

FINDING OF NO SIGNIFICANT IMPACT TENNESSEE VALLEY AUTHORITY

JOHN SEVIER DAM MODIFICATION FINAL ENVIRONMENTAL ASSESSMENT

The Tennessee Valley Authority (TVA) proposes to modify the downstream side of the right embankment of the existing John Sevier Fossil Plant Detention Dam (John Sevier Dam or JSF Dam), a run-of-river dam located on the Holston River in Hawkins County, Tennessee. TVA constructed the JSF Dam in 1955 to provide cooling water for the then-adjacent John Sevier Fossil Plant (JSF Plant) which was retired in 2014 and has since been deconstructed. The JSF Dam currently provides a reservoir of water for use at the nearby John Sevier Combined Cycle (JCC) Power Plant, as well as local boating and fishing opportunities on the approximately 305-acre-foot John Sevier Detention Reservoir. The Project Area overlaps the Cherokee Reservoir Reservation which includes the Cherokee Reservoir and land surrounding the reservoir in Jefferson, Grainger, Hamblen, and Hawkins counties in East Tennessee. The Cherokee Reservoir is a popular recreation destination with campgrounds and hiking trails (TVA 2022a).

The 1,176-foot-long JSF Dam structure includes the following principle features: a 636-foot (ft)-wide, 25-ft-tall concrete gravity overflow section that serves as the main spillway; a non-overflow section with a gated section (Decommissioned/Concrete Bulkhead); a 200-ft-long, 48-ft tall earthen embankment dam on the left (south) side of Cherokee Reservoir; and a 340-ft-long, 30-ft tall earthen embankment (armored with riprap and grout) on the right (north) side of Cherokee Reservoir. Currently, the right embankment at the JSF Dam is approximately 21 ft lower than the left embankment, is approximately 5 ft higher than the concrete overfall spillway and is prone to overtopping.

A 2019 risk assessment for the JSF Dam indicates that under high river flows, water can overtop the right earthen embankment (crest at elevation 1,085 ft) and potentially lead to failure of the earthen embankment. To a lesser degree, the risk assessment also indicates the potential for internal erosion related failure of the right embankment under normal operating conditions due to concentrated leakage at the interface of the right embankment and rock abutment, concentrated leakage at the interface of the right embankment and concrete training wall, or backward erosion piping into karst features under the right embankment. While the JSF Dam has a history of overtopping during relatively routine flood events and has performed well to date during normal operating conditions, TVA considers the probabilities of an overtopping induced or internal erosion induced failure to be high enough that upgrades to the right embankment are warranted. Soon after completing the risk assessment, TVA implemented interim risk reduction measures to improve the resistance of the right embankment to potentially erosive overtopping flows until a permanent solution could be identified.

TVA completed a dam safety modification study which identified two potential permanent options to address these potential dam failure modes. These two Action Alternative options, in addition to a No Action Alternative, were described and evaluated in an environmental assessment (EA). The EA is incorporated by reference herein.

Proposed Action

As described in detail in the EA, TVA evaluated three alternatives for the future disposition of the JSF Dam structure including A) taking no action, B) construction of additional riprap

armoring in conjunction with spillway modifications, and C) construction of a roller-compacted concrete (RCC) gravity dam in conjunction with spillway modifications. The project area for the proposed actions covers approximately 10.2 acres: a 6.5-acre area on the north side of the Holston River encompassing the proposed access road and construction zone and support area; and a 3.7-acre area on the JCC Power Plant reservation south of the Holston River that will be used for the construction office site and material storage.

The proposed action alternatives consist of the following project components: water diversion and control, excavation and foundation preparation, grouting, demobilization and site stabilization (Alternatives B and C), demolition (Alternative B only), training wall and rockfill spillway construction (Alternative B only), and roller-compacted concrete gravity dam construction (Alternative C only), which are described in detail in the EA.

Alternative A – No Action Alternative

Under Alternative A, TVA would continue to perform repair and maintenance activities as needed. This alternative would not address the risks identified in the 2019 JSF Dam risk assessment. Without these modifications, the dam would continue to be at an increased risk of overtopping-related failure of the right embankment (at crest elevation 1,085 ft) during high river flows. The dam would also be at an increased risk of moderate effects from internal erosion or internal erosion-related failure of the right embankment.

