

## City of Delray Beach

### MS4 Assessment Program: Part V. – Monitoring Requirements

#### MS4 Permit No. FLS 000018-004

The purpose of this document is to outline the assessment program for the City of Delray Beach Stormwater Management Program (SWMP). Part V of the Municipal Separate Storm Sewer System (MS4) permit for Palm Beach County and co-permittees (FLS000018-004) calls for the creation of an assessment program to determine the overall effectiveness of the Stormwater Management Program (SWMP). Submission of the program to the Florida Department of Environmental Protection for approval is required within the first 12 months of the permit issuance; no later than September 7, 2017. This Assessment Program shall include the three following components:

- Water Quality Monitoring Plan
- Pollutant Loading Estimate Plan
- Evaluation and Response Plan

### Water Quality Monitoring Plan

The intent of the program is to identify where local sources of urban stormwater are adversely affecting surface water resources so that decisions can be made to mitigate these effects.

A separate monitoring plan is required if the City's MS4 drains into a waterbody with an existing Total Maximum Daily Load (TMDL) approved prior to the issuance of this permit in accordance with Part VIII.B.2.c. The majority of the City's system drains to the Intracoastal Waterway, but a small portion of the city does discharge into Lake Ida so Delray Beach has submitted a separate plan.

WBID	Segment Name	Basin	Constituent	TMDL	Percent Reduction	Date	MS4's	Agency
3262A	Lake Ida	Lake Worth Lagoon	Nutrients	TN=0.857 mg/l TP=0.062 mg/l	20 45	11/9/2012	Boynton Beach, Delray Beach, FDOT, PBC	EPA

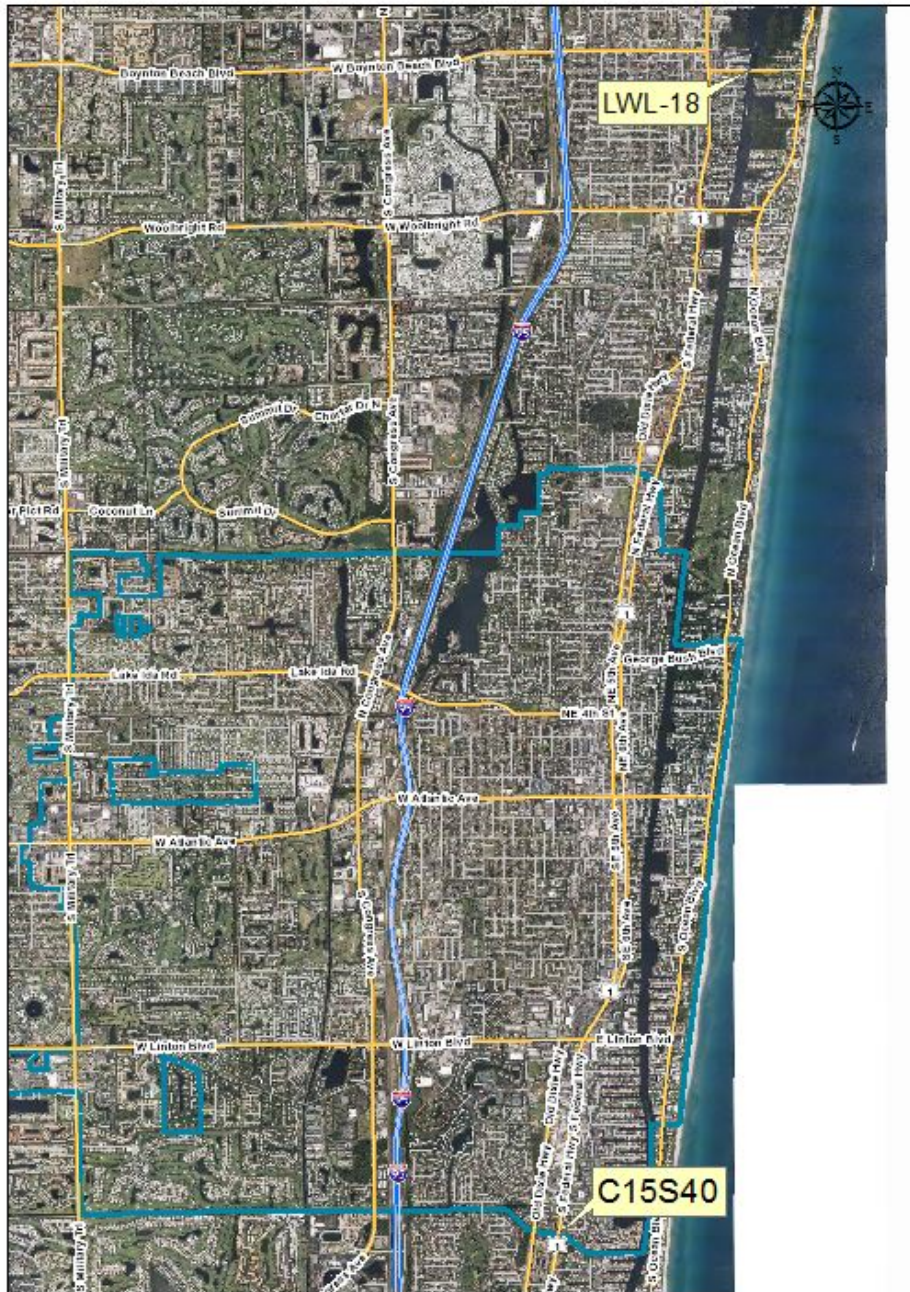
Currently, the joint NPDES program in Palm Beach County collects ambient water quality data at several monitoring sites based on the location of major outfalls and TMDLs within the County. For the Water Quality Monitoring Plan, the City is proposing to use the ambient water quality data provided by the joint program from sites C15S40 and LWL-18.

