

## Improved Wastewater Management at Locust Hill Country Club

In New York State, 30 out of 933 golf courses have achieved certification by Audubon International as Cooperative Sanctuaries, a program for golf courses that demonstrate their commitment to the environment by meeting standards for protecting water quality, conserving natural resources, and providing wildlife habitats. Of these 30, Locust Hill Country Club, located in Pittsford, NY, stands out as a sustainability leader.

As a member of New York Environmental Leader (NYEL), Locust Hill Country Club has decreased the amount of water used for irrigation by 2 million gallons a year, restored 3.5 acres of land to a natural state to filter storm water, decreased the amount of fertilizer and pesticides used by 400 lbs a year, and continued their internship program to train future leaders in golf course sustainability. Locust Hill is constantly searching for areas in their operations that can become more environmentally efficient.

### CHALLENGE

One of the gaps identified by Audubon International in Locust Hill Country Club's operations is the lawn mower washing, in which wastewater from the washing is sent through an underground tank and discharged into a town-approved wooded area nearby.



Washdown Basin and Screening System

This overflow sometimes creates undesirable odor problems. It had been determined that at peak times approximately 1,500 gal/day of wash water is discharged into the underground tank and to the nearby wooded areas. Even though the discharge is in compliance, Locust Hill Country Club wanted to mitigate the odor issues and reduce or eliminate discharge to the woods to benefit the environment and surrounding community.

### SOLUTION

The New York State Pollution Prevention Institute (NYSP2I) worked with Locust Hill Country Club to evaluate opportunities to reduce water use and recycle water from the mower cleaning operations. The work performed included a baseline determination of water use and wastewater quality, spray nozzle alternative trials to reduce water use, filtration testing for potential reuse, ultraviolet disinfection testing to reduce bacterial growth for



Photo Credit: Locust Hill Country Club

### CHALLENGE

- Reduce wastewater discharge into surrounding wooded areas and eliminate undesirable odor problems

### SOLUTION

- NYSP2I performed a baseline determination of water use and waste water quality, spray nozzle alternative trials to reduce water use, filtration testing for potential reuse, ultraviolet disinfection testing to reduce bacterial growth for water reuse, and an economic analysis of these alternatives

### RESULTS

- After reductions of up to 50% using air blowing and different nozzles, approximately 700 gal/day of wastewater would need to be managed. Then if, this wastewater can be filtered and reused, overall reductions in wastewater would exceed 90%. A screen and sand filter was tested and installed, and a UV lamp was added to help control bacterial growth
- Equipment costs were approximately \$6,000 and engineering support provided by NYSP2I
- As of Fall 2017, system working satisfactory and water recycled
- System will be monitored periodically for performance and quantification of water/wastewater reduction

## TESTIMONIAL

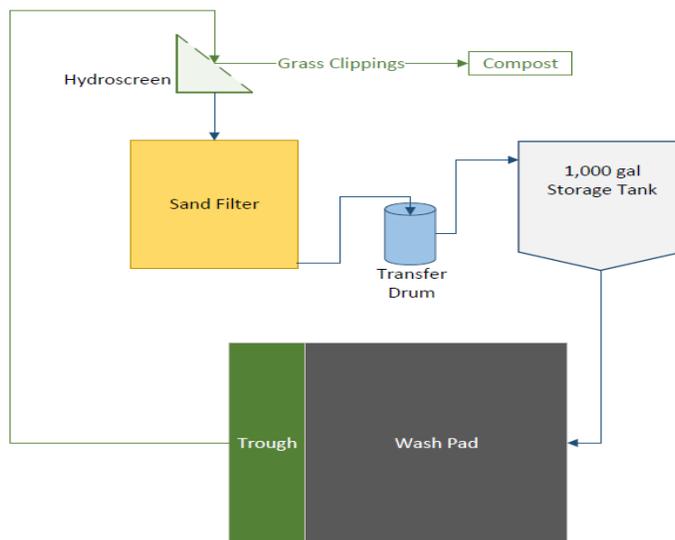
water reuse, and an economic analysis of these alternatives. NYSP2I collaborated with Rochester Institute of Technology's (RIT) School of Chemistry and Material Science to run the ultraviolet (UV) disinfection tests. Subsequently, NYSP2I and the SUNY Buffalo Department of Civil, Structural, and Environmental Engineering Department assisted in the final design and implementation of the recycling system which includes a screen filter, sand filtration, and UV technology.

### RESULTS

NYSP2I identified a number of options to help Locust Hill Country Club reduce the amount of wastewater discharge. Low cost water use reduction techniques, such as prewash air blowing and lower flow nozzles for mower washing, were implemented. NYSP2I and SUNY Buffalo finalized the design of the recycling system and assisted with implementation. Some of the key results are as follows:

- Prewash air blowing and lower flow nozzles reduced water use by 40-50% without significantly affecting cleaning time and quality.
- The design of the system to clean and reuse approximately 700 gal/day was finalized. Overall, over 90% of the water is expected to be reused, meaning water savings and wastewater reduction of over 90% are expected.
- A detailed bill of materials was created from which Locust Hill Country Club purchased/acquired all necessary components including the screen filter, plastic tanks, sand, UV lamp, pumps and associated piping and fittings. Total equipment costs were valued at \$6,000.
- With guidance from NYSP2I, Locust Hill Country Club constructed the system in the Fall of 2017 and started up this system. Hydraulically, the system was operating well.
- The recycling system will be monitored periodically to quantify metrics, including actual amount of water saved.

Locust Hill Country Club has benefited significantly from this project and has shared this information with other golf courses to spread the use and knowledge of such sustainable practices. NYSP2I is available to work with any New York State golf course to engineer optimum system for washwater recycle.



Process Schematic for Washwater Recycling System

"After working with NYSP2I, we have a number of options to choose from to successfully reach our sustainability goals. Our employees were able to test possible nozzles first hand, so we know we won't have to sacrifice quality or efficiency in order to save water. Beyond reducing our use of water, NYSP2I was able to identify further water saving opportunities like water filtration and reuse, which allows us the potential to drastically reduce water discharge. We plan to implement the use of new nozzles, as well as engage in a follow-up project with NYSP2I to determine how we can move forward with water reuse. Thanks to the economic analysis, we know these implementations, in addition to the environmental benefit, will save us money in the long run."

– Locust Hill Country Club

## NYSP2I PARTNERS

R·I·T

Rensselaer

UB

University at Buffalo

The State University of New York

Clarkson

UNIVERSITY

New York Manufacturing Extension Partnership

Funding provided by the Environmental Protection Fund as administered by the New York State Department of Environmental Conservation. © 2017 Rochester Institute of Technology Any opinions, results, findings, and/or interpretations of data contained herein are the responsibility of Rochester Institute of Technology and its NYS Pollution Prevention Institute and do not represent the opinions, interpretation or policy of the State.

For more information please contact us:

111 Lomb Memorial Drive, Bldg. 78  
Rochester, NY 14623

Tel: 585-475-2512

Web: [nysp2i.rit.edu](http://nysp2i.rit.edu)

E-mail: [nysp2i@rit.edu](mailto:nysp2i@rit.edu)

R·I·T  
Golisano Institute  
for Sustainability  
ROCHESTER INSTITUTE OF TECHNOLOGY