



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

July 10, 2024

James Barstow, Vice President  
Nuclear Regulatory Affairs  
and Support Services  
Tennessee Valley Authority  
1101 Market Street, LP 4A-C  
Chattanooga, TN 37402

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3 – LICENSE RENEWAL REGULATORY LIMITED SCOPE AUDIT REGARDING THE ENVIRONMENTAL REVIEW OF THE LICENSE RENEWAL APPLICATION (EPID NUMBER: L-2024-SLE-0000) (DOCKET NUMBERS: 50-259, 50-260, AND 50-296)

Dear James Barstow:

By letter, dated January 19, 2024 (Agencywide Documents Access and Management System (ADAMS) ML24019A010), Tennessee Valley Authority, submitted an application for subsequent license renewal of Renewed Facility Operating License Nos. DPR-33, DPR-52, and DPR-68 for Browns Ferry Nuclear Plant Units 1, 2, and 3 to the U.S. Nuclear Regulatory Commission (NRC) pursuant to Section 103 of the Atomic Energy Act of 1954, as amended, and Part 54 of Title 10 of the *Code of Federal Regulations*, "Requirements for renewal of operating licenses for nuclear power plants."

The NRC staff has initiated the environmental review for the application. A virtual limited scope environmental audit will be conducted the week of July 22, 2024, by NRC staff (see Enclosure 1).

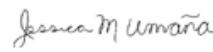
To the extent possible, the NRC staff requests the information identified in the Environmental Audit Needs List (Enclosure 2) be made available on the Browns Ferry online reference portal prior to the audit. A draft schedule of tours and meetings is provided in Enclosure 3.

J. Barstow

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If you have any questions, please contact me via email at [jessica.umana@nrc.gov](mailto:jessica.umana@nrc.gov).

Sincerely,



Signed by Umana, Jessica  
on 07/10/24

Jessica Umana, Environmental Project Manager  
Environmental Project Management Branch 1  
Division of Rulemaking, Environmental,  
and Financial Support  
Office of Nuclear Material Safety  
and Safeguards

Docket Nos. 50-259, 50-260, and 50-296

Enclosures:  
As stated

cc w/encls: Listserv

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3 – LICENSE RENEWAL REGULATORY LIMITED SCOPE AUDIT REGARDING THE ENVIRONMENTAL REVIEW OF THE LICENSE RENEWAL APPLICATION (EPID NUMBER: L-2024-SLE-0000) (DOCKET NUMBERS: 50-259, 50-260, AND 50-296

DATED: July 10, 2024

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**ADAMS Accession Nos.:**  
**ML24019A009 (Package)**  
**ML24019A476 (Letter)**  
**ML24023A476 (FRN)**

OFFICE	PM:REFS/EPMB1	LA:REFS/EPMB2	PM:REFS/EPMB1	BC:REFS/EPMB1	PM:REFS/EPMB1
NAME	ASabet	AWalker-Smith	JUmana	SKoenick	JUmana
DATE	7/08/2024	7/08/2024	7/09/2024	7/10/2024	7/10/2024

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## **Audit Plan**

# **License Renewal Environmental Review Browns Ferry Nuclear Plant Unit 1, 2 and 3**

**July 2024**

**Division of Materials and License Renewal  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission**

## **License Renewal Environmental Review Browns Ferry Nuclear Plant Units 1, 2, and 3**

### **1. Background**

By letter, dated January 19, 2024 (Agencywide Documents Access and Management System ML24019A010), Tennessee Valley Authority (TVA), submitted an application for subsequent license renewal of Renewed Facility Operating License Nos. DPR-33, DPR-52, and DPR-68 for Browns Ferry Nuclear Plant Units 1, 2, and 3 to the U.S. Nuclear Regulatory Commission (NRC). A *Federal Register (FR)* Notice (89 FR 8725) dated January 19, 2024, noted the receipt and availability of the application, including the environmental report (ER).

The NRC staff is conducting a limited environmental audit of the Browns Ferry site to improve understanding, to verify information, and to identify information for docketing to support the preparation of an environmental impact statement. Specifically, the NRC staff will be identifying pertinent environmental data, reviewing the facility, and seeking clarifications regarding information provided in the ER.

