



# Riverhead Water Resource Recovery Facility for the Peconic Estuary - Golf Course Irrigation

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Reclaimed Wastewater





# PROJECT BACKGROUND

If you have vacationed in Florida, California, or any arid state where drinking water is scarce, you probably noticed water supply pipes painted purple. Purple pipes are a water resource industry standard, signifying that wastewater has been reclaimed. . . that using water just once for domestic use is a luxury that is unsustainable. And, up until now, purple pipes on Long Island have not been seen.

The Town of Riverhead and Suffolk County have taken an important first step in implementing a long-term strategy towards conserving potable water and in protecting the environmentally sensitive surface waters of the Peconic Estuary. By reusing about 350,000 gallons of highly-treated wastewater each summer day to irrigate the Indian Island Golf Course, the Town and County have adopted a new paradigm to reclaim our waters.

Substituting reclaimed water for potable water protects the Peconic Estuary ecosystem by diverting about 1.4 tons per year of nitrogen. Nutrients, like nitrogen, have been scientifically proven to cause harmful algal blooms and contribute to fish kills. Nitrogen applied to the golf course helps to reduce the amount of fertilizer, thereby reducing the nitrogen load contributed by surface water runoff. Projected sea level rise will hasten aquifer contamination caused by salt water intrusion, so reduction in the amount of water drawn using groundwater supply wells serve well to retard aquifer degradation.

