

Wastewater Treatment at ACUA: Clean Water, Green Energy

ANJEC Fundamentals for Effective Environmental Commissions, March 10, 2022

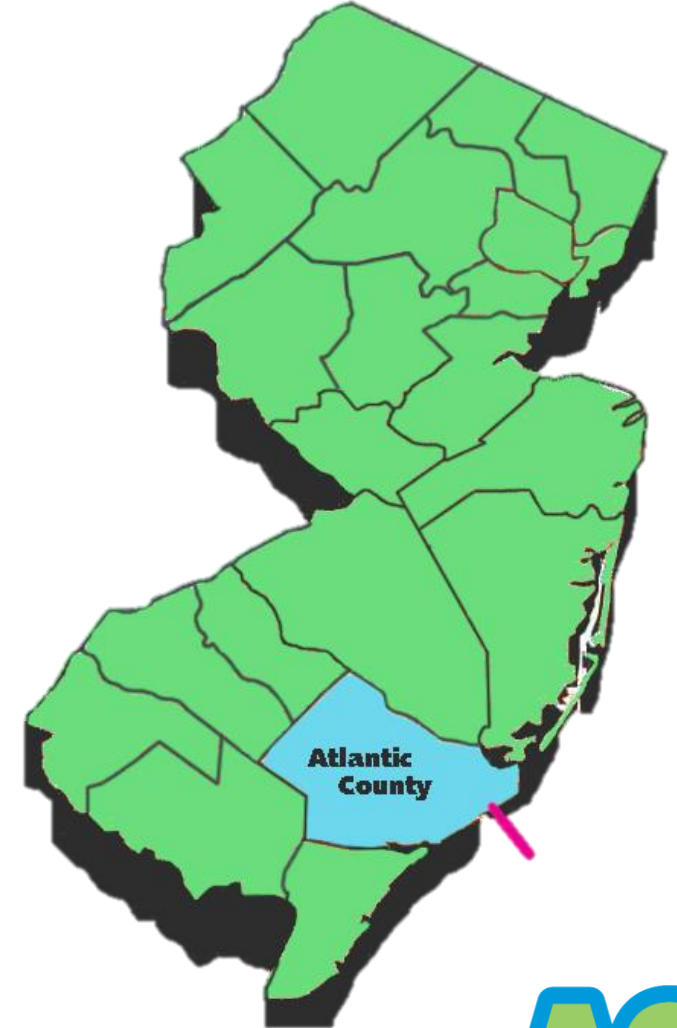


About the ACUA

The Atlantic County Utilities Authority is a public agency that provides environmental and waste management services to the people of Atlantic County and southern New Jersey.

The ACUA operates both Wastewater and Solid Waste Management Systems.

Full service regional wastewater treatment facility, trash & recycling collection, landfill, composting, and transfer station.






