**Document Type:** SEIS-Administrative Record
**Index Field:** Final Supplemental Environmental Impact Statement
**Project Name:** Continued Operation of the Kingston Fossil Plant
**Project Number:** 2021-14

# CONTINUED OPERATION OF THE KINGSTON FOSSIL PLANT FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

## ROANE COUNTY, TENNESSEE

***SEIS-455-00-000-1759311380***

**Prepared by:**
TENNESSEE VALLEY AUTHORITY
Knoxville, Tennessee

February 2026

To request further information, contact:
Elizabeth Smith
NEPA Compliance
Tennessee Valley Authority
400 West Summit Hill Drive, WT 11B
Knoxville, TN 37902
Email: nepa@tva.gov

# SUMMARY

## Introduction

The Tennessee Valley Authority (TVA) prepared this Supplemental Environmental Impact Statement (SEIS) to assess the environmental impacts associated with the proposed alternative to continue operation of Kingston Fossil Plant's (KIF) nine coal-fired units past 2027 along with construction and operation of the Kingston Gas Plant (KIG) and the 100-megawatt (MW) lithium-ion battery energy storage system (BESS). The proposed alternative allows for use of an existing asset to ensure reliable service to TVA customers at the lowest feasible cost to meet growing demand.

KIF is located on the Kingston Reservation in Harriman, Roane County, Tennessee, approximately 35 miles west of downtown Knoxville. The KIF Plant is situated on a 2,254-acre plot of land (i.e., Expanded Kingston Property), which includes additional property purchased by TVA after 2008 and the 1,255-acre reservation (Kingston Reservation). The Kingston Reservation includes KIF and is situated on a peninsula formed by the confluence of the Clinch and Emory Rivers. The KIF Plant was originally constructed between 1951 and 1955 and consists of nine coal-fired, steam-generating units. The KIG is being constructed within the Kingston Reservation as analyzed in the 2024 KIF Retirement Final Environmental Impact Statement (FEIS).

As detailed in TVA's April 2024 Record of Decision (ROD) for the FEIS, TVA's preferred alternative, Alternative A, involves the retirement of KIF, decommissioning and demolition of KIF's nine coal-fired units, and the construction and operation of an energy complex that includes a single natural gas–fired combined cycle (CC) plant, 16 dual-fuel aeroderivative combustion turbines (aero CTs) with a new switchyard (hereafter the "CC/aero CT Plant"), approximately 122 miles of new natural gas pipeline and associated gas system infrastructure, a 3- to 4-MW solar site, a 100-MW lithium-ion BESS, and new transmission line infrastructure.

Since the ROD was issued, TVA has proceeded with construction of KIG, which is not complete, and the gas units are not in operation. The coal units currently continue to operate and are not retired. The FEIS considered the continued operation of the coal units (as the No Action Alternative) and the construction and operation of a CC/aero CT Gas Plant and energy complex (as Alternative A). The FEIS did not analyze the continued operation of KIF together with operation of KIG.

## Purpose and Need for Action

After a decade of flat electricity demand, the TVA region is experiencing rapidly increasing demand for electricity beyond the growth expected when the KIF retirement and replacement decision was made. Accelerated electricity demand growth is being driven by growth in data center use, population, and employment, and increasing electricity demand. In addition to load growth, delays in planned resource additions have increased pressure to meet demand with all available assets. TVA requires firm,

dispatchable power to reliably meet system demands and planning reserve margin targets. Despite a variety of efforts and projects across the TVA Power Service Area, more generating capacity is needed to meet demand, prompting the consideration of continuing coal operations.

The purpose of the proposed alternative is to meet the increasing demand for electricity in alignment with TVA's 2019 Integrated Resource Plan (IRP). The 2019 IRP considers customer priorities around power cost and reliability across different futures. The document identified a set of near-term actions, including performing an evaluation of planned retirement dates for aging fossil units to inform long-term planning. This near-term action was met by the 2021 Aging Coal Fleet Evaluation, which recommended coal fleet planned retirement dates to reduce economic, reliability, and environmental risks. However, since this study was completed in 2021, the Tennessee Valley region has experienced high population growth and industrial growth which, in TVA's experience and expertise, has led to increased electricity demand which will in turn require TVA to increase its generating capacity. Based on these reasons, TVA is considering continued operations of KIF to maintain a low-cost, reliable, and resilient electric system and comply with the TVA Act.

This SEIS tiers from the 2019 IRP Environmental Impact Statement (EIS) and supplements the FEIS, building on its findings with site-specific analyses for the generating resources under consideration.

## Alternatives

The KIF FEIS considered three alternatives. The No Action Alternative was to operate KIF with no additional or replacement generation. The action alternatives both considered the decommissioning and demolition of KIF with some form of replacement generation. Alternative A, the preferred alternative, considered construction of an energy complex including KIG, a 3- to 4-MW solar facility, and 100-MW BESS on the Kingston Reservation and construction of approximately 122 miles of new natural gas pipeline and associated gas system infrastructure. Alternative B considered construction and operation of solar and energy storage facilities across multiple locations. TVA identified Alternative A as the preferred alternative in the Draft EIS and FEIS. Alternative A was the best option to meet the project purpose and need to provide 1,500 MW of low-cost, reliable energy to TVA's power system, and it could be built and made operational sooner than Alternative B, thereby reducing economic, reliability, and environmental risks. TVA determined that Alternative B would not fully meet the project's purpose and need because it would not provide 1,500 MW of firm, dispatchable replacement generation and could not be constructed and operational prior to the proposed retirement and decommissioning of the nine KIF coal-fired units by the end of 2027.

Alternative C represents the proposed alternative being considered in this SEIS: the construction and operation of a CC/aero CT Gas Plant and BESS (described and analyzed in Alternative A) along with the continued operation of KIF. Deconstruction and decommissioning of KIF and the construction of a 3 to 4-MW Solar Facility on the

Kingston Reservation that were considered under Alternative A, would not occur under Alternative C.

This SEIS tiers from the FEIS and analyzes the issues pertinent to Alternative C. It evaluates continued operation of all nine coal-fired units in conjunction with the previously characterized and analyzed KIG and BESS. The following activities would support the continued operation of KIF under Alternative C at historic levels of reliability:

***KIF Powerhouse Interior Updates***
Repairs and maintenance to maintain historic levels of operation for existing equipment located within the KIF Powerhouse include:

- Turbine and generator maintenance and repair
- Boiler tube replacements
- Distributed control system upgrades
- Air preheater basket replacement
- Coal burner replacement
- Automatic voltage regulator replacement
- Main condenser retubes
- Other maintenance and repairs, as needed

***Facility Effluent Limitation Guidelines and Requirements***
As explained in Chapter 2 of the FEIS, construction would be required at KIF to comply with the U.S. Environmental Protection Agency (USEPA)'s Steam Electric Effluent Limitations Guidelines (ELGs). Continued operations of KIF under Alternative C require construction of a new high recycle bottom ash transport water (BATW) recirculation system and flue gas desulfurization (FGD) wastewater treatment. The BATW recirculation system would include installation of new equipment, integration with existing systems, and repairs to existing infrastructure. Construction for FGD wastewater treatment could include a combination of the following: equalization, pH adjustment, metal precipitation, clarification, solids dewatering, membrane treatment, and thermal crystallization.

All BATW recirculation system construction activities would occur within the existing KIF operations footprint in a previously developed area adjacent to the existing bottom ash dewatering area. Construction and operation of the existing bottom ash dewatering (BADW) system was previously evaluated in 2016 in TVA's KIF Bottom Ash Dewatering Facility Environmental Assessment and 2023 Determination of National Environmental Policy Act (NEPA) Adequacy. The USEPA has communicated that it is currently reevaluating the 2024 ELG rule. Operation beyond 2034 may require additional controls and additional NEPA review, as appropriate.

### *Transmission and Electrical System Components*

TVA must modify two existing switchyards and reconfigure area 161-kilovolt lines to continue KIF operations. Any activities associated with transmission upgrades would occur within existing TVA facilities or corridors. Off-site transmission upgrades may be required, such as buswork, breaker replacements, and associated equipment for communication and protection purposes, reconductoring of existing transmission lines, and switch replacements. These activities, if necessary, would occur within existing TVA facilities and/or corridors and would be addressed as necessary under separate environmental reviews.

