

**FINDING OF NO SIGNIFICANT IMPACT**  
**TENNESSEE VALLEY AUTHORITY**  
SEQUOYAH NUCLEAR PLANT UNIT 2 STEAM GENERATOR REPLACEMENTS  
HAMILTON COUNTY, TENNESSEE  
SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

In November 2009, the Tennessee Valley Authority (TVA) completed an environmental assessment (EA) and issued a finding of no significant impact (FONSI) relating to the proposed replacement of the four Unit 2 steam generators at the Sequoyah Nuclear Plant. That EA documented the potential effects of the proposed action on various environmental resources.

The Nuclear Regulatory Commission regulation General Design Criterion 2, i.e., “Design Basis for Protection Against Natural Phenomena” of Appendix A (General Design Criteria for Nuclear Power Plants) to 10 CFR part 50, requires nuclear facilities to be designed to accommodate severe natural phenomena. This includes incorporating design features to protect against the probable maximum flood<sup>1</sup> (PMF) or flood events following the probable maximum precipitation<sup>2</sup> (PMP) event.

Because the locations of all ancillary structures and facilities associated with the steam generator replacements project were not known when the original EA was prepared, an analysis of potential effects to on-site drainage patterns during the PMF or following a PMP event was not conducted. However, that analysis has been completed, and results are documented in a supplemental environmental assessment (SEA), which is incorporated by reference.

The alternatives considered in the original EA were retained in the SEA. These included Alternative A (No Action Alternative) and Alternative B (Action Alternative). Under Alternative A, TVA would not replace the four Unit 2 steam generators. Undertaking this alternative could lead to long-term expensive repairs, a gradual derating of Unit 2, or possibly, eventually shutting down Unit 2. Under the Action Alternative, TVA would replace the four Unit 2 steam generators, which would allow Unit 2 to function at full capacity and provide a reliable supply of electric power over the long term.

**Impacts Assessment**

The analysis in the SEA focused on identifying the potential flood-related effects of the on-site placement of temporary ancillary structures and facilities, especially at the barge offload site and at locations near Unit 2 and the Multipurpose Building within the protected area.<sup>3</sup> Analysis of an initial site plan revealed that the siting of some structures, as proposed, would impede PMP drainage. Consequently, a revised site plan was developed that would allow unobstructed drainage following the PMP event. TVA has determined that if temporary ancillary structures and facilities are located according to the revised plan, potential effects to on-site drainage following the PMP event would be avoided or minimized provided the mitigation measures listed below are implemented.

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<sup>1</sup> The probable maximum flood is defined as the most severe flood that can reasonably be predicted to occur at a site as a result of extreme weather conditions.

<sup>2</sup> The probable maximum precipitation is defined as the theoretically greatest depth of precipitation for a given duration that is physically possible over a particular drainage area at a certain time of year.

<sup>3</sup> The protected area is the secure portion of the plant site containing the nuclear reactors and associated power generation equipment.

## **Mitigation**

To ensure unobstructed drainage of floodwaters from areas subject to the PMP drainage, TVA will implement the following nonroutine measures during the Unit 2 steam generator replacements project:

1. All temporary facilities or structures to be located in an area subject to the PMP drainage will be located on piers to prevent obstructing flood drainage. These structures will be elevated at least 18 inches above the existing ground level.
2. Any solid skirting placed on temporary structures or facilities to be located in an area subject to the PMP drainage will be placed such that the bottom of the skirting is at least 18 inches above the existing ground level. Lattice or open mesh wire fence-type skirting installed for security purposes may extend to the ground elevation.
3. Buried utility crossings of roads (e.g., for cables, water lines, etc.) associated with the steam generator replacements project will be installed such that the elevation of the crossing is the same as that of the road surface.
4. All sidewalks associated with temporary facilities or structures and located at elevation 706 feet mean sea level or less will be constructed so that the top of the sidewalk is no higher than the existing ground level.
5. All spoil material will be placed outside the PMP site drainage areas.
6. At the completion of the Unit 2 steam generator replacements project, all temporary structures and facilities associated with the project will be removed, and the sites of these structures and facilities will be returned to approximate preproject conditions.
7. Modifications to the placement of temporary structures or ancillary facilities as shown in Attachment A of the SEA are permissible, provided TVA River Operations staff has reviewed the proposed modifications and determined that such changes will not adversely affect site drainage following the PMP event.

## **Conclusion and Findings**

As stated in the 2009 EA, implementing the proposed action would not affect any species listed as threatened or endangered. Likewise, no critical habitat for any listed species would be affected. TVA has determined that no historic properties would be adversely affected by implementing the Action Alternative. The proposed action is consistent with the requirements of Executive Order 11990 (Protection of Wetlands).

Placement of temporary ancillary structures in the vicinity of Unit 2, as shown on the current site plan, during the steam generator replacements project is not expected to increase flood hazards from changes in flood elevations or from flow-carrying capacity. Thus, the proposed action is consistent with Executive Order 11988 (Floodplain Management).

TVA has determined that all ancillary structures and facilities would be located within the Tennessee River PMF inundation area. However, flooding of these structures and facilities during a PMF would not result in the shutdown of the plant. Based on additional analysis, TVA has determined that the proposed actions would not affect site drainage following the PMP event to the extent that safe operation of the plant would be jeopardized provided the mitigation measures listed above are implemented. Based on the findings in the original EA and those from the SEA, TVA has concluded that the Unit 2 steam generator replacements project would

not result in significant adverse impacts to the environment. The proposed action is not a major federal action significantly affecting the quality of the human environment. Accordingly, an environmental impact statement is not required. This FONSI is contingent upon adherence to the mitigation measures identified above.



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Susan J. Kelly, Senior Manager  
Federal Determinations  
Environmental Permits and Compliance  
Tennessee Valley Authority

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Date Signed