



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

February 28, 2024

Mr. Brian McDermott, Director,  
Licensing and Planning  
New Nuclear Program  
Tennessee Valley Authority  
1101 Market Street  
LP 1G-C  
Chattanooga, TN 37402

SUBJECT: GEOLOGIC AND GEOTECHNICAL AUDIT PLAN FOR TENNESSEE VALLEY  
AUTHORITY REQUEST: EXEMPTION FROM TITLE 10 OF THE CODE OF  
FEDERAL REGULATIONS SECTION 50.10(c) TO ALLOW EXCAVATION AT  
THE CLINCH RIVER NUCLEAR SITE PRIOR TO CONSTRUCTION PERMIT  
ISSUANCE (EPID L-2024-LLE-002)

Dear Mr. McDermott:

By letter dated January 31, 2024 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML24009A168), the U.S. Nuclear Regulatory Commission (NRC) accepted for review the Tennessee Valley Authority (TVA) request for exemption from Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.10, "License required; limited work authorization," paragraph (c) "Requirement for construction permit, early site permit authorizing limited work authorization activities, combined license, or limited work authorization," for the Clinch River Nuclear (CRN) Site. The TVA exemption request was submitted by letter November 30, 2023 (ML23335A100),

In support of the NRC's detailed technical review of the TVA exemption request, staff have prepared the attached geologic and geotechnical audit plan (consistent with LIC-111, Revision 1, Regulatory Audits) containing information needs for NRC-TVA engagement and discussion of technical and regulatory matters related to the proposed excavation. A separate environmental audit for this exemption request will be conducted by staff from NRC's Environmental Center of Expertise in the Office Nuclear Material Safety and Safeguards. Detailed audit summary reports will be prepared and transmitted to TVA within 60 days after close of each audit. You will be advised if any further information needed to support the NRC staff's detailed review by separate correspondence.

If you have any questions please contact me, Allen Fetter, the Senior Project Manager at [Allen.Fetter@nrc.gov](mailto:Allen.Fetter@nrc.gov).

Sincerely,

*/RA/*

Allen Fetter, Senior Project Manager  
New Reactor Licensing and Infrastructure Branch  
Division of New and Renewed Licenses  
Office of Nuclear Reactor Regulation

Docket No.: 99902056

Enclosure: Geologic and  
Geotechnical Audit  
Plan for Early Excavation  
Exemption Request

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DATED: FEBRUARY 28, 2024

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[bmcdermott@tva.gov](mailto:bmcdermott@tva.gov)[rjschiele@tva.gov](mailto:rjschiele@tva.gov)**ADAMS Accession No.: ML24058A144****\*via email****NRR-106**

<b>OFFICE</b>	NRR/DNRL/NLIB/PM	NRR/DNRL/NLIB/LA	NRR/DNRL/NLIB/BC
<b>NAME</b>	AFetter*	SGreen*	MHayes*
<b>DATE</b>	02/26/2024	02/27/2024	02/27/2024

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## **Geologic and Geotechnical Audit Plan for the Tennessee Valley Authority Early Excavation Exemption Request - Clinch River Nuclear Site, Oak Ridge, TN**

APPLICANT: Tennessee Valley Authority (TVA)

DATE: March 5, 2024 (subsequent interactions, as necessary)

LOCATION: Virtual (via Teams)

AUDIT TEAM: Jenise Thompson, Geologist (NRR/DEX/EXHB)  
Luisette Candelario, Geotechnical Engineer (NRR/DEX/ESEB)  
Zuhan Xi, Geotechnical Engineer (NRR/DEX/ESEB)

PROJECT MANAGER: Allen Fetter (NRR/DNRL/NLIB)

### **BACKGROUND AND AUDIT OBJECTIVE**

On November 30, 2023, Tennessee Valley Authority (TVA) submitted an exemption request to the U.S. Nuclear Regulatory Commission (NRC) to permit early excavation activities at the Clinch River Nuclear (CRN) Site prior to the issuance of a construction permit (CP) for the BWRX-300 reactor at the site (Agencywide Documents Access and Management System Accession No. ML23335A100). The proposed excavation is expected to be approximately 115 feet deep and 132 feet wide, large enough to accommodate the future below-grade construction of a BWRX-300 reactor. In preparation for the audit, the NRC staff reviewed the data and information within the early excavation exemption request and identified information needs/audit items that the staff requires to complete its review.

This virtual information audit will provide the opportunity for members of the NRC staff to discuss the audit items identified during the staff's initial review of the exemption request with TVA's subject matter experts, staff and contractors. During the audit, the staff will go over the audit items and relevant supporting materials made available by TVA. The audit will allow the staff to better understand the technical details of the proposed excavation process in order to make appropriate safety conclusions concerning TVA's exemption request and consider any implications there might be for the subsequent CP application review. If the staff still need additional information after completion of the audit, the staff will prepare formal requests for additional information in order to complete the review.

