

White Paper: Water Quality Update

Councilman Richard Blonna 1/19/20

Purpose:

The purpose of this White Paper is to provide current information regarding our waterways in partial fulfillment of our annual MS4 required element related to public education. It is also intended to set the stage for a more informed discussion of the results of the *Nutrient Source Evaluation and Assessment* that will be presented later in 2021.

Water Quality Overview

The degradation of water quality in Marco Island's waterways is linked to the stormwater that enters into them after heavy rains. This occurs primarily when the first inch of rainwater rinses pollen, nutrients, and other pollutants off of roadways, roofs, driveways, parking lots and other impervious surfaces into the city's streets. These materials enter our waterways through outlets from the stormwater system into our canals. When this happens, excess nitrogen, phosphorous, and other pollutants contained in the stormwater cause the level of these substances to rise to harmful levels.

Excessive levels of nitrogen and phosphorous can lead to the growth of nuisance plants and algal blooms. These contribute to lack of water clarity. When the algae blooms die off their decay can lead to the loss dissolved oxygen in the water, an essential element for aquatic life (Turrell Hall, 2019).

One of the measures used by the Florida Department of Environmental Protection (FDEP) to determine if a body of water is impaired is called the Total Maximum Daily Load (TMDL). The TMDL is a scientific determination of the maximum amount of a given pollutant (nutrients, bacteria, mercury, etc.) that a body of water can absorb and still meet the water quality standards that protect human health and aquatic life (State of Florida, 2020).

Water bodies that exceed the threshold for water quality standards are identified as "impaired" for the particular pollutants identified. In 2018 the FDEP found the waters in and around Marco Island to be impaired because their TMDLs for nitrogen exceeded the threshold established by the state (State of Florida, 2020). The actual readings found that for two consecutive years (2017 & 2018) the waters in and around Marco Island had total Nitrogen levels (TN) of .476 MG/L and .634 MG/L respectively. These readings exceeded the allowable TMDL of .30 MG/L.

Water Quality Oversight

In 1990, the U.S. Environmental Protection Agency (EPA) created the National Pollutant Discharge Elimination System (NPDES) to monitor impaired waterways and provide guidance in

cleaning them up. The Florida Department of Environmental Protection (FDEP) is responsible for overseeing the program in Florida (State of Florida, 2020).

The NPDES is divided into two phases based on population and urbanization. Phase I is designed for large municipalities of more than 100,000 people. Phase II, implemented in 1999, targets municipalities that have at least 10,000 people, but less than 100,000. The City of Marco Island falls under Phase II and on January 30th, 2013, was designated as a small Municipal Separate Storm Sewer System (MS4) (City of Marco Island, 2015).

As required by the NPDES Phase 11 program, the City of Marco Island has to apply for an annual MS4 permit. This permit allows the city to discharge stormwater into its waterways in a safe way using Best Management Practices (BMPs). Two of the required conditions of the initial permit application were:

- The development of a Stormwater Management Plan.
- The creation of a Stormwater Control Ordinance (City of Marco Island, 2015).

On July 20th, 2015 The City of Marco Island awarded Contract # 15-007 to with Wailer Engineering Corporation in Punta Gorda, FL to develop a *Stormwater Management Plan* that would guide its efforts to comply with the MS4 permitting process and implement BMPs associated with stormwater management (City of Marco Island, 2015).

Various versions of the ordinance were proposed between 2015 and 2018. On 3/5/2018 the City of Marco Island passed a *Stormwater Control Ordinance* 18.07. It covers all aspects of stormwater management including Illicit Discharges (Sec 18-212), Stormwater Pollution Prevention for Construction (Sec 18-213), and Maintenance of Stormwater Management Systems (Sec 18-214) (City of Marco Island, 2015).

Because of our impaired water quality status, to qualify for future MS4 permits the City of Marco Island needed to identify the major contributors to this impaired state and address these in a remediation plan. All remediation efforts needed to be described in the annual MS4 annual permit application.

The City Council, working with the City Public Works Department and Waterways Committee, decided that an effective way to attack the problem was to hire an expert to identify the major sources of impairment through a targeted, sophisticated water testing study while continuing to meet the ongoing elements of our MS4 permit.

The City of Marco Island awarded Contract #19-033 (Phase I/Tasks 1-12) *for Consulting Services for Nutrient Source Evaluation and Assessment* to Environmental Research & Design, Inc. in the Amount not to Exceed \$131,065.16. The study is currently being conducted by Harvey H. Harper III, PhD, a noted expert in the field. The 1–2-year project was designed to provide us with an analysis of the major contributors to our impaired waters. In addition, Dr Harper was charged with making recommendations for BMPs that could be added to our MS4 permitting efforts (City of Marco Island 2020a).

While we await the results of Dr. Harper's study, I feel it is important to share this background information with citizens as well as inform them of the work currently being done by the City and recommendations made by the Waterways Committee.

