Miami-Dade Water and Sewer Department

# Ocean Outfall Legislation

Chapter 2008-232 Laws of Florida Wastewater
Disposal/Ocean Outfalls
[Section 403.086 (9), Florida Statutes
and Amendment CS/SB 444]

# Compliance Plan

## June 28, 2013

Miami-Dade
Water and Sewer Department
P.O. Box 33-0316, Miami, FL 33233-0316

# Table of Contents

## Figures

## Tables



## Appendices

## Abbreviations

| | |
|---|---|
| AADF | Annual Average Daily Flow |
| AWS | Alternative Water Supply |
| AWT | Advanced Wastewater Treatment |
| BCC | Board of County Commissioners |
| CBMYCP | Capital Budget Multi-Year Capital Plan |
| CDWWTP | Central District Wastewater Treatment Plant |
| CERP | Comprehensive Everglades Restoration Plan |
| EPA | Environmental Protection Agency |
| FA | Floridan Aquifer |
| FDEP | Florida Department of Environmental Protection |
| FPL | Florida Power & Light Company |
| GIS | Geographical Information System |
| IMP | Integrated Master Plan |
| MIA | Miami International Airport |
| Gpd | gallons/day |
| HLD | High Level Disinfection |
| LEC | Lower East Coast |
| mgd | million gallons/day |
| MBR | membrane bioreactor |
| MDWASD | Miami-Dade Water and Sewer Department |
| MF | microfiltration |
| NOAA | National Oceanic and Atmospheric Administration |
| NDWWTP | North District Wastewater Treatment Plant |
| OOL | Ocean Outfall Legislation |
| RDII | Rainfall Dependent Infiltration/Inflow |
| RO | Reverse Osmosis |
| SCADA | Supervisory Control and Data Acquisition |
| SDWWTP | South District Wastewater Treatment Plant |
| SFWMD | South Florida Water Management District |
| SLR | Sea Level Rise |
| TP | Total Phosphorus |
| TN | Total Nitrogen |
| TAZ | Traffic Analysis Zone |
| UV | Ultraviolet disinfection |
| WDWWTP | West District Wastewater Treatment Plant |
| WTP | Water Treatment Plant |
| WWTP | Wastewater Treatment Plant |

## 1.0 Executive Summary

In 2008, the Florida Legislature approved and the Governor signed a law requiring all wastewater utilities in southeast Florida utilizing ocean outfalls for disposal of treated wastewater to reduce nutrient discharges by 2018, cease using the outfalls by 2025, and reuse 60% of the wastewater flows by 2025. The statute was amended in 2013 to provide greater flexibility to meet the reuse requirements and to allow continued use of the outfalls for managing peak sewage flows not to exceed 5% of the annual baseline flows. The statute requires the affected utilities to submit a preliminary compliance plan by July 1, 2013.

The Miami-Dade County Water and Sewer Department (MDWASD) has analyzed several compliance options. Each option includes additional system capacity to meet average daily and peak flow demands anticipated in 2035. Each option includes additional treatment that is required to achieve reuse standards or disposal standards through deep injection wells to the "Boulder Zone" of the lower Floridan Aquifer. One option is to retrofit and expand the existing three treatment plants in their present locations. Two other sets of options involve constructing a new treatment plant in the western part of the County, thereby reducing flows to the North and Central District plants. These options differ in terms of how much of the peak flows are directed to the coastal plants and how the peak flows are treated. The capital cost estimate for using only the existing plants is about $4.4 billion. The other options range in cost from $5.0 billion to $6.5 billion. A preliminary analysis of completely closing the Central District (Virginia Key) plant and moving all of that treatment capacity to a new West District plant revealed a cost in excess of $7.6 billion. The recommended alternative includes a new West District plant with an average daily flow of 102 million gallons per day (MGD), reduced daily flows to North District of 85 MGD and to Central District of 83 MGD, and flows to South District of 131 MGD. The estimated cost of system-wide wastewater facilities upgrades for this alternative is $5.2 billion of which $3.32 billion is directly attributed to Ocean Outfall Legislation compliance. This approach recognizes site constraints at the North District plant location, reduces storm surge risks by moving substantial treatment capacity to the west where storm surges are not an issue while avoiding premature investment in completely replacing treatment capacity at coastal facilities that may not be required in the long term, places treatment closer to locations of flow origin to reduce pumping requirements, and utilizes the ocean outfalls for more cost-effective peak flow management. The law now allows up to 5% diversion of flows to the outfalls for peak

flow management, but this plan only requires 0.4% of flows on an annual basis to be discharged after treatment through the outfalls.
Reduction of nutrient discharges is accomplished by continued use of four deep injection wells at the North District plant, thereby diverting flows from the outfall, and the construction of an industrial injection well at the Central District plant for disposal of nutrient-rich water (centrate) coming from the centrifuge process used to remove water from the sludge. This combination of nutrient diversion will meet the nutrient reduction requirements with the industrial well in service by 2016.

The statute requires reuse of 117.5 million gallons of treated wastewater per day, by far the largest volume of reuse of any utility in Florida. This will be accomplished through a contract with Florida Power and Light to provide up to 90 MGD of reuse water for cooling purposes at their Turkey Point facilities. An additional 27.5 MGD of reuse water will be used to replenish the Floridan aquifer at the Central, South, and West District plants. None of this reuse is needed to meet drinking water supply needs until at least 2035 according to current demand forecasts made by WASD and the South Florida Water Management District, so there is no direct or immediate water supply benefit that will occur. Pursuant to the amended statute, the affected utilities will review the proposed reuse plans with the Florida Department of Environmental Protection (FDEP) and the South Florida Water Management District (SFWMD), and FDEP will provide a report to the Legislature by 2015 recommending any adjustments to the reuse requirements based upon that review. This draft plan was presented to the community at an advertised meeting on June 5, 2013. The recommended compliance option is technically feasible, but very expensive (as are all of the options) in terms of the required treatment and collection system changes. Detailed design and construction is likely to require an 8 to 10 year time period. While provisions were made in the outfall statute to give priority to outfall projects for state project funding, state appropriations to fund water projects have not yet materialized, and the mandate remains unfunded at the state level. Revenue bonds will necessarily be the major funding source for these improvements in the absence of state and federal assistance. A more detailed financial plan will be prepared as part of the Consent Decree requirement for a financial plan as well as the Department's regular updates of the Multi-Year Capital Improvements Plan.

This preliminary plan will be reviewed by the FDEP to determine compliance with the requirements of the statute. An update of the plan is due to FDEP no later than July 1, 2016. A more detailed implementation plan will need to be in place by that time, including actual construction of some plan components, to assure that the 2025 deadline is met.

## 2.0 Introduction

### 2.1 Ocean Outfall Legislation

On June 30, 2008, Governor Charlie Crist signed Senate Bill 1302 related to wastewater disposal/ocean outfalls (Section 403.086(9)). Subsequently, on June 24, 2013, present Governor Rick Scott signed a revision to the Ocean Outfall Legislation. Main requirements of the bill, described herein as OOL, as amended follow below. Parameters as described relating to compliance with the OOL for the Miami-Dade Water and Sewer Department (MDWASD) are tabulated in the next section. A copy of the OOL and Amendment are included as Appendices A and B, respectively. Requirements are:

- The elimination of ocean outfalls that are being used for treated wastewater disposal as a primary means of domestic wastewater discharge by December 31, 2025 with the following exceptions:
  - Outfalls serving as a backup to a functioning reuse systems
  - Peak flows may not cumulatively exceed 5 percent a facility's baseline flow, measured on a five year rolling average and are subject to applicable secondary waste treatment and water quality-based effluent limitations specified in department rules. Baseline flow is defined as "the annual average flow of domestic wastewater discharging through the facility's ocean outfall, as determined by the department, using monitoring data available for calendar years 2003 through 2007."

- A functioning reuse system that reuses a minimum of 60 percent of the facility's baseline flow on an annual basis must be installed no later than December 31, 2025 at each domestic wastewater facility that discharges through an ocean outfall. Provision is included for utilities with multiple outfalls (such as MDWASD which operates two) that the 60 percent reuse requirement is applicable to the combined flow of the facilities. The MDWASD outfalls are located at the North and Central District Wastewater Treatment Plants (NDWWTP and CDWWTP). MDWASD wastewater facilities are shown on Figure 1.

All regular domestic wastewater discharged through ocean outfalls must either meet advanced wastewater treatment (AWT) and management by December 31, 2018, or an equivalent reduction in the cumulative outfall loadings of total nitrogen (TN) and total phosphorus (TP), between December 31, 2008 and December 31, 2025 which would be achieved if the AWT were fully implemented beginning December 31, 2018 and continued through December 31, 2025.

- Submission of a Plan to the Florida Department of Environmental Protection (FDEP) by July 1, 2013, describing how the outfalls will be eliminated from regular use for wastewater disposal. This Compliance Plan is intended to meet this requirement. The Plan must include:

    - Technical, environmental, and economic feasibility of reuse
    - Land acquisition
    - Facilities necessary and costs to meet treatment requirements
    - Cost comparison
    - Financing plan
    - Schedules

- By July 1, 2016 submission of a plan update with refinements in costs, actions, and financing.

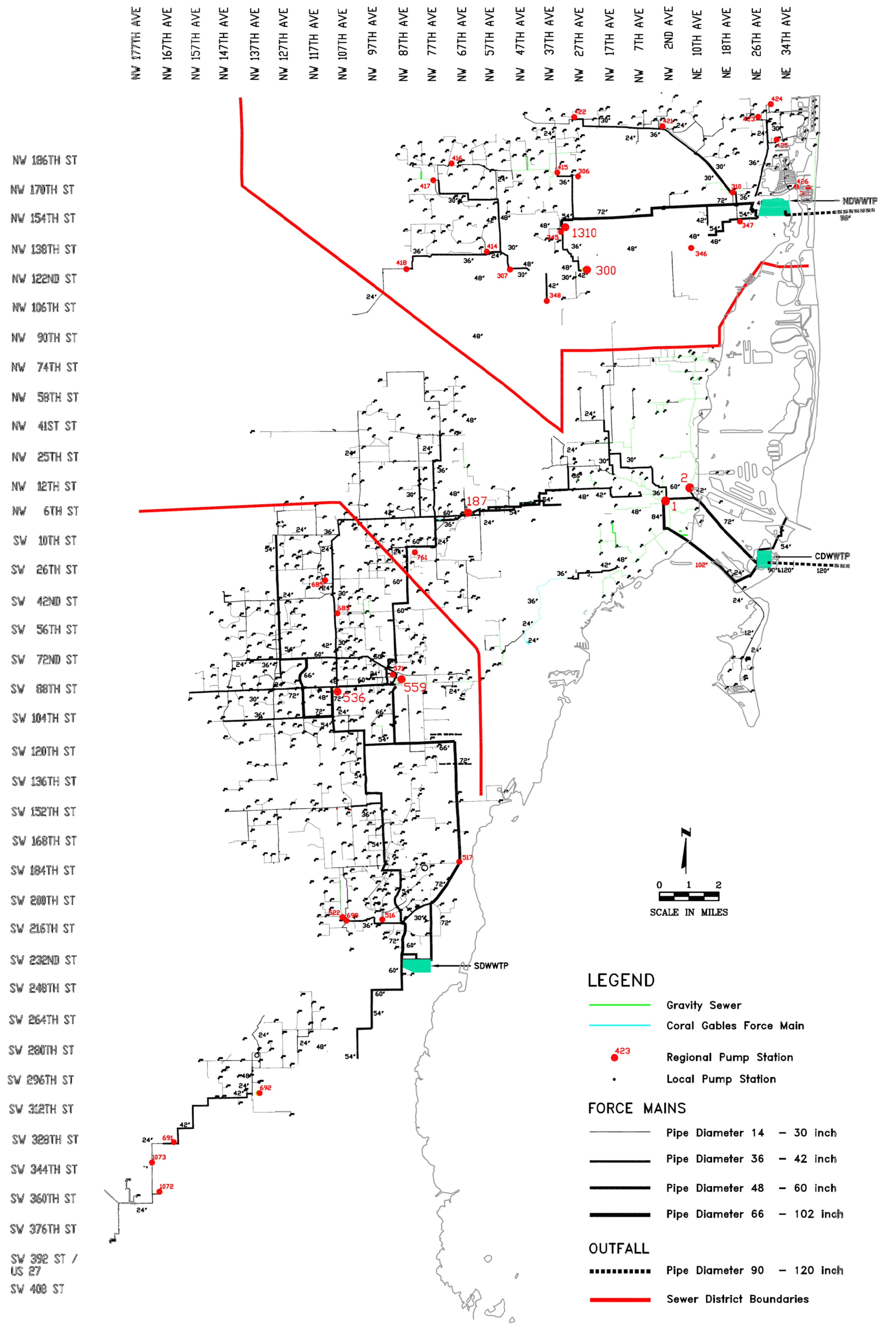
## 2.2 Miami-Dade Water and Sewer Department (MDWASD) Requirements

Discharges through the existing Ocean Outfalls at the North and Central District plants for the calendar years 2003 through 2007 (baseline flows) and reuse requirements are summarized on Table 1.

Table 1
NDWWTP and CDWWTP Ocean Outfall Flows, Mgd
Calendar Years 2003 through 2007

| | NDWWTP | CDWWTP | Total |
|---|---|---|---|
| 2003 | 81.1 | 114.8 | 195.9 |
| 2004 | 73.8 | 113.1 | 186.9 |
| 2005 | 78.6 | 122.2 | 200.8 |
| 2006 | 78.5 | 109.3 | 187.8 |
| 2007 | 90.4 | 114.8 | 205.2 |
| Average | 81.0 | 114.8 | 195.8 |
| Reuse Requirement, 60% | 48.6 | 68.9 | 117.5* |

*Reuse at any location within the MDWASD system to meet 117.5 mgd is acceptable.




| | | | |
|---|---|---|---|
| MIAMI-DADE COUNTY Water and Sewer Department | OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN | MDWASD Wastewater Facilities | Figure 1 |

- Note that MDWASD has entered into an Agreement with Florida Power & Light Company (FPL) to provide 90 mgd of reclaimed water to existing unit 5 and proposed units 6 and 7 at the FPL Turkey Point power generating complex. A copy of the Joint Participation Agreement for this in included as Appendix C. The 2013 OOL Amendment allows for the establishment of the required reuse “within the utility’s service area” so that based on crediting the 90 mgd reuse for FPL against the 117.5 mgd requirement, an additional 27.5 mgd of reuse is required.

## 2.3 Plan Development Approach

Due to the extensive nature of the modifications necessary to comply with the OOL, the analysis conducted for this Plan is in the form of a formal facilities master plan which includes the following elements:

- Selection of Planning Horizon (Year 2035)
- Flow Projections
- Alternatives Development and Evaluation
- Plan Selection
- Implementation Plan, including Scheduling
- Financing Plan

The original approach was to develop the OOL Compliance Plan as part of an Integrated Water, Wastewater, Reclaimed Water Master Plan. With recent population projections, issued by the Miami-Dade County Regulatory and Economic Resources Department (RER), Office of Sustainability, Planning and Economic Enhancement (SPEE), derived from the 2010 census, the 2035 projected county population has been reduced from 3,365,791 to 3,172,406. This represents a 5.7% decrease. With this reduction, it is anticipated that water supply projects in addition to those already planned will not be needed over the period through the year 2035. Figures regarding this follow a later section.

Based on the above, it was determined that the reuse component of the Compliance Plan will not provide future water supply and that the integrated approach is not necessary. The Integrated Master Plan (IMP) will proceed, however, in order to have respective water and wastewater planning fully coordinated; based on the updated population projections for both the water and wastewater systems with completion anticipated in mid-2014.

## 3.0 EPA Consent Decrees

On January 13, 1994 and September 11, 1995 respectively, the First Partial and Second/Final Partial Consent Decrees were entered into with the EPA. MDWASD has complied with all of the provisions of these Consent Decrees.

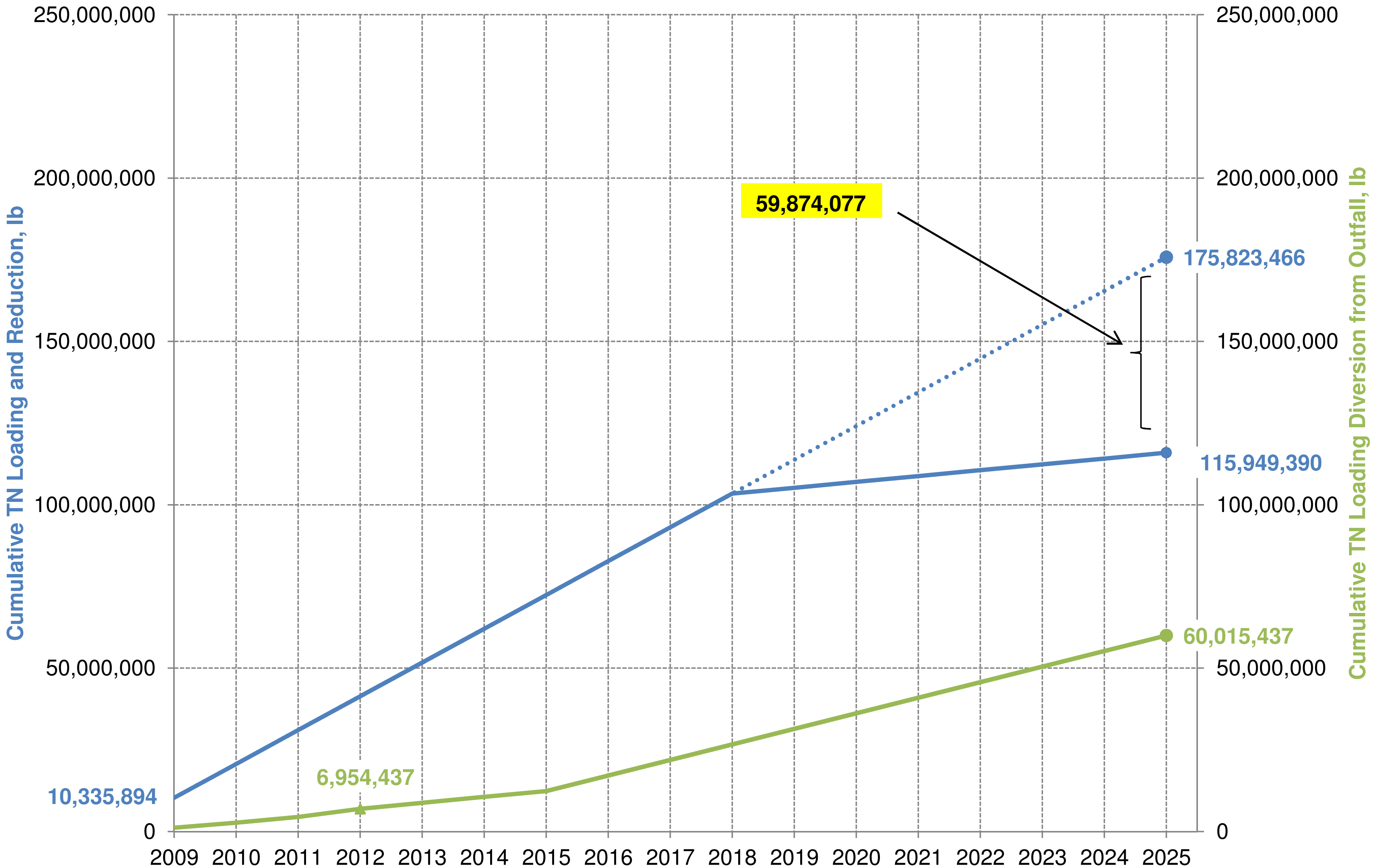
Subsequently, the peak flow criteria prescribed in SFPCD, paragraph 17, were implemented and used to derive peak flow projections for the analyses of the collection and transmission system alternatives including hydraulics computerized modeling to evaluate the ability of each pump station to manage peak 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 Consent Decrees and replacing them with a new Consent Decree which would emphasize the rehabilitation of the existing system. This Consent Decree was approved by the Miami-Dade Board of County Commissioners on May 21, 2013 and lodged on June 6, 1013. Rehabilitation projects with a total project cost of $1,550,634,370 are part of the obligations under the new Consent Decree. A table from the Consent Decree which enumerates the required projects is included as Appendix D. These projects are separate from those which are required for compliance with the OOL as described in Section 8 of this Compliance Plan.

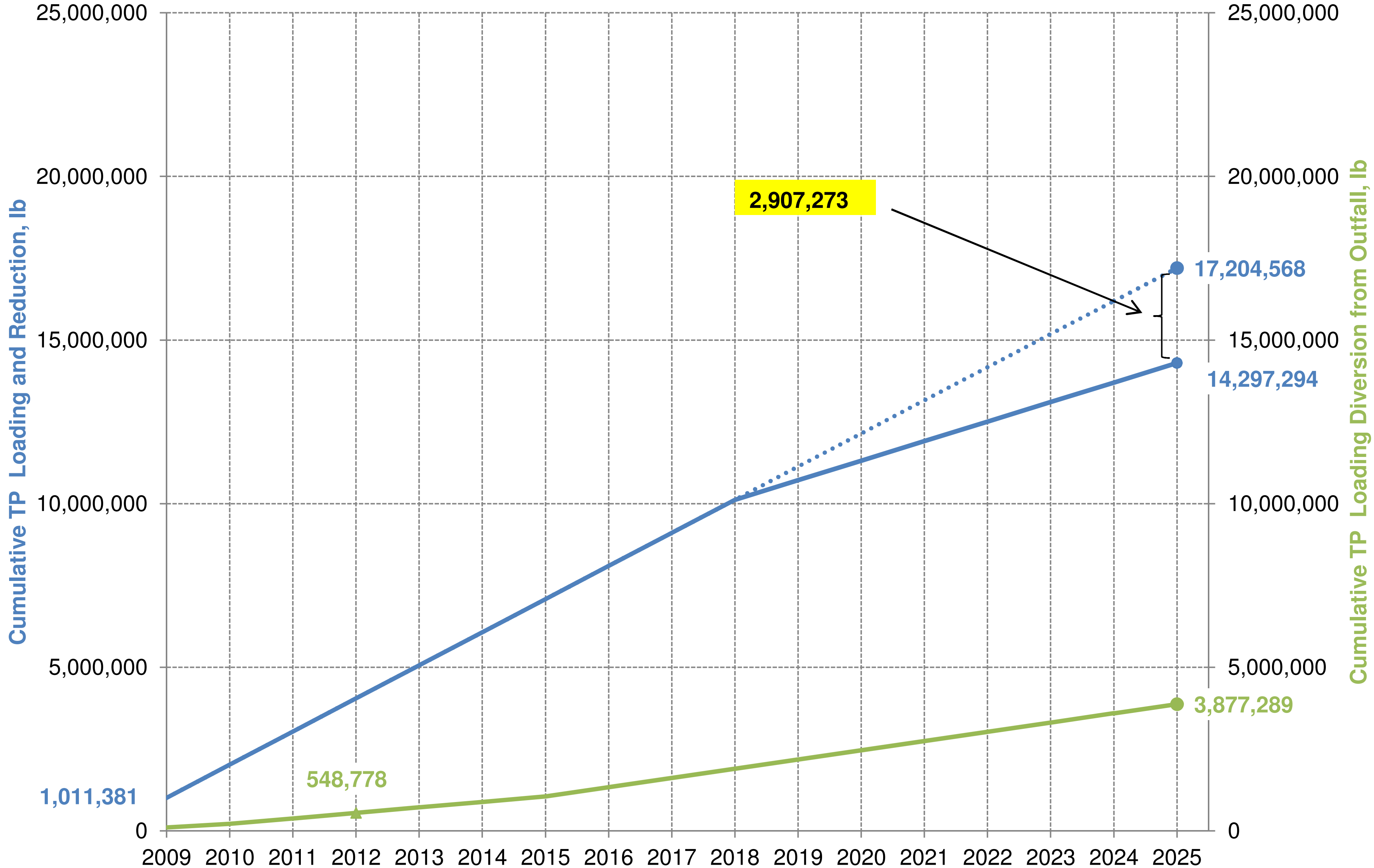
## 4.0 Nutrient Reduction Plan

As described above, the OOL requires that all regular domestic wastewater discharged through ocean outfalls must either meet advanced wastewater treatment (AWT) and management by December 31, 2018, or an equivalent reduction in the cumulative outfall loadings of total nitrogen and total phosphorus, between December 31, 2008, and December 31, 2025 which would be achieved if the AWT had been implemented by December 31, 2018. MDWASD has opted to meet this requirement by the second of the two possible methods allowed achieving the equivalent reduction of nutrient loading to the outfall.

