



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

**TENNESSEE VALLEY AUTHORITY – CLINCH RIVER NUCLEAR SITE ENVIRONMENTAL  
REPORT AUDIT PLAN**

**(CAC NUMBERS: 001912, 50-615; EPID NUMBER: L-2025-LNE-0000)**

**APPLICANT INFORMATION**

**Applicant:** Tennessee Valley Authority

**Applicant Address:** 1101 Market Street, Chattanooga, TN 37402

**Plant Name(s) and Unit(s):** Clinch River Nuclear (CRN) Site – CRN Unit 1

**Project Nos.:** 001912, 50-615

**Background**

By letter dated April 28, 2025, Agencywide Documents Access and Management System (ADAMS) Accession No. ML25118A209, Tennessee Valley Authority (TVA) submitted an Environmental Report (ER) in support of a construction permit (CP) application for its Clinch River Nuclear (CRN) Site. This was the first part of its CP application, the second part having been submitted by letter dated May 20, 2025, (ML25140A063). By letter dated June 12, 2025, the Nuclear Regulatory Commission (NRC) notified TVA of its acceptance of Part 1 of the CRN Site CP application for detailed review (ML25156A058). The staff is reviewing the information in the ER (ML25118A209) per Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51. In accordance with 10 CFR 51.20, the staff is preparing a supplement to the early site permit (ESP) final environmental impact statement to evaluate the environmental impacts from the proposed action.

In its initial review of data and information within the corresponding context of the ER, the staff has identified information needs (Enclosure 1) that would promote a better understanding of the detailed analysis and bases underlying the CP application. This environmental audit will provide the NRC staff with an opportunity to discuss these items with the applicant subject matter experts, staff and contractors. During the audit, the staff will discuss a wide range of environmental matters related to land use, ground and surface water, terrestrial and aquatic ecology, human health, postulated accidents, radiological and non-radiological waste, cultural resources, alternatives, air quality and noise. The audit will allow the staff to better understand the site, environmental interfaces of the project, and modeling results, in order to draw appropriate environmental findings.

**Purpose**

The NRC staff is conducting an environmental audit of the TVA ER to seek clarification, improve understanding, and to verify information provided in the ER and supporting documentation.

## Regulatory Audit Basis

Requirements for ERs supporting CPs are specified in 10 CFR 51.50, “Environmental Reports – construction permit, ESP or combined license stage.”

## Regulatory Audit Scope

Audit team members will review documents and other requested information outlined in the information needs list (Enclosure 1). This list covers those environmental review areas outlined in the Background section of this audit plan. Enclosure 2 lists those areas for which pre-arranged audit discussions will be worked out between the NRC and TVA project managers to take place the first week of the audit (see discussion below for audit logistics).

## Environmental Review Team

Table 1 includes a list of the NRC’s environmental review team assigned to the CRN Site CP review and their role or review area coverage. Additional NRC staff will participate in some audit discussions based on coordination with related reviews (see Enclosure 2).

Table 1. Review Areas with Assigned Team Members

Team Member	Role / Review Area
Dan Barnhurst	Environmental Review Supervisor
Madelyn Nagel	Environmental Project Manager; Site Layout and Plant Structures; Alternatives
Don Palmrose	Postulated Accidents; Non-Radiological Human Health; Noise
Jennifer Davis	Historic and Cultural Resources
Gerry Stirewalt	Groundwater and Geology
Brian Glowacki	Surface Water and Alternatives
Nancy Martinez	Air Quality and Climate Change
Jeff Rikhoff	Socioeconomics; Cost-Benefit Discussion;
Caroline Hsu	Land Use and Visual
Peyton Doub	Aquatic and Terrestrial Ecology

## Information and Other Material Necessary for the Regulatory Audit

The NRC staff requests that all the documents and other requested information identified in Enclosure 1 be provided by TVA on the online reference portal.

## Logistics

Entrance Meeting	July 14, 2025
Exit Meeting	August 21, 2025 (Tentative)

Audit meetings will take place in a virtual format, using Microsoft Teams, or via other, similar platforms. The NRC and TVA audit managers will schedule meetings as needed upon TVA’s review of this audit plan. The audit duration is anticipated to be approximately 6 weeks with activities occurring regularly throughout the first 2 weeks and intermittently thereafter.