#### 1. Monitoring Locations

The City of Delray Beach has 4 miles along the Intracoastal Waterway with over 19 miles of seawalls along many finger canals. There are 137 tidal outfalls discharging to the both the Intracoastal Waterway and those finger canals. The C15S40 and LWL-18 monitoring these monitoring stations, along with

relevant information about each location stations have been selected. The following map and table identify the monitoring locations.

### Delray Beach Stormwater Quality Monitoring Sites



City of Delray Beach - MS4 Permit No. FLS000018-004

Date: 9/15/2017

Delray Beach Monitoring Stations – Table 1

Monitoring Station Number	Location Description	Latitude/ Longitude	Receiving Water Body	Verified Impaired?	Adopted TMDL?
C15S40	SFWMD – ERM Freshwater station located at the SFWMD S40 tidal structure in the C-15 Canal	Lat: 26.421 Long:80.072	C-15 Canal		No
LWL18	ERM Marine station located at Ocean Ave Causeway in Boynton Beach, by the bridge	Lat: 26.527 Long: 80.053	Lake Worth Lagoon (South Segment)	Copper	No

Data from the most recent IWR\* run will also be incorporated into the analysis.

\* Impaired Surface Waters Rule

The City acknowledges the copper impairments in the estuarine segments and sees it as a recent issue as impairments have been appearing recently in estuaries along the east coast. The City is willing to work with FDEP and other communities to revolve the situation.

## 2. Sampling Method

The stations are part of existing programs maintained either by Palm Beach County Environmental Resource Management (ERM) or the South Florida Water Management District (SFWMD). ERM performs the sampling at monitoring station LWL18. The sites are sampled and initially analyzed in-situ by ERM staff using a multi-parameter water quality-monitoring instrument. Water samples are collected, preserved and stored according the DEP’s Standard Operating Procedures. Quality assurance / quality control measures include pre-cleaned equipment blanks, field-cleaned equipment blanks, field spikes, and the collection of duplicate samples. Further analysis of samples from all ERM-monitored sites is conducted by an independent laboratory under contract with ERM.

Stations can be adjusted based on annual reviews of the data which could adjust the locations and number of samples collected with prior approval from FDEP. It may be necessary to negotiate for additional samples with the Lagoon as the current locations may be focused on the discharges from C-17 and C-51 canals rather than representing the entire Lake Worth Lagoon.

### 3. Monitoring Parameters

The parameters sampled at ERM’s monitoring stations are shown in the table below.

