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Olver Associates: Treatment facility project improves Sebasticook Lake water quality



By William M.Olver,P.E. and Thomas N.Floyd

The Corinna Sewer District recently completed an infrastructure improvement project to enhance water quality in Sebasticook Lake. One goal of the project was to reduce nutrient discharges into the lake. Wastewater effluent contains nitrogen and phosphorus that can cause water quality problems.

Excessive nutrient loadings into lakes can trigger severe algal blooms. As algae die and settle to the lake bottom, nutrients are released back into the water and cause greater algae growth each subsequent year. Over time, nutrient laden lakes fill in with plant growth in a process called eutrophication. These plants decay and deplete oxygen that is needed to sustain fish.

As recently as 1970, Sebasticook Lake was one of the world's most eutrophic small lakes. Nutrients from sewage overflows, agricultural runoff and industries added about two pounds of phosphorus per acre annually to the lake. The threshold loading to prevent eutrophication was considered to be half that amount. The Maine Department of

Environmental Protection (DEP) has been working with communities in the watershed to reduce nutrient loadings. One goal was the elimination of all upstream wastewater plant discharges.

The Corinna Sewer District installed a plant in 1968 to treat wastewater from residential sewer users and a textile facility. Effluent from the plant flowed into the Sebasticook River which eventually reaches Sebasticook Lake. The plant did not have the capability to remove nutrients. In 2000, DEP required that the District eliminate the plant discharge and construct a new facility that disposed of effluent on land. Olver Associates Inc. was retained to assist in the design and implementation of this project.

Prior to constructing the new plant, significant sewer improvements were completed. The District's 100-year-old sewer pipes were in poor condition and contributed large volumes of groundwater infiltration and stormwater into the plant. During storm events, overloaded sewers caused sewage to overflow into the river and lake through five relief points.

To reduce flows, the District replaced four miles of sewer with new watertight pipes. This reduced peak flows in the system by ninety-six percent from over 35 MGD down to only 1.4 MGD and eliminated sewage overflows into the lake. It also allowed a smaller treatment plant to be built.

The old plant was replaced with a non-discharging lagoon and spray irrigation system. Water is pumped to two 3.5 MG treatment ponds where biological wastewater stabilization occurs. Treated effluent is stored in a 50 MG pond until weather conditions allow it to be land applied on a 36-acre site.

The cost of the upgrade project was over \$9.0 million. This was beyond the financial means of the Corinna Sewer District to incur on its own. Significant grant funding was provided by several agencies including DEP, EPA, Rural Development, and the CDBG program.

As a result of the project, Corinna's treatment plant discharge was removed from Sebasticook Lake last year. This eliminated the last remaining point source of nutrients into the lake. In conjunction with the cleanup efforts of other communities, the project has helped to transform Sebasticook Lake from a once polluted waterbody into a natural resource that benefits current and future generations.

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