Alternative B – Riprap Armoring

Under Alternative B, additional riprap armoring would be added to the existing right embankment of the dam to act as a rockfill spillway. Within the 10.2-acre combined Alternative B footprint, the proposed work area would include approximately 1.2 acres for the support/laydown area, about 2.5 acres for the construction zone (including temporary placement of a 0.4-acre coffer dam, permanent placement of 1.5 acres for the rock riprap structure, and 0.6-acre of workspace), an existing 1.4-acre access road, 1.0 acre of riprap placement for shoreline stabilization, 0.4 acre for a temporary debris boom, and a 3.7-acre area to include a temporary laydown area for a construction office and material storage. Riprap would be placed at a 10:1 (horizontal: vertical) slope over the existing 2:1 slope riprap embankment. The proposed slope and riprap armoring are designed for six feet of overtopping, which corresponds to a 500-year flood event. The 10:1 slope would allow for the use of smaller size riprap and would extend the embankment approximately 195 ft further downstream of the current embankment. The embankment would be armored with riprap for a length of approximately 300 ft for erosion protection and to direct flow into the downstream channel. The rockfill spillway would tie into the existing riprap armoring on the downstream bank where existing riprap armoring would be refreshed and replaced for up to approximately 750 feet further downstream to prevent future erosion of the bank and undercutting of the access road. The existing concrete right training wall on the left side of the rebuilt embankment would be extended approximately 195 ft in the downstream direction.

Alternative C – RCC Gravity Dam

Under Alternative C, an RCC gravity dam would be constructed on the downstream side of the existing right embankment dam. The proposed work area includes approximately 1.2 acres for the support/laydown area, about 2.5 acres for the construction zone (including temporary placement of a 0.4-acre coffer dam, permanent placement of 1.1-acre RCC gravity dam structure, and 1.0 acre of workspace), an existing 1.4-acre access road, 1.0 acre of riprap

placement for shoreline stabilization, 0.4 acre for a temporary debris boom, and a 3.7-acre area to include a temporary laydown area for a construction office and material storage. The RCC gravity structure would have a vertical upstream face and approximately a 1:1 sloped downstream face. The left (southern) end of the RCC gravity structure would wrap around the training wall with the sloped face positioned south towards the JCC Power Plant. A stilling basin would be constructed by excavating to bedrock immediately downstream of the RCC gravity structure, and the riverbank downstream of the stilling basin would be armored with RCC that would tie into the existing riprap armoring. The existing riprap armoring may be extended up to approximately 750 ft further along the downstream bank to prevent future erosion of the bank and undercutting of the access road and/or downstream bank RCC slope armoring. Additional riprap, RCC, grout, or conventional concrete may be required in the stilling basin to prevent future degradation of the rock abutment or bedrock during overtopping events. Water flowing over the spillway would be directed into the stilling basin at the bottom of the gravity dam and towards the downstream channel.

Preferred Alternative

TVA's preferred alternative is Alternative C; as such TVA proposes to modify the right embankment by constructing an RCC gravity dam along the downstream side of the embankment. The RCC gravity dam would address all of the dam safety failure modes of concern identified in the 2019 risk assessment and discussed in the EA, and would result in the most reliable structure. Alternative C would only require excavation in the downstream floodplain along 60 linear feet of the Cherokee Reservoir below the dam, approximately 40 linear feet less than Alternative B. Further, Alternative C would result in a sound structure that could immediately be subjected to overtopping without further risk of dam failure and has the lowest long-term maintenance costs associated with it.

Environmental Assessment

In the EA, TVA analyzed potential impacts to the following environmental and socioeconomic resource areas:

- Land Use
- Geology, Soils, and Prime Farmland
- Groundwater
- Surface Water and Water Quality
- Floodplains
- Wetlands
- Air Quality
- Greenhouse Gases and Climate Change
- Vegetation
- Wildlife
- Aquatic Ecology
- Threatened and Endangered Species
- Natural Areas, Parks, and Recreation
- Noise and Vibration
- Transportation
- Navigation
- Cultural Resources
- Visual Resources
- Solid and Hazardous Waste
- Utilities and Service Systems
- Socioeconomics and Environmental Justice
- Safety

The area of permanent fill effects of the proposed action would be approximately 2.5 acres under Alternative B (riprap placement at the dam and along shoreline) and 2.1 acres under Alternative C (riprap along shoreline and RCC gravity dam). The proposed action would result in temporary effects to approximately 7.7 acres under Alternative B and 8.1 acres under Alternative C. The access road, construction laydown area, construction zone, and proposed laydown area for a temporary construction office and material storage area are the same for Alternatives B and C, with impacts differing primarily from the proposed structure footprint (i.e., riprap versus RCC gravity dam).

