Everglades Law Center, Inc.
Defending Florida's Ecosystems and Communities

MIAMI WATERKEEPER®

February 17, 2023

Stormwater 2020 Rule Development
Florida Department of Environmental Protection
2600 Blair Stone Rd, MS 3595
Tallahassee, FL 32399

Submitted via email to Stormwater2020@floridadep.gov

RE: Comments on proposed state stormwater rule updates and draft language for ERP Applicant's Handbook

To whom it may concern:

Everglades Law Center ("ELC") and Miami Waterkeeper ("MWK") have been following the state's stormwater rulemaking process and support the comments submitted by the Conservancy of Southwest Florida and the Sanibel-Captiva Conservation Association, as well as those of Audubon Florida. We submit the following comments to provide additional context based on (1) our work reviewing the compliance of municipalities in Miami-Dade County (and unincorporated Miami-Dade County) with their municipal separate storm sewer system ("MS4") permits and (2) our review of proposed changes to Florida's Phase 1 MS4 Permit template. Our 2022 report summarizing our Miami-Dade County MS4 Permit assessment process and results is available HERE, and is attached as Appendix A.

In short, polluted stormwater is a significant contributor to nutrient water quality standard violations in Biscayne Bay, and Miami-Dade County is embarking on a multi-year, expensive process to develop a Reasonable Assurance Plan ("RAP") to address current Biscayne Bay water quality standard violations. ELC and MWK are currently meeting with municipalities to support greater MS4 permit compliance and are advocating for stronger MS4 permits as part of the ongoing permit renewal process.

However, municipalities tasked with managing stormwater within their boundaries depend on adequate regulatory protections at the state level to ensure that existing development, new development, and redevelopment are all required to design, implement, and maintain stormwater management systems that reduce the discharge of pollutants in their stormwater to the "maximum extent practicable." Because many portions of Miami-Dade County are already highly developed, it is critical that regulations address existing stormwater pollution from long-developed sites as well as proposals to develop currently undeveloped areas.

Biscayne Bay and Stormwater

Biscayne Bay is in crisis. Vast seagrass meadows have precipitously declined, and unprecedented fish kills and algae blooms have occurred over the last few years. The bay is Miami-Dade County's ecological and aesthetic jewel and sits at the heart of our community. Thousands of people sail, kayak, swim and fish its waters every year, and it is home to mangrove forests, seagrass meadows, and over a dozen threatened and endangered species. Biscayne Bay brings billions to the economy every year, supporting our real estate, tourism industries, and small businesses.

Water pollution not only causes significant harm to the bay, but it can also affect public health and our economy. Considering that Biscayne Bay contributes billions of dollars to our local economy, its health and well-being are imperative to our way of life.

Much of the pollution entering Biscayne Bay comes from land-based sources, and the municipal stormwater system is one of the most prominent pollution entry points. Individual developments have their own stormwater systems that often direct land-based pollution into local waterways and Biscayne Bay, including grease, herbicides, pet waste, fertilizers, debris, etc.

Miami-Dade County has begun collaborating with local and state partners to develop a "reasonable assurance plan" (or "RAP") to restore Biscayne Bay pursuant to standards under the Clean Water Act and Florida law with the goal of bringing waters back to meeting water quality standards. Although the current iteration of the proposed state stormwater rules would include waters with RAPs in the group of waters subject to more stringent requirements, it does not appear that the rule would include watersheds containing the canals tributary to Biscayne Bay as subject to higher stormwater treatment standards.

Development, Redevelopment, Impaired Waters and Outstanding Florida Waters

The current Miami-Dade County MS4 permit requires annual reporting about proactive inspections for illicit discharges and reactive inspections of illegal discharges when reports are received, and these reports can address stormwater discharges from properties that do not have

proper Environmental Resource Permits ("ERPs"). Each MS4 permittee must also have an inspection program for construction sites and a program to ensure projects have proper state ERP coverage. State ERP rules thus serve as the touchstone to ensure that pollutants in stormwater *after construction is finished* are reduced to the "maximum extent practicable" ("MEP").

Minimizing stormwater pollution *entering* an MS4 is critical to municipalities' efforts to reduce the discharge of pollutants *out of* their MS4s into Biscayne Bay directly and canals that drain into Biscayne Bay. Although – as discussed in more detail below – MS4 permits require local governments to review their own rules to identify opportunities to minimize stormwater pollution, current MS4 permits only require that local rules be no less stringent than state rules.

We are concerned that the language included in the current state stormwater rules falls short of ensuring stormwater from existing development, new development and redevelopment projects is minimized to the MEP to allow for the recovery of impaired waters and Outstanding Florida Waters ("OFWs") like Biscayne Bay.

We understand the proposed state stormwater rules may have continued to change, but what we have seen includes three basic standards:

- General: Stormwater systems for new developments are required to provide treatment sufficient to reduce Total Phosphorus and Total Nitrogen pollution by 80%, **or** a reduction such that the nutrient pollution burden post-development does not exceed the pre-development load, whichever provides a greater reduction, with "predevelopment" defined as the existing condition of the development site. (Applicant Handbook Vol I, 8.3.2.)
- OFWs: Stormwater systems "located within a HUC 12 subwatershed containing an OFW"are required to provide treatment sufficient to reduce Total Phosphorus and Total Nitrogen pollution by 95%, **or** a reduction such that the pollution burden post-development does not exceed the pre-development load, whichever provides a greater reduction (Applicant Handbook Vol I, 8.3.3.)
- Impaired waters: Stormwater systems "located within a HUC 12 subwatershed which contains an impaired water and located upstream of that impaired water" must reduce Total Phosphorus and Total Nitrogen pollution by 80%, **and** a reduction such that the post-development nutrient pollution burden and the pollutants not meeting water quality standards do not exceed the pre-development load. (Applicant Handbook Vol I, 8.3.4.)

These rules are problematic because they limit the reach of heightened standards for OFWs and impaired waters to specific HUC 12 subwatersheds, even though stormwater travels through canals in those watersheds in Miami-Dade County into Biscayne Bay. *Compare with* 62-40.432(2)(a)1., (2)(a)(2), F.A.C. (current rule without HUC limitation). Miami-Dade County contains multiple HUC 12 subwatersheds – including the Royal Glades Canal Watershed, the

Little River Canal Watershed, the Miami Canal Watershed, the North Biscayne Bay Watershed, the South Biscayne Bay Watershed, the Coral Gables Canal Watershed, and the Tamiami Canal Watershed, among others that drain into different parts of Biscayne Bay. Many if not all of these watersheds drain to canals and rivers that, in turn, eventually flow into Biscayne Bay. But the rivers and canals in the different HUC watersheds are generally not themselves listed as impaired for nutrients, even though Biscayne Bay is.

A significant problem we identified in our review of MS4 annual reports was that monitoring stations were not located in ways that allowed the identification of which municipalities' drainage was most likely causing nutrient water quality standard violations in Biscayne Bay. As a result, municipalities often indicated that water flowing into their jurisdictions was already polluted, and thus that the nutrient pollution leaving their jurisdictions and flowing toward Biscayne Bay could not be attributed to their land uses. To similar effect, limiting heightened protections for impaired waters to the boundaries of HUC 12 watersheds will undermine the ability of coastal municipalities adjacent to Biscayne Bay – a water that has been identified as impaired for nutrients – to address that nutrient pollution. Upstream municipalities, in watersheds that have rivers and canals that drain to Biscayne Bay but which are not listed as impaired for nutrients, will not be subject to the more protective standards.

Violation of Florida's Antidegradation Policy

New Rules Reduce Required Total Nitrogen Pollution Reductions

Importantly, these new proposals also appear to *reduce* the current standards for stormwater management systems for redevelopment projects. Instead of an 80% reduction of Total Nitrogen ("TN") in general and a 95% reduction in TN discharges to OFWs, the rules allow applicants to request approval of stormwater management systems that would reduce TN by 45% and 60% respectively. (Applicant Handbook Vol I, 8.3.5.) Only where a discharge "located within a HUC 12 subwatershed which contains an impaired water and located upstream of that impaired water" is this exception unavailable.

Florida's antidegradation policy (required by the federal Clean Water Act) stipulates:

- the "Department shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources, and all cost-effective and reasonable best management practices for nonpoint source control,"
- "highest statutory and regulatory requirements for new and existing point sources are those which can be achieved through imposition of effluent limits required under Sections 301(b) and 306 of the Federal Clean Water Act (as amended in 1987) and Chapter 403, F.S. [and f]or the purposes of this rule, cost-effective and reasonable best

management practices for nonpoint source control are those nonpoint source controls authorized under Chapters 373 and 403, F.S., and Department rules,"

- "excessive nutrients (total nitrogen and total phosphorus) constitute one of the most severe water quality problems facing the State [...and] the Department's policy [is] to limit the introduction of man-induced nutrients into waters of the State,"
- "[p]ollution which causes or contributes to new violations of water quality standards or to continuation of existing violations is harmful to the waters of this State and shall not be allowed. Waters having water quality below the criteria established for them shall be protected and enhanced…", and
- except in limited situations, no FDEP "permit or water quality certification shall be issued for any proposed activity or discharge within an Outstanding Florida Waters, or which significantly degrades, either alone or in combination with other stationary installations, any Outstanding Florida Waters…" unless "the proposed activity of discharge is clearly in the public interest" and "[t]he existing ambient water quality within Outstanding Florida Waters will not be lowered as a result of the proposed activity or discharge" except on a temporary basis during construction or within a restricted mixing zone.

62-302.300, 62-4.242(2)(a), F.A.C.

Current ERP rules, in turn, state:

- "[...D]esign and performance criteria for new stormwater management systems [... will generally a]chieve at least 80 percent reduction of the average annual load of pollutants that would cause or contribute to violations of state water quality standards [and will... a]chieve at least 95 percent reduction of the average annual load of pollutants that would cause or contribute to violations of state water quality standards in Outstanding Florida Waters."

62-40.432(2)(a)1., (2)(a)(2), F.A.C.

If Florida's antidegradation policy requires FDEP to ensure "that there shall be achieved the highest statutory and regulatory requirements for new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control," and an existing standard for a stormwater management system exists that requires an 80% reduction for nutrient pollution discharges in general and a 95% reduction for nutrient pollution discharges into OFWs, reducing that standard does not appear to comply with the antidegradation policy.

New Rules Change the Baseline for Pollution Reductions for OFWs

What is more, for OFWs like Biscayne Bay, the baseline from which reductions in water quality are to be measured is March 1, 1979, unless otherwise indicated. (Card Sound in Biscayne Bay was designated as an OFW in 1982). *See* 62-302.700(8), (9)(a) and (h).[1] But the proposed state stormwater rules set the baseline from which reductions in water quality are to be measured differently: "'Predevelopment condition' for nutrient loading determinations shall mean the average annual nutrient loading based on the land use, land cover, and other site conditions that are legally in existence at the time of the application" (Applicant Handbook Vol I, 2(90)) – potentially a much later date, and with much higher baseline pollutant loading than the date of OFW designation. Given the ongoing failure to adequately manage stormwater entering the system, this policy would have a negative, compounding effect on Biscayne Bay over time.