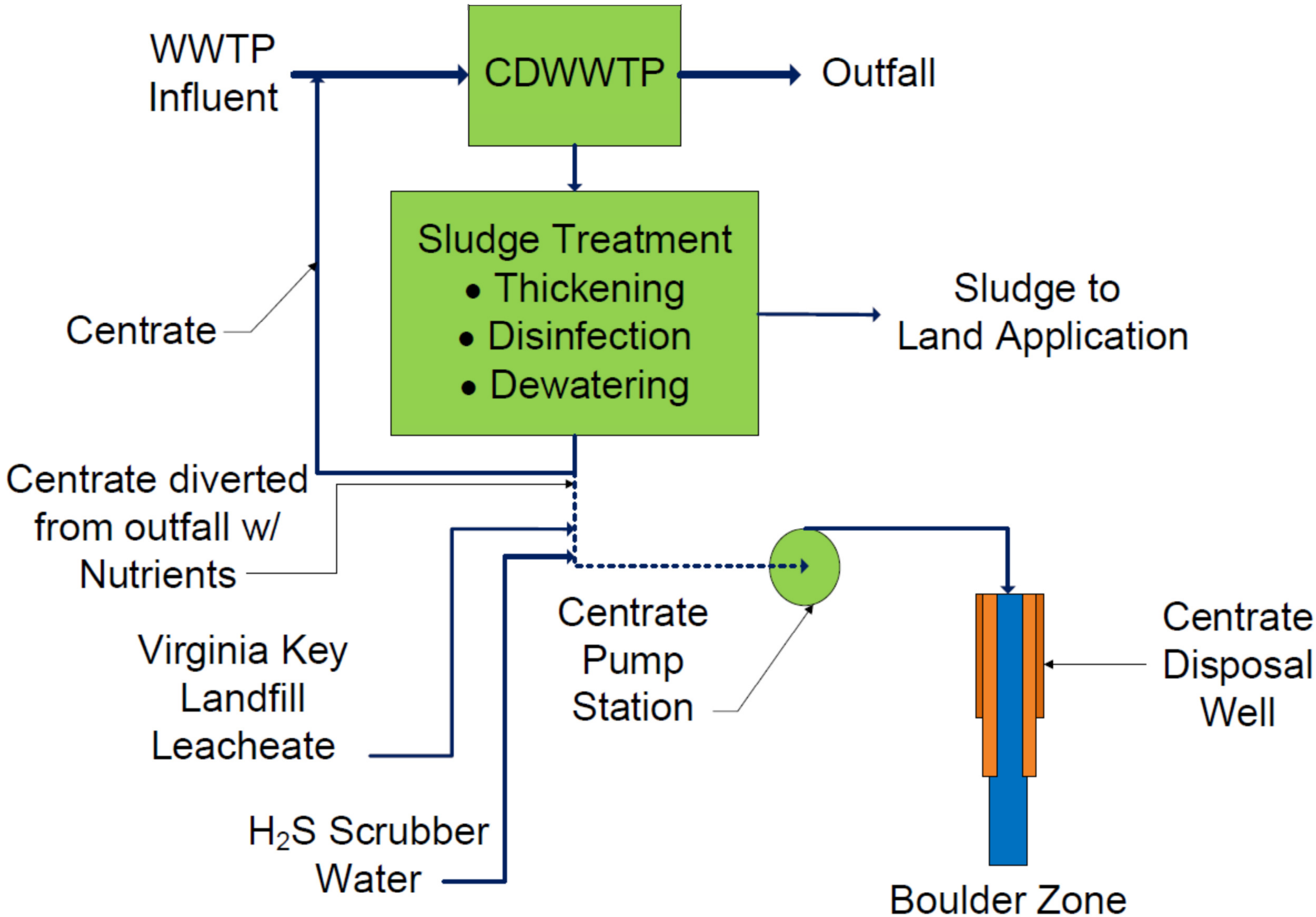
As shown on Figure 2, with the installation of the AWT on December 31, 2018, a total of 59,874,077 lbs of Total Nitrogen would have been diverted from the two MDWASD outfalls from that date until the required December 31, 2025 closing of the outfalls. The analogous information for the required phosphorus reduction is included on Figure 3.




| | | | |
|---|---|---|---|
| MIAMI-DADE COUNTY Water and Sewer Department | OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN | Nutrient Removal Plan – Total Nitrogen | Figure 2 |




| | | | |
|---|---|---|---|
| MIAMI-DADE COUNTY Water and Sewer Department | OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN | Nutrient Removal Plan – Total Phosphorus | Figure 3 |




| | | | |
|---|---|---|---|
| MIAMI-DADE COUNTY Water and Sewer Department | OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN | Centrate Disposal System Schematic | Figure 4 |

The total mass diversion from the outfalls for Total Phosphorus is as shown is 1,661,217 lbs. To obtain the equivalent nutrient diversion, MDWASD will:

- Maximize use of the existing Deep Injection Well system at the NDWWTP. As of December 2012, there have been 6,954,437 lbs of TN and 548,777 lbs of TP diverted from the outfall.

- Construct a disposal system at the CDWWTP for sludge dewatering centrifuge centrate. Disposal will be via a deep injection well and pumping station. Centrate will be combined with leachate from the adjacent landfill owned by the City of Miami and hydrogen sulfide scrubber water from the CDWWTP. Injection of the leachate requires construction of a Class I Industrial type well which does not require the installation of High Level Disinfection treatment upstream. The centrate disposal well and pump station system is scheduled to be in service by January 1, 2016. A schematic of system is shown on Figure 4. The pumping station and disposal well projects are incorporated in the overall project schedule on Figure 26-3 included Section 8.0 below.

## 5.0 Flow Projections

### 5.1 Population Projections

The wastewater flow projections as described below are based on the Miami-Dade County Regulatory and Economic Resources Department (RER) Planning Division population projections of 3,365,791 for the year 2035. In February 2013, an updated figure of 3,307,600 for the year 2040 based on the 2010 census was issued by RER Planning Division. Using a straight-line proportion, this corresponds to a 3,172,406 population for the year 2035, a 5.7% decrease. Figures for employment which, as described in the next section were used in forecasting wastewater flows, have not been issued to date. Accordingly the previous value is used in the wastewater flow projections. It is intended to revise the wastewater flow projections for use in the IMP, when the updated employment figures are issued.

### 5.2 Wastewater

Annual average daily wastewater flows (AADF) were projected for all existing MDWASD pump stations based on the following:

- Miami-Dade County RER Planning Division population and employment projections for year 2035. Projections are distributed spatially around the county by Traffic Analysis Zones (TAZs).
- MDWASD pump station service areas (basins).
- Dry weather flows at existing stations with the use computations using Supervisory Control and Data Acquisition (SCADA) historical influent flow.
- Estimates of population served in each pump station basin using septic tank installation data distributed spatially in Geographic Information System (GIS).
- Estimates of Infiltration/Inflow (I/I) for each pump station basin using 24-hour hydrographs developed from SCADA.
- Estimates of residential and non-residential flow using sewer billing information.
- Relationship between dry weather flows and AADF.

The MDWASD Geographic Information System (GIS) was instrumental in a number of these steps in the development of the flow projections.
The following factors were incorporated into the projections:

- The effect of MDWASD water conservation programs (reduced discharges to wastewater systems).
- Anticipated improvements in sewer design for future systems resulting in lower I/I for new flows.

Flows from presently undeveloped areas were estimated using existing per capita wastewater generation figures and population projections.

Based on the AADF flow projections and the observed system performance during a two-year recurrence rain event from September 28th through September 30th, 2010; for each existing and future pump station, a projected 72-hour hydrograph was developed for each basin for the year 2035. This was accomplished with the following steps:

- Existing station with wet weather hydrograph:
  - Subtracting the dry weather flow hydrograph from the total flow hydrograph to obtain a 72-hour hydrograph of the station rainfall dependent infiltration/inflow (RDII).
  - In order to approximate the worst case with respect to the 2-year storm timing within the diurnal pattern, shifting the RDII hydrograph to the time when the peak flow occurred at the wastewater treatment plants (WWTPs).
  - Adding the RDII hydrograph to the projected dry weather hydrograph.

- Existing stations without a wet weather hydrograph and future stations:

- Grouping existing stations into categories based on flow ranges and averaging flows for each hour over the 72-hour period.

- Unitizing the average wet weather hydrograph for each flow range (dividing by the average flow) and then multiply the projected average dry weather flow for each station to obtain the projected wet weather hydrograph.

With these procedures, a 72-hour wet weather hydrograph was generated for each existing and future station for the year 2035 for input into the hydraulic model. Flows from the MDWASD volume customers were developed using the same methodology described for the MDWASD pump stations using billing history as the starting point. All of the hydrographs were added together on an hour-by-hour basis in order to evaluate the effect on plant flows. The summed hydrograph resulted in a peak hour/AADF ratio of 3.38. A factor of 3.0 was used for the projections to allow for dampening of peak flows occurring on peak events to reflect storage in individual collection systems and major gravity interceptors. This factor will be further evaluated with additional hydraulic modeling which will be undertaken as part of the IMP.

Design capacities for the WWTPs and transmission system have been set so that there is a surplus of capacity at the end of the planning period. This surplus allows for the timely completion of new facilities needed based on the historical design flow increases. Based on these methodologies, the projected system-wide wastewater flows and system capacities for the year 2035 were developed and are shown in Table 2.

Table 2
Projected System-Wide Wastewater Flows
and Design Capacities, Mgd

| | Projected Flow | Design Capacity |
|---|---:|---:|
| Annual Average Daily Flow | 358 | 401 |
| Peak Hour Flow | 1,077 | 1,180 |

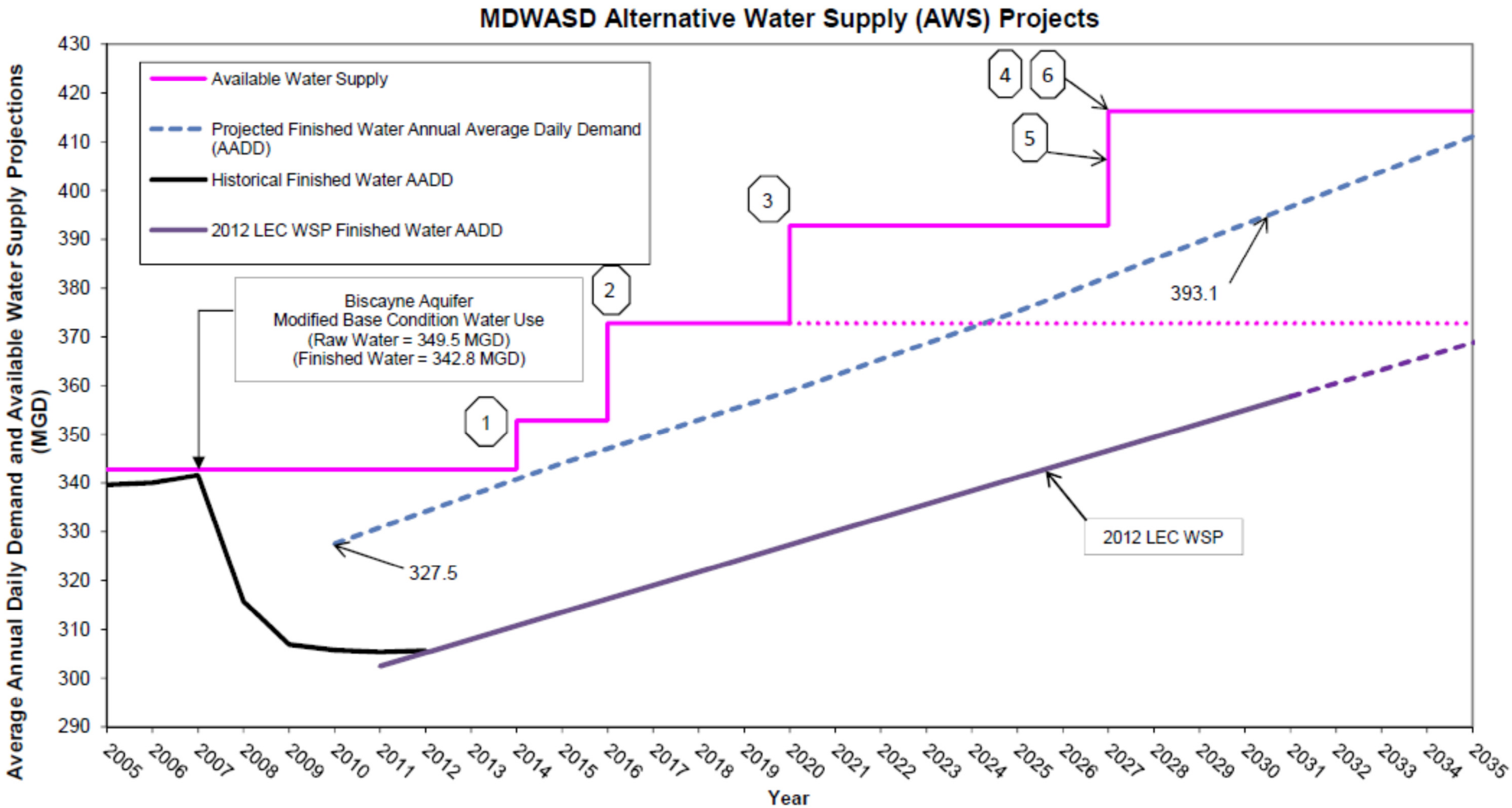
The distribution of these flows to the existing and proposed WWTPs is determined with the use of the MDWASD hydraulic computer model. Flows for each of the MDWASD existing and proposed pump stations, as well as from the MDWASD volume customers generated by the procedures described above are summarized in the table included as Appendix E.

## 5.3 Water

The current Lower East Coast Water Supply Plan flow projection for Miami-Dade County for the year 2030 is 356 mgd. Projected to the year 2035, the planning horizon of this Plan, this figure becomes 371 mgd. The present 20-year Water Use Permit from the SFWMD includes water supply projects as follows:

| | |
|---|---|
| Hialeah RO WTP | 10 mgd |
| South Miami Heights WTP | 20 mgd |

As shown on Figure 5, with the completion of these projects and the 371 mgd flow projection for the year 2035, no additional water supply projects are needed to meet projected demands prior to year 2035.  As a result, no reclaimed water projects necessary to meet water supply needs.




AWS Projects:

1. Hialeah Floridan Aquifer R.O. W.T.P. Phase 1 (Capacity 10.0 MGD, Operational 12/31/13)
2. South Miami Heights Biscayne/Floridan Aquifer R.O. W.T.P. (Capacity 20 MGD)
3. West District W.R.P. Canal Recharge Ph 1 (21 MGD)
4. Hialeah Floridan Aquifer R.O. W.T.P. Phase 2 (5.0 MGD)
5. West District W.R.P. Canal Recharge Ph 2 (16 MGD)
6. Hialeah Floridan Aquifer R.O. W.T.P. Phase 3 (2.5 MGD)

| | | | |
|---|---|---|---|
| MIAMI-DADE COUNTY Water and Sewer Department | OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN | MDWASD Alternative Water Supply (AWS) Projects | Figure 5 |

## 6.0 Sea Level Rise (SLR), Storm Surge

Cost-effective compliance with the OOL requires consideration of the construction of facilities at the existing MDWASD WWTPs in the east in the vicinities of the Intracoastal Waterway, Atlantic Ocean, and Biscayne Bay. In developing these alternatives, MDWASD considered the potential effects of sea level rise and storm surge at these sites to ensure investments in any new facilities at those locations would be of value in the long term.

In this effort, MDWASD reviewed available information regarding these impacts and retained a consultant to evaluate their effects at the existing WWTP sites.

Miami-Dade County and three other counties in the region (Monroe, Broward, and Palm Beach) have entered into a Compact to address climate change at the regional level. The Compact has developed a Regional Climate Action Plan, which was completed in October 2012. The Compact recognized how critical it was for the region to be planning with the same sea level rise projections. As a result, they developed the Unified Sea Level Rise Projection, which is shown in Figure 6 below. These projections are based on the historical water levels from Key West and the projections from United States Army Corps of Engineers (USACE) 2009 Sea-Level Change Considerations for Civil Works Programs (Circular 1165-2-211); which is modified from a National Research Council (NRC) Report, referred to as the NRC curves. The Unified Projection anticipates a sea level rise of 9-24 inches by the year 2060. The USACE modified High NRC III projection predicts a sea level rise of about 3 ft by 2075. On April 2, 2013, the Miami-Dade County Board of County Commissioners accepted the Southeast Florida Regional Climate Action Plan.

On the basis that facilities would need to be completed by the year 2025 to meet the OOL requirements and the useful life of wastewater treatment plant facilities is 50 years (Source: USEPA Publication, "The Clean Water and Drinking Water Infrastructure Gap Analysis"), 2075 has been set as the year when treatment near the coast must remain viable in consideration of the threats from SLR and storm surge.

As the first step, to determine levels of inundation near the coast at the three MDWASD treatment plant site due to sea level rise, the National Oceanic and Atmospheric Administration (NOAA) Sea Level Rise Viewer was used. Information received is shown for high range ends of 2 feet (2060) and 3 feet (2078) for the three plants on Figures 7 through 12. These figures show the plants to be at a sufficiently high elevation to avoid inundation at the 2 and 3 feet SLR levels, assuming that ground water rises directly to sea level. Note that 3 FT. SLR has been included in the evaluation of existing outfalls in the alternatives analyses which follow.

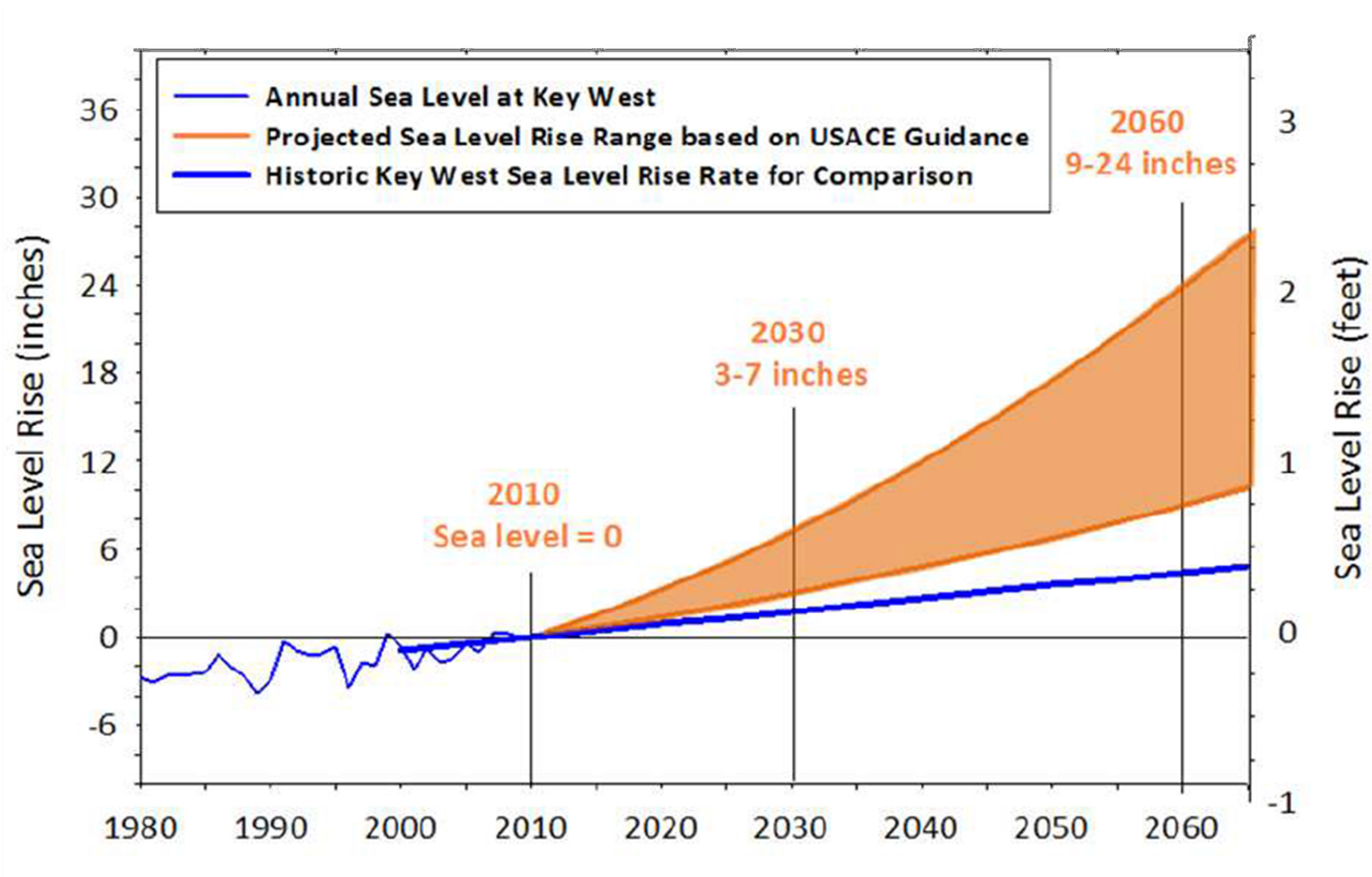
With regard to storm surge, the MDWASD consultant projected the storm surge effects of Hurricane Andrew which made a direct hit on the SDWWTP in August 1992 onto the three MDWASD plants at varying SLR's with estimates of lesser storms also included. The results of these analyses are shown on Figures 13 through 15. The elevations of the treatment units shown at the left of the figures are from survey data and construction drawings. The analysis shows the three existing wastewater treatment plants are already vulnerable to storm surges and that the 3 ft. SLR does not increase this vulnerability substantially. As was the case with Hurricane Andrew and the SDWWTP, and with the experience in the New York area with Hurricane Sandy, storm surge results in damage mostly to electrical and instrumentation/control systems. Structures and mechanical equipment do not generally suffer much damage due to storm surges. The consultant has made estimates of the replacement costs for all electrical and instrumentation equipment at the 3 MDWASD plants as shown on Table 3.

Table 3
Estimated Replacement Costs-MDWASD WWTPs
Electrical and Instrumentation Systems

| | Electrical | Instrument./Control | Total |
|---|---|---|---|
| NDWWTP | $51,851,000 | $24,961,000 | $76,812,000 |
| CDWWTP | $109,993,000 | $57,596,000 | $167,589,000 |
| SDWWTP | $29,753,000 | $12,942,000 | $42,695,000 |

The potential for these replacement costs in the event of the storm surges from direct hits from major hurricanes does not warrant plant relocations and the $billions required to replace capacity and redirect flows with major transmission system upgrades.

MDWASD has committed to a program to "harden" the existing WWTPs. Design for all of the projects listed in the new Consent Decree will include an examination of existing facilities for inclusion of features such as increasing the elevation of electrical and instrumentation/control equipment and/or providing water tight enclosures to decrease vulnerability to storm surges. In addition, MDWASD will proceed with a program to add concrete walls at strategic plant locations to reduce effects of storm surge, the addition of flood logs which are installed on an approaching storm, and watertight doors. The consultant has estimated a total cost of $30,000,000 to install these items at all three plants.