Enclosure 2 describes sessions to be pre-arranged for the first 2 weeks. Follow-up sessions will be scheduled, if needed, until audit closure.

### **Special Requests**

The NRC staff requests that TVA ensure that their technical staff are available to answer questions during the audit.

### **Deliverables**

At the completion of the audit, a publicly noticed exit meeting will be held at which time a summary of audit activities and discussions will be presented along with the status of staff information needs identified as part of the audit. In addition, the audit team will issue an audit summary within 90 days after the exit meeting. The audit summary will be declared and entered as an official agency record in ADAMS and be made available for public viewing through the publicly available records component of ADAMS.

### **References**

The audit will follow the guidance in the Office of Nuclear Reactor Regulation's Office Instruction LIC-111, Revision 1, "Regulatory Audits," (ML19226A274).

### **Contacts**

Please contact Madelyn Nagel at 301-415-0371 or via email at [Madelyn.Nagel@nrc.gov](mailto:Madelyn.Nagel@nrc.gov) about any issues related to the conduct of the audit.

Date: July 10, 2025



Signed by Nagel, Madelyn  
on 07/10/25

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Madelyn Nagel, Environmental Project Manager  
Environmental Project Management Branch 3  
Division of Rulemaking, Environmental,  
and Financial Support  
Office of Nuclear Materials Safety  
and Safeguards

SUBJECT: TENNESSEE VALLEY AUTHORITY – CLINCH RIVER NUCLEAR SITE  
 ENVIRONMENTAL REPORT AUDIT PLAN (CAC NUMBERS 001912, 50-615;  
 EPID NUMBER L-2025-LNE-0000)

DATED: July 10, 2025

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**ADAMS Accession No.: ML25189A385**

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DATE	7/09/2025	7/09/2025	7/09/2025

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## TVA CRN Site CP Application Environmental Audit Information Needs List

Information Need ID	Regulatory Basis	Information Needed
<b>General</b>		
GEN-1	10 CFR 51.45(d)	Please provide a knowledgeable person(s) to discuss status for all permits/authorizations in Table 1.5-2 and Table 1.5-3 of the environmental report (ER), such as Clean Water Act 401 Certification, Clean Water Act Section 404 permit, USACE Section 408 permit, Rivers and Harbors Act Section 10 permit, and air permits.
GEN-2	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person to discuss the interchange area at TN-58 and Bear Creek Road, the T-line corridor, the possible tunneling in the river/reservoir for the intake, and a future independent spent fuel storage installation (ISFSI).
<b>New and Significant Review Process</b>		
NS-1	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the new and significant information review process. Discuss (1) how new information was identified, (2) how it was compared to information available during the early site permit (ESP) proceedings, and (3) the metrics and/or logic used to categorize new information as confirmatory or as notable. To facilitate this discussion, consider the following examples of new information listed in the ER: 1. Watts Bar Reservoir characteristics including water surface elevations, bathymetry, sediment transport characteristics, and other physical attributes, 2. Seasonal trends in groundwater elevations, flow paths, gradients, and velocities, 3. Hydrologic alterations to Watts Bar Reservoir from building intake and discharge structures and associated mitigation measures for unavoidable impacts, 4. Aquatic ecology of the Watts Bar Reservoir, and 5. In-migrating workforce for building activities and related community infrastructure and services.
NS-2	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the new and significant information review process related to reasonably foreseeable future actions.
<b>Site Layout and Plant Structures</b>		
SL-1	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the updated project setting related to principal land uses (e.g., habitat protection area), transmission corridor and site utilization plan.

