

As accomplished by other local utilities, WASD recognizes that the projected 2035 water supply demands can be met by using the Floridan aquifer, an alternative source, without adverse impacts to other users and the environment. As a result, the 2013 Compliance Plan component to replenish the upper Floridan aquifer with 27.5 mgd of reclaimed water does not fulfill an existing or impending water supply need and provides questionable benefits to current customers at tremendous expense (WASD, 2014). With the recent drop in water demand by about 30 mgd, the need to recharge the aquifer no longer exists.

In addition to the volumes, recharging the upper Floridan aquifer using injection wells imparts a negative carbon footprint impact when compared to use of deep injection wells. Table 4-4 provides a summary of the difference in cost and carbon emissions between the Floridan aquifer recharge wells and deep injection wells. The predicted energy use for the upper Floridan wells will generate about four times the annual carbon emissions as compared to deep well use because of the injection pressure differential. The higher annual energy costs of operating un-needed recharge wells will also generate an unnecessary financial burden to the utility customers.

TABLE 4-4
Relative Estimated Costs and Carbon Emissions for Effluent Disposal Alternatives (27.5 mgd)

Description	Project Cost ($M)[c]	Annual Operations and Maintenance Cost ($M)[d]	Annual Carbon Emissions (Metric Tons CO_2e)[e]
Floridan Aquifer Recharge (with TN Limit)[a,b]	107.8	4.8	17,190
Floridan Aquifer Recharge (with TN Waiver)[b]	76.7	2.3	15,870
Deep Injection Well[b]	71.6	0.6	3,960

Notes:

[a] For the purposes of this evaluation, ion exchange for ammonia removal is assumed to be used post-secondary treatment to comply with the TN < 10 mg/L limit.

[b] HLD treatment costs are not included in this comparison, since they are assumed the same for all alternatives.

[c] Project costs are indexed to 2012 values and include engineering, permitting, contingency, and WASD internal costs.

[d] Operation and maintenance costs include power ($0.08/kilowatt-hour [kWh]) and chemical costs but does not include ancillary equipment replacement or labor costs. Pump pressures are assumed to be 300 pounds per square inch (psi) for the upper Floridan aquifer recharge wells and 75 psi for the deep injection wells in the bolder zone.

[e] Scope 2 emissions as defined by EPA (Executive Order 13423/13514), based solely on electrical consumption and used a factor of 543 metric tons of CO2e per 1 *10^6 kWh.

At the time of the original OOL, the forecasted regional water supply demands were expected to increase substantially for the foreseeable future. Even in combination with the 2007 Water Availability Rule (multiple modifications in Florida Administrative Code Chapter 40-E), it was reasonable to expect that an increase in regional demand for reclaimed water was going to occur. However, such a demand has clearly not been realized, in fact the opposite has occurred. Water demand has dropped about 30 mgd since 2007. Implementing the 2013 Compliance Plan reuse approach for recharging the Floridan aquifer serves only to achieve a narrow reading of compliance with the statute rather than its intent of supplying a needed alternative water supply. While reuse feasibility has historically been a determination made by utilities with water management oversight, FDEP concurrence is important for the OOL Program. Consequently, FDEP should agree with WASD that the current project to replenish the Floridan aquifer with 27.5 mgd of reuse water does not fulfill a specific water supply need, provides questionable benefits, negatively impacts the environment by higher energy use, and is not economically feasible under the statute.

Finally, the large drop in water demand is the result of WASD's very aggressive water conservation program, which includes best management practices (rebates); construction standards for new development, retrofits, permanent landscape irrigation, landscape planting standards; and Outreach Programs. These local efforts are in addition to the state and national effort to conserve water through more efficient appliances, limited irrigation, and public education. FDEP should support conservation measures since they deliver benefits superior to that of reuse of reclaimed water because it reduces the need for wastewater reclamation and the supply of raw water. As a result, finished water demand reductions achieved through conservation measures should receive a commensurate reuse benefit. Conservation efforts by WASD from the start of the OOL effort in 2006 are well documented and reductions in water demand, associated with goal-based best management practices only, are 14.14 mgd through 2015.

Based on future water supply demands, availability of traditional water supplies, existing projects for the development of alternative water supplies, and the degree to which various reuse options offset potable water supplies, the recharge wells are not needed until beyond 2035. Consequently, WASD intends to update its Reuse Master Plan by June 2017 to identify its technically and economically feasible reclaimed water reuse opportunities. It is expected that new reuse projects associated with the WDWWTP will not be built until the proposed WWTP is constructed and is placed in service (after 2025).

4.1.4 Ocean Outfall Impacts

There are no expected impacts from the updates described above that would conflict with the ocean outfall capacities. The projected peak discharge through the outfalls at the NDWWTP and the CDWWTP are within the capacity of the existing infrastructure after some of the peak flow is either attenuated or goes to injection wells. Two capacities for the NDWWTP outfall have been reported, including 250 mgd firm capacity of the pump station and 185 mgd capacity of the outfall structure. The outfall capacity of the NDWWTP is to be confirmed as part of a future project. The estimated maximum NDWWTP outfall capacity required for the 300 mgd peak influent flow case would be 173 mgd. The outfall capacity of the CDWWTP is 286 mgd. The estimated maximum CDWWTP outfall capacity required for the 368 mgd peak influent flow case would be 219 mgd.

4.1.5 Regulatory Impacts

There are no regulatory impacts to the refined alternative with respect to compliance with the nutrient reduction, reuse, or the peak flow backup outfall use requirements. The injection well projects will comply with nutrient reduction requirements as originally planned, although at a different pace. The reclaimed water reuse plans are uncertain at this time. Preliminary analysis of 1-year-long hydrographs for the CDWWTP and NDWWTP facilities indicated that the updated baseline alternative will comply with the 5-year rolling average limit for peak flow discharges. This analysis will be further refined as part of the development of the conceptual design for these facilities including updated hydrographs.

SECTION 5

Updated OOL Program Schedule

This schedule was updated by the OOL Program based on meeting the OOL mandates with some modifications to account for revenue flows. Funding is discussed in the next section, but the overall scheduling strategy is to keep essential elements moving on an aggressive schedule and delay other elements to improve the cash flow management to better meet the revenue sources. Some of the essential critical path elements include the new WDWWTP and the injection wells. The WDWWTP site acquisition and design is progressing and 5 parcels (38.7 acres) have already been acquired (total site is to be about 230 to 250 acres). The acquisition of the remaining parcels may require up to 2 years. Also, the projected peak flow rates were for 2035 conditions and the OOL requires compliance at 2025. Some projects may be constructed in phases depending on the actual observed growth in demand to better manage the financing, labor resources, and other construction issues. There will be future updates to the project schedules reported to FDEP during the compliance reports.

The injection wells are moving forward on an independent schedule that paces the construction of wells (drilling) to no more than two WWTPs at a time. The well schedule acknowledges that there may be a delay after the wells are drilled before the WWTPs can be upgraded with HLD facilities. WASD intends to work with FDEP in keeping the construction permits valid until all work is completed prior to testing and acceptance.

Table 5-1 and Figure 5-1 provide the construction schedule of projects that the OOL Program currently maintains (Appendix C has more detail of the entire project duration and phases). Some of the projects listed in Section 3 have not moved into this schedule at the time of the report because they are still being refined and are not fully approved by WASD.

Table 5-1. OOL Compliance Plan Construction Schedule
Compliance Plan 2016 Update

Project ID	Description	Start	Finish
CL-3	FM Connection in NW 58 Street from NW 107 Avenue to 87 Avenue - Doral	18-Oct-23	26-Sep-24
CL-4	East/West FM Connection from PS 197 to WDWWTP	7-Nov-22	19-Nov-24
CL-5	FM Connection in SW 137 Avenue to CL-4 in NW 6 Street	29-Sep-23	7-Jan-25
CL-X	Flow Control Pipeline Interconnections	5-Feb-24	15-Jan-25
CL-9	FM from WP-1 (Doral) to WDWWTP	5-Jun-23	31-Dec-24
CL-1	N. Biscayne FM Extension S. to PS 2 Discharge in NW 4 Street	30-Jul-19	17-Aug-21
CL-2	Coral Gables Reroute	8-Dec-22	24-Dec-24
CL-6	FM Connection in NW 74 Street from NW 97 to NW 107 Avenue – Doral	19-Oct-23	24-Dec-24
CL-8	FM Connection to SW 8 Street from SW 152 Avenue to SW 177 Avenue – West Dade	30-Sep-22	24-Apr-24
NL-1A	FM from Biscayne Blvd to North Miami Ave (Phase 1)	31-Aug-17	18-Jun-19
NL-1B	FM from North Miami Avenue to PS 306 (Phase 2)	8-Jan-18	8-Jan-20
NL-1C	FM from PS 306 to Red Road (Phase 3)	15-Aug-23	30-Dec-24
NL-2	FM Extension from NW 87 Avenue/W 76 Street to Pipeline in NW 67 Avenue	14-Sep-23	23-Oct-25

Table 5-1. OOL Compliance Plan Construction Schedule
Compliance Plan 2016 Update

Project ID	Description	Start	Finish
NL-3	FM in W 12 Avenue (NW 67 Avenue) from W 79 Street to W 84 Street (NW 138 Street)	10-Apr-24	3-Apr-25
NL-4	FM Connection from NW 62 Avenue at W 77 Street to Discharge FM at PS 307	29-Aug-22	22-Mar-24
NL-6	FM from PS 416 to FM at W 67 Avenue (NW 171 Street)	15-May-24	19-Feb-25
NL-7	FM to Allow PS 300 to Pump North to PS 1310 Discharge	5-Jan-24	27-Dec-24
SL-1B	FM Connection in SW 248 Street from SW 112 Avenue to SDWWTP	14-Sep-18	20-Oct-21
SL-2	FM Connection from SP-1 on SW 137 Avenue to SL-1B	29-Jan-19	18-Mar-22
SL-3A	FM Connection from SP-1 to SW 137 Avenue and SW 136 Street (Phase 1)	5-Mar-19	3-Dec-21
SL-3B	FM Connection in SW 137 Avenue from SW 136 Street to SW 104 Street (Phase 2)	31-Oct-18	3-Aug-21
SL-4	FM Connection from PS 692 to SW 268 Street and SW 127 Avenue	7-Mar-19	22-Oct-21
SL-5	FM Connection from PS 691 to PS 692	25-Jul-18	15-Mar-21
SL-6	FM Connection from PS 1073 to PS 691	22-Apr-19	13-Nov-20
XL-1	Lining Pipeline from PS 300 to NDWWTP	18-Oct-23	11-Dec-24
PSOP	Pump Station Optimization Program	10-Dec-19	20-Jun-22
PSPF	Pump Station Peak Flow Upgrades	2-Mar-22	18-Mar-24
CP-187E	Upgrades and Expansion of PS 187	15-Dec-22	30-Dec-24
CP-1	Downtown Booster Station	3-Jan-19	21-Jan-21
NP-416E	Upgrades to PS 416	5-Jun-23	31-Dec-24
PS-306	PS 306	14-Feb-24	26-Dec-24
WP-1	Doral Booster Station	2-Jun-22	27-Oct-23
SP-1	Southwest Dade Booster Station	7-Dec-18	14-Sep-20
SP-1073E	Upgrades to PS 1073	1-Nov-18	29-May-20
SP-522E	Upgrades to PS 522	18-Oct-18	14-May-20
SP-692E	Upgrades to PS 692	18-Oct-18	6-Oct-20
CT-2	CDWWTP HLD Filters	28-Jan-21	30-Dec-24
CT-3	CDWWTP Peak Flow Treatment	12-Jul-23	10-Dec-24
NT-2	NDWWTP HLD Filters	22-Jan-21	24-Dec-24
NT-3	NDWWTP Peak Flow Treatment	17-Aug-23	26-Dec-24
WT-1	WDWWTP Phase 1	20-Apr-20	02-Oct-25
WT-2	WDWWTP Phase 2	20-Mar-24	24-Apr-25
ST-1	SDWWTP Treatment Upgrade to 121 mgd	25-Jul-19	28-Jan-22
ST-2	SDWWTP Treatment Upgrade to 131 mgd	28-Oct-21	30-Apr-24

Table 5-1. OOL Compliance Plan Construction Schedule
Compliance Plan 2016 Update

Project ID	Description	Start	Finish
CE-1	CDWWTP Municipal Wells Pump Station	21-Oct-21	19-Jun-24
CE-3	CDWWTP Industrial Wells Pump Station	29-Nov-16	14-Aug-18
CE-2	CDWWTP Municipal Wells	11-Aug-17	24-Aug-20
NE-1	#NA	8-Jun-22	20-Jun-24
CE-4	CDWWTP Industrial Wells	20-Oct-14 A	3-Feb-17
NE-2	#NA	27-Jul-21	21-Feb-23
SE-1	SDWWTP Municipal Wells Pump Station Expansion	12-Mar-19	26-Mar-21
SE-2	SDWWTP Municipal Wells	11-Apr-18	10-Feb-20
WE-1	WDWWTP Municipal Wells Pump Station	3-Nov-21	24-Oct-24
WE-2	WDWWTP Municipal Wells	21-Jan-21	26-Nov-24
NE-4	NDWWTP Industrial Wells	10-Aug-20	2-Apr-21
NE-5	NDWWTP Industrial Wells Pump Station	28-Dec-20	11-Jan-23
SE-4	SDWWTP Industrial Wells Pump Station	9-Jul-19	2-Mar-20
SE-5	SDWWTP Industrial Wells	7-Dec-18	10-Jun-21
SR-2	SDWWTP Reclaimed Water Pipeline to Turkey Point	10-Apr-24	23-Jun-26
XR-1	Future Reclaimed Water Reuse Projects	02-Oct-25	02-Nov-27
XS-1	WWTP Storm Surge Protection	28-Mar-22	11-Apr-24