### **REGULATORY AUDIT BASES**

This regulatory audit is based on the following:

- 10 CFR 50.12, "Specific exemptions"
- 10 CFR 100.20, "Factors to be Considered When Evaluating Sites"
- 10 CFR 100.21, "Non-seismic Siting Criteria"
- 10 CFR 100.23, "Geologic and Seismic Siting Criteria"
- LIC-111, Revision 1, Regulatory Audits

Enclosure

## **AUDIT ACTIVITIES AND SCHEDULE**

The NRC staff plan to conduct the audit in less than one business day, March 5, 2024, but might extend the audit if additional time is needed. The need for an extension will be determined by the NRC staff responsible for the audit before the planned audit exit on March 5, 2024.

An agenda for the audit is presented in Attachment A. Attachment B contains specific information needs for each review section. If necessary, any circumstances related to the conductance of the audit will be communicated to the safety PM, Allen Fetter (NRC), at 301-415-8556 or at [Allen.Fetter@nrc.gov](mailto:Allen.Fetter@nrc.gov).

## **DELIVERABLES**

The audit team plans to issue an audit report within 60 days after completing the audit.

**Agenda: March 5, 2024**  
**Audit Plan for Early Excavation Exemption Request, Clinch River Nuclear Site**

**Tuesday, March 5, 2024, AUDIT**

- 08:00-08:15** Audit Entrance/Introductions .....[NRC/TVA]
- 08:15-08:45** Overview presentation on Early Excavation Exemption Request and TVA's approach to addressing Attachment B information needs<sup>1</sup> .....[TVA]
- 08:45-10:30** Review and discussion of audit items/information needs (Attachment B) [NRC/TVA]
- 10:30-11:15** NRC Internal Caucus.....[NRC]
- 11:15-11:45** Audit Exit<sup>2</sup> .....[NRC/TVA]
- 11:45** Adjourn

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<sup>1</sup> Electronic Reading Room documents should be available to facilitate discussion.

<sup>2</sup> The audit exit date and time might be deferred if additional audit interactions are needed to complete the audit.

### Information Needs Specific to the Exemption Request

The Early Site Permit (ESP) issued for the CRN site, ESP-006, included two permit conditions (in 3.F.) and 17 action items (In Appendix C) that are described in the staff's final safety evaluation report (FSER) sections 2.5.3, 2.5.4 and 2.5.5. TVA's planned excavation support activities may influence the implementation of the permit conditions and/or action items in a subsequent CP or combined license (COL) application. In accordance with 10 CFR 50.12:

1. Please discuss the need to address FSER Permit Conditions 2.5-1 (3) and 2.5-2 (4) and if so, provide a detail plan outlining how the applicant intends to address each permit condition to ensure compliance with regulatory requirements as part of the exemption request.
2. Please identify and discuss the need to address action items 2.5-1 through 2.5-17 as part of the exemption request and acknowledge if the planned excavation support activities described in the exemption request could affect addressing the action items in subsequent CP or COL application. If so, discuss how the applicant intends to address each COL action item.

### Other Technical Information:

1. Additional information on the confirmatory/supplemental borings performed at the site that may address the requirements of Permit Condition 4 as it relates to confirmatory borings at the excavation level and Permit Condition 3 related to geologic mapping of features and structures at the foundation interface.
2. Details of the excavation process, sequence and documentation.
3. Groundwater effects during and after excavation and evaluation of the stability of the excavated walls considering the effects of groundwater drawdown (i.e. collapse, rockfall, unexpected changes in ground water conditions).
4. Exemption request assumes hard rock conditions for the full extent once the Benbolt formation is encountered. The applicant plans to conduct a vertical excavation and staff needs to understand TVA's contingency plans if the vertical rock surface presents conditions that need retaining methods.
5. The applicant stated the following on the exemption request: "Any effects of the initial ground support system will be considered through seismic soil structure interaction (SSI) sensitivity analyses performed using best estimate properties of surrounding in-situ subgrade materials on a reactor building (RB) finite element model that includes the excavation support structure and the fill material to assess their effect on the BWRX-300 RB seismic response."
  - a. Discussion about the initial ground support system and best estimate properties of surrounding in-situ subgrade materials vs. estimates of upper and lower bound properties as part of the SSI sensitivity analysis.
  - b. Discussion about the potential need for additional retaining measures during the excavation and as part of the initial ground support system. This shall include potential effects of the additional retaining measures on the RB structure,

especially if exposed to ground water, and the evaluation of the additional retaining measures as part of the SSI sensitivity analysis.

**Process:**

TVA will give an overview presentation of the exemption request with consideration of the audit information needs. NRC staff and TVA will then discuss specific audit information needs above and document how information needs were addressed and note any unresolved technical issues that need to be resolved through the request for additional information process.