

**FINDING OF NO SIGNIFICANT IMPACT
TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT THERMAL PERFORMANCE PROGRAM
COOLING TOWER CAPACITY IMPROVEMENTS
Limestone County, Alabama**

The Tennessee Valley Authority (TVA) Browns Ferry Nuclear Plant (BFN) is a three-unit General Electric boiling water reactor facility with seven linear Mechanical Draft CTs (MDCT, herein referred to as CTs) located in Limestone County, Alabama. TVA previously determined that increasing electric power generation from the BFN would be a cost-effective means of meeting increased demand for electricity in the Tennessee Valley. The increased electrical power generation was executed with the implementation of the Extended Power Uprate (EPU) at BFN in 2018, which resulted in increased heat rejected to the Condenser Cooling Water (CCW) from the turbine by 15 percent. To minimize thermal impacts to the Tennessee River and to reduce the potential for thermal derates, increases of both cooling tower lift pump (CTLP) flow and CT capacity are required. There are four issues related to reliable operation of the BFN CT system:

- Inadequate CTLP Flow to support three BFN units
- Equipment reliability/operational challenges
- EPU increase in heat rejection
- Deficient CT total cell capacity and material condition

To address these issues, TVA is considering the replacement and upgrade of the existing original 16-cell CT 1 and CT 2, replacement and upgrade of the CTLPs, and upgrades to CT 7.

CT 1 and CT 2 (including the associated CTLPs) were placed in service in 1974. These CTs and associated CTLPs have reached the end of useful function as performance has declined and the degradation of the Redwood frames of the CTs have introduced safety concerns. Replacement of CT 1 and CT 2 was addressed in previous National Environmental Policy Act (NEPA) documents; however, the current proposed replacements are slightly larger than those proposed in previous documents.

CT 7 was placed in service along with four new CTLPs in 2012, the environmental effects of which were addressed in a TVA 2010 Environmental Assessment (EA). Due to differences in the pumping capacity of the four CTLPs (440 thousand gallons per minute [Kgpm]) and the flow capacity of the nozzles in CT 7 (410 Kgpm in clean conditions), the CT is not able to support the operating design of all four CTLPs in service simultaneously. Initial efforts to resolve this condition were unsuccessful and resulted in the partial collapse of CT 7 in 2016. Since that time, operation has been limited to only three of the four CTLPs to prevent overflowing the hot water basin.

The Proposed Action considered for this EA would provide CT capacity improvement modifications to the BFN Thermal Performance Program including: CT replacements, CTLP upgrades, pumping station upgrades, and other improvements. Specifically, the Proposed Action consists of:

- Demolition of the existing CT 1 and CT 2, which have a 275 Kgpm flow capacity, and replacement with two CTs with a proposed design flow of up to approximately 330 Kgpm, and piping to carry water to the new CTs
- Replacement of CTLP 1A, CTLP 1B, CTLP 2A, and CTLP 2B to increase flow from 275 Kgpm to approximately 330 Kgpm, per CT including refurbishment of the pumping station
- Upgrade of the flow distribution system to gain use of all four CTLPs on CT 7
- Upgrades to the vacuum priming system and cold water channel outlet gate
- Addition of a CT CCW chlorination system.

These improvements are intended to provide margin in the design and operational flexibility for normal component fouling during operation and the ability to have margin for pump swaps and CT maintenance. The total flow delivered to and through the CTs would remain at 2.04 Million gpm (Mgpm).

The Proposed Action is the subject of an Environmental Assessment (EA) prepared by TVA, which is incorporated herein by reference. In the EA, TVA evaluated potential impacts of an Action Alternative as well as the alternative of not implementing the action (i.e., the No Action Alternative). Under the No Action Alternative, TVA would not replace CT 1 and CT 2 or construct the proposed associated upgrades. Under the Action Alternative, TVA would replace CT 1 and CT 2, as well as implement associated upgrades. Alternatives considered but not eliminated from further discussion are also included.

The Action Alternative would occur within a 224.46-acre area at the BFN. TVA would implement appropriate measures, such as best management practices (BMPs) and best construction practices, to minimize or reduce negative potential environmental impacts of the Action Alternative to minor levels. These practices include installation of sediment and erosion controls; management of fugitive dust; and a restriction allowing work during day time work hours only.

TVA has determined that the Action Alternative would not impact wetlands, floodplains, aquatic ecology, archeology, or historic sites or structures. Implementing the Action Alternative would result in minor, temporary, and localized impacts to air quality and climate change, geology and groundwater, soil erosion and surface water, terrestrial zoology, botany, noise, solid and hazardous waste and hazardous materials, and transportation during construction.

Implementation of the Action Alternative is anticipated to result in minor, intermittent, and localized beneficial impacts to surface waters based on hydrothermal modeling performed in support of the EA and no impacts to other resources during operations.

No wetlands or surface waters within the Project Area are considered jurisdictional Waters of the United States (WOTUS) subject to Clean Water Act (CWA) Section 404 permitting from the United States Army Corps of Engineers (USACE) and CWA Section 401 Water Quality Certification from ADEM.