Note:
FM = force main
PS = Pump Station

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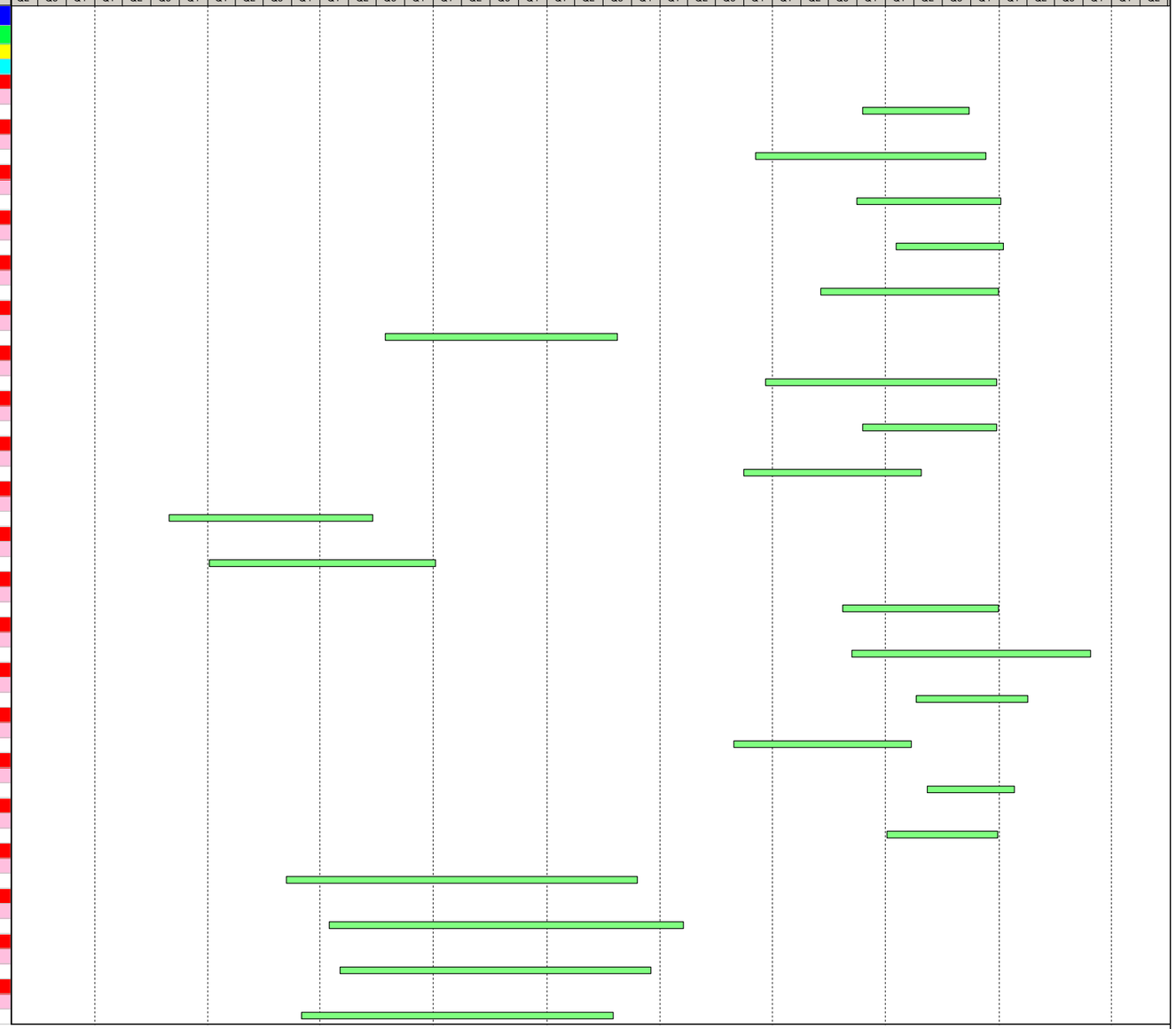
Activity ID	Activity Name	Dur	Start	Finish
Miami-Dade Water and Sewer Department Programs		2969	20-Oct-14 A	23-Jun-26
WASD Ocean Outfall Legislation Program		2969	20-Oct-14 A	23-Jun-26
Miami-Dade Ocean Outfall Legislation Program		2969	20-Oct-14 A	23-Jun-26
Pipelines		2073	31-Aug-17	23-Oct-25
CL-3 48-Inch FM Connection in NW 58th St from NW 107th Ave to 87 Ave - Doral		240	18-Oct-23	26-Sep-24
Construction		240	18-Oct-23	26-Sep-24
CN-1000	Construction	240	18-Oct-23	26-Sep-24
CL-4 East/West 72/84-Inch FM Connection from PS 187 to WDWWTP		520	07-Nov-22	19-Nov-24
Construction		520	07-Nov-22	19-Nov-24
CN-1000	Construction	520	07-Nov-22	19-Nov-24
CL-5 72-Inch FM Connection in SW 137 Ave to CL-4 FM in NW 6th St.		322	29-Sep-23	07-Jan-25
Construction		322	29-Sep-23	07-Jan-25
CN-1000	Construction	322	29-Sep-23	07-Jan-25
CL-X Flow Control - Pipeline Interconnections		241	05-Feb-24	15-Jan-25
Construction		241	05-Feb-24	15-Jan-25
CN-1000	Construction	241	05-Feb-24	15-Jan-25
CL-9 54-Inch Force Main From WP-1 (Doral) to WDWWTP		400	05-Jun-23	31-Dec-24
Construction		400	05-Jun-23	31-Dec-24
CN-1000	Construction	400	05-Jun-23	31-Dec-24
CL-1 North Biscayne 42-inch FM Ext. S to PS2 Discharge 48-Inch in NW 4 Street		522	30-Jul-19	17-Aug-21
Construction		522	30-Jul-19	17-Aug-21
CN-1000	Construction	522	30-Jul-19	17-Aug-21
CL-2 Coral Gables Reroute		522	08-Dec-22	24-Dec-24
Construction		522	08-Dec-22	24-Dec-24
CN-1000	Construction	522	08-Dec-22	24-Dec-24
CL-6 24 Inch FM Connection in NW 74 St from NW 97 to NW 107 Ave - Doral		300	19-Oct-23	24-Dec-24
Construction		300	19-Oct-23	24-Dec-24
CN-1000	Construction	300	19-Oct-23	24-Dec-24
CL-8 24 Inch FM Connection in SW 8 St from SW 152 to 177 Ave - West Dade		400	30-Sep-22	24-Apr-24
Construction		400	30-Sep-22	24-Apr-24
CN-1000	Construction	400	30-Sep-22	24-Apr-24
NL-1A 48-Inch Force Main from Biscayne Blvd to North Miami Ave (Phase I)		455	31-Aug-17	18-Jun-19
Construction		455	31-Aug-17	18-Jun-19
CN-1000	Construction	455	31-Aug-17	18-Jun-19
NL-1B 48-Inch Force Main from North Miami Ave to PS306 (Phase II)		509	08-Jan-18	08-Jan-20
Construction		509	08-Jan-18	08-Jan-20
CN-1000	Construction	509	08-Jan-18	08-Jan-20
NL-1C 42-Inch Force Main from PS 306 to Red Rd (Phase III)		349	15-Aug-23	30-Dec-24
Construction		349	15-Aug-23	30-Dec-24
CN-1000	Construction	349	15-Aug-23	30-Dec-24
NL-2 FM Ext. from 36-Inch at NW 87 Ave/W 76 St to 48-Inch in NW 67 Ave		537	14-Sep-23	23-Oct-25
Construction		537	14-Sep-23	23-Oct-25
CN-1000	Construction	537	14-Sep-23	23-Oct-25
NL-3 30-Inch Force Main in W 12 Ave (NW 67 Ave) from W 79 St to W 84 St (NW 138 St)		250	10-Apr-24	03-Apr-25
Construction		250	10-Apr-24	03-Apr-25
CN-1000	Construction	250	10-Apr-24	03-Apr-25
NL-4 48-Inch Force Main Connection from NW 62 Ave at W 77 St to Discharge Force Main of PS 307		400	29-Aug-22	22-Mar-24
Construction		400	29-Aug-22	22-Mar-24
CN-1000	Construction	400	29-Aug-22	22-Mar-24
NL-6 24-Inch FM from PS 416 to 30-Inch FM at NW 171 St/67 Ave		194	15-May-24	19-Feb-25
Construction		194	15-May-24	19-Feb-25
CN-1000	Construction	194	15-May-24	19-Feb-25
NL-7 48-Inch - Allows P.S. 300 to Pump North to P.S. 1310 Discharge		250	05-Jan-24	27-Dec-24
Construction		250	05-Jan-24	27-Dec-24
CN-1000	Construction	250	05-Jan-24	27-Dec-24
SL-1B 54/72 Inch Force Main Connection in SW 248 ST from SW 112 Ave to SDWWTP		788	14-Sep-18	20-Oct-21
Construction		788	14-Sep-18	20-Oct-21
CN-1000	Construction	788	14-Sep-18	20-Oct-21
SL-2 54/60 Inch Force Main Connection from SP-1 on SW 137 Ave to SL-1B		800	29-Jan-19	18-Mar-22
Construction		800	29-Jan-19	18-Mar-22
CN-1000	Construction	800	29-Jan-19	18-Mar-22
SL-3A 48/54 Inch Force Main Connection from SP-1 to SW 137 Ave and SW 136 St (Phase I)		700	05-Mar-19	03-Dec-21
Construction		700	05-Mar-19	03-Dec-21
CN-1000	Construction	700	05-Mar-19	03-Dec-21
SL-3B 48/54 Inch Force Main Connection in SW 137 Ave from SW 136 St to SW 104 St (Phase II)		700	31-Oct-18	03-Aug-21
Construction		700	31-Oct-18	03-Aug-21
CN-1000	Construction	700	31-Oct-18	03-Aug-21



Completed Work | Critical Remaining Work | Remaining Work | ◆ Milestone

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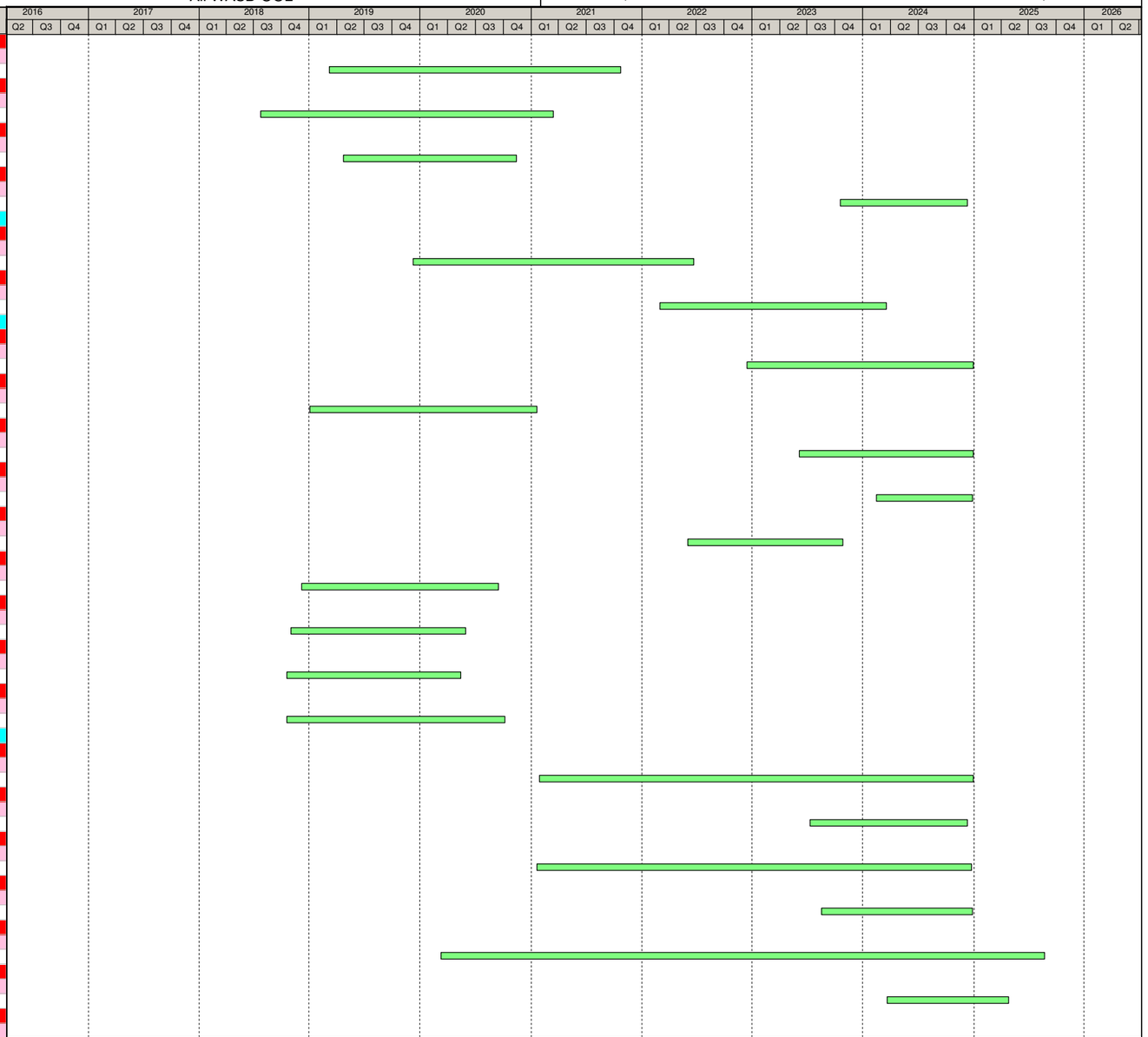
Activity ID	Activity Name	Dur	Start	Finish
SL-4 48 Inch Force Main Connection from PS 692 to SW 268 ST and SW 127 Ave		670	07-Mar-19	22-Oct-21
Construction		670	07-Mar-19	22-Oct-21
CN-1000	Construction	670	07-Mar-19	22-Oct-21
SL-5 42-Inch FM Connection from PS 691 to PS 692		670	25-Jul-18	15-Mar-21
Construction		670	25-Jul-18	15-Mar-21
CN-1000	Construction	670	25-Jul-18	15-Mar-21
SL-6 24-Inch Force Main Connection from PS 1073 to PS 691		400	22-Apr-19	13-Nov-20
Construction		400	22-Apr-19	13-Nov-20
CN-1000	Construction	400	22-Apr-19	13-Nov-20
XL-1 48-Inch Lining from PS 300 to NDWWTP		292	18-Oct-23	11-Dec-24
Construction		292	18-Oct-23	11-Dec-24
CN-1000	Construction	292	18-Oct-23	11-Dec-24
Local Pumping Stations and Force Mains		1089	10-Dec-19	18-Mar-24
PSOP Pump Station Optimization Program		645	10-Dec-19	20-Jun-22
Construction		645	10-Dec-19	20-Jun-22
CN-1000	Construction	645	10-Dec-19	20-Jun-22
PSPF Pump Station Peak Flow Upgrades		522	02-Mar-22	18-Mar-24
Construction		522	02-Mar-22	18-Mar-24
CN-1000	Construction	522	02-Mar-22	18-Mar-24
Major Pumping Stations		1578	18-Oct-18	31-Dec-24
CP-187E Upgrade and Expansion of PS187		520	15-Dec-22	30-Dec-24
Construction		520	15-Dec-22	30-Dec-24
CN-1000	Construction	520	15-Dec-22	30-Dec-24
CP-1 Downtown Booster Station		522	03-Jan-19	21-Jan-21
Construction		522	03-Jan-19	21-Jan-21
CN-1000	Construction	522	03-Jan-19	21-Jan-21
NP-416E Upgrade to PS 416		400	05-Jun-23	31-Dec-24
Construction		400	05-Jun-23	31-Dec-24
CN-1000	Construction	400	05-Jun-23	31-Dec-24
PS-306 Pump Station 306		221	14-Feb-24	26-Dec-24
Construction		221	14-Feb-24	26-Dec-24
CN-1000	Construction	221	14-Feb-24	26-Dec-24
WP-1 Doral Booster Station		360	02-Jun-22	27-Oct-23
Construction		360	02-Jun-22	27-Oct-23
CN-1000	Construction	360	02-Jun-22	27-Oct-23
SP-1 Southwest Dade Booster Station		450	07-Dec-18	14-Sep-20
Construction		450	07-Dec-18	14-Sep-20
CN-1000	Construction	450	07-Dec-18	14-Sep-20
SP-1073E Upgrade PS 1073		400	01-Nov-18	29-May-20
Construction		400	01-Nov-18	29-May-20
CN-1000	Construction	400	01-Nov-18	29-May-20
SP-522E Upgrade to PS 522		400	18-Oct-18	14-May-20
Construction		400	18-Oct-18	14-May-20
CN-1000	Construction	400	18-Oct-18	14-May-20
SP-692E Upgrade to PS 692		500	18-Oct-18	06-Oct-20
Construction		500	18-Oct-18	06-Oct-20
CN-1000	Construction	500	18-Oct-18	06-Oct-20
Wastewater Treatment		1548	25-Jul-19	21-Aug-25
CT-2 CDWWTP - HLD Filters (141 MGD)		1000	28-Jan-21	30-Dec-24
Construction		1000	28-Jan-21	30-Dec-24
CN-1000	Construction	1000	28-Jan-21	30-Dec-24
CT-3 CDWWTP - Peak Flow Treatment		360	12-Jul-23	10-Dec-24
Construction		360	12-Jul-23	10-Dec-24
CN-1000	Construction	360	12-Jul-23	10-Dec-24
NT-2 NDWWTP - HLD Treatment 57 MGD		1001	22-Jan-21	24-Dec-24
Construction		1001	22-Jan-21	24-Dec-24
CN-1000	Construction	1001	22-Jan-21	24-Dec-24
NT-3 NDWWTP - Peak Flow Treatment		345	17-Aug-23	26-Dec-24
Construction		345	17-Aug-23	26-Dec-24
CN-1000	Construction	345	17-Aug-23	26-Dec-24
WT-1 WDWWTP - West District Wastewater Treatment Plant		1390	10-Mar-20	21-Aug-25
Construction		1390	10-Mar-20	21-Aug-25
CN-1000	Construction	1390	10-Mar-20	21-Aug-25
WT-2 WDWWTP - Peak Flow Treatment		280	20-Mar-24	24-Apr-25
Construction		280	20-Mar-24	24-Apr-25
CN-1000	Construction	280	20-Mar-24	24-Apr-25
ST-1 SDWWTP-Upgrade to 121 MGD ADE		640	25-Jul-19	28-Jan-22
Construction		640	25-Jul-19	28-Jan-22