Atlantic County, NJ

Population: about 275,000

Households: 102,847

Square miles : 555.7





ACUA's Wastewater Treatment Facility

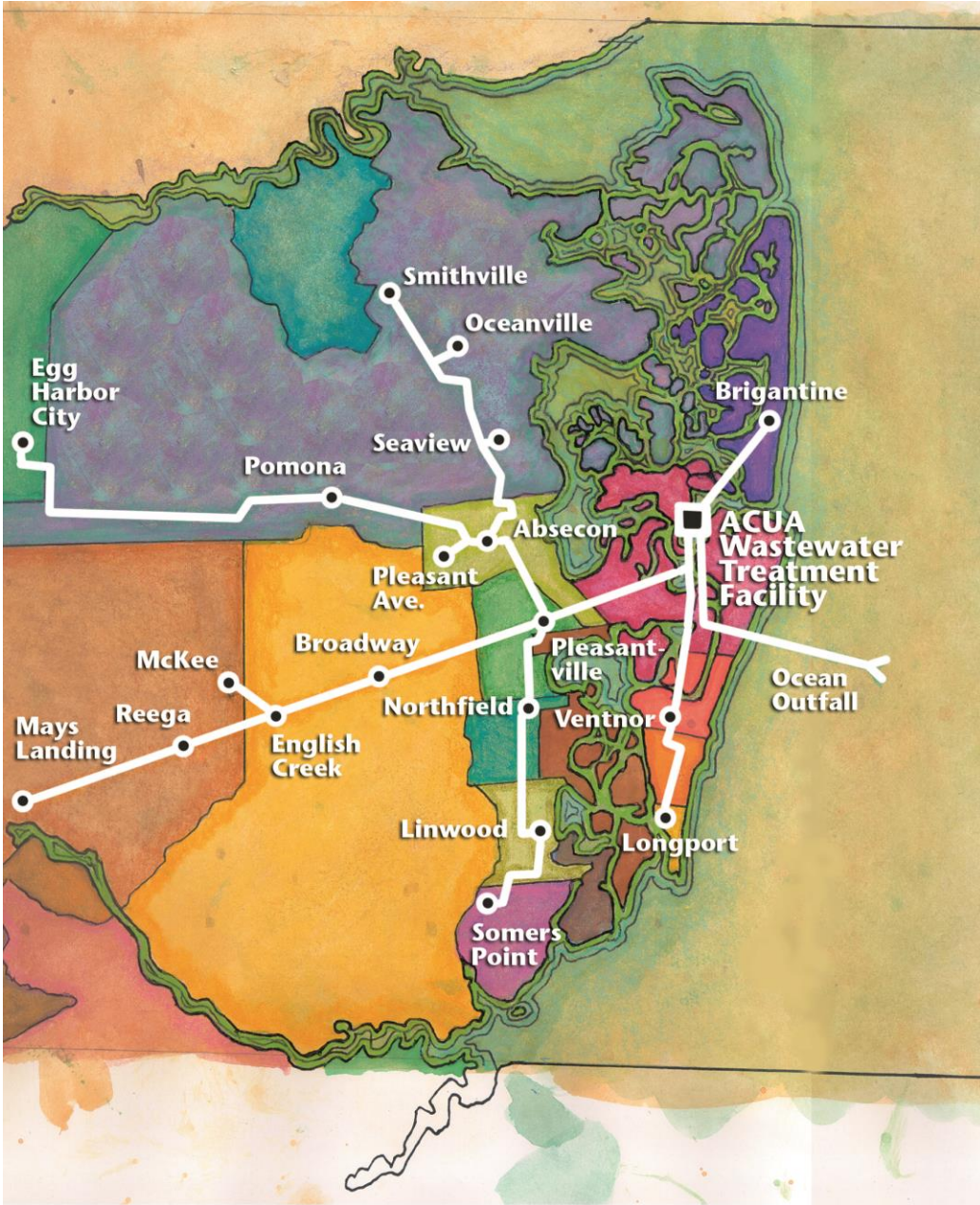
WATER
BIO SOLID

- 40 MGD Activated Sludge Treatment Plant
- 20 Regional Pumping Stations
- 14 Member Municipalities
- Ocean Outfall



ACUA's Regional System

- 20 Regional Pumping Stations
- 14 Member Municipalities
- Planned and developed in the 1970's
- Expanded in the 1980's to include Pinelands Regional Growth Areas in Mays Landing, Egg Harbor City, Galloway and Egg Harbor Townships.