Generally, TVA's analysis found that for both Alternatives B and C most environmental resources would be minimally affected by the proposed modification. Most activities associated with the proposed upgrades would occur on the dam's earthen embankment, which is a previously disturbed area; therefore, impacts to most resources are anticipated to be minimal. No substantive effects are anticipated for climate change, cultural resources, and utilities and service systems. Minor and temporary effects to wildlife, transportation, noise and vibration, visual resources, soils, air quality, greenhouse gases, recreational navigation, safety, and environmental justice populations would result from construction-related impacts in temporary workspaces; these effects would be mitigated through implementation of standard best management practices and mitigation measures identified in the EA. There would be minor permanent and temporary effects to land use, geology, floodplains, vegetation, aquatic ecology, threatened and endangered species, and solid/hazardous waste generation. Based on a review of reasonably foreseeable future actions near JSF, and considering the minor and temporary effects identified above, neither Alternative B or C would result in cumulative effects.

The proposed action would require removal of less than one acre (approximately 0.57 acres) of suitable summer roost habitat for Indiana bats, northern long-eared bats, and tricolored bats. Tree removal would be performed between November 15, 2023 and March 31, 2024, which would avoid direct impacts to these species as bats are roosting underground at that time. For those activities with potential to affect bats, TVA committed to implementing specific conservation measures. These activities and associated conservation measures are identified on the TVA Bat Strategy Project Screening Form and would be reviewed/implemented as part of the proposed project. Activities associated with the proposed project, including tree removal and burning, were addressed in TVA's programmatic consultation with the USFWS on routine actions and federally listed bats in accordance with ESA Section 7(a)(2) and completed in April 2018, and updated in 2023 (USFWS 2018, 2023a).

In addition, the proposed action was found to be consistent with Executive Order 11988 on floodplain management and Executive Order 11990 on wetlands.

Public Involvement and Intergovernmental Review

On May 30, 2023, TVA issued a draft of the EA for a 30-day review and comment period. Comments were received from seven individuals, the Tennessee Department of Environment and Conservation (TDEC), and the Care Net regional committee of the Sierra Club. TVA responded to these comments in the Final EA.

As required under Section 106 of the National Historic Preservation Act, TVA consulted appropriate recognized Native American tribes and the State of Tennessee Historic Preservation Officer (SHPO) concerning potential impacts to the project area and the dam. Further, by letter dated February 13, 2020, the SHPO concurred that the John Sevier Dam is no longer eligible for inclusion on the National Register of Historic Places (NRHP), and that no NRHP listed or eligible properties would be affected by the repairs proposed by TVA. The SHPO also concurred with TVA's determination that the project would have no adverse effect on historic or archaeological properties. TVA received no objection from any of the tribes.

Prior to implementing the proposed action, TVA would coordinate and secure required permits from TDEC and the U.S. Corps of Engineers (USACE) to address potential impacts to water resources, including streams, floodplains and wetlands, under the Clean Water Act.

Best Management Practices and Routine Measures

Floodplains

- The least amount of fill and access road riprap as practicable would be used to achieve project objectives.
- Any excess excavated material would be disposed of outside 100-year floodplains.
- Any road improvements would be done in a manner such that upstream flood elevations would not be increased by more than 1.0 ft.
- The laydown area would be returned as close as practicable to pre-construction conditions following completion of the project.
- An evacuation plan would be created for removal of flood-damageable equipment and materials from the floodplain in the event of a flood or high-flow event.

Soils

- TVA would develop a Stormwater Pollution Prevention Plan (SWPPP) that identifies mitigation measures and best management practices (BMPs) that would be implemented during construction to reduce stormwater runoff. Erosion and sediment controls would be installed or implemented in accordance with the provisions of the Tennessee Erosion and Sediment Control Handbook and TVA's NPDES permit.
- Fill materials would be clean and free of contaminants.
- TVA would stabilize disturbed areas with permanent vegetation upon construction completion.
- TVA would install BMPs for sediment and erosion control, and these controls would remain in place until the Project Area was permanently stabilized.
- TVA would employ sedimentation barriers and dewatering silt bags to capture sediment and dry it out; water from the dewatering bags would be discharged back into the Cherokee Reservoir.
- TVA would seed disturbed areas with native or non-invasive plant species to prevent the introduction and spread of invasive species.
- Fugitive air and dust emission from construction activities would be reduced and controlled through the implementation of construction BMPs, which may include but are not limited to the following:
 - o covering waste or debris piles, using covered containers to haul waste and debris, and wetting unpaved vehicle access routes during hauling;
 - o enforcing vehicle speed restrictions on the on-site haul roads to minimize road dust; and
 - o requiring on-site contractors to maintain engines and equipment in good working order to improve fuel efficiency and reduce potential CO emissions from poorly operating engines and equipment.