### *Water Intake Upgrades*

Continued operation of KIF would require a revised approach to achieve compliance with Section 316(b) of the Clean Water Act. This would require the evaluation and selection of one of the following compliance options to reduce impacts to fish and other aquatic life from the cooling water intake structure. The options currently under consideration for KIF include those identified at 40 Code of Federal Regulations (CFR) 125.94(c)(3), (5), (6), and (7). These options would be evaluated based on their technical feasibility, alignment with operational requirements, risk tolerance, and compatibility with permitting and implementation schedules. The water intake upgrade options include implementing: 1) a through-screen velocity of 0.5 feet per second, 2) modified traveling screens, 3) a combined system of technologies, operational measures, and management practices representing best technology available, or 4) impingement mortality performance standards.

### *Coal Combustion Residuals Management*

Continued operation of KIF would result in production of additional coal combustion residuals (CCR). The ash and gypsum products would be stored in the existing KIF landfill. Brine salts would also result from the continued operation of KIF. These salts could be stored in a separate cell within the existing landfill to prevent commingling, which would render CCR materials unsuitable for beneficial use, or they could be disposed of in an existing, permitted off-site landfill.

## Tiered Analysis

The scope of analysis for this SEIS includes activities proposed under Alternative C that were not previously analyzed in the FEIS, including those supporting continued operation of KIF. Information presented in this SEIS comes from the FEIS and updates the affected environment and related impact analyses associated with SEIS Alternative C.

TVA evaluated whether there was any new information relevant to the assessment of potential impacts of continued operation of KIF that differ from those activities considered in the FEIS. Through this process, TVA determined that several resource sections are fully bounded by the analyses, control measures, and commitments included in the FEIS. Either the information and the related impact analyses for the resource are unchanged or the impacts of any new information were effectively the same as that described for the FEIS.

## Summary of Environmental Impacts Associated with the Proposed Alternative

The anticipated environmental impacts of Alternative C are described in detail in the SEIS and summarized in Table 2-1. Table 2-1 also includes a summary of effects from the FEIS selected alternative, Alternative A, and the No Action Alternative.

Minor adverse impacts to geology, soils, recreation, land use, noise, cultural, visual, and safety under Alternative C would not be notably different than those associated with activities under the FEIS alternatives and discussion of those resources are incorporated by reference in the SEIS.

Activities to support continued operation of KIF under Alternative C would result in minor and temporary effects that were determined to require additional analysis in the SEIS for the following resources: floodplains, groundwater, surface water, water quality, air quality, vegetation, wildlife, aquatic life and utilities. However, impacts from these activities on these resources would be temporary and minor. Alternative C would result in moderate temporary impacts to transportation. A temporary minor benefit to socioeconomics during construction activities would result, consistent with the impact findings for Alternative A in the FEIS.

Alternative C would result in minor adverse operational impacts to groundwater, surface water, water quality, wetlands, wildlife and solid and hazardous wastes. Nominal increases in effluent flows would occur under Alternative C compared to the FEIS No Action Alternative. The operation of KIF and KIG would adhere to National Pollutant Discharge Elimination System (NPDES) requirements and other relevant regulations; effects from continued operation of KIF, in conjunction with KIG, to surface water, water quality, wetlands, and groundwater would be minor. Long-term benefits would occur for utilities from added generation capacity. Water intake improvements would result in long-term benefits to aquatic life, relative to existing conditions, by reducing the risk of impingement and entrainment.

With the continued operation of KIF in conjunction with the operation of KIG under Alternative C, the net decrease of regulated pollutants considered in the FEIS would not occur. Prevention of Significant Deterioration (PSD) review for KIG was not required due to this net decrease. TVA is currently in the early stages of preparing a PSD permit application, tentatively targeted for submittal as early as May 2026.

Through completion and submittal of the PSD permit application, TVA would demonstrate compliance with all required elements of the PSD process, including protection of ambient air quality and compliance with National Ambient Air Quality Standards (NAAQS) primary standards. As required by the Clean Air Act (40 CFR part 50), NAAQS are developed to protect human health, including the health of sensitive or at-risk groups, with an adequate margin of safety. Continued operation under Alternative C would not result in exceedances of primary NAAQS standards because TVA would comply with all applicable federal and state regulations stipulated in current and future permits, thereby ensuring protection of public health. Compliance with PSD permit requirements would be protective of ambient air quality and would ensure the

proposed project does not cause or contribute to NAAQS or PSD increment violations. Alternative C would negate the greenhouse gas (GHG) emission reduction from KIF retirement. Continued operation of KIF in conjunction with the operation of KIG under Alternative C represents an increase in future estimated GHG emissions, particularly in the context of its contribution to TVA's system-wide GHG emissions and Tennessee's GHG emissions.

Information about threatened and endangered terrestrial species and habitats has been updated since publication of the FEIS. Although the project boundaries include less than one acre (0.6 acre) of trees that have been identified as potentially suitable roosting habitat for tricolored bat (*Perimyotis subflavus*), proposed for listing as federally endangered, TVA would avoid direct impacts to trees, to the extent practicable. Based on lack of suitable roosting habitat for Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*), TVA has determined that Alternative C would have no effect on Indiana bat, northern long-eared bat, or gray bat (*Myotis grisescens*), all federally endangered, and is not likely to jeopardize the continued existence of the tricolored bat. This is further supported by negative detection results obtained during presence/absence surveys on the Kingston Reservation in accordance with U.S. Fish and Wildlife Service (USFWS) survey guidelines.

## Mitigation Measures

Means to avoid and minimize environmental harm were identified in the ROD for the FEIS, signed on April 2, 2024, and are incorporated herein by reference. TVA may apply additional project-specific best management practices (BMPs) as appropriate on a site-specific or technology-specific basis to enable efficient maintenance of construction projects and further reduce potential impacts on environmental resources. In addition, TVA would:

- Implement BMPs described in Section 2.3 of the FEIS and updated in Section 2.2 of the SEIS including those described in *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority*.
- Conduct additional floodplain review if modified traveling screens, a system of technologies, or impingement mortality performance standards are selected as the Clean Water Act Section 316(b) compliance option.
- Conduct additional floodplain review for all facilities, activities, or structures (including transmission and CCR) proposed below elevation 750.0.

## TVA's Preferred Alternative

TVA's preferred alternative is Alternative C – Continued Operations of the KIF Plant in Conjunction with the Construction and Operation of a CC/Aero CT Gas Plant and 100-MW BESS within the Kingston Reservation. Alternative C meets the purpose and need of the project to address the increasing demand for electricity in alignment with the 2019 IRP.

# Table of Contents

# List of Appendices

# List of Tables



# List of Figures

# Symbols, Acronyms, and Abbreviations

| Acronym | Description |
|---|---|
| µg/$m^3$ | micrograms per cubic meter |
| AADT | Annual Average Daily Traffic |
| Aero | Aeroderivative |
| Aero CT | Aeroderivative combustion turbines |
| ARAP | Aquatic Resources Alteration Permit |
| BACT | Best Available Control Technology |
| BADW | Bottom Ash Dewatering |
| BADW FEA | Bottom Ash Dewatering Facility Environmental Assessment |
| BATW | Bottom Ash Transport Water |
| BESS | Battery Energy Storage System |
| BMP | Best Management Practice |
| BTA | Best Technology Available |
| CAA | Clean Air Act |
| CC | Combined Cycle |
| CCR | Coal Combustion Residuals |
| CEQ | Council on Environmental Quality |
| CFR | Code of Federal Regulations |
| CGP | Construction General Permit |
| $CH_4$ | Methane |
| CO | Carbon Monoxide |
| $CO_2$ | Carbon Dioxide |
| $CO_2e$ | Carbon Dioxide Equivalent |
| CRL | Combustion Residual Leachate |
| CT | Combustion Turbine |
| CWA | Clean Water Act |
| CWIS | Cooling Water Intake Structure |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| ELG | Effluent Limit Guidelines |
| EO | Executive Order |
| FEIS | Final Environmental Impact Statement |