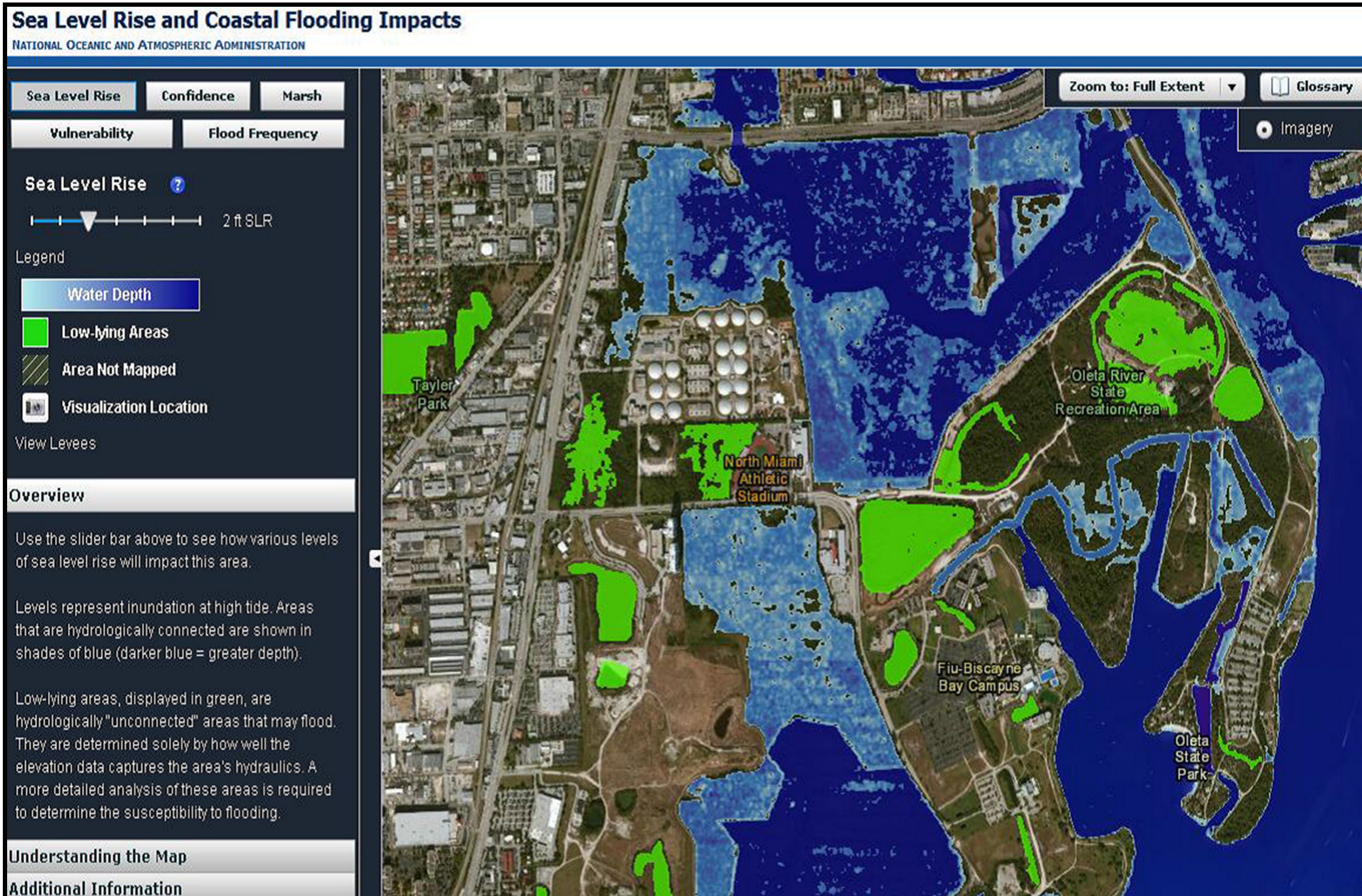



MIAMI-DADE COUNTY Water and Sewer Department

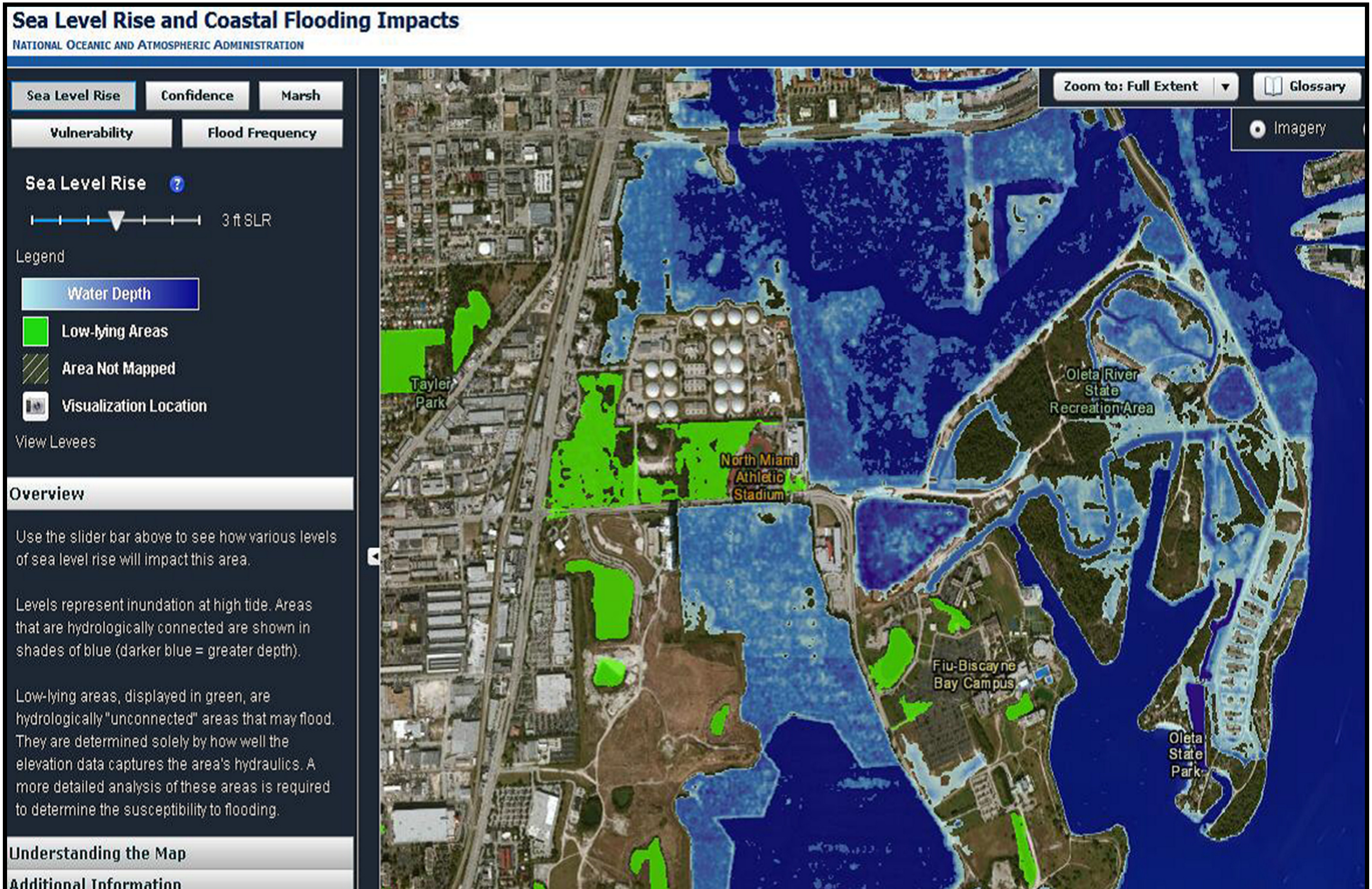
OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN

SE Florida Regional Climate Change Compact
Sea Level Rise Projection

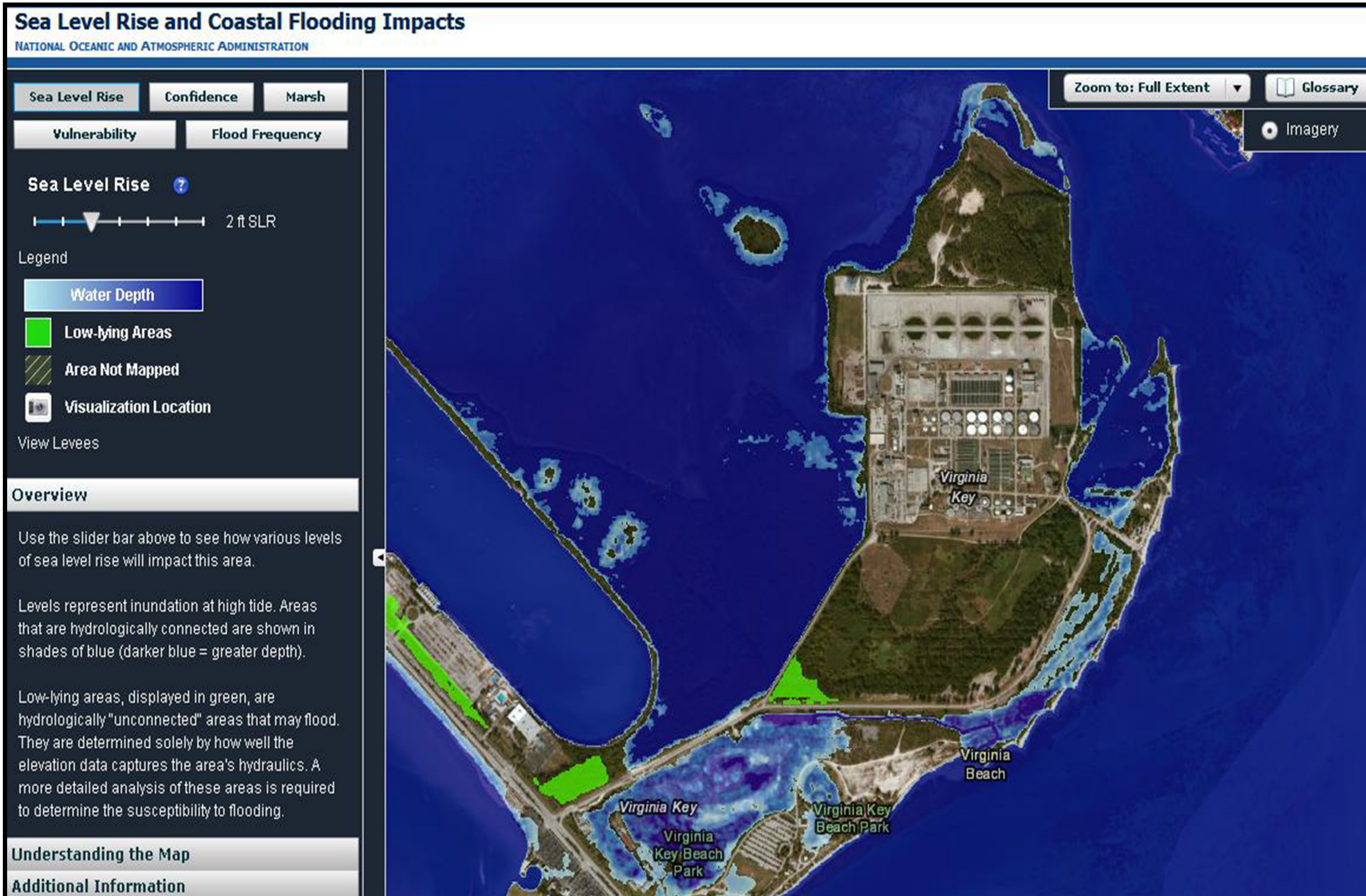
Figure 6



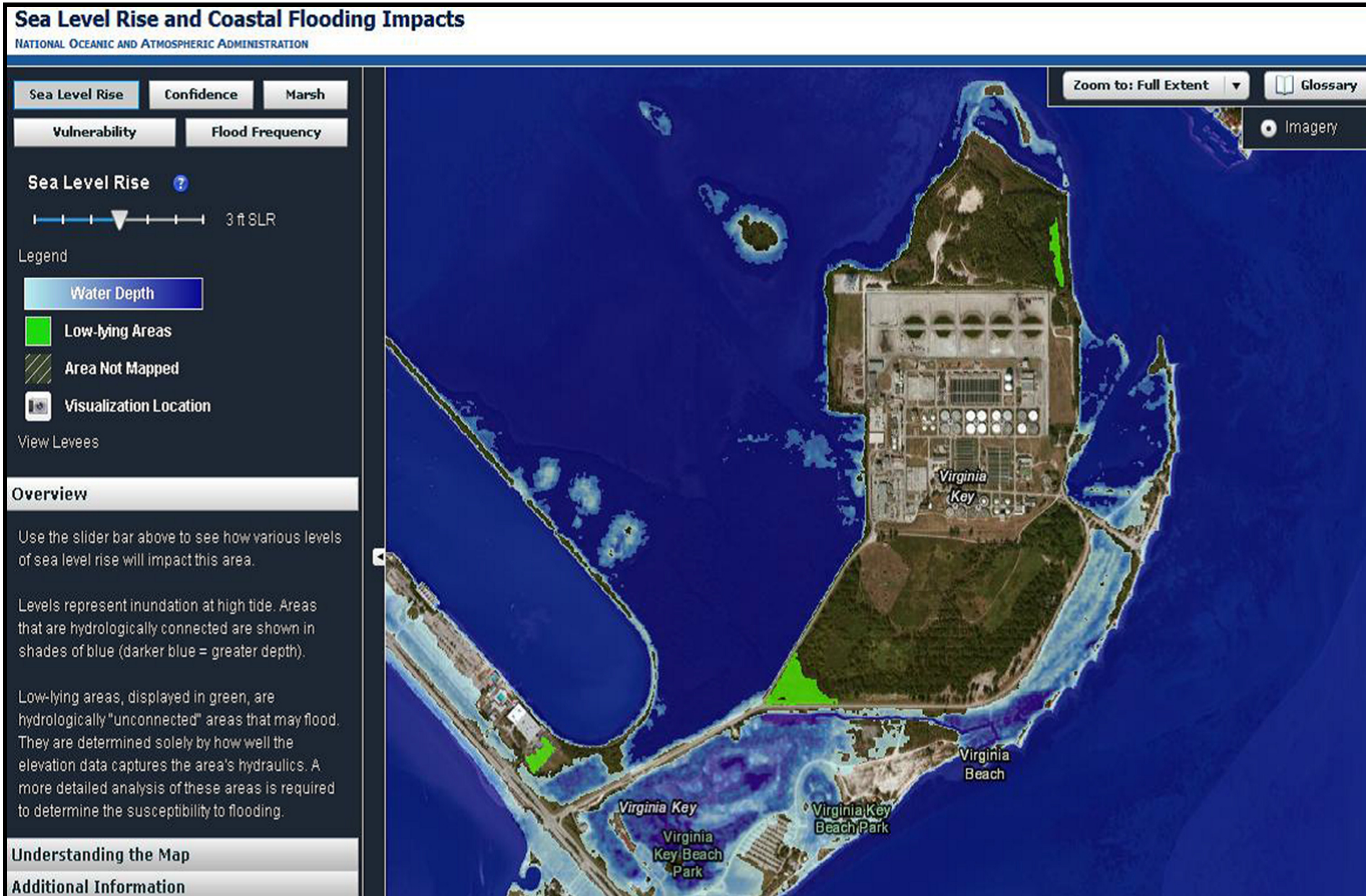

| | | | |
|---|---|---|---|
| MIAMI-DADE COUNTY<br>Water and Sewer Department | OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN | NDWWTP 2 ft. Sea Level Rise | Figure 7 |



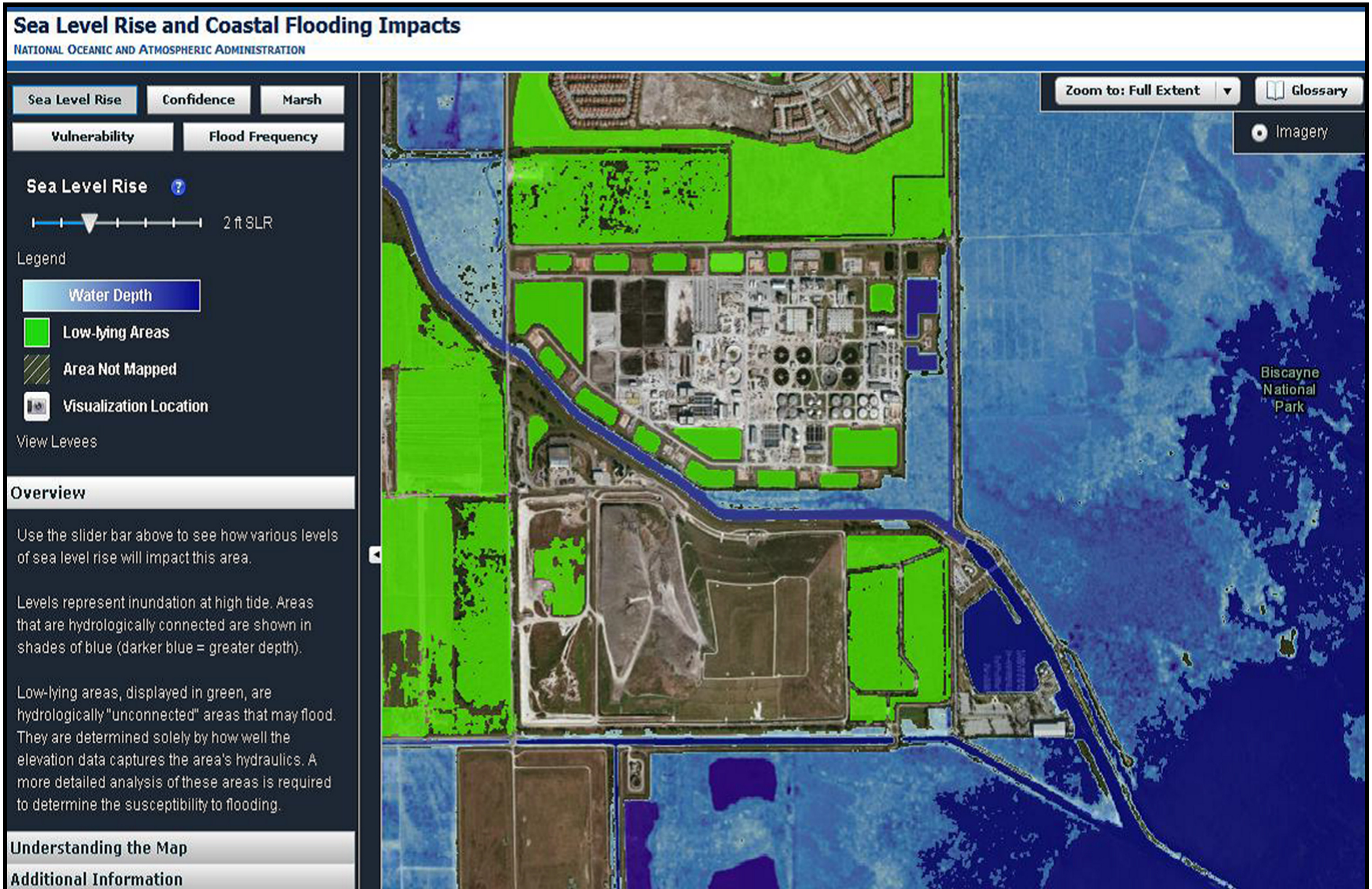

| | | | |
|---|---|---|---|
| MIAMI-DADE COUNTY Water and Sewer Department | OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN | NDWWTP 3 ft. Sea Level Rise | Figure 8 |



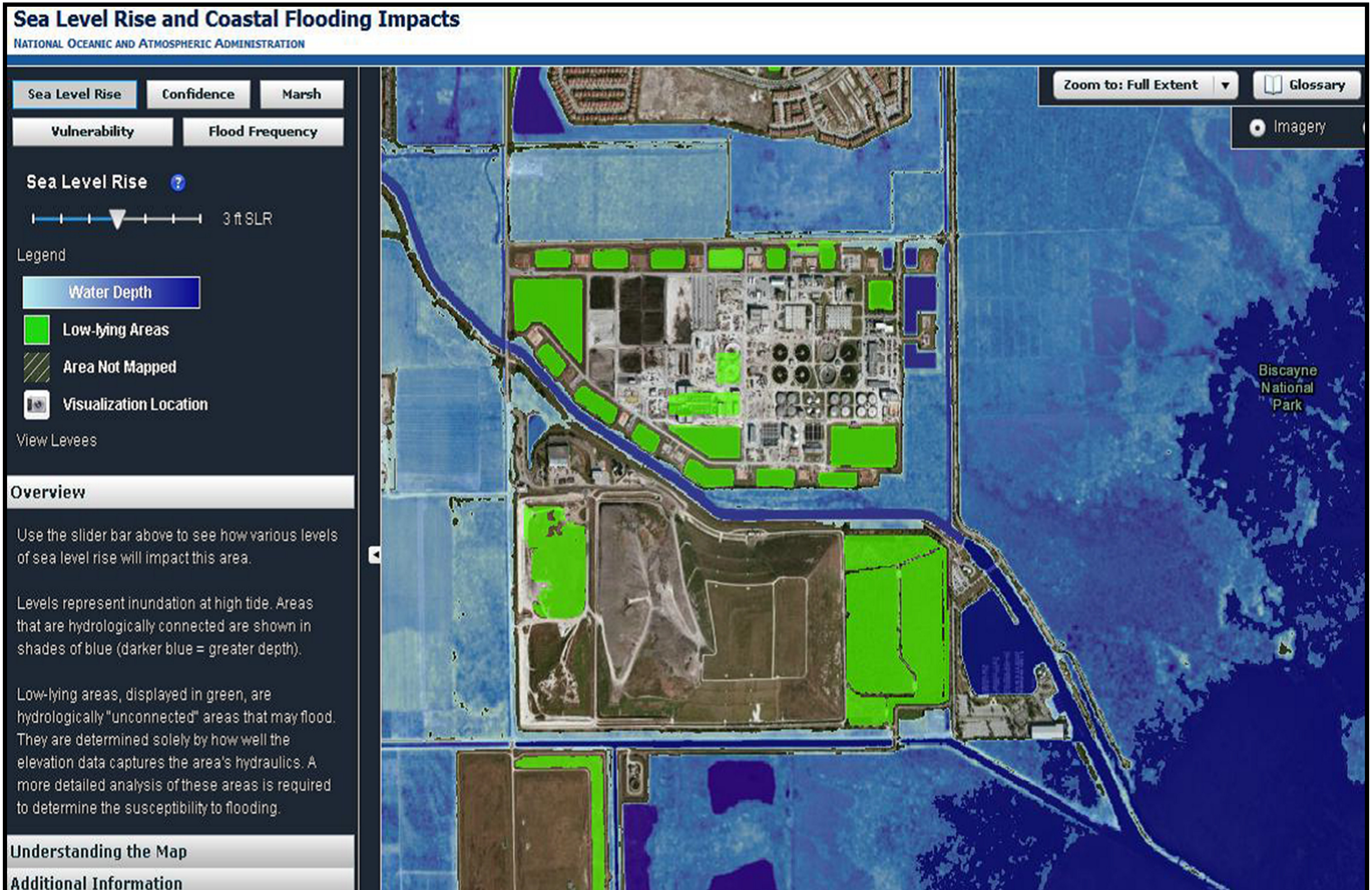

| | | | |
|---|---|---|---|
| MIAMI-DADE COUNTY Water and Sewer Department | OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN | CDWWTP 2 ft. Sea Level Rise | Figure 9 |



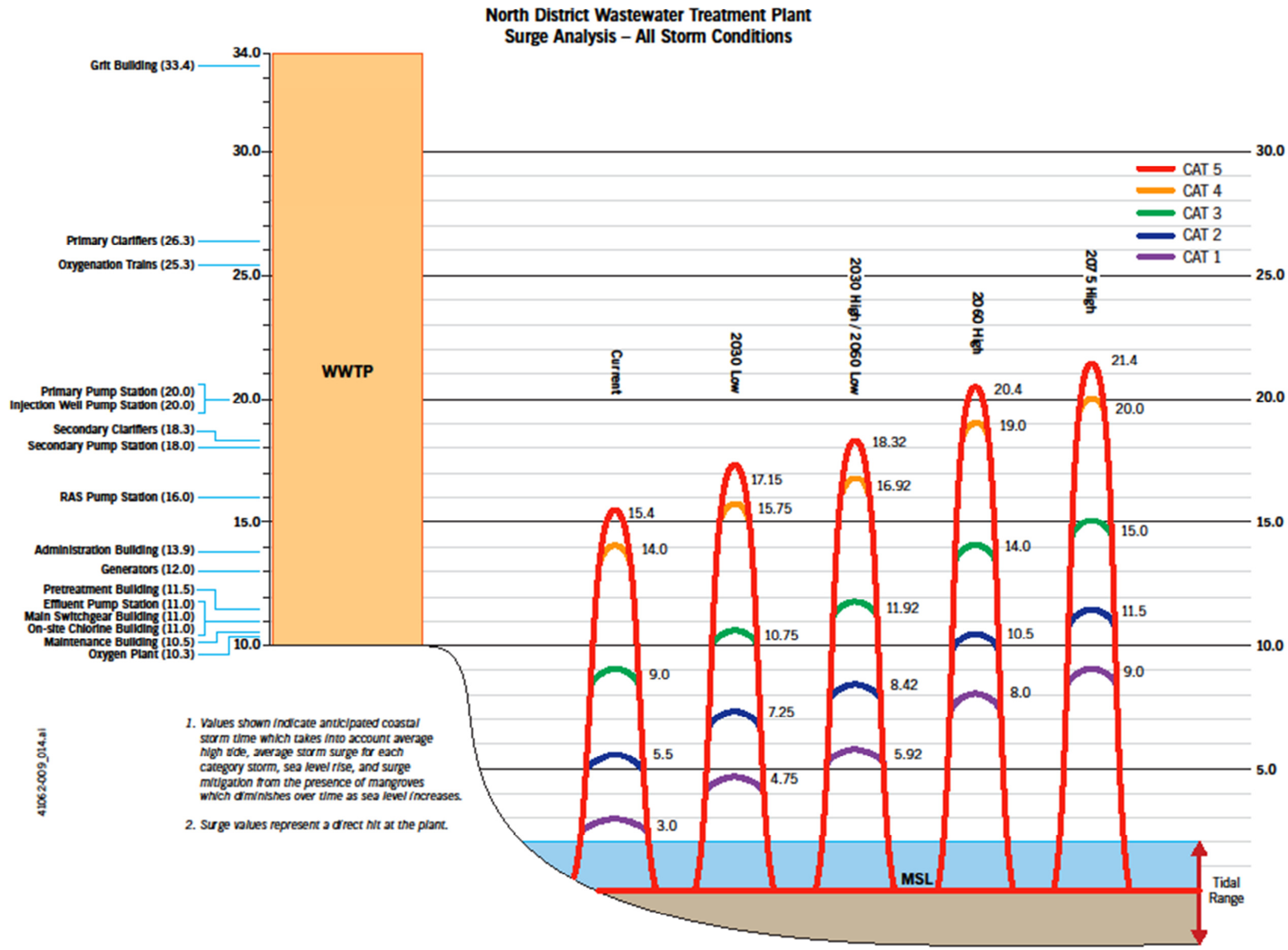

| MIAMI-DADE COUNTY Water and Sewer Department | OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN | CDWWTP 3 ft. Sea Level Rise | Figure 10 |
|---|---|---|---|




| | | | |
|---|---|---|---|
| MIAMI-DADE COUNTY Water and Sewer Department | OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN | SDWWTP 2 ft. Sea Level Rise | Figure 11 |




| | | | |
|---|---|---|---|
| MIAMI-DADE COUNTY Water and Sewer Department | OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN | SDWWTP 3 ft. Sea Level Rise | Figure 12 |