Water Resources

- TVA would request coverage under Tennessee's NPDES Construction General Permit (CGP) by submitting an NOI and site-specific SWPPP along with an application fee to TDEC. TVA would then comply with the terms and requirements of the CGP by ensuring any proposed stormwater discharge meets requirements of the SWPPP and applicable water quality standards, and other requirements as identified in the CGP permit.
- TVA would request coverage under Clean Water Act (CWA) Section 404/401 by submitting permit applications to USACE and TDEC. TVA would then comply with the terms and requirements identified in the permits.

Biological Resources

- Follow USFWS recommendations regarding biological resources and pollinator species;
- Use of downward and inward facing lighting to limit attracting wildlife, particularly migratory birds and bats; and
- Instruct construction personnel on wildlife resource protection measures, including applicable federal and state laws such as those that prohibit animal disturbance, collection, or removal, the importance of protecting wildlife resources, and avoiding unnecessary vegetation removal.

Waste Management

- Develop and implement plans and programs to ensure safe handling, storage, and use of hazardous materials.

Noise

- Minimize construction activities during overnight hours, where possible, and ensure that heavy equipment, machinery, and vehicles utilized at the Project Area meet all federal, state, and local noise requirements.

Transportation / Navigation

- Construction activities would primarily occur during daylight hours for 5 days a week, except for Alternative C which may require work at night during summer months for the placement of RCC. A traffic plan would be established and may include measures such as using signage or posting a flag person to manage traffic flow, and prioritizing access for local residents to minimize potential adverse impacts to traffic and transportation.
- Reflective tape and lighting of barges or other equipment, including the floating debris boom, extending into the Cherokee Reservoir during construction would be advised for nighttime visibility of recreational boaters.

Visual

- Use of downward- and inward-facing lighting.

Air Quality/Greenhouse Gases/Climate Change

- Comply with local ordinances or burn permits if burning of vegetative debris is required and use BMPs, such as periodic watering, covering open-body trucks, and establishing a speed limit to mitigate fugitive dust (TVA 2017).
- Maintain engines and equipment in good working order (TVA 2017).
- Comply with TDEC Air Pollution Control Rule 1200-3-8, which requires reasonable precautions to prevent particulate matter (PM) from becoming airborne (TVA 2017).
- Comply with the USEPA mobile source regulations in 40 U.S. Code of Federal Regulations (CFR) Part 85 for on-road engines and 40 CFR Part 1039 for non-road engines, requiring a maximum sulfur content in diesel fuel of 15 ppm.

Mitigation

TVA would implement the routine environmental protection measures identified in the EA and would implement mitigation measures to avoid, minimize, or mitigate adverse impacts on the environment. In addition, all applicable permits would be acquired and permit-related mitigation measures and best management practices would be implemented to further minimize impacts and restore areas disturbed during construction.

- Prior to initiating construction activities, TVA would perform a pre-construction assessment to document existing road conditions along McKinney Chapel Road. During construction, TVA would monitor McKinney Chapel Road for deteriorating conditions associated with large equipment travel related to the proposed project.
- If contaminated or suspect soils are encountered during construction, TVA would take immediate steps, if feasible, to isolate the contamination and would implement additional measures, as appropriate, such as stopping work activities in the immediate vicinity of the Project Area; making the appropriate internal and external notifications; determining appropriate sampling requirements; and coordinating for disposal of contaminated media, if necessary (based on analytical results).
- Tree removal would occur between November 2023 and March 2024 when listed bat species are not expected to be on the landscape. Removal of suitable habitat in winter would avoid direct impacts to bat species as bats are roosting underground at that time. TVA would also implement conservation measures identified in TVA's programmatic consultation with the USFWS on routine actions and federally listed bats in accordance with the Endangered Species Act (ESA) Section 7(a)(2), originally signed in April 2018 and updated in May 2023.

Conclusion and Findings

Based on the findings listed above and the analyses in the EA, we conclude that the proposed modification of the John Sevier Dam, Alternatives B and C, would not be a major federal action significantly affecting the environment. Accordingly, an environmental impact statement is not required. This finding of no significant impact is contingent upon adherence to the permit conditions and mitigation measures described above.



Dawn Booker
 Manager
 NEPA Compliance

09/12/2023

Date Signed