

THE ISSUE: HIGH-HAZARD UNSAFE DAMS

By:

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Introduction

Recently, the Governor's Office announced that they had approved a five-year funding plan to fix up to 10 high-hazard, unsafe dams owned by the Commonwealth that are managed by Pennsylvania Fish and Boat Commission (Commission). For many, this raises some important questions. What is a high-hazard, unsafe dam, and what are the potential risks associated with them? Why is it necessary to fund these projects with a specialized plan? And lastly, what exactly does the plan entail?

This issue, while perhaps one that not everyone is familiar with, is important for the entire Commonwealth. Pennsylvania is home to thousands of dams, man-made lakes and reservoirs. These structures provide recreation, economic opportunities and, in many cases, flood protection, water and renewable power. However, with these benefits come significant costs. With the average dam in the United States being 52 years old, according to the American Society of Civil Engineers, many of these structures are rapidly aging and repairing or removing them can be costly.

Dams come in many sizes and varieties, ranging from just a few feet high to the towering 179-foot Kinzua Dam in Warren County. The structures are evaluated in terms of their potential impact. If a dam's failure would endanger human lives or property, they are considered "high-hazard." This classification, while ominous sounding, does not necessarily mean that the dam is in immediate danger of failing. In that case, where a dam is seen to have structural deficiencies or is compromised in a significant way, the dam is considered "unsafe."

Unfortunately, the problem of high-hazard, unsafe dams is a growing one, not only in Pennsylvania, but in the country as a whole. In this edition of the Joint Legislative

Conservation Committee's Green Paper, we will explore how this problem has evolved over several decades, how the final funding plan was conceived, and how the plan can be used as a framework for other public funding problems in the future.

History of Dam Safety

Dams were in the forefront of the nation's consciousness in the 1970s, when several high-profile dam failures highlighted the lack of government regulation and safety programs. One such failure was here in Pennsylvania.

The flood of 1977 devastated Johnstown, Cambria County, after both the Laurel Run and Sandy Run dams were overwhelmed by heavy rainfall. The resulting flood killed over 40 people and displaced many more. Homes were swept away in the current and millions of dollars' worth of property damage followed.

Incredibly, this was not the first, nor even the second time that this community had seen this kind of tragedy. Prior to this disaster, the floods of 1889 and 1936 combined, claimed over 2,000 lives in Johnstown. Both disasters resulted from structural dam failures.

After the 1889 flood, which stands as the deadliest dam failure in the United States, Pennsylvania passed the Dam Safety Act of 1913. This introduced a permitting process for new and existing dams, as well as the authority for the state Water Supply Commission to investigate these structures. Decades later, as dams continued to fail both in Pennsylvania and across the nation, the federal government implemented their own strategy. The National Dam Safety Act of 1972 charged

Spotlight on Somerset Lake

One of the dams managed by the Commission that is projected to benefit from the Commission's new funding strategy is Somerset Lake in Somerset County. It was placed on the high-hazard, unsafe list when water was discovered in the breast of the dam in 2012.

A year later, the Somerset Lake Action Committee (SLAC) was formed to improve recreational opportunities around the lake and to coordinate efforts to save it. One such effort was the raising of \$100,000 to assist with the repairs. Though this amount may seem diminutive when compared to the

total sum needed to repair the dam, it was a powerful way to demonstrate the community's commitment to the lake.

Through a targeted fundraiser known as Lake Fest, voluntary donations by businesses who benefit from its presence and from individual donations, the target amount was reached in a little over one year. The local Chamber of Commerce supported these efforts as Somerset Lake is only half of a mile north of a Pennsylvania Turnpike exit and has the potential to be a major attraction alongside the Flight 93 National Memorial. In fact, the Chamber of Commerce estimates that the

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the U.S. Army Corps of Engineers with compiling and classifying any non-federal dam over 25 feet high or dam with more than 50 acre feet of storage capacity. This act separated dams into high-hazard, significant-hazard, and low-hazard during a one-time inventory process. Two years later, 750 dams in Pennsylvania were found to be high hazard.

