

Stormwater engineering for urban pond restoration

MANCHESTER — The City of Manchester Environmental Protection Division (EPD) and Supplemental Environmental Projects Program (SEPP) Committee have been actively working to improve the quality of Manchester's urban ponds for many years. Top on that list is Nutt Pond, located near the busy urban South Willow Street shopping areas in Manchester.

Nutt Pond is one of the

few natural ponds in Manchester, used recreationally for boating and fishing. At 18 acres in size, Nutt Pond has an expansive watershed of 400 acres of highly urbanized area. As a result, it receives sediment-laden stormwater at high velocity containing large volumes of pollution from three main inlets. Once a source of ice harvested for the area, this popular swimming area was closed due to water quality

issues and was later listed as impaired by the state for primary contact recreation.

Comprehensive Environmental, Inc. (CEI), a Merrimack-based civil engineering and environmental consulting firm, was brought on board to help. CEI assessed pollutant loads and recommended the design and construction of treatment at two of the pond's inlets. The team quickly realized that site

constraints combined with high volumes and large pollutant loads originating via stormwater from the urban watershed required some unique treatment methods. CEI engineered a first flush diversion structure that uses the transition from supercritical to subcritical flow conditions to create a hydraulic jump that deposits sediments in a maintenance forebay at one location and a series of gabion check



The same area at Nutt Pond is shown before, left, and after improvements.

dams and level spreaders to create sediment forebays and wetland treatment at another location. As a second phase to this work, the

EPD and CEI are currently designing gravel wetlands to treat runoff for excess nutrients such as nitrogen and phosphorus.