Information Need ID	Regulatory Basis	Information Needed
SL-2	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the updated facility utilities including reactor power conversion system, plant water use, cooling systems, and cooling system components.
SL-3	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the discharge construction, excavation and dredging, and the riprap wall used to protect the discharge pipes.
SL-4	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the location and design of the intake structure and any changes between the ESP and the construction permit ER.
<b>Land Use and Visual (SEIS Section 3.1)</b>		
LU-1	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the timber harvesting of the 161-kV transmission corridor.
LU-2	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the amount and disposition of spoils and dredged material.
LU-3	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the potential Clinch River Nuclear (CRN) site quarry permanent and temporary impacts.
LU-4	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the offsite rights for the 161-kV transmission corridor.
LU-5	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to identify and discuss lands owned by the U.S. Department of Energy (DOE), future plans, and offsite land rights.
LUTE-1	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss building activities within streams, wetlands and floodplains and visual intrusion from the 161-kV transmission line.
<b>Meteorology and Air Quality (SEIS Section 3.2)</b>		
MET-1	Clean Air Act, 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss quantified greenhouse gas emissions and criteria pollutant emissions and its precursors from 1.) building activities (preconstruction and U.S. Nuclear Regulatory Commission authorized construction); 2.) vehicular traffic (worker vehicles, delivery vehicles) during operations, and 3.) air quality impacts from these activities. This information is needed per Section 176(c) of the Clean Air Act.
MET-2	10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss new and significant information related to greenhouse gas and criteria pollutant emissions during operations; emissions from cooling towers and auxiliary systems; cooling tower plume, fogging, icing,

Information Need ID	Regulatory Basis	Information Needed
		and salt deposition; emissions from new transmission lines; and associated calculations and assumptions for these estimates.
MET-3	10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss new and significant information related to the local climate, meteorological measurements, and extreme weather.
MET-4	10 CFR 51.45(d)	Please provide a knowledgeable person(s) to discuss air permits associated with building activities.
MET-5	10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss currently available design details of the cooling tower(s) including its location.
MET-6	10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss quantified greenhouse gas emissions, criteria air pollutant emissions, and vehicle and truck shipments associated with quarry operations.
<b>Geology (SEIS Section 3.3)</b>		
GEO-1	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss new geotechnical borings that confirm karst settings.
<b>Hydrology – Surface Water (SEIS Section 3.4)</b>		
SW-1	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss updated reservoir surface elevation, bathymetric mapping, surface water delineation (e.g., dimensions) and functional assessment, drainage areas, and slope profiles in the affected environment section.
SW-2	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss updated hydrologic alterations to onsite and offsite streams, ponds, and WWCs (either temporary or permanent) during construction.
SW-3	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss floodplain encroachment and construction practices to adhere to Executive Order 11988.
SW-4	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss water quality effects of plant effluents including explanation of figures showing normal and maximum flow rate of the blowdown stream from cooling water systems to the Reservoir.
<b>Hydrology – Groundwater (SEIS Section 3.4)</b>		
GW-1	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the potential onsite quarry, specifically the construction extent and method, groundwater levels in the vicinity of the quarry (new monitoring and updated water quality data), anticipated rate of dewatering for construction and operation, and whether the pit will become an onsite reservoir.

Information Need ID	Regulatory Basis	Information Needed
GW-2	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the closure and abandonment of wells.
<b>Aquatic Ecology (SEIS Section 3.5)</b>		
AE-1	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the 2022 and 2023 aquatic biota surveys that Tennessee Valley Authority (TVA) conducted.
AE-2	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss STR09 (where/which water body it is), Grassy Creek, and other streams in the 161-kV transmission line corridor.
AE-3	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the new information that was identified for aquatic ecology in the Watts Bar Reservoir.
AE-4	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss habitat descriptions and/or surveys for the new streams identified in the new 161 kHz transmission ROW (STR09, STR17).
AE-5	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss TVA's streamside management zone provisions to reduce impacts to the surrounding areas.
<b>Terrestrial Ecology (SEIS Section 3.6)</b>		
TE-1	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss pertinent communications with TDEC regarding the State status of affected wetlands, including those in the proposed right-of-way (ROW) for the new 161-kV transmission line and the proposed mitigation plan for jurisdictional wetlands.
TE-2	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the habitat conversions from forested to scrub/shrub or herbaceous.
TE-3	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the vegetation management practices and the differences if the Sherwood injunction stands versus if the injunction is lifted.
TE-4	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the sustainability measures to be implemented including pollinator habitats and land management practices.
TE-5	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the chemical components added to the cooling water (particularly the sulfuric acid).
TE-6	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the basis that no habitat for the white fringeless orchid and Virginia spiraea have been observed onsite or in the proposed 161-kV transmission line ROW during the vegetation surveys.