Nine federally protected and state-listed aquatic species, one state-listed species (osprey [*Pandion haliaetus*]), and one federally listed species (gray bat [*Myotis grisescens*]) were identified as potentially occurring in the vicinity of the BFN based on review of the TVA Regional Natural Heritage database and the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) database. Additionally, one federally protected species (bald eagle [*Haliaeetus leucocephalus*]) has been identified within Limestone County, Alabama. Suitable or preferred habitat or occurrences of these species were identified within the Project Area based on field surveys performed in February 2020. However, impacts to the species as a result of the Action Alternative are not anticipated. No work would occur in the Wheeler Reservoir / Tennessee River and applicable BMPs such as installation of sediment and erosion controls would be implemented. Construction activities would be performed in compliance with applicable stormwater permitting requirements to minimize impacts to nearby aquatic habitats and foraging habitat for bat and avian species. Because tree clearing is not proposed as a part of the Action Alternative, no suitable summer roosting habitat for protected bat species would be impacted during construction activities. Project activities will be performed in accordance with the Migratory Bird Treaty Act (e.g., construction timing restrictions or nest surveys) to avoid impacts to avian species. Activities associated with the Action Alternative were addressed in the TVA programmatic consultation (April 2018) with the USFWS on routine actions and federally listed bats in accordance with Endangered Species Act Section 7(a)(2). For those activities with potential to affect bats, TVA committed to implement specific Conservation Measures when direct and indirect impacts to federally-listed bat species are anticipated. Relevant conservation measures for the Action Alternative listed in the TVA Bat Strategy Project Screening Form and will be reviewed and implemented as a precautionary measure as part of the Action Alternative.

TVA previously conducted several archaeological surveys within the BFN. Based on the archaeological surveys and review of TVA and Alabama Office of Archaeological Research records, there are no identified archaeological sites in the Project Area. The entire Project Area has been previously disturbed during the construction of the BFN and subsequent development activities. None of these areas retain the original soils that could have contained archaeological sites. TVA has therefore determined that no archaeological sites are located within the Project Area. The CT replacements would also have no impact on the potential NRHP eligibility of BFN because the CT replacements would not diminish the qualities that give significance to BFN and would not diminish the integrity of setting, association, or feeling of BFN. Therefore, TVA has determined that the Action Alternative would not result in an adverse impacts on BFN even if BFN were found to be eligible for inclusion in the NRHP.

A review of available online information from the ALDOT, Limestone County Government, the Limestone County Economic Development Agency (LCEDA), the North Alabama Industrial Development Association (NAIDA), the Economic Development Partnership of Alabama (EDPA), and the TVA Economic Development websites did not identify any properties that are proposed for development or are currently under development within one mile of the BFN. Should a project in the vicinity of BFN occur in the future, the cumulative impacts to resources would be required to be avoided, minimalized, or mitigated for in accordance to applicable federal, state, and local permit requirements. Additional upgrades and outages are proposed and planned for BFN in the reasonably foreseeable future. These upgrades and outages will be coordinated by TVA to avoid or minimize cumulative impacts. Unavoidable impacts associated with additional upgrades and outages will be mitigated for in accordance to applicable federal,

state, and local permit requirements. Based on the review of available information, there are no cumulative impacts associated with implementation of the Action Alternative.

Public and Intergovernmental Review

TVA reviewed the project under the TVA Programmatic Agreement titled, *Programmatic Agreement Among the Tennessee Valley Authority, the Advisory Council on Historic Preservation, and the State Historic Preservation Officers of Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee, and Virginia, and Federally Recognized Indian Tribes, Regarding Undertakings Subject To Section 106 of the National Historic Preservation Act of 1966*, executed in 2019. Ground-disturbing activities that are part of the Action Alternative would take place in areas documented to have been subjected previously to severe ground disturbance resulting from the construction of BFN and associated facilities. These areas have no potential to contain intact archaeological sites. TVA also conferred with the Alabama State Historic Preservation Officer (SHPO) regarding the need for any additional consultation regarding the potential eligibility of BFN as a historic architectural property. The SHPO stated via email dated March 6, 2020 that the SHPO continues to find that the 1974 CTs are not eligible for the National Register of Historic Places due to age, were not part of the original design, and have lost historic context. Therefore, TVA finds that the proposed actions would result in no effects on historic properties.

Mitigation

To minimize or reduce the environmental effects, TVA would utilize the following standard operating procedures, BMPs, and mitigation measures.

- If one acre or more of land would be disturbed at a given time, TVA would obtain coverage under the 2016 NPDES General Permit for Discharges Associated with Construction Activity (ALR100000).
- To control fugitive dust during construction activities, TVA would comply with the Alabama Department of Environmental Management (ADEM) Air Division Administrative Code Chapter 335-3-4, Control of Particulate Emissions and implement reasonable precautions and applicable BMPs.
- Applicable BMPs such as installation of sediment and erosion controls would be implemented and construction activities would be performed in compliance with applicable stormwater permitting.
- Specific avoidance and conservation measures identified on the TVA Bat Strategy Project Screening Form would be implemented as a part of the Action Alternative to reduce potential impacts to federally-listed bat species.
- TVA would implement applicable BMPs to minimize the amount and duration of noise generated during construction activities.
- To ensure that BFN noise levels continue to meet applicable guidelines, TVA would conduct additional environmental sound pressure level assessments with all CTs running in July 2020 and following completion of the CT replacements (i.e., a single assessment after both CTs are replaced and are fully operational).

- All wastes would be managed in accordance with existing BFN waste management procedures and general BMPs.

Conclusion and Findings

Based on the findings listed above, the analyses in the EA, and implementation of the mitigation measures, TVA concludes that the Action Alternative of replacing CT 1 and CT 2, as well as implementing associated upgrades would not be a major federal action significantly affecting the environment. Accordingly, an Environmental Impact Statement is not required.



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Date Signed