| Acronym | Description |
|---|---|
| FGD | Flue Gas Desulfurization |
| FSLG | TVA Flood Storage Loss Guideline |
| GDA | Gypsum Disposal Area |
| GHG | Greenhouse Gas |
| GWP | Global Warming Potential |
| HAP | Hazardous Air Pollutants |
| IPaC | Information for Planning and Consultation |
| IRP | Integrated Resource Plan |
| IWG | Interagency Working Group |
| KIF | Kingston Fossil Plant |
| KIG | Kingston Gas Plant |
| LCA | Life Cycle Analysis |
| MMBtu | Million British Thermal Units |
| MW | Megawatt |
| $N_2O$ | Nitrous Oxide |
| NAAQS | National Ambient Air Quality Standards |
| NEPA | National Environmental Policy Act |
| NOPP | Notice of Planned Participation |
| NOx | Nitrogen Oxides |
| NPDES | National Pollutant Discharge Elimination System |
| PCCC | Permanent Cessation of Coal Combustion |
| PEA | Programmatic Environmental Assessment |
| PM | Particulate Matter |
| $PM_{2.5}$ | Particulate Matter (Less than or equal to 2.5 microns wide) |
| PSA | Power Service Area |
| PSD | Prevention of Significant Deterioration |
| PVC | Polyvinyl Chloride |
| RFFA | Reasonably Foreseeable Future Actions |
| ROD | Record of Decision |
| ROW | Right-of-Way |
| SEIS | Supplemental Environmental Impact Statement |
| $SF_6$ | Sulfur Hexafluoride |
| SME | Subject Matter Expert |

| Acronym | Description |
|---|---|
| $SO_2$ | Sulfur Dioxide |
| SPCC | Spill Prevention Counter Measure and Control |
| SWPPP | Stormwater Pollution Prevention Plan |
| TDEC | Tennessee Department of Environment and Conservation |
| TDOT | Tennessee Department of Transportation |
| TMSP | Tennessee Stormwater Multi-Sector General NPDES Permit for Industrial Activities |
| TN | Tennessee |
| TVA | Tennessee Valley Authority |
| U.S. | United States |
| USC | U.S. Code |
| USCB | U.S. Census Bureau |
| USEIA | U.S. Energy Information Administration |
| USEPA | U.S. Environmental Protection Agency |
| USFWS | U.S. Fish and Wildlife Service |
| VIP | Voluntary Incentives Program |
| WWC | Wet Weather Conveyance |
| WWT | Wastewater Treatment |
| ZLD | Zero-Liquid Discharge |

# CHAPTER 1 – PURPOSE AND NEED FOR ACTION

In February 2024, the Tennessee Valley Authority (TVA) issued an environmental impact statement (EIS) evaluating the environmental effects of the retirement and demolition of Kingston Fossil Plant's (KIF) nine coal-fired units and the installation of at least 1,500 megawatts (MW) of replacement generation, paired with additional on-site solar and battery components, by the end of 2027 (TVA 2024a). As detailed in TVA's April 2024 Record of Decision (ROD), TVA's preferred alternative, Alternative A, involves the retirement of KIF, decommissioning and demolition of KIF's nine coal-fired units, and the construction and operation of an energy complex that includes a single natural gas-fired combined cycle (CC) plant, 16 dual-fuel aeroderivative combustion turbines (aero CTs) with a new switchyard, a 3- to 4-MW solar site, a 100-MW lithium-ion battery energy storage system (BESS), approximately 122 miles of new natural gas pipeline and associated gas system infrastructure, and new transmission line infrastructure. Construction at the Kingston Gas Plant (KIG) is ongoing and is anticipated to be completed in 2027. The BESS construction is anticipated to begin in 2027. Solar construction is not anticipated until closure of KIF, because the area proposed for solar is within the operating footprint. The nine KIF coal-fired units have not retired and are currently operating.

Because of the increase in power demand and associated reliability concerns that have affected the project's original purpose and need, TVA prepared this supplemental environmental impact statement (SEIS) to assess the environmental impacts associated with the proposed alternative to continue operation of KIF units past 2027 along with KIG and the BESS. The proposed alternative allows for use of an existing asset to ensure reliable service to TVA customers at the lowest feasible cost to meet this growing demand.

In accordance with the National Environmental Policy Act of 1969, as amended (NEPA) (42 US Code [USC] § 4321 et seq.), TVA's NEPA procedures (18 Code of Federal Regulations [CFR] Part 1318]), and Executive Order (EO) 14154 (Unleashing American Energy), TVA has prepared this SEIS to inform decision-makers, regulatory agencies, and the public of the potential environmental, cultural, and socioeconomic impacts of the proposed alternative and alternatives proposal. This SEIS also addresses requirements associated with relevant federal, state, and local regulations, including but not limited to Section 106 of the National Historic Preservation Act, Section 7 of the Endangered Species Act, and Sections 401 and 404 of the Clean Water Act (CWA).

KIF is located on the Kingston Reservation in Harriman, Roane County, Tennessee, approximately 35 miles west of downtown Knoxville (Figure 1-1). KIF is situated on a 2,254-acre plot of land (i.e., Expanded Kingston Property), which includes additional property purchased by TVA after 2008 and the 1,255-acre original plant site (Kingston Reservation), which is situated on a peninsula formed by the confluence of the Clinch and Emory Rivers. The KIF Plant was originally constructed between 1951 and 1955 and consists of nine coal-fired, steam-generating units. KIF has a summer net generating capacity of 1,298 MW; this capacity is less than the 1,398 MW reported for

2020 because of long-term fuel blend changes at KIF. The KIG is being constructed within the Kingston Reservation as analyzed in the 2024 KIF Retirement EIS.

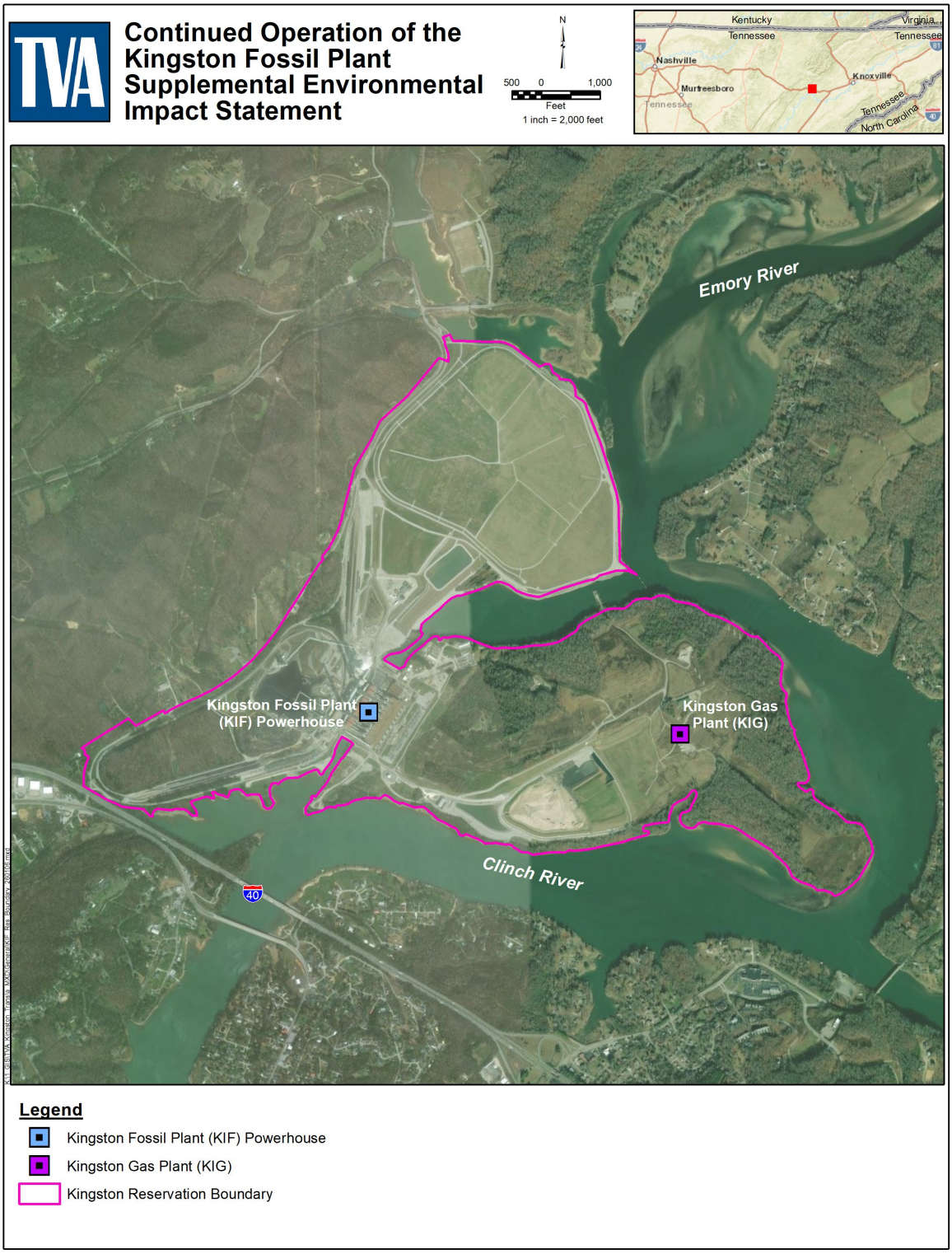


**Figure 1-1. Map of Kingston Reservation**

## 1.1 Purpose and Need

After a decade of flat electricity demand, the TVA region is experiencing rapidly increasing demand for electricity beyond the growth expected when the Kingston retirement and replacement decision was made. Accelerated growth in electricity demand is being driven by growth in data center use, population and employment, and increasing electricity demand. In addition to load growth, delays in planned resource additions have increased pressure to meet demand with all available assets.

