



Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

October 1, 2012

10 CFR 50.4
10 CFR 50.34(b)

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Watts Bar Nuclear Plant, Unit 1
NRC Docket No. 50-390
Facility Operating License No. NPF-90

Watts Bar Nuclear Plant, Unit 2
NRC Docket No. 50-391

Subject: **Notification of Completion of Review of Updated Hydrologic Analysis Results for Impact on Watts Bar Nuclear Plant (WBN) Units 1 and 2 Final Environmental Statements**

- References:
1. Tennessee Valley Authority (TVA) Submittal to NRC Document Control Desk, Application to Revise Watts Bar Nuclear Plant Unit 1 Updated Final Safety Analysis Report Regarding Changes to Hydrologic Analysis, TAC No. ME8200 (WBN-UFSAR-12-01), dated July 19, 2012, Accession No. ML12236A167
 2. NUREG-0498, Supplement No. 1, Final Environmental Statement Related to the Operation of Watts Bar Nuclear Plant, Units 1 and 2, November 1994, Accession No. ML073470585
 3. NUREG-0498, Supplement No. 2, Draft Final Environmental Statement Related to the Operation of Watts Bar Nuclear Plant, Unit 2, October 2011, Accession Nos. ML11298A094 and ML11298A095

As committed to in the Reference 1 letter, Tennessee Valley Authority (TVA) has reviewed the Reference 2 Final Environmental Statement (1994 FES) and Reference 3 Draft Final Environmental Statement (2011 FES) for impact resulting from the revised hydrologic analysis for the Watts Bar Nuclear Plant (WBN) Units 1 and 2 sites. The 1994 FES and 2011 FES describe the surface water resources and hydrologic processes in and around the WBN site including existing water use and water quality in the environment in the vicinity of WBN Units 1 and 2. These descriptions of the affected environment for WBN Units 1 and 2 include citing recent information from TVA, and were not expected to be affected by the updated hydrologic analysis. TVA has reviewed the information contained in the updated hydrologic analysis, and has determined that the information provided in the 1994 FES and 2011 FES is not affected. The results of this review are described in Enclosures 1 and 2, respectively.

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The commitment due date provided in the Reference 1 letter was September 30, 2012. Since this was a Sunday, TVA is submitting this letter on October 1, 2012.

The enclosures contain no new regulatory commitments. Please address any questions regarding this request to Terry Cribbe at (423) 751-3850.

Respectfully,

A handwritten signature in black ink that reads "J.W. Shea". The signature is written in a cursive style and is positioned above the printed name and title.

J.W. Shea
Vice President, Nuclear Licensing

Enclosures:

1. Impact of Revised Hydrologic Analysis on WBN Units 1 and 2 Final Environmental Statement (1994 FES)
2. Impact of Revised Hydrologic Analysis on WBN Unit 2 Draft Final Environmental Statement (2011 FES)

cc (Enclosure):

NRC Regional Administrator - Region II
NRC Senior Resident Inspector – Watts Bar Nuclear Plant, Unit 1
NRC Senior Resident Inspector – Watts Bar Nuclear Plant, Unit 2

ENCLOSURE 1

IMPACT OF REVISED HYDROLOGIC ANALYSIS ON WBN UNITS 1 AND 2 FINAL ENVIRONMENTAL STATEMENT (1994 FES)

The original Final Environmental Statement issued in 1978 (1978 FES) represented the Nuclear Regulatory Commission's (NRC) previous environmental review related to the proposed operation of Watts Bar Nuclear Plant (WBN). In the early 1990's, the NRC determined that it was appropriate to re-examine the issues associated with the environmental review before issuance of an operating license for WBN Unit 1. The purpose of this NRC review was to discuss the effects of observed changes in the environment and to evaluate the changes in environmental impacts that have occurred as a result of changes in the WBN plant design and proposed methods of operations since the last environmental review. A full scope of environmental topics were evaluated, including regional demography, land and water use, meteorology, terrestrial and aquatic ecology, radiological and non-radiological impacts on humans and the environment, socioeconomic impacts, and environmental justice. NUREG-0498, Supplement No. 1, Final Environmental Statement Related to the Operation of Watts Bar Nuclear Plant, Units 1 and 2, November 1994, Accession No. ML073470585, documents the staff's environmental review. This document is referred to as the WBN Units 1 and 2 Final Environmental Statement (1994 FES). The staff concluded in the 1994 FES that there were no significant changes in the environmental impacts since the NRC 1978 FES from changes in plant design, proposed methods of operations, or changes in the environment.