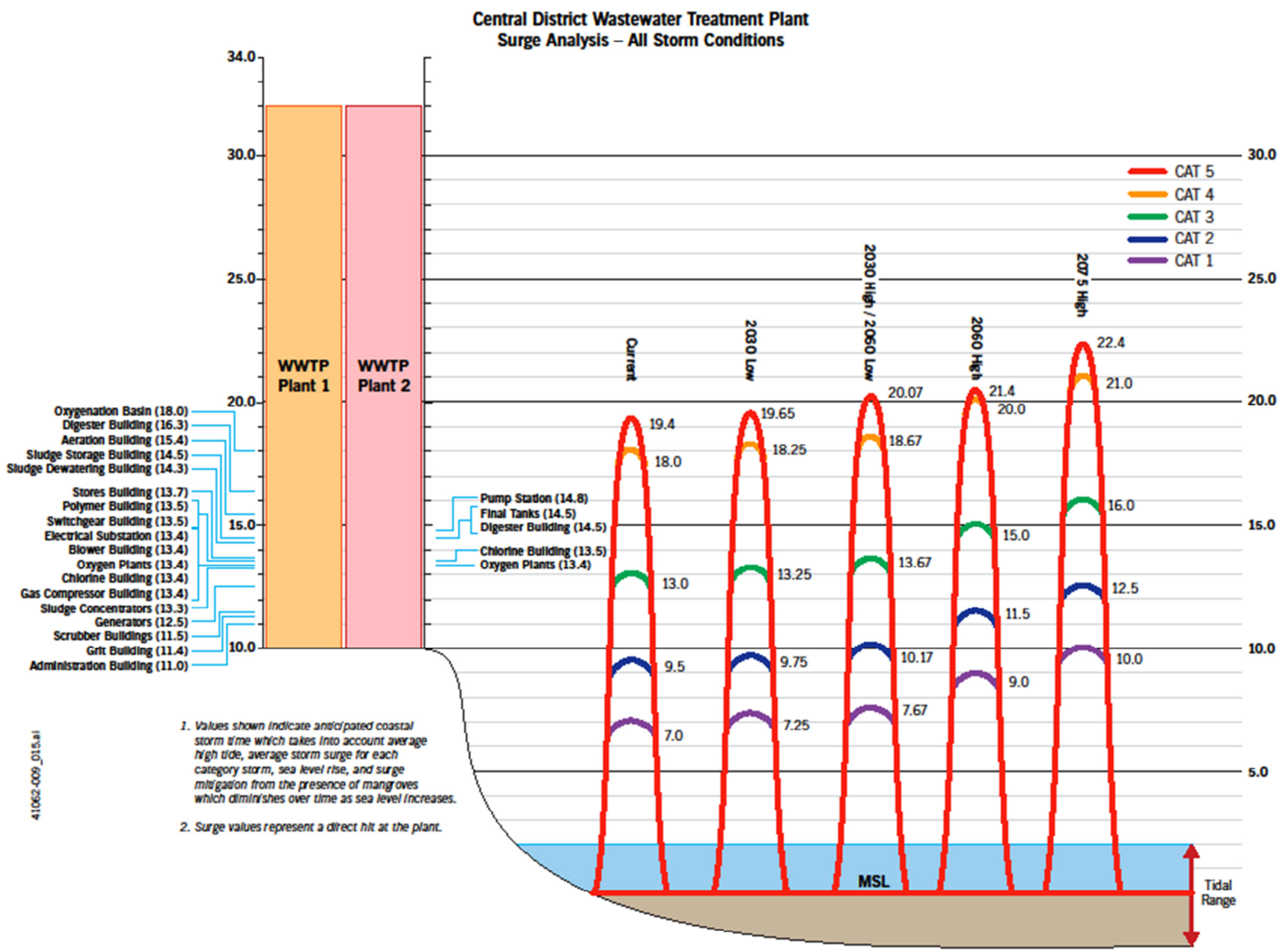



MIAMI-DADE COUNTY Water and Sewer Department

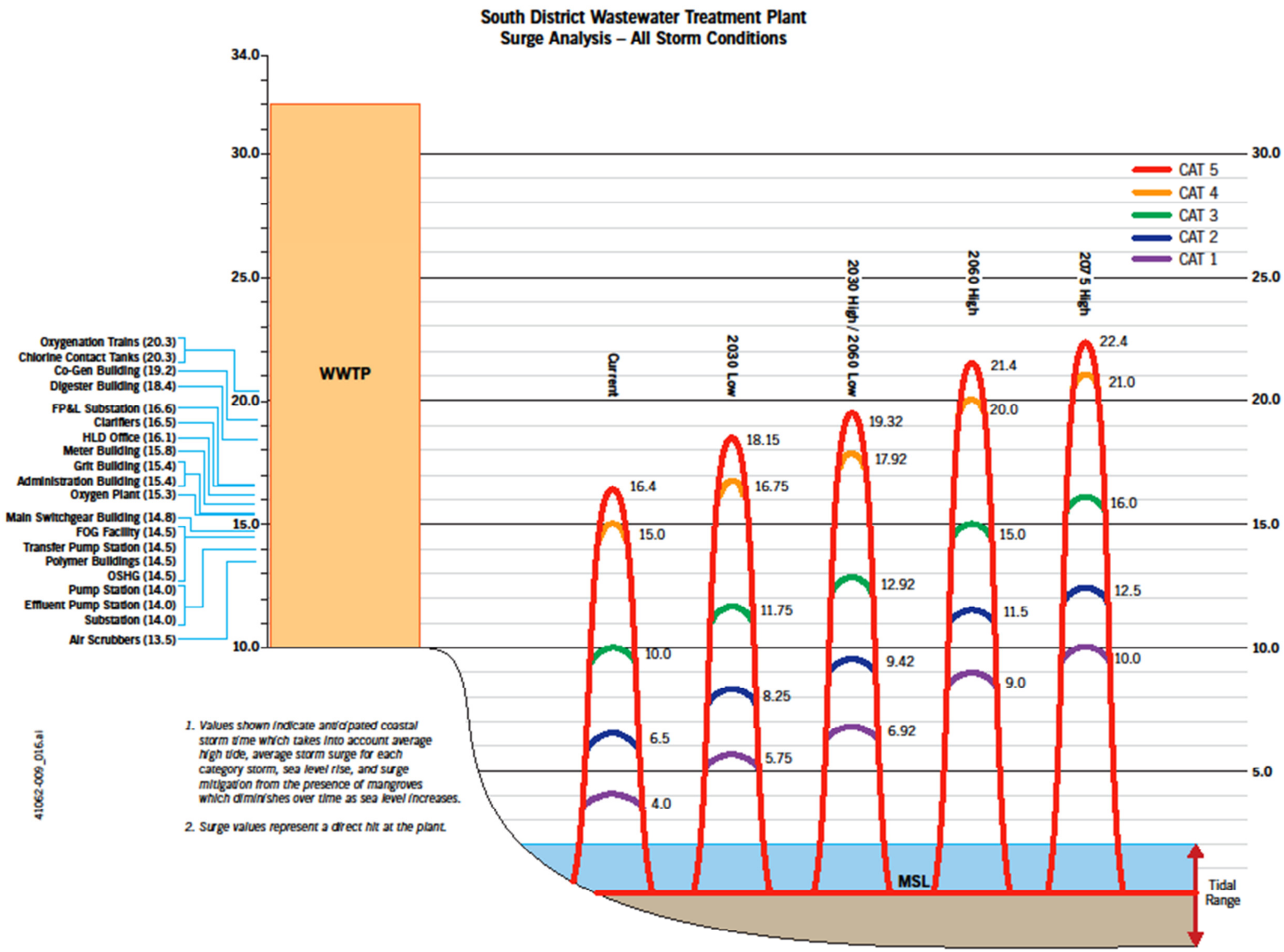
OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN

NDWWTP Storm Surge Analysis

Figure 13




| | | | |
|---|---|---|---|
| MIAMI-DADE COUNTY Water and Sewer Department | OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN | CDWWTP Storm Surge Analysis | Figure 14 |




MIAMI-DADE COUNTY Water and Sewer Department

OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN

SDWWTP Storm Surge Analysis

Figure 15

## 7.0 Alternatives Development and Evaluation

### 7.1 General

Projects for the various alternatives have been designated with project numbers per the system defined in Table 4.

Table 4
Project Designation System

| First Letter | | Second Letter | | Number Suffix | Letter Suffix |
|---|---|---|---|---|---|
| WW Collection District | | Project Type | | Project ID | |
| N | North | L | Transmission Line | | |
| C | Central | P | Pumping Station | | |
| S | South | T | Treatment Plant Upgrade | 1,2,3,… | E=Upgrade to existing |
| W | West | E | Effluent Disposal | | |
| | | R | Reuse | | |

Costs estimates for facilities identified are based on total project costs for similar facilities where available with suitable contingency factors. Costs for recent similar projects have been escalated using the Engineering News Record Construction Cost Index. Cost estimates for pipeline construction include restoration and lump sum additions for major crossings, such as highways, canals and railways. Also included are costs for site acquisition, where necessary, engineering, legal and administrative costs. Costs for wet weather treatment expansions at the regional wastewater treatment plants are based on estimates provided in consultant preliminary engineering reports for the NDWWTP and from equipment suppliers.

### 7.2 Reuse

#### 7.2.1 OOL Requirement

As previously indicated in Table 1, the 60% of baseline flow reuse requirement is 117.5 mgd. With flow commitment to FPL of 90 mgd for cooling water makeup to the Turkey Point facility, an additional 27.5 mgd of reuse is required.

#### 7.2.2 Summary of Options

Reuse option examined in the Reuse Feasibility Study of April, 2007 included:

- Urban Irrigation
- Agricultural Irrigation

- Industrial Reuse
- Aquifer Recharge via Rapid Infiltration Trenches (RITs)
- Saltwater Barriers
- Canal Recharge
- Wetland Application
- Satellite Treatment
- Potable Reuse

Recharge of the Floridan Aquifer is another reuse possibility which has been evaluated.

### 7.2.3 Treatment Requirements

Typical treatment processes needed for the types of reuse described above in order to meet state and local standards are summarized on Table 5.

Table 5
Treatment Levels for Various Types of Reuse

| Reuse Option | Treatment Required |
|---|---|
| Urban Irrigation, Satellite Treatment | Secondary Treatment High Level Disinfection (Filtration); Reverse Osmosis (RO) if needed for chloride reduction |
| Agricultural Irrigation-Non-Edible Crops | Secondary Treatment; Reverse Osmosis (RO) if needed for chloride reduction |
| Agricultural Irrigation-Edible Crops | Secondary Treatment; RO if needed for chloride reduction. |
| Industrial | Secondary Treatment and basic disinfection-additional treatment possible |
| Biscayne Aquifer Recharge, Salt Water Barrier | HLD, RO treatment for microconstituents, Microfiltration (MF), Ultraviolet (UV) disinfection, advanced oxidation. |
| Canal Recharge | HLD, RO treatment for microconstituents, Microfiltration (MF), Ultraviolet (UV) disinfection, advanced oxidation, nutrient removal by chemical processes. |
| Wetland Rehydration | Tertiary MBR followed by RO followed by either UV/Hydrogen Peroxide or Ozone/Hydrogen Peroxide |
| Potable Reuse | High pH lime treatment, single- or two- recarbonation, pressure infiltration, ion exchange for ammonia removal, granular activated carbon adsorption, ozonation, RO, air stripping, chlorine |
| Floridan Aquifer Recharge | HLD; Waiver needed for TN limits. |

### 7.2.4 Evaluation

An evaluation of the reuse options described was carried out. The following should be noted with regard to this evaluation:

- MDWASD examined a number of potential reuse projects to determine feasibility and cost. These potential projects were:
  - Crandon Park Golf Course Irrigation
    - Option 1-RO plant at the CDWWTP and piping to the Golf Course
    - Option 2-Satellite membrane bioreactor (MBR) and (RO) plants located at the Golf Course.
  - Satellite Plant-Irrigation of golf courses in Doral area.
  - Satellite Plant-Air conditioning Cooling Water at Miami International Airport.

- In compliance with the 20-year Water Use Permit issued in November, 2007, MDWASD retained a consultant to design a system for recharging the Biscayne Aquifer with highly treated effluent from the SDWWTP. The project was to construct an advanced wastewater treatment plant at a 30-acre site directly to the west of the SDWWTP and piping to convey the reuse water approximately 7 miles north for discharge in the vicinity of Zoo Miami. The project capacity was for 21 mgd of treated effluent (approximately 30 mgd of wastewater). The project was suspended in 2011 with the design work nearly completed on the basis of cost and based on discussions with FDEP regarding the option of meeting OOL reuse requirement by means of recharging the Floridan Aquifer (FA). The Water Use permit was subsequently modified to revise the water source for the proposed South Miami Heights Water Treatment Plant to be from the Floridan and Biscayne Aquifers without the need for Biscayne Aquifer recharge. MDWASD considers other types of reuse which require similar advanced treatment to be economically infeasible at this time. Costs for these projects are summarized on Table 6.

An assessment of the technical, environmental, and economic feasibility of the reuse options tabulated above is given on Table 7. In view of the appreciable cost difference between FA recharge and the other possibilities, all options except the FA recharge are designated as not economically feasible.

Based on this analysis, recharge of the FA at a rate of 27.5 mgd has been selected as the mean to achieve the required 60% reuse flow of 117.5 mgd in addition to the 90 mgd for FPL Turkey Point. In view of the high discharge pressures determined per hydrogeological modeling performed for the FA, the reuse for the alternatives analysis is distributed evenly among the WWTPs included in each alternative, with the exception of the NDWWTP where space constraints make it impractical.

Table 6

Potential Reuse Project Summary

| Project | Description | Capacity, 1,000 gpd | Project Cost ($1,000) | | Comment |
|---|---|---|---|---|---|
| | | | Total | Cost/gpd | |
| Crandon Park Golf Course Irrigation-Option 1 | Installation of treatment facilities (HLD and RO for chloride reduction) at the CDWWTP and pipeline to the Golf Course | 600 | $17,100 | $28.50 | Issue of water quality with respect to possible runoff to Biscayne Bay needs to be addressed. |
| Crandon Park Golf Course Irrigation-Option 2 | Satellite WWTP to treat Key Biscayne wastewater at the Golf Course (MBR and RO for chloride reduction) | 600 | $11,700 | $19.50 | Issue of water quality with respect to possible runoff to Biscayne Bay needs to be addressed. |
| Doral Area Golf Course Irrigation | Satellite MBR WWTP to provide irrigation to 5 golf courses in close proximity in the Doral area | 3,888 | $41,700 | $11.33 | Requires land procurement and WWTP siting. |
| Miami International Airport (MIA) Air Conditioning Makeup Water | Satellite MBR WWTP to provide makeup water to MIA central air conditioning plant | 600 | $13,900 | $23.17 | Requires land procurement and WWTP siting. Water quality needed for makeup water could require additional treatment. |
| Biscayne Aquifer Recharge | 30 mgd Advanced Treatment Plant at SDWWTP for recharge of the Biscayne Aquifer to provide water supply for proposed South Miami Heights WTP | 30,000 | $312,000 | $10.40 | Actual project which was cancelled. Costs include pipeline for discharge to BA. |
| Floridan Aquifer Recharge | Cost for pump station, piping to wells and Floridan Aquifer Wells for the 27.5 mgd OOL requirement | 27,500 | $76,674 | $2.78 | Cost for HLD treatment not included since it is needed for effluent disposal to injections wells per OOL. Waiver on TN limit from FDEP required. |

Table 7

Feasibility for Various Types of Reuse

| Reuse Option | Feasibility | | |
|---|---|---|---|
| | Technical | Environmental | Economic |
| Urban Irrigation, Satellite Treatment | Feasible | Feasible | Not Feasible |
| Agricultural Irrigation-Non-Edible Crops | Not Feasible-Insufficient demand | Feasible | Not Feasible |
| Agricultural Irrigation-Edible Crops | Feasible | Feasible | Not Feasible |
| Industrial | Dependent on application | Feasible, depending on application | Feasible, depending on application |
| Biscayne Aquifer Recharge, Salt Water Barrier | Feasible-EPOCS, Flooding | Feasible | Not Feasible |
| Canal Recharge | Feasible | Feasible | Not Feasible |
| Wetland Rehydration | Feasible | Requires Additional Testing | Not Feasible |
| Potable Reuse | Feasible | Feasible, public perception | Not Feasible |
| Floridan Aquifer Recharge | Feasible | Feasible | Feasible |

## 7.3 Wastewater

### 7.3.1 Wastewater Treatment

In the development of treatment processes for alternatives considered, secondary treatment is provided for all flow with further High Level Disinfection (HLD) treatment (per the Florida Administrative Code, FAC, Chapter 62, 600.440(5)) for a portion as described below. For peak wet weather flows, capacities of the biological reactors and final settling tanks are exceeded at the projected flows for a number of the alternatives.

Where the biological reactor capacity is exceeded for peak wet weather flows, parallel aeration tanks are provided. These basins would be activated on peak events and seeded with biomas via return sludge from the normally operating process trains. Where the secondary settling loading rates are exceeded (reflecting standard and conservative loading rates as described below), parallel settling in the form of high-rate clarification is included. Ballasted flocculation is a common system used in this application. This process also would be activated for peak flow wet weather events.

The OOL Compliance Plan approach for managing the projected 1,180 mgd system-wide peak flow is as follows:

| | |
|---|---|
| Reuse | 117.5 mgd |
| Boulder Zone | Remainder less peak flow discharge through outfalls |

With the exception of 71 mgd at the NDWWTP, HLD treatment will be provided for all flow to be discharged into the Boulder Zone as described above. The NDWWTP operating permit allows for discharge of 71 mgd to the Boulder Zone with the existing deep well disposal system with secondary treatment only. Per OOL amendment, that flow which is discharged through outfalls on peak flow events will receive secondary treatment only.

### 7.3.2 Ocean Outfall Discharges/HLD Capacities

As previously indicated, the OOL Amendment allows for the discharge of peak flows through the existing ND and CD outfalls which do not cumulatively exceed 5 percent of a facility's baseline flow. Based on the baseline flows shown in Table 1 of 81.0 and 114.8 mgd for the NDWWTP and CDWWTP, respectively, the total cumulative volumes (five year rolling average per OOL) which can be discharged through the outfalls are:

| | |
|---|---|
| NDWWTP | 1,478 mg or 4.0 mgd |
| CDWWTP | 2,095 mg or 5.7 mgd |

A statistical analysis was performed on hourly flows at the NDWWTP and CDWWTP for the 2003-2012 to set the capacities of HLD at these plants. The analysis indicated that at HLD Design Capacity/AADF ratios of 1.5 for the NDWWTP and 1.7 for the CDWWTP result in discharges out the outfalls of 2% of the annual hours and 0.4% of the accumulated baseline flow. A table summarizing this analysis is given in Appendix F. These factors are used in the development and costing of alternatives described below.

### 7.3.3 Alternatives Evaluated

Alternatives were developed through evaluation per the matrix shown on Figure 16.

Descriptions of the opposing alternatives and subalternatives are as follows:

- With (Alternative 2-) and without (1-) a proposed West District Wastewater Treatment Plant.

- With (Subalt. A-) and without (B-) the transfer of additional peak wet weather flow to the NDWWTP and CDWWTP. For the A- subalternative, additional secondary treatment in the form of high rate clarification to be installed in parallel with existing final settling tanks is included. Ballasted flocculation has been selected as the basis for the evaluation due to its small footprint and suitability for operation on a standby basis during peak wet weather events. For the B- subalternative, no additional secondary treatment has been considered.

- With (Subalt -2-) and without (-1-) a booster station and force main connections in the Doral area. (-1-, -2- under the A subalternative). This system allows for an increased flow transfer to the NDWWTP and reduced peak flow pressures in the Doral area. It also provides additional system flexibility with regard to flow transfers between WWTPs.

- At the NDWWTP and CDWWTP, conservative loading on all secondary clarification process units (Subalt. -1) or conservative loading only on those process units followed by HLD treatment (Subalt. -2). The conservative loading (855 gpd/ft$^2$) is used to reduce the possibility of high discharge of solids to filters during a plant upset. Use of this conservative loading for the entire plant increases the need of additional peak flow capacity such as parallel ballasted flocculation for the A subalternatives and reduces overall plant peak flow processing capacity for the B subalternatives. For the -2 subalternatives, secondary clarifiers which are not followed by HLD treatment are loaded with the standard 1,200 gpd/ ft$^2$, so that these subalternatives have dual (855 and 1,200 gpd/ $ft^2$ ) settling tank loading rates.

An alternative to decommission the CDWWTP was evaluated and not included in the formal alternatives analysis due to excessive cost. This is described below.

### 7.3.4 Transmission System Analysis

The transmission system requirements for the five alternatives resulting from the concepts described above were developed using the MDWASD InfoWorks, CS hydraulic model. The model was set up for direct input of flows via 72-hour hydrographs as described previously. For the cases where the system includes repumping, upstream station flows were added to flows generated in a receiving station for input into the transmission system. Flows for receiving pump stations are included in Appendix E as well as a tabulation of upstream stations contributing to their flow. Booster stations were modeled as screw pumps which simulate the operation of a properly-sized station, i.e. the station pumps all influent flow while maintaining its suction pressure at the minimal set point value irrespective of the pump station discharge pressure generated. These pressures were adjusted to be within the standard maximum WASD operating pressures mainly through the addition and size adjustment of additional downstream force mains. In order to determine the adequacy of both the local and booster stations, flows and pressures were taken from the model runs and applied to a separate spreadsheet where the model operating conditions were compared to the station characteristic operating curves. Stations where the model output exceeded the capacity of the station were included in the Plan as an upgrade project.

### 7.3.5 Analysis Results

Based on the alternatives considered as described above, five transmission system alternatives were developed, two of which are the same for the -1 and -2 subalternatives with the conservative and dual secondary clarifier loading rates, so that a total of 7 overall alternatives have been analyzed.

The transmission system configurations were developed to process the 2035 projected flows included in Table 3 based on projected wastewater flows distributed in MDWASD service area and target average/peak flows at the WWTPs reflecting the following:

- Existing Plant configurations.

OOL Compliance Plan
Alternatives Matrix

<table>
<tr><td>1</td><td colspan="6">2</td></tr>
<tr><td>No West Plant</td><td colspan="6">With West Plant</td></tr>
<tr><td></td><td colspan="4">2A</td><td colspan="2">2B</td></tr>
<tr><td></td><td colspan="4">New Process Tankage at ND, CD (Actiflo)</td><td colspan="2">No New Process Tankage at ND, CD</td></tr>
<tr><td></td><td colspan="2">2A-1</td><td colspan="2">2A-2</td><td>2B-1</td><td>2B-2</td></tr>
<tr><td></td><td colspan="2">No Doral Booster<br>ND/WD-317/225 mgd</td><td colspan="2">With Doral Booster<br>ND/WD-327/215 mgd</td><td>855 gpd/sq. ft. Loading on all Secondary Clarifiers</td><td>855 and 1200 gpd/sq.ft .loading on Secondary Clarifiers</td></tr>
<tr><td></td><td></td><td>2A-1-2</td><td>2A-2-1</td><td>2A-2-2</td><td></td><td></td></tr>
<tr><td></td><td>855 gpd/sq. ft. Loading on all Secondary Clarifiers</td><td>855 and 1200 gpd/sq.ft. Loading on Secondary Clarifiers</td><td>855 gpd/sq. ft. Loading on all Secondary Clarifiers</td><td>855 and 1200 gpd/sq.ft. Loading on Secondary Clarifiers</td><td></td><td></td></tr>
</table>

- Long-range capacity reductions at the NDWWTP and CDWWTP due to proximity to coasts.

- Use of existing outfalls for peak wet weather flows

- Treatment plant operation

- Minimizing of local pressures for optimal operation of local pump stations

- Provision of system flexibility and redundancy.

The transmission systems developed are shown on Figures 17 through 21. Alternative costs including summaries of the flow distribution among the WWTPs are included on Table 8. Appendix G includes a detailed breakdown of the projects which comprise each of the alternatives. Appendix H includes flow diagrams of each of the WWTPs for each alternative. These diagrams show the required treatment units, disposal systems, and reuse with the flows to each under average and peak wet weather flow conditions.

It should be noted that the alternatives evaluated are for the entire MDWASD wastewater system and reflects facilities needs factors including future growth and the processing of wet weather flows which are not part of the OOL requirements. Projects which are needed specifically to meet the OOL are delineated on the Appendix G alternative project costs sheets and are summed on those pages as well as the Table 8 alternatives comparison summary.

