

Executive Summary

Camp Pond Dam is a small, earthen dam located in the Richland Estates neighborhood in Raleigh, North Carolina. The dam and its impoundment are privately co-owned by four residents on Richland Drive who share the responsibility for maintaining the dam. The City of Raleigh (City) maintains the public right-of-way for Richland Drive, a City-owned street, that crosses the dam. Richland Drive is the only access to the Lakeland Woods neighborhood south of Camp Pond. Damage to Richland Drive resulting from failure or overtopping of the dam could prevent access to residents as well as emergency responders. In addition, there are three homes immediately downstream of the embankment as well as several homes farther downstream on Richland Creek that would be at risk in the event of dam overtopping or failure.

Camp Pond Dam is regulated by the North Carolina Dam Safety Program (Dam Safety) as a high hazard dam based on the potential for downstream property damage and loss of life. Dam Safety has issued multiple Notices of Deficiency (NODs) to the owners of Camp Pond Dam, most recently in December 2021. Recommendations in the NOD include performing an engineering study to determine appropriate measures to correct the deficient conditions (see Section 1.2). This Camp Pond Dam Engineering Study (Study) was initiated by the City to identify and evaluate preliminary engineering alternatives to address the NOD.

The modeling for the Study shows that the existing Camp Pond Dam is expected to overtop during a spillway design flood (SDF). The dam and its outlet system need to be able to safely pass the SDF to comply with Dam Safety requirements and remain in service. Also, since Camp Pond is an existing lake, the identified alternatives were evaluated according to the City's Lake Management Evaluation Program Policy (Policy), adopted by the City Council in 1994 and amended in 2020. As such, in addition to addressing Dam Safety requirements, the City desires that potential public stormwater management benefits be explored. Three alternatives were evaluated and selected for preliminary (25% level) design:

- Alternative 1 ("Pond Preservation/Restoration") would maintain Camp Pond at its current water surface and improve the dam embankments and spillways to bring the dam into compliance with Dam Safety regulations. This alternative would include replacement of the deficient, existing 36" principal spillway pipe and riser as well as modifications to the auxiliary spillway weir and embankment to safely pass the SDF. The proposed configuration would include a new principal spillway comprised of one 8' x 6' reinforced concrete box culvert (RCBC) with a 16' x 12' concrete riser box structure, lengthening of the existing auxiliary spillway weir with a proposed labyrinth weir configuration, regrading the downstream embankment, and removal of woody vegetation (e.g., trees) per Dam Safety requirements.
- Alternative 2 ("Stream Restoration") would lower the dam spillways to allow the stream to re-establish in the pond bottom. Improvements to the dam spillways would be necessary to bring the dam into compliance with Dam Safety regulations. This alternative would involve replacement of the deficient, existing principal spillway pipe with one 8' x 5' RCBC, lowering and lengthening the existing auxiliary spillway weir, grading the upstream side of the dam and pond bottom, removal of woody vegetation, and regrading the downstream embankment. A defining feature of Alternative 2 is the proposed lowering of the normal pool elevation to the current pond bottom, allowing for the restoration of the impounded stream with grade control and stabilization measures. Because Alternative 2 would mostly eliminate the permanent impoundment of water behind the dam, the potential for deregulation or reclassification of the dam to a lower

hazard class was preliminarily investigated as part of this study but was determined to not be a viable path forward for Camp Pond Dam.

- Alternative 3 (“Hybrid Solution”) would partially lower the dam spillways to establish a stream transitioning to a wetland within the pond bottom. Compared with Alternative 2, the stream and wetland system would function as a lower gradient (i.e., less erosive) system. The dam spillways would also be improved to comply with Dam Safety regulations. Alternative 3 would include replacement of the deficient, existing primary spillway pipe and riser with one 8’ x 6’ RCBC and an 8’ x 12’ concrete box riser structure, lowering and lengthening the existing auxiliary spillway weir, grading the upstream side of the dam and bottom of the pond, removal of woody vegetation, and regrading the downstream embankment. Whereas Alternative 2 proposes lowering the permanent pool elevation to the current pond bottom (287.0-ft NAVD88), Alternative 3 proposes lowering the permanent pool to 289.0-ft NAVD88, allowing for the establishment of a larger marsh and open water areas.

All three design alternatives would resolve the deficient conditions identified in the NOD and bring the dam into compliance with Dam Safety regulations. This study evaluated the hydrologic and hydraulic performance, potential public stormwater management benefits, construction complexity, permitting considerations, financial impacts (i.e., capital and life cycle construction and operation and maintenance costs), and other pertinent decision criteria to weigh the relative benefits and disadvantages of the three alternatives. In addition, a public meeting and website were hosted by the City and AECOM to gather input from the private co-owners and surrounding community. Alternative 1 (Pond Preservation/Restoration) received nearly unanimous support from both the private co-owners of the dam and members of the greater neighborhood who value the pond and view it as an asset to their community. In August 2023 and October 2023, the City and AECOM team presented the study recommendations to the Raleigh Stormwater Management Advisory Commission (SMAC) and received consensus on advancing Alternative 1 to the detailed design phase.

Perhaps most importantly, implementation of improvements to Camp Pond Dam will impact access for residents south of the dam since the spillways cross beneath Richland Drive, which forms a portion of the dam embankment. Access and public safety must be prioritized for all of the alternatives, as uninterrupted access for residents and emergency vehicles must be maintained throughout the duration of construction. Based on AECOM’s preliminary assessment, there do not appear to be viable, cost-effective options for alternative, temporary access routes. Therefore, it is likely that at least one lane of traffic will need to be maintained along Richland Drive throughout construction, likely increasing the duration and cost of construction. These considerations will continue to be prioritized as the Camp Pond Dam Engineering Study advances to detailed design.