Completed Work | Critical Remaining Work | Remaining Work | Milestone

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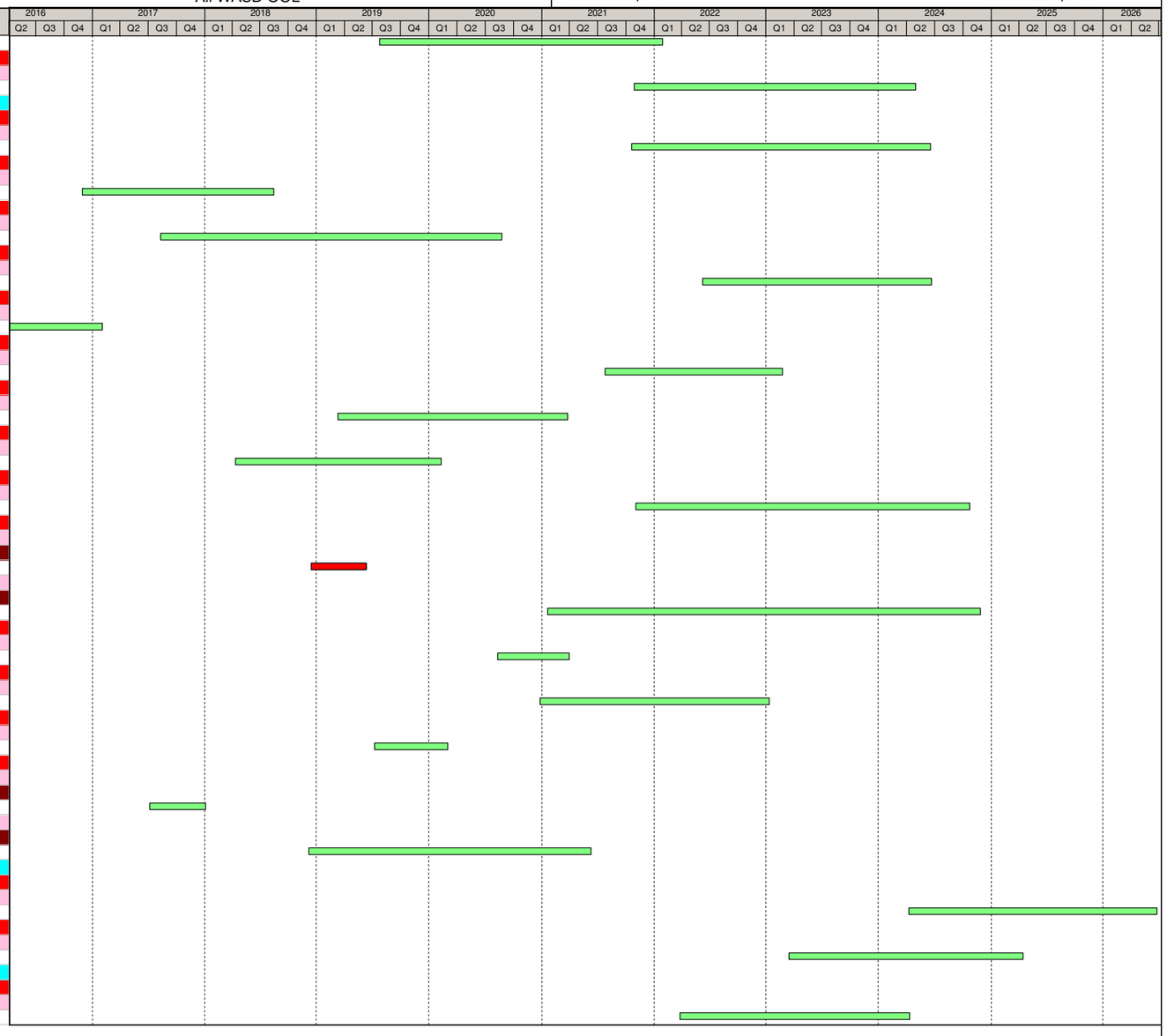
Activity ID	Activity Name	Dur	Start	Finish
CN-1000	Construction	640	25-Jul-19	28-Jan-22
ST-2 SDWWTP-Upgrade to from 121 MGD to 131 MGD		640	28-Oct-21	30-Apr-24
Construction		640	28-Oct-21	30-Apr-24
CN-1000	Construction	640	28-Oct-21	30-Apr-24
Effluent Disposal		2571	20-Oct-14 A	26-Nov-24
CE-1 CDWWTP - BZ Disposal Effluent Pump Station		680	21-Oct-21	19-Jun-24
Construction		680	21-Oct-21	19-Jun-24
CN-1000	Construction	680	21-Oct-21	19-Jun-24
CE-3 CDWWTP - Centrate Disposal Pump Station		434	29-Nov-16	14-Aug-18
Construction		434	29-Nov-16	14-Aug-18
CN-1000	Construction	434	29-Nov-16	14-Aug-18
CE-2 CDWWTP - BZ Deep Municipal Injection Wells		771	11-Aug-17	24-Aug-20
Construction		771	11-Aug-17	24-Aug-20
CN-1000	Construction	771	11-Aug-17	24-Aug-20
NE-1 NDWWTP - BZ Disposal Effluent Pump Station		520	08-Jun-22	20-Jun-24
Construction		520	08-Jun-22	20-Jun-24
CN-1000	Construction	520	08-Jun-22	20-Jun-24
CE-4 CDWWTP - Centrate Disposal Well		582	20-Oct-14 A	03-Feb-17
Construction		582	20-Oct-14 A	03-Feb-17
CN-1000	Construction	582	20-Oct-14 A	03-Feb-17
NE-2 NDWWTP - BZ Deep Municipal Injection Wells		403	27-Jul-21	21-Feb-23
Construction		403	27-Jul-21	21-Feb-23
CN-1000	Construction	403	27-Jul-21	21-Feb-23
SE-1 SDWWTP - BZ Effluent Disposal Pump Station Expansion		520	12-Mar-19	26-Mar-21
Construction		520	12-Mar-19	26-Mar-21
CN-1000	Construction	520	12-Mar-19	26-Mar-21
SE-2 SDWWTP - BZ Deep Municipal Injection Wells		465	11-Apr-18	10-Feb-20
Construction		465	11-Apr-18	10-Feb-20
CN-1000	Construction	465	11-Apr-18	10-Feb-20
WE-1 WDWWTP - Injection Well Pump Station		760	03-Nov-21	24-Oct-24
Construction		760	03-Nov-21	24-Oct-24
CN-1000	Construction	760	03-Nov-21	24-Oct-24
WE-2 WDWWTP - Municipal Injection Wells		1518	13-Dec-18	26-Nov-24
Phase 01 - Monitor Well		125	13-Dec-18	10-Jun-19
Construction		125	13-Dec-18	10-Jun-19
CN-1000	Construction	125	13-Dec-18	10-Jun-19
Phase 02 - Municipal Injection Wells		984	21-Jan-21	26-Nov-24
Construction		984	21-Jan-21	26-Nov-24
CN-2000	Construction	984	21-Jan-21	26-Nov-24
NE-4 NDWWTP - Pump Station for Industrial Wells		165	10-Aug-20	02-Apr-21
Construction		165	10-Aug-20	02-Apr-21
CN-1000	Construction	165	10-Aug-20	02-Apr-21
NE-5 NDWWTP - Industrial Wastewater Injection Wells		522	28-Dec-20	11-Jan-23
Construction		522	28-Dec-20	11-Jan-23
CN-1000	Construction	522	28-Dec-20	11-Jan-23
SE-4 SDWWTP - Pump Station for Industrial Wells		165	09-Jul-19	02-Mar-20
Construction		165	09-Jul-19	02-Mar-20
CN-1000	Construction	165	09-Jul-19	02-Mar-20
SE-5 SDWWTP - Industrial Wastewater Injection Wells		997	07-Jul-17	10-Jun-21
Phase 01 - Monitor Well		125	07-Jul-17	05-Jan-18
Construction		125	07-Jul-17	05-Jan-18
CN-1000	Construction	125	07-Jul-17	05-Jan-18
Phase 02 - Industrial Injection Wells		638	07-Dec-18	10-Jun-21
Construction		638	07-Dec-18	10-Jun-21
CN-1440	Construction	638	07-Dec-18	10-Jun-21
Reclaimed Water Facilities		833	15-Mar-23	23-Jun-26
SR-2 SR-D 72-Inch Reclaimed Water Pipeline - SDWWTP to FPL (Turkey Point)		560	10-Apr-24	23-Jun-26
Construction		560	10-Apr-24	23-Jun-26
CN-1000	Construction (Design and Construction by FPL)	560	10-Apr-24	23-Jun-26
XR-1 Reuse Placekeeper		530	15-Mar-23	14-Apr-25
Construction		530	15-Mar-23	14-Apr-25
CN-1000	Construction (Design and Construction by FPL)	530	15-Mar-23	14-Apr-25
WWTP Storm Surge		522	28-Mar-22	11-Apr-24
XS-1 WWTP Storm Surge Protection		522	28-Mar-22	11-Apr-24
Construction		522	28-Mar-22	11-Apr-24
CN-1000	Construction	522	28-Mar-22	11-Apr-24



Completed Work | Critical Remaining Work | Remaining Work | Milestone

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Figure 5-1. Construction Schedule
Compliance Plan 2016 Update

SECTION 6

Financial Plan

The 2013 Compliance Plan included a capital cost estimate of about $3.3B for the limited list of 28 projects considered part of the Compliance Plan (Table 10; WASD, 2013). As part of the Alternatives Analysis presented in the 2013 Compliance Plan, a number of capacity projects were considered in the evaluation of all alternatives. The selected alternative carried an overall cost of system wide waste water facility upgrades of $5.2B (Table 5, Appendix G; WASD, 2013). As described in Section 4, the OOL Program has altered the projects that are needed to address both capacity and operational needs resulting from upgrading the wastewater system to address the OOL and practical planning needs for 2035 conditions.

In addition, several WASD programs were using different factors to account for the total capital costs. These factors include items like contingencies, traffic control, engineering and surveying during construction, land acquisition costs, and WASD's own overhead and management costs. WASD recently updated and standardized these factors, which has also increased the capital costs of individual projects. The updated capital costs of the current projects are summarized in Table 6-1. The revised OOL capital budget for OOL program related costs is currently $5.7B.

Table 6-1. Estimated Capital Costs for OOL Program
Compliance Plan 2016 Update

Project ID	Description	Capital Cost Total
OOL Compliance Projects		
	FM Pipelines Total:	$579,406,289
	Municipal Wells Total:	$339,938,372
	Pump Stations Total:	$430,727,461
	HLD/Peak Flow Treatment Total:	$2,511,367,619
	OOL Compliance Projects - Subtotal:	**$3,861,439,741**
OOL Related Capacity Projects		
	Industrial Wells Total:	$57,116,342
	Local Pump Stations Total:	$398,069,163
	Pipelines Total:	$528,557,135
	Pump Stations Total:	$234,154,965
	Treatment/Reuse/Hardening Total:	$612,534,388
	Other Program Costs	$11,002,556
	Subtotal: OOL Required Capacity Projects	**$1,841,434,548**
Program Totals:		**$5,702,874,289**

WASD has a large capital improvement plan that includes both water and wastewater system work (Multi-Year Capital Improvement Plan [MYCIP] Fiscal Years 2015 through 2021; WASD, 2015). The overall future expenditures have a combined multi-year total of about $13.5B for both systems. The OOL planned expenditures are about 54 percent of the $10.5B total wastewater capital improvement budget. Table 6-2 includes the schedule that is currently approved for WASD by the County Commissioners (WASD, 2015). WASD regularly updates the capital improvement plan but it is only approved annually. Updates to the plan are public record and include a listing of projects and funding plans.

Table 6-2. WASD Multi-Year Capital Improvement Plan Expenditure Summary – Adopted MYCIP FY15-21[a]

Compliance Plan 2016 Update

	Combined Water and Wastewater Expenditures ($1,000)	Wastewater Alone, Expenditures ($1,000)
Subtotal Prior Year	**720,177**	**422,957**
2015-2016	562,664	394,994
2016-2017	709,661	482,050
2017-2018	1,085,616	796,948
2018-2019	1,242,384	926,104
2019-2020	1,348,767	996,389
2020-2021	1,362,006	976,035
Future	6,473,022	5,465,675
Total	**13,504,298**	**10,461,152**

[a]WASD, 2015

The financial approach presented in the 2013 Compliance Plan remains unchanged recognizing higher estimated investment costs. WASD's primary funding source will be revenue bonds, state revolving loans and some restricted funds as projects qualify for their use. Funding a Compliance Plan of this magnitude will require periodic rate increases to fund debt service on bonds sold and maintain the utility's financial rating status. Additionally, WASD will be applying for any grants that may come available during this compliance period. The MYCIP includes a listing of the expected funding sources by category (Adopted MYCIP; WASD, 2015).

SECTION 7

Public Outreach

Miami-Dade County is a culturally and economically diverse community. Recognizing that the OOL program will impact the entire community, it is imperative to keep citizens informed as to the purpose, benefits, and impacts of OOL implementation. With this public outreach plan, WASD strives to ensure that the public is informed of the OOL program and supports the projects that allow WASD to meet the requirements of the OOL.

WASD is committed to conducting proactive public outreach that educates the public and fosters feedback about the planning, design, and construction of the OOL projects. Establishing opportunities for dialogue with the community is a fundamental component of effective community engagement. As such, WASD is implementing general OOL program outreach, small business and workforce development outreach, and construction communication outreach.

7.1 General OOL Program Outreach

Public meetings will be hosted throughout the life of the program. Beginning in 2015, WASD organized and delivered informational meetings in districts throughout Miami-Dade County, presenting the public with details about each of the CIPs including OOL. WASD and the Owner's Representative's Public Outreach team developed and distributed fact sheets for each of the 13 Commission Districts in the county at outreach meetings, and provided information to community participants at each meeting. The fact sheets noted the types of projects and expected outcomes to occur within each district and tentative construction start and end dates.

To appropriately target outreach to potentially affected community members, a stakeholder database has been initiated. This database includes active projects and those projected to be active in the coming year, and lists those potentially affected or interested by the projects. This database will be maintained throughout the life of the program. Stakeholders include, but are not limited to, residents and businesses potentially affected by projects, businesses who may be able to contribute to the performance of OOL projects, public agencies with an interest in the projects, community leaders, and elected and appointed officials.

Given the divergence of stakeholder types and communication methods, WASD continues to identify the most effective communication methods and platforms in which to engage with stakeholder groups. Monitoring participation in events, inquiries, and other measures are being implemented to gauge the effectiveness of outreach. Another method in which stakeholder can obtain information is through an interactive program web site (iWASD Projects; http://mdc.maps.arcgis.com/apps/webappviewer/index.html?id=a9ffec2ca2b34243ab302c4db76a40d9) that describes all active water and sewer infrastructure projects. This web site allows stakeholders to get status updates on projects and provides detailed project information to affected and interested residents and businesses.

7.2 Small Business and Workforce Development Outreach

To maximize opportunities for small businesses to participate in OOL projects and assist in workforce development, WASD is developing and delivering training workshops. Beginning in 2016, workshops addressing invoicing, planning, and scheduling. In July 2016, a construction management workshop for contractors will be held. In addition to small business support, WASD and OOL program staff have identified potential job classifications and skills that may be required on projects. It is anticipated that capacity and skill-building will occur throughout the life of the project, resulting in increased levels of local employment.

7.3 Construction Communication Outreach

Construction communication outreach will require specialized project-specific materials, including: door hangers, a variety of media tools, and project summary sheets. These will be developed for construction projects as necessary. Methods of distribution will coincide with the communication needs of the project-affected stakeholders. It is anticipated that door hangers will be placed before construction in impacted neighborhood to give residents an alert that construction is coming soon. To ensure fluid operations during construction, as needed by project, the OOL program outreach team will meet with potentially affected organizations to provide information about schedule, nature and duration of the construction, and where to go to get more information.

In addition to general public communication, WASD has initiated communication with several of the cities to expedite local permits. Inter-local agreements are planned so that some pipeline projects can be permitted as quickly as practical when the capacity projects are implemented.

SECTION 8

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Appendix A
Projected Nutrient Load Diversions

Estimated Total Nitrogen (TN) Diversion to Injection Wells

Appendix A

Miami-Dade Ocean Outfall Legislation Program Calculation

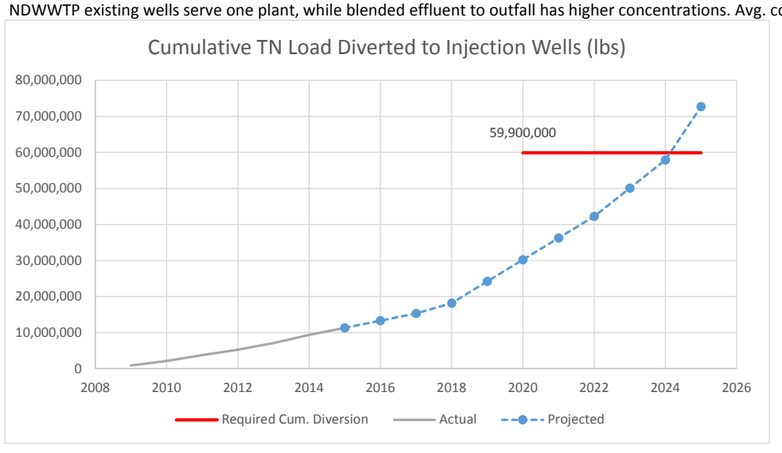
M.L. Griffin 4/8/2016

Year	days per year	AADF NDWWTP and CDWWTP Total Flow (mgd)		TOTAL AADF to Wells (mgd)	Flow Diversion Schedule NDWWTP ex. Wells (mgd)	NDWWTP Ind. Wells (mgd)	NDWWTP New Muni. Wells (mgd)	CDWWTP Ind. Wells (mgd)	CDWWTP New Muni. Wells (mgd)	Concentrations Avg. TN NDWWTP Effluent (mg/L)	Blended Ind. Well NDWWTP TN (mg/L)	Blended Ind. Well CDWWTP TN (mg/L)	Concentrations CDWWTP Effluent TN (mg/L)	Wells Flow Weighted Avg. TN (mg/L)	TN Load to Wells (lb/yr)	230.4K Discounted per FDEP (lb/yr)	Cummulative TN Load to Wells (lbs)
2009	365	208.8		20.6	20.6					17.3				17.3	1,085,624	855,231	855,231
2010	365	187.2		28.2	28.2					17.4				17.4	1,494,736	1,264,343	2,119,573
2011	365	195.0		36.0	36.0					16.9				16.9	1,853,341	1,622,948	3,742,521
2012	366	215.0		39.4	39.4					14.3				14.3	1,721,022	1,490,629	5,233,151
2013	365	214.7		35.1	35.1					19.3				19.3	2,063,624	1,833,231	7,066,381
2014	365	206.8		47.7	47.7					17.3				17.3	2,513,799	2,283,406	9,349,787
2015	365	206.5		43.3	43.3					16.5				16.5	2,176,396	1,946,003	11,295,790
2016	366	225.1	est.	43.0	*43.0*					17				17.0	2,232,912	2,002,519	13,298,309
2017	365	227.6		43.0	*43.0*					17				17.0	2,226,811	1,996,418	15,294,727
2018	365	230.1		60.0	*60.0*					17		34.4	19.2	17.0	3,107,179	2,876,786	18,171,513
2019	365	232.6		90.0	*60.0*			30.0		17		34.4	19.2	22.8	6,250,912	6,020,519	24,192,032
2020	366	235.0		90.0	*60.0*			30.0		17		34.4	19.2	22.8	6,268,038	6,037,645	30,229,677
2021	365	237.5		90.0	*60.0*			30.0		17		34.4	19.2	22.8	6,250,912	6,020,519	36,250,196
2022	365	240.0		90.0	*60.0*			30.0		17		34.4	19.2	22.8	6,250,912	6,020,519	42,270,715
2023	365	242.5		120.0	*60.0*	30.0		30.0		17.7	18.2	34.4	19.2	22.0	8,042,109	7,811,716	50,082,431
2024	366	245.0		120.0	*60.0*	30.0		30.0		17.7	18.2	34.4	19.2	22.0	8,064,142	7,833,749	57,916,181
2025	365	247.5		242.0	*60.0*	30.0	27.0	30.0	95.0	17.7	18.2	34.4	19.2	20.4	15,038,744	14,808,351	72,724,532
		see assumption 6		sum right	see assumptions 1 and 2	see 4.	see asssumpt. 9	see 4.	see asssumpt. 9	Approx. future conc. see assumption 10	??? No info. similar to CD	computed	computed	Avg. TN			

Assumptions:

1. 2009 through 2015 flow and concentrations are based on reported data.
2. NDWWTP existing wells based on observed flows through 2015. Hold steady at 45.5 mgd thereafter, but max. permit capacity is 71 mgd. Actual available flow is lower.
3. Used 4/30/2016 OOL Schedule for new wells availability. HLD capacity affects the municipal wells use.
4. Each well is 24-inch OD with a maximum permissible capacity of 19 mgd per well. Assumed avg. capacity per new well: 15 mgd AADF
5. First year of operation for industrial well is testing, assume full use and that it will continue. Prorate first year by months available.
6. AADF WWTP flows from 2013 Compliance Plan, linearly increased from then current to 2035 at 270 mgd. These are superceded, but are included here for a flow check.
7. Loads based on total AADF to Wells times flow weighted average concentration to Wells.
8. lb/d ==> flow (mgd) x Conc. (mg/L) x 8.3459 ; lb/yr is lb/d x days per year
9. Total AADF to wells is limited by the expected AADF at the WWTF, about 117 mgd at NDWWTP and 125 mgd at CDWWTP
10. NDWWTP existing wells serve one plant, while blended effluent to outfall has higher concentrations. Avg. concentrations increase with municipal well use.

