

An aerial photograph of Miami Beach, showing the coastline, sandy beaches, turquoise water, and a dense urban skyline with numerous high-rise buildings. The sky is blue with scattered white clouds.

MIAMI BEACH RISING ABOVE

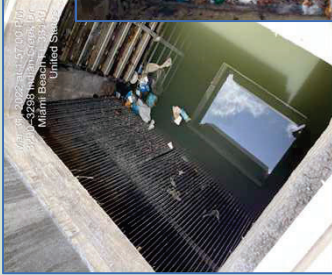
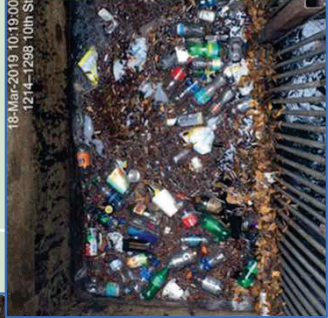
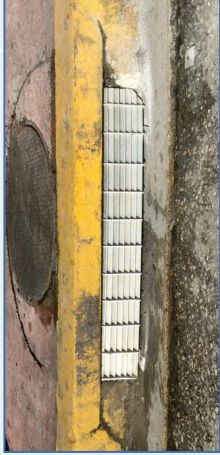
STORMWATER GRATES & Our Approach to Debris Removal