Information Need ID	Regulatory Basis	Information Needed
TE-7	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the locations of the mist nest surveys and the gray bat and tricolored bat capture locations.
<b>Historical and Cultural Resources (SEIS Section 3.7)</b>		
HC-1	36 CFR 800.4, 36 CFR 800.5	Please provide a knowledgeable person(s) to discuss when the updated design schedule for the interchange area at TN-58 and Bear Creek Road and Barge Traffic Area (BTA) areas will be finalized, including a description of construction activities within the Clinch River at the BTA. This information is required to understand potential effects to historic properties and impacts to historic and cultural resources for the proposed project. This information is needed per 36 CFR 800.4 and 36 CFR 800.5 for identifying the area of potential effects and assessing potential effects.
HC-2	36 CFR 800.4, 36 CFR 800.5	Please provide a knowledgeable person(s) to discuss the permit and National Historic Preservation Act (NHPA) Section 106 compliance status of the offsite borrow pit and how it relates to the scope of the project. ER Section 4.5.2 states that the offsite borrow area is not included in the CRN-1 project scope, however ER Section 2.2.2 indicates that the offsite borrow area is included in the bounding analysis for this project. This information is needed per 36 CFR 800.4 and 36 CFR 800.5 for identifying the area of potential effects and assessing potential effects.
HC-3	36 CFR 800.4, 36 CFR 800.5	Please provide a knowledgeable person(s) to explain DOE's role and responsibilities for NHPA Section 106 compliance on their property, specifically for the building of the 161-kV transmission line. This information is needed per 36 CFR 800.4 and 36 CFR 800.5 for identifying the area of potential effects and assessing potential effects.
HC-4	36 CFR 800.4, 36 CFR 800.5	Please provide a knowledgeable person(s) to discuss the location of a future ISFSI and expected temporary and/or permanent disturbance. ER Section 3.2.4.1.3 describes the future need for an ISFSI but does not indicate a specific location on the site layout map (ER Figure 2.1-2). This information is needed per 36 CFR 800.4 and 36 CFR 800.5 for identifying the area of potential effects and assessing potential effects.
HC-5	36 CFR 800.2	Please provide a knowledgeable person(s) to discuss which Indian Tribes TVA will consult with if there are potential adverse effects to 40RE232 and 40RE233, resulting from the planned construction of the

Information Need ID	Regulatory Basis	Information Needed
		interchange at TN-58 and Bear Creek Road. This information is needed per 36 CFR 800.2 to identify consulting parties as part of the Section 106 process.
HC-6	36 CFR 800.4, 36 CFR 800.5	Please provide a knowledgeable person(s) to discuss whether any archaeological maps and figures, including the potential for deeply buried deposits, have been updated or modified from TVA's 2016 programmatic agreement. This information is needed per 36 CFR 800.4 and 36 CFR 800.5 for identifying the area of potential effects and assessing potential effects.
<b>Socioeconomics (SEIS Section 3.8)</b>		
SOC-1	10 CFR 51.45(c)	Please provide a knowledgeable person(s) to discuss the estimates of TVA's payments in lieu of taxes during construction and operation.
SOC-2	10 CFR 51.45(c)	Please provide a knowledgeable person (s) to discuss the traffic study.
SOC-3	10 CFR 51.45(c)	Please provide a knowledgeable person (s) to discuss the overnight capital cost and other costs for the construction and operation of the CRN-1.
<b>Human Health – Non-Radiological (SEIS Section 3.11)</b>		
NRH-1	10 CFR 51.50(c)(1)(iii)	Please provide a knowledgeable person(s) to discuss blasting frequency for the optional onsite quarry and the approximate construction time for the quarry.
NRH-2	10 CFR 51.50(c)(1)(iii)	Please provide a knowledgeable person(s) to discuss the location of the nearest sensitive noise receptor from the cooling towers and the nearest publicly accessible area from the cooling tower.
<b>Accidents (SEIS Section 3.15)</b>		
ACC-1	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the 8.75 percent higher power level and the preliminary Probabilistic Safety Assessment results discussed in Preliminary Safety Analysis Report (PSAR) sections 15.6 and 15.7. Be able to discuss how this compares to the severe accident evaluation discussed in the ESP final environmental impact statement (FEIS).
ACC-2	10 CFR 51.50(c)(1), 10 CFR 51.92(e)	Please provide a knowledgeable person(s) to discuss the design basis accident (DBA) analysis and results discussed in PSAR section 15.5. Be able to discuss how this compares to the BDA analysis in the ESP FEIS. Specifically, the differences in X/Qs and resulting doses.
<b>Alternatives (Chapter 4)</b>		