ACUA's Wastewater Treatment Facility

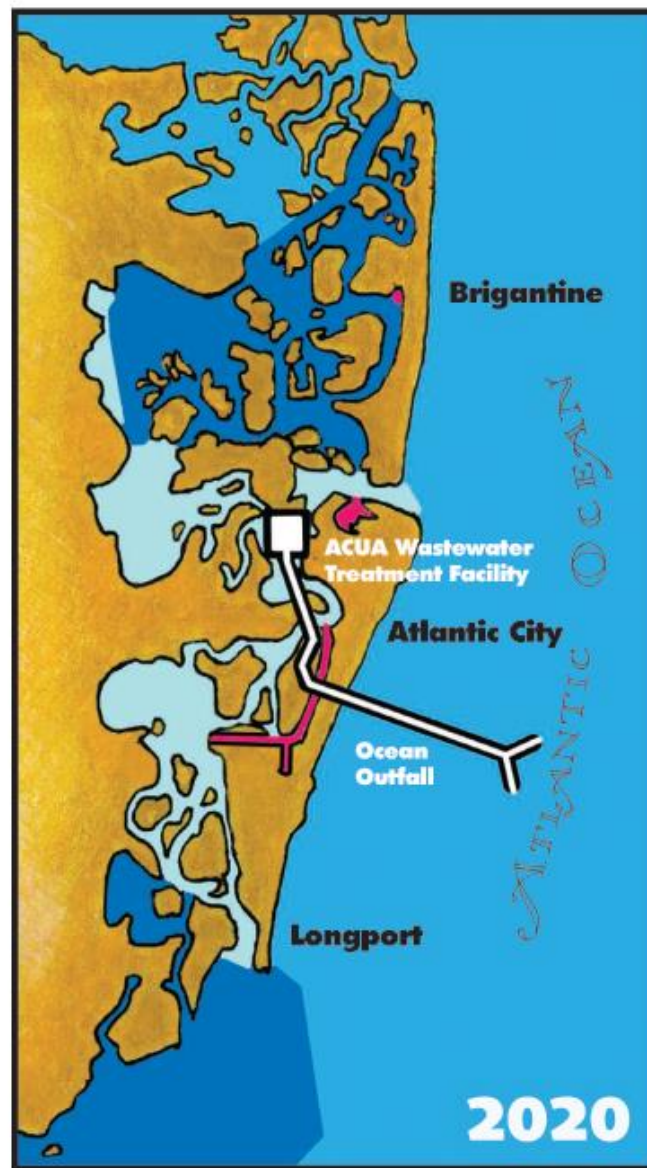


- ACUA processes about 29 million gallons of wastewater every day.
- Staff is onsite 24-hours every day monitoring the treatment process.
- Typically, ACUA removes over 95 % of the contamination in the water.





Before ACUA



After

Water Quality in Atlantic County

ACUA's Regional Treatment Facility was planned and developed in the 1970's in response to the contamination of the back bays.

Shellfishing was banned in the back bays and intercoastal waterways.

-  Water treatment facilities
-  Waters condemned for taking shellfish
-  Waters approved for seasonal shellfishing
-  Waters approved for shellfishing

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The wastewater treatment process includes:

Wet End Treatment

- Removal of solids and colloidal solids from wastewater
- Disinfection of treated effluent
- Discharge to Ocean

Solids End Treatment

- Solids Thickening
- Incineration
- Ash Disposal



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Where does wastewater influent come from?

- Pipelines for the collection system
- Trucked septic tank and storage tank waste



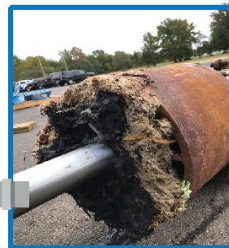
Protect Our Sewer System!

Help us sustain our critical wastewater infrastructure! **DO NOT** flush or place these items down the drain (even if they fit)!

- X "Flushable" wipes - these items, while marketed as flushable, commonly cause major build up in sewage pipes
- X Tampons, condoms and feminine hygiene products
- X Q-tips, tissues or paper towels
- X Cooking oil and grease residue - bag oil or place in a non-recyclable container then throw into the trash
- X Fat trimmings
- X Toilet cleaning pads - yes, even those that claim to be "flushable"
- X Medicine (see acua.com/medicine for proper disposal)



Yuck! Toys and other items recovered at ACUA's wastewater treatment plant over the years.



Our friends at Mount Laurel MUA recently experienced damaged equipment from a massive clog of wipes in their pipeline.