Need to Reduce Pollution to the Maximum Extent Practicable

Finally, as a practical matter, stormwater runoff from existing land uses is causing water quality violations and significant ecological disruptions in Biscayne Bay. End-of-pipe stormwater management system retrofits will undoubtedly be required to address Biscayne Bay nutrient pollution, but there is little space available in coastal Miami-Dade County for many end-of-pipe technologies. Significant reductions in existing stormwater runoff will also be required to restore and protect Biscayne Bay and its communities. These new state stormwater rules must set and reinforce a framework for stormwater management for new and existing developments and redevelopments that truly reduces stormwater pollution to the ***maximum*** extent practicable.

Monitoring and Inspections

Many have already raised critical concerns throughout this rulemaking process related to (1) monitoring of water quality impacts of implemented stormwater management systems and (2) inspections of stormwater management systems/BMPs as implemented. We reiterate that both of these are foundational to ensuring that systems start out working as planned/projected and continue to work as planned/projected. Our work reviewing municipalities' annual reports in compliance with their MS4 permits in Miami Dade County, together with follow up meetings

[1] *See* Rule 62-4.242(2)(c), F.A.C.:

> For the purpose of this section the term "existing ambient water quality" shall mean (based on the best scientific information available) the better water quality of either (1) that which could reasonably be expected to have existed for the baseline year of an Outstanding Florida Water designation or (2) that which existed during the year prior to the date of a permit application. It shall include daily, seasonal, and other cyclic fluctuations, taking into consideration the effects of allowable discharges for which Department permits were issued or applications for such permits were filed and complete on the effective date of designation.

and walking tours with municipalities, have made clear that systems designed to manage stormwater pollution discharges do not always function as planned.

Critically, we found that inspections and reviews may be especially needed when rainfall patterns are changing and sea level (and groundwater levels) are rising increasingly more rapidly – as is the case in parts of Florida, including Miami-Dade County. Monitoring data required by MS4 permits sometimes suggested flat or upward trends in pollutant loading when modeled assessments of stormwater pollutant loading changes over the permit period based on data about land use changes, BMPs in use, and rainfall patterns were less clear. This experience reinforces our recommendation that ***modeling alone is inadequate*** to assure effectiveness of stormwater management systems' and BMPs' effectiveness in minimizing and mitigating stormwater pollution caused by new development and redevelopment projects. Continued monitoring is needed to identify deficiencies.

Low Impact Design and Green Infrastructure Requirements

We are concerned that the proposed rules do not ***require*** the use of Low Impact Design (LID) approaches.[2] FDEP is the issuing agency for MS4 permits (as part of the federally delegated National Pollutant Discharge Elimination Service (NPDES) program. Those permits require that municipalities reduce the discharge of pollutants from their municipal stormwater systems to the "maximum extent practicable." 33 U.S.C. § 1342(p)(3)(B)(iii). As discussed above, a key part of municipalities' reducing the *discharge* of pollutants *from* their MS4s to the MEP is reducing *inflows* of pollutants *into* their MS4s to the MEP. To that end, current Phase I MS4 permits in Florida generally require municipalities to review their regulatory structures with an eye to:

> changes to the code that will promote low impact design, also termed green infrastructure: reductions in impervious surfaces, the use of swales or other retention BMPs, the incorporation of low impact development principles, reduction in flow and

[2] *See* proposed section 9.5.3. (Green Stormwater Infrastructure and Low Impact Design)(emphasis added):

> The Agencies ***encourage*** the use of Low Impact Design (LID) approaches, such as Green Stormwater Infrastructure (GSI), which can be used to supplement or replace traditional stormwater infrastructure for managing the impacts of rain and stormwater runoff. GSI and LID reduce pollution and treat stormwater by retaining rainfall near its source instead of directing it to a centralized pond or treatment system. When applied early in the design process, low impact design techniques can reduce stormwater runoff volume and pollutants generated from project sites. Thus, the use of GSI and LID may reduce stormwater treatment BMP size requirements. GSI and LID, depending on the technology, can also treat stormwater in a manner similar to a traditional BMP by treating TN and TP. Typical GSI and LID features are described in the Applicant's Handbook Volume IIs and BMP library.

volume of stormwater, increase in natural hydrology, and adherence to the principles of the UF/IFAS Florida Yards and Neighborhoods (FYN) program in new landscaping.

E.g., 2017 Miami-Dade County MS4 Permit, Permit Number: FLS000003-004. The permits then require permittees to report on a plan to implement these changes to local codes and regulations to promote reducing stormwater impacts from new development and areas of significant redevelopment. *Id.* To similar effect, MS4 permits in other states and guidance from the federal Environmental Protection Agency have also emphasized that requiring the incorporation of LID techniques and principles into new developments is a key part of reducing the discharge of pollutants to the MEP. *See* June 2022 Compendium of MS4 Permitting Approaches (U.S. EPA, available at: https://www.epa.gov/system/files/documents/2022-06/Green%20Infrastructure%20MS4%20Compendium%202022.pdf)

In short, the overarching legal requirement to reduce the discharge of pollutants from their MS4s to the MEP means that local governments must ***require*** the implementation of LID approaches in local municipal ordinances to comply with their MS4 permits. The new statewide stormwater rules should reinforce that ***requirement***, not confuse it.

* * * * * * * * * *

We appreciate the opportunity to comment on these proposed new state stormwater rules, based on our specific experience with municipal stormwater in Miami-Dade County.

Sincerely,

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Attachment 1

MIAMI-DADE COUNTY STORMWATER PERMIT (MS4) COMPLIANCE AUDIT

2022 REPORT CARD AND RECOMMENDATIONS

MIAMI WATERKEEPER®

Everglades Law Center, Inc.

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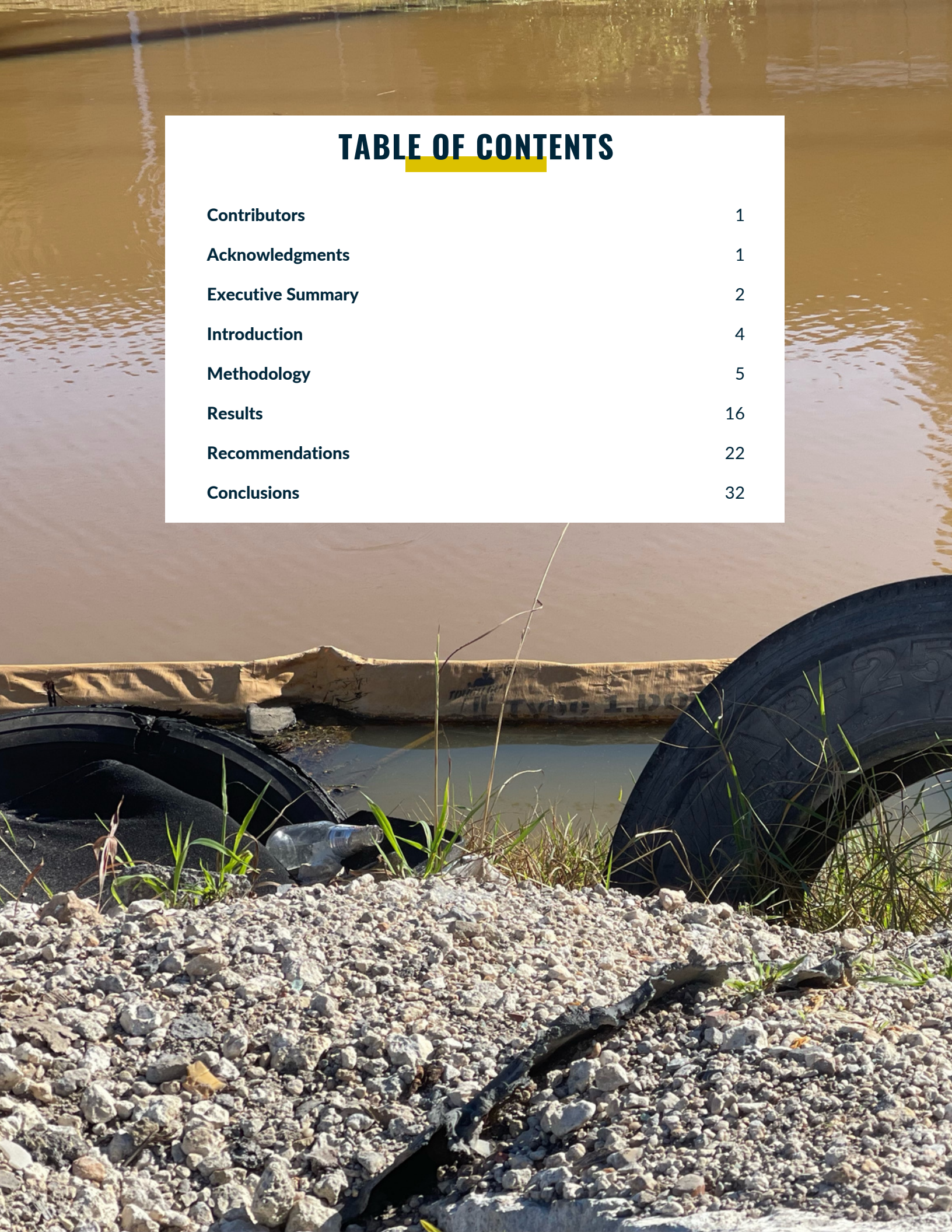

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EXECUTIVE SUMMARY

Biscayne Bay is in crisis. Vast seagrass meadows have precipitously declined, and unprecedented fish kills and algae blooms have occurred over the last few years. The Bay is our ecological and aesthetic jewel and sits at the heart of our community. Thousands of people sail, kayak, swim and fish its waters every year, and it is home to mangrove forests, seagrass meadows, and over a dozen threatened and endangered species. Biscayne Bay brings billions to the economy every year, supporting our real estate, tourism industries, and small businesses. Water pollution not only causes significant harm to the bay, but it can also affect public health and our economy. Considering that Biscayne Bay contributes billions of dollars to our local economy, its health and well-being are imperative to our way of life.

Much of the pollution entering Biscayne Bay comes from land-based sources, and the stormwater system is one of the most prominent pollution entry points. Stormwater systems direct land-based pollution into local waterways and Biscayne Bay, including grease, herbicides, pet waste, fertilizers, debris, etc. Municipal separate storm sewer systems (MS4s) are regulated under the U.S. Clean Water Act by the Florida Department of Environmental Protection (FDEP), which requires permits with mandatory requirements to operate and maintain stormwater systems. Miami-Dade County is a permit-holder, along with 32 municipalities that are Co-permittees. The City of Miami and Hialeah have their own MS4 permits.