Current Efforts of the City of Marco Island Department of Public Works

Elements of Marco Island's MS4 Permit

There are six different elements that comprise the City of Marco Island's MS4 permit. Each one targets a different aspect of water quality improvement and is described in detail in the City's Stormwater Management Plan (City of Marco Island, 2015). The NPDES Phase II MS4 permit requires that the city address five of the following six elements:

1. Public Education and Outreach as to Stormwater Impacts
2. Public Involvement/Public Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Stormwater Runoff Control
5. Post- Construction Stormwater Management in New Development and Redevelopment*
6. Pollution Prevention/Good Housekeeping for Municipal Operations

*The City of Marco Island is exempted from this section because it is allowed to use a qualified alternative program.

The best way to describe the efforts of the city is to list the specific actions being taken to address each of the six elements of the MS4 (City of Marco Island, 2020b).

Element # 1: Public Education and Outreach as to Stormwater Impacts

City Stormwater Information Website

- City created a web page with stormwater management information, pollution prevention, and educational material. The material is geared towards a variety of age groups and provides information explaining the NPDES MS4 program.

City Participation at Local Events

- Reach out to residents at local annual events (Farmer's Market etc.). During these events, brochures were distributed with educational material on pollution prevention and the NPDES MS4 Phase 11 program.

New Homeowner Packets

- Informational packets delivered to new residents in Marco Island. Packets discuss the NPDES program, pollution prevention, contact numbers for stormwater questions or comments, and information on the City's recycling program.

Utility inserts

- Information sheets added to utility bills that cover public education on stormwater issues, fact sheets, and updates on City codes. This material serves as a valuable tool to reach out to the public regarding stormwater topics.

Labeling of Storm Sewer Drains

- The City will coordinate with volunteers to label storm sewer drains with a "No Dumping Drains to Ocean" sign on drains.

Element # 2: Public Involvement/Public Participation

Public Involvement in Meetings

- Involve the public in more Council meetings/workshops to gain public input specifically to the NPDES MS4 program. Public is notified on every Council (2x/month) and Waterways Advisory Meeting (1x/month) via City website.
- Allow the public to take part in decisions related to ordinances, and address concerns of the community.

Beach Clean-Up/Outfall Monitoring

- The City of Marco Island partnered with Friends of Tigertail beach and the Beach Advisory Committee to offer beach clean-ups with volunteers. Not only did this prevent trash from entering the water, but the new partnership also allows for outfall monitoring to assist with the current stormwater inspections.

Element # 3: Illicit Discharge Detection and Elimination

Storm Sewer Map

- The City has a storm sewer system map as part of their Geographic Information System and Asset Management System updated through 2012. This data depicts all stormwater conveyance systems, outfalls, and bodies of water. The systems will be updated on an annual basis as needed.

Illicit Discharge Inspections

- Illicit Discharge Ordinance 18.07 implements stronger regulation on illicit discharge.
- The ordinance continues inspection of all stormwater systems prior to rainy season.
- The ordinance implemented an SOP for illicit discharge inspections and continues to accept complaints and inspections completed.

Element # 4: Construction Site Stormwater Runoff Control

Erosion and Sediment Control Ordinance

- Ordinance 18.07 requires erosion and sediment controls for all construction sites per Ordinance 18-07. This requires the proper use and maintenance of protective barriers.

Construction Site Waste Control Ordinance

- Ordinance 18-07 mandates the proper disposal of waste from construction sites including litter, concrete truck washout regulations, and the disposal of chemicals.

Site Plan Review

- Ordinance 18-07 requires a site plan review that incorporates consideration of potential water quality impacts. This ordinance mandates BMPs be implemented and meet the requirements of the City, State and Federal agencies.

Public Complaints, Comments, and Feedback

- The City currently utilizes an existing hotline through the Public Works Department. This will be combined with the updated City web page to further reach the public and address construction concerns

Construction Site Inspections

- Conduct inspections of construction sites to ensure erosion and sediment control regulations are being followed as per Ordinance 18.07.

Post– Construction Stormwater Management in New Development and Redevelopment

- This section is not applicable to Marco Island because the City of Marco Island is allowed to use a qualified alternative program. MS4s operating in the SFWMD are covered under Rule 40E of the FAC. These are your Environmental Resource Permits (ERP).

Element # 6. Pollution Prevention/Good Housekeeping for Municipal Operations

Pet Waste Collection

- The City provides plastic bags around Marco Island for pet owners to pick up pet waste to reduce the amount of nutrients and pathogens entering into the stormwater system.

Storm Sewer System Vacuuming

- The City will continue to utilize its vac truck to clean debris from storm sewer inlets and basins. This method is used in conjunction with the storm sewer maintenance and inspections to ensure proper functioning.

Storm Sewer System Maintenance

- The storm sewer system will continue to be properly cleaned and maintained to ensure that all broken pipes and components are fixed in a timely manner.