### **2. Environmental Audit Bases**

License renewal requirements for environmental reports are specified in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, "Postconstruction environmental reports." As specified by 10 CFR 51.53(c): *Operating license renewal stage*, "(1) Each applicant for renewal of a license to operate a nuclear power plant under Part 54 of this chapter shall submit with its application a separate document entitled "Applicant's Environmental Report—Operating License Renewal Stage." Review guidance for the staff is provided in NUREG–1555, Supplement 1, Revision 1, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants: Supplement 1 – Operating License Renewal."

The NRC staff is required to prepare a site-specific supplement to NUREG–1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants." During the scoping process required in 10 CFR 51, the NRC staff is required to define the proposed action, identify significant issues which must be studied in depth, and to identify those issues that can be eliminated from further study.

### **3. Environmental Audit Scope**

The scope of this limited scope environmental audit is to identify new and significant issues and issues which can be eliminated from further study. The NRC staff will also identify environmental resources that must be described and evaluated in the Supplemental Environmental Impact Statement. Audit team members will review the documents and other requested information made available on the Browns Ferry online reference portal identified in the environmental audit needs list (Enclosure 2) and discuss any questions and additional information needs with the applicant's subject matter experts.

### **4. Information and Other Material Necessary for the Environmental Audit**

As identified on the environmental audit needs list (Enclosure 2).

**5. Environmental Audit Team Members and Resource Assignments**

The environmental audit team members and their assignments are shown in the table below.

<b>Discipline</b>	<b>Team Members</b>
Environmental Review Supervisor	Steve Koenick
Environmental Project Manager	Jessica Umana
Environmental Support Project Manager	Angela Sabet
Air Quality	Nancy Martinez
Meteorology and Climatology	Nancy Martinez
Surface Water	Lloyd Desotell
Geologic Environment	Gerry Stirewalt
Human Health	Beth Alferink
Waste Management (rad and non-rad)	Don Palmrose
Greenhouse Gases/Climate Change	Nancy Martinez

**6. Logistics**

A virtual limited scope environmental audit will be conducted by the NRC staff the week of July 22, 2024.

**7. Special Requests**

TVA staff and contractors who are subject matter experts in the disciplines identified on the environmental audit needs list should be available for interviews and tours.

**8. Deliverables**

An audit summary report will be issued by the NRC staff within 90 days from the end of the full environmental audit occurring September and October of 2024.

## **Browns Ferry Nuclear Power Plant Audit and Information Needs**

The information below describes the breakout sessions and the information needs of the U.S. Nuclear Regulatory Commission (NRC) staff. Information needs are identified as either resource-specific questions or document requests. Please arrange for the meetings specified below to occur during the virtual environmental audit as noted. Additionally, we ask that you provide responses to the information needs on the electronic portal and make subject matter experts available to discuss these items with the NRC staff.

### **Meetings**

Please be prepared to schedule breakout meetings with the appropriate subject matter expert(s) and/or contractor(s) concerning the following topics. Those in attendance should be prepared to discuss the corresponding questions as described in the “Information Needs and Document Requests” section below. The staff intends to use these breakout meetings, as needed, to resolve or clarify any outstanding data needs or questions arising from the environmental audit. NRC intends to leverage virtual breakouts to the extent possible.

- Air Quality
- Meteorology and Climatology
- Surface Water Resources
- Geologic Environment
- Human Health
- Waste Management
- Greenhouse Gas Emissions and Climate Change

### **Browns Ferry Site-Specific Information Needs for Limited Scope Audit**

#### **Information Needs and Document Requests**

Information needs and document requests are identified below by resource area for this limited scope audit (LSA).

#### **Topic-specific**

The following requests are specific to this LSA and a single-environmental review area; however, this does not preclude follow-up requests for this audit or the NRC staff having additional information needs as part of the full scope audit currently scheduled for September 2024.

