

# Memorial Park Pond Dam Removal and Stream Restoration FAQs

## Why is the dam being removed?

In 2019, New Jersey Dam Safety officials notified the Borough of Bernardsville that the Memorial Park Pond Dam in Nervine Park, adjacent to Borough Hall, no longer met current safety standards. The Borough was required to either make major upgrades to the dam or remove it to reduce flood and public safety risks.

## What is wrong with the dam?

The dam is classified by the New Jersey Department of Environmental Protection (NJDEP) as High Hazard, meaning its failure could result in loss of life or significant property damage. Key concerns include: a deteriorating wall that is at risk of failure and the spillway does not meet current DEP capacity requirements.

## Were other options considered?

Yes. Engineers evaluated two options:

- Repairing and upgrading the existing dam
- Completely removing the dam

Both options were reviewed based on safety, environmental impact, and cost. After careful study, the Borough determined that dam removal was the safest and most cost-effective long-term solution.

## Who worked on the studies and design?

Two engineering firms assisted the Borough:

Ferriero Engineering conducted hydrologic and hydraulic analysis, feasibility and conceptual design studies. Their work included dam rehabilitation and upgrades to the existing dam to achieve regulatory compliance.

Rippled Waters Engineering (RWE) completed environmental studies, conceptual design and feasibility assessments for the dam removal including preliminary cost estimates and is responsible for final design and permitting for the dam removal.

## Additional options have since been discussed;

## have these been explored?

Yes. Specifically, two possibilities were recently advanced as alternatives and have been rejected for the reasons cited.

1. Piano Key Weir – While the hydraulic principles that a piano key weir is based on are functionally sound - the piano key weir shape increases the overall length for water to pass and increases the spillway capacity – the Bureau of Dam Safety stated that there are no currently permitted piano key weir dam spillways in New Jersey. The design is highly complex and they have never been permitted as there are typically better and more cost-effective solutions.

Even in the unlikely event that this weir was permitted, significant structural and geotechnical evaluations which would be required to ensure that this design could function as intended in Bernardsville. In addition, the timeline associated with a rehabilitation option involving a piano key weir would extend the project more than five additional years. Additionally, the construction cost would be significant and include dredging of the pond to restore its function, replacement of the low-level outlet structure, significant dewatering, and replacement of portions of the existing spillway including an abutment wall as well as a structural support system necessary to support the weight of the piano key weir structure.

2. Labyrinth Weir (at Lake Lenape) – A labyrinth weir by itself does not provide the full dam retention function; it only provides improved overflow handling. Therefore, a labyrinth weir cannot by itself replace the dam because it cannot hold back any of the reservoir's water. Furthermore, the cost to retrofit the existing spillway with a labyrinth weir involves more than the cost of the weir alone. The Memorial Park Pond project would also need to include upgrades to the dam itself to support the weight of the weir retrofit, dredging the pond, repairing the abutment walls, replacing the low-level outlet, and the park improvements in addition to engineering and permitting costs. The Lake Lenape labyrinth weir is a **spillway upgrade on an existing dam** to increase discharge capacity while keeping the dam and reservoir in place.

## When was the decision made to remove the dam?

In June 2022, following several public meetings and presentations, the Borough Council voted to proceed with dam removal.

## What has happened since that decision?

Since June 2022, the project has progressed through the following steps:

- Development of detailed engineering plans
- Submission of environmental and safety permit applications
- Review by state agencies
- Revisions to designs to meet all safety and environmental requirements
- The project is now nearing final permit approval.

## When will the dam removal be permitted?

The final State permit for dam removal is expected in February. All permits are anticipated to be in hand by May.

## Project Timeline (Simplified)

2019: State requires action on the dam

2020–2021: Engineering studies and cost estimates completed

2022: Public meetings held; Borough Council approves dam removal

2022–2025: Design, permitting, and state review

2026: Final permits anticipated and project moves toward construction

## How much will the project cost?

2022 Estimated Cost: \$2.2 million

2025 Updated Estimate: \$3.47 million

As the project advanced from early concepts to detailed design, costs increased to reflect actual construction conditions, updated safety requirements, and added park improvements.

## Why did the cost increase?

The increase is primarily due to three factors:

1. Added Park Improvements

The Borough chose to include enhancements beyond dam removal, such as new walking trails, benches and signage, and streambank stabilization near the parking lot. These improvements added approximately \$605,000.