IN AN EFFORT TO CONSERVE WATER AND PROTECT OUR  
SURFACE WATERS FROM NUTRIENT OVER-ENRICHMENT, THIS  
GOLF COURSE IS

**IRRIGATED WITH NON-POTABLE  
RECYCLED WATER**



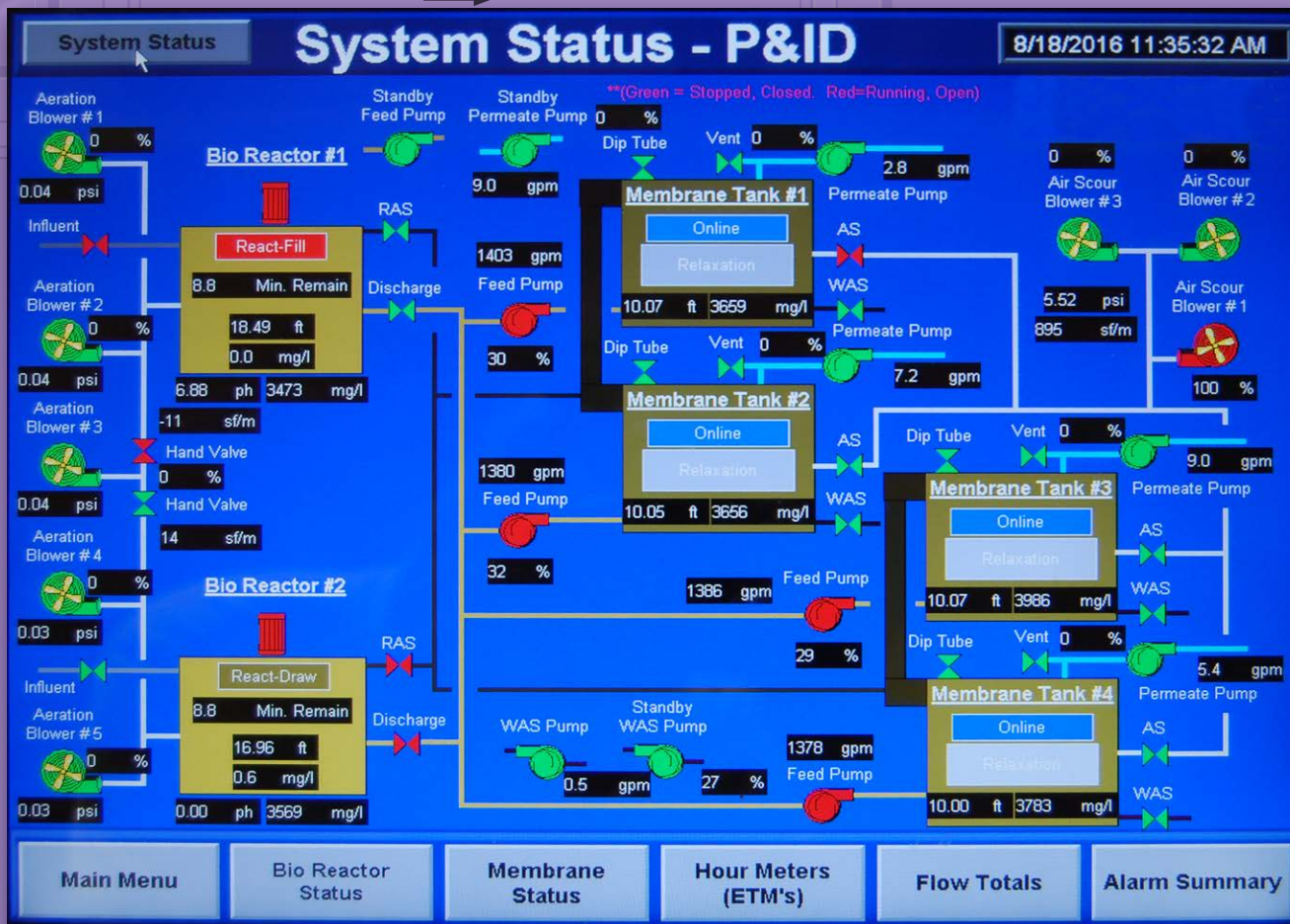
NON-POTABLE WATER IS NOT CERTIFIED FOR DRINKING

HOURS OF IRRIGATION ARE FROM 9:00 PM TO 5:00 AM

## about the Peconic Estuary


In 1992, the Peconic Estuary became the 20th estuary in the nation to receive the designation as an "Estuary of National Significance" by the U.S. Environmental Protection Agency (EPA). As part of the National Estuary Program (NEP), the Peconics were charged with developing and implementing a watershed-based comprehensive management plan. A new alliance was necessary to carry out this colossal task, and the Peconic Estuary Program (PEP) was born. The PEP is an innovative partnership of local, state, and federal governments, citizen and environmental groups, businesses and industries, and academic institutions. After years of hard work, the PEP Comprehensive Conservation and Management Plan (CCMP) was formally approved on November 15, 2001 by EPA Administrator Christine Whitman, with the concurrence of New York State Governor George Pataki. There are an ambitious 340 management tasks included in the CCMP; priority topics include Brown Tide, nutrients, habitat and living resources, pathogens, toxic pollutants, and critical lands protection.





The public often refers to plants that treat sewage as "sewage treatment plants". The shift towards water reclamation and the high levels of treatment required to produce a reusable product have required a concerted effort to change public perception. The Riverhead Water Resource Recovery Facility is a state-of-the art \$23.5 million project designed to treat 1,500,000 gallons of wastewater to the technological limit of about 3 mg/L of nitrogen. Sewage generated by the Riverhead Sewer District, Suffolk County Correctional Facility and the Suffolk County court complex off of County Route 24 are served by the Riverhead Water Resource Recovery Facility using membrane technology and high-dose ultraviolet disinfection to achieve virus removal.



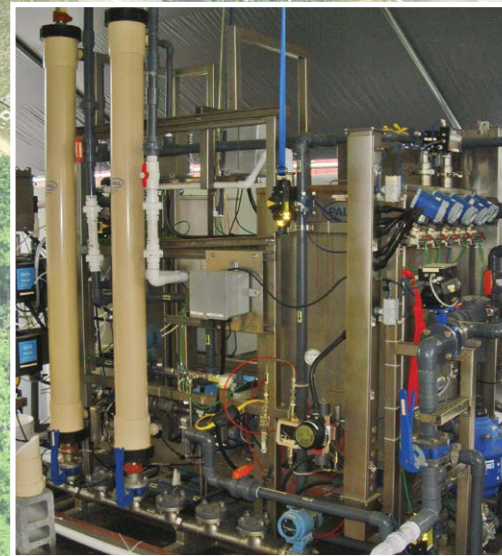
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- The Town upgraded the Riverhead sewage treatment plant in 2000 to comply with the effective NYSDEC SPDES permit. The existing trickling filter plant was decommissioned and the plant was reconstructed to the activated sludge process using Sequencing Batch Reactor (SBR) technology followed by ultraviolet disinfection.
  - Then in 2007, USEPA issued TMDL regulations for the Peconic Estuary requiring the plant to be upgraded again to achieve a summer nitrogen loading of 40 pounds of nitrogen per day. At the design flow of 1.5 million gallons per day, the effluent summer total nitrogen concentration required to meet the mass loading is approximately 3 mg/L.