#### **Air Quality (AQ)**

##### **Audit Needs**

##### **AQ-1-LSA**

Section 3.2.6 of the environmental report (ER) identifies air pollutant sources at Browns Ferry Nuclear Plant (BFN): auxiliary boilers, the emergency diesel or propane fired generators, and miscellaneous sources such as fuel storage facilities. Section 3.2.6 of the ER goes on to state that BFN operates under a synthetic minor source permit. Table 4.2-2 of the ER provides BFN annual emissions for a single year. Please, identify the air pollutant sources that are regulated under BFN’s synthetic minor source permit.

### **AQ-2-LSA**

Section 4.2.1 of the ER states that cooling tower particulate emissions in the “air via steam drift cannot be reasonably quantifiable” and are considered negligible. Please explain the basis for concluding that particulate emissions cannot be quantified for the mechanical draft cooling towers.

### **AQ-3-LSA**

Section 4.2.2 of the ER states that ozone and nitrogen oxide emissions associated with BFN high-voltage transmission lines are minimal. Have field tests concerning ozone and nitrogen oxide emissions generated by BFN’s in-scope transmission lines been conducted? If so, please provide a copy. If field tests have not been conducted, provide a basis for concluding that air quality impacts associated with transmission line are SMALL.

### Document Needs

### **AQ-4-LSA**

Please provide a copy of BFN’s synthetic minor source permit (Permit No. 708-0003-X005).

### **AQ-5-LSA**

Please provide annual air emissions for the most recent five years for the sources listed in table 4.2-2 of the ER.

## **Meteorology and Climatology (MET)**

### Audit Needs

### **MET-1-LSA**

Section 3.2.1 of the ER provides meteorological data (mean annual temperature, mean daily temperature) at Decatur, Alabama. However, site-specific meteorological data is not provided. Please provide the following meteorological data from BFN’s onsite meteorological facility for the past five years:

- Prevailing wind direction and average wind speed
- Monthly and annual daily mean temperature data and temperature extremes
- Monthly and annual total mean precipitation

## **Surface Water (SW)**

### Audit Needs

### **SW-1-LSA**

Page E4-11 of the ER states: “*The Water Quality Branch of [Alabama Department of Environmental Management] (ADEM) has determined that the NPDES permit will address any water quality concerns. Therefore, a CWA Section 401 Water Quality Certification from ADEM will not be required as part of the license renewal process.*”

Section 401 of the Clean Water Act requires that an applicant for a Federal license or permit, whose activities may cause any discharge into navigable waters, provide the Federal licensing or permitting agency with a certification decision from the appropriate certifying authority (e.g., State water pollution control agency) in which the discharge originates or will originate. If the applicant has not received Section 401 certification, the NRC cannot issue a license or permit unless the certifying authority has waived the requirement. The U.S. Environmental Protection Agency (EPA) issued a final rule in 2023 (88 FR 66558; September 27, 2023) revising the regulations in 40 CFR 121 governing water quality certification under Clear Water Act (CWA) Section 401. It prescribes



procedural requirements for applicants, certifying authorities, the NRC as the federal licensing agency, and the EPA.

Please clarify if ADEM has issued Tennessee Valley Authority (TVA) a Section 401 Water Quality Certification waiver and provide any correspondence between TVA and ADEM regarding CWA Section 401 Water Quality Certification.

## **Geologic Environment (GE)**

### Audit Needs

#### **GE-1-LSA**

Section 3.4.1 of the ER does not describe rare or unique geologic resources, including rock, mineral, or energy rights and assets at or adjoining the BFN site, as recommended in Regulatory Guide (RG) 4.2, Supplement 1, Revision 1. It is possible to assume there are none since Alabama Code Section 45-42.170.43 indicates that, in Limestone County after May 11, 2009, no new rock quarry may be established, nor any existing rock quarry located outside the corporate limits of any municipality within 10 miles of the BFN site. Please provide an explanation for the presence or absence of rare or unique geologic resources at or adjoining the BFN site.