### 7.3.6 Decommissioning of the CDWWTP

The analysis to decommission the CDWWTP was completed and not included in the formal alternatives analysis due to excessive cost. The estimates for the system upgrades including the Ocean Outfall Legislation for the year 2035 are estimated at $7.64 billion without the CDWWTP and $5.18 billion for the selected alternative which keeps the CDWWTP in service as described below. Therefore, relocation of the CDWWTP is estimated to cost an additional $2.46 billion. The following actions would need to be taken for the CDWWTP relocation:

Table 8

Preliminary Opinion of Costs – Ocean Outfall Legislation – Compliance Plan

| ALTERNATIVE | 1 | | 2A-1-1 | | 2A-1-2 | | 2A-2-1 | | 2A-2-2 | | 2B-1 | | 2B-2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **DESCRIPTION** | All Wastewater Treatment at Existing WWTPs | | New WDWWTP | | New WDWWTP | | New WDWWTP | | New WDWWTP | | New WDWWTP | | New WDWWTP | |
| **New Peak Flow Treatment** | | | ND & CD | | ND & CD | | ND & CD | | ND & CD | | | | | |
| **NDWWTP Peak Flow** | Higher | | Lower (No Doral Booster) | | Lower (No Doral Booster) | | Higher (Doral Booster) | | Higher (Doral Booster) | | Lower | | Lower | |
| **Reuse** | FPL Cooling Water from SD<br>FA Recharge at SD & WD | | FPL Cooling Water from SD<br>FA Recharge at SD, CD & WD | | FPL Cooling Water from SD<br>FA Recharge at SD, CD & WD | | FPL Cooling Water from SD<br>FA Recharge at SD, CD & WD | | FPL Cooling Water from SD<br>FA Recharge at SD, CD & WD | | FPL Cooling Water from SD<br>FA Recharge at SD, CD & WD | | FPL Cooling Water from SD<br>FA Recharge at SD, CD & WD | |
| **Sec. Clarifier Loading** | Lower | | Lower | | Dual | | Dual | | Dual | | Lower | | Dual | |
| **FACILITY DESIGN FLOW (MGD)** | Design Capacity AADF | Wet Weather Peak | Design Capacity AADF | Wet Weather Peak | Design Capacity AADF | Wet Weather Peak | Design Capacity AADF | Wet Weather Peak | Design Capacity AADF | Wet Weather Peak | Design Capacity AADF | Wet Weather Peak | Design Capacity AADF | Wet Weather Peak |
| ND WWTP | 120 | 372 | 85 | 317 | 85 | 317 | 85 | 327 | 85 | 327 | 85 | 206 | 85 | 262 |
| CD WWTP | 150 | 496 | 83 | 333 | 83 | 333 | 83 | 333 | 83 | 333 | 83 | 203 | 83 | 234 |
| SD WWTP | 131 | 312 | 131 | 305 | 131 | 305 | 131 | 305 | 131 | 305 | 131 | 384 | 131 | 300 |
| WD WWTP | -- | -- | 102 | 225 | 102 | 225 | 102 | 215 | 102 | 215 | 102 | 387 | 102 | 384 |
| TOTALS | 401 | 1180 | 401 | 1180 | 401 | 1180 | 401 | 1180 | 401 | 1180 | 401 | 1180 | 401 | 1180 |
| **WWTP PROJECTS COSTS** | | | | | | | | | | | | | | |
| Wastewater Transmission Mains | $ | 1,050,810,000 | $ | 778,190,000 | $ | 778,190,000 | $ | 908,450,000 | $ | 908,450,000 | $ | 1,103,210,000 | $ | 882,540,000 |
| Regional Pumping Stations | $ | 513,000,000 | $ | 280,000,000 | $ | 280,000,000 | $ | 330,000,000 | $ | 330,000,000 | $ | 430,000,000 | $ | 330,000,000 |
| Local PS & FM | $ | 435,940,000 | $ | 405,500,000 | $ | 405,500,000 | $ | 402,730,000 | $ | 402,730,000 | $ | 423,490,000 | $ | 422,100,000 |
| Existing WWTP Upgrades | $ | 225,498,271 | $ | 225,498,271 | $ | 225,498,271 | $ | 225,498,271 | $ | 225,498,271 | $ | 225,498,271 | $ | 225,498,271 |
| HLD Treatment | $ | 446,921,798 | $ | 264,988,378 | $ | 264,988,378 | $ | 264,988,378 | $ | 264,988,378 | $ | 374,662,299 | $ | 258,213,082 |
| Peak Flow Treatment | $ | 474,480,116 | $ | 162,322,061 | $ | 103,724,471 | $ | 169,057,417 | $ | 110,459,826 | $ | 70,152,794 | $ | -- |
| Deep Injection Well Systems | $ | 678,401,362 | $ | 398,301,858 | $ | 398,301,858 | $ | 398,301,858 | $ | 398,301,858 | $ | 536,569,449 | $ | 395,427,405 |
| Biosolids Class AA Improvements | $ | 437,416,999 | $ | 328,506,077 | $ | 328,506,077 | $ | 328,506,077 | $ | 328,506,077 | $ | 328,506,077 | $ | 328,506,077 |
| Storm Surge Protection | $ | 30,000,000 | $ | 30,000,000 | $ | 30,000,000 | $ | 30,000,000 | $ | 30,000,000 | $ | 30,000,000 | $ | 30,000,000 |
| New WD WWTP | $ | -- | $ | 1,306,538,763 | $ | 1,306,538,763 | $ | 1,303,913,184 | $ | 1,303,913,184 | $ | 1,420,214,970 | $ | 1,418,875,809 |
| Peak Flow Treatment | $ | -- | $ | 207,572,177 | $ | 207,572,177 | $ | 182,649,075 | $ | 182,649,075 | $ | 540,184,615 | $ | 533,259,171 |
| Deep Injection Well System | $ | -- | $ | 384,044,843 | $ | 384,044,843 | $ | 378,295,936 | $ | 378,295,936 | $ | 662,879,587 | $ | 661,154,915 |
| Biosolids Class AA Improvements | $ | -- | $ | 150,731,533 | $ | 150,731,533 | $ | 150,731,533 | $ | 150,731,533 | $ | 150,731,533 | $ | 150,731,533 |
| **FACILITIES SUBTOTAL 1** | **$** | **4,292,468,545** | **$** | **4,922,193,963** | **$** | **4,863,596,372** | **$** | **5,073,121,729** | **$** | **5,014,524,139** | **$** | **6,296,099,596** | **$** | **5,636,306,264** |
| **REUSE SYSTEM COSTS** | | | | | | | | | | | | | | |
| FPL Reclaimed Water Pipeline | $ | 95,000,000 | $ | 95,000,000 | $ | 95,000,000 | $ | 95,000,000 | $ | 95,000,000 | $ | 95,000,000 | $ | 95,000,000 |
| FA Pump Station, Wells and Piping | $ | 76,674,149 | $ | 76,674,149 | $ | 76,674,149 | $ | 76,674,149 | $ | 76,674,149 | $ | 76,674,149 | $ | 76,674,149 |
| **FACILITIES SUBTOTAL 2** | **$** | **171,674,149** | **$** | **171,674,149** | **$** | **171,674,149** | **$** | **171,674,149** | **$** | **171,674,149** | **$** | **171,674,149** | **$** | **171,674,149** |
| **OOL COMPLIANCE COSTS** | **$** | **2,301,987,320** | **$** | **3,222,626,227** | **$** | **3,164,028,636** | **$** | **3,265,633,993** | **$** | **3,322,986,402** | **$** | **4,162,311,350** | **$** | **3,923,110,029** |
| **ANNUAL O&M COSTS (1)** | **$** | **376,991,611** | **$** | **404,277,177** | **$** | **402,952,582** | **$** | **403,995,827** | **$** | **402,671,232** | **$** | **410,588,772** | **$** | **408,779,731** |
| **TOTAL CAPITAL COSTS (2)** | **$** | **4,464,142,695** | **$** | **5,093,868,112** | **$** | **5,035,270,522** | **$** | **5,244,795,878** | **$** | **5,186,198,288** | **$** | **6,467,773,745** | **$** | **5,807,980,413** |

1. Annual Operation and Maintenance Costs include 2% inflation increase per year for total capital projects by year 2035.
2. Total Capital Costs include the cost of capacity to year 2035 demand in addition to the Ocean Outfall Legislation (OOL) Compliance Costs. All project costs include land acquisition where necessary, engineering, legal and administrative costs.

ND - North District Wastewater Treatment Plant
CD - Central District Wastewater Treatment Plant
SD - South District Wastewater Treatment Plant
WD - West District Wastewater Treatment Plant

FPL - Florida Power & Light Turkey Point Facility
HLD - High Level Disinfection
OOL - Ocean Outfall Legislation

Low - 855 gpd/sf loading rate on secondary clarification followed by HLD
Dual - 855 gpd/sf loading rate on secondary clarification followed by HLD and 1200 gpd/sf for peak flow to Ocean Outfall

- Construct the New West District Wastewater Treatment Plant, but at a higher capacity than planned (185 MGD average & 425 MGD peak), including all the additional treatment and disposal capacity

- Decommission the Central District WWTP and construct a Booster Station at the site, to move the flows from Miami Beach (includes Bal Harbor, Bay Harbor Islands, Indian Creek, & Surfside), Village of Key Biscayne, and Virginia Key to the mainland.

- Construct a pipeline from the existing 102" pipeline (in Brickell area) to the West District WWTP (about 15 miles of 72" to 84" pipelines)

- Construct intermediate Booster Station at Barnes Park

- New 54" pipeline to reroute Coral Gables flows

- Construct new pipeline to transfer the North District WWTP Sludge from Pump Station No. 2 (located at 390 N. RIVER DR NW, by American Airlines Arena) to West District WWTP

A system map and detailed cost estimated for facilities for this option are included in Appendix I.

### 7.3.7 Alternative Selection

Project, operation, and maintenance costs for facilities for each of the alternatives, tabulated in Table 8 in the previous section, are listed in ascending order of cost in Table 9 by total project cost.

Alternative 1, which does not include a fourth WWTP in the west, though somewhat less costly overall; is not recommended, primarily to avoid expansion of the existing North District and Central District facilities to obtain treatment capacity for future growth. Alternative 1 also requires substantially more large diameter force mains through highly populated areas of the county.

Table 9
Alternatives Ranked by Project Cost in Ascending Order

| Alt. | Total Project Cost | Difference from Lowest | |
|---|---|---|---|
| | | Amount | Percent |
| 1 | $ 4,464,142,695 | $ - | 0.0% |
| 2A-1-2 | $ 5,035,270,522 | $ 571,127,827 | 12.8% |
| 2A-1-1 | $ 5,093,868,112 | $ 629,725,418 | 14.1% |
| 2A-2-2 | $ 5,186,198,288 | $ 722,055,593 | 16.2% |
| 2A-2-1 | $ 5,244,795,878 | $ 780,653,184 | 17.5% |
| 2B-2 | $ 5,807,980,413 | $ 1,343,837,718 | 30.1% |
| 2B-1 | $ 6,467,773,745 | $ 2,003,631,050 | 44.9% |

The advantages of the establishment of the West District Wastewater Treatment Plant include:

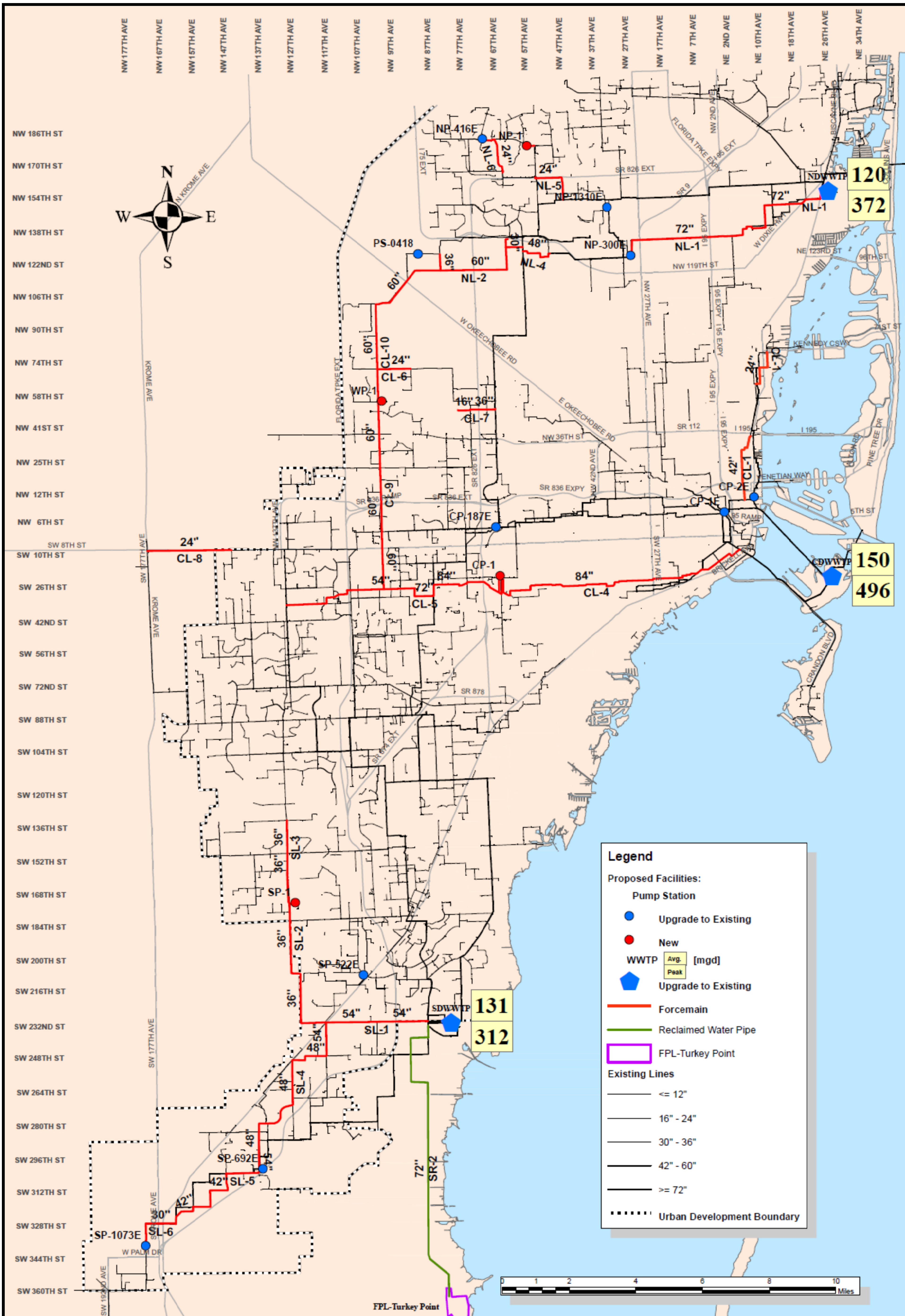
- Allows for use of state-of-the-art treatment technology for capacity needed for future growth and to replace capacity transferred from NDWWTP and CDWWTP. Cost estimates are based on the membrane bioreactor (MBR) process.

- Site location is suitable for possible groundwater recharge for the Alexander Orr Water Treatment plant wellfields in the future.

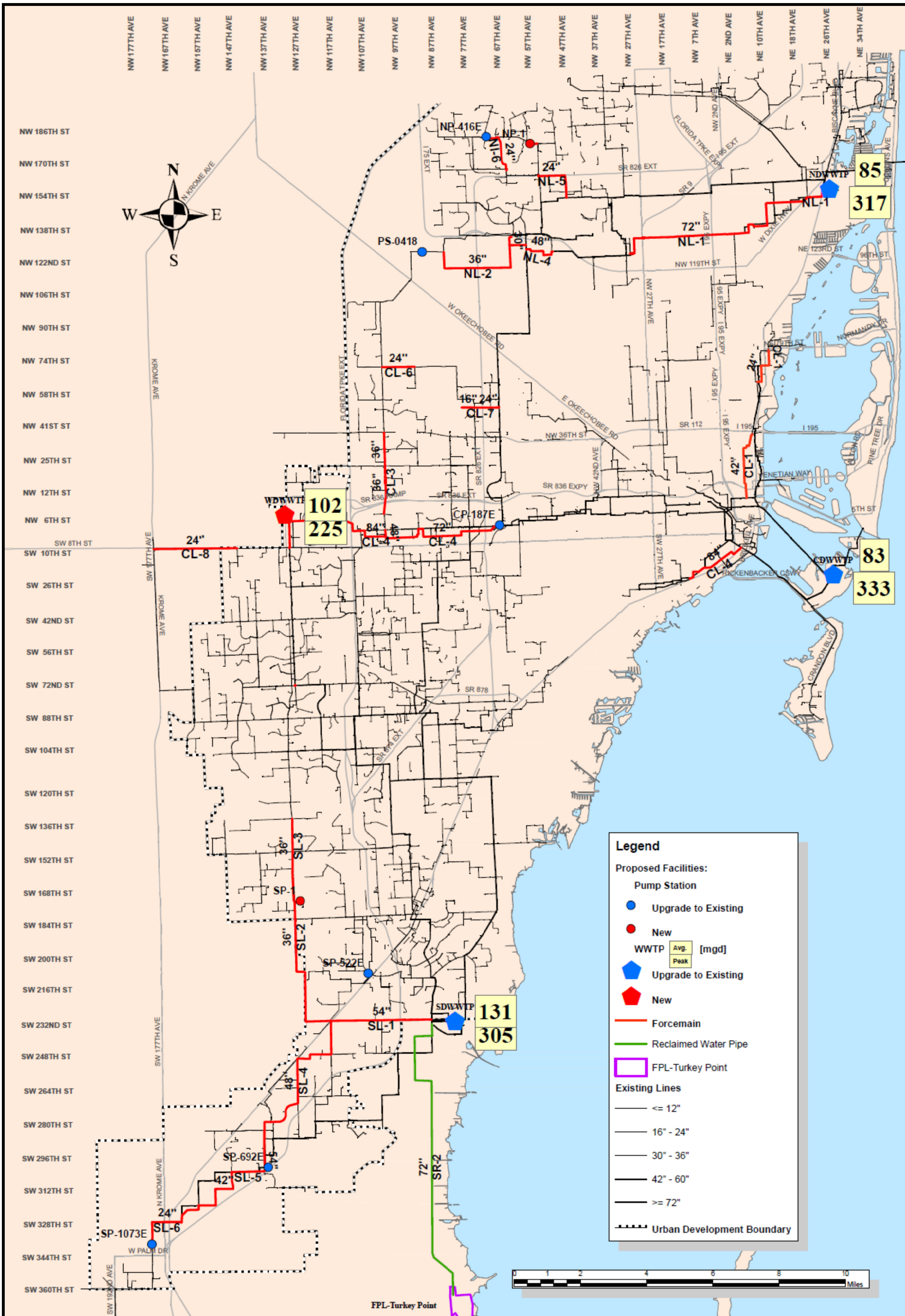
- Site location at the farthest location from the existing WWTPs allows for pressure relief in the transmission system to improve system operation during wet weather events.

- Establishment of a fourth treatment plant away from the coast reduced the overall system vulnerability to storm surge and SLR.

The B alternatives are based on no construction of additional secondary treatment capacity at the NDWWTP and CDWWTP, for treating peak wet weather flows for discharge via the existing outfalls, requires the shifting of higher peak wet weather flows to the proposed West District WWTP. This results in substantially higher costs to provide




| | | | |
|---|---|---|---|
| MIAMI-DADE COUNTY<br>Water and Sewer Department | OCEAN OUTFALL LEGISLATION<br>COMPLIANCE PLAN | Alternative 1<br>Proposed Facilities | Figure<br>17 |

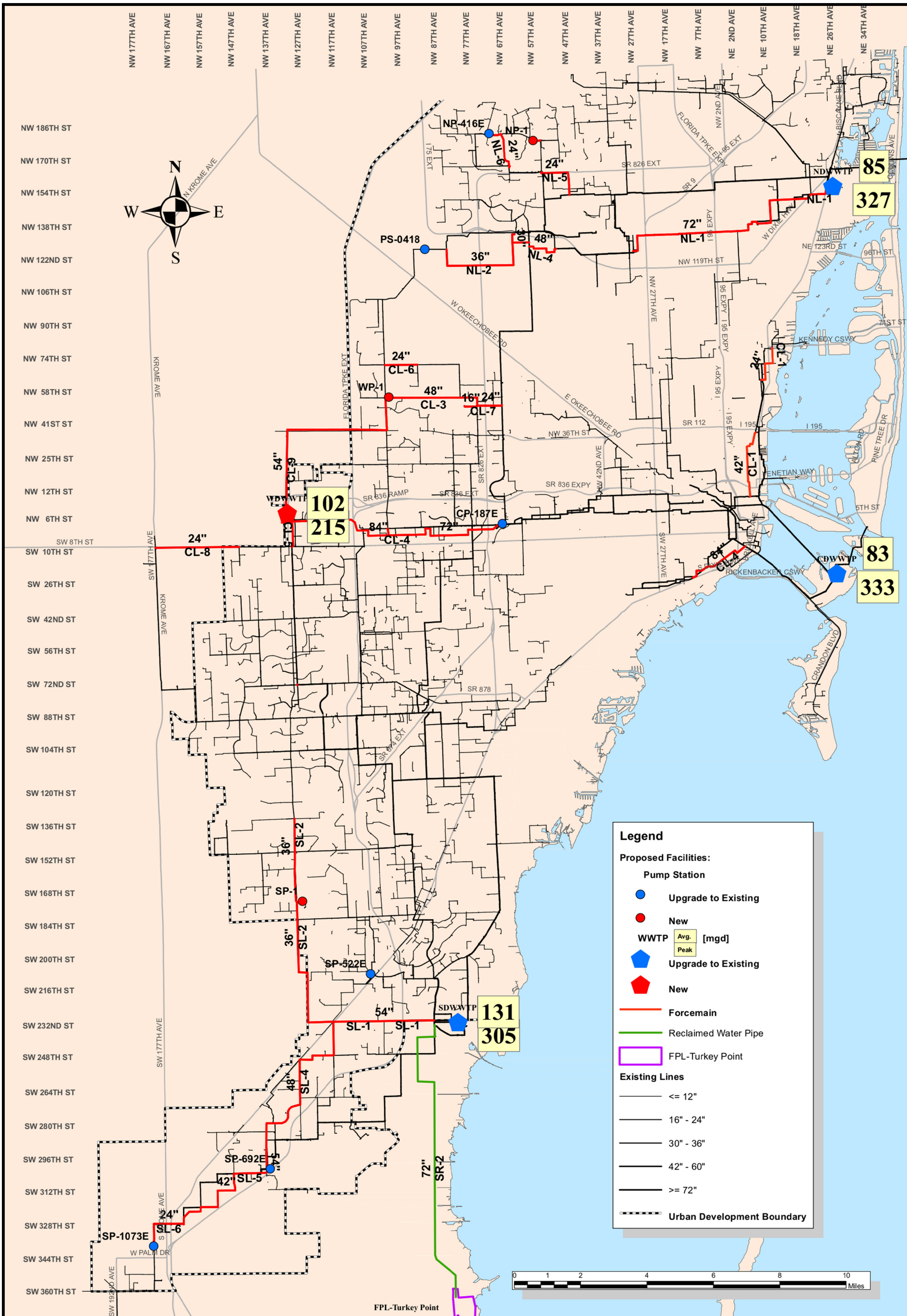



MIAMI-DADE COUNTY Water and Sewer Department

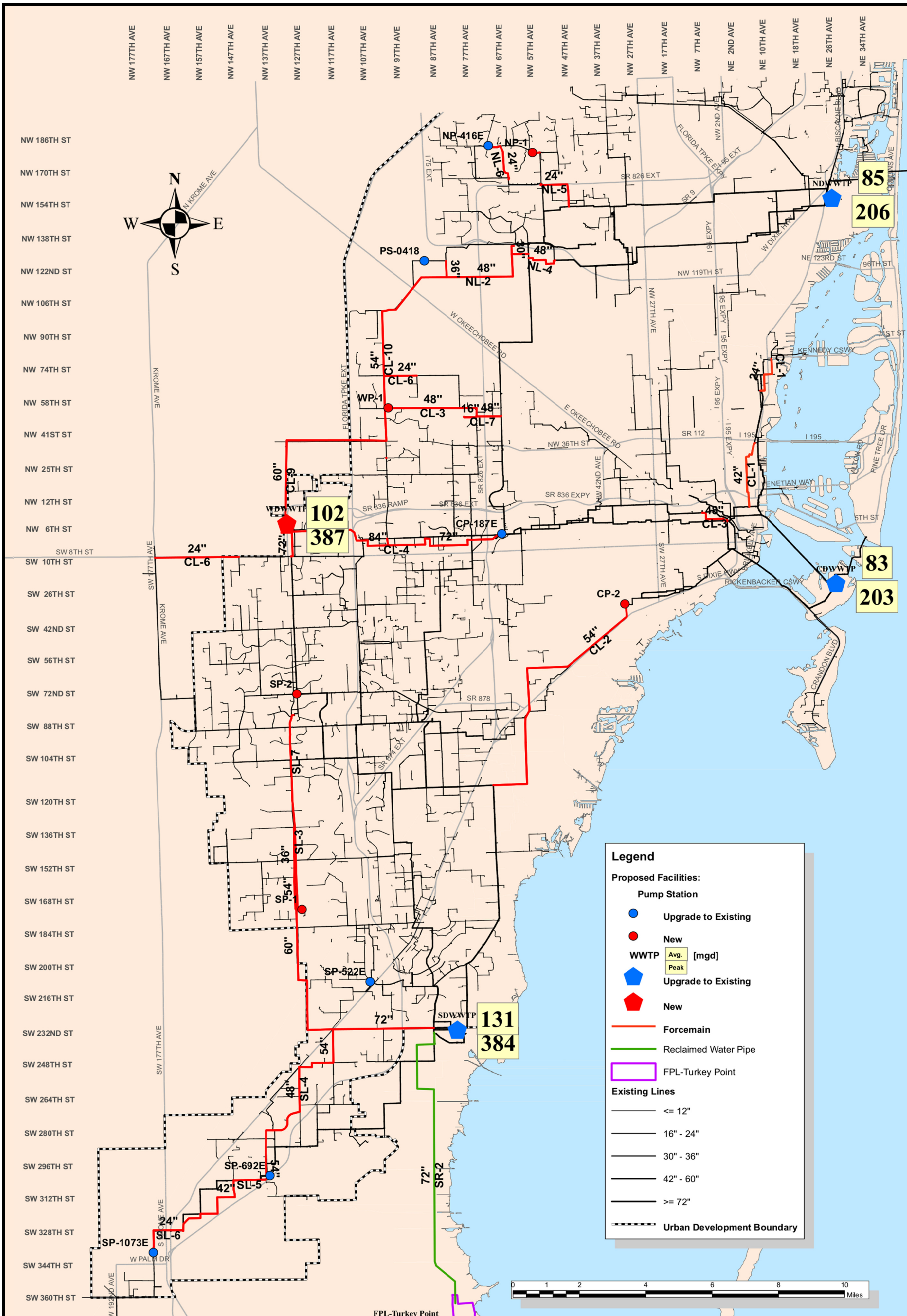
OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN

