Projects

Union Lake Dam

Millville, New Jersey

HIGHLIGHTS

- **This project serves as evidence of Conti's strong civil construction skills and their ability to perform complex construction activities in hazardous environments.**
- **In order to conduct the controlled demolition and remove the existing stone masonry dam, Conti constructed an 85,000 CY earthen cofferdam upstream in the lake and downstream across the river.**

The Union Lake Dam project serves as evidence of Conti's strong civil construction skills and their ability to perform complex construction activities in hazardous environments. Conti was the prime contractor for the replacement of the existing concrete and masonry dam and spillway on the Maurice River, structures originally constructed in the late 1800's to form Union Lake. Because of the historic nature of the dam, much of the stone was salvaged during controlled demolition and used to build a memorial dam structure in a nearby park.

In order to conduct the controlled demolition and remove the existing stone masonry dam, Conti constructed an 85,000 CY earthen cofferdam upstream in the lake and downstream across the river. Overflow from the lake was allowed to continue flowing through the steel sheet pile emergency spillway that rejoined the river just downstream of the dam. This new concrete gravity dam included a set of lake level controlling sluice gates, a spillway and emergency spillway, and an aluminum fish ladder. Over 13,000 CY of reinforced and mass concrete were placed in the new dam structure. The reinforced concrete splash apron with energy diffusers was anchored into the underlying strata by a system of post tensioned concrete tendons. Upon completion of the concrete dam structure the existing earthen abutments were raised to ensure that they would not be overtopped during a significant flood event.

This large construction project had major environmental implications. Conti installed an extensive well point and deep well dewatering system around the perimeter of the cofferdam to lower the groundwater in the foundation excavation area for the new dam structure. The lowering of the lake exposed sediments which were contaminated with arsenic. As a result, after the existing stone dam was demolished, Conti excavated over 64,000 CY of arsenic-contaminated sediments and transported and disposed of them off-site. The dewatering operation had to be carefully controlled to limit the extent to which sediments were exposed and allowed to dry out.

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The Wheaton Glass Company utilized the lake created by the dam for water supply, fire protection, water power and eventually to produce electricity for their glass manufacturing plant. The existing structure was constructed of stone masonry units placed on top of a timber grillage and pile system driven into and placed across the Maurice River. Several improvements had been made over the life of the stone structure. A concrete spillway and an emergency spillway were constructed of steel sheet-piling in order to protect the stone structure and adjacent earthen abutments from overtopping.

The Vineland Chemical Company's plant site--one of the top ten NPL sites in New Jersey--can be found upstream from the lake, along the upper reaches of the Maurice River. In the past, Vineland Chemical manufactured organic arsenic herbicides and fungicides at this location, using river water for processing and waste disposal. Arsenic waste released from the plant has since contaminated the Maurice River and migrated into Union Lake where it contaminated sediment near the original stone masonry dam.

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