Monitoring Parameters – Table 2

Parameter	ERM - Sampling Frequency		Collection Method	Notes
	Freshwater	Mariner		
Arsenic	BM	--	Grab Samples	Ambient
Cadmium	BM	Q	Grab Samples	Ambient
Chlorophyll-a (corrected)	BM	M	Grab Samples	Ambient
Copper BM Q	BM	Q	Grab Samples	Ambient
Dissolved Oxygen	BM	M	Grab Samples	Ambient
Lead	BM	Q	Grab Samples	Ambient
Nitrogen, Ammonia	BM	M	Grab Samples	Ambient
Nitrogen, Nitrate-Nitrite	BM	M	Grab Samples	Ambient
Nitrogen, Total Kjeldahl	BM	M	Grab Samples	Ambient
pH	BM	M	Grab Samples	Ambient
Phosphorus, Orthophosphate	BM	M	Grab Samples	Ambient
Phosphorus, Total	BM	M	Grab Samples	Ambient
Salinity	--	M	Grab Samples	Ambient
Specific Conductivity	BM	M	Grab Samples	Ambient
Temperature	BM	M	Grab Samples	Ambient
Total Hardness (as CaCO3)	BM	--	Grab Samples	Ambient
Total Suspended Solids	BM	--	Grab Samples	Ambient
Turbidity	BM	M	Grab Samples	Ambient
Zinc	BM	Q	Grab Samples	Ambient

ERM – Palm Beach County Environmental Resource Management

- Not all parameters are collected for every site
- M (Monthly)
- Q (Quarterly)
- BM (Bi-Monthly)
- (Not Sampled)

### Pollutant Loading Estimate Plan

The pollutant loading exercise is to estimate the Pollutant Loading from the MS4 contributing area, based on land uses and BMPs.

The Palm Beach County MS4 permittee group will be developing pollutant loading estimates during the 3<sup>rd</sup> year of the current permit cycle, using the SIMPLE protocol. In order to provide each permittee with pollutant loading estimates that reflect their respective MS4 areas, the group effort will provide the loading estimates “by MS4,” in addition to “by watershed” (as was done in past permit cycles). Prior to Year 3, the City of Delray Beach will participate in this effort by reviewing its MS4 contributing areas to each receiving water, and will provide updated information on the area extents and the land uses located

therein. In addition, any water quality best management practices (BMPs) that are in place within the MS4 area, will be identified, along with their geospatial extent.

Information on the pollutant load estimates and event mean concentration values for various land uses is reported in the group's Joint Annual Report (Year 3). The group's estimated pollutant loading results will be provided to each permittee for use in this assessment effort.

To determine a practical estimate of the current pollutant loading, the City of Delray Beach will use the land use based pollutant loading estimates provided by the group as the starting point from which pollutant load reductions will be subtracted. The pollutant load reductions will be estimated based on the BMPs that have been put in place within the MS4 contributing areas. In this way, when future estimates are done, and potentially additional reduction measures or BMPs are put in place, the estimated pollutant loading will reflect the reductions.

## Evaluation and Response Plan

The response plan is the plan of action to be taken based on the results from the Water Quality Monitoring Plan and Pollutant Loading Estimate Plan and will be used to:

1. evaluate trends in pollutants loading from the MS4
2. evaluate trends in water quality (of discharge from the MS4)
3. identify portions of the MS4 to be targeted for loading reduction/corrective action

The results from the above analyses will be used to direct further actions within the MS4 areas to reduce pollutants to the maximum extent practicable. This could include additional targeted monitoring to identify specific areas in need of changes to the SWMP, increased street sweeping, implementing focused educational activities or prioritize for stormwater retrofits. It is the intent that data will aid in guiding the decision of which approach to take.

The data from the water quality monitoring and pollutant loading estimates could be integrated with additional data, i.e. rainfall, IWR datasets, and reported annually with each Annual Report. Each report will include an update on the implementation of the monitoring plan, including a discussion of possible changes to the plan based on results which will be submitted to FDEP for approval. As part of the Year 4 annual report, the Assessment Program will be resubmitted for approval by FDEP including an evaluation of the Assessment Program's ability to measure the effectiveness of the City's SWMP and suggests changes accordingly.