Required Reduction for Compliance	59,900,000 TN
Annual reduction in TN (lb/y):	230,393



Estimated Total Phosphorus (TP) Diversion to Injection Wells

Appendix A

Miami-Dade Ocean Outfall Legislation Program Calculation

M.L. Griffin 4/8/2016

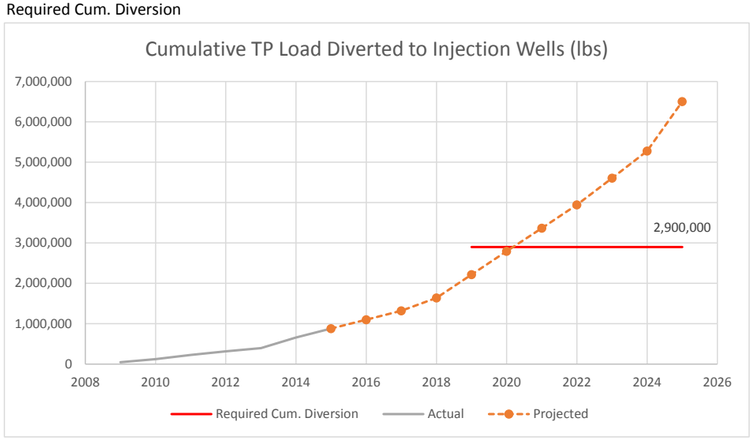
Year	days per year	AADF NDWWTP and CDWWTP Total Flow (mgd)		TOTAL AADF to Wells (mgd)	Flow Diversion Schedule NDWWTP ex. Wells (mgd)	NDWWTP Ind. Wells (mgd)	NDWWTP New Muni. Wells (mgd)	CDWWTP Ind. Wells (mgd)	CDWWTP New Muni. Wells (mgd)	Concentrations Avg. TP NDWWTP Effluent (mg/L)	Blended Ind. Well NDWWTP TP (mg/L)	Blended Ind. Well CDWWTP TP (mg/L)	Concentrations CDWWTP Effluent TP (mg/L)	Wells Flow Weighted Avg. TP (mg/L)	TP Load to Wells (lb/yr)	28.2K Discounted per FDEP (lb/yr)	Cummulative TP Load to Wells (lbs)
2009	365	208.8		20.6	20.6					1.20				1.2	75,303	47,106	47,106
2010	365	187.2		28.2	28.2					1.16				1.2	103,085	74,888	121,995
2011	365	195.0		36.0	36.0					1.23				1.2	131,598	103,401	225,396
2012	366	215.0		39.4	39.4					0.98				1.0	120,351	92,154	317,550
2013	365	214.7		35.1	35.1					0.98				1.0	106,923	78,726	396,276
2014	365	206.8		47.7	47.7					1.96				2.0	290,613	262,416	658,692
2015	365	206.5		43.3	43.3					1.88				1.9	250,615	222,418	881,110
2016	366	225.1	est.	43.0	*43.0*					1.90				1.90	249,561	221,364	1,102,474
2017	365	227.6		43.0	*43.0*					1.90				1.90	248,879	220,682	1,323,156
2018	365	230.1		60.0	*60.0*					1.90		2.80	1.55	1.90	347,273	319,076	1,642,232
2019	365	232.6		90.0	*60.0*			30.0		1.90		2.80	1.55	2.20	603,158	574,961	2,217,193
2020	366	235.0		90.0	*60.0*			30.0		1.90		2.80	1.55	2.20	604,811	576,614	2,793,807
2021	365	237.5		90.0	*60.0*			30.0		1.90		2.80	1.55	2.20	603,158	574,961	3,368,768
2022	365	240.0		90.0	*60.0*			30.0		1.90		2.80	1.55	2.20	603,158	574,961	3,943,729
2023	365	242.5		120.0	*60.0*	30.0		30.0		1.53	1.69	2.80	1.55	1.90	694,546	666,349	4,610,078
2024	366	245.0		120.0	*60.0*	30.0		30.0		1.53	1.69	2.80	1.55	1.90	696,449	668,252	5,278,330
2025	365	247.5		242.0	*60.0*	30.0	27.0	30.0	95.0	1.53	1.69	2.80	1.55	1.70	1,253,229	1,225,032	6,503,361
		see assumption 6		sum right	see assumptions 1 and 2	see 4.	see asssumpt. 9	see 4.	see asssumpt. 9	Approx. future conc. see assumption 10	??? No info. similar to CD	computed	computed	Avg. TN			

Assumptions:

1. 2009 through 2015 flow and concentrations are based on reported data.
2. NDWWTP existing wells based on observed flows through 2015. Hold steady at 45.5 mgd thereafter, but max. permit capacity is 71 mgd. Actual available flow is lower.
3. Used 4/30/2016 OOL Schedule for new wells availability. HLD capacity affects the municipal wells use.
4. Each well is 24-inch OD with a maximum permissible capacity of 19 mgd per well. Assumed avg. capacity per new well: 15 mgd AADF
5. First year of operation for industrial well is testing, assume full use and that it will continue. Prorate first year by months available.
6. AADF WWTP flows from 2013 Compliance Plan, linearly increased from then current to 2035 at 270 mgd. These are superceded, but are included here for a flow check.
7. Loads based on total AADF to Wells times flow weighted average concentration to Wells.
8. lb/d ==> flow (mgd) x Conc. (mg/L) x 8.3459 ; lb/yr is lb/d x days per year
9. Total AADF to wells is limited by the expected AADF at the WWTF, about 117 mgd at NDWWTP and 125 mgd at CDWWTP
10. NDWWTP existing wells serve one plant, while blended effluent to outfall has higher concentrations. Avg. concentrations increase with municipal well use.

Required Reduction for Compliance	2,900,000 TP
Annual reduction in TP (lb/y):	28,197

Required Cum. Diversion



Central District WWTP Proposed Industrial Wells

Appendix A

Preliminary Estimate of Impact of Removing Centrate from CDWWTP

OOL Program Calculation
M.L. Griffin 4/5/2016

1.	**No Diversion**			Comments
	Treated Effluent	116.4	mgd	2010-2015 average AADF (116.4 mgd)+ 0% for growth
	Typical TN	22.9	mg/L	2010-2015 average (Ref. 1)
	Typical TP	1.81	mg/L	2010-2015 average (Ref. 1)
	Undiverted Loadings to Outfall (no wells)			= Flow (mgd) x Conc. (mg/L) x 8.3459 x 365 [typ]
	TN	**8,119,971**	**lbs/yr**	
	TP	**641,797**	**lbs/yr**	

2.	**Two Industrial Wells**			Comments	TN (mg/L)	TP (mg/L)
	Plant 1 Scrubber Wastewater	2.20	mgd	Reference 2, T.1.1 T.3.1	11.3	2.9
	Plant 2 Scrubber Wastewater	3.80	mgd	Reference 2, T.1.1 T.3.1	19.4	3.1
	GRS Leachate	1.50	mgd	Reference 2, T.1.1 T.3.4	44.8	0.44
	Dewatering Centrate	0.50	mgd	Reference 2, T.1.1 T.3.3	869	60.35
	Treated Effluent	22.50	mgd	*Concentration from #4a below, flow is remainder of well capacity*	19.2	1.6
	Total Waste Stream Flow to Wells (mgd)	30.00	mgd	Assumed average, Ref. 2, T.4.2	34.4	2.8
	Estimated TN (mg/L)	34.38	mg/L	flow weighted average from above		
	Estimated TP (mg/L)	2.80	mg/L	flow weighted average from above		
	Diverted Loadings to Wells			= Flow (mgd) x Conc. (mg/L) x 8.3459 x 365		
	TN	**3,142,337**	**lbs/yr**			
	TP	**255,542**	**lbs/yr**			

3.	**Effect on CDWWTP Effluent Flow**			Comments
	Treated Effluent	116.4	mgd	assumed AADF for calculation
	Diverted effluent	-30.00	mgd	
	Outfall Flow	**86.4**	**mgd**	**to outfall after diversion**
		25.8%	**of the effluent is diverted**	

4.	**Effect on CDWWTP Effluent Concentration**			
	Undiverted Loadings from above			
	TN	8,119,971	lbs/yr	from #1 above
	TP	641,797	lbs/yr	from #1 above
	Centrate	0.50	mgd	from #2 above
	Ammonia + Nox	869	mg/L	from #2 above
	TP	60.35	mg/L	from #2 above

a. Portion of Loading Diverted to Well from Centrate Alone

TN	**1,323,597**	**lbs/yr**	**16.3%**	**undiverted load**
TP	**91,921**	**lbs/yr**	**14.3%**	**undiverted load**

Revised Effluent Concentration:
(Undiverted Loads - Centrate Load) /(Treated Flow - Centrate Flow)/8.3459/365
Assumes negligible denitrification at CDWWTP.

TN	**19.2**	mg/L
TP	**1.55**	mg/L

The above values are used in the computed diverted loads in #2 above.

b. Portion of Loading Diverted to Well from Treated Effluent Alone

Treated Effluent to Ind. Well 22.50 mgd

TN	**1,313,732**	**lbs/yr**	**16.2%**	**undiverted load**
TP	**106,290**	**lbs/yr**	**16.6%**	**undiverted load**

c. Total Loading Diverted to Well from Outfall from #2 above

TN	**3,142,337**	**lbs/yr**	**38.7%**	**undiverted load**
TP	**255,542**	**lbs/yr**	**39.8%**	**undiverted load**

d. Remaining Loading to the Outfall undiverted loads less diversion to well

TN	**4,977,634**	**lbs/yr**	**61.3%**	**undiverted load**
TP	**386,255**	**lbs/yr**	**60.2%**	**undiverted load**

5. References

1. WASD water quality and flow data results for the injection wells.2008-2015
2. MWH. 2014. Central District Wastewater Treatment Plan Injection Well Surface Facilities Basis of Design Report. Prepared for Miami-Dade Water and Sewer Department. April.

North District WWTP Proposed Industrial Wells

Appendix A

Preliminary Estimate of Impact of Removing flows from NDWWTP

OOL Program Calculation
M.L. Griffin 4/5/2016

1.	**No Diversion**			Comments
	Treated Effluent	100	mgd	future flow, before 2025
	Typical TN	17.65	mg/L	2009-2015 average (Ref. 1) is 18.3 mg/L for outfall
	Typical TP	1.525	mg/L	2009-2015 average (Ref. 1) is 1.65 mg/L for outfall
	Undiverted Loadings to Outfall (no wells)			= Flow (mgd) x Conc. (mg/L) x 8.3459 x 365 [typ]
	TN	**5,376,637**	**lbs/yr**	
	TP	**464,554**	**lbs/yr**	

2.	**Two Industrial Wells**			Comments	TN (mg/L)	TP (mg/L)
	Plant 1 Scrubber Wastewater	2.00	mgd	Reference 2	11.3	2.9
	Plant 2 Scrubber Wastewater	2.00	mgd	Reference 2	19.4	3.1
	GRS Leachate	1.00	mgd	Reference 2	44.8	0.44
	Dewatering Centrate	0.00	mgd	Reference 2	869	60.35
	Treated Effluent	25.00	mgd	*Concentration from #4a below, flow is remainder of well capacity*	17.7	1.5
	Total Waste Stream Flow to Wells (mgd)	30.00	mgd	Assumed average	18.2	1.7
	Estimated TN (mg/L)	18.25	mg/L	flow weighted average from above		
	Estimated TP (mg/L)	1.69	mg/L	flow weighted average from above		
	Diverted Loadings to Wells			= Flow (mgd) x Conc. (mg/L) x 8.3459 x 365		
	TN	**1,667,671**	**lbs/yr**			
	TP	**154,034**	**lbs/yr**			

3.	**Effect on CDWWTP Effluent Flow**			Comments
	Treated Effluent	100	mgd	assumed AADF for calculation
	Diverted effluent	-30.00	mgd	
	Outfall Flow	**70**	**mgd**	**to outfall after diversion**
		30.0%	**of the effluent is diverted**	

4.	**Effect on CDWWTP Effluent Concentration**			
	Undiverted Loadings from above			
	TN	5,376,637	lbs/yr	from #1 above
	TP	464,554	lbs/yr	from #1 above
	Centrate	0.00	mgd	from #2 above
	Ammonia + Nox	869	mg/L	from #2 above
	TP	60.35	mg/L	from #2 above
a.	**Portion of Loading Diverted to Well from Centrate Alone**			
	TN	**0**	**lbs/yr**	**0.0% undiverted load**
	TP	**0**	**lbs/yr**	**0.0% undiverted load**

Revised Effluent Concentration:
(Undiverted Loads - Centrate Load) /(Treated Flow - Centrate Flow)/8.3459/365
Assumes negligible denitrification at CDWWTP.

TN	17.7	mg/L
TP	1.53	mg/L

The above values are used in the computed diverted loads in #2 above.

b.	**Portion of Loading Diverted to Well from Treated Effluent Alone**			
	Treated Effluent to Ind. Well	25.00	mgd	
	TN	**1,344,159**	**lbs/yr**	**25.0% undiverted load**
	TP	**116,138**	**lbs/yr**	**25.0% undiverted load**

c.	**Total Loading Diverted to Well from Outfall**			from #2 above
	TN	**1,667,671**	**lbs/yr**	**31.0% undiverted load**
	TP	**154,034**	**lbs/yr**	**33.2% undiverted load**

d.	**Remaining Loading to the Outfall**			undiverted loads less diversion to well
	TN	**3,708,966**	**lbs/yr**	**69.0% undiverted load**
	TP	**310,520**	**lbs/yr**	**66.8% undiverted load**

5. References

1. WASD water quality and flow data results for the injection wells.2008-2015
2. MWH. 2014. Central District Wastewater Treatment Plan Injection Well Surface Facilities Basis of Design Report. Prepared for Miami-Dade Water and Sewer Department. April.

Appendix B
Map of OOL Projects

Miami-Dade Water and Sewer Department

Updated OOL Alternative Proposed Facilities

WATER CONSERVATION AREA 3B

BROWARD CO.

Everglades

NDWWTP

- NE-1 - BZ Disposal Pump Station
- NE-2 - BZ Deep Injection Wells
- NE-4 - Pump Station for Industrial Wells
- NE-5 - Industrial Wastewater Injection Wells
- NT-2 - HLD Treatment
- NT-3 - Peak Flow Treatment
- XS-1 Storm Surge Protection

WDWWTP

- WE-1: Injection Well Pump Station
- WE-2: Injection Wells
- WT-1: Treatment Plant
- WT-1L: Land Acquisition
- WT-2: Peak Flow Treatment

CDWWTP

- CE-1: BZ Disposal Effluent Pump Station
- CE-2: BZ Deep Injection Wells
- CE-3: Centrate Disposal Pump Station
- CE-4: Centrate Disposal Well
- CT-2: HLD Filters
- CT-3: Peak Flow Treatment
- XS-1: Storm Surge Protection

SDWWTP

- SE-1: BZ Effluent Disposal Pump Station Expansion
- SE-2: BZ Deep Injection Wells
- SE-4: Pump Station for Industrial Wells
- SE-5: Industrial Wastewater Injection Wells
- ST-1: Upgrade Treatment Plant to 121 MGD ADE
- ST-2: Upgrade Treatment Plant from 121 MGD to 131 MGD
- XS-1: Storm Surge Protection

Countywide Projects

- XR-1: Future Reuse Project
- CL-X: Flow Control/Pipeline Interconnections
- PSOP: Pump Station Optimization Program
- PSPF: Pump Station Peak Flow Upgrades

NP-416E · NL-6A · NL-1C · NL-1B · NP-1 · PS-306 · NL-1A · NL-3 · NL-2 · PS-300 · NL-7 · CL-6 · WP-1 · CL-9 · CL-10A · CL-10B · CL-10C · CL-1 · CP-1 · CL-5 · CL-4 · CP-187E · CL-8 · CL-2 · SL-3C · SL-3B · SP-1 · SL-3A · SP-522E · SL-2 · SL-1B · PS-559E · SL-1A · SL-4 · SR-2 · SP-692E · SL-5 · SP-1073E · Turkey Point

MIAMI-OPA LOCKA EXECUTIVE AIRPORT · MIAMI INTERNATIONAL AIRPORT · MIAMI EXECUTIVE AIRPORT · HOMESTEAD AIR RESERVE BASE · Miami (downtown) · Port of Miami · Virginia Key · Zoo · F.I.U. (Florida International University) · National Hurricane Center · Miami-Dade College · University of Miami · M.D.C. E.O.C.

AREA OF DETAIL — MIAMI - DADE CO.

