

# PINEY RUN WATERSHED STUDY

PURPOSE AND NEED STATEMENT

CARROLL COUNTY BUREAU OF RESOURCE  
MANAGEMENT

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Prepared for:

CARROLL COUNTY BUREAU OF RESOURCE MANAGEMENT

Prepared by:

AECOM  
12420 Milestone Center Drive  
Germantown, MD 20876  
aecom.com

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# 1. Changes Requiring Preparation of a Supplement

Piney Run Dam, managed and owned by Carroll County, Maryland, is designed as a high hazard (“C”) class dam. Current requirements of both United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) and the state of Maryland require a freeboard hydrograph event of the probable maximum flood or PMF (NRCS, 2005, State of Maryland, 2019). The design hydrologic and hydraulic analysis for the dam showed that it was capable of passing a six-hour duration event equivalent to 2.58 times the 100-year rainfall, or 13.7 inches at the crest elevation of 540.5 feet, and that a maximum probable storm (MPS), similar to a probable maximum precipitation event that is used currently, of five times the 100-year rainfall depth or 26.5 inches would overtop the dam crest (Rummel, Klepper, and Kahl, 1972). Subsequent analyses completed in 2016 and one currently being developed in 2020, show similar results that the dam cannot pass the PMF without overtopping the dam. Therefore, Piney Run Dam does not meet current state of Maryland or NRCS design and safety criteria for a high hazard class dam. In addition, the regulatory agency for dams in Maryland, the Maryland Department of the Environment (MDE) issued a letter to Carroll County (hereafter referred to as “the owner”) expressing concern over the hydraulic capacity of the dam discussed herein and requesting that the owner complete an analysis of the auxiliary spillway integrity under the required freeboard hydrograph loading conditions.

## 2. Introduction

This Supplemental Watershed Plan and Environmental Assessment formulates and evaluates alternatives to implement the modernization of Piney Run Dam (Proposed Action). The dam was constructed between 1973 and 1975 and has since been operated and maintained by Carroll County. The dam is regulated by MDE as a high hazard class dam and as such is inspected annually. Regular investigations and analyses of the dam have been completed between 1975 and present day. Most notably, MDE commissioned a hydrologic and hydraulic analysis of the dam in 2016 to evaluate the dam’s hydraulic capacity and to develop breach inundation maps using current tools and methods. The analysis found that the dam did not have the capacity to pass the required freeboard hydrograph, which for high hazard dams is the PMF for both MDE and NRCS criteria (Charles P. Johnson, 2016). The Proposed Action is intended to meet current Federal and State design and safety criteria for a high hazard class dam.

In addition, the Proposed Action examines the potential for the Piney Run Dam reservoir to serve as an alternative public water supply to the surrounding community. The owner had previously elected to not activate the raw water supply infrastructure designed and constructed in the dam. This infrastructure includes an intake tower with six rising stem gates at various depths in the reservoir, a 24-inch conveyance conduit to carry the water downstream of the dam, and a rate control system adjacent to the downstream end of the

conveyance conduit. However, at this time the owner desires to explore alternative sources of water supply. Therefore, the proposed project would also explore the viability of Piney Run Reservoir as an alternative public water supply.

### 3. Project Purpose

The *purpose* of the project is to improve flood reduction, public safety, water conservation, and public water supply alternatives by modernizing Piney Run Dam to meet current NRCS and MDE requirements. The project is proposed in response to a 2016 hydrologic and hydraulic analysis that found Piney Run Dam does not have the capacity to safely pass the required freeboard hydrograph; however, the flood protection originally intended for the dam is still being provided (up to the one percent annual exceedance event). In addition, MDE has expressed concern over the integrity of the auxiliary spillway in the event of significant flow through the spillway. Previous discussions with the owner and review of financial data also show that the reservoir impounded by the dam and surrounding park are an attractive recreational area for the community. In addition, the raw water supply in the reservoir is considered as an option for alternative water supply.

Implementing the proposed Supplemental Watershed Plan and associated dam improvements would allow Piney Run Dam to provide continued and enhanced flood protection and reduction to downstream areas while serving the recreational needs of the surrounding area. The proposed project would also explore the viability of Piney Run Dam as an alternative public water supply source.

### 4. Project Need

The proposed project is *needed* to: 1) protect life and property from future flooding threats; 2) comply with NRCS and MDE spillway capacity criteria to adequately address spillway deficiencies and erodibility surrounding Piney Run Dam; and 3) ensure the needs of local area residents are met.

When the dam was designed in the early 1970s, the requirements at the time were that it pass a storm equivalent to 2.58 times the 100-year precipitation depth for a six-hour duration event. Since then, NRCS and MDE criteria have changed due to regulatory amendments. Current regulations evaluate dam efficacy based on the PMF event. Based on current analyses, a storm of this magnitude under current conditions is estimated to overtop Piney Run Dam by up to three feet, which has the potential to cause erosion on the downstream slope and ultimately result in a dam failure and uncontrolled release. The failure of Piney Run Dam would result in serious loss of property and the potential to cause probable loss of life. As such, Piney Run Dam does not comply with current regulatory requirements.

Recent investigations of the spillway integrity conducted to inform the Supplemental Watershed Plan identified deficiencies under the required loading conditions that support the need for this project. In addition, the owner has expressed a need to explore alternative water supply sources. As Piney Run Dam is a recreational resource for the surrounding

community and has the potential to provide an adequate alternative public water supply, it must be preserved and protected to ensure long-term viability and harmony between the human and natural environment.

## 5. Opportunities

By meeting the purpose for and need of the project, the following opportunities would be recognized by implementing an alternative to carry out the Proposed Action.

Quantification of these opportunities will be provided in other sections of this report.

- Comply with Federal and State dam safety criteria and regulations.
- Reduce the potential for human life loss associated with failure of the dam.
- Reduce Sponsor liability associated with operation of a noncompliant dam.
- Continue to provide downstream flood damage reductions for events up to and including the one percent annual exceedance, 24-hour duration event to protect lives, property and maintain property values.
- Examine available alternatives for the Carroll County public water supply system by exploring the viability of using water from the reservoir.
- Continue to provide recreational opportunities on the reservoir and in Piney Run Park.

## 6. References

- Charles P. Johnson and Associates. (2016). "Piney Run Dam, Dam Breach Analysis".
- Malcolm Pirnie. (2009). "Carroll County Alternatives Evaluation".
- NRCS. (2005). "Earth Dams and Reservoirs, TR-60". Washington, D.C.
- Rummel, Klepper, and Kahl. (1972). "Piney Run Watershed Carroll County, Maryland Design Report".
- SCS. (1968). "Work Plan for the Piney Run Watershed". Carroll County, Maryland.
- SCS. (1972). "Supplemental Work Plan for the Piney Run Watershed". Carroll County, Maryland.
- State of Maryland. (2019). "Dams and Reservoirs". Code of Maryland Regulations 26.17.04.05.B (3)