Land Use and Sustainability Committee
July 7, 2022

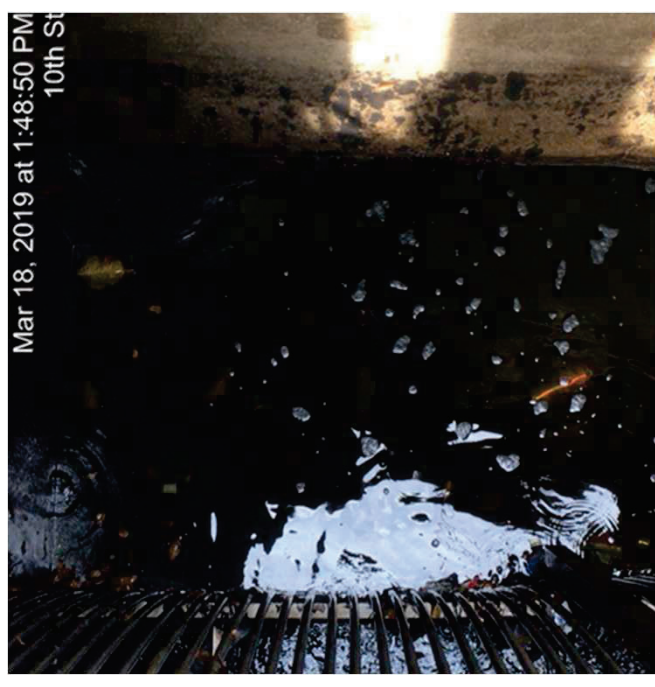
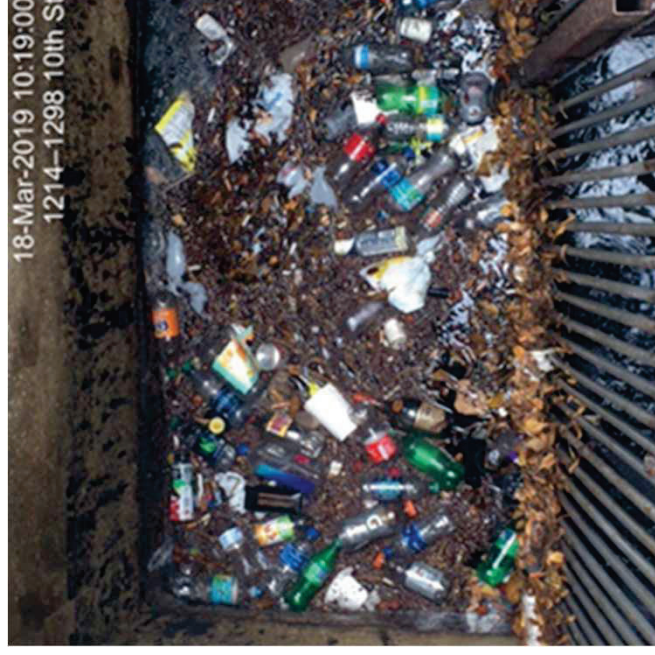
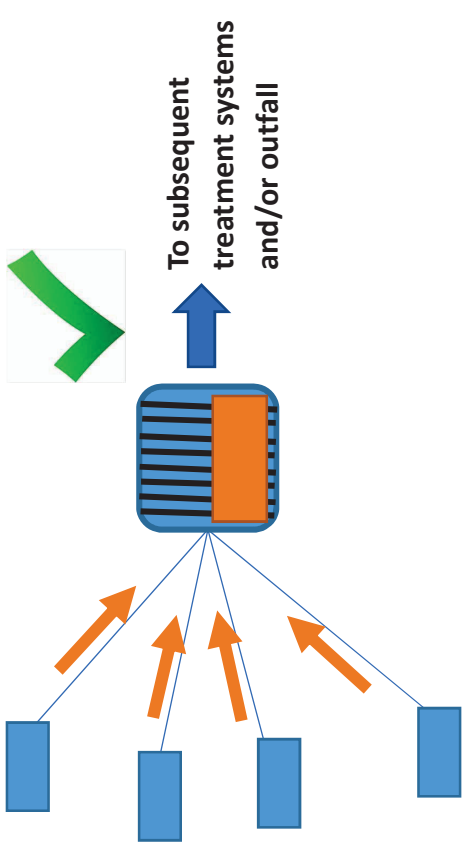
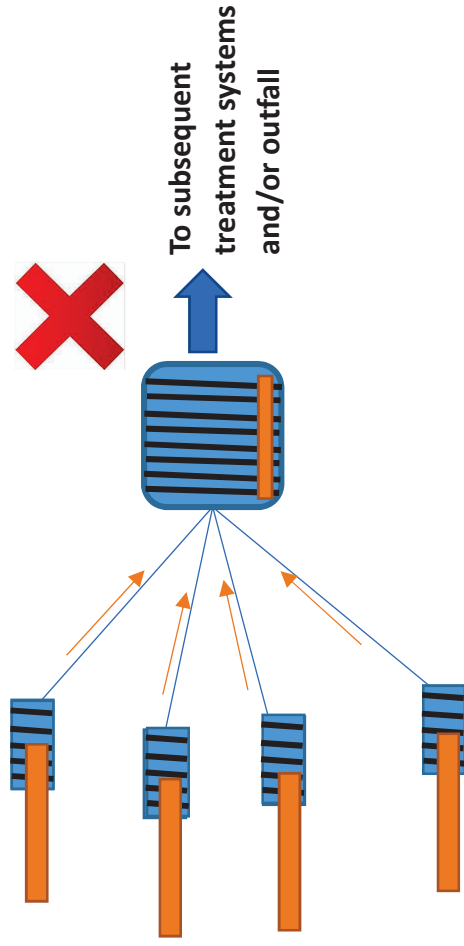
Joe Gomez, PE, F. FES
Public Works Director

Cristina Ortega Castineiras, PE, ENV SP
City Engineer

Bar Racks are Recommended for Debris Collection at CMB Stormwater System over Grates

Alternative	Location	Pros	Cons	Costs
Bar Racks 	Consolidated, Upstream of Stormwater Outfall Discharge 	✓ Is already in use throughout the City: CMB Pump Station Locations – installation and maintenance procedures are known ✓ Low visual impact ✓ Minimum impact to stormwater flow ✓ Works in free-draining and submerged environments	☒ Requires the construction of an additional stormwater structure ☒ Community and traffic impacts during construction and maintenance	Capital \$\$\$
				Maintenance \$
				Overall \$\$
Stormwater Inlet Grates 	Multiple Installations, at Every Stormwater Inlet 	✓ Easy to install ✓ Different configurations available	☒ Disrupts flow when blocked with debris, causing flooding ☒ Will require each stormwater inlet to be cleaned and maintained frequently ☒ Community and traffic impacts during construction and maintenance	Capital* \$\$ *\$3.6M City-wide Installation
				Maintenance \$\$\$
				Overall \$\$\$
Outfall Filtration Net 	Consolidated, At Outfall Discharge	✓ Works in free-draining and submerged environments ✓ Relatively easy installation process ✓ Minimum impact on flow ✓ Minimum impacts to the community and traffic during construction and maintenance operations	☒ May be unsightly ☒ May impact boat traffic ☒ May be difficult to access ☒ Nets may become damaged at high flow velocities ☒ When net becomes full, it disengages from the main unit, and though there is a safety system, it no longer catches debris ☒ Requires a crane and boat for cleaning the net	Capital \$
				Maintenance \$\$
				Overall \$\$