TVA requires firm, dispatchable power to reliably meet system demands and planning reserve margin targets. Firm, dispatchable power refers to a generating resource that can adjust power output up or down on demand within the specific operating limitations of that resource. It ensures that TVA can call on the generating capacity year-round, particularly during peak load events—those periods of maximum electricity demand from customers, typically late afternoon in the summer and before or around dawn in the winter.

To address the overall need for more generating capacity, TVA is engaging in the following:

- Investing in the existing natural gas fleet and in additional gas capacity.
- Implementing new demand-side programs.
- Exploring new nuclear opportunities and pursuing license extension for operational nuclear units.
- Maintaining reliability with past investments in coal-fired units.
- Securing market capacity and related on- and off-system resources.

Despite these efforts, more generating capacity is still needed to meet demand, which has prompted consideration of continuing coal operations.

Investing in TVA's existing fleet would allow TVA to safeguard against reliability risks that may come with purchasing power from the market. Market capacity may be limited or unavailable as neighboring electric utility companies are experiencing similar issues (e.g., load growth, need for capacity, etc.). Relying on purchased power can adversely affect TVA's ability to meet required year-round generation, maximum capacity system demands and planning reserve margin targets. Investing in the material condition of the existing coal fleet would help close the capacity gap.

The purpose of the proposed alternative is to meet the increasing demand for electricity in alignment with the 2019 Integrated Resource Plan (IRP) (TVA 2019a). The 2019 IRP considers customer priorities around power cost and reliability across a set of different futures. The document identified a set of near-term actions including conducting an evaluation of planned retirement dates for aging fossil units to inform long-term planning. This near-term action was met by the 2021 Aging Coal Fleet Evaluation, which recommended coal fleet planned retirement dates to reduce economic, reliability, and environmental risks. However, since this study was completed in 2021, the

Tennessee Valley region has experienced high population growth and industrial growth, which, in TVA's experience and expertise, has led to increased and increasing electricity demand. Based on this, and for the reasons discussed above, TVA is considering continued operations of KIF to maintain a low-cost, reliable, and resilient electric system and comply with the TVA Act.

This SEIS tiers from the 2019 IRP EIS (TVA 2019b) and supplements the 2024 Kingston Fossil Plant Retirement Final Environmental Impact Statement (referred to throughout this document as the "FEIS" or the "KIF FEIS") and builds on its findings with site-specific analyses for the generating resources under consideration. The IRP is discussed in the KIF FEIS Section 1.1, and that discussion is incorporated by reference in this SEIS. Additional background information that informs the purpose and need for the proposed alternative is provided in the following sections.

### 1.1.1 Least Cost Planning and the TVA Act

TVA's core statutory objectives under the TVA Act are to provide the people of the Tennessee Valley with low-cost and reliable electricity, environmental stewardship, and a prosperous economy (16 USC §§ 831 et seq.). Consistent with, and as mandated by the Energy Policy Act of 1992, TVA engages in a long-range, "least-cost planning" process that "evaluates the full range of existing and incremental resources (including new power supplies, energy conservation and efficiency, and renewable energy resources) to provide adequate and reliable service to electric customers of [TVA] at the lowest system cost" (16 U.S.C. § 831m-1(b)(1)). TVA engages in the "least-cost planning" process through development of the IRP.

### 1.1.2 Growth in the Tennessee Valley and the TVA Power Service Area

In 1950, about 2 percent of the energy used in the United States (U.S.) was delivered in the form of electricity. Today, this number has increased to approximately 22 percent and continues to grow (TVA 2023). During the decade before the 2020 COVID pandemic, TVA's seven-state region saw almost no electric load growth. In the years since the COVID pandemic, the region has experienced tremendous and unexpected economic growth, driven in part by a post-pandemic migration into TVA's Power Service Area (PSA) by new residents, businesses, and major industries. The full-time work-from-home culture born from the COVID pandemic triggered large waves of migration across the country, with southern states comprising the fastest-growing region in the nation (Business Insider 2024).

A comparison of U.S. Census Bureau (USCB) population statistics (USCB 2025) for the counties in TVA's PSA to population statistics for all U.S. counties combined was done for the period from July 1, 2021, through July 1, 2024. During this period, the population of TVA's PSA grew to over an estimated 10.9 million people and had a 1.1 percent average annual growth rate, which was 1.4 times the U.S. population growth rate. The rate of population growth in TVA's PSA increased by more than 1 percent in each of the three years, whereas the forecasted national growth rate for these same three years was under 1 percent each year (USCB 2025).

Until October 1, 2023, when a base rate increase was put into effect, TVA's base power rates had remained relatively flat during the past four years while significant investments were made in TVA's power system. Over the last 10 years, TVA has invested $25 billion in existing and new generation. In addition, TVA is working to offset approximately 30 percent of forecasted new load growth in the next 10 years through energy efficiency and demand response programs. TVA anticipates investing $1.5 billion in fiscal years 2023–2027 in energy efficiency and demand response programs to accomplish this, continuing to help lower energy bills (TVA 2023). TVA is focused on meeting growing electricity demand while maintaining energy security, reliability, and affordability.

TVA continuously monitors a variety of market signals to inform its planning, including forecasts for loads, commodities, and resource costs. Higher demand expectations for residential and support services, such as data centers, are driven by an observed shift in interstate migration patterns into the Tennessee Valley that is expected to continue.

## 1.2 Decision to Be Made

The decision TVA must make is whether to proceed with the currently planned retirement, decommissioning, and demolition of KIF coal units based on the 2021 Aging Coal Fleet Evaluation or to continue operation of the KIF units beyond the retirement dates indicated in the KIF Retirement EIS in conjunction with the construction and operation of KIG and the BESS, to reflect current conditions. This SEIS has been prepared to inform TVA decision-makers, regulatory agencies, and the public about the environmental consequences of the proposed alternative.

## 1.3 Related Environmental Reviews

Related environmental documents and materials relevant to this assessment are listed below. The contents of the following documents help describe the affected properties and are incorporated by reference as appropriate:

- **Groundwater Corrective Action Final Programmatic Environmental Assessment (2025):** This Programmatic Environmental Assessment (PEA) (TVA 2025a) programmatically assesses the effects of groundwater corrective actions implemented to address exceedances of groundwater protection standards at one or more coal plants. As part of this programmatic assessment, TVA developed new guidance, including an Environmental Screening Checklist and a bounding analysis, that complies with NEPA's procedural requirements, up to and including potential site-specific considerations of groundwater corrective actions at one or more of these coal plants, including KIF.

- **Kingston Fossil Plant Retirement Final EIS (April 2024):** This EIS evaluated the retirement of the nine coal-fired units at Kingston Fossil Plant and replacement generation including installation of a CC/aero CT Plant, BESS, solar facility, and associated transmission upgrades (TVA 2024a).

- **TVA Aging Coal Fleet Evaluation (May 2021):** This evaluation was performed to recommend near-term retirement planning assumptions to reflect practical

timelines for replacement generation. The first draft of the evaluation was completed during the 2020 fiscal year, with refinements made in May 2021.

- **Kingston Fossil Plant Borrow Site #3 Environmental Assessment (January 2020):** This Environmental Assessment (EA) evaluated the proposed construction of a new borrow site (Borrow Site No. 3) in response to landfill project phasing indicating that soil types in Borrow Site No. 3 may have been needed to supplement the soil types available in other borrow sites. This would support routine operations as well as upcoming construction projects (TVA 2020).

- **TVA Integrated Resources Plan and EIS (July 2019):** The 2019 IRP programmatic EIS (TVA 2019b) evaluated the potential effects of TVA's long-term IRP, which provides direction on how TVA can best meet future electricity demand. The 2019 IRP evaluated six scenarios (plausible futures) and five strategies (potential TVA responses to those futures) and identified a range of potential resource additions and retirements throughout the TVA PSA. The 2019 IRP remains valid and guides future generation planning consistent with least-cost planning procedures.