Despite these new laws and regulations, the staffing and funding of state dam safety programs tended to be inadequate. With limited resources, only about 100 dams were inspected each year, out of the approximately 2,600 dams in Pennsylvania at the time.

In the wake of the 1977 Johnstown flood, Pennsylvania's Dam Safety Act was updated to include more regulatory safeguards. Dam owners were now required to monitor their dams and install failure warning systems, while the Pennsylvania Emergency Management Agency (PEMA) was mandated to help develop evacuation plans with downstream communities.

Since then, the inspection requirements have become more rigorous, and have been put in the hands of the dam owner and the state government. Private owners must now have an engineer conduct quarterly inspections and the Pennsylvania Department of Environmental Protection (DEP) inspects all high-hazard dams for safety each year.

Dam Classifications and Potential Remedies

The dams covered by the Commission's funding plan are specifically dams classified as both high-hazard and unsafe. While these may sound similar, they are two separate categories.

economic impact could be in the millions of dollars, though an exact figure is difficult to calculate.

According to SLAC, Somerset is known nationally for fishing and birdwatching opportunities. Over 200 species of birds can be seen around the lake, including many rare and localized species. Additionally, land surrounding the lake is currently being developed into a county park.

While funding is being secured, the lake has been lowered by six feet to alleviate pressure on the dam. This action is already impacting the recreational value. One boat ramp has been rendered

unusable, and the muddy shorelines have impacted both shorebird visitations and fishing access.

While the lake has not been utilized to its fullest potential in the past, the community expects the economic and recreational value to increase in coming years. This success, however, depends on critical repairs being made to the dam so the lake can avoid being drained or drawn down further.

This uncertainty is described by SLAC as a possible deterrent to investors, business owners and policy makers. They hope that once the dam is repaired even more development opportunities will follow.

A dam is high-hazard if its failure could result in the loss of life or significant property damage. In other words, this classification does not address the structural integrity of the dam, but rather the potential impacts of its failure. For example, a dam which is brand new with no discernable problems would still be considered high-hazard if there are people living downstream.

On the other hand, a classification of “unsafe” means that the dam is in danger of failing. One criteria for being unsafe is being unable to withstand projected flood levels. Other issues such as bowing, cracks or seepage would place a dam in this category.

The dams funded by the Commission’s plan are both high-hazard and unsafe. That is why these dams are being given priority, as they threaten human life and property if their deficiencies are not addressed. While the situation sounds dire, it is not cause for those living downstream of one of these dams to evacuate just yet. If a dam is an imminent threat or if it is deemed too costly to repair, the reservoirs are drawn down over a period of time to alleviate pressure on the dam. If there is no plan or funding to repair the dam, the draining can be permanent.

One such draining was Mountain Springs Lake, in Luzerne County. In the early 1900s, the dam supported an ice cutting business and a small company town built near the lake. However, long after the ice cutting industry became obsolete and the old concrete dam began to deteriorate, the Commission had to choose between removing the dam and spending millions of dollars to repair it. Unfortunately, the recreation and commerce the lake supported was not enough to justify the cost so beginning in late 2012, the lake was drained with no plans to repair the dam.

Just this year, before the approval of the final funding plan, two more lakes were scheduled to be drained. Miller Pond and White Oak Pond in Wayne County were found to have severe deficiencies, posing a threat to human safety if funding was not secured. A Commission press release notified the public that anglers were welcome to catch and keep any fish from these two locations, regardless of established limits.

