

CITY OF NAPLES

WATER RECLAMATION FACILITY



History

The 14-acre site has been the location of a wastewater treatment plant for over 62 years. The first plant was built in 1958. The plant has gone through several expansions with the first in 1967 and again in 1975, 1988, and 2000. At the completion of the third expansion in 1988, the treatment facility was capable of treating 8.5 million gallons a day, yet it did not meet advanced waste treatment requirements. The conventional activated sludge wastewater treatment facility needed to be upgraded to comply with advanced treatment quality standards in order to protect the water quality of the Naples Bay and the Gordon River, Class II and Class III waters, respectively. The upgrade resulted in the four-stage Bardenpho biological nutrient removal system, an Advanced Waste Treatment (AWT) facility. Aside from the upgrade, the facility treatment capacity was increased to 10.0 million gallons per day.

The objectives of the wastewater treatment facility is to:

- * Accelerate the natural process in a controlled environment
- * Separate the resulting biological solids
- * Provide disinfection to produce clean and safe effluent for ultimate disposal

WASTEWATER

Wastewater is the water that flows into a lift station and is pumped to a wastewater treatment facility. It is made up of waste from toilets, sinks, garbage disposals, industries and restaurants. Wastewater is over 99.9% pure water. Wastewater can contain a wide variety of objects such as sand, rocks, bottles, "disposable" wipes, personal hygiene products, grease balls, articles of clothing, lumber, PVC parts, and an occasional cell phone. Items such as these are removed during the first stage of treatment using mechanical barscreens and an aerated grit removal system.



Grit Removal



Barscreen

Bio-Trickling Filter unit is used to maintain the proper environment for odor treating organisms to develop. This biological system utilizes air, moisture, nutrients and media to provide ideal conditions for the development of organisms that break down the odorous compounds. The clean air is then released into the atmosphere.



Odor Control Unit

ODOR CONTROL

Odors are a major concern at any wastewater treatment facility. As wastewater is collected and pumped to the plant, odor causing compounds are formed. These compounds are released when the wastewater is discharged into the grit and screenings process. In an effort to contain and treat as much odor as possible, the City has covered all open channels in this area. The contaminated air under these covers is collected and sent to the odor control system.



Covered Channels & Odor Control Ductwork

BIOLOGICAL TREATMENT

The BardenPho process was selected in the last facility expansion due to its superior ability to remove nutrients such as nitrogen from the process. Our BardenPho process consists of four treatment trains with a capacity of 4.2 million gallons and contain approximately 138,711 pounds of microorganisms called mixed liquor. Mixed liquor is a mixture of raw sewage and healthy activated sludge, sludge teeming with bacteria, fungi, and protozoa. This mixture is the heart of the biological wastewater treatment process. When properly conditioned through the control of oxygen and solids content, the organisms in mixed liquor will eat, absorb or convert pollutants (mainly nitrogen) to an environmentally acceptable form.



BardenPho Treatment Trains

FINAL EFFLUENT

After proper biological treatment aluminum sulfate is added for the removal of phosphate from the water. The mixed liquor then flows into settling basins known as clarifiers. The heavier solid particles are settled out and collected to be used as activated sludge that is returned to the beginning of the process and a portion of the particles are removed, dewatered, composted and land applied. The remaining clear water is then filtered and disinfected.



Six Final Clarifiers

BIOSOLIDS MANAGEMENT

A portion of the activated sludge collected from the clarifiers is removed from the process for final disposal. This process is called beneficial reuse of wastewater biosolids.

During this process, the biosolids are:

- *Held in aerobic (with air) storage tanks
- *Dewatered (thickened) on belt filter presses
- *Processed into a compost material through a cooperative agreement with a composting facility



Biosolids Storage

RECLAIMED WATER

The reclaimed water provided by the City is regulated by FAC 62-610 Part III, slow rate land application system with public access. This type of system is the most stringently regulated reclaimed water system due to the fact that the areas irrigated are intended to be used by the public. When reclaimed water is used for a beneficial purpose, this use is called water “Reuse”. Since 2012 - 99.6% of the wastewater received has been reclaimed as reuse water.

