DEP TAKES ACTION TO REMOVE UNSAFE DAM

Brisbane Lake Dam is located in Wall Township, Monmouth County, New Jersey. The lake and dam are located within the Allaire State Park. Traversing the crest of the dam is County Route 524. The dam is an earthen embankment dam approximately 18 feet high and 200 feet long. The lake impounded by the dam is approximately 7 acres in size. The spillway is a concrete spillway approximately 14 feet high. The spillway is located on the downstream side of the County bridge structure. According to the plaque on the bridge, the structure was built in 1926. The dam is classified as a significant hazard dam due to the existence of the county roadway across its crest and the existence of the historic Allaire Village immediately downstream.

Previous inspections of the dam had identified a seepage condition behind the downstream wingwall (see Photo 1). Extensive investigations failed to identify the source of this seepage. No fines were noted in the flow and the flow was not impacting the ability of the dam to impound the lake. With a consulting engineer already on board for the design of a total rehabilitation of this dam, it was decided to closely monitor this condition until such time that the design could be finalized and the rehabilitation work completed.

Photo 1

In October 2005, a severe rainfall resulted in the failure of the dams immediately upstream and downstream of the Brisbane Lake Dam. Higher than usual water levels were experienced at the dam, but the condition of the seepage remained unchanged. Continued monitoring was recommended as the rehabilitation project drew closer to fruition.

Photo 2

On September 12, 2007, it was reported to the Bureau of Dam Safety and Flood Control by Allaire State Park's Staff that the water level in Brisbane Lake had dropped and continued to recede. An immediate inspection by engineers from the Bureau identified that the seepage had increased significantly and that the seepage was carrying out fill materials from behind the wingwall (see Photo 2).

Given the rate of flow from behind the wingwall and the existence of suspended soil materials within the seepage, the Bureau and the Division of Parks and Forestry activated the Emergency Action Plan for this dam and declared a Dam Advisory Condition. To activate the EAP, the Department contacted State Police, Monmouth County and Wall Township Emergency Management Officials.

It could not be determined if the internal erosion of the embankment could potentially jeopardize the integrity of the dam and hence County Route 524. In consultation with Parks and Forestry, it was determined to take immediate action to remove this dam to relieve the head pressure on the piping condition. The dam was closely monitored while the Division of Parks and Forestry staff contracted with Caruso Excavating to undertake the emergency removal of the spillway. Due to quickly receding water levels, the Division of Fish and Wildlife was contacted and a fish salvage operation was carried out where numerous large mouth and calico bass were relocated to other impoundments.

The dam possesses a low level outlet, but the gate was not operable. Additionally, just opening the gate would not have provided additional spillway capacity, allowing the lake to refill during storm events, resulting in increased head pressure on the internal piping condition. It was decided to remove a 9 foot wide section of the concrete spillway. The spillway is an ogee shaped spillway approximately one foot thick at the crest and widening to approximately 5 feet thick at the base. The spillway is 13 feet wide between the concrete wingwalls.

Photo 3

Photo 4

Caruso subcontracted with Atlantic Concrete Cutting to saw out the section of the spillway proposed to be removed. On September 26 and 27, 2007, holes were drilled for inserting the saw bands and lifting the sections from the spillway (see Photo 3). On September 29, the sawing of the spillway commenced. One horizontal cut was made at the base of the proposed breach. Two vertical cuts were made to define the width of the breach and one vertical cut was made in the middle of the massive concrete block for ease of lifting. (See Photo 4)

Upon completion of the saw cuts, Caruso was back on site on October 2 to proceed with the removal of the spillway section. Heavy equipment was utilized to lift the massive concrete blocks from the spillway. As anticipated, the section broke horizontally in the center at a cold joint in the concrete, resulting in four separate blocks to be removed. The upper portion of the removal was completed on this day. (See Photos 5 and 6).

Photo 5

Photo 6

On October 3, Caruso removed the lower blocks of the spillway. (See Photos 7 and 8). At this time, there was still approximately 10 inches of water impounded above the horizontal cut to serve as the bottom of the breach. In anticipation of a surge of water when the block was lifted, the Mill Pond Dam located downstream (which has been rebuilt since it's failure in 2005) was lowered to assist in reducing the surge.

Photo 7

Photo 8

Lateral braces were placed across the channel to account for any loss of lateral support provided by the spillway. Some of the impoundment still remains which will help in controlling sedimentation as a channel develops through the upper reaches of the lake bed. The removal project was completed with no detrimental impacts to the environment. Sediment control measures were in place throughout construction to minimize the impacts of sediment release. The presence of the egret in the lake bed on a continuous basis during the work indicated that the lake was still alive and well. The final product resulted in a safe structure until such time as the plans can be completed for the reconstruction of the dam.