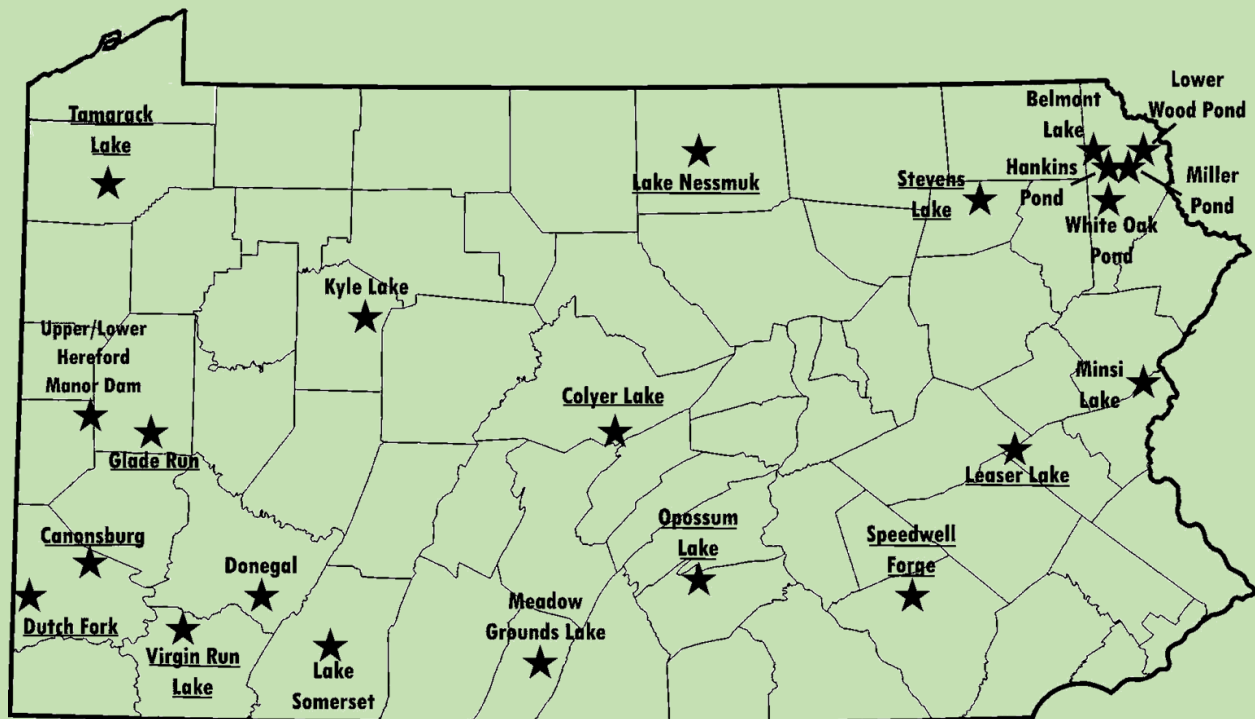
Normally, while a lake is being lowered, the Commission conducts fish salvages, where as many fish as possible are captured and relocated. A fish salvage was not done in these cases, as both bodies of water left substantial natural ponds.

Fortunately for those who pursue recreation on these ponds in Wayne County, the approval of the new funding plan came soon after the decision to drain them. The plan includes these two locations within the funding schedule, so repairs will be completed and the ponds will be refilled.

The Commission’s Solution

The Commission manages 56 of the state’s dams, 23 of which were originally considered high-hazard, unsafe. Today, 13 of those 23 have been funded and repaired, or are in the process of being repaired, which left 10 dam rehabilitation projects unfunded.

Before we address the specifics of the new funding plan, an important question is where are these high-hazard, unsafe dams located?



**The dams which have been underlined have either been repaired, or are the process of being repaired. The dams which are not underlined are part of the five-year plan approved by the Governor's Office. Information obtained from the PA Fish and Boat Commission website: www.fishandboat.com on October 30, 2015.*

As the map shows, these structures exist throughout the Commonwealth. While Wayne County has the highest concentration of these unfunded projects, dams which are also awaiting for funding are spread out across the state. Additionally, this is a very small fraction of Pennsylvania's approximately 3,400 dams, making this a problem that is significant to the entire state as existing dams continue to age.

The dams shown above are only those owned by the Commonwealth that are managed by the Commission and classified as high-hazard, unsafe. Again, this means that not only are they structurally compromised, but their failure could result in loss of life and substantial property damage.

The dam rehabilitation projects which have been underlined on the map above were funded through a variety of programs. The Commission drew upon several different pools, including H20 PA, Growing Greener II, the capital budget, locally raised money, and their own revenues from sources such as fishing license sales, boat registration fee and federal funding. For many of these sources, such as H20 PA and two Growing Greener II grants received from the Pennsylvania Department of Conservation and Natural Resources and DEP, the Commission was in competition with private owners and other local and government agencies to secure grant funding.