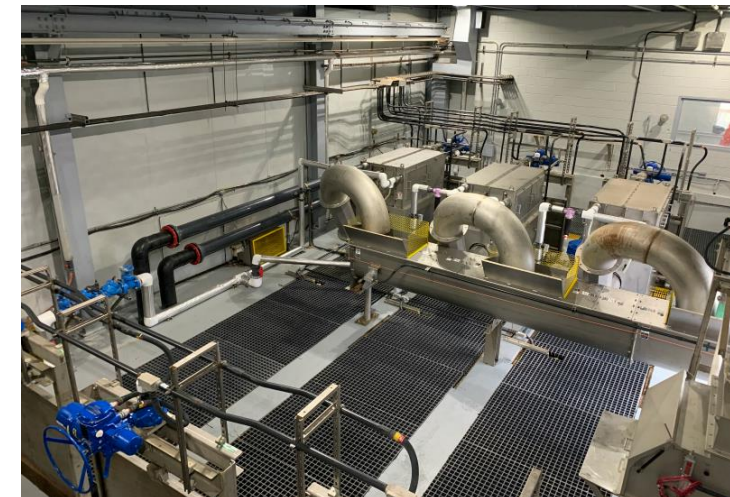


Atlantic County Utilities Authority www.acua.com 609.272.6950

Headworks Bar Screens



Before



After

Primary Treatment

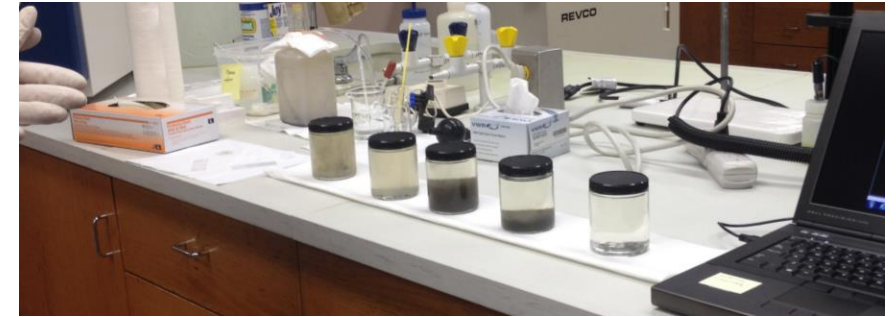
- Removes settleable solids
- Primary effluent flows over weirs
- Settleable solids are removed from the bottom of the tank



Aeration Basins



Biological Treatment



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ACUA maintains a NJ state-certified water and wastewater environmental testing laboratory

- Staff test and monitor the water treatment process onsite.
- The lab performs tests on water from Atlantic County bathing beaches.
- Additionally, staff test school districts and other public agencies.



Secondary Clarification

- Treated water overflows weirs to the effluent equalization basin prior to discharge to the ocean.
- Biological solids (microorganisms) settle to bottom and are returned to aeration tanks.



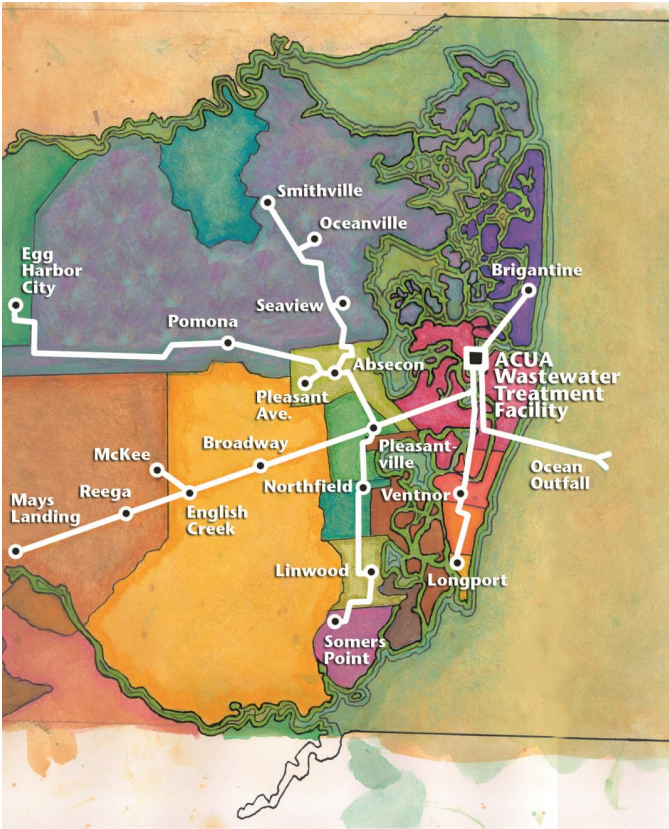
Effluent Disinfection and Odor Control

- Sodium hypochlorite is applied to the wastewater to disinfect the treated effluent prior to discharge to the ocean.
- Odor control covers on tanks where turbulent conditions exist control odors.
- Carbon filters and biofilters are used.