Alternative 2A-1-1, -2
Proposed Facilities

Figure 18




| | | | |
|---|---|---|---|
| MIAMI-DADE COUNTY Water and Sewer Department | OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN | Alternative 2A-2-1, -2 Proposed Facilities | Figure 19 |

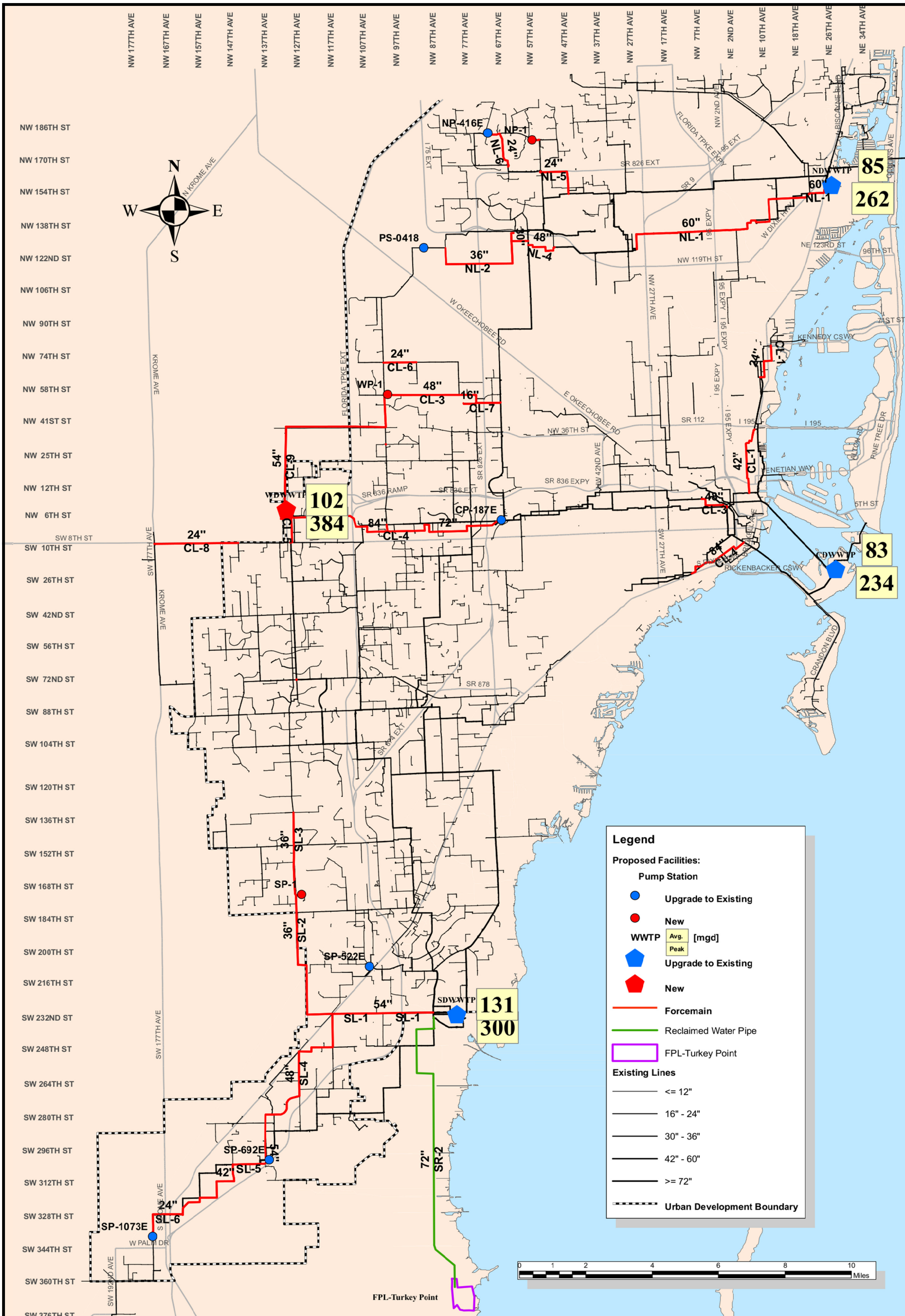



MIAMI-DADE COUNTY Water and Sewer Department

OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN

Alternative 2B-1
Proposed Facilities

Figure 20




| MIAMI-DADE COUNTY Water and Sewer Department | OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN | Alternative 2B-2 Proposed Facilities | Figure 21 |
|---|---|---|---|

deep injection well and HLD treatment at the WDWWTP, which is not necessary with the use of the existing outfalls for the peak flow discharges. Substantially more cost for transmission facilities to effect the flow transfer to the WDWWTP are also included for Alternative 2B-1 which reflects the lower design peak flows at the existing plants due to the conservative treatment unit loadings. Based on cost, the B alternatives are not selected.

Of the remaining A alternatives, A2-2-2 is selected as the Plan for OOL compliance due to the following:

- Its cost is within several percent of the lowest of the A alternatives. This is considered to be within the accuracy of the cost estimates.

- It includes a measure of redundancy and flexibility which is not included in the lowest cost A alternative system (2A-1-2) due to the proposed Doral Pumping Station and associated force mains (Projects WP-1, CL-7, and CL-9). This system can be used to transfer flows to and from North District and provides additional major influent to the WDWWTP (CL-9). The selected alternative includes the cost of oversizing 54-in CL-9 force main to the WDWWTP, which is not included in the Alternative 2A-1-2.

# 8.0 The Recommended Plan

## 8.1 General

As described above, Alternative 2A-2-2 is the recommended plan. Projects are as summarized in Table 10.

Site plans with preliminary layouts of proposed facilities for the three existing WWTPs and the proposed WDWWTP are shown on Figures 22 through 25. These site plans have been developed for a preliminary visualization of needed facilities and demonstrating that sufficient space is available. They will be refined and finalized during the design process. The last column in Appendix E shows the hydraulic computer model results for the stations discharging their service area and upstream station flows directly into the manifolded transmission system.

## 8.2 Descriptions of Facilities

### 8.2.1 Reuse

Reuse for the recommended Plan is based on equal capacities at the existing CDWWTP and SDWWTP and proposed WDWWTP. For the 27.5 mgd system-wide requirement, this results in 9.2 mgd per plant. For this flow, 4 wells per WWTP, which includes one standby well at each WWTP, are included in the Plan. Hydrogeological modeling of the Floridan Aquifer (FA) was conducted to obtain estimated operating pressures with above flows at the plant locations. A description of the model and the analyses results is included in Appendix J. The equal flow distribution between the WWTPs and well design flows will be refined as hydrogeological information is obtained from test wells and further hydrogeological modeling is done. For the CDWWTP, this information will be obtained during the drilling of the centrate disposal well (Project CE-4). Due to the high pressures which can be developed with the injection of recharge water to the FA, preliminary siting of the wells has been set with maximum separation distances on the various plant sites.

### 8.2.2 Transmission

- CP-187E-Upgrade to Pump Station 187

  The station will boost local flow and transfer flows between districts as it currently does. The station structure will allow for pumping units to be installed below grade to allow for improved operation in flow transfers during dry weather conditions. The station will be constructed on the site of existing PS 187 if possible. An additional site in the vicinity will be obtained and interconnecting piping provided between it and PS 187 if necessary.

- CL-4-East/West 72/84-Inch Force Main Interconnection from PS 187 to WDWWTP

  Force main will carry the largest flow to the proposed WDWWTP. The route parallels W. Flagler St.

- WP-1 Doral Booster Station

  Station will booster local Doral area flow. For flexibility, the station will be configured to reverse flow direction so as to transfer flows between districts, directing local flow in either or both directions simultaneously. Timing for construction of the station with the CL-7 force main will precede other

Compliance Plan Projects to provide pressure relief in the Doral area. See next bullet. Several potential sites for this station are shown in Appendix K.

Table 10
OOL Compliance Plan Projects

| No. | Description | Project Cost |
|---|---|---|
| CL-3 | 48-INCH FM CONNECTION IN NW 58 ST FROM NW 107 AVE TO 87 AVE - DORAL | $ 41,370,000 |
| CL-4 | EAST/WEST 72/84-INCH FM CONNECTION FROM PS 187 TO WDWWTP | $ 157,380,000 |
| CL-5 | 72-INCH FM CONNECTION IN SW 137 AVE TO CL-4 FM IN NW 6TH ST | $ 30,730,000 |
| CL-7 | 48-INCH FM CONNECTION IN NW 53 ST FROM PS 14 TO NW 72 AVE - DORAL | $ 16,370,000 |
| CL-9 | 54-INCH FORCE MAIN FROM WP-1 (DORAL) TO WDWWTP | $ 99,580,000 |
| CL-X | FLOW CONTROL - PIPELINE INTERCONNECTIONS | $ 5,000,000 |
| CP-187E | UPGRADE TO PS187 | $ 100,000,000 |
| WP-1 | DORAL BOOSTER STATION | $ 50,000,000 |
| NT-2 | NDWWTP - HLD TREATMENT | $ 63,940,937 |
| NT-3 | NDWWTP - PEAK FLOW TREATMENT | $ 43,779,809 |
| CT-2 | CDWWTP - HLD TREATMENT | $ 173,321,438 |
| CT-3 | CDWWTP - PEAK FLOW TREATMENT | $ 66,680,017 |
| WT-1 | WDWWTP - TREATMENT PLANT | $ 1,303,913,184 |
| WT-2 | WDWWTP - PEAK FLOW TREATMENT | $ 182,649,075 |
| NE-1 | NDWWTP - INJECTION WELL PUMP STATION | $ 37,711,282 |
| NE-2 | NDWWTP - INJECTION WELLS | $ 92,851,223 |
| CE-1 | CDWWTP - INJECTION WELL PUMP STATION | $ 75,828,087 |
| CE-2 | CDWWTP - INJECTION WELLS | $ 167,132,202 |
| CE-3 | CDWWTP - CENTRATE DISPOSAL PUMP STATION | $ 20,000,000 |
| CE-4 | CDWWTP - CENTRATE DISPOSAL WELL | $ 20,000,000 |
| SE-1 | SDWWTP - INJECTION WELL PUMP STATION | $ 6,208,820 |
| SE-2 | SDWWTP - INJECTION WELLS | $ 18,570,245 |
| WE-1 | WDWWTP - INJECTION WELL PUMP STATION | $ 118,312,512 |
| WE-2 | WDWWTP - INJECTION WELLS | $ 259,983,425 |
| CR-1 | CDWWTP - FLORIDAN AQUIFER RECHARGE | $ 25,558,050 |
| SR-1 | SDWWTP - FLORIDAN AQUIFER RECHARGE | $ 25,558,050 |
| SR-2 | SDWWTP - FPL RECLAIMED WATER PIPELINE | $ 95,000,000 |
| WR-1 | WDWWTP - FLORIDAN AQUIFER RECHARGE | $ 25,558,050 |
| Total | | $ 3,322,986,402 |

- CL-7, CL-9-Pump Station WP-1 Interconnection Piping

The CL-7 project coincides with a local Master Planning project to connect the Downtown Doral development to the existing 48-in force in Milam Dairy Road

(NW 72nd Ave. The CL-7 project will be coordinated with this project and advanced to provide pressure relief to the Doral area.

- CL-5-72-Inch Force Main Connection in SW 137th Ave to CL-4 Force Main in NW 6th St.

  This project will connect the existing 54-inch force main in the FPL easement paralleling SW 137th Ave to the WDWWTP. A connection will be made to the 24-in east/west force main in SW 8th St. so that flows from this local area can be discharged to the WDWWTP.

### 8.2.3 Treatment

Design AADF and peak weather flows with resulting treatment plant design parameters for selected alternative are summarized on Table 11.

General features of the wastewater treatment components of the Compliance Plan are as follows:

- NDWWTP (Figure 22)

  MDWASD owns 27.5 acres of land at the southwest portion of the present WWTP property. The preliminary plan is to locate the Boulder Zone deep injection wells along the periphery of that area. The remaining facilities are shown at the eastern side of the existing plant to minimize transfer of flows back and forth to the available 27.5 acre parcel.

- CDWWTP (Figure 23)

  The plan is to operate Plant 2, the newer of the two process streams for normal operation and to activate Plant 1 with biomass seeding from Plant 1 during peak wet weather events. With this scheme, the filtration system is located in the northeast corner of the site in the decommissioned sludge drying beds in the vicinity of the Plant 2 effluent. The high rate clarification will be located in the location of the decommissioned Plant 1 aeration basins. This will require demolition of a portion of these tanks. This location is optimal for wet weather discharges through the outfall. The deep injections wells are arranged along the periphery of the sludge drying beds and the FA wells sited with maximum spacing as shown.

Table 11
Wastewater Treatment Plant Design Parameters

| WWTP | | ND | CD | SD | WD |
|---|---|---|---|---|---|
| Design Flows (Mgd) | AADF | 85 | 83 | 131 | 102 |
| | Peak | 327 | 333 | 305 | 215 |
| HLD/AADF Ratio | | 1.5 | 1.7 | - | - |
| HLD Capacity | Exist. | 5[1] | 0 | 285 | - |
| | Proposed | 57 | 141 | 20 | 215[2] |
| | Total | 57 | 141 | 305 | 215 |
| Peak Effluent Flows, Mgd | DIW-HLD | 57 | 132 | 295.8[3] | 205.8 |
| | DIW-No HLD | 71 | 0 | 0 | 0 |
| | Outfall | 199 | 192 | - | - |
| | Reuse-FA | 0 | 9.2 | 9.2 | 9.2 |
| | Reuse-FPL | - | - | 90 | - |
| Number of Deep Injection Wells | Exist. | 4 | 0 | 17 | - |
| | Proposed | 5 | 9 | 1 | 14 |
| | Total | 9 | 9 | 18 | 14 |
| Number of FA Wells | | 0 | 4 | 4 | 4 |

[1]Existing HLD (filtration) capacity at ND to be replaced.
[2]MBR proposed for HLD at WDWWTP
[3]Includes backup to 90 mgd reuse flow to FPL

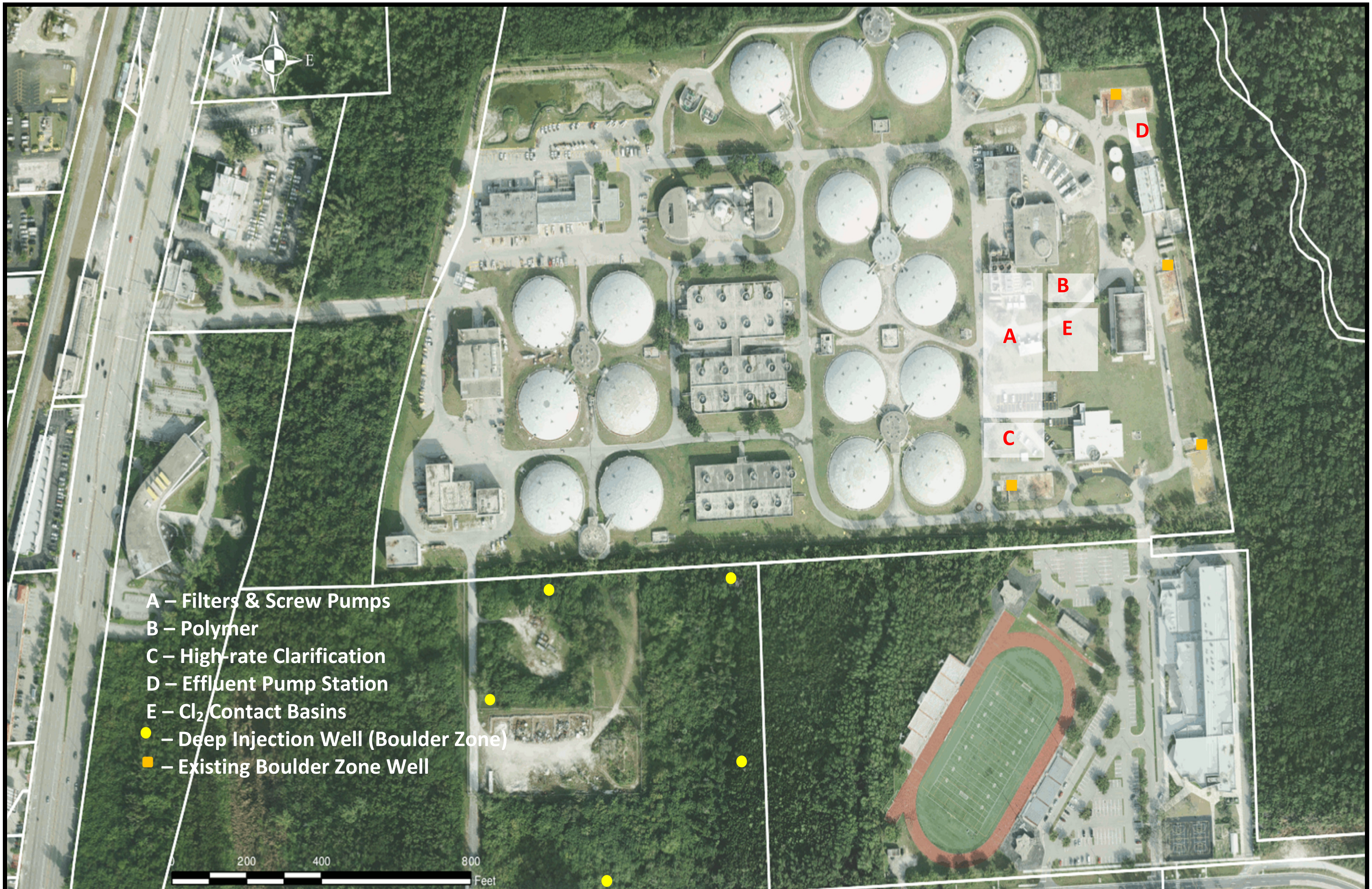
- SDWWTP (Figure 24)

  All effluent is discharged to deep injection wells at this plant so that HLD treatment is required for the peak wet weather flow. In order to maintain the conservative 855 gpd/ft$^2$ loading on the secondary clarifiers at the increased peak flow projected for the plant, an additional two final clarifiers are included. The recently-completed HLD facility at the SDWWTP was laid out for expansion and an additional filter has been added. FA wells are sited with maximum spacing.

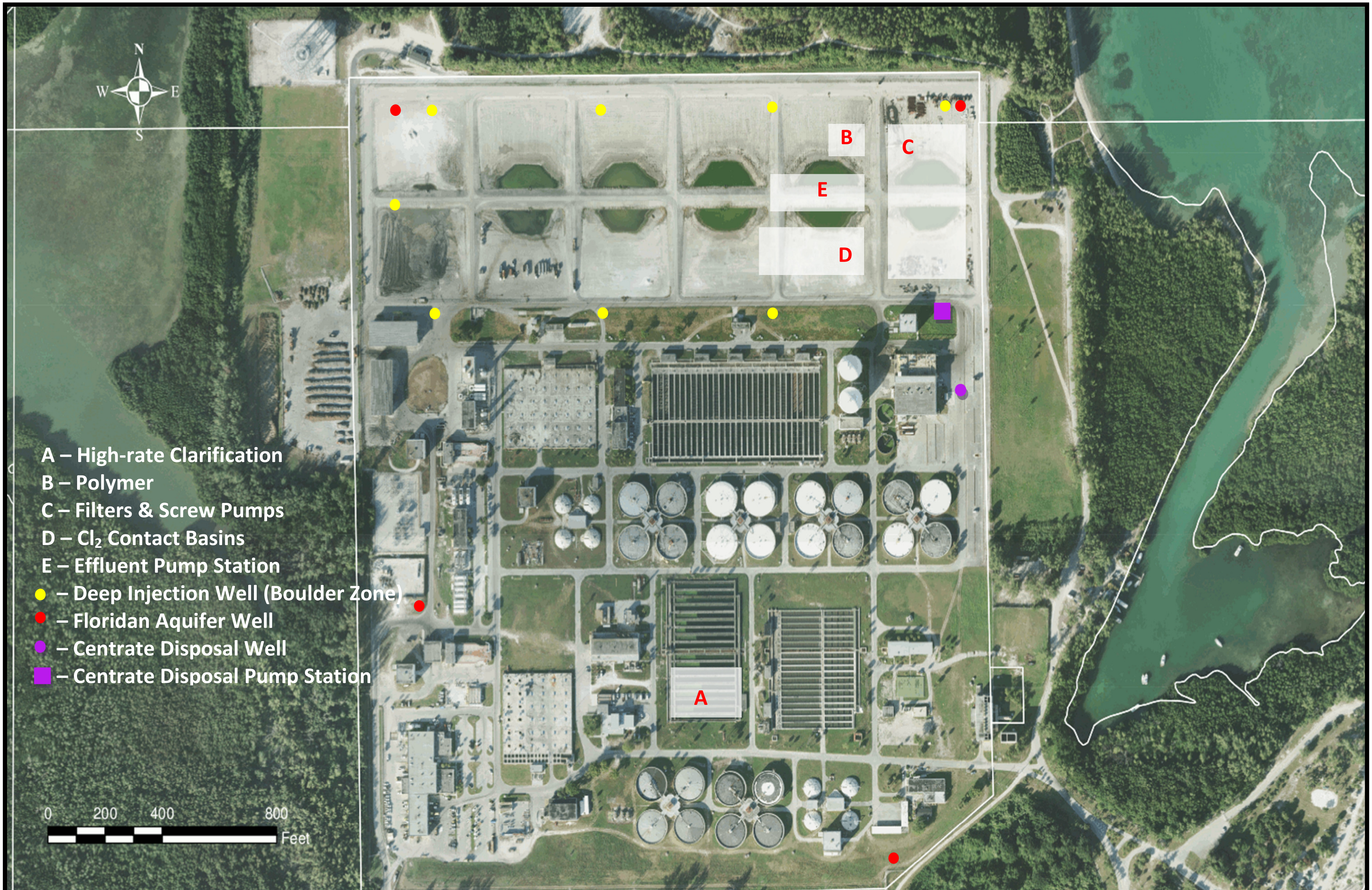
- WDWWTP (Figure 25)

  A preliminary site plan is shown. The 245-acre site has been selected via a formal site selection procedure. The site is located west of NW 137$^{th}$ Ave at NW 6$^{th}$ St. Funding is included in the proposed 2013-2019 Capital Budget Multi-Year Capital Plan (CBMYCP) the purchase of the site. A description of the activities completed to date with regard to the site selection process and figures showing candidate sites evaluated and the selected site are included as Appendix L. Also included in Appendix L is a consultant preliminary assessment of site design elevation and site development requirements.