Information Need ID	Regulatory Basis	Information Needed
ALT-1	10 CFR 51.45(b)	Please provide a knowledgeable person(s) to discuss the alternative plant systems including heat dissipation systems, circulating water systems, discharge designs and alternative water sources, water treatment, and other system alternatives.
ALT-2	10 CFR 51.45(b), 40 CFR 230	Please provide a knowledgeable person(s) to discuss alternatives to impacts to waters of the U.S., including in the 161-kV transmission line corridor and the barge and traffic area.
<b>Cost-Benefit (Chapter 4)</b>		
CB-1	10 CFR 51.45(c)	Please provide a knowledgeable person(s) to discuss annual labor income estimates for construction, operational and outage workforce.

### TVA CRN Site CP Application Environmental Audit Sessions for Week 1

<b>Audit Sessions Anticipated</b>	<b>PNNL and NRC staff to attend</b>	<b>Information Needs to Be Covered</b>
Introductory Meeting (Audit Kickoff)	All audit participants	N/A
General/ New and Significant Process	Rajiv Prasad/Kim Leigh; Madelyn Nagel	GEN-1, GEN-2, NS-1, NS-2
Historic and Cultural Resources	Cyler Conrad; Jennifer Davis	HC-1 – HC-6
Non-radiological Human Health	Kim Leigh; Donald Palmrose	NRH-1 and NRH-2
Postulated Accidents	Jon Napier/Josh Hargraves; Donald Palmrose	ACC-1 and ACC-2
Air Quality	Saikat Ghosh; Nancy Martinez	MET-1 – MET-6
Geology	Rebecka Iveson/Phil Meyer; Gerry Stirewalt	GEO-1
Socioeconomics	Lin Zeng; Caroline Hsu/Jeff Rikhoff	SOC-1 – SOC-3
Cost-Benefit	Lin Zeng; Caroline Hsu/Jeff Rikhoff	CB-1

### TVA CRN Site CP Application Environmental Audit Sessions for Week 2

<b>Audit Sessions Anticipated</b>	<b>PNNL and NRC staff to attend</b>	<b>Information Needs to Be Covered</b>
Site Layout and Plant Structures	Kazi Tamaddun; Madelyn Nagel	SL-1 – SL-4
Hydrology – Surface Water	Kazi Tamaddun; Brian Glowacki	SW-1 – SW-4
Hydrology – Groundwater	Rebecka Iveson/Phil Meyer; Gerry Stirewalt	GW-1 and GW-2
Aquatic Ecology	Caitlin Wessel/Ann Miracle; Peyton Doub	AE-1 – AE-5
Terrestrial Ecology	Dana Vesty/Ann Miracle; Peyton Doub	TE-1 – TE-7
Land Use and Visual	Dana Vesty; Caroline Hsu/Jeff Rikhoff	LU-1 – LU-5
Land Use/Terrestrial Ecology	Dana Vesty; Peyton Doub/Caroline Hsu	LUTE-1
Alternatives	Kazi Tamaddun; Brian Glowacki	ALT-1 and ALT-2