Since issuance of the 1994 FES, the Tennessee Valley Authority (TVA) has updated the hydrologic analysis for the WBN Units 1 and 2 site. The update of the hydrologic analysis includes, but is not limited to, the following:

- Changes to the description of the current hydrosphere,
- Use of more recent flood history information,
- Changes to the inputs used for determining probable maximum precipitation (PMP),
- Changes to the probable maximum flood (PMF) and design basis flood (DBF) elevations at the plant site,
- Changes to the runoff and stream course model,
- Changes to the determination of seismically induced dam failure flood impacts at the plant site,
- Changes to the analysis for determining that adequate water is available for operation of WBN Units 1 and 2, and
- Updates to flooding protection requirements.

The update to the runoff and stream course model includes updated discharge rating curves to address recently identified rim leaks for Fort Loudoun Reservoir and Watts Bar Reservoir which result in bypass flow around the respective dams. As a result of the issues and updates associated with the hydrologic analysis, the PMF elevation at the WBN site is increased from elevation 734.9 ft to 739.2 ft, and the resulting DBF elevations affecting the safety-related systems, structures, and components (SSCs) are increased. Most of the SSCs that are

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IMPACT OF REVISED HYDROLOGIC ANALYSIS ON WBN UNITS 1 AND 2 FINAL ENVIRONMENTAL STATEMENT (1994 FES)

required to be protected from a flood are not impacted by the increased DBF elevations, because margin remains between the DBF elevations and the elevations of the SSCs or the existing flood protection measures are still effective. However, there are exceptions that require temporary compensatory measures to ensure adequate flood protection in the interim, with permanent plant modifications planned to restore or gain additional margin between the revised DBF elevations and the elevations of the limiting safety-related SSCs.

In Section 2.2 of the 1994 FES, a description of the regional water use (Section 2.2.1), the changes in the surface water hydrology of the plant (Section 2.2.2), and changes in the water quality (Section 2.2.3) are discussed. The impact of the revised hydrologic analysis including update to the methodology for determining PMF and DBF elevations at the plant as well as revision of the PMF and DBF elevations themselves is described for each corresponding section in the following discussions.

2.2.1 Regional Water Use

Regional water use by the downstream users of both public and industrial water supplies within an 80-kilometer (50-mile) radius of the plant, and the water's travel time and dilution factor for these users, are discussed in this subsection of the 1994 FES. The latest information identifying the water users is provided in Table 2.5, which is based on the letter from D. E. Nunn, TVA, to U.S. NRC, Watts Bar Nuclear Plant (WBN) Units 1 and 2 - Request for Additional Information Related to the Environmental Review, dated November 4, 1994 (Accession No. ML073470438). The information and analyses in this section were not significantly changed in the 1994 FES from that discussed in the 1978 FES. The information presented in the 1994 FES remains accurately described and is not impacted by the revised hydrologic analysis.

TVA has confirmed that the discussions involving regional water use and the summary in Table 2.5, including the cited supporting documentation, require no revision as a result of the updated hydrologic analysis. Therefore, there is no impact warranting further NRC review of this section of the 1994 FES.

2.2.2 Surface Water Hydrology

Surface water hydrology is discussed in this subsection of the 1994 FES, including descriptions of the holding and evaporation/percolation ponds on the WBN site, discussions concerning the approvals by the State of Tennessee of site controls for the monitoring of the ponds as evident from the issuance of the National Pollution Discharge Elimination System (NPDES) permit in 1993, and controls for handling storm water including erosion and sedimentation controls. The latest information supporting these discussions is based on the TVA report, Watts Bar Groundwater Impacts of Evaporation/Percolation Pond, WR28-1-85-133, dated July 1990; the 1993 State of Tennessee NPDES permit; and the letter from D. E. Nunn, TVA, to U.S. NRC, Watts Bar Nuclear Plant (WBN) Units 1 and 2 - Request for Additional Information Relating to Final Environmental Statement, dated August 5, 1994 (Accession No. ML073470403). The information and analyses in this section were updated in the 1994 FES from that discussed in the 1978 FES, primarily to address the following areas:

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IMPACT OF REVISED HYDROLOGIC ANALYSIS ON WBN UNITS 1 AND 2 FINAL ENVIRONMENTAL STATEMENT (1994 FES)

1. The two temporary chemical holding ponds discussed in the 1978 FES were retained as permanent features, and are still being used to contain and treat chemicals from the turbine building. The discharges from these ponds were being monitored in accordance with the NPDES permit for metal cleaning wastes.
2. A 2.5 million gallon evaporation/percolation pond was constructed after issuance of the 1978 FES and approved by the State of Tennessee in the 1993 NPDES permit. The 1994 FES stated that TVA planned to eventually discontinue use of the pond and then would cap and revegetate the area.
3. The runoff holding pond that was originally built for construction discussed in the 1978 FES was retained as a permanent feature. The discharge from the pond was being monitored in accordance with the NPDES permit.
4. As discussed in the 1978 FES, all point source discharges and storm water runoff points were being monitored in accordance with the NPDES permit. Under the general storm water permit for industrial sources, all requirements for erosion and sedimentation controls (i.e., inspections, corrective actions, and annual sampling) were implemented at WBN. In addition, biotoxicity sampling was being conducted semiannually at the main diffuser discharge and the runoff holding pond in accordance with the NPDES permit. The 1994 FES confirmed this information.