0 miles 60 · 0 km 96.56

- Proposed Wastewater Treatment Plant — WDWWTP - West District Wastewater Treatment Plant
- Existing Wastewater Treatment Plant — CDWWTP - Central District Wastewater Treatment Plant; NDWWTP - North District Wastewater Treatment Plant; SDWWTP - South District Wastewater Treatment Plant
- OOL Pump Station Project
- OOL Conveyance Project
- CP-1 Related Pipelines
- Related Consent Decree Project
- Existing Force Main

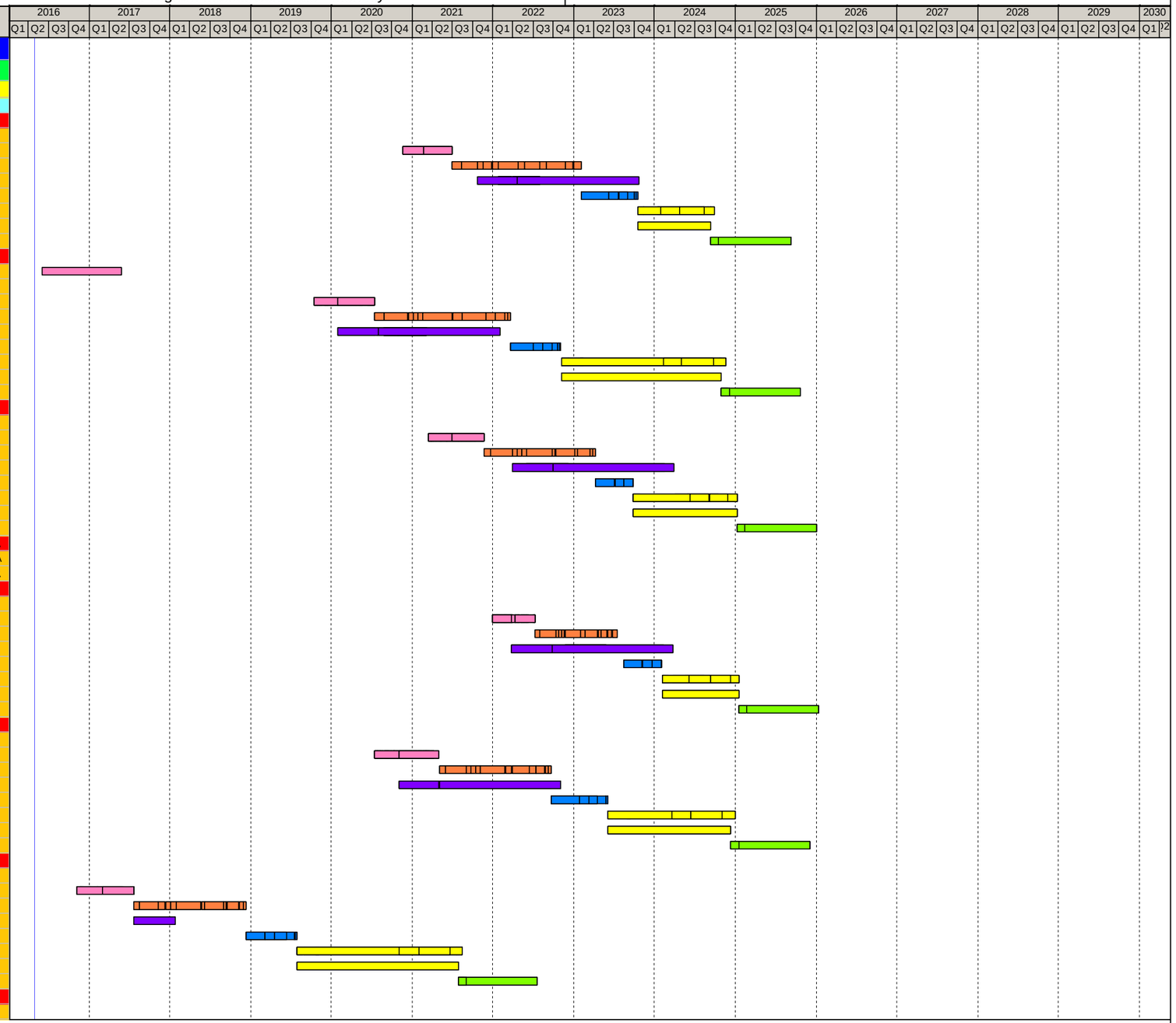
N · W · E · S

0 2.5 5 7.5 miles · 0 kilometers 12.07

Appendix C
OOL Program Schedule by Phase

Miami-Dade Water and Sewer Department | Program Master Schedule - Monthly | 01-May-16 | Printed: 18-May-16

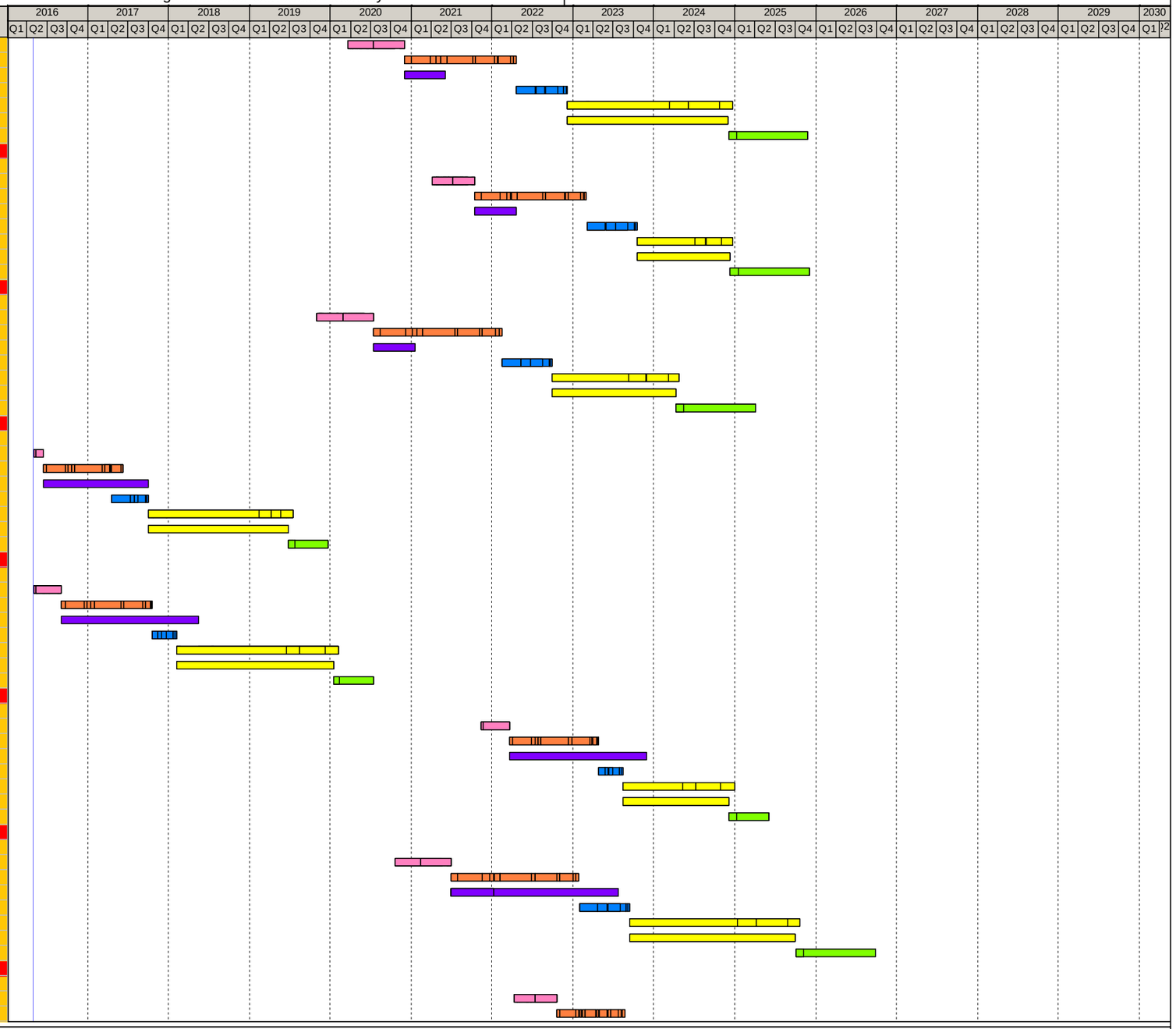
Activity ID	Activity Name	Duration	Start	Finish
Miami-Dade Water and Sewer Department Programs		4184	02-Jul-12 A	13-Jul-28
WASD Ocean Outfall Legislation Program		4184	02-Jul-12 A	13-Jul-28
Miami-Dade Ocean Outfall Legislation Program		4079	02-Jul-12 A	13-Jul-28
Pipelines		3281	03-Mar-14 A	28-Sep-26
CL-3 48-Inch FM Connection in NW 58th St from NW 107th Ave to 87 Ave - Doral		1221	20-Nov-20	08-Sep-25
Program Management		1221	20-Nov-20	08-Sep-25
Pre-Design/Planning/A&E Selection		153	20-Nov-20	29-Jun-21
Design		408	30-Jun-21	02-Feb-23
Permitting		512	22-Oct-21	23-Oct-23
Contractor Selection		180	03-Feb-23	17-Oct-23
Construction		240	18-Oct-23	26-Sep-24
Construction Contingency/Escalation		230	18-Oct-23	12-Sep-24
Close-Out		250	13-Sep-24	08-Sep-25
CL-4 East/West 72/84-Inch FM Connection from PS 187 to WDWWTP		2391	01-Jun-16	23-Oct-25
Pre-Engineering CDR		252	01-Jun-16	26-May-17
Program Management		1536	14-Oct-19	23-Oct-25
Pre-Design/Planning/A&E Selection		191	14-Oct-19	14-Jul-20
Design		430	15-Jul-20	22-Mar-22
Permitting		511	31-Jan-20	01-Feb-22
Contractor Selection		160	23-Mar-22	04-Nov-22
Construction		520	07-Nov-22	19-Nov-24
Construction Contingency/Escalation		505	07-Nov-22	29-Oct-24
Close-Out		250	30-Oct-24	23-Oct-25
CL-5 72-Inch FM Connection in SW 137 Ave to CL-4 FM in NW 6th St.		1223	15-Mar-21	31-Dec-25
Program Management		1223	15-Mar-21	31-Dec-25
Pre-Design/Planning/A&E Selection		177	15-Mar-21	19-Nov-21
Design		354	22-Nov-21	10-Apr-23
Permitting		511	30-Mar-22	29-Mar-24
Contractor Selection		120	11-Apr-23	28-Sep-23
Construction		322	29-Sep-23	07-Jan-25
Construction Contingency/Escalation		322	29-Sep-23	07-Jan-25
Close-Out		250	08-Jan-25	31-Dec-25
CL-7 48-Inch FM Connection in NW 54 St from NW 79 Ave to NW 72 Ave - Doral		365	03-Mar-14 A	01-Apr-15 A
Pre-Design/Planning/A&E Selection		152	03-Mar-14 A	01-Oct-14 A
Design		216	04-Aug-14 A	01-Apr-15 A
CL-X Flow Control - Pipeline Interconnections		1025	31-Dec-21	09-Jan-26
Program Management		1025	31-Dec-21	09-Jan-26
Pre-Design/Planning/A&E Selection		134	31-Dec-21	08-Jul-22
Design		260	11-Jul-22	14-Jul-23
Permitting		510	25-Mar-22	25-Mar-24
Contractor Selection		120	14-Aug-23	02-Feb-24
Construction		241	05-Feb-24	15-Jan-25
Construction Contingency/Escalation		241	05-Feb-24	15-Jan-25
Close-Out		250	16-Jan-25	09-Jan-26
CL-9 54-Inch Force Main From WP-1 (Doral) to WDWWTP		1374	13-Jul-20	03-Dec-25
Program Management		1374	13-Jul-20	03-Dec-25
Pre-Design/Planning/A&E Selection		205	13-Jul-20	30-Apr-21
Design		354	03-May-21	20-Sep-22
Permitting		509	03-Nov-20	01-Nov-22
Contractor Selection		180	21-Sep-22	02-Jun-23
Construction		400	05-Jun-23	31-Dec-24
Construction Contingency/Escalation		385	05-Jun-23	09-Dec-24
Close-Out		250	10-Dec-24	03-Dec-25
CL-1 North Biscayne 42-inch FM Ext. S to PS2 Discharge 48-Inch in NW 4 Street		1448	07-Nov-16	19-Jul-22
Program Management		1448	07-Nov-16	19-Jul-22
Pre-Design/Planning/A&E Selection		177	07-Nov-16	19-Jul-17
Design		354	20-Jul-17	11-Dec-18
Permitting		130	20-Jul-17	24-Jan-18
Contractor Selection		160	12-Dec-18	29-Jul-19
Construction		522	30-Jul-19	17-Aug-21
Construction Contingency/Escalation		507	30-Jul-19	27-Jul-21
Close-Out		250	28-Jul-21	19-Jul-22
CL-2 Coral Gables Reroute		1448	23-Mar-20	25-Nov-25
Program Management		1448	23-Mar-20	25-Nov-25



Program Management | Pre-Design | Permitting
Construction | Procurement | Completed Work
Closeout | Design

WASD OOL Program
Summary Schedule

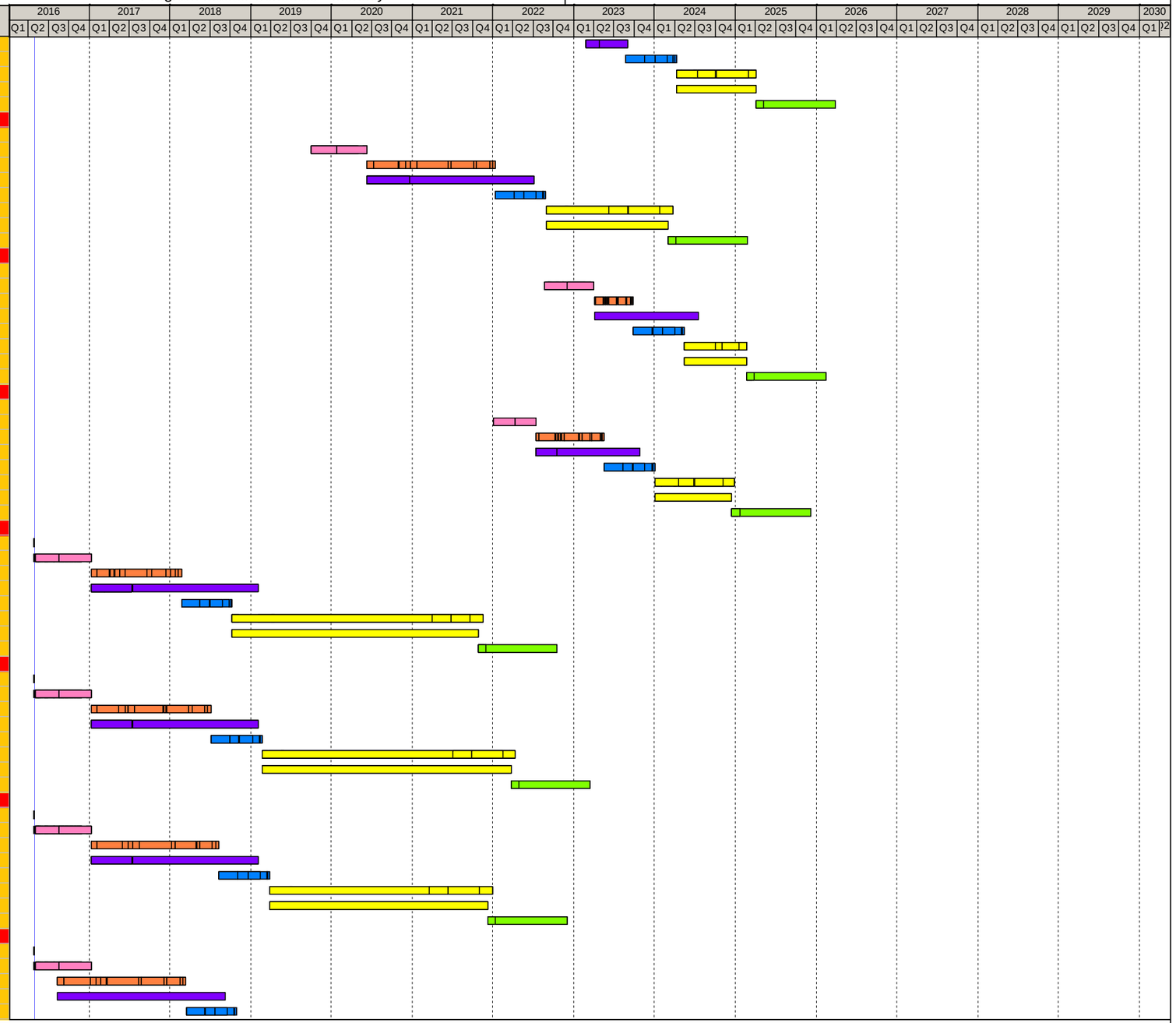
Activity ID	Activity Name	Duration	Start	Finish
Pre-Design/Planning/A&E Selection		177	23-Mar-20	01-Dec-20
Design		354	02-Dec-20	20-Apr-22
Permitting		130	02-Dec-20	04-Jun-21
Contractor Selection		160	21-Apr-22	07-Dec-22
Construction		522	08-Dec-22	24-Dec-24
Construction Contingency/Escalation		507	08-Dec-22	03-Dec-24
Close-Out		250	04-Dec-24	25-Nov-25
CL-6 24 Inch FM Connection in NW 74 St from NW 97 to NW 107 Ave - Doral		1189	06-Apr-21	04-Dec-25
Program Management		1189	06-Apr-21	04-Dec-25
Pre-Design/Planning/A&E Selection		135	06-Apr-21	14-Oct-21
Design		354	15-Oct-21	03-Mar-23
Permitting		130	15-Oct-21	18-Apr-22
Contractor Selection		160	06-Mar-23	18-Oct-23
Construction		300	19-Oct-23	24-Dec-24
Construction Contingency/Escalation		290	19-Oct-23	10-Dec-24
Close-Out		250	11-Dec-24	04-Dec-25
CL-8 24 Inch FM Connection in SW 8 St from SW 152 to 177 Ave - West Dade		1381	01-Nov-19	04-Apr-25
Program Management		1381	01-Nov-19	04-Apr-25
Pre-Design/Planning/A&E Selection		177	01-Nov-19	14-Jul-20
Design		404	15-Jul-20	14-Feb-22
Permitting		130	15-Jul-20	19-Jan-21
Contractor Selection		160	15-Feb-22	29-Sep-22
Construction		400	30-Sep-22	24-Apr-24
Construction Contingency/Escalation		390	30-Sep-22	10-Apr-24
Close-Out		250	11-Apr-24	04-Apr-25
NL-1A 48-Inch Force Main from Biscayne Blvd to North Miami Ave (Phase I)		926	02-May-16	24-Dec-19
Program Management		926	02-May-16	24-Dec-19
Pre-Design/Planning/A&E Selection		31	02-May-16	14-Jun-16
Design		250	15-Jun-16	08-Jun-17
Permitting		330	15-Jun-16	02-Oct-17
Contractor Selection		115	19-Apr-17	02-Oct-17
Construction		455	02-Oct-17	18-Jul-19
Construction Contingency/Escalation		440	02-Oct-17	26-Jun-19
Close-Out		125	26-Jun-19	24-Dec-19
NL-1B 48-Inch Force Main from North Miami Ave to PS306 (Phase II)		1066	02-May-16	13-Jul-20
Program Management		1066	02-May-16	13-Jul-20
Pre-Design/Planning/A&E Selection		89	02-May-16	06-Sep-16
Design		284	06-Sep-16	17-Oct-17
Permitting		432	06-Sep-16	18-May-18
Contractor Selection		75	18-Oct-17	05-Feb-18
Construction		509	06-Feb-18	06-Feb-20
Construction Contingency/Escalation		494	06-Feb-18	16-Jan-20
Close-Out		125	16-Jan-20	13-Jul-20
NL-1C 42-Inch Force Main from PS 306 to Red Rd (Phase III)		906	15-Nov-21	04-Jun-25
Program Management		906	15-Nov-21	04-Jun-25
Pre-Design/Planning/A&E Selection		89	15-Nov-21	21-Mar-22
Design		284	21-Mar-22	27-Apr-23
Permitting		432	21-Mar-22	29-Nov-23
Contractor Selection		75	28-Apr-23	14-Aug-23
Construction		349	15-Aug-23	30-Dec-24
Construction Contingency/Escalation		334	15-Aug-23	06-Dec-24
Close-Out		125	06-Dec-24	04-Jun-25
NL-2 FM Ext. from 36-Inch at NW 87 Ave/W 76 St to 48-Inch in NW 67 Ave		1513	19-Oct-20	28-Sep-26
Program Management		1263	19-Oct-20	02-Oct-25
Pre-Design/Planning/A&E Selection		177	19-Oct-20	29-Jun-21
Design		404	30-Jun-21	27-Jan-23
Permitting		528	30-Jun-21	24-Jul-23
Contractor Selection		160	30-Jan-23	13-Sep-23
Construction		537	14-Sep-23	23-Oct-25
Construction Contingency/Escalation		522	14-Sep-23	02-Oct-25
Close-Out		250	03-Oct-25	28-Sep-26
NL-3 30-Inch Force Main in W 12 Ave (NW 67 Ave) from W 79 St to W 84 St (NW 138 St)		1010	11-Apr-22	30-Mar-26
Program Management		760	11-Apr-22	03-Apr-25
Pre-Design/Planning/A&E Selection		135	11-Apr-22	19-Oct-22
Design		215	20-Oct-22	22-Aug-23