## pilot plant = wastewater reuse →

- Prior to the issuance of the 2007 TMDL, the Town embarked on a program to irrigate the Indian Island Golf Course. The plan was to take a "side stream" flow of approximately 350,000 gallons per day from the SBR process and further treat it to achieve wastewater reuse standards.
- The Suffolk County Department of Health Services was introduced to the project in 2003, wherein they required that a full scale pilot program be undertaken to demonstrate compliance with wastewater reuse standards for the end application as golf course irrigant. (SCDHS and New York State did not have regulations or standards governing wastewater reuse.)
- Consequently, the County required that the Town research USEPA standards and other state standards (i.e., California Title 22 regulations, Arizona Class A reuse requirements) to ascertain the requirements for golf course irrigation and make recommendations for the discharge standards. Several engineering and scientific reports were commissioned by the Town to make such recommendations and to design the pilot plant according to the standards. H2M architects + engineers was retained to manage the program and to design and implement the pilot program. A risk assessment of health effects was also conducted.
- The pilot plant was constructed consisting of cloth media filtration, ultrafiltration using membrane technology and high dose ultraviolet disinfection to achieve virus removal. To best demonstrate the impact to the golf course, a scaled version of the Indian Island Golf Course was constructed on the property of the sewage treatment plant that mimicked in every way the conditions of a typical golf hole at the course. Pilot plant effluent was applied to the model golf hole over the summer months of 2004.





## Full-Scale Implementation

- A final report was prepared and approved by SCDHS and NYS DOH in 2006. The Town received a NYSDEC grant for approximately \$2 million to undertake the project.
- The TMDL requirements were then issued in 2007 which required the entire facility to be upgraded. The side stream plan was abandoned and the project was placed on-hold indefinitely pending the issuance of the new SPDES Permit and sufficient funds to undertake the upgrade.
- The NYSDEC SPDES Permit had to be modified to incorporate the new discharge requirements for TMDL compliance. A modified permit was issued in 2009.
- A facility plan (engineering design report) was prepared and submitted to New York State Environmental Facilities Corporation for approval in 2010. The plan still diverted treated effluent to the golf course so as to reduce the load to the Peconic Estuary by 12 pounds per day during the irrigation season and when the Parks Department choose to use the reuse water.
- On June 4, 2013, the Town applied for the Suffolk County Sewer Infrastructure Grant to help fund the project. The project budget was established as \$23.5 million. The County subsequently awarded the Town \$8,091,000. New York State Environmental Facilities Corp. provided short term construction funds and low interest long term loans for the remainder of the project.
- The construction documents for the TMDL upgrade were prepared and the project was advertised and publicly bid. Construction bids were received on December 20, 2013 totaling \$21,914,600.
- The Town Board approved a project budget of \$23.5 million on February 6, 2014 and the bids were accepted. The construction contracts were executed and the construction commenced in April 2013.

**Steve Bellone**  
County Executive



**Al Krupski**  
County Legislator - 1st District



## Town of Riverhead

**Sean Walter**  
Supervisor



**John Dunleavy**  
Council Member

**Jodi Giglio**  
Council Member

**Tim Hubbard**  
Council Member

**James Wooten**  
Council Member





...in with the  
**NEW**(science)



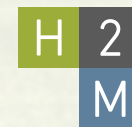


*For more information . . .*

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