The information presented in the 1994 FES remains accurately described and is not impacted by the revised hydrologic analysis.

TVA has confirmed that the discussions involving surface water hydrology on the site, including the cited supporting documentation, require no revision as a result of the updated hydrologic analysis. Therefore, there is no impact warranting further NRC review of this section of the 1994 FES.

2.3.3 Water Quality

Information and analyses of water quality in the Tennessee River in the vicinity of the WBN plant are discussed in this subsection of the 1994 FES. In the letter from D. E. Nunn, TVA, to U.S. NRC, Watts Bar Nuclear Plant (WBN) Units 1 and 2 - Request for Additional Information Relating to Final Environmental Statement, dated August 5, 1994 (Accession No. ML073470403), TVA confirmed that the information and analyses of water quality had not significantly changed from that discussed in the 1978 FES, and the NRC agreed in the 1994 FES. The information presented in the 1994 FES remains accurately described and is not impacted by the revised hydrologic analysis.

TVA has confirmed that information and analyses of water quality, including the cited supporting documentation, require no revision as a result of the updated hydrologic analysis. Therefore, there is no impact warranting further NRC review of this section of the 1994 FES.

ENCLOSURE 2

IMPACT OF REVISED HYDROLOGIC ANALYSIS ON WBN UNIT 2 DRAFT FINAL ENVIRONMENTAL STATEMENT (2011 FES)

On March 4, 2009, TVA submitted an update to the NRC regarding the previously submitted application for a facility operating license to possess, use, and operate WBN Unit 2. The NRC published the notice of the receipt of application and the opportunity for hearing in the *Federal Register* on May 1, 2009. The NRC's regulations in Title 10 of the *Code of Federal Regulations* (10 CFR) 51.92, Supplement to the Final Environmental Impact Statement, require the NRC staff to prepare a supplement to the final environmental statement if there are substantial changes in the proposed action relevant to environmental concerns or if there are significant new circumstances or information relevant to environmental concerns bearing on the proposed action or its impacts. The same regulation permits the staff to prepare a supplement when, in its opinion, preparation of a supplement will further the interests of the National Environmental Policy Act of 1969. NUREG-0498, Supplement No. 2, Draft Final Environmental Statement Related to the Operation of Watts Bar Nuclear Plant, Unit 2, October 2011, Accession Nos. ML11298A094 and ML11298A095, documents the staff's environmental review. This document is referred to as the WBN Unit 2 Draft Final Environmental Statement (2011 FES). The staff concluded in the 2011 FES that impacts from the operation of WBN Unit 2 associated with water use, terrestrial resources, aquatic ecology, design-basis accidents, socioeconomics, the radiological and nonradiological environments, decommissioning, air quality, and land use are generally consistent with those reached in the 1978 FES and Supplement No. 1 to the Final Environmental Statement Related to the Operation of Watts Bar Nuclear Plant, Units 1 and 2, dated April 1995 (1995 SFES-OL-1). In some cases, the impacts were less than those identified in the 1978 FES.

Since the issuance of the 2011 FES, TVA has updated the hydrologic analysis for the WBN Units 1 and 2 site. The update of the hydrologic analysis includes, but is not limited to, the following:

- Changes to the description of the current hydrosphere,
- Use of more recent flood history information,
- Changes to the inputs used for determining PMP,
- Changes to the PMF and DBF elevations at the plant site,
- Changes to the runoff and stream course model,
- Changes to the determination of seismically induced dam failure flood impacts at the plant site,
- Changes to the analysis for determining that adequate water is available for operation of WBN Units 1 and 2, and
- Updates to flooding protection requirements.

The update to the runoff and stream course model includes updated discharge rating curves to address recently identified rim leaks for Fort Loudoun Reservoir and Watts Bar Reservoir which result in bypass flow around the respective dams. As a result of the issues and updates

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associated with the hydrologic analysis, the PMF elevation at the WBN site is increased from elevation 734.9 ft to 739.2 ft, and the resulting DBF elevations affecting the safety-related SSCs are increased. Most of the SSCs that are required to be protected from a flood are not impacted by the increased DBF elevations, because margin remains between the DBF elevations and the elevations of the SSCs or the existing flood protection measures are still effective. However, there are exceptions that require temporary compensatory measures to ensure adequate flood protection in the interim, with permanent plant modifications planned to restore or gain additional margin between the revised DBF elevations and the elevations of the limiting safety-related SSCs.