Program Management | Pre-Design | Permitting
Construction | Procurement | Completed Work
Closeout | Design

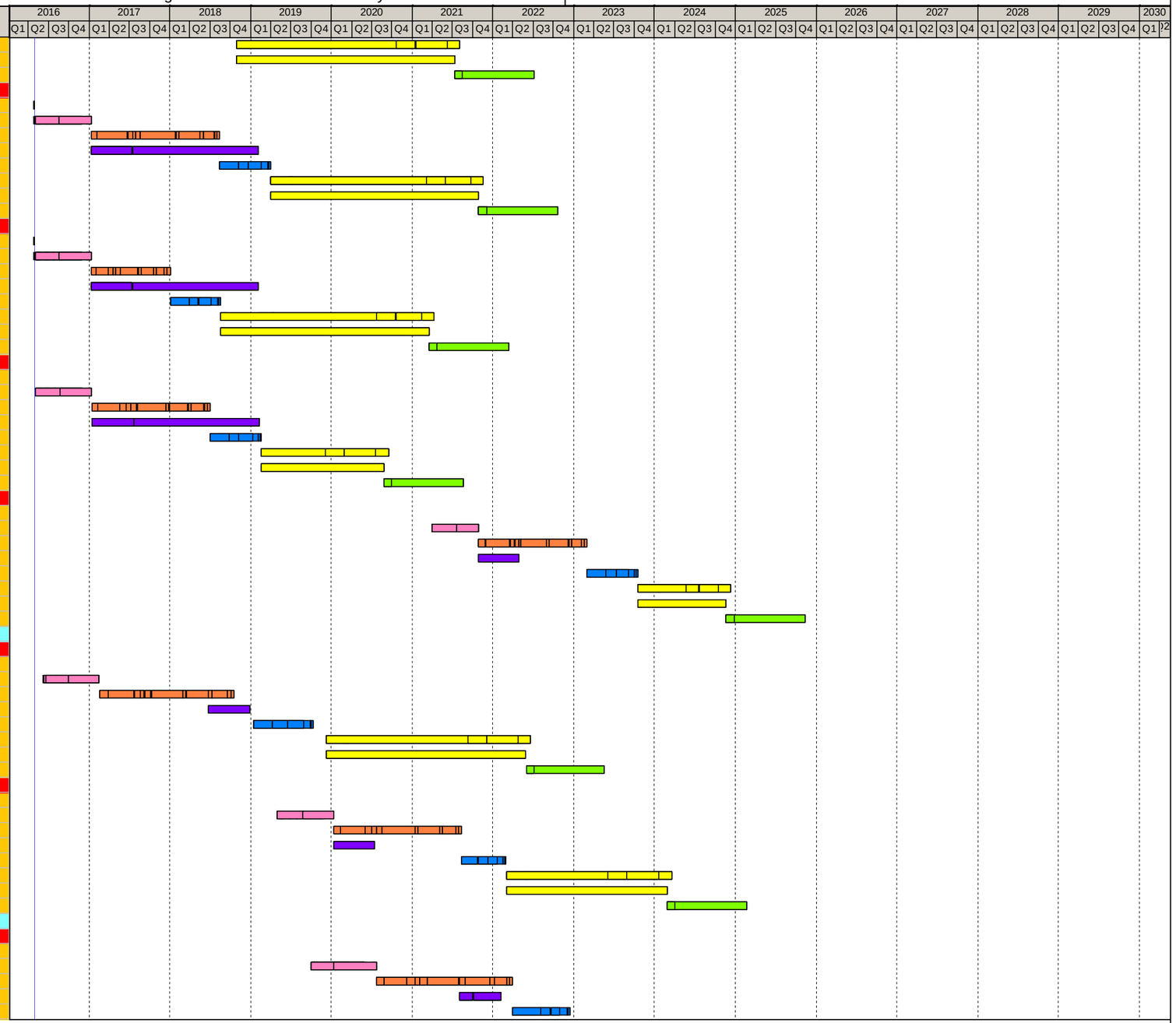
WASD OOL Program
Summary Schedule

Activity ID	Activity Name	Duration	Start	Finish
Permitting		132	27-Feb-23	31-Aug-23
Contractor Selection		160	23-Aug-23	09-Apr-24
Construction		250	10-Apr-24	03-Apr-25
Construction Contingency/Escalation		250	10-Apr-24	03-Apr-25
Close-Out		250	04-Apr-25	30-Mar-26
NL-4 48-Inch Force Main Connection from NW 62 Ave at W 77 St to Discharge Force M		1376	01-Oct-19	25-Feb-25
Program Management		1376	01-Oct-19	25-Feb-25
Pre-Design/Planning/A&E Selection		177	01-Oct-19	10-Jun-20
Design		404	11-Jun-20	12-Jan-22
Permitting		528	11-Jun-20	07-Jul-22
Contractor Selection		160	13-Jan-22	26-Aug-22
Construction		400	29-Aug-22	22-Mar-24
Construction Contingency/Escalation		385	29-Aug-22	01-Mar-24
Close-Out		250	04-Mar-24	25-Feb-25
NL-6 24-Inch FM from PS 416 to 30-Inch FM at NW 171 St/67 Ave		885	23-Aug-22	13-Feb-26
Program Management		885	23-Aug-22	13-Feb-26
Pre-Design/Planning/A&E Selection		156	23-Aug-22	31-Mar-23
Design		125	03-Apr-23	27-Sep-23
Permitting		330	03-Apr-23	18-Jul-24
Contractor Selection		160	28-Sep-23	14-May-24
Construction		194	15-May-24	19-Feb-25
Construction Contingency/Escalation		194	15-May-24	19-Feb-25
Close-Out		250	20-Feb-25	13-Feb-26
NL-7 48-Inch - Allows P.S. 300 to Pump North to P.S. 1310 Discharge		1000	05-Jan-22	08-Dec-25
Program Management		1000	05-Jan-22	08-Dec-25
Pre-Design/Planning/A&E Selection		135	05-Jan-22	14-Jul-22
Design		215	15-Jul-22	16-May-23
Permitting		330	15-Jul-22	27-Oct-23
Contractor Selection		160	17-May-23	04-Jan-24
Construction		250	05-Jan-24	27-Dec-24
Construction Contingency/Escalation		240	05-Jan-24	12-Dec-24
Close-Out		250	13-Dec-24	08-Dec-25
SL-1B 54/72 Inch Force Main Connection in SW 248 ST from SW 112 Ave to SD WWTP		1664	27-Apr-16 A	17-Oct-22
Program Management		1646	27-Apr-16 A	17-Oct-22
Pre-Design/Planning/A&E Selection		195	27-Apr-16 A	09-Jan-17
Design		286	10-Jan-17	22-Feb-18
Permitting		528	10-Jan-17	06-Feb-19
Contractor Selection		160	23-Feb-18	09-Oct-18
Construction		788	10-Oct-18	15-Nov-21
Construction Contingency/Escalation		773	10-Oct-18	25-Oct-21
Close-Out		250	26-Oct-21	17-Oct-22
SL-2 54/60 Inch Force Main Connection from SP-1 on SW 137 Ave to SL-1B		1769	27-Apr-16 A	15-Mar-23
Program Management		1751	27-Apr-16 A	15-Mar-23
Pre-Design/Planning/A&E Selection		195	27-Apr-16 A	09-Jan-17
Design		379	10-Jan-17	05-Jul-18
Permitting		528	10-Jan-17	06-Feb-19
Contractor Selection		160	06-Jul-18	21-Feb-19
Construction		800	22-Feb-19	13-Apr-22
Construction Contingency/Escalation		785	22-Feb-19	23-Mar-22
Close-Out		250	24-Mar-22	15-Mar-23
SL-3A 48/54 Inch Force Main Connection from SP-1 to SW 137 Ave and SW 136 St (Ph		1694	27-Apr-16 A	30-Nov-22
Program Management		1426	27-Apr-16 A	08-Dec-21
Pre-Design/Planning/A&E Selection		195	27-Apr-16 A	09-Jan-17
Design		404	10-Jan-17	09-Aug-18
Permitting		528	10-Jan-17	06-Feb-19
Contractor Selection		160	10-Aug-18	28-Mar-19
Construction		700	29-Mar-19	29-Dec-21
Construction Contingency/Escalation		685	29-Mar-19	08-Dec-21
Close-Out		250	09-Dec-21	30-Nov-22
SL-3B 48/54 Inch Force Main Connection in SW 137 Ave from SW 136 St to SW 104 St		1586	27-Apr-16 A	05-Jul-22
Program Management		1331	27-Apr-16 A	13-Jul-21
Pre-Design/Planning/A&E Selection		195	27-Apr-16 A	09-Jan-17
Design		404	11-Aug-16	15-Mar-18
Permitting		528	11-Aug-16	10-Sep-18
Contractor Selection		160	16-Mar-18	30-Oct-18



Program Management | Pre-Design | Permitting
Construction | Procurement | Completed Work
Closeout | Design

Activity ID	Activity Name	Duration	Start	Finish
Construction		700	31-Oct-18	03-Aug-21
Construction Contingency/Escalation		685	31-Oct-18	13-Jul-21
Close-Out		250	14-Jul-21	05-Jul-22
SL-4 48 Inch Force Main Connection from PS 692 to SW 268 ST and SW 127 Ave		1666	27-Apr-16 A	19-Oct-22
Program Management		1648	27-Apr-16 A	19-Oct-22
Pre-Design/Planning/A&E Selection		195	27-Apr-16 A	09-Jan-17
Design		406	10-Jan-17	13-Aug-18
Permitting		528	10-Jan-17	06-Feb-19
Contractor Selection		160	14-Aug-18	01-Apr-19
Construction		670	02-Apr-19	17-Nov-21
Construction Contingency/Escalation		655	02-Apr-19	27-Oct-21
Close-Out		250	28-Oct-21	19-Oct-22
SL-5 42-Inch FM Connection from PS 691 to PS 692		1510	27-Apr-16 A	10-Mar-22
Program Management		1492	27-Apr-16 A	10-Mar-22
Pre-Design/Planning/A&E Selection		195	27-Apr-16 A	09-Jan-17
Design		250	10-Jan-17	03-Jan-18
Permitting		528	10-Jan-17	06-Feb-19
Contractor Selection		160	04-Jan-18	17-Aug-18
Construction		670	20-Aug-18	08-Apr-21
Construction Contingency/Escalation		655	20-Aug-18	18-Mar-21
Close-Out		250	19-Mar-21	10-Mar-22
SL-6 24-Inch Force Main Connection from PS 1073 to PS 691		1346	02-May-16 A	18-Aug-21
Program Management		1286	27-Jul-16	18-Aug-21
Pre-Design/Planning/A&E Selection		177	02-May-16 A	12-Jan-17
Design		374	13-Jan-17	02-Jul-18
Permitting		528	13-Jan-17	11-Feb-19
Contractor Selection		160	03-Jul-18	19-Feb-19
Construction		400	20-Feb-19	15-Sep-20
Construction Contingency/Escalation		385	20-Feb-19	24-Aug-20
Close-Out		250	25-Aug-20	18-Aug-21
XL-1 48-Inch Lining from PS 300 to NDWWTP		1178	01-Apr-21	12-Nov-25
Program Management		1178	01-Apr-21	12-Nov-25
Pre-Design/Planning/A&E Selection		147	01-Apr-21	27-Oct-21
Design		344	28-Oct-21	02-Mar-23
Permitting		130	28-Oct-21	29-Apr-22
Contractor Selection		160	03-Mar-23	17-Oct-23
Construction		292	18-Oct-23	11-Dec-24
Construction Contingency/Escalation		277	18-Oct-23	18-Nov-24
Close-Out		250	19-Nov-24	12-Nov-25
Local Pumping Stations and Force Mains		2215	06-Jun-16	19-Feb-25
PSOP Pump Station Optimization Program		1771	06-Jun-16	19-May-23
Program Management		1771	06-Jun-16	19-May-23
Pre-Design/Planning/A&E Selection		177	06-Jun-16	15-Feb-17
Design		424	16-Feb-17	16-Oct-18
Permitting		130	25-Jun-18	28-Dec-18
Contractor Selection		190	15-Jan-19	10-Oct-19
Construction		645	10-Dec-19	20-Jun-22
Construction Contingency/Escalation		630	10-Dec-19	27-May-22
Close-Out		250	31-May-22	19-May-23
PSPF Pump Station Peak Flow Upgrades		1478	01-May-19	19-Feb-25
Program Management		1478	01-May-19	19-Feb-25
Pre-Design/Planning/A&E Selection		177	01-May-19	13-Jan-20
Design		404	14-Jan-20	12-Aug-21
Permitting		130	14-Jan-20	15-Jul-20
Contractor Selection		140	13-Aug-21	01-Mar-22
Construction		522	02-Mar-22	18-Mar-24
Construction Contingency/Escalation		507	02-Mar-22	26-Feb-24
Close-Out		250	27-Feb-24	19-Feb-25
Major Pumping Stations		2635	09-Nov-15 A	12-Dec-25
CP-187E Upgrade and Expansion of PS187		1571	01-Oct-19	02-Dec-25
Program Management		1571	01-Oct-19	02-Dec-25
Pre-Design/Planning/A&E Selection		205	01-Oct-19	21-Jul-20
Design		430	23-Jul-20	30-Mar-22
Permitting		132	02-Aug-21	04-Feb-22
Contractor Selection		180	31-Mar-22	14-Dec-22



Program Management | Pre-Design | Permitting
Construction | Procurement | Completed Work
Closeout | Design

