



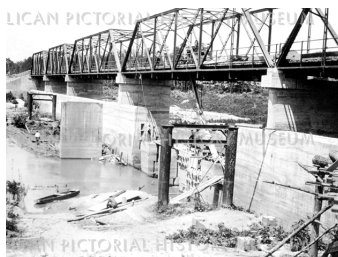
Background: Armstrong Ford Dam is a low head dam that is mostly submerged by the backwater of Lake Wylie. The level of Lake Wylie varies and therefore the water drop over the dam also varies (from 1-3' typically). The dam was constructed in the mid-1920's to serve functional and recreational purposes for the Cramerton Mill. The dam is being evaluated for partial removal and the benefits and potential impacts of the project are currently being assessed. The purpose of this public meeting is to share the findings of the current feasibility study and to collect feedback on the level of support or lack thereof as well as interests and concerns. We would like to know why you support or do not support the dam removal and what you are concerned and/or excited about. Thanks for your participation!

Stations have been set up to walk participants through the project:

- Station 1 - Information is presented on the rationale for removal of the Armstrong Ford Dam.
- Station 2 - The benefits and potential impacts of removal are presented in detail.
- Station 3 - Some of the basic technical logistics for conducting the proposed project are provided to help participants understand more about the project activities and timeline.

STATION 1 – WHY REMOVE THE ARMSTRONG FORD DAM?

- **Flood Reduction:** The dam exacerbates flooding between Armstrong Ford Road and the McAdenville Dam adversely affecting areas such as the Cramerton Fire Department, Eagle Road WWTP, and public recreational areas. The removal of the structure will reduce upstream flooding and backwater across 100 acres of low-lying area in the floodplain. When Lake Wylie is lowered in advance of flood events, this additional available area will attenuate over 250 acre-feet of floodwater to assist with flood reduction.
- **Safety Hazard:** During high water, the Armstrong Ford Dam weir and historic bridge piers projecting from the water serve as a river hazard. The structures catch debris, a secondary hazard, and may cause unsafe hydraulics. Unfortunately, obsolete dams are implicated in many drownings nationwide. Increasing river access for the public without an understanding of the presence of, or risk presented by, this structure is a concern this project would address.
- **Benefits to Aquatic Life:** The dam is a barrier to the passage of fish and other aquatic organisms. Aquatic species benefit from connectivity to habitat and refuge from pollution, flooding and other stressors. In addition, when aquatic habitat is reconnected, isolated genetic pools can mingle and strengthen species through genetic diversification.
- **Wetland Restoration and Water Quality Treatment:** Inundated floodplain areas could be potentially repurposed for stormwater management and would have a more natural wetness regime under post-removal conditions.
- **Recreation:** Water-based recreation is a growing industry and a safe and fun family and friends' activity. Removal of the dam will facilitate safe passage of non-motorized boats from Lake Wylie up the South Fork River. Fishing is already a popular activity in the area and will only get better with the dam removal.



Please visit the feedback station before you leave and tell us what you think about the project. We appreciate your input!



STATION 2 – WHAT WOULD THE REMOVAL OF THE ARMSTRONG FORD DAM MEAN?

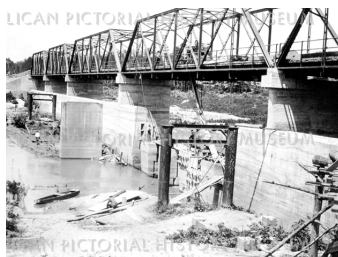
From data collection and assessment activities that have been part of this feasibility stage of evaluation, the potential impacts and benefits of the project have been studied to develop a better understanding of the degree to which these consequences may present themselves throughout project implementation.

There may be public concerns about removing the dam and what it will mean for water levels, sedimentation, or other considerations. Here's what we know about the potential impacts currently:

- **Water Levels:** Removal would result in a greater fluctuation in water levels upstream of the dam (water level would fluctuate with Lake Wylie). An average drop of 2' is expected. Banks, trees and manmade structures (mainly river access locations) could be affected. Activities such as retrofitting structures and livestocking banks are being considered as measures to mitigate these impacts.
- **Sediment Movement:** The dam is a barrier to sediment, but, because it is submerged and will only be partially removed, sediment redistribution volume is anticipated to be relatively low compared to historic sediment influx. Due to the low sediment volume, impacts of this redistribution are anticipated to be short-term and overshadowed by long-term aggradation trends that are already persistent.

It is understood that sediment is a significant concern in downstream areas of Lake Wylie and that small changes can adversely influence access. What we know about the sediment behind the dam includes:

- The sediment levels upstream and downstream of Armstrong Ford Dam are similar and this suggests that the dam impacts on sediment levels are localized with the sediment level further above and below being in apparent equilibrium. This is based on the overwhelming influence of the backwater from Lake Wylie which is >20' above the original river level.
- The loose sediment behind the Armstrong Ford Dam that is prone to movement is sediment that has already been delivered into the Lake that is likely to move with storm flows, with or without removal. Sediment that is behind the dam is expected to move and adjust to the changed hydraulics onsite, but the overall hydraulics of the river are dominated by Lake Wylie rather than Armstrong Ford Dam, which is almost completely submerged the majority of the time.
- Sedimentation will continue to be an issue in areas where it is presently an issue, but the removal of the dam is unlikely to create noticeable impacts when viewed on a time scale of 5-10 years. The impact of the project may be noticeable for a shorter time scale of 5-10 months as sediment levels adjust in the reservoir.
- Sediment removal from upstream of the structure is an effort that will yield little benefit for a high cost and environmental impact (to remove and haul sediment to a waste site).