- **Kingston Fossil Plant Landfill Expansion Supplemental EA (August 2019):** This EA evaluated the proposed expansion of the boundary for the on-site landfill at KIF. The proposed expansion included additional acreage for a new laydown area, stormwater management, new clay soil borrow sites, and the development of haul roads. The EA proposed action was needed so TVA could adequately and effectively construct the second phase of the landfill (TVA 2019c).

- **Kingston Bottom Ash Dewatering Facility Final EA (March 2016):** This EA evaluated the proposed design of a dewatering facility for the conversion of wet bottom ash generated at KIF to a dry coal combustion residuals (CCR) product in accordance with TVA's recommendation to convert the wet bottom ash management system at KIF to a dry storage system (TVA 2016a).

- **Fossil Plant Ash Impoundment Closure EIS (June 2016):** This programmatic EIS evaluated the closure of ash impoundments containing CCR at fossil fuel plants across the Tennessee Valley to support the implementation of TVA's goal to eliminate all wet CCR storage at its coal plants (TVA 2016b).

- **Installation of Flue Gas Desulfurization System on Kingston Fossil Plant, Roane County, TN Final EA (April 2006):** This EA evaluated a proposal to reduce sulfur dioxide ($SO_2$) emissions at KIF by installing flue gas desulfurization equipment that employs the wet limestone forced oxidation technology in response to the 1990 Clean Air Act (CAA) requirements (TVA 2006).

- **Kingston Fossil Plant Alternative Coal Receiving Systems New Rail Spur Construction Near the Cities of Kingston and Harriman, Roane County, TN (April 1999):** This EIS evaluated the elimination of two heavily used railroad-

highway intersections that receive coal deliveries via the existing rail line with minor upgrades. In addition, this EIS evaluated the construction of a new high-speed coal unloading/loading system in its existing coal yard at KIF (TVA 1999).

## 1.4 Scope of the Environmental Review

NEPA requires federal agencies to consider the environmental effects of their proposed actions in their decision-making. Actions, in this context, include new and continuing activities that are conducted, financed, assisted, regulated, or approved by federal agencies. The NEPA review process is intended to ensure federal agencies consider the environmental effects of their actions in the decision-making process (NEPA; 42 USC § 4321 et seq.).

Based on review of activities associated with the proposed Alternative C, TVA has reviewed the analysis presented in the KIF FEIS for the following resources and determined there would be no new impacts. That analysis is incorporated herein by reference and therefore these resources do not warrant further discussion in this SEIS:

- Physical Characteristics (including geology, soils, and prime farmland)
- Natural Areas, Parks, and Recreation
- Land Use
- Cultural Resources
- Safety
- Noise
- Visual Resources

This SEIS discusses potential impacts to floodplains, water resources, air quality, greenhouse gas (GHG) emissions, climate change, biological resources including threatened and endangered species, transportation, utilities, solid and hazardous waste, utilities, and socioeconomics.

## 1.5 Scoping and Public Involvement

Section 1.6 of the KIF FEIS describes scoping and public involvement to date and is incorporated herein by reference. In accordance with TVA's NEPA regulations §1318.401, during the development of the SEIS, TVA obtained comments from the U.S. Environmental Protection Agency (USEPA). Substantive comments were addressed in the SEIS, and the comments are summarized in Appendix B.

## 1.6 Necessary Permits, Licenses, and Consultations

TVA holds the permits necessary for the current operation of KIF. TVA would obtain all necessary permits or permit modifications, licenses, and approvals required for the selected alternative. Necessary permits would be evaluated based on site-specific conditions. Permits or consultation requirements relevant to the proposed alternative are identified in subsequent sections.

To implement the proposed alternative, TVA would maintain, obtain, or seek modifications to the following permits that are already in place at KIF:

- Tennessee Stormwater Multi-Sector General Permit for Industrial Activities – TNR051787
- Solid Waste Class II Disposal Permits: Peninsula Gypsum Disposal Area (Tennessee Department of Environment and Conservation [TDEC]: IDL 73-0211)
- National Pollutant Discharge Elimination System (NPDES) permit – TN0005452
- KIF Operating Permit (Title V) - 572149
- Permit To Construct/Modify Air Contaminant Source(s) – 981915KIF
- Kingston Phase II PDA CCR Landfill Construction – TNR191877
- Tennessee Construction Stormwater General Permit coverage for all qualifying construction activities – TNR10000
- KIF Special Waste Permits

# CHAPTER 2 – ALTERNATIVES

This SEIS supplements the KIF Retirement FEIS (TVA 2024a), which analyzed the retirement of KIF and a range of alternatives for replacement generation. In the KIF FEIS, three alternatives were evaluated. The No Action Alternative evaluated the continuing operation of KIF. Both action alternatives considered the decommissioning and demolition of KIF together with replacement generation. Alternative A, the preferred alternative in the KIF FEIS, considered construction of an energy complex including KIG, a 3- to 4-MW solar facility, and 100-MW BESS on the Kingston Reservation, and construction of approximately 122 miles of natural gas pipeline and associated gas system infrastructure. Alternative B considered construction and operation of solar and energy storage facilities. TVA issued a ROD in April 2024, documenting the adoption of Alternative A and has since proceeded with construction of KIG, which is not complete, and the gas units are not in operation. The coal units currently continue to operate and are not retired.

The FEIS considered the continued operation of the coal units (as the No Action Alternative) and the construction and operation of a CC/aero CT Gas Plant and energy complex (as Alternative A). The FEIS did not analyze the continued operation of KIF together with operation of KIG.

Alternative C represents the proposed alternative being considered in this SEIS: the continued operation of KIF along with construction and operation of a CC/aero CT Gas Plant and BESS (described and analyzed in Alternative A).

## 2.1 Description of Alternatives

### 2.1.1 Alternatives Considered in the Retirement EIS

The No Action Alternative and Alternative A were previously analyzed in the KIF Retirement EIS. This document supplements that analysis with a new Alternative C. All associated analysis of the alternatives previously studied is incorporated herein by reference. Therefore, these alternatives will not be discussed in significant detail in this SEIS.

### 2.1.2 Alternative C: Continued Operations of the KIF Plant in Conjunction with Construction and Operation of a CC/Aero CT Gas Plant and 100-MW BESS within the Kingston Reservation

Under Alternative C (proposed alternative), TVA would continue to operate all nine coal-fired units in conjunction with the previously characterized and analyzed KIG and BESS. The construction and operation of KIG was fully analyzed in the FEIS and is not reanalyzed here. The following activities would support the continued operation of KIF under Alternative C at historic levels of reliability.

#### 2.1.2.1 KIF Powerhouse Interior Updates

Repairs and maintenance to maintain historic levels of operation for existing equipment located within the KIF Powerhouse include:

- Turbine and generator maintenance and repair
- Boiler tube replacements
- Distributed control system upgrades
- Air preheater basket replacement
- Coal burner replacement
- Automatic voltage regulator replacement
- Main condenser retubes
- Other maintenance and repairs, as needed

#### 2.1.2.2 Facility Effluent Limitation Guidelines and Requirements

As explained in Chapter 2 of the FEIS, construction at KIF would be required to comply with the USEPA CCR Rule and Steam Electric Effluent Limit Guidelines (ELGs). Before the decision to retire the KIF fossil units was made in 2024, partial upgrades were successfully completed to bring KIF into compliance with the 2015 ELGs via a phased approach. These upgrades included the addition of the bottom ash dewatering system (BADW), which separates the bottom ash solids from the liquid waste stream. The ELG rules provide for certain compliance options, known as subcategories, and allow for certain transfers between subcategories. TVA previously submitted a Notice of Planned Participation (NOPP) to TDEC on October 6, 2021, to preserve the option of KIF participating in the retirement subcategory of permanent cessation of coal combustion (PCCC) by 2028. Under current regulations, continued operations of KIF beyond 2028 would require transfer from the 2028 PCCC subcategory. For KIF to continue to generate beyond 2028 and be in compliance with ELG regulations, TVA must install additional flue gas desulfurization (FGD) wastewater and bottom ash transport water (BATW) recirculation system.

After publication of the FEIS, the USEPA finalized the 2024 ELG rule, which established more stringent discharge standards for FGD wastewater, BATW, and combustion residual leachate. The rule also established new effluent limitations for various legacy wastewaters, which may be present in surface impoundments. The 2024 ELG rule created a new subcategory for coal-fired units that permanently cease coal combustion by 2034. Units in this new subcategory are required to meet the 2020 rule requirements for FGD wastewater and BATW. USEPA has published a supplement to the 2024 ELG rule in December 2025 that extends specific compliance and NOPP deadlines and grants state permitting authorities additional flexibility to extend deadlines based on demand, reliability, and supply chain concerns.