WASD OOL Program

Summary Schedule

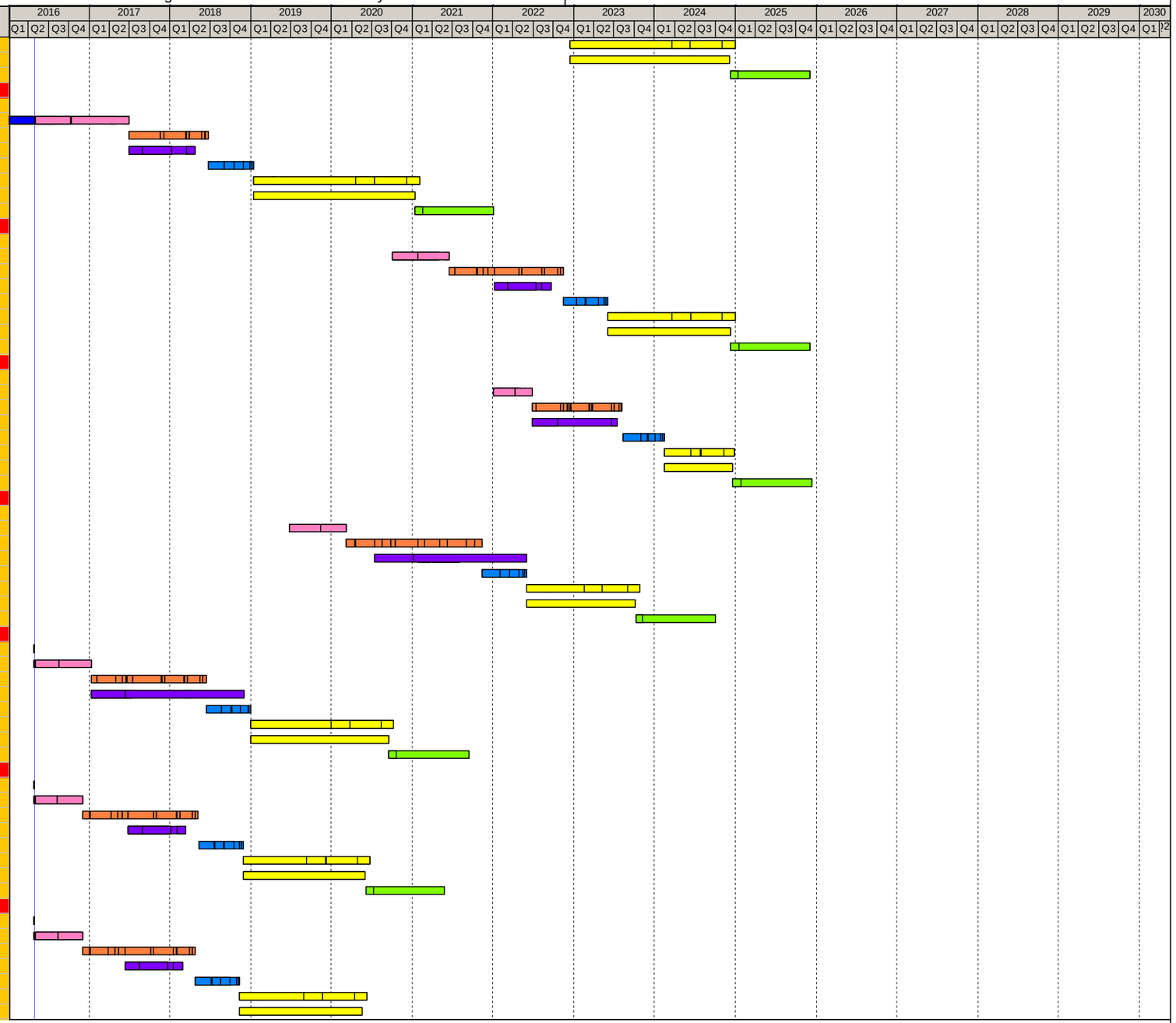
Miami-Dade Water and Sewer Department

Program Master Schedule - Monthly

01-May-16

Printed: 18-May-16

Activity ID	Activity Name	Duration	Start	Finish
Construction		520	15-Dec-22	30-Dec-24
Construction Contingency/Escalation		505	15-Dec-22	06-Dec-24
Close-Out		250	09-Dec-24	02-Dec-25
CP-1 Downtown Booster Station		1554	09-Nov-15 A	04-Jan-22
Program Management		1442	02-May-16	04-Jan-22
Pre-Design/Planning/A&E Selection		411	09-Nov-15 A	28-Jun-17
Design		250	29-Jun-17	22-Jun-18
Permitting		210	29-Jun-17	26-Apr-18
Contractor Selection		140	25-Jun-18	14-Jan-19
Construction		522	15-Jan-19	02-Feb-21
Construction Contingency/Escalation		507	15-Jan-19	12-Jan-21
Close-Out		250	13-Jan-21	04-Jan-22
NP-416E Upgrade to PS 416		1316	02-Oct-20	03-Dec-25
Program Management		1316	02-Oct-20	03-Dec-25
Pre-Design/Planning/A&E Selection		177	02-Oct-20	14-Jun-21
Design		364	15-Jun-21	15-Nov-22
Permitting		180	07-Jan-22	20-Sep-22
Contractor Selection		140	16-Nov-22	02-Jun-23
Construction		400	05-Jun-23	31-Dec-24
Construction Contingency/Escalation		385	05-Jun-23	09-Dec-24
Close-Out		250	10-Dec-24	03-Dec-25
PS-306 Pump Station 306		1006	03-Jan-22	12-Dec-25
Program Management		1006	03-Jan-22	12-Dec-25
Pre-Design/Planning/A&E Selection		125	03-Jan-22	27-Jun-22
Design		285	28-Jun-22	08-Aug-23
Permitting		270	28-Jun-22	18-Jul-23
Contractor Selection		130	09-Aug-23	13-Feb-24
Construction		221	14-Feb-24	26-Dec-24
Construction Contingency/Escalation		216	14-Feb-24	18-Dec-24
Close-Out		250	19-Dec-24	12-Dec-25
WP-1 Doral Booster Station		1342	26-Jun-19	01-Oct-24
Program Management		1342	26-Jun-19	01-Oct-24
Pre-Design/Planning/A&E Selection		177	26-Jun-19	06-Mar-20
Design		430	09-Mar-20	12-Nov-21
Permitting		480	15-Jul-20	01-Jun-22
Contractor Selection		140	15-Nov-21	01-Jun-22
Construction		360	02-Jun-22	27-Oct-23
Construction Contingency/Escalation		345	02-Jun-22	06-Oct-23
Close-Out		250	09-Oct-23	01-Oct-24
SP-1 Southwest Dade Booster Station		1384	27-Apr-16 A	13-Sep-21
Program Management		1366	27-Apr-16 A	13-Sep-21
Pre-Design/Planning/A&E Selection		195	27-Apr-16 A	09-Jan-17
Design		364	10-Jan-17	13-Jun-18
Permitting		484	10-Jan-17	04-Dec-18
Contractor Selection		140	14-Jun-18	03-Jan-19
Construction		450	04-Jan-19	08-Oct-20
Construction Contingency/Escalation		435	04-Jan-19	17-Sep-20
Close-Out		250	18-Sep-20	13-Sep-21
SP-1073E Upgrade PS 1073		1310	27-Apr-16 A	27-May-21
Program Management		1292	27-Apr-16 A	27-May-21
Pre-Design/Planning/A&E Selection		171	27-Apr-16 A	02-Dec-16
Design		364	05-Dec-16	09-May-18
Permitting		180	28-Jun-17	14-Mar-18
Contractor Selection		140	10-May-18	28-Nov-18
Construction		400	29-Nov-18	24-Jun-20
Construction Contingency/Escalation		385	29-Nov-18	03-Jun-20
Close-Out		250	04-Jun-20	27-May-21
SP-522E Upgrade to PS 522		1300	27-Apr-16 A	13-May-21
Program Management		1282	27-Apr-16 A	13-May-21
Pre-Design/Planning/A&E Selection		171	27-Apr-16 A	02-Dec-16
Design		354	05-Dec-16	25-Apr-18
Permitting		180	14-Jun-17	28-Feb-18
Contractor Selection		140	26-Apr-18	12-Nov-18
Construction		400	13-Nov-18	10-Jun-20
Construction Contingency/Escalation		385	13-Nov-18	19-May-20



Program Management
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WASD OOL Program

Summary Schedule

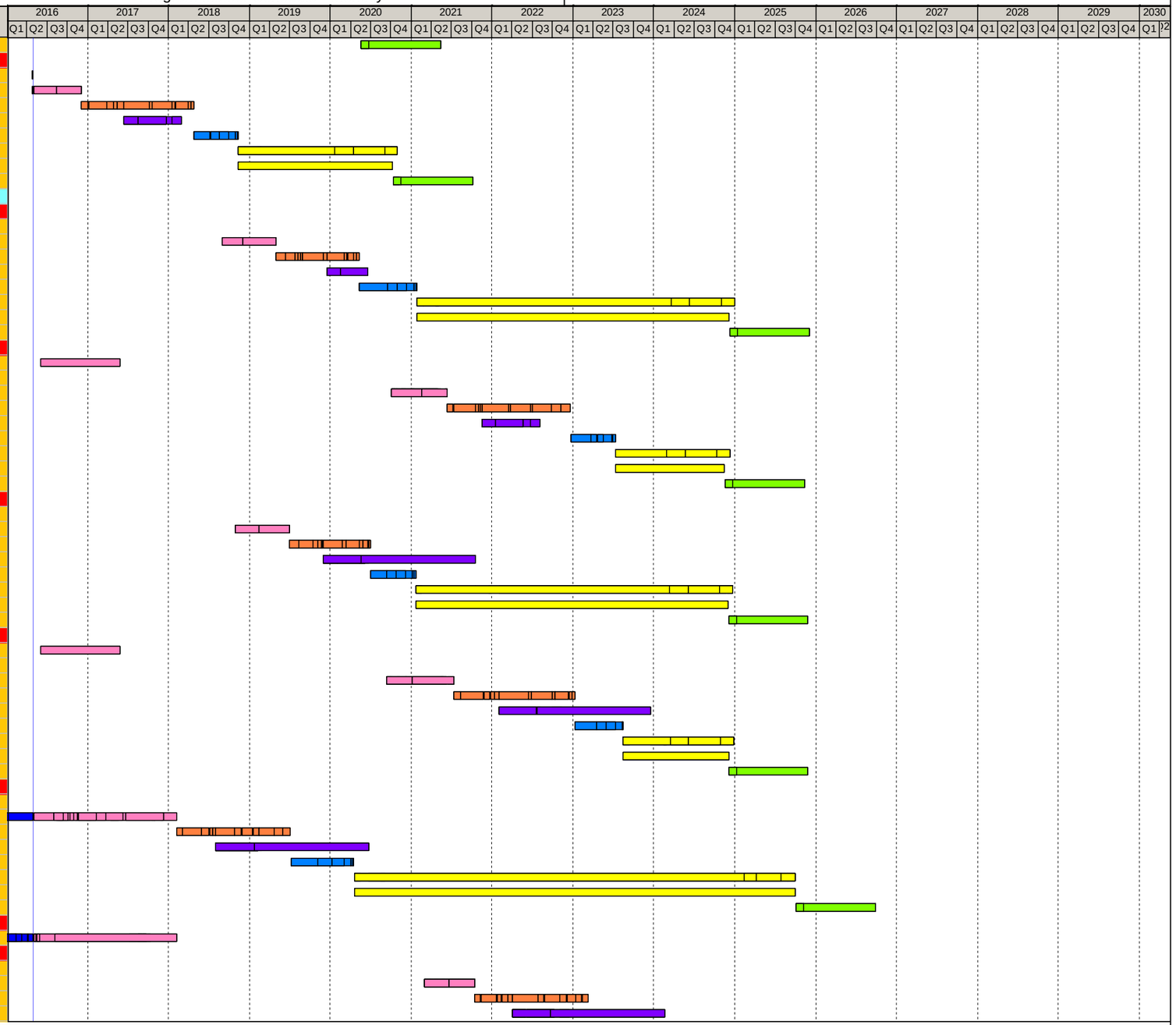
Miami-Dade Water and Sewer Department

Program Master Schedule - Monthly

01-May-16

Printed: 18-May-16

Activity ID	Activity Name	Duration	Start	Finish
Close-Out		250	20-May-20	13-May-21
SP-692E Upgrade to PS 692		1400	27-Apr-16 A	05-Oct-21
Program Management		1382	27-Apr-16 A	05-Oct-21
Pre-Design/Planning/A&E Selection		171	27-Apr-16 A	02-Dec-16
Design		354	05-Dec-16	25-Apr-18
Permitting		180	14-Jun-17	28-Feb-18
Contractor Selection		140	26-Apr-18	12-Nov-18
Construction		500	13-Nov-18	30-Oct-20
Construction Contingency/Escalation		485	13-Nov-18	09-Oct-20
Close-Out		250	12-Oct-20	05-Oct-21
Wastewater Treatment		2876	08-Jun-15 A	28-Sep-26
CT-2 CDWWTP - HLD Filters (141 MGD)		1845	31-Aug-18	02-Dec-25
Program Management		1845	31-Aug-18	02-Dec-25
Pre-Design/Planning/A&E Selection		167	31-Aug-18	29-Apr-19
Design		263	30-Apr-19	11-May-20
Permitting		130	17-Dec-19	18-Jun-20
Contractor Selection		180	12-May-20	27-Jan-21
Construction		1000	28-Jan-21	30-Dec-24
Construction Contingency/Escalation		985	28-Jan-21	06-Dec-24
Close-Out		250	09-Dec-24	02-Dec-25
CT-3 CDWWTP - Peak Flow Treatment		2404	01-Jun-16	11-Nov-25
Pre-Engineering CDR		251	01-Jun-16	25-May-17
Program Management		1302	02-Oct-20	11-Nov-25
Pre-Design/Planning/A&E Selection		175	02-Oct-20	10-Jun-21
Design		390	11-Jun-21	21-Dec-22
Permitting		185	16-Nov-21	05-Aug-22
Contractor Selection		141	22-Dec-22	10-Jul-23
Construction		360	12-Jul-23	10-Dec-24
Construction Contingency/Escalation		345	12-Jul-23	15-Nov-24
Close-Out		250	18-Nov-24	11-Nov-25
NT-2 NDWWTP - HLD Treatment 57 MGD		1799	01-Nov-18	25-Nov-25
Program Management		1799	01-Nov-18	25-Nov-25
Pre-Design/Planning/A&E Selection		168	01-Nov-18	01-Jul-19
Design		255	02-Jul-19	01-Jul-20
Permitting		480	02-Dec-19	19-Oct-21
Contractor Selection		140	02-Jul-20	21-Jan-21
Construction		1001	22-Jan-21	24-Dec-24
Construction Contingency/Escalation		986	22-Jan-21	03-Dec-24
Close-Out		250	04-Dec-24	25-Nov-25
NT-3 NDWWTP - Peak Flow Treatment		2415	01-Jun-16	26-Nov-25
Pre-Engineering CDR		252	01-Jun-16	26-May-17
Program Management		1329	10-Sep-20	26-Nov-25
Pre-Design/Planning/A&E Selection		212	10-Sep-20	12-Jul-21
Design		382	13-Jul-21	09-Jan-23
Permitting		480	01-Feb-22	18-Dec-23
Contractor Selection		155	10-Jan-23	16-Aug-23
Construction		345	17-Aug-23	26-Dec-24
Construction Contingency/Escalation		330	17-Aug-23	04-Dec-24
Close-Out		250	05-Dec-24	26-Nov-25
WT-1 WDWWTP - West District Wastewater Treatment Plant		2876	08-Jun-15 A	28-Sep-26
Program Management		2584	01-Aug-16	28-Sep-26
Pre-Design/Planning/A&E Selection		676	08-Jun-15 A	05-Feb-18
Design		360	06-Feb-18	05-Jul-19
Permitting		480	02-Aug-18	22-Jun-20
Contractor Selection		200	08-Jul-19	17-Apr-20
Construction		1390	20-Apr-20	02-Oct-25
Construction Contingency/Escalation		1390	20-Apr-20	02-Oct-25
Close-Out		250	03-Oct-25	28-Sep-26
WT-1.1 WDWWTP - West District Wastewater Treatment Plant - Land Acquisition		676	08-Jun-15 A	05-Feb-18
Land Acquisition		676	08-Jun-15 A	05-Feb-18
WT-2 WDWWTP - Peak Flow Treatment		1295	01-Mar-21	30-Mar-26
Program Management		1295	01-Mar-21	30-Mar-26
Pre-Design/Planning/A&E Selection		160	01-Mar-21	13-Oct-21
Design		360	14-Oct-21	10-Mar-23
Permitting		480	04-Apr-22	20-Feb-24



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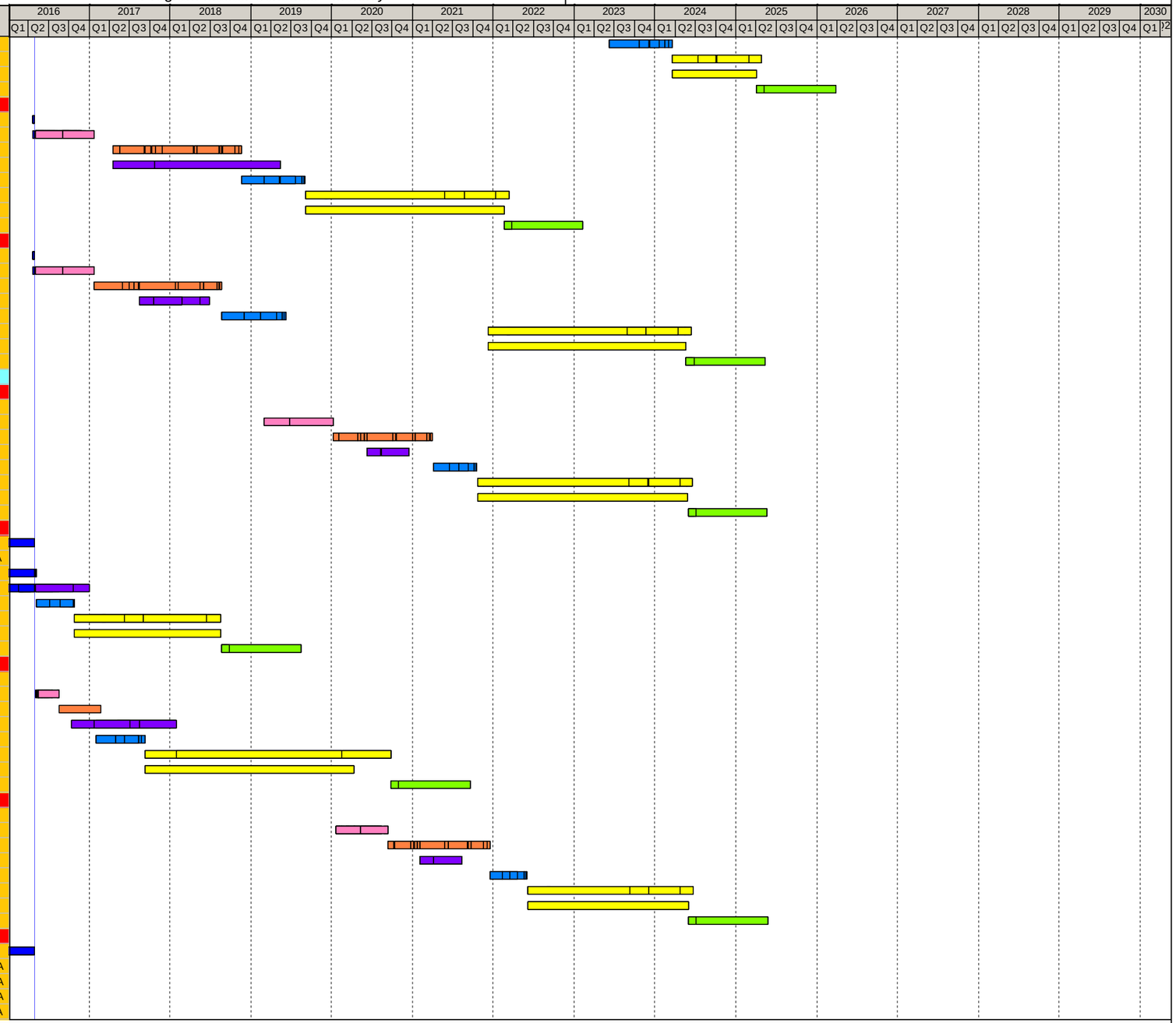
WASD OOL Program

Summary Schedule

Miami-Dade Water and Sewer Department | Program Master Schedule - Monthly | 01-May-16 | Printed: 18-May-16