STATION 2 – WHAT WOULD THE REMOVAL OF THE ARMSTRONG FORD DAM MEAN?

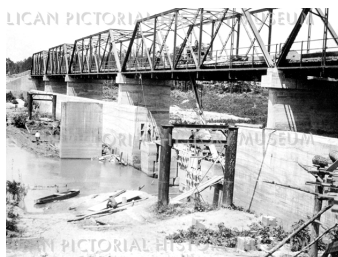
There are additional potential impacts and benefits that have been evaluated, as follows:

Impacts to wastewater treatment plant (WWTP) permit / structure: The Eagle Road WWTP was contacted to review potential impacts on their permit and operations. NCDEQ was contacted and the proposed project would not impact the WWTP’s permit. The WWTP has indicated that they do not have low water issues that impair operations but do have high water issues that impair operations when their discharge area is submerged excessively.

Flooding Levels: Station 2 includes an example of Lake Wylie water level lowering in advance of flood waves. Lake Wylie is outfitted with flood gates that become operational at full pond (568.6’ NAVD88) which can accommodate flood flows without increasing the stage above full pond. Lake Wylie is often lowered 2’-3’ to levels near 564.5’ (NAVD88) in advance of incoming flood waves from the South Fork or Catawba Rivers. Currently, water levels upstream of Armstrong Ford Dam remain at or above 568.0’ which is the base level of flow over the dam weir. The proposed partial removal of Armstrong Ford Dam would extend this pre-flood lowering upstream into the Cramerton and McAdenville areas and would reduce the level of flooding as a result. It would also modify the hydraulics at the Armstrong Ford Dam which controls the level of upstream flooding. In the plan and profile figure at Station 2, the 10-year flood is depicted on the profile with the dam causing a rise of approximately 5 feet in the flood water surface levels above the dam as compared to below.

Bridge Scour: The same hydraulics that cause potentially unsafe conditions have also been implicated in scour threatening the foundation of the Armstrong Ford Road (NCDOT) bridge. Extensive studies were conducted to evaluate the threat that this scour poses to the bridge foundation. Ultimately, the foundation was judged to be only partially undermined and largely bearing on rock or other minimally erosive material. Removal of the dam would greatly reduce the downward scouring force. The project team anticipates that rock broken off of the dam during demolition would be suitable scour protection which would also eliminate the exceedingly difficult task of removing this rock from the river bottom as part of the project scope. It is likely that several feet of riverbed material may eventually deposit in the existing scour hole due to the change in hydraulics that the project would cause, further protecting the bridge foundation.

Floodplain Wetlands / Water Quality: The partial removal of AFD will result in dewatering of open water areas in the historic floodplain of the Catawba River. This will improve amphibian habitat as it will be less subject to predation by fish since these wetland areas will no longer be consistently ponded. In other areas, it may also present opportunities to route stormwater from adjacent developments into these areas for water quality treatment. Natural and existing hydrology will be evaluated to further explore such green infrastructure opportunities.





STATION 3 – WHAT WOULD THE REMOVAL OF THE ARMSTRONG FORD DAM ENTAIL?

The removal of Armstrong Ford Dam could be implemented over the next 3-5 years.

- **Project Timing:** *Why 3-5 years?* Funding acquisition and permitting are anticipated to add 1-2 years to the design and construction timeline.
- **Permitting and Coordination:** The following permits are required. Some of these permits require careful consideration of environmental and cultural impacts, the study of which is dependent on agency concerns. Some projects require archeological or historical studies.
 - Floodplain/FEMA permit, 404 and Section 10 Corps permits, 401 DEQ permit, erosion & sediment control DEQ/DEMLR permit, local zoning and grading permit, dam safety review, Duke/FERC lake impact permit, NCDOT encroachment agreement, temporary construction easements.
- **Construction Methods:** The dam will be removed using a hammer hoe or hoe with pulverizer working from a floating barge platform. Alternate or complimentary methods such as setting charges within the core of the dam to hasten the removal process are being evaluated.
- **Construction Phase:**
 - No watercraft will be allowed to pass through during the construction phase.
 - Some intermittent impacts to traffic are anticipated but should primarily occur during mobilization efforts.
 - Locations for temporary earth staging areas need to be identified close to the site.
 - Clearing and grading will be required to prepare the site for a crane that will set the floating barge platform – 4 platform segments will be combined to create the platform.
 - The depth of removal will likely be limited by the depth to which the trackhoe-mounted demolition equipment can be submerged. Air compressors will be used to extend this depth as feasible.
- **Post Construction:**
 - The construction work area will be returned to a naturalized condition.
 - The dam will be removed to a level that is 5-6' below the normal water surface. At very low water (Duke Minimum Pond), the dam remnant will be 2-3' below the surface. It will be recommended that signage be posted on the NCDOT bridge to warn boats coming from both directions.
 - It is anticipated that the riverbanks will be more prone to the potential erosive impact of boat wake due to the lowered water level. A no wake zone or other limitations on power boats may be appropriate. The low clearance under the Armstrong Ford Road bridge also dictates caution.
- Project cost estimation is underway, but costs are still being refined and agencies are being consulted to better understand regulatory requirements that may affect project cost.

Please visit the feedback station before you leave and tell us what you think about the project.



If you have feedback at a later date, please reach out to Brandon Jones brandon@catawbariverkeeper.org. Wildlands Engineering is the Project Engineer for the Armstrong Dam Removal Feasibility Study phase that will conclude in early 2023.