## **Human Health (HH)**

### Audit Needs

#### **HH-1-LSA**

Section 3.9.2 of the ER discusses Microbiological Hazards, but there is no discussion regarding consultation with state agencies as recommended by RG 4.2, Supplement 1, Revision 1, which states the applicant should consult the State agency responsible for environmental health regarding potential existence and concentration of microbiological organisms in the receiving water for plant cooling water discharge to ensure that the Title 10 of the *Code of Federal Regulations* (10 CFR) Section 51.53(c)(ii)(G) assessment of the impact of the proposed action on public health from thermophilic organisms has been completed. Provide copies of consultation correspondence with the responsible state agency for microorganisms in the receiving waters of the plant cooling water discharge. This correspondence should indicate the state's concurrence with the applicant's risk assessment and proposed mitigation strategy if one is required. Following consultation, if the state agency requests additional assessments or actions related to thermophilic microbiological organisms, provide the status of those assessments or actions.

#### **HH-2-LSA**

Sections 3.9.3 and 4.9.8 of the ER discusses electric shock hazards and notes that all in-scope transmission lines meet national electric safety code standards, but there is no discussion of how this conclusion was drawn. Please plan to have a subject matter expert available to discuss the assessment or study performed for the in-scope transmission lines as it relates to the National Electric Safety Code (NESC) criteria and the maintenance program to ensure that design ground clearances are maintained. As part of this discussion, please plan to provide the assessment or study to ensure NESC criteria are being met in accordance with 10 CFR 51.53(c)(3)(ii)(H). The study performed as part of initial license renewal is not applicable to subsequent license renewal unless further verification for continued applicability due to the potential for land use changes in the vicinity of the lines, line voltage changes, facility construction, etc. are confirmed.

## Document Needs

### **HH-3–LSA**

As noted in HH-2, please provide a copy of the study and analysis findings used to determine compliance with the current NESC guidance. When providing a copy of the study, ensure that the conclusion of no clearance issues and that NESC clearance requirements are met as stated in the ER.

### **Waste Management (WM)**

#### Audit Needs

### **WM-1-LSA**

RG 4.2, Supplement 1, Section 2.2, General Plant Information, states:

“The applicant should provide in the ER a brief plant-specific description of the major features of the liquid, gaseous, and solid radioactive waste management system. The information should include, at a minimum, a physical description of the systems and the types of treatment used (e.g., filtration, demineralizers, dewatering, and resin filtration for liquid wastes), a discussion about the use of an offsite waste processor, and details of the transportation and disposal of the waste and onsite storage facilities.

RG 4.2, Supplement 1, Section 3.11, Waste Management, the following is stated regarding the affected environment:

This section should describe the nuclear plant’s radioactive and nonradioactive waste management systems and programs. Some of this information can be incorporated by reference to Section 2.2 of the ER. The ER should include the following information:

- a description of the radioactive and nonradioactive waste management systems and effluent control systems, including the systems and controls used for liquid, gaseous, and solid wastes, or alternatively, citations showing where such information would be available in the final safety analysis report, or other documents submitted to the NRC;
- pollution prevention and waste minimization measures in place or planned to reduce or eliminate the quantities of **gaseous** and liquid emissions to the environment and the quantities of wastes shipped off site for processing or disposal; [...]

This information is missing from the ER, Section 2.2.4.2, Gaseous Radioactive Waste Management Systems, and Section 3.11, Waste Management. Please provide the information noted above or the appropriate citation to the Updated Final Safety Analysis Report (UFSAR) to allow the staff to complete its assessment of gaseous radioactive waste management for the BFN.

## Document Needs

### **WM-2-LSA**

Please provide the appropriate section of the BFN’s UFSAR that describes the associated gaseous radioactive waste management systems to meet the guidance provided in RG 4.2, Supplement 1.

Sections 2.2 and 3.11.

## **Greenhouse Gas Emissions and Climate Change (GG)**

### Audit Needs

#### **GC-1-LSA**

Section 3.2.6 of the ER states that as of July 7, 2022, BFN generated a total of 17,593 tpy [tons per year] CO<sub>2</sub>e.