To assess compliance with MS4 permit requirements, we reviewed the compliance and practices of all 35 Phase I MS4 operators in Miami-Dade County. Information was self-disclosed by permit-holders via public records requests and through FDEP's electronic document management system portal, Oculus. Four independent reviewers scored all Permittees using two rubrics: 1) binary compliance based on the entity's compliance with the permit terms; and 2) compliance based on a weighted scale to gauge the entity's qualitative level of compliance and implementation of best management practices.

None of the 35 MS4 permit holders in Miami-Dade County are 100% compliant with the MS4 permit requirements. Based on the binary rubric of compliance, the overall average compliance of Miami-Dade County and its 32 Co-permittees was a C- (71%), the City of Miami received a C+ (79%), and the City of Hialeah received a C (76%). Based on the qualitative compliance level, Miami-Dade County and its 32 Co-permittees was a D (67%), the City of Miami received a B+ (89%), and the City of Hialeah received a D- (61%). We found a wide disparity in compliance between Permittees. For example, 15 Permittees did not have a Stormwater Management Program (SWMP), and four Permittees had a SWMP over ten years old, indicating that 54% of the Co-permittees rely on outdated practices and technologies. When graded on the binary compliance standard, Virginia Gardens (47%), Miami Springs (47%), Sunny Isles Beach (61%), El Portal (62%), and Palmetto Bay (65%) were the lowest scoring permit holders. When graded on the qualitative compliance standard, the lowest scoring permit holders were El Portal (37%), Virginia Gardens (39%), Opa-Locka (47%), and Sunny Isles Beach, West Miami, Pinecrest, and Hialeah Gardens, tied with 57%.

MS4 permit holders must increase compliance with the letter and spirit of the permit program to curb stormwater pollution entering Biscayne Bay. Miami-Dade County should closely coordinate with Co-permittees, monitor their compliance, and ultimately ensure adherence of Co-permittees. Additionally, FDEP must conduct more regular oversight and enforcement of MS4 permit holders. To enhance water quality, we recommend improving permit terms to improve compliance. The MS4 permit for Miami-Dade County (and its 32 Co-permittees) is up for renewal in June, providing a once-in-five-year chance to improve the terms of the MS4 permit itself.

Permit Holder Grade Summaries

Percent	A) Binary Compliance Standard	B) Qualitative Compliance
90-100%	Key Biscayne, Doral	Key Biscayne
80-89%	North Miami, FDOT 6, Miami Beach, Miami-Dade County	City of Miami, Doral, Miami Beach, North Miami, Miami-Dade County, Coral Gables, Aventura, FDOT 6
70-79%	City of Miami, Coral Gables, Aventura, Cutler Bay, Miami Lakes, Homestead, Hialeah, South Miami, Medley, North Bay Village, Bal Harbour, FDOT Turnpike, Golden Beach	FDOT Turnpike, Miami Lakes, Medley, Cutler Bay, Homestead
60-69%	Miami Shores, Surfside, Indian Creek, Pinecrest, Miami Gardens, West Miami, North Miami Beach, Miami-Dade Expressway, Bay Harbor Islands, Hialeah Gardens, Palmetto Bay, El Portal, Sunny Isles Beach	Golden Beach, South Miami, North Miami Beach, North Bay Village, Bal Harbour, Miami Shores, Surfside, Miami-Dade Expressway, Miami Gardens, Bay Harbor Islands, Hialeah, Palmetto Bay
< 59%	Miami Springs, Virginia Gardens, Opa-Locka	Indian Creek, Hialeah Gardens, Pinecrest, West Miami, Sunny Isles Beach, Miami Springs, Opa-Locka, Virginia Gardens, El Portal

Table 1. A summary of permit holder grades based on the evaluation of Annual Reports.

Figure 1. An outfall discharging stormwater in Coconut Grove.

INTRODUCTION

South Florida was once a continuum of natural habitats, including wetlands, stretching from the Everglades to the Bay. Wetlands acted as a natural sink for rainwater, but as the County was developed, urbanization transformed wetlands and other natural areas into hard surfaces: roads, buildings, and compacted soil. As a result, the earth's natural capacity to absorb rain has diminished. Water moving over the land flows through stormwater management features such as exfiltration trenches, ditches, swales, and culverts and may ultimately empty into natural water bodies or groundwater. At the same time, water moving over the land encounters and carries with it pollution typical of an urban setting (chemicals, fertilizers, debris) and often enters destination waterways largely untreated, where it degrades the natural environment.

Because of the potential to carry pollution to the waters of the United States, stormwater discharge is regulated under the Clean Water Act. The Environmental Protection Agency (EPA) delegated authority to Florida to manage stormwater pollution within its borders. The Florida Department of Environmental Protection (FDEP) provides regulatory oversight to ensure that stormwater management structures are adequately designed to capture, convey, and deposit excess rainfall while retaining pollutants before entering receiving waters. This regulation is a matter of water quality and water quantity. Governmental oversight authorizes stormwater management systems to discharge water into the waters of the United States through the National Pollutant

Discharge Elimination System (NPDES) permit. The NPDES permit regulates point source releases from three potential stormwater sources, requiring one of the following permits: Municipal Separate Storm Sewer Systems (MS4s), construction activities, and industrial activities. MS4 permits authorize publicly-owned stormwater management systems (counties, municipalities, universities, the Department of Transport, etc.) to discharge water in waterways. Based on population, a Phase I permit serves urban populations of 100,000 or more, while a Phase II permit serves smaller urban populations.

Three Phase I MS4 permits authorize large municipal stormwater discharges in Miami-Dade County. The Permittees include 1) Miami-Dade County and 32 municipalities as Co-permittees, 2) the City of Miami, and 3) Hialeah. Miami-Dade County operates under a 2017 inter-local agreement with its Co-permittees which expires in September 2022, but the renewal process begins in June. The contract outlines County and the 32 Co-permittees' roles with monitoring and sampling activities required by the general NPDES permit. Permittees also perform site inspections, complaint investigations, and enforcement activities and report annually to FDEP as required by the MS4 permit conditions. The cities of Miami and Hialeah filed stormwater permit renewal requests in 2021.

Stormwater management in Miami-Dade County is essential to public health and water quality, as clean water makes Miami, Miami. Biscayne Bay is an ecological and aesthetic jewel and sits at the heart of the community.[1] With 2.8 million residents and millions of visitors every year,[2] the Bay contributes billions of dollars to the local economy. Despite existing protections, it is still impacted by ongoing pollution events, resulting in algae blooms, fish kills,[3] and declining seagrass.[4] After rain events, stormwater flows along roads and sidewalks, picking up contaminants like oil, debris, fertilizers, and pesticides and carrying them into storm drains, canals, and the Bay.

To serve as a starting point for understanding the current terms of Miami-Dade County's MS4 permit and how and to what degree municipalities comply with its terms, we performed a review of compliance with 20 key categories based on the MS4 permit terms. We developed a rubric to evaluate the County and its 32 Co-permittees, the City of Miami, and the City of Hialeah both on their compliance with the terms of the permit and how well they were managing their stormwater pollution.

METHODOLOGY

A rubric aligning with the permit requirements was developed to evaluate compliance amongst the three Phase I Miami-Dade County MS4 permit holders. The rubric has 20 categories following the basic requirements imposed on Miami-Dade County and Co-permittees under the 2017 MS4 permit FLS000003, the City of Miami under the 2016 MS4 permit FLS000002, and the City of Hialeah under the 2016 MS4 permit FLS000023. These rubric and related permit requirements can be found in Table 2. The rubric evaluated most but not all permit requirements.

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[1] Miami-Dade County. (n.d.) *About Biscayne Bay*. https://www.miamidade.gov/global/economy/environment/about-biscayne-bay.page

[2] Hazen and Sawyer (2005). Biscayne Bay Economic Study. https://www.hazenandsawyer.com/work/projects/biscayne-bay-economic-study/

[3] Miami Waterkeeper. (2021). Fish Kill in Biscayne Bay: A Report. https://d3n8a8pro7vhmx.cloudfront.net/miamiwaterkeeper/pages/5046/attachments/original/1627491061/fish-kill-report.pdf?1627491061

[4] Miami-Dade County. (2019) Report on the Findings of the County's Study on the Decline of Seagrass and Hardbottom Habitat in Biscayne Bay- Directive No. 171537 https://www.miamidade.gov/govaction/legistarfiles/Matters/Y2019/190191.pdf

Figure 2. A pollution report sent to Miami Waterkeeper of debris in the Little River.

The Permittees were evaluated based on self-reported data gathered through public records requests submitted between October 2021 and December 2021 to Miami-Dade County and its 32 Co-permittees (29 municipalities, the Miami-Dade Expressway Authority, and the Florida Department of Transportation District 6 and Turnpike Enterprise), the City of Miami, and the City of Hialeah – totaling 35 entities graded in this report. Records were received from MS4 permit holders between October 2021 and March 2022. FDEP's electronic document management system, Oculus, was also utilized to obtain records. Public records requests were sent to each permit holder for their 2020 Annual Report, all required attachments in Section V. of the Annual Report, their most recent Stormwater Management Program, and maps of their outfalls and stormwater system. Oculus was only used when the Permittee did not provide the most up-to-date Annual Report. The other records were not searched for on Oculus.

Permittees were evaluated based on self-reported data and research on Oculus for the 2020 reporting year on two scales: A) a binary compliance standard (i.e., were requirements met; yes or no), and B) a qualitative weighted scale of compliance and implementation of best management practices (i.e., a Permittee that performed street sweeping once a year would receive fewer points than another that performed street sweeping once a month). When graded on the
binary compliance standard, Permittees were given one point if the category met all requirements and did not receive any points if the requirements for the permit were not met -- except for whether or not the Permittee had a SWMP, which received two points. When graded on the level of compliance and best practices, partial credit was possible if the permit holder made an effort towards fulfilling the permit requirements, and full credit was given if there was complete or "above" compliance. Some categories included more than two points to account for a range of compliance scenarios. If a category did not apply to a Permittee (e.g., a Permittee does not have major outfalls, so they did not perform inspections), it was graded as 'not applicable' or NA, and it was not considered in that Permittees' grade. Permittees were only graded on stormwater structures they do have; the lack of a structure does not hinder their grade.

Four individuals from Miami Waterkeeper and Everglades Law Center independently evaluated all 35 Permittee Annual Reports. Since most categories are quantifiable metrics, the scores were finalized objectively. If there was a disagreement among graders, the team of four met to resolve it unanimously. Three categories in the qualitative compliance level sections are more subjective, so scores were averaged among the four graders. The subjective categories are:

1. A complete, up-to-date map of the stormwater system and outfalls
2. Implementation of public education
3. Proposed changes to the stormwater management program

After finalizing the scores for each Permittee, a map was developed to illustrate the range of MS4 permit compliance in Miami-Dade County. The map depicts red (least compliance) to blue (most compliance).