## 2. Updated Safety Requirements

State Dam Safety reviewers required removal of additional material and increased rock placement and stabilization. These requirements added approximately \$206,000.

## 3. Additional Sediment Removal

Because more rock stabilization is required, additional sediment must be removed from the former pond area, adding approximately \$158,000.

## Does this cost include engineering and contingencies?

Yes. The updated estimate includes engineering oversight during construction and contingency funds to address unforeseen conditions.

## Is it possible to reduce the cost?

Yes. Engineers will propose Value Engineering options that may help reduce overall project costs without compromising safety.

## Are there financial consequences if the dam is not removed?

There may be. Because Dam Safety has been working with the Borough for five years, there is a strong possibility that they would not allow repair at this point, and the Borough could face fines of up to \$25,000 per day.

## Did the Borough apply for grants for this project?

Yes. The Borough has received \$25,000 in grant funding and is applying for an additional \$25,000 grant and a \$700,000 grant. A previous application for a \$1.4 million grant was not awarded.

## What are the long-term benefits of removing the dam?

-Dams alter a stream's natural ecology and function by disrupting the natural sediment movement through the river system and degrading water quality. Right now, the dam creates slow, shallow water that stays calm most of the year. While this might seem peaceful, these conditions are actually ideal for Canada geese. Geese prefer still water with open shorelines because it gives them easy access to food, clear sightlines to watch for predators, and safe places to gather in large numbers. Unfortunately, when geese dominate an area, many people choose to avoid the park altogether. Without the dam, the water would flow more naturally, becoming deeper in some places and faster in others. Moving water is much less attractive to geese, which generally avoid areas where currents make it harder to rest, feed, and gather in large flocks. As a result, goose numbers are expected to decline naturally—without the need for hazing, fencing, or other ongoing control measures.

-Sediment behind dams is both a maintenance and water quality problem. As sediment accumulates behind the dam, it reduces the depth of the water. Not only does this create an unsightly pond for park users, it also reduces water depths making it optimal for Canada geese, but it also results in increased water temperature.

Sediment also reduces habitat for native fish and aquatic organisms and increases the risk of Harmful Algal Blooms (HABs) which are toxic to humans and pets. The water requires use of aerators now to control algae growth and eliminate odors, however, neither will exist with the free-flowing river after the dam is removed.

-Removing the dam lowers flood risk. Given the proximity of the municipal and police building to the dam itself, it is a High Hazard Dam. This means that there is a risk to human life if the dam were to fail or overtop. Removing the dam reduces that risk. The current pond area becomes an open floodplain so that water can rise out of the river and flood into the former pond area and slow down. With the pond full of sediment and water, it does not have the same area to store floodwaters.

In addition, because the pond behind the dam is currently extremely full of sediment, the area is at risk during extreme weather events. If the dam were to fail or partially fail, the accumulated sediment would flow downstream reducing capacity at downstream roadway crossings including Quarry Road. It would also cause increased flooding because the sediment will drop out and reduce carrying capacity of the river downstream. The free-flowing river allows water to move through the park more naturally and reduces the chance of sudden surges that exist when a dam is in place.

-Dams impede the movement of aquatic organisms throughout the river including native fish and macroinvertebrates. This disrupts the natural food chain and degrades the health of the river for recreational use for fishing.

Once the dam is removed, the shoreline of the stream will have healthier vegetation along the shoreline edge with taller native plants and edges that have more shade. With increased shade the water temperature will be reduced and the water quality improves. The paths that will remain the park will have fewer goose droppings and

-With the dam removed the risks to park users are reduced. Water spilling over the dam can result in strong underwater currents that are not visible from the water surface. These currents are strong enough that they can pull people under and make it extremely difficult to escape, even for strong swimmers. Removing the dam eliminates this hidden hazard and liability and creates a predictable, free-flowing river that reduces risk of accidental falls and entrapment. Dams are difficult for first responders to safely reach during emergencies and rescue efforts are simpler and safer. Cracked concrete and masonry on the dam itself pose risks to park visitors, especially children, who are naturally drawn to climb on structures like these.

-Lower long-term maintenance costs – once the dam is removed there is no ongoing maintenance cost associated with the river itself beyond seasonal vegetation and trash removal. The existence of the dam requires biannual inspections by licensed Professional Engineers, formal structural inspections every 10 years, and dredging of the pond to maintain capacity as well as upgrades and modifications to maintain compliance with Dam Safety regulations.

-Enhanced park amenities for residents including signage, benches and fishing.