Transfer into the 2034 PCCC subcategory for BATW could be achieved, with permitting authority regulatory approval, through construction of a new high recycle recirculation system. Construction would include new fencing around the BADW, new recirculation pumps, new medium voltage transformers, a new BATW pipe rack, new process lift pumps, new bottom ash sluice lines that would tie into the existing sluice lines, two new recirculation tanks, repair of boiler bottoms, replacement of bottom ash hoppers, and

the relocation of a storage shed. All BATW construction activities would occur within the existing KIF reservation in a previously developed area adjacent to the existing bottom ash dewatering area. Figure 2-1 shows the potential locations of BATW infrastructure construction activity within the overall project boundary. Construction and operation of the BATW was previously evaluated in the KIF Bottom Ash Dewatering Facility EA and 2023 Determination of NEPA Adequacy, which are incorporated herein by reference.

Transfer into the Voluntary Incentives Program (VIP) subcategory for FGD waste stream could be achieved, with permitting authority regulatory approval, through the installation of membrane technology. This system uses a series of membranes to reduce and minimize flows to treat the FGD waste stream with specific discharge limits. Additional options to meet FGD requirements could include a combination of equalization, pH adjustment, metal precipitation, clarification, solids dewatering, and thermal crystallization, with permitting authority regulatory approval.

Under the 2024 ELG rule, continued operation past 2034 would require the design and commissioning of a zero-liquid discharge (ZLD) system for BATW, FGD, and combustion residual leachate (CRL). The USEPA has communicated that it is currently reevaluating the 2024 ELG rule, including the ZLD as a BTA requirement (USEPA 2025a). However, under the current USEPA ELG regulations, to operate KIF past 2034, further environmental review would be necessary to evaluate installation of ZLD systems for BATW, FGD, and CRL waste streams to meet longer term ELG requirements.

Groundwater remediation and pore water treatment applicable to CCR management and closure is required regardless of the decision on plant operations, and the NEPA review of these actions was considered in the Groundwater Corrective Action Programmatic EA (PEA) (TVA 2025a).

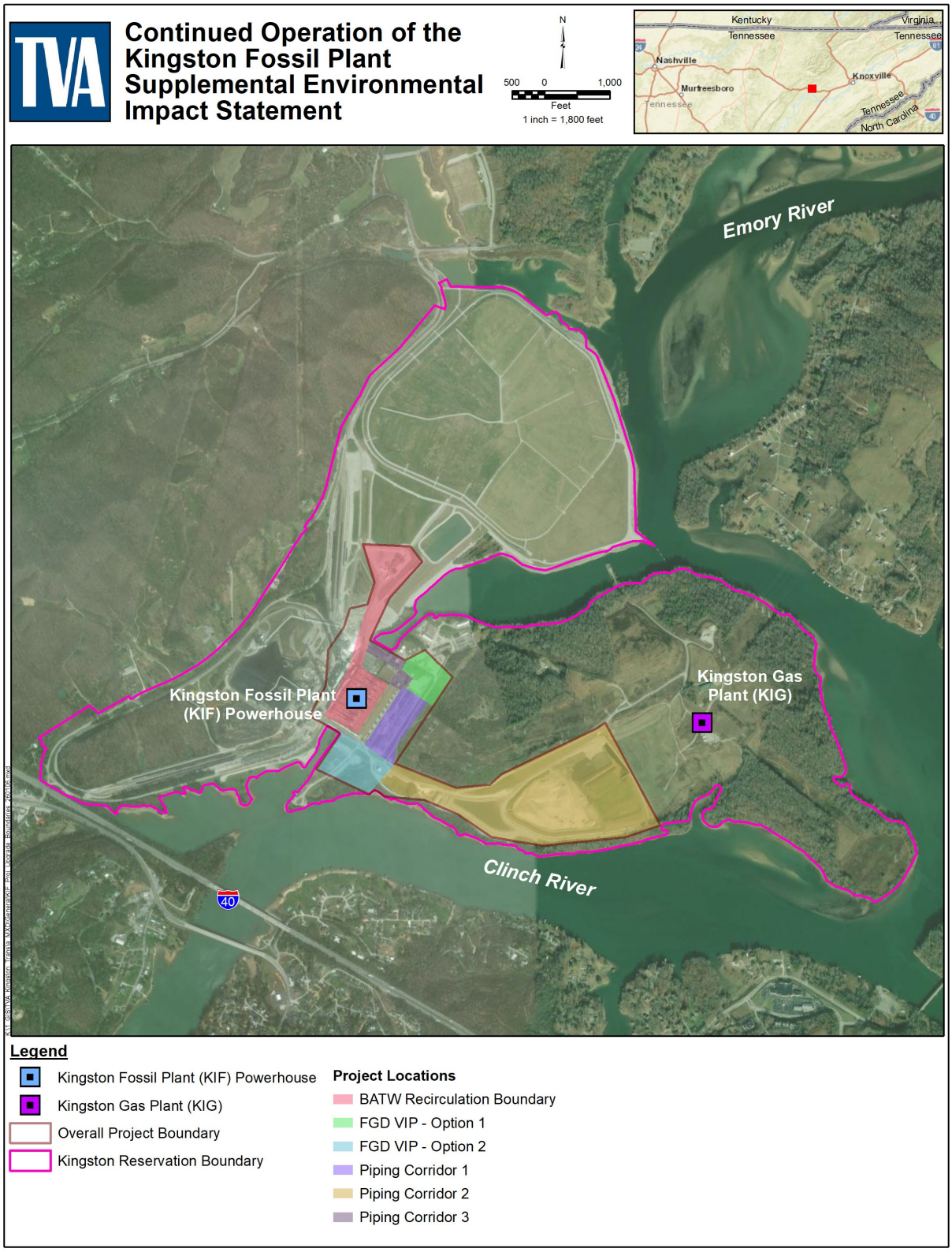


**Figure 2-1. Location of Kingston Reservation Proposed Action**

#### 2.1.2.3 Transmission and Electrical System Components

Continued operation of KIF would be supported by modifying the existing transmission lines in the area, modifying two existing switchyards, and reconfiguring area 161-kilovolt lines. Any activities associated with transmission upgrades would occur within existing TVA facilities or rights-of-way (ROWs). Off-site transmission upgrades, such as buswork, breaker replacements, and associated equipment may be required for communication and protection purposes, reconductoring of existing transmission lines, and switch replacements. These activities, if necessary, would occur within existing TVA facilities and/or ROWs and would be addressed as necessary under separate environmental reviews.

#### 2.1.2.4 Water Intake Upgrades

Under Section 316(b) of the CWA, facilities that withdraw more than 2 million gallons per day of cooling water are required to implement best technology available (BTA) to minimize adverse environmental impacts associated with cooling water intake structures (CWIS). Continued operation of KIF would require a revised approach to achieve compliance with CWA Section 316(b). This would require the evaluation and selection of one of the following compliance options to reduce impacts on fish and other aquatic life from the CWIS. The options currently under consideration for KIF include those identified at 40 CFR 125.94(c)(3), (5), (6), and (7). These options would be evaluated based on their technical feasibility, alignment with operational requirements, risk tolerance, and compatibility with permitting and implementation schedules. A summary of each option and its associated environmental impacts is provided below.

*Through-Screen Velocity of 0.5 Feet per Second*

Operation of a CWIS with a maximum through-screen intake velocity of 0.5 feet per second. Compliance may be achieved through operational flow reductions or replacement of existing pumps to reduce intake flow rates. No physical modifications to the intake structure are anticipated.

*Modified Traveling Screens*

Under this option, TVA would install modified traveling screens that meet the definition in 40 CFR 125.92(s) and are determined by the TDEC Director of Water Resources—based on the impingement technology performance optimization study (40 CFR 122.21(r)(6)(i))—to represent BTA for KIF. Implementation would involve the timed removal and replacement of existing screens during scheduled outages. The new screens would be designed to fit within existing housings to avoid structural modifications to the CWIS.

A fish return system would need to be constructed to safely convey impinged organisms back to the source waterbody. This system would typically consist of a polyvinyl chloride (PVC) or similar return pipe or flume, which may require the installation of support pilings to maintain structural integrity. Additionally, the use of raw water to transport the organisms could result in minor flow alterations at the discharge location.