Phase I MS4 Miami-Dade County Permit Holder Rubrics

Category	Binary Compliance	Qualitative Compliance
1. Written Stormwater Management Program (SWMP)	0 - No SWMP 2 - Complete SWMP	0 - No SWMP 2 - SWMP is 11+ years old 3 - SWMP is 6-10 years old 4 - SWMP is 0-5 years old
2. Annual Report (Year 3) Submitted	0 - No Annual Report submitted 1 - Complete Annual Report submitted	0 - No Annual Report submitted 1 - Incorrect form or missing information 2 - Complete Annual Report submitted
3. Water Quality Monitoring Program Outside of Basic DERM Program	NA - Not required in the permit for municipalities	0 - No water quality monitoring 1 - Sporadic or infrequent water quality monitoring performed 2 - Frequent water quality monitoring performed
4. Submitted Required Annual Report Attachments	0 - No attachments/incomplete attachments 1 - All attachments are submitted	0 - No attachments 1 - Incomplete attachments 2 - All attachments are submitted
5. Map of the stormwater system and outfalls*	0 - No stormwater or outfalls map 1 - There are stormwater and outfall maps	0 - No stormwater or outfalls map 1 - Incomplete or out of date map 2 - Complete and current map
6. Conduct inspection for at least 33% of structural controls (dry retention, exfiltration trenches, french drains, grass treatment, swales, wet detention.)	0 - 33% inspection not met 1 - 33% inspection met	NA - Not applicable 0 - No inspection 1 - Partial inspection (< 33%) 2 - Complete inspection met (33% >)
7. Conduct quarterly inspection of pollution control boxes	0 - Quarterly inspection not met 1 - Quarterly inspection met	NA - Not applicable 0 - No inspection 1 - Partial inspection (< quarterly) 2 - Complete inspection met (quarterly >)
8.Conduct semi-annual inspection of stormwater pumps	0 - Semi-annual inspection not met 1 - Semi-annual inspection met	NA - Not applicable 0 - No inspection 1 - Partial inspection (< semi-annual) 2 - Complete inspection met (semi-annual >)
9. Conduct annual inspection of major stormwater outfalls	0 - Annual inspection not met 1 - Annual inspection met	NA - Not applicable 0 - No inspection 1 - Partial inspection (at least one inspection for some outfalls, but not all) 2 - Complete inspection met (at least one inspection per major outfall)
10. Conduct inspection for at least 10% of pipes and culverts	0 - 10% inspection not met 1 - 10% inspection met	NA - Not applicable 0 - No inspection 1 - Partial inspection (<10%) 2 - Complete inspection met (10% >)
11. Conduct inspection of at least 10% of storm sewer inlets, catch basin grates, ditches, and conveyances	0 - 10% inspection not met 1 - 10% inspection met	NA - Not applicable 0 - No inspection 1 - Partial inspection (<10%) 2 - Complete inspection met (10% >)

Category	Binary Compliance	Qualitative Compliance
12. Implementation of a litter control program for public streets, road, and highways in the Permittees jurisdiction	0 - No litter control program 1 - There is a litter control program	0 - No litter control program 1 - Monthly litter collection 2 - Weekly litter collection
13. Implementation of a street sweeping schedule	0 - No street sweeping schedule 1 - There is a street sweeping schedule	0 - No street sweeping schedule 1 - Street sweeping annually 2 - Street sweeping between annual and monthly 3 - Street sweeping monthly
14. Report on the proactive inspection program plan for identifying and eliminating sources of illicit discharges, connections, or dumping to the MS4	0 - No proactive inspections 1 - There are proactive inspections	0 - No proactive inspections 1 - The County or the City are performing proactive inspections 2 - The City performed proactive inspections
15. Reactive investigations of reports of suspected illicit discharges matches the total reports received	NA - No reports to investigate 0 - Fewer investigations than reports 1 - All reports had an investigation	NA - No reports to investigate 0 - No investigations 1 - Inspection on some reports 2 - All reports had an investigation
16. Personnel training/refresher for illicit discharges	0 - No personnel were trained 1 - Personnel were trained	0 - No personnel were trained 1 - Personnel were trained
17. Personnel training/refresher for spill prevention response	0 - No personnel were trained 1 - Personnel were trained	0 - No personnel were trained 1 - Personnel were trained
18. Implementation of public education programs*	0 - No public education implemented 1 - Public education was implemented	0 - No public education implemented 1 - Public education was implemented 2 - Several categories were utilized to promote public education
19. Inspection of all active construction sites for proper stormwater, erosion, and sedimentation BMP's	0 - No inspections of construction sites 1 - Inspection of all construction sites	0 - No inspections of construction sites 1 - Inspection of some construction sites 2 - Inspection of all construction sites
20. Proposed changes to the SWMP*	0 - No proposed changes 1 - Proposed changes were written	0 - No reflection 1 - Some reflection 2 - Reflection and proposed changes to the SWMP

Table 2. The rubric was utilized to determine 1) binary permit compliance and 2) the qualitative level of stormwater best management practices (BMPs) implemented by each Permittee. Note that because scores were based on self-reported information, the score of a Permittee may be skewed if they did not send the most up-to-date information or if incorrect information was provided. *Indicates that an average of the grades was taken in that category's B) Qualitative Compliance Level section.

The rubric's categories are explained here as follows:

1. Stormwater Management Program

Part II. of the MS4 permit requires each Permittee and any Co-permittees to have a Stormwater Management Program (SWMP) to guide each Permittee's efforts to manage its stormwater and stormwater pollution. Annual reports include sections prompting each Permittee to evaluate different parts of their SWMP, identifying strengths and weaknesses, and detailing any revisions to address shortcomings.

The MS4 permit requirements for implementing a Stormwater Management Program are as follows:

> *"Each Permittee shall implement a Stormwater Management Program (SWMP) that shall include pollution prevention measures, treatment or removal techniques, stormwater monitoring, use of legal authority, and other appropriate means to control the quality of stormwater discharged from the MS4." Part II. of the Miami-Dade County, City of Miami, and City of Hialeah MS4 Permits.*

2. Annual Report

Part VI. of the MS4 permit requires an Annual Report (AR); this is a summary of the Permittee's stormwater program submitted directly to FDEP for review and approval. All MS4 operators, including permit Co-permittees, must submit this report annually. Permit holders fill out a comprehensive overview of inspection and maintenance of stormwater management structures, public education and outreach, programs for assessing construction sites, and more. The AR informs the State of its activities and best management practices (BMPs) to reduce pollution entering nearby waterways. These annual reports formed the basis of the compliance evaluations.

The MS4 permit requirements for submitting an annual report are:

> *"Each Permittee shall prepare an ANNUAL REPORT to be submitted by no later than six months following the period covered by the report. The ANNUAL REPORT shall cover the 12-month period beginning on December 29 of each year and must be submitted no later than June 28 of each year. If a Permittee has a legal agreement with Miami-Dade County to conduct any permit requirements on its behalf, the Permittee shall obtain (and upon request, Miami-Dade County shall make available) the necessary annual report information from the County." Part VI. of the Miami-Dade County MS4 Permit.*
>
> *Similar language exists in the City of Miami and City of Hialeah permits.*

3. Water Quality Monitoring

The Miami-Dade County MS4 permit requires each Co-permittee to report annually on monitoring results and water quality trends. The permit also requires that the Year 3 Annual Report assess pollutant loading data at the Permittee's major outfalls and major watersheds. As a result, there is a requirement to compare the results to the prior permit cycle to determine whether the Permittee's SWMP is progressing toward making water quality improvements and meeting water quality standards.

The MS4 permit requirements for water quality monitoring are as follows:

> *"Each ANNUAL REPORT shall include the following:*
>
> *Status of water quality monitoring plan implementation. Status may include sampling frequency changes, monitoring location changes, or sampling waiver conditions.*
>
> *Brief discussion of the assessment program results to date which includes a summary of the water quality monitoring data and/or stormwater pollutant loading changes from the reporting year. NOTE: Results must be specific to each Permittee's SWMP.*
>
> *An analysis of the data discussing changes in water quality and/or stormwater pollutant loading from previous reporting years. NOTE: Analysis must be specific to each Permittee's SWMP. "*
>
> *Part V.B. of the Miami-Dade County, City of Miami, and City of Hialeah MS4 Permits.*

4. Annual Report Attachments

As discussed above in the Water Quality Monitoring section, 2020 Annual Reports require water quality monitoring and pollutant loading information; these must be appended to the Permittees AR. Permittees were awarded full credit if they attached the required documents outlined in the AR. It should be noted that because scores were based on self-reported information, the Permittee's score may be skewed if they did not send the correct attachments or if incorrect information was provided.

5. Map of Stormwater System and Outfalls

Permittees are required to map their stormwater systems. These maps are valuable for stormwater management because they outline an inventory of all stormwater facilities and outfalls that collect and convey water through the system. Some Permittees did not provide stormwater system maps, and it is unclear whether this was because the maps did not exist or because of some other concern, such as national security. Since the maps' completeness and age are subjective to the grader, points for qualitative compliance level were averaged among the four graders in this category for all permit holders.

The MS4 permit requirements for maps of the stormwater systems and outfalls are as follows:

> *"Maintain an up-to-date inventory of the structural controls and roadway stormwater collection structures owned or operated by the Permittee and report the current known inventory in each annual report. Provide an inventory of all known major outfalls owned or operated by the Permittee and a map depicting the location of the major outfalls (hard copy or electronic) once at the beginning of each permit cycle." Part III. of the Miami-Dade County MS4 Permit.*

6.-11. Inspection of Structural Controls

Maintaining structures is critical to improving the quality of water that is released from the stormwater system to nearby waterbodies. As mentioned above, stormwater can include significant pollution that runs off from the land and towards waterways. The inspection of these structural controls was split into six categories to represent this importance. Inspection of these controls can affect up to 30% of a permit holder's grade in the rubric in A) binary compliance standard and 29% of a permit holder's grade in B) qualitative compliance level.

Inspection of structural controls in the stormwater system and major outfalls comprises six graded categories. These categories were graded based on information directly found in the permit holder AR reported to FDEP.

Part II. Table II.A.1.a of the Miami-Dade County MS4 Permit states:

- *Dry Retention, exfiltration trench/french drains, grass treatment, swales, wet detention - at least 33%*
  - *New structure: annually first 2 years of operation*
  - *Existing—with no problems: Every 3 years*
  - *Existing—with chronic problems: every year until the problem is fixed*
- *Pollution Control Boxes - Quarterly*
- *Stormwater Pumps - Semi-Annually*
- *Major Stormwater Outfalls - Annually*
- *Pipes/Culverts - inspect a minimum of 10% of the total number of structures each year. All structures must be checked at least once over 2 consecutive permit cycles (i.e., 10 years)*
- *Storm sewer inlets, catch basin grates, ditches, and conveyances - inspect a minimum of 10% of the total number of structures each year. All structures must be checked at least once over 2 consecutive permit cycles (i.e., 10 years)*

12.-13. Implementation of a Litter Control Program and a Street Sweeping Program

The litter control program is to take place at municipally-operated highways and streets within each Permittee's jurisdictional area. The program requires metrics on the frequency of litter collection activities, an estimate of the total number of road miles cleaned, the amount of area covered by the activities, the method for documenting the litter control program activities, and an estimate of the quantity of litter collected.