Benefits of Reclaimed Water for Irrigation:

- *Lower cost than potable water
- *Reduces fertilizer need by providing 10% of nitrogen and 100% of phosphorous needs for landscaping
- *Keeps wastewater effluent out of bays and rivers





Three Belt Filter Presses



Dewatered Biosolids

COMPOSTING

Composting is a natural, biological treatment process, which exposes organic materials, such as biosolids, to high temperatures and results in a safe, stable, usable soil amendment product with numerous benefits. Another unique attribute of biosolids-based compost is that the primary nutrients are in an organic form, i.e., these nutrients are not in a pure chemical form as in chemical fertilizers, but instead are largely complexed in organic forms. Therefore, nitrogen and other primary nutrients in biosolids-based composts are released more slowly to plants, fertilizing the plants at a slower rate over a longer period of time.



Composting Facility



Compost

LABORATORY

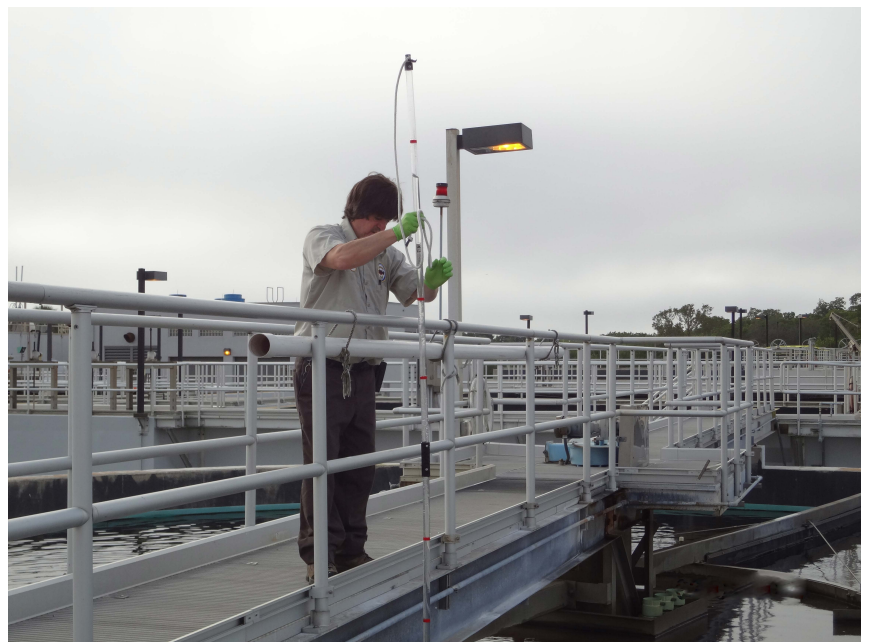
The City's state certified environmental laboratory is located on site. The primary function of the laboratory is to provide field sampling and analysis services to both the Water Treatment Plant and Water Reclamation Facility. Data generated by the laboratory is utilized for compliance reporting to regulatory agencies and process control to assist plant personnel with daily operations.



Central Laboratory

SUMMARY

The BardenPho wastewater treatment process is primarily a biological process with limited chemical addition. The water treatment process is continually monitored, sampled and analyzed by professional licensed staff as well as by computer assisted programs, 24 hours a day and 365 days a year. The City produces a very high quality effluent suitable for return to the environment via irrigation and to the Gordon River. The City's effluent consistently meets or exceeds the limits set forth by the numerous state and federal regulations, thus helping to preserve Florida's limited water resources.



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FACT SHEET

The City of Naples Water Reclamation Facility is an Advanced Waste Treatment (AWT) facility. The Facility treats wastewater from the City of Naples as well as portions of Collier County. Listed below is just a small portion of the data collected at the facility.

Location:	1400 3rd Ave. N.
Design Capacity:	10 million gallons per day (MGD)
Number of plant operators:	9
Average Daily Flow - FY 22/23:	4.445 MGD
Water Treated - FY 22/23:	2,636,187,000 gallons
Biosolids Produced for Beneficial use - FY 22/23:	4,225 tons
Reuse Delivered for Irrigation - FY 22/23:	2,249,647,000 gallons
River Discharge - FY 22/23:	0 gallons
Nitrogen Removal:	90% to 95% removal efficiency
Phosphate Removal - FY 22/23: Treatment	92.06% removal efficiency
Cost - FY 22/23:	\$1.74 per 1,000 gallons treated
Chemical Used/Reason:	Aluminum Sulfate (ALUM) / Phosphorus Precipitation Chlorine / High Level Disinfection Sulfur Dioxide / Dechlorination Cationic Polymer / Biosolids De-watering

Tours are encouraged and available to all schools, civic organizations, and individuals. To schedule, please contact the Water Reclamation Superintendent at (239) 213-4732.