*System of Technologies*

The facility would implement a combination of technologies, operational measures, and management practices that, upon review of the optimization study (40 CFR 122.21(r)(6)(ii)), are determined by the TDEC Director of Water Resources to represent BTA. Although this is considered a less likely compliance path for KIF, it must still be evaluated. These measures may include, but are not limited to, barrier nets, variable speed pumps, or behavioral deterrents. The selected system must be supported by enforceable permit conditions to ensure performance consistency.

*Impingement Mortality Performance Standard*

This would require the facility to demonstrate a 12-month average impingement mortality rate of no more than 24 percent for non-fragile species. This would not prescribe specific technologies, allowing flexibility in compliance strategies. Measures could include installation of new or modified intake structures, with associated construction impacts; deployment of monitoring infrastructure, such as fish collection and sampling systems. These activities could require in-water work or vessel activity. Adaptive management changes would also be evaluated potentially resulting in iterative construction or retrofitting of site infrastructure.

Each of the Section 316(b) compliance options would undergo further evaluation during the detailed design phase to assess site-specific environmental impacts and ensure consistency with applicable regulatory requirements. Any necessary permit modifications, including updates to the NPDES permit, would be obtained prior to implementation.

#### 2.1.2.5 Coal Combustion Residuals Management

Continued operation of KIF would result in production of additional CCR. As described in FEIS Section 2.1.2.1, which is incorporated herein by reference, TVA currently markets gypsum produced at KIF for wallboard manufacturing (or other approved uses). Additionally, TVA markets ash for specific approved uses. Otherwise, the ash and gypsum products would be stored on site. Brine salts would also result from the required membrane treatment of the FGD effluent that would occur during continued operations of KIF. These salts could be stored in a separate cell within the existing landfill to prevent commingling, which would maintain the CCR materials' suitability for beneficial use, or they could be disposed of in an existing, permitted off-site landfill.

#### 2.1.2.6 Other Activities at the Kingston Reservation

In addition to continued operation of KIF, conditions at the Kingston Reservation would include the following activities as described as part of Alternative A in the 2024 KIF Retirement FEIS and incorporated herein by reference:

- Continued Construction of KIG
- Operation of KIG

- Upcoming Construction of the BESS facility
- Operation of the BESS facility

However, because the proposed solar facility evaluated in the 2024 FEIS was located within the KIF operations footprint, the solar project would be delayed until after retirement of KIF or until a new location could be identified, which would require a separate NEPA review.

### 2.1.3 Comparison of Alternatives

Impacts evaluated may be beneficial or adverse and may apply to the full range of natural, aesthetic, historic, cultural, and socioeconomic resources within the project areas of each alternative and within the surrounding areas. Impact severity depends on the relative magnitude and intensity of the impact and resource sensitivity. In both the FEIS and SEIS, four descriptors characterize the level of impacts in a manner that is consistent with TVA's current practice. In order of the degree of impact, the descriptors are as follows:

- No Impact (or "absent"): Resource not present or, if present, not affected by project alternatives under consideration.
- Minor: Environmental effects are not detectable or are so minor that they would not noticeably alter any important attribute of the resource.
- Moderate: Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
- Significant (or "large"): Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

Chapter 3 describes the potential impacts associated with the alternatives reviewed in this SEIS. The analysis presented in Chapter 3 is summarized in Table 2-1.

**Table 2-1. Summary and Comparison of Alternatives by Resource Area**

| Resource Area | FEIS No Action Alternative | FEIS Alternative A | SEIS Alternative C |
|---|---|---|---|
| Floodplains | No impact. | Construction of the gas plant would result in 1.0 acre-foot or less of net fill within the Clinch River 100-year floodplain and Watts Bar Flood Storage Zone and impacts would be minor. New transmission line and pipeline construction would result in minor temporary impacts to floodplains, but capacity would be restored after completion. | Construction and operation of required additional infrastructure for KIF below elevation 750.0 or 747.5, could result in effects within the floodplain. Therefore, additional floodplain review would be required for all facilities, activities, or structures, including CCR, if proposed below elevation 750.0 on the Kingston Reservation. No direct impacts to floodplains or the Watts Bar Flood Storage Zone for those actions occurring above elevation 750.0 on the Kingston Reservation. Indirect impacts are anticipated to be minor. |
| Water Resources<br>- *Groundwater*<br>- *Surface Water and Water Quality*<br>- *Wetlands-* | No impact. | Construction of gas plant facilities may result in permanent impacts to streams and wetlands. Upgrades in the on- and off-site transmission line corridor would cause indirect temporary impacts to streams and waterbodies. Negligible effects to groundwater may occur but would be avoided and minimized through the use of BMPs. Pipeline construction would result in temporary impacts to waterbody banks and water quality. Potential permanent impacts from wetland type conversion would result in minor effects with the use of BMPs and adherence to all permit conditions. | Construction of the FGD WWT system would result in temporary minor impacts to groundwater from dewatering and minor impacts from operation with implementation of BMPs and appropriate design considerations.<br>Minor impacts on groundwater would occur from CCR management with use of liner and collection system.<br>Stormwater runoff from construction of the BATW system upgrades and FGD WWT system would result in minor indirect effects on surface waters and water quality and wetlands. Discharges associated with operation of the BATW system upgrades and the FGD WWT would comply with NPDES and other applicable regulatory requirements resulting in minor direct impacts to surface water and water quality and downgradient wetlands.<br>In-water construction and dewatering for the water intake upgrades may result in minor, localized, and temporary direct impacts to water quality from increased turbidity. Periodic in-water work associated with operation and maintenance may result in temporary and minor impacts to water quality. CCR management would comply with applicable effluent requirements for stormwater and wastewater and impacts to downgradient wetland would be minor.<br>Under Alternative C, the net benefit of reducing effluent discharges under Alternative A would be negated, and there would be a nominal increase in effluent flows relative to the No Action Alternative. Effluent discharges from KIF and KIG would adhere to NPDES and other relevant regulations. Overall impacts from continued operation of KIF in conjunction with KIG to surface water, water quality, wetlands and groundwater would be minor. |

| Resource Area | FEIS No Action Alternative | FEIS Alternative A | SEIS Alternative C |
|---|---|---|---|
| Air Quality and Greenhouse Gases/Climate Change | No impact.<br>No Action Alternative would be comparable to current emissions. | Construction of gas plant facilities, transmission lines, and the pipeline may result in temporary, minor effects to air quality. Operation of the gas plant facilities would result in permanent, moderate beneficial reductions in GHG emissions and regional climate impacts. Operation of the natural gas pipeline would result in periodic long-term, minor impacts to air quality. | Temporary and minor impacts to air quality during activities described in Section 2.1.2.<br>Continued operation of KIF in conjunction with KIG would negate the net air quality and GHG emissions reductions described under Alternative A. Continued operation of KIF and KIG concurrently would not result in exceedances of primary NAAQS standards as TVA would comply with all applicable federal and state regulations stipulated in current and future permits. Continued operation of KIF in conjunction with the operation of KIG would represent an increase (3.08 percent TVA system-wide) in future estimated regulated air emissions. |
| Biological Resources<br>- *Vegetation*<br>- *Wildlife*<br>- *Aquatic Life*<br>- *Threatened and Endangered Species* | No impact. | Construction of gas plant facilities, transmission lines, and the pipeline may result in minor permanent adverse effects to vegetation and/or wildlife and minor to negligible temporary effects on aquatic life.<br>Tree clearing would result in minor impacts to protected bat species. Effects to bats would be minimized by use of specific conservation measures established through TVA's updated programmatic consultation with USFWS for protected bats. | Minor direct and indirect impacts to vegetation from construction of the BATW system upgrades and FGD WWT system.<br>Temporary direct and indirect impacts to wildlife may occur as a result of noise and increased presence of workers during activities described in Section 2.1.2.<br>Retrofitting and/or construction activities associated with the CWIS upgrades would have minor adverse effects on aquatic life; however, upgrades to the CWIS would result in permanent long-term benefits, relative to existing conditions, by reducing the risk of impingement and entrainment.<br>Temporary minor effects could occur during retrofitting and construction activities associated with the CWIS upgrades if lake sturgeon are present in the channel. A long-term net benefit from reduction in impingement risk relative to existing conditions. |
| Transportation | No impact. | Construction and operation of gas plant facilities, transmission line, and pipeline may result in temporary, minor increases in traffic volume on public roadways. The effect from traffic volume would have a moderate, temporary impact to driver safety and roadway degradation. Permanent impacts during operation would be minor due to the size of the operations workforce. | Temporary, moderate impacts to transportation during outages resulting from the peak on-site workforce which includes KIF operations and outage personnel, as well as KIG construction workforce. Long-term effects from operation would not be anticipated. |