The street sweeping program is necessary to remove small particles of debris from streets and roadways. The reporting requires the frequency of sweeping, total miles swept, an estimate of the quantity of sweepings collected, and the estimated pounds of total nitrogen and total phosphorus removed by the sweeping.

Part III.A.3 of the Miami-Dade County MS4 permit states:

"Implement a litter control program for public streets, roads, and highways, including rights-of-way operated by the Permittee; and procedures to properly dispose of collected material. Implement the program on a monthly, or on an as-needed, basis."

"Implement and report on a street sweeping program for highways and streets, including rights-of-way, with curbs and gutters operated by the Permittee."

14.-15. Proactive and Reactive Inspection Programs

The Miami-Dade County MS4 permit requires annual reporting about proactive inspections for illicit discharges and reactive inspections of illegal discharges when reports are received. Permittees received partial credit (1 point) for reactive inspections if they responded to some, but not all, reports of illicit discharges under B) of the rubric. Miami-Dade County Co-permittees were awarded an extra point in B) of the rubric for proactive inspections if they implemented a proactive inspection program and did not simply rely on the County's proactive inspections.

Part III.A.7.c of the Miami-Dade County MS4 permit states:

"Each municipality must have the legal authority to conduct inspections, conduct monitoring, control illicit discharges, illicit connections, illegal dumping, improper disposal and spills into the MS4 and to require compliance with conditions in ordinances, permits, contracts, and orders, including authority to take legal action to eliminate illicit discharges or connections. Municipalities must continually assess non-stormwater discharges to the MS4 to ensure compliance with the MS4 permit."

"Municipalities must implement both proactive and reactive inspection programs to inspect the MS4 and identify and eliminate sources of illicit discharges, illicit connections, illegal dumping, improper disposal, or other sources of non-stormwater to the MS4."

16.-17. Personnel Training

As part of the proactive inspection program, the permit expects that permit holders conduct training and annual refreshers for appropriate Permittee personnel on proper spill prevention, containment, and response techniques and procedures. They must report the kind of training and the total personnel that are trained. The rubric did not differ in A) or B) because the team determined that COVID safety protocols made it too difficult to determine how to weigh different approaches to training during the pandemic.

MS4 permit personnel training requirements are as follows:

"Implement a training program for the training of all appropriate Permittee personnel and ensure contractors employed by or under contract with the Permittee have been appropriately trained (including field crews, fleet maintenance staff, and inspectors) to identify and report conditions in the stormwater system that may indicate the presence of illicit discharges/connections/dumping to the MS4." Part III.A.7.c of the Miami-Dade County MS4 permit.

"Implement a training program for the training of all appropriate Permittee personnel and ensure contractors employed by or under contract with the Permittee have been appropriately trained (including field crews, firefighters, fleet maintenance staff and inspectors) on proper spill prevention, containment, and response techniques and procedures." Part III.A.7.d of the Miami-Dade County MS4 permit.

18. Implementation of Public Education Programs

Public education constitutes an essential requirement of an MS4 permit. However, tracking these activities was challenging during COVID-19, particularly as the Year 3 Annual Reports tracked compliance during COVID-19's initial outbreak. Noncompliance was often tied to COVID-19 protections, and we thus reasoned that heavily weighting noncompliance for these items would be unreasonable. Therefore, points for qualitative compliance levels were averaged among the four graders in this category for all permit holders.

MS4 permit public education requirements are as follows:

"Implement a public education and outreach program to promote, publicize, and facilitate public reporting of the presence of illicit discharges and improper disposal into the MS4. The Permittee shall maintain and publicize a phone line for public reporting of suspected illicit discharges and improper disposal. The Permittee shall also disseminate information on the problems associated with illicit discharges, illicit connections and improper disposal, how to identify them, and how to report incidents discovered." Part III.A.7.f of the Miami-Dade County MS4 permit.

19. Inspection of Active Construction Sites

Each Permittee must report on the inspection program for privately operated and Permittee-operated construction sites. This report includes the number of active construction sites during the reporting year, the number of inspections of active construction sites, the percentage of active construction sites inspected, and the number and type of enforcement actions/referrals taken. Partial credit was awarded in B) if the Permittee made an effort to inspect construction sites and full credit was given when all construction sites were inspected.

MS4 permit requirements for inspection of active construction sites are as follows:

"Implement a construction site inspection program for stormwater, erosion, and sedimentation inspections of construction sites discharging stormwater to the MS4. The plan shall apply to both Permittee-operated and privately operated construction projects discharging into the Permittee's MS4 unless the Permittee does not have the ability to obtain the legal authority to inspect privately-operated sites. For FDOT District Six, FDOT Florida's Turnpike Enterprise, and Miami-Dade Expressway Authority, privately-operated sites are those sites within FDOT's or MDX's right-of-way that were issued a DCP or MDX Special Permit; construction inspections are outfall inspections." Part III.A.9.b of the Miami-Dade County MS4 permit.

20. Proposed Changes to the Stormwater Management Program

Annual reporting forms include two basic locations that request both feedback on the strengths and weaknesses of each Permittee's SWMP. The input allows suggested changes to address weaknesses in the SWMP. The first is at the end of each section reporting MS4 programs (maintenance, inspections, education, etc.). The second is at the very end of the form. Permittees must use these sections to evaluate and propose appropriate changes to SWMP programs to ensure the discharge of stormwater pollution is reduced – as required – to the maximum extent practicable. Points for qualitative compliance level were averaged among the four graders in this category for all permit holders.

Section VIII. of the Annual Report form states:

> *"Proposed Changes to the Stormwater Management Program Activities Established as Specific Requirements Under Part III.A. of the permit (Including the Rationale for the Change)" Section VIII. of the Annual Report Form*

Figure 3. Pollution found at a storm drain in the City of Hialeah.

RESULTS

Overall Scores

When graded on A) binary compliance standard, the average of Miami-Dade County and its 32 Co-permittees was a C- (71%), the City of Miami received a C+ (79%), and the City of Hialeah received a C (76%). When graded on B) qualitative compliance, the overall average of Miami-Dade County and its 32 Co-permittees was a D (67%), the City of Miami received a B+ (89%), and the City of Hialeah received a D- (61%). It is important to note that, although some of these Permittees did exhibit high levels of compliance, no single permit holder was 100% compliant with the Phase I MS4 permit, based on the graded ARs. For example, Key Biscayne, one of the two highest scoring Permittees with a 95% in A), still did not propose improvements to its SWMP, so they, too, did not receive a 100% in this rubric. There is a broad range of compliance scores among the Permittees with A) ranging from 44-95% and B) ranging between 37-93%. Tables 3 and 4 present each rubric's highest and lowest overall scoring permit holders. To view all of the Permittee's grades, see Table 5.

Highest Scoring Permit Holders	Percentage	Lowest Scoring Permit Holders	Percentage
Key Biscayne	95%	Palmetto Bay	65%
Doral	95%	El Portal	62%
North Miami	89%	Sunny Isles Beach Florida	61%
FDOT District6	81%	Miami Springs	47%
Miami Beach	80%	Virginia Gardens	47%
Miami Dade County	80%	Opa-Locka	44%

Table 3. The highest and lowest scoring permit holders, when graded on the A) binary compliance standard rubric.

Highest Scoring Permit Holders	Percentage	Lowest Scoring Permit Holders	Percentage
Key Biscayne	93%	Hialeah Gardens	57%
City of Miami	89%	Pinecrest	57%
Doral	87%	West Miami	57%
Miami Beach	85%	Sunny Isles Beach	57%
North Miami	82%	Miami Springs	49%
Coral Gables	82%	Opa-Locka*	47%
Miami Dade County	82%	Virginia Gardens	39%
		El Portal	37%

Table 4. The highest and lowest scoring permit holders, when graded on the B) qualitative compliance level rubric.

Phase I MS4 Permittee Grades

Municipality	A) Binary Compliance Standard	B) Qualitative Compliance
Aventura	79%	81%
Bal Harbour	72%	65%
Bay Harbor Islands	65%	61%
City of Miami	79%	89%
Coral Gables	79%	82%
Cutler Bay	78%	70%
Doral	95%	87%
El Portal	62%	37%
FDOT 6	81%	80%
FDOT Turnpike*	71%	75%
Golden Beach	71%	69%
Hialeah	76%	61%
Hialeah Gardens	65%	57%
Homestead	76%	70%
Indian Creek	69%	58%
Key Biscayne	95%	93%
Medley	72%	73%
Miami Beach	80%	85%
Miami Gardens	67%	62%
Miami Lakes	76%	74%
Miami Shores	69%	64%
Miami Springs	47%	49%
Miami-Dade County	80%	82%
Miami-Dade Expressway	65%	63%
North Bay Village	72%	67%
North Miami	89%	82%
North Miami Beach	65%	68%
Opa-Locka*	44%	47%
Palmetto Bay	63%	60%
Pinecrest	67%	57%
South Miami	75%	68%
Sunny Isles Beach Florida	61%	57%
Surfside	69%	64%
Virginia Gardens	47%	39%
West Miami	67%	57%

Table 5. Grades of Permittees based on both categories of A) compliance and B) qualitative compliance level. Scores were unanimously decided on by four graders, with three categories averaged in B) qualitative compliance. *Indicates that the 2019 annual report was graded rather than the 2020 annual report submitted to FDEP.

1. Stormwater Management Program

Of the 32 County Co-permittees, many did not have a written SWMP. Fourteen municipalities and the Miami-Dade Expressway Authority (MDX) (45% of the Co-permittees) lacked a written SWMP. The Florida Department of Transportation (FDOT) noted that they are not required to have a SWMP in their annual report. A written SWMP ensures that a Permittee-specific plan is set in place for pollution prevention measures, treatment or removal techniques, stormwater monitoring, and other appropriate means to control the quality and quantity of stormwater that is discharged from the MS4.

Both the Cities of Miami and Hialeah did have a written SWMP. Of the written SMWPs reviewed, we noted that they varied broadly among the Permittees, both in content and in age/version date. The dates of written SWMPs ranged from 1999 to 2021. Four Permittees had SWMPs over ten years old: Hialeah (1999), El Portal (2002), Miami Gardens (2007), and Cutler Bay (2008); conversely, seven Permittees had SWMPs less than five years old: Miami (2021), North Miami Beach (2020), Palmetto Bay (2020), Miami Lakes (2019), Aventura (2017), and Medley (2017). Miami-Dade County updated its stormwater management program in 2021 as well.