Effluent Discharge

- Treated wastewater stored in the equalization basin prior to discharge to the ocean
- Treated wastewater is pumped 4 miles to the effluent pipeline
- Clean effluent is discharged 1.5 miles out from the beach



Managing Biosolids

- Biosolids settled out from primary treatment
- Grease is skimmed from clarifiers
- Excess biosolids from the activated sludge process
- Biosolids and grease received from outside sources



Thickening and Dewatering

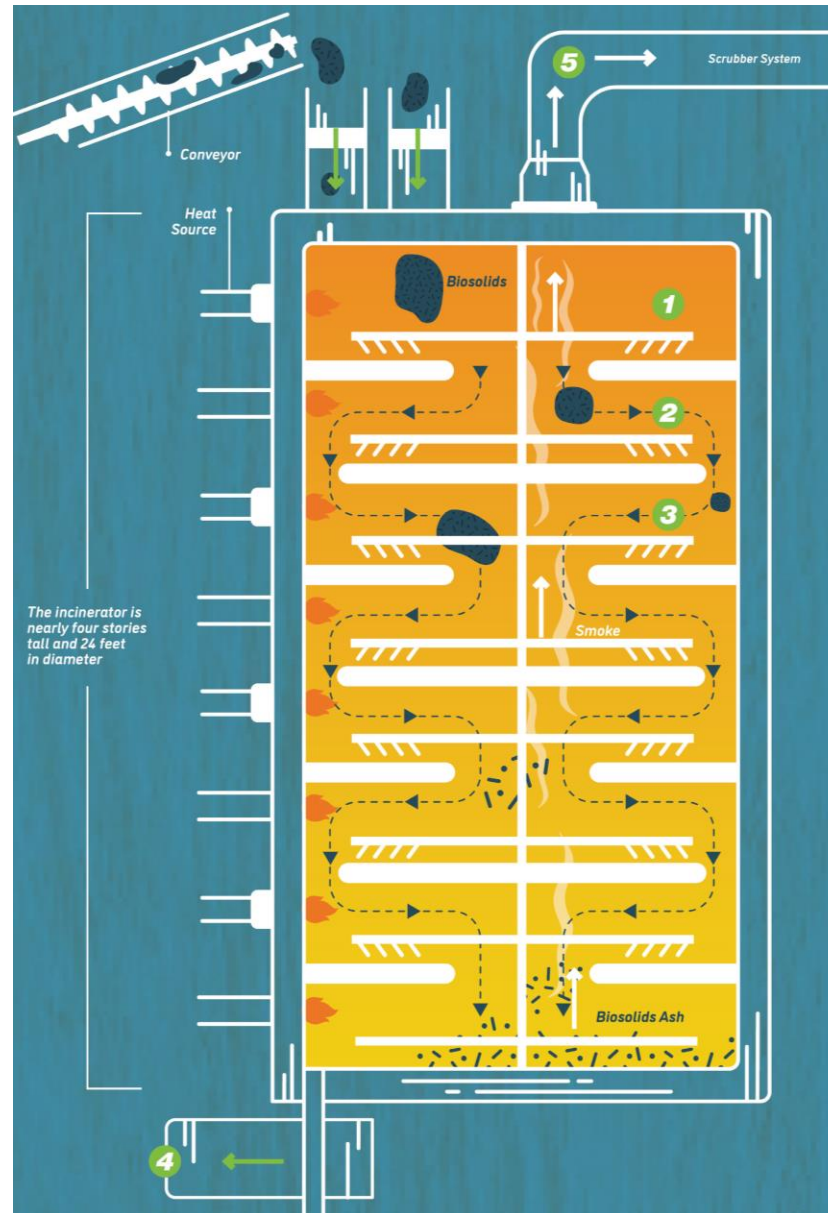
- Polymer is added
- Centrifuges spin out liquid to dewater biosolids



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Biosolids are incinerated in ACUA's multihearth furnace

- Temperatures to 1500 F
- Converted to ash, reduced 90% in volume
- Beneficial reuse as landfill cover