- a. Please provide annual greenhouse gas (GHG) emissions for the most recent five years. Emissions should account for direct and indirect GHG emissions (e.g., worker vehicles).
- b. Are fluorinated gases, such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, used onsite? If so, please identify the equipment that use these gases and include GHG emissions for these sources for the last 5 years as part of the response under part a above. Additionally, if fluorinated gases are used, identify and discuss procedures implemented to manage the handling of fluorinated gases.

#### **GC-2-LSA**

In Section 4.13.2.1, Temperature and Precipitation Effects, the ER concludes that “because current climate change patterns in the southeast do not indicate a trend toward drought, climate change impacts on water availability in Wheeler Reservoir are anticipated to be SMALL.” The ER states that climate change is likely to result in higher temperatures within the BFN area. The effect of climate change on precipitation within the BFN area is unknown because the BFN area is in a transition zone between projected high latitude increases and subtropical decreases in precipitation. With increased temperatures, evaporation could increase, reducing water availability. Please provide data and/or an assessment to support the ER conclusion regarding water availability for Wheeler Reservoir.

#### **GC-3-LSA**

Section 3.5.1.2 of the ER states that BFN’s National Pollutant Discharge Elimination System permit requires that temperature differentials between upstream and downstream monitoring points and flow be reported in monthly Discharge Monitoring Reports. Has a warming trend been observed in river water temperatures measured at upstream or downstream monitoring points for the available period of record? Has a trend been observed in average daily flow in Wheeler Reservoir for the available period of record? Please provide data to support the conclusions reached (e.g., graphs, time series analysis, etc.).

#### **GC-4-LSA**

Section 4.13 of the ER states, “[c]hanges in climate have broader implications for environmental resources (e.g., water resources, air quality, and ecosystems) [...] As a consequence, climate change can have overlapping impacts on environmental resources by inducing changes in resource conditions that can also be affected by the proposed action.” The effects of climate change in Section 4.13.2 of the ER considered impacts on water availability in Wheeler Reservoir; public health; thermophilic organisms in Wheeler Reservoir; and environmental justice. Please discuss why the ER did not consider climate change impacts to other environmental resource areas affected by the proposed action (e.g., air quality).

## **Browns Ferry Site-Specific Items for Consideration**

The following are items for consideration (IFC) as a supplement and are editorial in nature.

### **Uranium Fuel Cycle (UFC)**

#### **UFC-IFC-1**

Section 4.15 of the ER refers to table 4.14-1 but should refer to table 4.15-1. In addition, table 4.15-1 lists the ER Sections discussing Uranium Fuel Cycle Issues but references SLR Sections under the headers in Waste Management (4.14.1, 4.14.2, 4.14.3, etc). Note that these are incorrect and should be pointing to text sections following the table in 4.15. There are also reference errors in the text in this section. Please consider an update with the correct pointers.

### **Decommissioning (DECOM)**

#### **DECOM-IFC-1**

Section 4.16 of the ER refers to table 4.15-1 in error. In addition, table 4.16-1 points to the incorrect section in the ER and should be pointing to the discussion on Termination of Nuclear Plant Operations and Decommissioning in Section 4.16. There are also reference errors in the text in this section. Please consider an update with the correct pointers.

**Browns Ferry Nuclear Plant Units 1, 2, and 3**  
**Environmental Audit Schedule**

**Monday, July 22, 2024**

START	END	ACTIVITY
9:00 am ET	9:30 am ET	Kick off limited scope audit and introductions
9:30 am ET	11:30 am ET	Air Quality
1:00 pm ET	3:00 pm ET	Meteorology and Climatology

**Tuesday, July 23, 2024**

START	END	ACTIVITY
9:00 am ET	11:00 am ET	Greenhouse Gases/Climate Change
1:00 pm ET	3:00 pm ET	Geologic Environment

**Wednesday, July 24, 2024**

No breakout sessions scheduled.

**Thursday, July 25, 2024**

START	END	ACTIVITY
9:00 am ET	11:00 am ET	Waste Management Human Health

**Monday, July 29, 2024**

START	END	ACTIVITY
10:00 am ET	12:00 pm ET	Surface Water