Older SWMPs indicate that municipal stormwater practices likely do not encompass technological advances, account for sea-level rise, or address the more recent public concerns about stormwater management's implications on environmental and water quality.

2. Annual Report

All Permittees were graded based on the Year 3 (2020) report, except Opa-Locka and the FDOT Turnpike. Opa-Locka submitted the 2020 AR on an incorrect form that could not accurately be graded on the rubric, so the 2019 AR was used instead. As a result, Opa-Locka received no credit for having an annual report in the binary compliance standard but received partial credit in B) qualitative compliance level based on the information reported in their 2019 AR.

FDOT responded to the public records request with information regarding FDOT District 6 but did not provide records for the Turnpike Enterprise, due to potential confusion in the records request language. We, therefore, searched Oculus and were only able to locate the Year 2 AR for the Turnpike, which was graded instead. FDOT's Turnpike Enterprise received full credit in this category.

Five Permittees (Hialeah Gardens, Palmetto Bay, Sunny Isles Beach, Miami Springs, and Hialeah) did not receive full credit in qualitative compliance level due to missing information throughout the report (i.e., not filling out all parts of the report, missing attachments, etc.) These Permittees received 1 point for partial credit.

3. Water Quality Monitoring

The vast majority of Permittees defer to Miami-Dade County's assessment program, including the City of Hialeah, even though they are not Co-permittees. Still, many fail to discuss the specific relevant results in their municipality as required by their MS4 permits. Three Co-permittees have recognized that they need additional monitoring data to ascertain whether their SWMPs result in water quality improvements or contribute to water quality standard violations and have implemented supplemental monitoring plans.

The qualitative compliance level category evaluated whether a Co-permittee went above and beyond the County's monitoring data to conduct their own. Therefore, this did not apply to Miami-Dade County. Since the County does its monitoring, it cannot get credit for an additional monitoring program. Additionally, the Cities of Miami and Hialeah are not Co-permittees on the County MS4 permit; as such, the qualitative compliance rubric does not apply to them. A total of three Permittees out of the 32 Co-permittees performed their own water quality monitoring regularly: Coral Gables, Key Biscayne, and Miami Beach. The City of Coral Gables is involved with a tide gauge sediment evaluation study with Florida International University and an assessment of water quality and habitat conditions in the Coral Gables Waterway to inform management and restoration efforts. The Village of Key Biscayne has a monitoring program[5] focused on bacteria and nutrient sampling to supplement the data collected by the County. The City of Miami Beach has a robust water quality sampling program[6] that allows them to identify potential water quality issues and make informed decisions.

4. Annual Report Attachments

Of the 35 reviewed reports, six Permittees (Miami Shores, North Bay Village, Palmetto Bay, West Miami, Pinecrest, and El Portal) did not include the required attachments in response to the public records request and therefore received no credit in either category. Seven Permittees (Miami Lakes, Sunny Isles Beach, Surfside, North Miami Beach, Miami, Miami Springs, and Opa-Locka) received partial credit in the qualitative rubric although they did not self-disclose any attachments in the public records request, the detailed information in their report presented that these attachments existed. A total of 21 Co-permittees and entities received full credit in both categories.

5. Map of Stormwater System and Outfalls

Many Permittees did not share maps of their stormwater systems or only shared old and incomplete maps. A total of 24 Permittees did not receive full credit in B) qualitative compliance level for this metric. The lack of accurate stormwater system maps calls into question whether reported maintenance actions are accurate or encompass all of their stormwater infrastructures. Five Permittees did not submit maps in response to the public records request (Cutler Bay, Bal Harbour, Pinecrest, Miami Springs, and Virginia Gardens). Only 11 of the 25 permit holders received full credit for the stormwater system and outfall maps.

The City of Coral Gables noted that its Public Works Department was working on a Geographic Information Systems (GIS) database to facilitate stormwater maintenance. Additionally, Miami Lakes specified that one of their limitations was the need to continue mapping their system. A revision to address this was by purchasing an asset management system to "update its existing GIS files for better asset tracking and maintenance operations."

6.-11. Inspection of Structural Controls

There is a wide variation in MS4 inspection and maintenance reporting among Permittees. Several Permittees reported stormwater management structures that did not fit into categories on the forms (e.g., weirs, canals). In many cases, reporting across categories was grouped in ways that made it difficult, if not impossible, to determine whether a Permittee met minimum compliance standards. Sometimes reporting was done in ways that did not allow for assurance that minimum maintenance requirements were met.

[5] Miami Waterkeeper is sub-contracted by FIU for the Coral Gables Waterway study.

[6] Miami Waterkeeper is contracted to sample and analyze fecal indicator bacteria at four sites in Key Biscayne.

A total of ten Permittees received full credit in all six categories of inspections (including Permittees that do not have a specific structure but were marked as NA). These ten Permittees are Coral Gables, Doral, Golden Beach, Key Biscayne, North Bay Village, Palmetto Bay, Sunny Isles Beach, MDX, Homestead, and Bal Harbour. Only one Permittee, Key Biscayne, had all six types of structures and was compliant with the permit requirements for reporting detailed structural inspections. Key Biscayne complied with each inspection category, but it also inspected structures such as major outfalls, pipes, and culverts after every major storm. On the other hand, El Portal only has two of the six categories of structures, but the total of each structure category is unknown, and it did not perform any inspections. El Portal claims to have cleaned the entire system in 2017, but this is not adequate for permit compliance. As noted in the permit in the methodology, a certain percentage of each structure category is required to be inspected annually.

Reporting from some Permittees suggests that they recognize the need for improvements in how system maintenance is tracked and documented. Some Permittees conceded that, while they believed they maintained their systems, their recordkeeping was inadequate. And at least one Permittee, Homestead, recognized that it needed to automate reporting on maintenance activities for tracking purposes.

12.-13. Implementation of a Litter Control Program and a Street Sweeping Program

All Permittees have a litter control program established except for Bal Harbour, which claims that this is performed along with street sweeping. Because street sweeping and litter control are separate programs required by the permit, Bal Harbour received no credit for this category. Miami-Dade County and West Miami are the only two Permittees that do not perform weekly litter collection; instead, it is collected 20 times per year by the County and quarterly by West Miami.

Most Permittees, 29, reported street sweeping at least once a month. Three Permittees (Miami-Dade County, Virginia Gardens, and Hialeah) street sweep less frequently. Three Permittees do not appear to be required to street sweep by the permit because they do not have "curb or gutter" streets (El Portal, Palmetto Bay, and Pinecrest).

14.-15. Proactive and Reactive Inspection Programs

Proactive Inspections

Reporting across the various municipalities that are Co-permittees indicates broad variation in programs across these areas and how Permittees report about their programs. Proactive inspections are expected to be performed by both the County and its Co-permittees. Of the County's 32 Co-permittees, Miami-Dade County was reported to have held proactive inspections within 16 municipalities; 11 of these municipalities also performed their own proactive inspections (there was a wide range – from one to over 150 inspections – in how many proactive inspections were done by different Co-permittees). A total of nine municipalities did their own proactive inspections but reported no County proactive inspections. No proactive inspections were clearly reported to have occurred within seven Permittees by either the municipality or the County. Although five of these seven Permittees (Golden Beach, Palmetto Bay, MDX, Virginia Gardens, and Opa Locka) noted that they relied on DERM to perform proactive inspections, they did not report (as required) the number of the County's inspections in this category nor other details. The other two municipalities (Bal Harbour and El Portal) only marked zero inspections. These seven municipalities received no credit in this category due to a lack of proactive inspections.

The County reported 2,400 proactive inspections but did not report any observations of illicit discharges; however, the County also reported seven notices of violation/warning letters that were issued for illicit discharges found during proactive inspections. The City of Hialeah reported four proactive inspections during the reporting period between June 2020 and June 2021. The City of Miami reported 1,887 proactive inspections performed by the City's Public Works department and the County between November 2019 and November 2020.

Reactive Inspections

Many municipalities – 19 of 32 Miami-Dade County MS4 Co-permittees and the City of Hialeah – claim to have received no reports of illicit discharges. Opa-Locka received no credit in this category because this report section was left entirely blank. The City of Miami received partial credit in B) qualitative compliance level because only 32% of the reports of suspected illicit discharge had a reactive investigation performed. Medley received partial credit due to a conflict in the report, where zero reports of suspected illicit discharge were received, but 21 reactive investigations occurred; the evaluators questioned the accuracy of these metrics and were unsure of the total reports received by Medley. Of the Co-permittees, 12 received and investigated 100% of the reports of suspected illicit discharge (Miami Beach, Hialeah Gardens, Aventura, Coral Gables, Doral, Key Biscayne, Miami Gardens, North Bay Village, Homestead, and FDOT District 6).

16.-17. Personnel Training

Each Permittee is expected to report the training activities and the number of Permittee personnel and contractors trained in each AR. Six Permittees did not host personnel training for either category (illicit discharges or spill prevention and response). Three of the six Permittees (Aventura, North Miami Beach, and Miami Springs) did not provide training due to COVID-19. The other three Permittees (Bay Harbor Islands, Palmetto Bay, and MDX) marked zero training in the AR. The Cities of Miami and Hialeah and 16 Co-permittees trained personnel in both categories. Five Co-permittees only trained personnel in illicit discharges, while six only trained personnel in spill prevention and response.

It was found that five Permittees (Coral Gables, Golden Beach, Key Biscayne, Miami, and Miami Beach) rely on their fire department to ensure compliance with training personnel in spill prevention and response. Two Permittees, Bal Harbour and Sunny Isles Beach, relied on their police department to fulfill this permit requirement. It could make economic and practical sense for other Permittees to invest in their city departments to meet these permit requirements as opposed to paying outside contractors to perform the services.

18. Implementation of Public Education Programs

There are a number of public education activities that Permittees can use in their program (public service announcements on the radio or television, distributing information through newsletters or brochures, hosting community presentations, having a page about stormwater management on their website, etc.) FDOT and MDX are both exempt from this requirement based on the permit. Five of the Co-permittees did not engage in public education (South Miami, Miami Gardens, Sunny Beach Isles, Bal Harbour, and Virginia Gardens). Category B) qualitative compliance level was averaged among evaluators due to its subjectiveness; eight Co-permittees and the City of Miami received full credit in this category.

It should be noted that El Portal and Indian Creek received credit in compliance with the permit in A) binary compliance standard, but they both received a score less than 1 in B) qualitative compliance level. El Portal

reported that one brochure/flyer/fact sheet was distributed, and there was one activity to publicize the Miami-Dade County Chemical Collection program in 2020. Indian Creek reported that one brochure was created that was distributed at one 'special event' to 40 participants. Although COVID-19 hindered public education in 2020, other Permittees reached out to their communities through other methods. North Miami's AR specifically mentioned that in-person events were canceled due to the pandemic, but it distributed 2,000 brochures and had daily public service announcements on television.