Activity ID	Activity Name	Duration	Start	Finish
Contractor Selection		200	06-Jun-23	19-Mar-24
Construction		280	20-Mar-24	24-Apr-25
Construction Contingency/Escalation		265	20-Mar-24	03-Apr-25
Close-Out		250	04-Apr-25	30-Mar-26
ST-1 SDWWTP-Upgrade to 121 MGD ADE		1745	21-Apr-16 A	09-Feb-23
Program Management		1716	21-Apr-16 A	09-Feb-23
Pre-Design/Planning/A&E Selection		192	21-Apr-16 A	24-Jan-17
Design		404	19-Apr-17	19-Nov-18
Permitting		528	19-Apr-17	16-May-19
Contractor Selection		200	20-Nov-18	04-Sep-19
Construction		640	05-Sep-19	10-Mar-22
Construction Contingency/Escalation		625	05-Sep-19	17-Feb-22
Close-Out		250	18-Feb-22	09-Feb-23
ST-2 SDWWTP-Upgrade to from 121 MGD to 131 MGD		2377	21-Apr-16 A	14-May-25
Program Management		2377	21-Apr-16 A	14-May-25
Pre-Design/Planning/A&E Selection		206	21-Apr-16 A	24-Jan-17
Design		403	25-Jan-17	23-Aug-18
Permitting		220	18-Aug-17	29-Jun-18
Contractor Selection		200	24-Aug-18	07-Jun-19
Construction		640	10-Dec-21	11-Jun-24
Construction Contingency/Escalation		625	10-Dec-21	20-May-24
Close-Out		250	21-May-24	14-May-25
Effluent Disposal		3601	02-Jul-12 A	20-Apr-26
CE-1 CDWWTP - BZ Disposal Effluent Pump Station		1586	04-Mar-19	22-May-25
Program Management		1586	04-Mar-19	22-May-25
Pre-Design/Planning/A&E Selection		215	04-Mar-19	07-Jan-20
Design		316	08-Jan-20	02-Apr-21
Permitting		130	11-Jun-20	15-Dec-20
Contractor Selection		140	05-Apr-21	20-Oct-21
Construction		680	21-Oct-21	19-Jun-24
Construction Contingency/Escalation		665	21-Oct-21	29-May-24
Close-Out		250	30-May-24	22-May-25
CE-3 CDWWTP - Centrate Disposal Pump Station		2858	06-Jan-14 A	14-Aug-19
Program Management		1295	06-Jan-14 A	14-Aug-19
Pre-Design/Planning/A&E Selection		202	06-Jan-14 A	17-Oct-14 A
Design		394	20-Oct-14 A	06-May-16
Permitting		361	27-Aug-15 A	03-Jan-17
Contractor Selection		119	09-May-16	25-Oct-16
Construction		461	26-Oct-16	20-Aug-18
Construction Contingency/Escalation		461	26-Oct-16	20-Aug-18
Close-Out		250	21-Aug-18	14-Aug-19
CE-2 CDWWTP - BZ Deep Municipal Injection Wells		1367	02-May-16	17-Sep-21
Program Management		1367	02-May-16	17-Sep-21
Pre-Design/Planning/A&E Selection		76	02-May-16	17-Aug-16
Design		130	18-Aug-16	22-Feb-17
Permitting		328	13-Oct-16	30-Jan-18
Contractor Selection		157	31-Jan-17	11-Sep-17
Construction		771	12-Sep-17	23-Sep-20
Construction Contingency/Escalation		657	12-Sep-17	13-Apr-20
Close-Out		250	24-Sep-20	17-Sep-21
NE-1 NDWWTP - BZ Disposal Effluent Pump Station		1364	20-Jan-20	23-May-25
Program Management		1364	20-Jan-20	23-May-25
Pre-Design/Planning/A&E Selection		167	20-Jan-20	11-Sep-20
Design		320	14-Sep-20	16-Dec-21
Permitting		130	05-Feb-21	09-Aug-21
Contractor Selection		120	17-Dec-21	03-Jun-22
Construction		520	08-Jun-22	20-Jun-24
Construction Contingency/Escalation		505	08-Jun-22	30-May-24
Close-Out		250	31-May-24	23-May-25
CE-4 CDWWTP - Centrate Disposal Well		1416	02-Jul-12 A	30-Jan-18
Program Management		816	20-Oct-14 A	30-Jan-18
Pre-Design/Planning/A&E Selection		100	02-Jul-12 A	20-Nov-12 A
Design		100	02-Jul-12 A	20-Nov-12 A
Permitting		644	20-Nov-12 A	31-Dec-13 A
Contractor Selection		60	21-Nov-12 A	18-Feb-13 A



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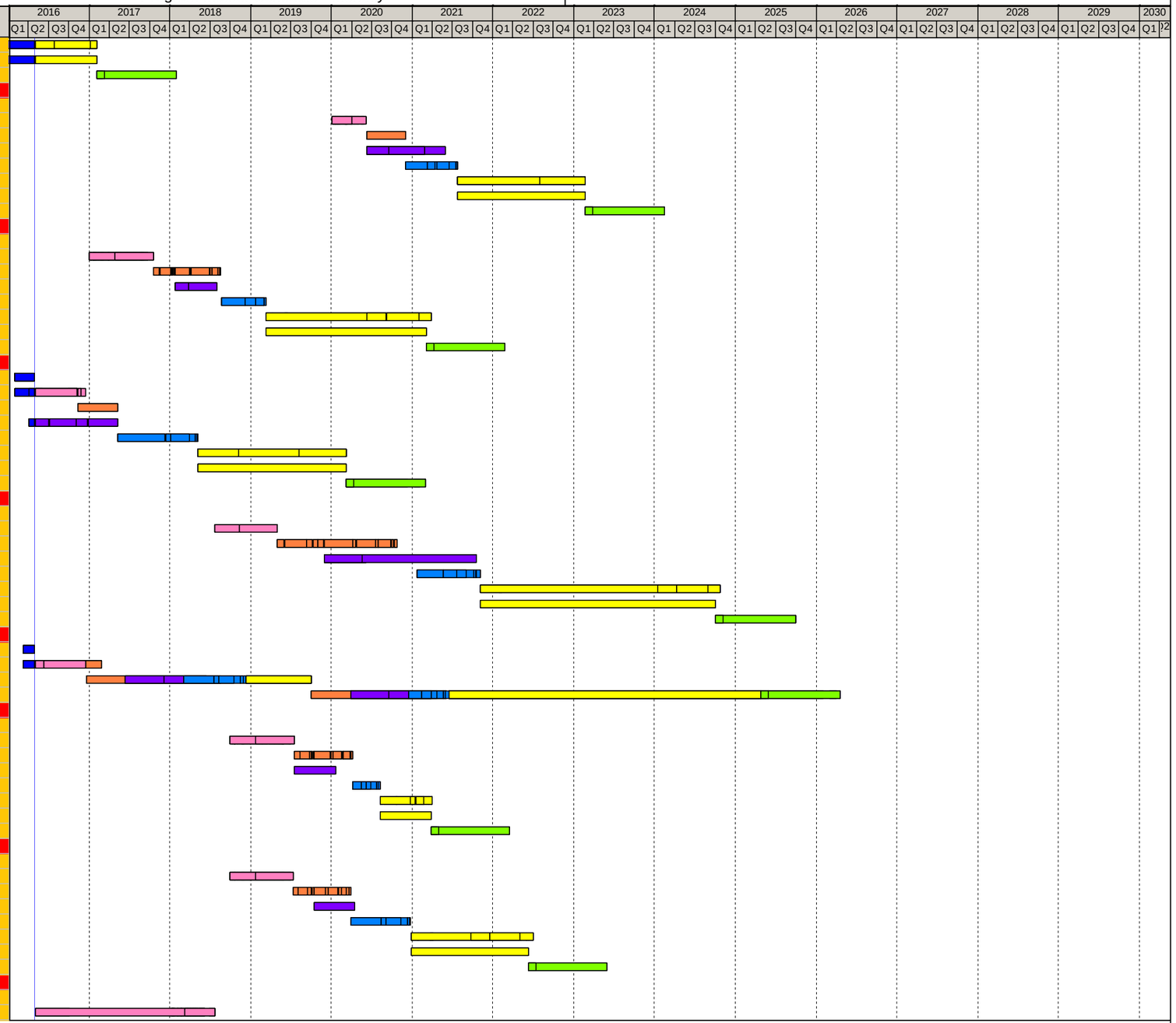
WASD OOL Program
Summary Schedule

Miami-Dade Water and Sewer Department | Program Master Schedule - Monthly | 01-May-16 | Printed: 18-May-16

Activity ID	Activity Name	Duration	Start	Finish
Construction		1005	20-Oct-14 A	03-Feb-17
Construction Contingency/Escalation		730	20-Oct-14 A	03-Feb-17
Close-Out		250	06-Feb-17	30-Jan-18
NE-2 NDWWTP - BZ Deep Municipal Injection Wells		1052	02-Jan-20	15-Feb-24
Program Management		1052	02-Jan-20	15-Feb-24
Pre-Design/Planning/A&E Selection		111	02-Jan-20	05-Jun-20
Design		125	08-Jun-20	03-Dec-20
Permitting		250	08-Jun-20	01-Jun-21
Contractor Selection		163	04-Dec-20	26-Jul-21
Construction		403	27-Jul-21	21-Feb-23
Construction Contingency/Escalation		403	27-Jul-21	21-Feb-23
Close-Out		250	22-Feb-23	15-Feb-24
SE-1 SDWWTP - BZ Effluent Disposal Pump Station Expansion		1310	03-Jan-17	24-Feb-22
Program Management		1310	03-Jan-17	24-Feb-22
Pre-Design/Planning/A&E Selection		204	03-Jan-17	18-Oct-17
Design		212	19-Oct-17	20-Aug-18
Permitting		130	26-Jan-18	30-Jul-18
Contractor Selection		140	21-Aug-18	11-Mar-19
Construction		520	12-Mar-19	26-Mar-21
Construction Contingency/Escalation		504	12-Mar-19	04-Mar-21
Close-Out		250	05-Mar-21	24-Feb-22
SE-2 SDWWTP - BZ Deep Municipal Injection Wells		1294	29-Jan-16 A	03-Mar-21
Program Management		1247	29-Jan-16 A	03-Mar-21
Pre-Design/Planning/A&E Selection		226	29-Jan-16 A	16-Dec-16
Design		125	10-Nov-16	09-May-17
Permitting		280	04-Apr-16 A	09-May-17
Contractor Selection		253	10-May-17	08-May-18
Construction		465	09-May-18	09-Mar-20
Construction Contingency/Escalation		465	09-May-18	09-Mar-20
Close-Out		250	10-Mar-20	03-Mar-21
WE-1 WDWWTP - Injection Well Pump Station		1830	23-Jul-18	29-Sep-25
Program Management		1830	23-Jul-18	29-Sep-25
Pre-Design/Planning/A&E Selection		199	23-Jul-18	02-May-19
Design		376	03-May-19	23-Oct-20
Permitting		480	02-Dec-19	19-Oct-21
Contractor Selection		200	22-Jan-21	02-Nov-21
Construction		760	03-Nov-21	24-Oct-24
Construction Contingency/Escalation		745	03-Nov-21	03-Oct-24
Close-Out		250	04-Oct-24	29-Sep-25
WE-2 WDWWTP - Municipal Injection Wells		2571	11-Mar-16 A	20-Apr-26
Program Management		0	11-Mar-16 A	02-May-16
Pre-Design/Planning/A&E Selection		245	11-Mar-16 A	27-Feb-17
Phase 01 - Testing Injection Well		707	19-Dec-16	30-Sep-19
Phase 02 - Municipal Injection Wells		1668	01-Oct-19	20-Apr-26
NE-4 NDWWTP - Pump Station for Industrial Wells		882	01-Oct-18	18-Mar-22
Program Management		882	01-Oct-18	18-Mar-22
Pre-Design/Planning/A&E Selection		200	01-Oct-18	15-Jul-19
Design		187	16-Jul-19	08-Apr-20
Permitting		130	16-Jul-19	20-Jan-20
Contractor Selection		85	09-Apr-20	07-Aug-20
Construction		165	10-Aug-20	02-Apr-21
Construction Contingency/Escalation		160	10-Aug-20	26-Mar-21
Close-Out		250	29-Mar-21	18-Mar-22
NE-5 NDWWTP - Industrial Wastewater Injection Wells		1190	01-Oct-18	01-Jun-23
Program Management		1190	01-Oct-18	01-Jun-23
Pre-Design/Planning/A&E Selection		199	01-Oct-18	12-Jul-19
Design		180	15-Jul-19	27-Mar-20
Permitting		130	15-Oct-19	17-Apr-20
Contractor Selection		189	30-Mar-20	24-Dec-20
Construction		387	28-Dec-20	30-Jun-22
Construction Contingency/Escalation		372	28-Dec-20	09-Jun-22
Close-Out		250	10-Jun-22	01-Jun-23
SE-4 SDWWTP - Pump Station for Industrial Wells		1218	02-May-16	17-Feb-21
Program Management		796	02-Jan-18	17-Feb-21
Pre-Design/Planning/A&E Selection		565	02-May-16	23-Jul-18



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WASD OOL Program
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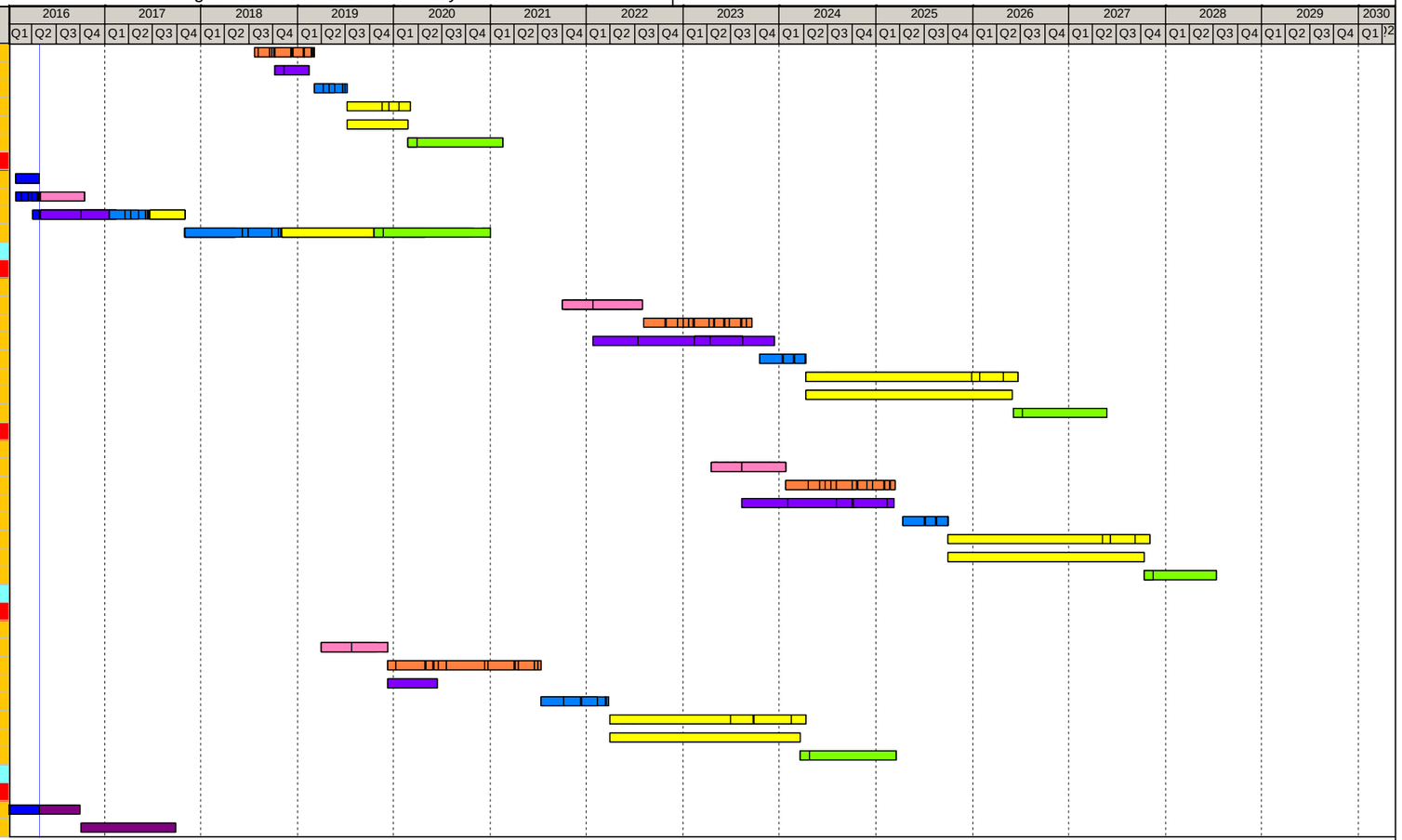
Miami-Dade Water and Sewer Department | Program Master Schedule - Monthly | 01-May-16 | Printed: 18-May-16

Activity ID	Activity Name	Duration	Start	Finish
Design		158	24-Jul-18	07-Mar-19
Permitting		87	10-Oct-18	13-Feb-19
Contractor Selection		85	08-Mar-19	08-Jul-19
Construction		165	09-Jul-19	02-Mar-20
Construction Contingency/Escalation		160	09-Jul-19	24-Feb-20
Close-Out		250	25-Feb-20	17-Feb-21
SE-5 SDWWTP - Industrial Wastewater Injection Wells		1236	29-Jan-16 A	30-Dec-20
Program Management		1189	29-Jan-16 A	31-Jan-20
Pre-Design/Planning/A&E Selection		185	29-Jan-16 A	18-Oct-16
Phase 01 - Monitor Well		405	04-Apr-16 A	02-Nov-17
Phase 02 - Industrial Injection Wells		791	03-Nov-17	30-Dec-20
Reclaimed Water Facilities		1730	01-Oct-21	13-Jul-28
SR-2 SR-D 72-Inch Reclaimed Water Pipeline - SDWWTP to FPL (Turkey Point)		1439	01-Oct-21	26-May-27
Program Management		1439	01-Oct-21	26-May-27
Pre-Design/Planning/A&E Selection		214	01-Oct-21	02-Aug-22
Design		290	03-Aug-22	20-Sep-23
Permitting		480	25-Jan-22	11-Dec-23
Contractor Selection		120	19-Oct-23	09-Apr-24
Construction		560	10-Apr-24	23-Jun-26
Construction Contingency/Escalation		545	10-Apr-24	02-Jun-26
Close-Out		250	03-Jun-26	26-May-27
XR-1 Future Reuse Projects		1335	18-Apr-23	13-Jul-28
Program Management		1335	18-Apr-23	13-Jul-28
Pre-Design/Planning/A&E Selection		195	18-Apr-23	24-Jan-24
Design		290	25-Jan-24	14-Mar-25
Permitting		400	10-Aug-23	07-Mar-25
Contractor Selection		120	14-Apr-25	01-Oct-25
Construction		530	02-Oct-25	02-Nov-27
Construction Contingency/Escalation		515	02-Oct-25	12-Oct-27
Close-Out		195	13-Oct-27	13-Jul-28
WWTP Storm Surge		1518	01-Apr-19	17-Mar-25
XS-1 WWTP Storm Surge Protection		1518	01-Apr-19	17-Mar-25
Program Management		1518	01-Apr-19	17-Mar-25
Pre-Design/Planning/A&E Selection		177	01-Apr-19	10-Dec-19
Design		404	11-Dec-19	13-Jul-21
Permitting		130	11-Dec-19	12-Jun-20
Contractor Selection		180	14-Jul-21	25-Mar-22
Construction		522	28-Mar-22	11-Apr-24
Construction Contingency/Escalation		507	28-Mar-22	21-Mar-24
Close-Out		250	22-Mar-24	17-Mar-25
Program Management		508	01-Oct-15 A	29-Sep-17
PM Owners Representative Services for OOL Program & Wastewater System		508	01-Oct-15 A	29-Sep-17
Program Management FY 2016		255	01-Oct-15 A	30-Sep-16
Program Management FY 2017		253	03-Oct-16	29-Sep-17



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Ocean Outfall Legislation Program

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