These updates have been addressed in the Final Safety Analysis Report (FSAR) portion of the application for an operating license for WBN Unit 2 (Reference: Letter from Raymond A. Hruby, Jr. (Watts Bar Unit 2, General Manager, Technical Services) to U.S. NRC dated August 23, 2012, Watts Bar Nuclear Plant (WBN) Unit 2 – Final Safety Analysis Report (FSAR), Amendment 109, Accession No. ML12244A018).

In Section 2.2 of the 2011 FES, a description of the surface water hydrology (Section 2.2.1.1), regional water use (Section 2.2.2.1), and surface water quality (Section 2.2.3.1) are discussed. The impact of the revised hydrologic analysis including update to the methodology for determining PMF and DBF elevations at the plant as well as revision of the PMF and DBF elevations themselves is described for each corresponding section in the following discussions.

2.2.1.1 Surface Water Hydrology

Surface water hydrology is discussed in this subsection of the 2011 FES, including changes in the operations of the reservoirs on the Tennessee River upstream of WBN Unit 2 by TVA River Operations (RO) since issuance of the 1995 SFES-OL-1. The changes discussed are for the Watts Bar and Chickamauga reservoirs as a result of a Reservoir Operations Study (ROS) completed in 2004 (Reference: *Reservoir Operations Study Final Programmatic Environmental Impact Statement*, Tennessee Valley Authority in cooperation with U.S. Army Corps of Engineers and U.S. Fish and Wildlife Service, Accession Nos. ML041100586, ML041100585, ML041100590, ML041100588), with information regarding the physical characteristics of these reservoirs from the ROS presented in Table 2-2. The information presented in the 2011 FES remains accurately described and is not impacted by the revised hydrologic analysis.

Also discussed in this subsection is TVA's renewal application for the NPDES permit in 2006 (Reference: Letter from J.D. Smith (Manager, Site Licensing and Industry Affairs (Acting), TVA) to U.S. NRC dated December 19, 2006, Watts Bar Nuclear Plant (WBN) Unit 1 - Notification of National Pollution Discharge Elimination (NPDES) Permit Renewal, Accession No. ML063560378). This renewal application updates the 1993 State of Tennessee NPDES permit cited in the 1995 SFES-OL-1, and remains accurately described in the 2011 FES and is not impacted by the revised hydrologic analysis.

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TVA has confirmed that the discussions involving surface water hydrology, including the cited supporting documentation, require no revision as a result of the updated hydrologic analysis. Therefore, there is no impact warranting further NRC review of this section of the 2011 FES.

2.2.2.1 Regional Water Use

Regional water use by the downstream users of both public and industrial water supplies within an 80-kilometer (50-mile) radius of the plant, and the water's travel time and dilution factor for these users, are discussed in this subsection of the 2011 FES. Since the issuance of the 1995 SFES-OL-1, TVA provided updated information regarding downstream water users in 2010 (Reference: Letter from Masoud Bajestani (Watts Bar Unit 2, Vice President) to U.S. NRC dated February 25, 2010, Watts Bar Nuclear Plant (WBN) Unit 2 - Additional Information Regarding Environmental Review (TAC No. MD8203), Accession No. ML100630115), as addressed in the 2011 FES. In addition, as part of the most recent update to the WBN Unit 2 FSAR portion of the application for an operating license (Reference: Letter from Raymond A. Hruby, Jr. (Watts Bar Unit 2, General Manager, Technical Services) to U.S. NRC dated August 23, 2012, Watts Bar Nuclear Plant (WBN) Unit 2 – Final Safety Analysis Report (FSAR), Amendment 109, Accession No. ML12244A018), TVA has provided the most recent regional water use information. The information presented in the 2011 FES remains accurately described and is not impacted by the revised hydrologic analysis.

TVA has confirmed that the discussions involving regional water use, including the cited supporting documentation, require no revision as a result of the updated hydrologic analysis. Therefore, there is no impact warranting further NRC review of this section of the 2011 FES.

2.2.3.1 Surface Water Quality

Information and analyses of surface water quality in the Tennessee River in the vicinity of the WBN plant are discussed in this subsection of the 2011 FES. As stated in the 2011 FES, in response to Requests for Additional Information (RAIs) for the environmental review, TVA provided analyses performed between January 2006 and December 2008. The results fell within the range previously observed (Reference: Letter from Masoud Bajestani (Watts Bar Unit 2, Vice President) to U.S. NRC dated December 23, 2009, Watts Bar Nuclear Plant (WBN) Unit 2 - Additional Information Regarding Environmental Review (TAC No. MD8203), Accession No. ML100210350). The information presented in the 2011 FES remains accurately described and is not impacted by the revised hydrologic analysis.

TVA has confirmed that the discussions involving surface water quality, including the cited supporting documentation, require no revision as a result of the updated hydrologic analysis. Therefore, there is no impact warranting further NRC review of this section of the 2011 FES.