19. Inspection of Active Construction Sites

All ARs were unclear in reporting construction inspection programs in terms of the total times a site was inspected or when it was inspected, although construction runoff has emerged as a significant source of stormwater pollution. Miami Beach commented that there was an average of three inspections of each active construction site during the project's life, but even this detail of reporting is in the minority. Seven Co-permittees are not compliant with this permit requirement; Miami Springs, Opa Locka, and Sunny Isles Beach left this section of the AR blank. At the same time, Indian Creek and Miami Gardens did fill out the section but marked 0% inspected and "unknown," respectively. FDOT District 6 and North Miami Beach did not inspect all active construction sites but received partial credit in qualitative compliance level because they inspected some active construction sites.

20. Proposed Changes to the Stormwater Management Program

Each permit holder is expected to reflect on the metrics provided in the AR and present proposed changes to the SWMP. Of the 35 entities reviewed, only two addressed possible improvements. Aventura noted two recommended modifications, 1) the new City Florida Friendly Fertilizer Ordinance[7] and 2) expanding public education to parks and private development displays. Medley wrote a detailed evaluation of its SWMP, including the need to document maintenance activities more efficiently and continue involving Code enforcement at sites not meeting MS4 and NPDES regulations. This section is not applicable during the Year 4 AR, so this does not apply to the City of Miami because its permit is slightly off-cycle from Miami-Dade County's and its 2020 AR covered the fourth year of its permit terms.

RECOMMENDATIONS

Permit requirements are designed to reduce the discharge of pollutants from municipal stormwater management systems to the "maximum extent practicable," effectively prohibit non-stormwater discharges from these systems, and meet water quality standards in receiving waters. Our review of Miami-Dade County MS4 Permit 2020 Annual Reports demonstrated widespread noncompliance with current permit requirements.

Overall, compliance with the MS4 permits by the 35 Miami-Dade County permit holders is low (average grade of C- for compliance level, D for quality of compliance). While some permit holders may be accomplishing the letter of the permit (i.e., they have a stormwater management plan), even fewer are adhering to the spirit of the permit (i.e., that plan may be over ten years old). A few municipalities are achieving near-total compliance (Key Biscayne and Doral at 95% compliance), but none are at 100% compliance. Most receive sub-satisfactory scores in binary compliance and qualitative analysis: 16 Permittees have less than 70% compliance in both rubrics. The category with the lowest compliance was "proposed changes to the SWMP," which was only fulfilled by the City of

[7] The Miami-Dade County Florida Friendly Ordinance had not yet come into effect when Aventura submitted their Year 3 AR.

Aventura and Medley. Providing a SWMP and complete and updated maps of the stormwater system and major outfalls also had among the lowest compliance levels. The lack of compliance documented contributes to increased stormwater pollution; it harms Biscayne Bay's fragile and valuable ecosystem, thus diminishing the benefits that Biscayne Bay can provide to the community. We recommend improving compliance, oversight, enforcement, and the terms of the MS4 permit itself, which is up for renewal this year. This new, five-year permit cycle presents an opportunity to examine key enhancements to achieve water quality benefits.

Improving MS4 Permit Compliance

The FDEP, as the MS4 program administrator, has the oversight responsibility to provide support, assist with compliance, and ultimately enforce the permit terms and conditions. We consulted Oculus for compliance records and examined the five lowest-performing municipalities. We found that enforcement actions, where they were started or attempted, were ineffectual at gaining full compliance. For example, FDEP repeatedly asked certain Co-permittees for standard information, such as annual reports and details about maintenance and other activities required therein. Yet FDEP follow-up and warning letters appear unheeded by certain Co-permittees. Opa-Locka provides an example of this. FDEP has issued warnings since 2005 to the City of Opa-Locka for multiple violations, even indicating that the City could be subject to civil penalties of up to $10,000/day for violations. The last correspondence in Oculus between FDEP and Opa-Locka is March 14, 2022, when FDEP requests City officials to set up a meeting with the State within ten days. The FDEP explicitly states that they cannot reissue a new MS4 permit without addressing the City's outstanding compliance items. At the time of this report, there is no record of Opa-Locka responding and no record of FDEP follow-up.

After reviewing each municipality's AR in-depth, we find that more proactive FDEP engagement is needed and suggest more detailed engagement that would cover the items below that we identified as critical to permit compliance. An annual AR training should also require Miami-Dade County and Co-permittees to attend and provide an overview of its written report of monitoring and sampling activities. This event might be well-received by municipalities that may have experienced staff turnover and are seeking to comply with the permit and find the annual report form daunting.

All requirements in the current MS4 permits must be met. However, we highlight below a few areas critical to minimizing stormwater pollution and meeting water quality standards.

1. Up-to-date, Written SWMPs

Although the current permit is not as explicit as it should be to meet the requirements in the permit, **Permittees must have written SWMPs,** and yet many do not. FDEP should offer assistance to municipalities to ensure they have written SWMPs that are complete and up-to-date; SWMPs could be discussed in detail during an annual training. Additionally, FDEP could consider creating a written SWMP template for MS4 Phase I Permittees.

2. Water Quality Monitoring

Although the current permit requires **individualized, jurisdiction-specific assessment of water quality monitoring data generated by Miami-Dade County**, many Co-permittees do not analyze their jurisdiction-specific data. Instead many simply reference Miami-Dade County's report. The Co-permittees' ARs that do include specific analyses of jurisdiction-specific data, by contrast, are instructive about how more detailed assessment can drive iterative improvement. These analyses can highlight instances where monitoring stations a

are not situated in locations to allow a clear evaluation of the impact of a specific municipality's stormwater discharges on water quality and provide opportunities for municipalities to explain why a particular location might have elevated levels of a specific pollutant. For example, Medley did a jurisdiction-specific assessment of water quality data based on two nearby monitoring stations. However, as it sought to explain some of its results, it noted: "The LR10 monitoring station is located downstream from MR15, inside the Town of Hialeah Gardens. While the station is in close proximity to the Town of Medley, it is not a good indicator of the pollutant loads from Medley as the pollutants it measures come from Hialeah Gardens."

3. Reviews and Inspections

Many Permittees fail to investigate illicit discharges, adequately review construction applications, or inspect active construction sites. The current permit requires Permittees to 1) report detailed information about proactive and reactive investigations to identify and correct illicit discharges to their stormwater management systems; 2) review proposed private construction activities to ensure compliance with local codes and state/federal permit requirements, and 3) create and implement a construction inspection program to ensure that approved construction activities are implemented in accordance with approved plans and permits. **Required reporting must be more detailed than is currently being implemented in terms of when and how illicit discharge inspections are performed; whether proposed construction activities are properly reviewed to ensure compliance with local, state, and federal permitting requirements; when construction activities are inspected; and how often and how enforcement of requirements is ensured.**

Construction runoff has been a major source of visible stormwater pollution during the past year, leaving large, turbid plumes streaming into Biscayne Bay (see Figure 4). Some construction sites had incidents of failing to control runoff, including the Aston Martin construction site in downtown Miami and the FDOT I-395 bridge project, some of which resulted in Notices of Violation. Identifying and preventing illicit non-stormwater discharges is critical for minimizing the discharges of untreated pollutants into our waters. Ensuring that proposed construction activities obtain coverage under state and federal permits helps ensure compliance with best management practices to reduce stormwater pollution.

Figure 4. A pollution report of a sediment plume was sent to Miami Waterkeeper. This construction runoff is coming from the FDOT I-395 bridge project on September 2, 2021.

4. Stormwater System Maintenance Reporting

Permittees must do **annual maintenance reporting in a format sufficient to allow reviewers to ensure that they are meeting minimum inspection and maintenance requirements**. Annual reports sometimes describe structures in ways that do not conform to permit categories or group reporting about structure maintenance in ways that combine structures with different maintenance requirements under the MS4 permit. To ensure reporting is in a form that allows for a compliance assessment, FDEP should offer annual training on how to fill out an Annual Report form to municipalities and their consultants.

5. Litter Control and Street Sweeping

Annual reports must be clear about the frequency and scope of litter control and street sweeping, **sufficient to allow an evaluation of what is being swept and/or collected and where (e.g., roads, public parks, public parking lots).**

6. Stormwater System Map

Although the current permit requires a map of the MS4 and annual reporting of the stormwater management structures in each Permittee's MS4, many Permittees appear not to meet this requirement. **An up-to-date, complete map of the MS4 is critical to allow adequate maintenance, inspections for illicit discharges, and assessment of impacts of the MS4 on water quality.** The FDEP should offer compliance assistance to permitted MS4 operators who do not report the current, up-to-date inventory/map of the MS4 system components, working collaboratively with any county-level Co-permittee to aid those municipalities who lack the resources to accomplish this.

7. Iterative Improvement

The current permits require general reporting on potential improvements related to all aspects of the SWMP (e.g., maintenance activities, inspections, permit reviews, public information, and training). However, most Permittees do not utilize this opportunity to offer suggestions to improve their compliance or to reduce discharges through their system, even where they document inadequacies in their programs. The few Permittees who have done this help illustrate how this reporting can form the basis for new approaches to reducing pollution and improving water quality. For example, Aventura is one of the few Co-permittees to do a deep dive into water quality data specific to its jurisdiction. Aventura's Year 3 AR notes that, while ammonia was decreasing over time at the one monitoring station in the city, phosphorus had been increasing. Comparing these data, the city concluded that the cause of the increases in total phosphorus "is probably not from organic matter, which also contains high levels of nitrogen, but due to the use of fertilizers." (Aventura Year 3 AR, Attachment 1). Aventura continued with a discussion of how to address this continuing issue with improvements to its SWMP, stating that the results "indicate[] that methods used to reduce Phosphorus have not been effective [and…] that other Best Management Practices (BMPs) should be implemented to decrease the existing concentration." And so it proposed new BMPs – in particular, a new fertilizer ordinance and expansions of its public education programming in one section of the permit. It also noted that it had already increased street sweeping and would continue that work.

The current MS4 permits also require Co-permittees to suggest specific changes focused on reductions in pollutant loadings in the Year 4 AR. Co-permittees must include these detailed plans for iterative improvement of water quality and pollutant loading in their Year 4 ARs to be submitted this summer (2022).

Improving MS4 Permit and the County Inter-local Agreement

In addition to improving compliance with current MS4 permit terms, the renewed MS4 permits must be strengthened. The new MS4 permit will be renewed this Fall with the renewal process starting in June. This presents a rare opportunity to improve the MS4 permit itself. Additionally, the County Interlocal Agreement should be strengthened when it is re-issued after it expires on September 30, 2022. We highlight below some key areas for improvement.