Page intentionally left blank

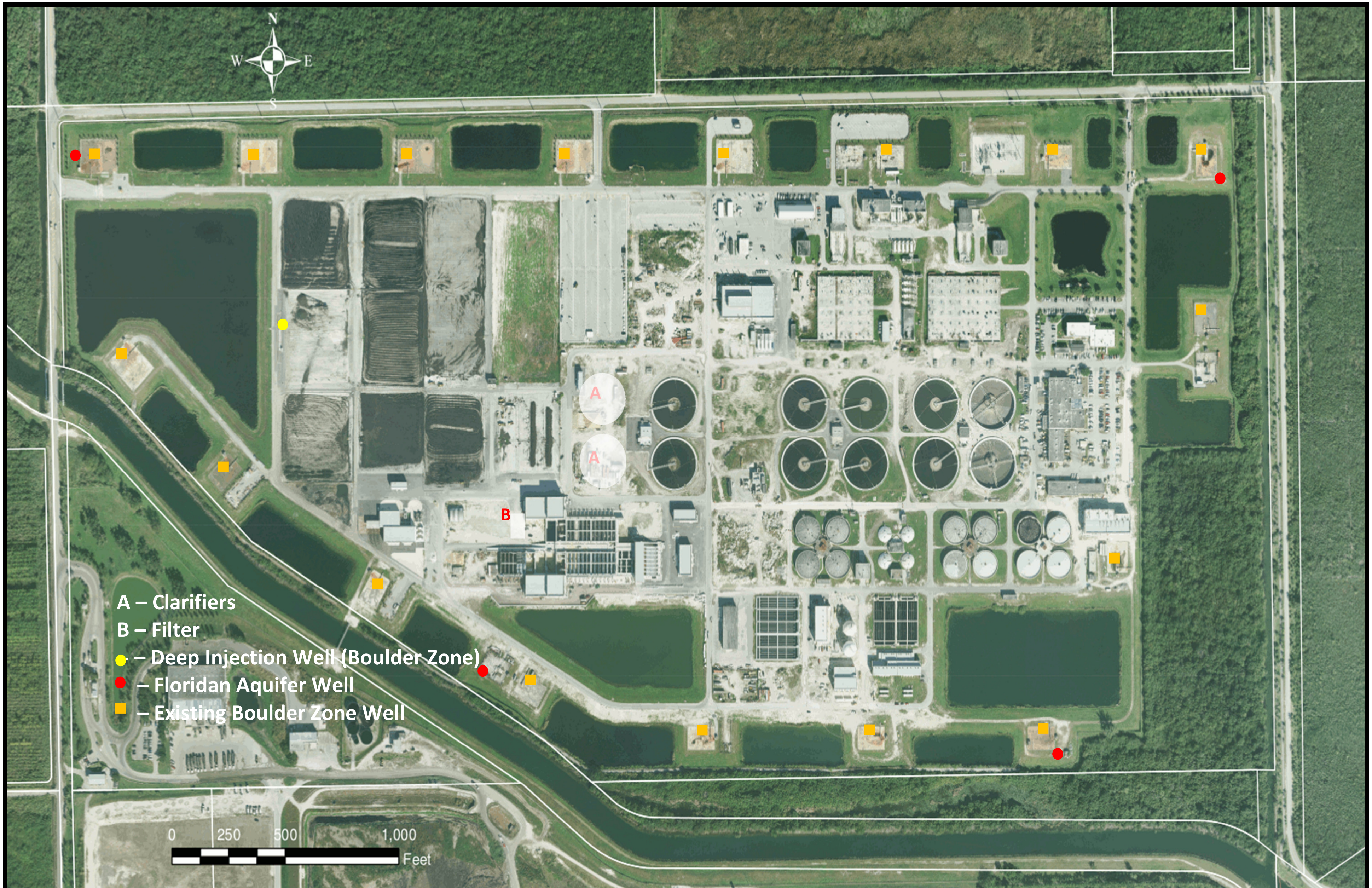



| | | | |
|---|---|---|---|
| MIAMI-DADE COUNTY Water and Sewer Department | OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN | NDWWTP – Proposed Facilities | Figure 22 |




MIAMI-DADE COUNTY Water and Sewer Department

| | | | |
|---|---|---|---|
| MIAMI-DADE COUNTY Water and Sewer Department | OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN | CDWWTP – Proposed Facilities | Figure 23 |

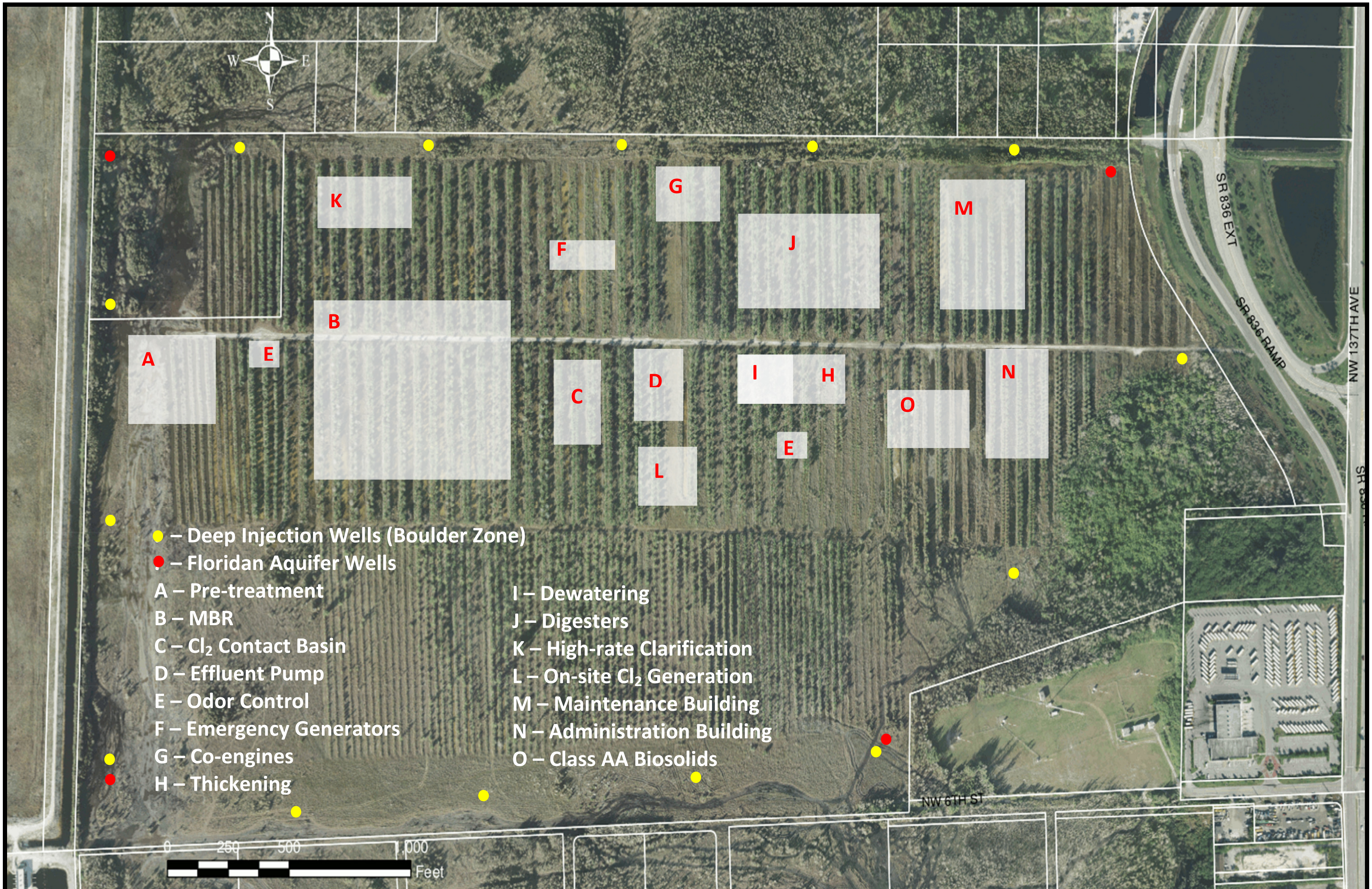



MIAMI-DADE COUNTY Water and Sewer Department

OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN

SDWWTP – Proposed Facilities

Figure 24




| | | | |
|---|---|---|---|
| MIAMI-DADE COUNTY Water and Sewer Department | OCEAN OUTFALL LEGISLATION COMPLIANCE PLAN | WDWWTP – Proposed Facilities | Figure 25 |

## 8.3 Project Schedules

Project schedules are included in Figures 26-1, 26-2, 26-3, and 26-4. As indicated, most of the projects are scheduled to be completed one year before the December 31, 2025 deadline included in the OOL for removal of flow from the outfalls and initiation of reuse projects. Projects for near term initiation are:

- Projects CE-3, CE-4-Centrate Disposal Well and Pump Station-As previously described, these projects are needed to comply with the nutrient reduction requirements of the OOL and need to be in service by December 31, 2015. Hydrogeological data obtained from the drilling of the disposal well will be used in the FA well design.

- Project CP-187E is scheduled for initiation in FY 2013-2014. It will provide hydraulic relief to the central part of the county and improve inter-district flow transfers within the MDWASD system.

- Projects CL-3 and CL-7-As indicated this project is needed for a proposed development in the Doral area. Completion of pump station WP-1 will provide capacity relief in the Doral area. These projects have been advanced to be initiated in FY 2-13-2014.

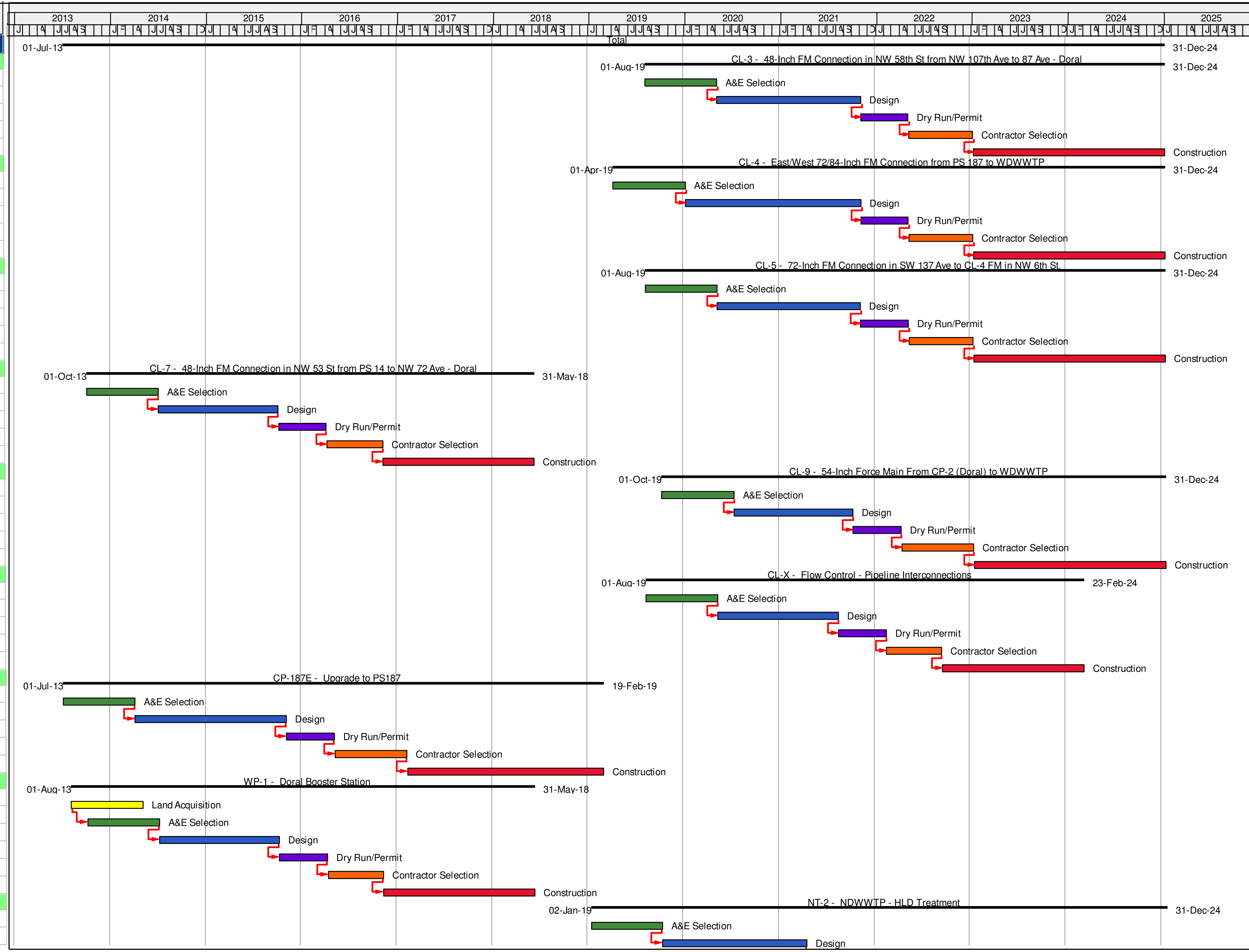
- The CDWWTP projects for HLD and Peak Flow, including the Deep Injection Well system have been advanced to be initiated in 2015-2016 to provide an additional measure of assurance that the required OOL nutrient reductions have been achieved. These are projects CE-1, CE-2, CT-2 and CT-3.

- For the proposed WDWWTP, in addition to the land acquisition during 2013-2014, steps for procuring engineering assistance to initiate activities such as site permitting and rezoning will proceed following FDEP response to the submission of this Plan.

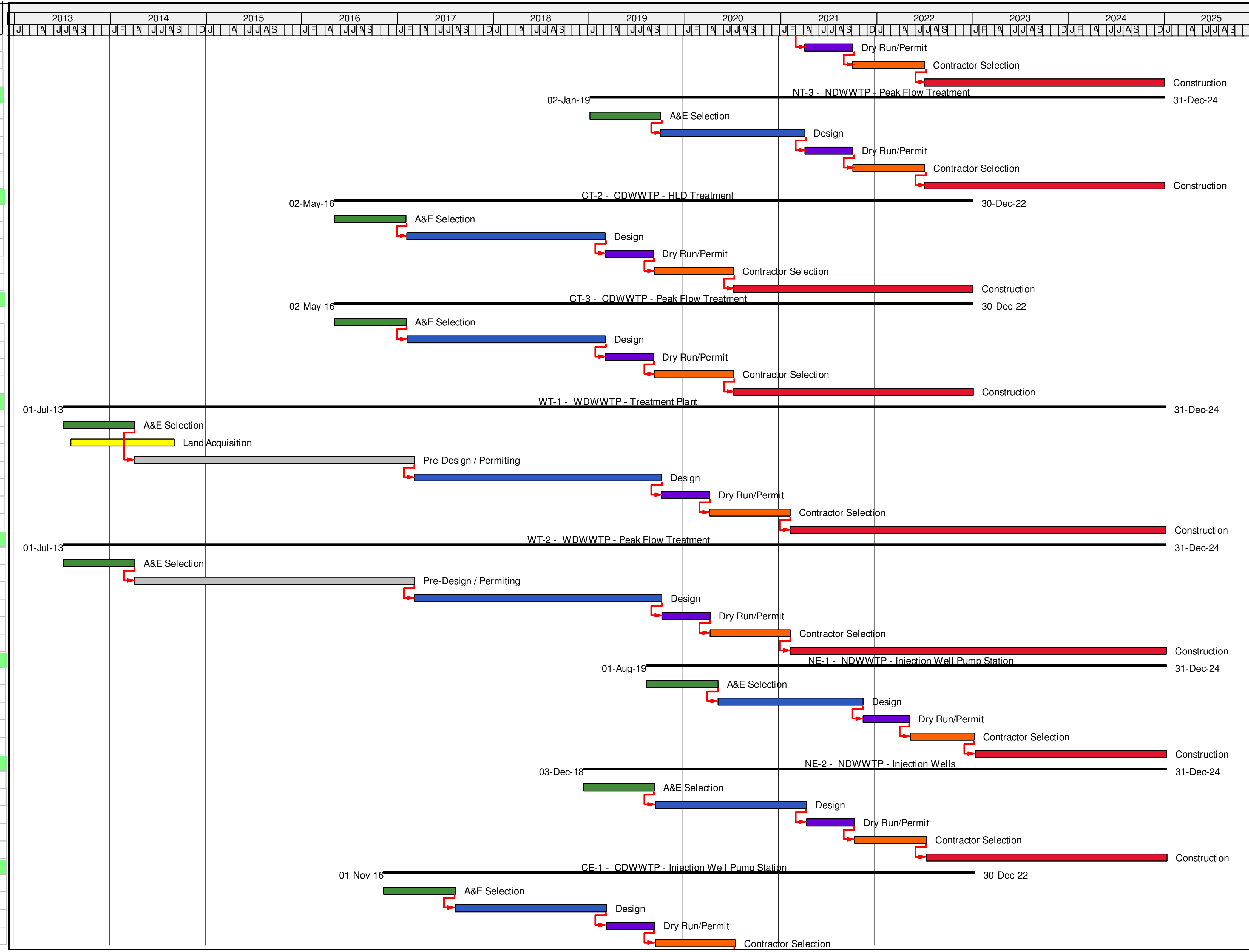
The schedules are cost-loaded with monthly projected expenditures assigned to each month of the estimated project durations. This information is summarized on Table 12 which shows the annual projected cost for each project and annual totals for all of the projects for each of the project phases.

Page intentionally left blank

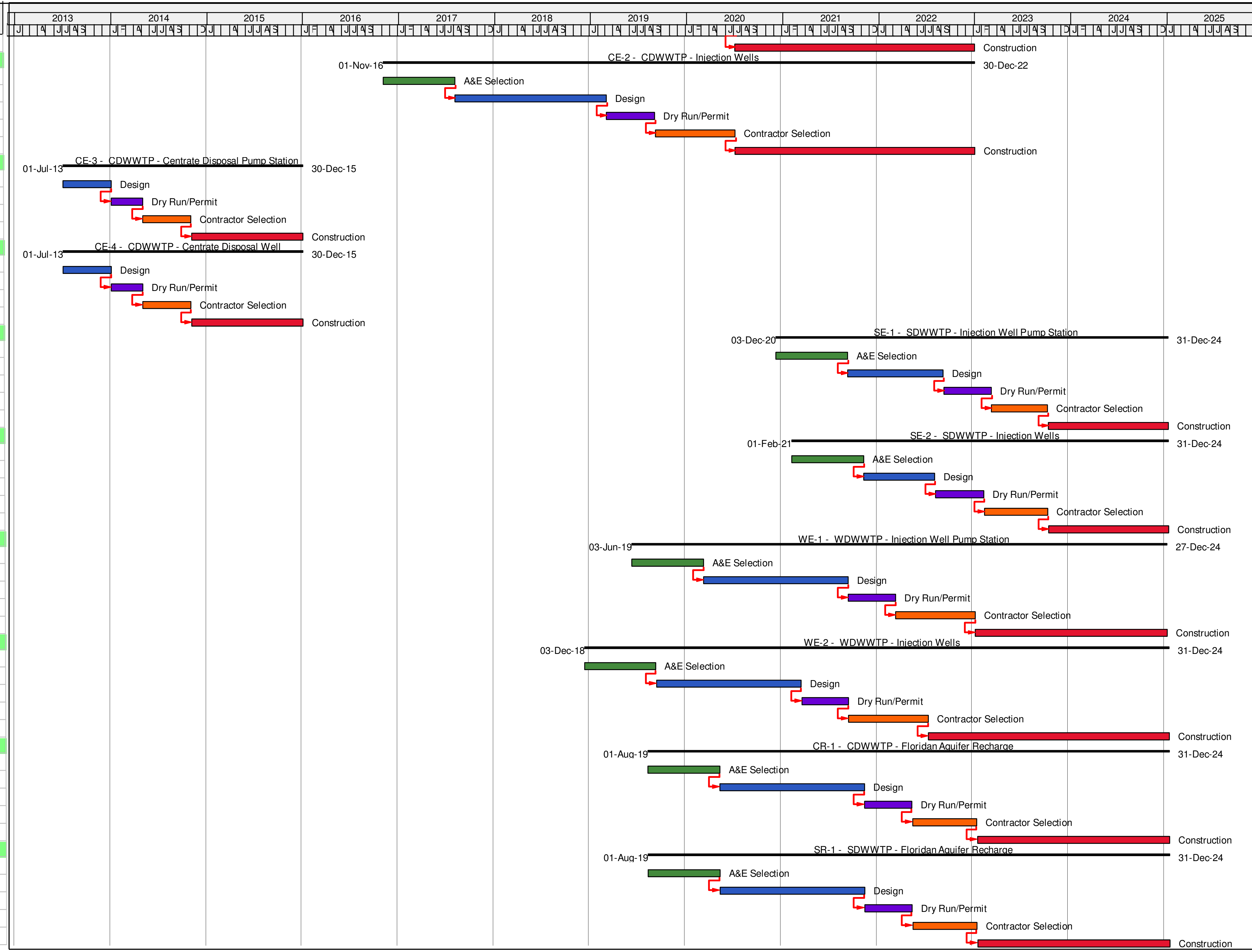
| Project Name and Phases | Project Cost | Start | Finish | Dur (Mo.) |
|---|---|---|---|---|
| **Total** | $3,322,986,406 | 01-Jul-13 | 31-Dec-24 | 136 |
| **CL-3 - 48-Inch FM** | $41,370,000 | 01-Aug-19 | 31-Dec-24 | 65 |
| A&E Selection | $5,000 | 01-Aug-19 | 30-Apr-20 | 9 |
| Design | $3,203,852 | 01-May-20 | 29-Oct-21 | 18 |
| Dry Run/Permit | $503,007 | 01-Nov-21 | 29-Apr-22 | 6 |
| Contractor Selection | $10,000 | 02-May-22 | 30-Dec-22 | 8 |
| Construction | $37,648,141 | 02-Jan-23 | 31-Dec-24 | 24 |
| **CL-4 - East/West 7** | $157,380,000 | 01-Apr-19 | 31-Dec-24 | 69 |
| A&E Selection | $5,000 | 01-Apr-19 | 31-Dec-19 | 9 |
| Design | $12,191,254 | 02-Jan-20 | 29-Oct-21 | 22 |
| Dry Run/Permit | $1,914,170 | 01-Nov-21 | 29-Apr-22 | 6 |
| Contractor Selection | $10,000 | 02-May-22 | 30-Dec-22 | 8 |
| Construction | $143,259,576 | 02-Jan-23 | 31-Dec-24 | 24 |
| **CL-5 - 72-Inch FM** | $30,730,000 | 01-Aug-19 | 31-Dec-24 | 65 |
| A&E Selection | $5,000 | 01-Aug-19 | 30-Apr-20 | 9 |
| Design | $2,379,562 | 01-May-20 | 27-Oct-21 | 18 |
| Dry Run/Permit | $373,581 | 28-Oct-21 | 29-Apr-22 | 6 |
| Contractor Selection | $10,000 | 02-May-22 | 30-Dec-22 | 8 |
| Construction | $27,961,857 | 02-Jan-23 | 31-Dec-24 | 24 |
| **CL-7 - 48-Inch FM** | $16,370,000 | 01-Oct-13 | 31-May-18 | 54 |
| A&E Selection | $5,000 | 01-Oct-13 | 30-Jun-14 | 9 |
| Design | $1,267,079 | 01-Jul-14 | 30-Sep-15 | 15 |
| Dry Run/Permit | $198,903 | 01-Oct-15 | 31-Mar-16 | 6 |
| Contractor Selection | $10,000 | 01-Apr-16 | 31-Oct-16 | 7 |
| Construction | $14,889,018 | 01-Nov-16 | 31-May-18 | 18 |
| **CL-9 - 54-Inch For** | $99,580,000 | 01-Oct-19 | 31-Dec-24 | 63 |
| A&E Selection | $5,000 | 01-Oct-19 | 30-Jun-20 | 9 |
| Design | $7,713,435 | 01-Jul-20 | 28-Sep-21 | 15 |
| Dry Run/Permit | $1,211,083 | 29-Sep-21 | 31-Mar-22 | 6 |
| Contractor Selection | $10,000 | 01-Apr-22 | 30-Dec-22 | 9 |
| Construction | $90,640,482 | 02-Jan-23 | 31-Dec-24 | 24 |
| **CL-X - Flow Contro** | $5,000,000 | 01-Aug-19 | 23-Feb-24 | 55 |
| A&E Selection | $5,000 | 01-Aug-19 | 28-Apr-20 | 9 |
| Design | $386,236 | 29-Apr-20 | 03-Aug-21 | 15 |
| Dry Run/Permit | $60,597 | 03-Aug-21 | 02-Feb-22 | 6 |
| Contractor Selection | $10,000 | 02-Feb-22 | 31-Aug-22 | 7 |
| Construction | $4,538,167 | 01-Sep-22 | 23-Feb-24 | 18 |
| **CP-187E - Upgrad** | $100,000,000 | 01-Jul-13 | 19-Feb-19 | 66 |
| A&E Selection | $5,000 | 01-Jul-13 | 31-Mar-14 | 9 |
| Design | $7,745,972 | 01-Apr-14 | 27-Oct-15 | 18 |
| Dry Run/Permit | $1,216,192 | 28-Oct-15 | 29-Apr-16 | 6 |
| Contractor Selection | $10,000 | 02-May-16 | 31-Jan-17 | 9 |
| Construction | $91,022,836 | 01-Feb-17 | 19-Feb-19 | 24 |
| **WP-1 - Doral Boos** | $50,000,000 | 01-Aug-13 | 31-May-18 | 56 |
| Land Acquisition | $750,000 | 01-Aug-13 | 30-Apr-14 | 9 |
| A&E Selection | $5,000 | 02-Oct-13 | 01-Jul-14 | 9 |
| Design | $3,872,426 | 02-Jul-14 | 01-Oct-15 | 15 |
| Dry Run/Permit | $607,984 | 02-Oct-15 | 01-Apr-16 | 6 |
| Contractor Selection | $10,000 | 04-Apr-16 | 01-Nov-16 | 7 |
| Construction | $44,754,590 | 02-Nov-16 | 31-May-18 | 18 |
| **NT-2 - NDWWTP -** | $63,940,937 | 02-Jan-19 | 31-Dec-24 | 72 |
| A&E Selection | $5,000 | 02-Jan-19 | 30-Sep-19 | 9 |
| Design | $4,952,444 | 01-Oct-19 | 31-Mar-21 | 18 |