Consolidate Capture of Large Debris at Bar Racks



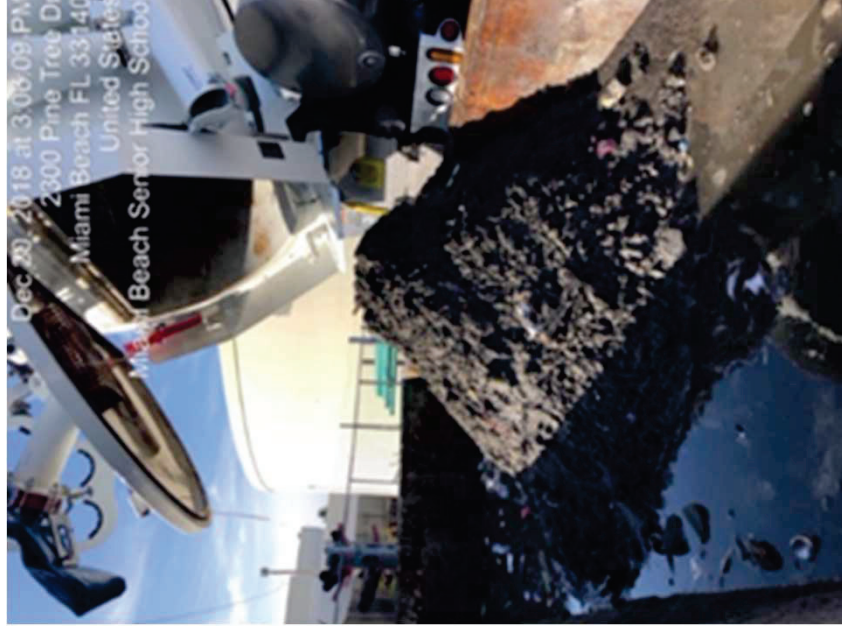
Cleaning at Bar Rack Structure

- ✓ Entire system is cleaned yearly & high priority areas are cleaned more frequently – More than 5 times what is required by NPDES