The Governor's Office of the Budget was a major contributor of funding during these efforts. Funds set aside for capital construction projects were approved in 2008 to be used by the Commission for their high-hazard, unsafe dams.

This method of funding created a great deal of uncertainty for all of the parties involved. After dealing with the coordination and construction of the first 13 dams, the Pennsylvania Department of General Services (DGS) approached the Commission for a new strategy. While the Commission manages the dams, it was up to DGS to contract and complete the actual construction, and moving forward with so much uncertainty proved difficult.

Together with the Office of the Budget, they developed a new plan which would allocate a set amount of funding each year, to be approved for each budget cycle, until repairs on the remaining high-hazard, unsafe dams were completed. As for the specific cost of each project, developing the funding schedule was a fairly straightforward process since the Commission already had estimates for the repairs of each dam. The new plan was simply drawing from more predictable funding sources.

For the first two years of the plan, the bulk of the funds will be provided through the capital budget, which is administered and managed by the Office of the Budget. The Wolf Administration has committed to releasing the funds upon the passage of a structurally balanced budget with sufficient revenues to afford debt service payments. For the remaining three years of the plan, the Commission proposes to use its Act 89 revenues. Act 89 was passed in 2013 and amended the Transportation and Vehicle Code to allow the Commission to receive the taxes paid by boaters on gasoline and diesel used in motorboats.

Over the entire five year schedule, the funding will be used for the design, property easement acquisition (where required), and construction activities. While the Commission remains hopeful that the repairs for each facility can be completed in a much shorter timeframe, each project is projected to take up to five years to complete, which includes ample time for permits to be obtained from DEP.

Conclusions

The new funding plan for high-hazard, unsafe dams is more efficient for a number of reasons. First, infrastructure projects such as dam construction often take longer than a year, meaning they outlive the yearly state budget process. This adds a great deal of uncertainty when it comes to planning and implementation. It also leaves the possibility that the funds will not be allocated at all. Much like the case of Miller Pond and White Oak Pond, because of safety concerns, the Commission had to drain the ponds regardless of whether or not the funding materialized.

The uncertainty associated with the previous funding plan created problems during the planning and permitting processes. With the new funding strategy, the Commission can commit resources to design and permitting knowing that funding for the construction will follow.

This funding plan has the potential to be a framework for similar public works projects in the future. In fact, DGS has expressed hope that other agencies and governmental entities will consider this as a possibility if they are facing a similar situation. As the Commission's case illustrates, a predetermined funding plan can expedite important projects, as well as relieve uncertainty, not only for the owners and managers, but for other parties involved in the process.

While this type of funding schedule will not be feasible in all situations, in the Commission's case, this approach can help with nearly every stage of the process. Removing uncertainty will

possibly streamline the process of applying for grants, applying for permits and coordinating with other agencies.

Whether an agency is waiting for permits from DEP or the Pennsylvania Department of Agriculture, or whether they are contracting through DGS or a private entity, having a reliable source of funding for the project's completion is vital to the efficiency of the operation and the overall success of the project.

Editor's Note

Green Papers are issued periodically by the Joint Legislative Air and Water Pollution Control and Conservation Committee staff. As indicated by the subtitle, each Green Paper is a brief on a specific environmental issue that has come to the attention of, or is currently being examined, by the Committee. Each Green Paper is intended to provide a more in depth look at specific issues than normally permitted by other Committee publications, such as the Committee's monthly newsletter, the Environmental Synopsis.

The Joint Conservation Committee is a bipartisan committee consisting of 18 members of the House and Senate which conducts studies, holds hearings and makes recommendations to the General Assembly on a variety of issues related to the sustainable use of Pennsylvania's diverse natural resources. Recent issues that the Committee has focused on include fluoridation of public drinking water systems and the environmental benefits of natural gas vehicles.

For more information about the Committee, or to be added to our mailing list, please contact the Committee office at (717)787-7570.