| Project Name and Phases | Project Cost | Start | Finish | Dur (Mo.) |
|---|---|---|---|---|
| Dry Run/Permit | $777,564 | 01-Apr-21 | 30-Sep-21 | 6 |
| Contractor Selection | $10,000 | 01-Oct-21 | 30-Jun-22 | 9 |
| Construction | $58,195,929 | 01-Jul-22 | 31-Dec-24 | 30 |
| **NT-3 - NDWWTP -** | $43,779,809 | 02-Jan-19 | 31-Dec-24 | 72 |
| A&E Selection | $5,000 | 02-Jan-19 | 30-Sep-19 | 9 |
| Design | $3,390,542 | 01-Oct-19 | 31-Mar-21 | 18 |
| Dry Run/Permit | $532,320 | 01-Apr-21 | 30-Sep-21 | 6 |
| Contractor Selection | $10,000 | 01-Oct-21 | 30-Jun-22 | 9 |
| Construction | $39,841,947 | 01-Jul-22 | 31-Dec-24 | 30 |
| **CT-2 - CDWWTP -** | $173,321,438 | 02-May-16 | 30-Dec-22 | 79 |
| A&E Selection | $5,000 | 02-May-16 | 31-Jan-17 | 9 |
| Design | $13,426,252 | 01-Feb-17 | 28-Feb-19 | 24 |
| Dry Run/Permit | $2,108,085 | 01-Mar-19 | 30-Aug-19 | 6 |
| Contractor Selection | $10,000 | 03-Sep-19 | 30-Jun-20 | 10 |
| Construction | $157,772,101 | 01-Jul-20 | 30-Dec-22 | 30 |
| **CT-3 - CDWWTP -** | $66,680,017 | 02-May-16 | 30-Dec-22 | 79 |
| A&E Selection | $5,000 | 02-May-16 | 31-Jan-17 | 9 |
| Design | $5,164,642 | 01-Feb-17 | 28-Feb-19 | 24 |
| Dry Run/Permit | $810,882 | 01-Mar-19 | 30-Aug-19 | 6 |
| Contractor Selection | $10,000 | 03-Sep-19 | 30-Jun-20 | 10 |
| Construction | $60,689,493 | 01-Jul-20 | 30-Dec-22 | 30 |
| **WT-1 - WDWWTP -** | $1,303,913,184 | 01-Jul-13 | 31-Dec-24 | 136 |
| A&E Selection | $5,000 | 01-Jul-13* | 31-Mar-14 | 9 |
| Land Acquisition | $15,600,000 | 01-Aug-13* | 29-Aug-14 | 13 |
| Pre-Design / Permitii | $4,000,000 | 01-Apr-14 | 28-Feb-17 | 34 |
| Design | $97,014,236 | 01-Mar-17 | 30-Sep-19 | 30 |
| Dry Run/Permit | $15,860,777 | 01-Oct-19 | 31-Mar-20 | 6 |
| Contractor Selection | $10,000 | 01-Apr-20 | 29-Jan-21 | 10 |
| Construction | $1,171,423,171 | 01-Feb-21 | 31-Dec-24 | 48 |
| **WT-2 - WDWWTP -** | $182,649,075 | 01-Jul-13 | 31-Dec-24 | 136 |
| A&E Selection | $5,000 | 01-Jul-13 | 31-Mar-14 | 9 |
| Pre-Design / Permitii | $1,000,000 | 01-Apr-14 | 28-Feb-17 | 34 |
| Design | $13,148,872 | 01-Mar-17 | 30-Sep-19 | 30 |
| Dry Run/Permit | $2,221,547 | 01-Oct-19 | 31-Mar-20 | 6 |
| Contractor Selection | $10,000 | 01-Apr-20 | 29-Jan-21 | 10 |
| Construction | $166,263,656 | 01-Feb-21 | 31-Dec-24 | 48 |
| **NE-1 - NDWWTP -** | $37,711,282 | 01-Aug-19 | 31-Dec-24 | 65 |
| A&E Selection | $5,000 | 01-Aug-19 | 30-Apr-20 | 9 |
| Design | $2,920,409 | 01-May-20 | 03-Nov-21 | 18 |
| Dry Run/Permit | $458,502 | 04-Nov-21 | 29-Apr-22 | 6 |
| Contractor Selection | $10,000 | 02-May-22 | 30-Dec-22 | 8 |
| Construction | $34,317,371 | 02-Jan-23 | 31-Dec-24 | 24 |
| **NE-2 - NDWWTP -** | $92,851,223 | 03-Dec-18 | 31-Dec-24 | 73 |
| A&E Selection | $5,000 | 03-Dec-18 | 30-Aug-19 | 9 |
| Design | $7,192,151 | 03-Sep-19 | 31-Mar-21 | 19 |
| Dry Run/Permit | $1,129,233 | 01-Apr-21 | 30-Sep-21 | 6 |
| Contractor Selection | $10,000 | 01-Oct-21 | 30-Jun-22 | 9 |
| Construction | $84,514,839 | 01-Jul-22 | 31-Dec-24 | 30 |
| **CE-1 - CDWWTP -** | $75,828,087 | 01-Nov-16 | 30-Dec-22 | 73 |
| A&E Selection | $5,000 | 01-Nov-16 | 31-Jul-17 | 9 |
| Design | $5,873,353 | 01-Aug-17 | 28-Feb-19 | 18 |
| Dry Run/Permit | $922,161 | 01-Mar-19 | 30-Aug-19 | 6 |
| Contractor Selection | $10,000 | 03-Sep-19 | 30-Jun-20 | 10 |



| Project Name and Phases | Project Cost | Start | Finish | Dur (Mo.) |
|---|---|---|---|---|
| Construction | $69,017,573 | 01-Jul-20 | 30-Dec-22 | 30 |
| **CE-2 - CDWWTP -** | **$167,132,202** | **01-Nov-16** | **30-Dec-22** | **73** |
| A&E Selection | $5,000 | 01-Nov-16 | 31-Jul-17 | 9 |
| Design | $12,946,766 | 01-Aug-17 | 28-Feb-19 | 18 |
| Dry Run/Permit | $2,032,798 | 01-Mar-19 | 30-Aug-19 | 6 |
| Contractor Selection | $10,000 | 03-Sep-19 | 30-Jun-20 | 10 |
| Construction | $152,137,638 | 01-Jul-20 | 30-Dec-22 | 30 |
| **CE-3 - CDWWTP -** | **$20,000,000** | **01-Jul-13** | **30-Dec-15** | **29** |
| Design | $1,553,299 | 01-Jul-13 | 31-Dec-13 | 6 |
| Dry Run/Permit | $243,059 | 02-Jan-14 | 30-Apr-14 | 4 |
| Contractor Selection | $10,000 | 01-May-14 | 31-Oct-14 | 6 |
| Construction | $18,193,642 | 03-Nov-14 | 30-Dec-15 | 13 |
| **CE-4 - CDWWTP -** | **$20,000,000** | **01-Jul-13** | **30-Dec-15** | **29** |
| Design | $1,553,299 | 01-Jul-13 | 31-Dec-13 | 6 |
| Dry Run/Permit | $243,059 | 02-Jan-14 | 30-Apr-14 | 4 |
| Contractor Selection | $10,000 | 01-May-14 | 31-Oct-14 | 6 |
| Construction | $18,193,642 | 03-Nov-14 | 30-Dec-15 | 13 |
| **SE-1 - SDWWTP -** | **$6,208,820** | **03-Dec-20** | **31-Dec-24** | **49** |
| A&E Selection | $5,000 | 03-Dec-20 | 31-Aug-21 | 9 |
| Design | $479,884 | 01-Sep-21 | 31-Aug-22 | 12 |
| Dry Run/Permit | $75,301 | 01-Sep-22 | 28-Feb-23 | 6 |
| Contractor Selection | $10,000 | 01-Mar-23 | 29-Sep-23 | 7 |
| Construction | $5,638,635 | 02-Oct-23 | 31-Dec-24 | 15 |
| **SE-2 - SDWWTP -** | **$18,570,245** | **01-Feb-21** | **31-Dec-24** | **48** |
| A&E Selection | $5,000 | 01-Feb-21 | 29-Oct-21 | 9 |
| Design | $1,437,534 | 01-Nov-21 | 29-Jul-22 | 9 |
| Dry Run/Permit | $225,667 | 01-Aug-22 | 31-Jan-23 | 6 |
| Contractor Selection | $10,000 | 01-Feb-23 | 29-Sep-23 | 8 |
| Construction | $16,892,044 | 02-Oct-23 | 31-Dec-24 | 15 |
| **WE-1 - WDWWTP** | **$118,312,512** | **03-Jun-19** | **27-Dec-24** | **67** |
| A&E Selection | $5,000 | 03-Jun-19 | 28-Feb-20 | 9 |
| Design | $9,164,660 | 02-Mar-20 | 31-Aug-21 | 18 |
| Dry Run/Permit | $1,438,948 | 01-Sep-21 | 28-Feb-22 | 6 |
| Contractor Selection | $10,000 | 01-Mar-22 | 28-Dec-22 | 10 |
| Construction | $107,693,904 | 29-Dec-22 | 27-Dec-24 | 24 |
| **WE-2 - WDWWTP** | **$259,983,425** | **03-Dec-18** | **31-Dec-24** | **73** |
| A&E Selection | $5,000 | 03-Dec-18 | 30-Aug-19 | 9 |
| Design | $20,140,036 | 03-Sep-19 | 05-Mar-21 | 18 |
| Dry Run/Permit | $3,162,255 | 08-Mar-21 | 31-Aug-21 | 6 |
| Contractor Selection | $10,000 | 01-Sep-21 | 30-Jun-22 | 10 |
| Construction | $236,666,134 | 01-Jul-22 | 31-Dec-24 | 30 |
| **CR-1 - CDWWTP -** | **$25,558,050** | **01-Aug-19** | **31-Dec-24** | **65** |
| A&E Selection | $5,000 | 01-Aug-19 | 30-Apr-20 | 9 |
| Design | $1,978,886 | 01-May-20 | 29-Oct-21 | 18 |
| Dry Run/Permit | $310,668 | 01-Nov-21 | 29-Apr-22 | 6 |
| Contractor Selection | $10,000 | 02-May-22 | 30-Dec-22 | 8 |
| Construction | $23,253,496 | 02-Jan-23 | 31-Dec-24 | 24 |
| **SR-1 - SDWWTP -** | **$25,558,050** | **01-Aug-19** | **31-Dec-24** | **65** |
| A&E Selection | $5,000 | 01-Aug-19 | 30-Apr-20 | 9 |
| Design | $1,978,886 | 01-May-20 | 29-Oct-21 | 18 |
| Dry Run/Permit | $310,668 | 01-Nov-21 | 29-Apr-22 | 6 |
| Contractor Selection | $10,000 | 02-May-22 | 30-Dec-22 | 8 |
| Construction | $23,253,496 | 02-Jan-23 | 31-Dec-24 | 24 |



| Project Name and Phases | Project Cost | Start | Finish | Dur (Mo.) |
|---|---|---|---|---|
| **SR-2 - SDWWTP -** | $95,000,000 | 01-Jul-20 | 31-Jul-20 | 1 |
| Construction | $95,000,000 | 01-Jul-20 | 31-Jul-20 | 1 |
| **WR-1 - WDWWTP** | $25,558,050 | 01-Aug-19 | 31-Dec-24 | 65 |
| A&E Selection | $5,000 | 01-Aug-19 | 30-Apr-20 | 9 |
| Design | $1,978,886 | 01-May-20 | 29-Oct-21 | 18 |
| Dry Run/Permit | $310,668 | 01-Nov-21 | 29-Apr-22 | 6 |
| Contractor Selection | $10,000 | 02-May-22 | 30-Dec-22 | 8 |
| Construction | $23,253,496 | 02-Jan-23 | 31-Dec-24 | 24 |

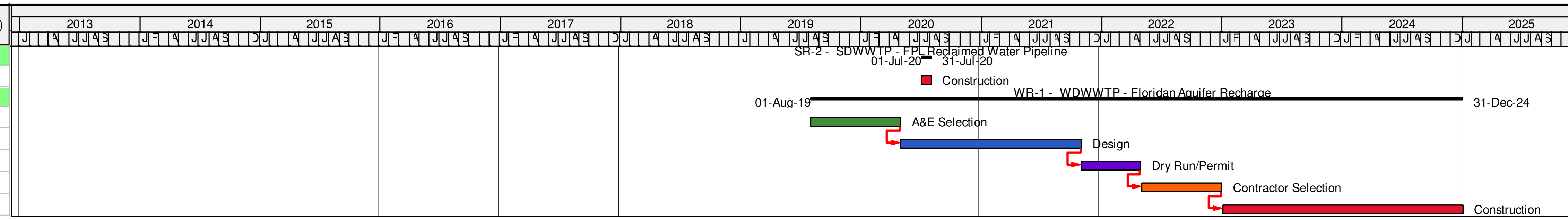


Table 12

Ocean Outfall Legislation Projects – Compliance plan – Annual Projected Expenditures by Project and Project Phase October 1, 2012 – September 30, 2025

| No | Project Name | Project Cost | 2012/2013 | 2013/2014 | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | 2022/2023 | 2023/2024 | 2024/2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CL-3 - 48-Inch FM Connection in NW 58th St from NW 107th Ave to 87 Ave - Doral | $41,370,000 | | | | | | | $294 | $327,761 | $2,863,276 | $528,257 | $8,674,326 | $28,301,016 | $675,070 |
| 2 | CL-4 - East/West 72/84-Inch FM Connection from PS 187 to WDWWTP | $157,380,000 | | | | | | | $4,203 | $3,460,196 | $8,677,151 | $1,976,603 | $33,001,374 | $107,691,681 | $2,568,792 |
| 3 | CL-5 - 72-Inch FM Connection in SW 137 Ave to CL-4 FM in NW 6th St. | $30,730,000 | | | | | | | $294 | $247,397 | $2,125,036 | $393,145 | $6,443,141 | $21,019,603 | $501,385 |
| 4 | CL-7 - 48-Inch FM Connection in NW 53 St from PS 14 to NW 72 Ave - Doral | $16,370,000 | | $58,901 | $1,213,178 | $208,698 | $10,211,966 | $4,677,257 | | | | | | | |
| 5 | CL-9 - 54-Inch Force Main From CP-2 (Doral) to WDWWTP | $99,580,000 | | | | | | | | $317,406 | $7,402,864 | $1,217,574 | $20,880,241 | $68,136,638 | $1,625,278 |
| 6 | CL-X - Flow Control - Pipeline Interconnections | $5,000,000 | | | | | | | $303 | $71,255 | $329,170 | $86,903 | $4,071,920 | $440,448 | |
| 7 | CP-187E - Upgrade to PS187 | $100,000,000 | $917 | $1,194,075 | $6,520,860 | $1,257,903 | $14,857,486 | $72,942,230 | $3,226,529 | | | | | | |
| 8 | WP-1 - Doral Booster Station | $50,000,000 | $44,759 | $865,138 | $3,716,300 | $618,988 | $30,586,306 | $14,168,510 | | | | | | | |
| 9 | NT-2 - NDWWTP - HLD Treatment | $63,940,937 | | | | | | | $5,000 | $4,110,529 | $1,619,479 | $610,675 | $28,394,801 | $28,599,779 | $600,675 |
| 10 | NT-3 - NDWWTP - Peak Flow Treatment | $43,779,809 | | | | | | | $5,000 | $2,814,150 | $1,108,712 | $421,232 | $19,439,575 | $19,579,907 | $411,232 |
| 11 | CT-2 - CDWWTP - HLD Treatment | $173,321,438 | | | | $3,295 | $2,103,777 | $10,804,138 | $2,628,223 | $1,570,555 | $75,923,251 | $78,688,531 | $1,599,668 | | |
| 12 | CT-3 - CDWWTP - Peak Flow Treatment | $66,680,017 | | | | $3,295 | $810,303 | $4,156,000 | $1,011,021 | $610,233 | $29,205,060 | $30,268,767 | $615,337 | | |
| 13 | WT-1 - WDWWTP - Treatment Plant | $1,303,913,184 | $411,564 | $15,323,559 | $2,039,781 | $1,745,937 | $6,325,259 | $66,680,522 | $24,092,614 | $15,868,177 | $36,406,123 | $348,951,145 | $610,423,800 | $168,079,740 | $7,564,964 |
| 14 | WT-2 - WDWWTP - Peak Flow Treatment | $182,649,075 | $917 | $36,614 | $509,945 | $436,484 | $866,930 | $9,037,577 | $3,265,404 | $2,228,947 | $5,169,463 | $49,527,698 | $86,639,308 | $23,856,069 | $1,073,718 |
| 15 | NE-1 - NDWWTP - Injection Well Pump Station | $37,711,282 | | | | | | | $294 | $294,182 | $2,612,823 | $484,342 | $7,907,100 | $25,797,196 | $615,346 |
| 16 | NE-2 - NDWWTP - Injection Wells | $92,851,223 | | | | | | | $41,141 | $6,114,051 | $2,171,191 | $882,328 | $41,236,252 | $41,533,931 | $872,328 |
| 17 | CE-1 - CDWWTP - Injection Well Pump Station | $75,828,087 | | | | | $79,346 | $5,290,478 | $1,430,785 | $692,612 | $33,212,707 | $34,422,381 | $699,776 | | |
| 18 | CE-2 - CDWWTP - Injection Wells | $167,132,202 | | | | | $168,883 | $11,661,922 | $3,153,855 | $1,514,820 | $73,211,829 | $75,878,353 | $1,542,539 | | |
| 19 | CE-3 - CDWWTP - Centrate Disposal Pump Station | $20,000,000 | $805,003 | $1,001,039 | $17,315,644 | $878,314 | | | | | | | | | |
| 20 | CE-4 - CDWWTP - Centrate Disposal Well | $20,000,000 | $805,003 | $1,001,039 | $17,315,644 | $878,314 | | | | | | | | | |
| 21 | SE-1 - SDWWTP - Injection Well Pump Station | $6,208,820 | | | | | | | | | $9,045 | $478,186 | $82,954 | $5,404,813 | $233,822 |
| 22 | SE-2 - SDWWTP - Injection Wells | $18,570,245 | | | | | | | | | $4,938 | $1,478,523 | $194,739 | $16,191,567 | $700,477 |
| 23 | WE-1 - WDWWTP - Injection Well Pump Station | $118,312,512 | | | | | | | $1,944 | $2,334,689 | $6,877,869 | $1,402,984 | $25,426,787 | $80,460,963 | $1,807,277 |
| 24 | WE-2 - WDWWTP - Injection Wells | $259,983,425 | | | | | | | $111,000 | $17,871,632 | $5,324,763 | $2,452,667 | $115,473,502 | $116,307,089 | $2,442,771 |
| 25 | CR-1 - CDWWTP - Floridan Aquifer Recharge | $25,558,050 | | | | | | | $294 | $204,244 | $1,768,526 | $329,219 | $5,358,594 | $17,480,214 | $416,959 |
| 26 | SR-1 - SDWWTP - Floridan Aquifer Recharge | $25,558,050 | | | | | | | $294 | $204,244 | $1,768,526 | $329,219 | $5,358,594 | $17,480,214 | $416,959 |
| 27 | SR-2 - SDWWTP - FPL Reclaimed Water Pipeline | $95,000,000 | | | | | | | | $95,000,000 | | | | | |
| 28 | WR-1 - WDWWTP - Floridan Aquifer Recharge | $25,558,050 | | | | | | | $294 | $204,244 | $1,768,526 | $329,219 | $5,358,594 | $17,480,214 | $416,959 |
| | **Total** | **$3,322,986,406** | **$2,068,164** | **$19,480,365** | **$48,631,351** | **$6,031,227** | **$66,010,257** | **$199,418,636** | **$38,978,784** | **$156,061,323** | **$299,560,330** | **$631,137,949** | **$1,028,822,923** | **$803,841,082** | **$22,944,014** |

| No | Phase Name | Project Cost | 2012/2013 | 2013/2014 | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 | 2021/2022 | 2022/2023 | 2023/2024 | 2024/2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Land Acquisition** | **$16,350,000** | **$455,406** | **$15,894,594** | | | | | | | | | | | |
| 2 | Land Acquisition | $16,350,000 | $455,406 | $15,894,594 | | | | | | | | | | | |
| 3 | **Design** | **$289,439,532** | **$1,612,757** | **$3,566,403** | **$14,000,064** | **$4,248,440** | **$10,354,498** | **$107,630,639** | **$35,751,870** | **$56,658,304** | **$46,431,793** | **$8,927,070** | **$257,694** | | |
| 4 | Pre-Design, Planning | $5,000,000 | | $162,654 | $2,549,726 | $2,182,421 | $105,198 | | | | | | | | |
| 5 | A&E Selection | $125,000 | $2,751 | $22,249 | | $6,590 | $13,410 | | $28,211 | $41,789 | $9,938 | $62 | | | |
| 6 | Design | $245,054,853 | $1,610,007 | $2,895,381 | $11,450,337 | $36,350 | $10,235,890 | $107,630,639 | $29,849,733 | $38,534,191 | $40,764,314 | $2,048,011 | | | |
| 7 | Dry Run / Permit | $39,259,679 | | $486,118 | | $2,023,079 | | | $5,873,926 | $18,082,324 | $5,657,541 | $6,878,998 | $257,694 | | |
| 8 | **Construction** | **$3,017,196,874** | | **$19,369** | **$34,631,288** | **$1,782,787** | **$55,655,758** | **$91,787,997** | **$3,226,914** | **$99,403,020** | **$253,128,538** | **$622,210,879** | **$1,028,565,230** | **$803,841,082** | **$22,944,014** |
| 9 | Contractor Selection | $270,000 | | $19,369 | $631 | $26,159 | $3,841 | | $385 | $54,414 | $5,305 | $121,199 | $38,697 | | |
| 10 | Construction | $3,016,926,874 | | | $34,630,656 | $1,756,628 | $55,651,918 | $91,787,997 | $3,226,529 | $99,348,605 | $253,123,233 | $622,089,680 | $1,028,526,533 | $803,841,082 | $22,944,014 |
| | **Total** | **$3,322,986,406** | **$2,068,164** | **$19,480,365** | **$48,631,351** | **$6,031,227** | **$66,010,257** | **$199,418,636** | **$38,978,784** | **$156,061,323** | **$299,560,330** | **$631,137,949** | **$1,028,822,923** | **$803,841,082** | **$22,944,014** |

NDWWTP - North District Wastewater Treatment Plant

CDWWTP - Central District Wastewater Treatment Plant

SDWWTP - South District Wastewater Treatment Plant

WDWWTP - West District Wastewater Treatment Plant

FPL - Florida Power & Light

HLD - High Level Disinfection

OOL - Ocean Outfall Legislation

### 8.4 Financial Plan

The MDWASD water and wastewater rates are set annually as part of the County's budgeting process. Each year, the MDWASD prepares a budget that includes estimated water and wastewater flows, expenses, revenues and rates necessary to meet cash flow and debt service requirements. Rates are set on an annual basis as the budget is approved. Future rate requirements are estimated and submitted with the proposed Capital Budget and Multi-Year Capital Plan (CBMYCP) over the 6-year horizon each year, with only the next year's rates approved by the Miami-Dade County Board of County Commissioners (BCC).

The present proposed budget includes the following five year retail rate adjustments:

| | |
|---|---|
| 2013-2014 | 8% (Approved by BCC on June 4, 2013) |
| 2014-2015 | 6% |
| 2015-2016 | 6% |
| 2016-2017 | 5% |
| 2017-2018 | 5% |

Wholesale rates are computed based on cost recovery. An estimated 4% annual increase is included in the rate computations. These projected retail and wholesale rate increases were based on preliminary estimates for compliance with the Ocean Outfall legislation (OOL) prior to the completion of this report. Table 13 shows the latest proposed CBMYP, submitted to the Office of Management and Budget (OMB) on June 7, 2013, together with adjustments based on the implementation of the selected alternative. Note that the OOL figure for compliance is slightly higher than estimated with a reduction in the overall wastewater total. The CBMYCP and rate adjustments are reviewed for updates and prepared annually for budget submittal.

Table 13
Proposed Wastewater Capital Budget and Multi-Year Capital Plan Adjustments

| CBMYCP FY2013-FY2019 | | OOL Compliance Plan |
|---|---|---|
| OOL - Project 1040 | $ 2,987,929,371 | |
| OOL - Other related projects | $ 249,729,972 | |
| OOL - Total | $ 3,237,659,343 | $ 3,322,986,402 |
| Total CBMYCP | $ 8,559,724,151 | $ 8,300,252,126 |

The primary means of funding the needed projects will be revenue bonds supported through rate adjustments including the rate increases indicated above. Funding via the State of Florida revolving loan fund will also be sought, in addition to any grants that may become available.

## 8.5 Public Meeting

A public meeting was held at the MDWASD Douglas Road Headquarters on June 5, 2013 to present the draft Plan for public comments. The presentation given at the meeting and sign-in sheet are included as Appendix M.