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Renewable Energy at ACUA



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Jersey Atlantic Wind Farm

- Five 1.5 MW GE Turbines
- 7.5 MW production capacity
- \$12.5 M
- Provides 60% of the electricity to power ACUA's Wastewater Treatment Facility
- 20-year agreement with Leeward - low, fixed cost to purchase electricity

Savings: >\$6.8 M since 2006

Electric Cost offset	\$6,566,191
Land Lease Revenue	\$235,000
Total	\$6,801,191

Emissions Reduction: >4000 Metric Tons of CO₂ annually

Total since 2006 : 66,210 Metric Tons of CO₂





Solar Power at ACUA

- 500 kW project
- 2700 panels – ground mounted, rooftop & parking canopy
- Provides 4% of electricity to power ACUA's Wastewater Treatment Facility
- \$3.25 M project, 57% CORE rebate

Savings: >\$3.9 M since 2006

Electric Cost offset	\$1,095,283
SREC Revenue	\$2,809,464
Total	\$3,904,747

Emissions Reduction: >200 Metric Tons of CO₂ annually

Total since 2006 : 66,210 Metric Tons of CO₂





Battery Storage Project

- First public renewable energy storage battery to be operational in NJ
- Partnership with Viridity Energy (Ormat)
- Commissioned February 2018
- \$300,000 grant from NJBPU
- 1 MW
- L2 containerized system
- Lithium Ion Battery



Benefits of Battery Storage

- Supports overall grid operations
- Improves the integration of renewable energy resources
- Provides additional capacity to the grid in times of need
- Can be charged during off-peak times, discharged during peak times, to reduce peak energy needs
- Modular designs can be placed strategically where they are needed most



Future Projects

- Community Solar
- Green Hydrogen
- Wastewater Reuse
- Pipeline Quality Renewable Natural Gas



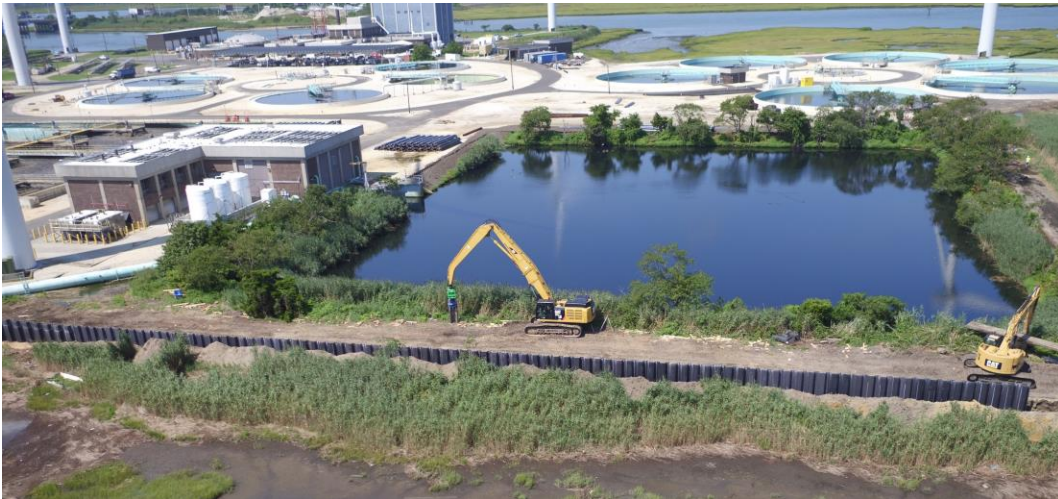
Preparing for the Future



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Seawall

- \$3.7 million investment
- Funded through the NJEIT
- Surrounds low-lying areas of the facility
- Fiberglass reinforced polymer sheet piling
- Corrosion-resistant to withstand saltwater exposure
- Top of wall set 11 ft. above sea level



Portable Flood Barriers

- \$279,000 Investment
- 24-inch tubes filled with water that can be stacked
- Act as temporary barriers for flooding events
- Can be easily placed at pump stations or other areas as needed



Maintaining Critical Infrastructure

ACUA's Asset Management Program encompasses

- Risk Assessment
- Preventative Maintenance (PM) Schedules
- Details of all repairs and improvements
- Inspection and Cleaning Projects



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