Recycling Program

- The City currently has a curbside pickup program for recyclables as well as a local drop off facility that accepts paper, metal, waste oil, antifreeze, batteries, and other harmful wastes for no charge

Grate Inlet Skimmer Boxes

- The City currently uses SunTree Technologies, Inc. Grate Inlet Skimmer Boxes in some of the stormwater inlets. These skimmer boxes capture hydrocarbons, sediment, litter, and debris (1,324 total filters in system).

City of Marco Island Facility Inspections

- Inspections of City Facilities will take place to ensure that materials that are hazardous to water are properly contained

Street Sweeping

- The City implemented a street sweeping program to reduce the amount of trash entering the stormwater system.

Employee Spill Prevention/ Hazardous Materials Training

- The City conducted a spill prevention and hazardous material training program to teach staff members methods to reduce the stormwater pollution through proper handling and disposal of dangerous materials

Fleet Maintenance

- This program provides extra training for staff members on the proper maintenance protocols for City vehicles and equipment. This focuses on proper handling and disposal of chemicals, proper storage, proper care of maintenance yards etc.

Erosion and Sediment Control Inspection Training

- Staff members will be trained and become certified as Erosion and Sediment Control Inspectors

Waterways Committee Report

The Waterways Committee plays an integral part in our Stormwater Management Plan. They were charged for the development of pamphlets, informational inserts, and other public education materials. In addition, they provided research reports on BMPs for most of the six elements in the MS4 application.

One of their most notable contributions was the presentation of their report on Best Management Practices on 1/9/20. Many of the recommendations in the report are on hold until the results of the Nutrient Source Evaluation and Assessment study are reported.

I am including their report here so citizens can see what kinds of best practices are available for consideration for use on Marco Island. The results of Dr. Harper's study will help us decide on which BMPs make the most sense for us to consider.

Best Practices Environmental and Stormwater Initiative and First Steps on Pollution Reduction and Waterbody Restoration to Meet FDEP Requirements

1. Implement the Nutrient Source Evaluation and Assessment testing program as soon as possible.
2. Enforce the existing Fertilizer Ordinance and MS4 Ordinances.
3. Step up enforcement of the ordinances by random inspecting and testing of landscapers and lawn treatment providers.
 - Implement regular canal patrols to fine homeowners and landscape contractors who violate ordinances.
4. Recommend to City Council that they amend the current Stormwater Ordinance to expand coverage to single family homes, improve pollutant removal efficiencies, and provide for penalties for failure to adhere to the Code.
5. Limit overspray of all City sprinklers on all hard surfaces, especially on City controlled property.
 - Eliminate water treatment effluent from entering the canals.
 - Ban phosphorus completely in reuse water.
6. Budget funding for street vacuuming on residential streets on Marco Island.
7. Institute an annual registration of landscape and fertilizer contractors and issuance of permits like resident beach passes and use the fees to help pay for enforcement.
8. Form a new "Department of Environmental and Stormwater Management" with adequate staffing, authority and budget empowered to work with Code Enforcement to enforce all our existing and future ordinances.
9. Immediately explore the feasibility of establishing a Marco Island Stormwater Management District funded by annual fees.
 - Over 160 Florida cities already have Stormwater management Districts including Naples, Cape Coral and Ft. Meyers.
10. Enforce the existing Stormwater and MS4 Ordinances regarding grass clippings discarded in canals and stormwater conveyance drains.

- More aggressively educate Marco citizens on the issues relating to fertilizer and the swales. Implement an immediate education program to all Marco residents and businesses.

11. Provide more funding and staffing to reconstitute the swale drainage system as originally designed for the island.

- The 2020 budget had only \$100,000 budgeted for renovating swales.
- At the current pace the City will never catch up.
- Raise all the existing stormwater outlets to allow for longer percolation.

12. Step up enforcement and inspection of new construction for code compliance and enforcement of all existing environmental ordinances.

- Require all new single family permits to be reviewed by the new Environmental and Stormwater Department.

13. Actively encourage Florida friendly landscape.

14. Demand Countywide enforcement of fertilizer Ordinances in other Collier county cities and unincorporated areas.

15. Aggressively explore state and federal grant funding for meeting FDEP requirements (Waterways Advisory Committee, 2020).

References

City of Marco Island (2015). Contract # 15-007, Resolution # 15-59, 7/20/15. *Stormwater Management Program*. Wailer Engineering Corporation, Punta Gorda FL.
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City of Marco Island (2020a). Contract 19-033. *Consulting Services for Nutrient Source Evaluation & Assessment*, 1/7/20. City of Marco Island:
<file:///C:/Users/Owner/Downloads/Contract%2019-033.pdf>. Marco Island FL.

City of Marco Island (2020b). *NPDES Annual Report. City of Marco Island*, 9/8/20, City of Marco Island, Department of Public Works, Marco Island FL.

State of Florida, Department of Environmental Protection (2020). What is a TMDL? Total Maximum Daily Loads (TMDL) Program, 12/22/20. <https://floridadep.gov/dear/water-quality-evaluation-tmdl/content/total-maximum-daily-loads-tmdl-program>. Tallahassee FL.

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