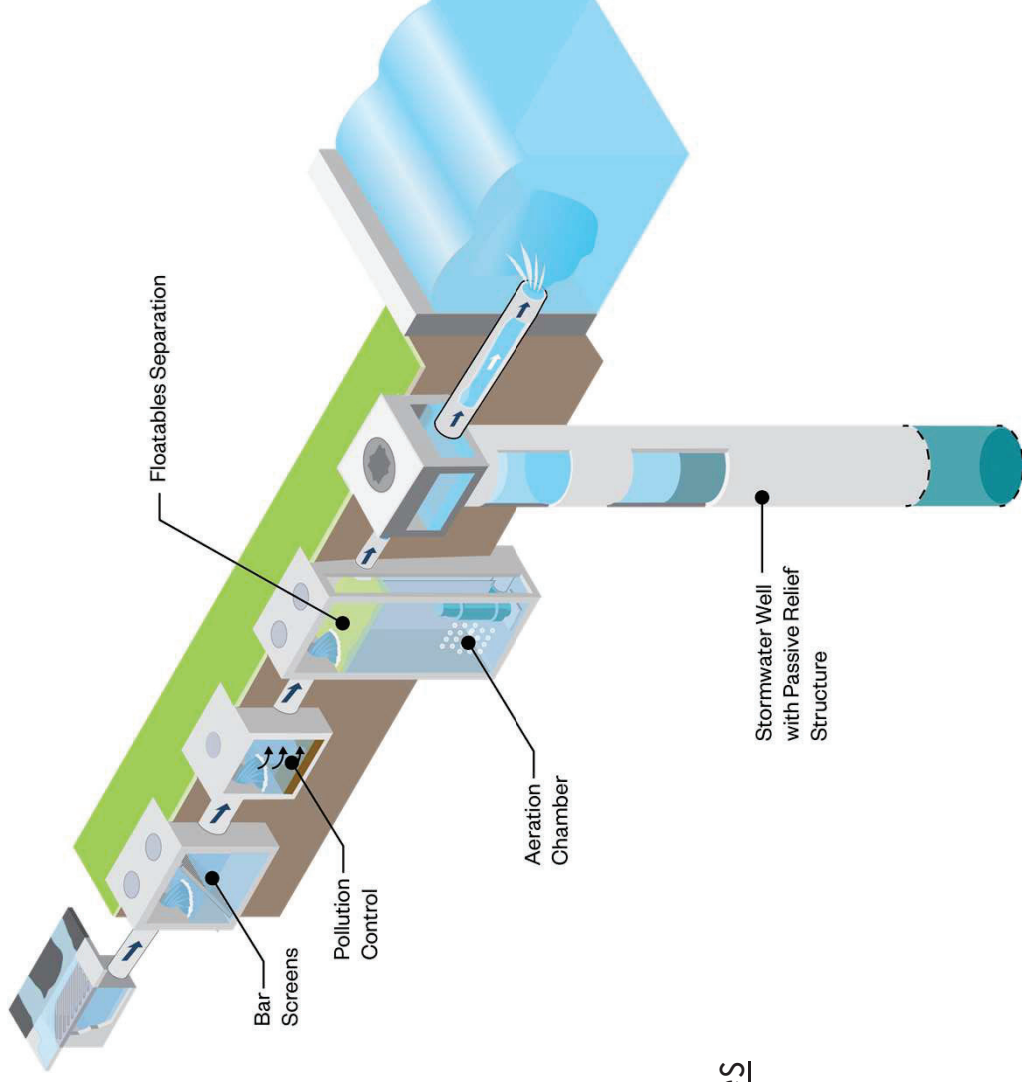


Stormwater Cleaning

- ✓ More than 300 tons of debris captured annually



New-Generation Stormwater Treatment Systems – Our Current Strategy



Water Quality Treatment Systems:

- ✓ 5 stage treatment - incorporates best of available technologies
- ✓ Includes injection well to sequester “first flush”
- ✓ Outfall for Large Storms

Stormwater Management Practices in Miami-Dade County: County-wide Report Card (May 2021)



MIAMI

collaboration between

WATERKEEPER® and UM RSMAS

UNIVERSITY
OF MIAMI
ROSENSTIEL
SCHOOL of MARINE &
ATMOSPHERIC SCIENCE



Municipality Name	Final Average	Final Grade
Aventura	45.00%	F
Bal Harbour	65.00%	D
Bay Harbor Islands	39.00%	F
Coral Gables	65.00%	D
Cutler Bay	100.00%	A
Doral	90.00%	A
El Portal	38.00%	F
FDOT District 6	89.00%	B+
FDOT FL Turnpike	100.00%	A
Golden Beach	95.00%	A
Hialeah Gardens	50.00%	F
Homestead	55.00%	F
Indian Creek Village	44.00%	F
Key Biscayne	90.00%	A
Medley	56.00%	F
Miami Beach	100.00%	A
Miami-Dade County (unincorporated)	70.00%	C
Miami Gardens	50.00%	F
COUNTY AVERAGE	62.26%	D