1. Stormwater Management Programs

Given our rapid urbanization, the pace of population growth, the state of our watershed, and climate change challenges, the MS4 permit should be updated to require that written SWMPs must be updated every five years. For those Co-permittees operating under the auspices of the County permit and who may not have the resources to create a SWMP or update their SWMP every five years, the County should work collaboratively to offer assistance to meet this important standard. Moreover, the FDEP should offer assistance and enforce failures to provide adequate SWMPs.

The MS4 permit should be updated to more explicitly require *written* SWMPs during the permit application for all applicants. SWMPs should be required to include clear water quality goals, metrics, iterative improvement evaluations, and plans to meet those goals in the same way they currently evaluate and address flood risks.

FDEP must set quantitative standards and procedures to measure progress toward water quality compliance within the permit.

2. Water Quality Monitoring/Pollutant Loading and Assessment

FDEP should modify the MS4 permit to require more monitoring in targeted locations, designed to answer specific questions about where pollutant loadings are coming from and how specific BMPs affect loadings in distinct canals and Biscayne Bay.

The current sampling regime is basin-wide, where stormwater from multiple Co-permittees has already mixed, and pollutant sources cannot be readily identified. Monitoring should occur at a direct outfall from a specific Permittee's system.

While this audit evaluated mostly Year 3 ARs, Permittees are required to submit a Year 4 AR in June 2022. As part of the upcoming Year 4 ARs, Co-permittees must suggest needed changes to their monitoring assessment program to identify sources causing water quality issues and recommended BMPs. The FDEP must review these proposals to ensure the new MS4 permit includes a comprehensive, robust sampling plan across all municipalities authorized to discharge stormwater under its terms, designed to identify specific sources of pollutants and the efficacy of BMPs to reduce pollutant loads. Additional samples at sites outside the area covered by the permit should be included, as they likely influence the water quality within the permit coverage area.

This proposed revised monitoring plan should be made available for a public comment period as part of the MS4 reapplication process for meaningful feedback from citizens and stakeholders within the permit coverage area.

The MS4 permit should also be revised to require, more specifically, an annual assessment of pollutant loadings

and proposed changes to the SWMP to ensure continuing reductions in pollutant loading and progress in meeting water quality standards. The current permit requires that a Co-permittee re-evaluate its SWMP and identify and submit revisions in its upcoming Year 4 AR if an assessment at that time shows that annual pollutant loadings for listed pollutants have not decreased.

Lastly, the MS4 permit should be revised to ensure:

1. Progress toward compliance with TMDLs/Reasonable Assurance Plans (RAPs)
2. An established plan for and progress towards compliance with water quality standards and effluent limitations for waters that have been designated as impaired and placed on the list to receive a TMDL - but do not yet have a TMDL.

The current MS4 permit does not include specific sections on compliance with any established RAPs nor a process for implementing water quality standards for waters on lists for TMDL development. The revised MS4 permit should include loading targets and/or effluent limitations for TMDL or RAP waters and for waters designated for TMDL or RAP development. The permit should also include clear consequences and improvements if required targets/effluent loads are not achieved.

3. <u>Reviews and Inspections</u>

Municipalities should be required to report **annually** on their comprehensive plans or similar documents to demonstrate how their plan requires the use and maintenance of appropriate structural and non-structural erosion, sedimentation, and waste controls during construction and included in new or updated development to reduce the discharge of pollutants to the MS4. These reports and updates will be key to enacting policies to ensure that stormwater issues are addressed by local laws and regulations. They should be required 1) to adaptively manage requirements to ensure that stormwater pollution is reduced and water quality standards are met, and 2) to include, to the maximum extent practicable, green infrastructure practices, low impact development requirements, and novel technologies to clean and treat stormwater entering waterways. They should be required to report on any changes or proposed changes annually. Incentives should be put in place to support the implementation of green infrastructure.

Some Permittees indicated that they did not receive reports of illicit discharges. The reactive inspection program should ensure that community outreach is done to guarantee that the residents and community members know how and where pollution reports can be made. Public education about illicit discharges can improve a Permittee's reactive inspection program. The revised MS4 permit should require additional outreach if a municipality receives no reports of illicit discharges or related violations and required reporting of the Permittee’s response to the lack of community reports.

Permittees are currently required to report sewage leaks that may enter the MS4 system as illicit discharges of non-stormwater to the MS4. There is increasing evidence that septic tanks may be leaking into surface waters during heavy rains. Permittees should be required to annually document the steps taken to test and ensure that leakage from failing on-site sewage disposal systems (septic systems), especially during storms and with regional sea-level rise, is not making its way as an illicit discharge into the MS4. Part III of the MS4 permit should make this documentation a required element of the SWMP.

Many Permittees fell short in ensuring development activities within their jurisdictions obtained appropriate permits and designing and implementing illicit discharge and construction inspection programs to identify and

address pollution hotspots. In item 8. below, we discuss the need for the County to spearhead additional collaboration with and oversight of all Co-permittees. In item 9., we discuss the need for additional oversight by FDEP. These collaborations and oversight structures would be particularly important in helping to address the current permit requirements that have not been uniformly implemented. In particular, such collaborations and oversight structures could help ensure that proposed construction activities are reviewed to ensure compliance with federal and state permitting requirements, and also that municipalities appropriately assess and designate priority areas for both illicit discharge and construction inspections that are comprehensive, and include critical waters and watersheds and areas upstream of sensitive or impaired waters. FDEP should set a baseline for how many proactive illicit discharge inspections are carried out.

4. Stormwater System Maintenance

Municipalities should coordinate with regulators about appropriate inspection and maintenance schedules for all components of MS4s to ensure that requirements maximize efficiencies. While at least 33% of exfiltration trenches and french drains are required to be inspected every year, for example, in some instances, currently required maintenance schedules may not appropriately account for the connections between different structures in the stormwater management system (e.g., pipes connected to exfiltration trenches, where pipes must be inspected at least once over ten years and exfiltration trenches must be inspected at least once every three years).

Additionally, the MS4 permit does not seem to clearly include all potential structures in a municipality's stormwater management system – for example, minor outfalls are not explicitly mentioned. The revised MS4 permit should ensure that all of these structural aspects of an MS4 have clear minimum maintenance requirements since stormwater system maintenance has a key impact on water quality. Inspecting the pipes and storm sewer inlets every ten years is not sufficient. We recommend that more frequent maintenance of stormwater systems be required in the upcoming permit.

5. Litter Collection and Street Sweeping

Litter collection and street sweeping frequencies varied widely amongst permit holders. The revised MS4 permit should set a clear minimum standard for frequency and scope of litter collection and street sweeping and should clearly require street sweeping in and around all streets, road segments, and public parking lots. For areas where street sweeping may be technically infeasible (e.g., streets without curbs or gutters), the revised MS4 permit must require Co-permittees to implement other trash/litter control procedures to minimize pollutant discharges to storm drains and waters.

The revised MS4 permit should require more detailed documentation about each municipality's litter collection and street sweeping programs: where and why pick-ups occur, where and when street sweeping occurs, plans to assess the programs' impacts on nutrient pollution, and systems to identify and address documented problem areas. Where monitoring shows high levels of nutrient pollution likely connected to stormwater, a method for additional litter control would be appropriate. Ideally, this would be spelled out in each municipality's written SWMP.

6. Stormwater System Maps and Stormwater Management Systems

Renewed MS4 permits should require that all stormwater maps be provided digitally through a GIS-based system and be updated to ensure accuracy. We strongly recommend adopting a standard, computerized

stormwater management system that includes technology for mapping the system. Stormwater Asset Management Systems (SAMS) are designed to facilitate the organization and recordkeeping of the entirety of a municipality's stormwater assets. This system will highlight the areas that require more focus and assist with maintenance and inspections. SAMs work with GIS so that all stormwater assets are identified on maps and provide reports that allow users to comply with MS4 reporting requirements seamlessly.

7. Iterative Improvement

Revised MS4 permits should include a system to incentivize iterative improvement when water quality standards, TMDLs, or RAPs are not met in or adjacent to an MS4. Other states have designed these kinds of programs – one example is a state implementing a point system and requiring Permittees to earn points over the life of an MS4 permit. For example, investments such as land purchases and conservation under appropriate circumstances and specific changes to street sweeping frequencies can earn Permittees points.

8. County Oversight and Support

The County's interlocal agreement with Co-permittees is a key place in which the County can exercise additional oversight over the broader MS4 system discharging into Biscayne Bay. We strongly recommend that the County take a leadership role in ensuring best management practices and permit compliance amongst Co-permittees.

Currently, the interlocal agreement is not structured to require the County to assume a kind of "co-lender" role if a Co-permittee defaults on its obligations. While it specifies the rights of the County and Co-permittees in regards to monitoring, it does not provide a County obligation to assist Co-permittees who demonstrate a legitimate need for assistance in meeting permit requirements. We believe that the County should offer technical and financial assistance to under-performing municipalities if they can demonstrate need and update the inter-local agreement to reflect this.

9. FDEP Oversight and Enforcement

We encourage FDEP to conduct regular audits of the Miami-Dade County MS4 permits and require improved compliance and iterative improvements. In some cases of chronic non-compliance, enforcement actions must be implemented.

FDEP should also amend the permit to include a clause that, if a Co-permittee defaults on its responsibilities with the terms and conditions of the permit, the County will be made a party to compliance assistance and enforcement actions. The MS4 interlocal agreement should be modified to reflect this. This would compel serious discussions on how to address low-performing, chronically non-compliant entities and how to ameliorate instances where under-resourced local governments are failing to achieve full compliance.

10. Resource Allocation among Permittees

We recognize that Miami-Dade County contains a wide range of capacity and size amongst municipalities, with some areas fully resourced and staffed with large budgets to match, and other small communities operating with minimal personnel. For example, a May 2, 2017 audit of Virginia Gardens reports that the Village has no full-time staff, whereas Miami-Dade and FDOT have large departments focused solely on environmental protection. Therefore, we suggest that the County and State offer technical and funding assistance to those municipalities that can demonstrate a legitimate need for support in achieving MS4 permit compliance.

CONCLUSIONS

Our research has revealed numerous examples of protracted non-compliance amongst MS4 permit holders. We strongly encourage regulatory agencies to closely audit the compliance status of permit-holders and take remedial action swiftly. The new MS4 five-year permit cycle is a critical opportunity for FDEP and Miami-Dade County to limit stormwater runoff, achieve better compliance, and ultimately cleaner water. Novel technologies for controlling runoff, monitoring stormwater systems, and improving water quality should be implemented immediately by the Permittees. To ensure that water quality standards are achieved for Biscayne Bay, we encourage FDEP and Miami-Dade County to engage Permittees on multiple levels to ensure that the letter -- but also the spirit -- of the MS4 permit program is followed. Our community relies on our waterways, and urgent action must be taken to remedy Biscayne Bay's current -- and evident -- decline.

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