Using Stormwater Runoff For Golf Course Irrigation

Cutten Fields Golf Club   **Guelph, Ontario**
David Kuypers, CGCS, superintendent

Issue

Cutten Fields Golf Club is an 83-year old golf course located in Guelph, Ontario. The course is located in a region that has sufficient, but not abundant, water resources and a diverse range of water users. The water supply is shared by agricultural users, aggregate producers, city services and small, private permit holders like the golf course. The golf course has a permitted allowance of 230,000 gallons per day, adequate during times of average rainfall but insufficient during times of drought. Mandated reductions in water use during drought periods quickly placed the golf course in a deficit irrigation position.

Action

It was not possible to increase their daily water allotment, so the club undertook an innovative project to capitalize on a unique situation. A storm sewer originating on the University of Guelph campus, located to the south of the golf course, passed beneath the golf course and discharged into the Eramosa River, located to the north. The sewer collected storm water from parking lots and roads on the north end of campus as well as the foundation drains from many of the University buildings. Working in partnership with the University, and with the approval of the local conservation authority, a connection was made to the sewer as it passed through the golf course. This connection would feed a stream that discharged into the golf course irrigation reservoir, providing a valuable supplemental water supply. This extra water would be particularly helpful in times of low-flow or required reductions.

Results

Depending on the level of flow, the connection to the storm sewer can provide 30 - 70 percent of the daily permitted water allotment, meaning that the golf course does not need to pump this water from the Eramosa River. As the club renovated other parts of the facility, including parking lots and the practice range, they connected drainage from those areas to the stream as well. This enabled them to capture even more runoff that could be used for irrigation. In addition to a supplemental irrigation source, the captured runoff also provides steady flow through a golf course water feature, enhancing its aesthetics.

A challenging aspect of this system is that the water quality of the captured runoff is not ideal for irrigating turfgrass. Since the majority of the storm water is collected from parking lots and roadways, it is very high in sodium and chlorides which are injurious to plants. Sodium and chloride levels in the water have been found to be 3 - 5 times higher than the acceptable limits of those elements for turfgrass irrigation, 50ppm for sodium and 140ppm for chlorides. There are many challenges that come from elevated salt levels; the most notable is dehydration damage to trees and landscape plantings on the golf course. Turf health is also impacted by the poor water quality, especially when dry weather persists and irrigation is used more frequently. During these times, the effects of irrigation water quality on turf health need to be monitored and managed diligently. Supplemental fertility applications, improved drainage through aggressive cultivation and frequent flushing are all necessary in order to keep salt levels in a healthy range for turf.

In spite of these challenges, connecting the irrigation reservoir to the storm sewer has provided a more consistent water supply and reduced pumping expenses. These benefits have made any agronomic adjustments more than worthwhile.

Cutten Fields Golf Club developed a valuable supplemental water supply by connecting to a storm sewer that collected runoff from parking lots and roads.

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