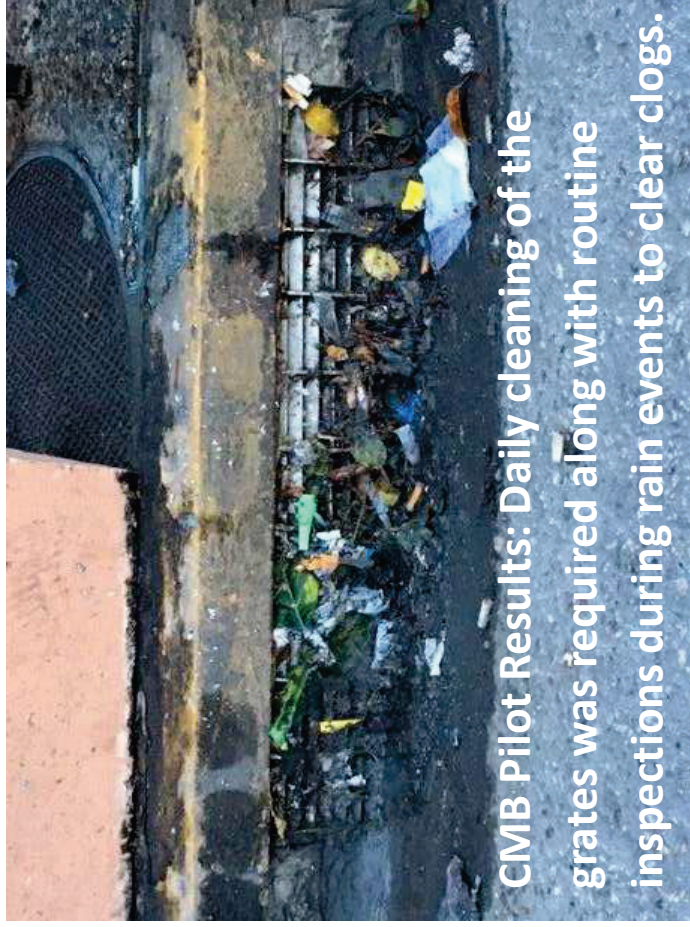
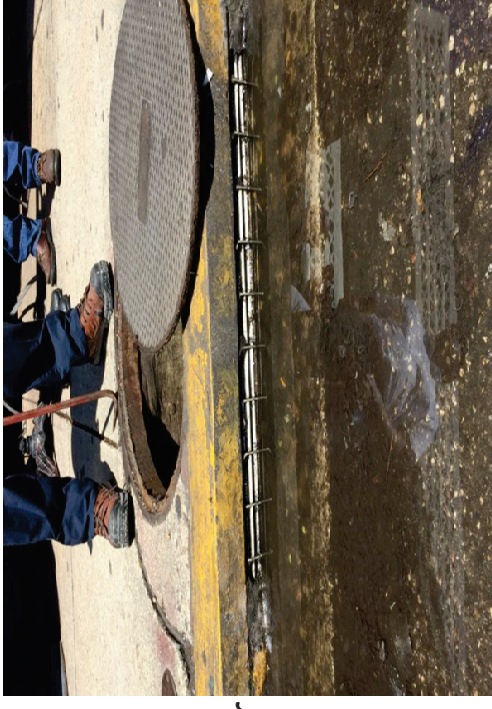


Municipality Name	Final Average	Final Grade
Miami Lakes	60.00%	D
Miami Shores	38.00%	F
Miami Springs	10.00%	F
Miami-Dade Expressway Authority	60.00%	D
North Bay Village	55.00%	F
North Miami	75.00%	C
North Miami Beach	60.00%	D
Opa-Locka	55.00%	F
Palmetto Bay	44.00%	F
Pinecrest	83.00%	B
South Miami	75.00%	C
Sunny Isles Beach	45.00%	F
Surfside	55.00%	F
Virginia Gardens	33.00%	F
West Miami	45.00%	F
City of Miami (permit no. FLS0000002)	100.00%	A
City of Hialeah (permit no. FLS0000023)	45.00%	F
COUNTY AVERAGE	62.26%	D

“The City of Miami Beach scored 100%, as they met all the requirements of the permit and had performed additional activities not required by the permit.”

Consolidated Capture of Large Debris at Bar Racks is Recommended over Inlet Grates

- City-wide installation of Inlet Grates: **\$3.6M**
- This is **NOT recommended** due to significant **O&M cost increase**:
 - Street sweeping increase from **\$700k to \$1.1 M** per year
 - Additional cleaning (beyond street sweeping) by stormwater group estimated at **\$250k to \$500k** per year*for 2 to 4 cleanings on average per devise per year (over the current annual budget of ~\$1M to clean existing stormwater system)*
- Additional flooding complaints expected



CMB Pilot Results: Daily cleaning of the
grates was required along with routine
inspections during rain events to clear clogs.



City received numerous phone calls, service requests, and other complaints regarding the ineffectiveness of the grates during the short time they were installed.

MIAMI BEACH RISING ABOVE

Questions?