| Resource Area | FEIS No Action Alternative | FEIS Alternative A | SEIS Alternative C |
|---|---|---|---|
| Utilities | Moderate, adverse, permanent impacts due to increasing performance challenges. | Service disruptions during construction of all facilities are expected to be minimized through coordination with impacted utilities and effects would be minor. Permanent, beneficial impacts during operation due to decreased water use for the gas plant. | Reliable year-round generation and meeting maximum capacity demands could result in long-term beneficial effects; however, the long-term beneficial effects due to decreased water use described for Alternative A would be negated. Impacts to existing utilities are anticipated to be minor, and there would be no impact on the greater utility systems in the surrounding area. |
| Solid and Hazardous Waste | No impact. | Temporary increase in generation of hazardous waste during construction of the gas plant and pipeline. Once operational, the gas plant facilities would connect to the existing online sewer system. Moderate impacts due to end-of-life disposal for potentially hazardous infrastructure. | Under Alternative C, the decrease in long-term waste generation associated with the retirement of KIF would be negated. Solid and hazardous waste impacts even with the addition of salts would be minor. |
| Socioeconomics | No impact. | Increases in construction employment would result in short-term benefits (3–5 years). Minor adverse effects from permanent loss of coal plant related employment. Construction activities would create negligible, temporary adverse effects on housing and minor temporary impacts to public services, and transportation systems in the associated communities. | Temporary increase in the on-site workforce during activities described in Section 2.1.2 would have a minor beneficial impact on local employment levels. Long-term increase in the operational workforce would have minor, beneficial effects on local employment by retaining existing positions and supporting temporary labor needs during operational periods. Impacts on housing and community resources would be temporary and minor. Operation of KIF would contribute to reliable year-round generation and peak demand needs and provide electricity at the lowest feasible rate for customers. |

Key: BATW = bottom ash transfer water; CCR = coal combustion residuals; CWIS = cooling water intake structure; FGD = flue gas desulfurization; GHG = greenhouse gases; KIF = Kingston Fossil Plant; NAAQS = National Ambient Air Quality Standards; USFWS = U.S. Fish and Wildlife Service; WWT = wastewater treatment

## 2.2 Identification of Mitigation Measures

Best management practices (BMPs), mitigation measures, and commitments identified in Section 2.3 of the FEIS are incorporated by reference with the following changes.

### 2.2.1 Standard Practices and Routine Measures

#### 2.2.1.1 Surface Water

For ground-disturbing activities, TVA would develop a project-specific stormwater pollution prevention plan (SWPPP) and obtain a Tennessee Construction General Stormwater Permit (TNR100000) prior to the start of construction.

Regulated aquatic resources, including streams, reservoir, and wetlands that could be affected by activities described in Section 2.1.2 would be avoided and minimized to the extent practicable by design. TVA would comply with requirements in the applicable CWA 404 and 401 and TDEC Aquatic Resources Alteration Permits (ARAPs). Standard BMPs as identified in the SWPPP and TVA's Guide for Environmental Protection and Best Management Practices (TVA 2022) would be used to minimize runoff and indirect impacts to aquatic resources.

Equipment washing and dust control discharges would be handled in accordance with BMPs described in the SWPPP for water-only cleaning and the Tennessee Erosion and Sediment Control Handbook (TDEC 2012).

TVA would comply with the terms of KIF's individual NPDES permit TN0005452 for industrial wastewater discharges by ensuring the proposed process water discharge meets applicable effluent limits and water quality standards, as identified in the existing or renewed NPDES permit.

#### 2.2.1.2 Air Quality

Fugitive dust produced from construction activities would be controlled by BMPs (e.g., wet suppression) as provided in TVA's fugitive dust control plans. Construction permits contain language for fugitive emissions, including the development of a dust management plan. TVA would comply with all applicable federal and state regulations stipulated in current and future permits.

#### 2.2.1.3 Threatened and Endangered Species

Conservation measures as identified in the TVA Bat Strategy Project Screening Form (Appendix C) would be implemented. TVA programmatically consulted on routine actions with potential to affect federally listed bats in accordance with Section 7(a)(2) of the Endangered Species Act and committed to implementing any relevant project-specific conservation measures identified during analysis of proposed activities. These conservation measures also would minimize any unavoidable impacts to summer roosting habitat for the proposed endangered tricolored bat.

### 2.2.2 Nonroutine Mitigation Measures

#### 2.2.2.1 Floodplains

Additional floodplain review would be required if modified traveling screens, a system of technologies, or impingement mortality performance standard were selected as the CWA Section 316(b) compliance option.

Additional floodplain review would be required for all facilities, activities, or structures (including transmission and CCR) proposed below elevation 750.0.

## 2.3 The Preferred Alternative

TVA's preferred alternative is Alternative C – Continued Operation of KIF in Conjunction with Construction and Operation of a CC/Aero CT Gas Plant and 100-MW BESS within the Kingston Reservation. Under Alternative C, TVA would continue to operate all nine coal-fired KIF units after the CC/aero CT Plant becomes operational. Alternative C meets the purpose and need to address TVA's projected capacity needs in a way that is consistent with the recommendations in the 2019 IRP, to meet the increasing demand for electricity, ensure that TVA can reliably meet required year-round generation, maximum capacity system demands, planning reserve margin targets, and comply with the requirement under the TVA Act that power be sold at rates as low as feasible.

# CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the baseline environmental conditions (affected environment) of environmental resources in the KIF proposed alternative boundary (Figure 2-1) and the anticipated environmental consequences (or impacts) that would occur from the implementation of the alternatives described in Chapter 2. NEPA requires federal agencies to evaluate reasonably foreseeable environmental effects of proposed actions.

## 3.1 Scope of Analysis

The scope of analysis for this SEIS includes activities proposed under Alternative C that were not previously analyzed in the FEIS. The analysis also updates the affected environment with any new information necessary to support the impact assessment. For many resources, the affected environment analysis and impacts determinations rely on analyses from the FEIS and incorporate those analyses by reference. The following subsections detail the analysis approach.

### 3.1.1 Impact Assessment

This SEIS supplements the FEIS and updates the affected environment and related impact analyses associated with the alternatives analyzed in the FEIS as they relate to the actions considered under Alternative C. The assessment of impacts associated with the continued operation of KIF were previously considered under the No Action Alternative in the FEIS and are herein incorporated by reference. However, the following elements proposed under Alternative C and described in detail in Section 2.1.2 require additional analysis as they are new or conditions have changed since the FEIS and ROD were issued:

- KIF Powerhouse Interior Updates
- Facility Effluent Limitation Guidelines and Requirements
- Transmission and Electrical System Components
- Water Intake Upgrades
- CCR Management

Additionally, under Alternative C, the continued operation of KIF would occur in conjunction with actions evaluated in Alternative A of the FEIS – namely, construction and operation of the KIG on the Kingston Reservation, construction and operation of the associated natural gas pipeline, and construction and operation of the BESS. Notably, the deconstruction and decommissioning of KIF and the construction of a 3- to 4-MW Solar Facility on the Kingston Reservation, which were also evaluated under Alternative A, would not occur under Alternative C. Thus, impacts described in the FEIS resulting from deconstruction and decommissioning activities or the construction of a solar facility would not occur and would not be included in impacts that are otherwise incorporated by reference from Alternative A.

The environmental consequences of the proposed alternative assessed in this section include those activities associated with continued operation of KIF and the components listed above—specifically, where impacts differ from previous FEIS alternatives due to new project components, or because additional impacts would result from concurrent operation of KIF and KIG. The combined effects from concurrent operation of KIF and KIG are presented in resources where applicable. Impacts from these activities are evaluated in this chapter. As described in Section 2.1.3, both the FEIS and this SEIS use the descriptors below for the impact assessment:

- No Impact (or “absent”): Resource not present or, if present, not affected by project alternatives under consideration.
- Minor: Environmental effects are not detectable or are so minor that they would not noticeably alter any important attribute of the resource.
- Moderate – Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
- Significant (or “large”) – Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

### 3.1.2 Supplemental Environmental Impact Statement Scope

As part of the development of this SEIS, TVA evaluated whether there was any new information relevant to the assessment of potential impacts of continued operation of KIF that differ from those activities considered in the FEIS. This thorough and systematic review considered changes in the characteristics of baseline environmental conditions (affected environment) since 2024 and the potential impacts based on the description of the proposed alternative in Chapter 2.

As part of this analysis, TVA reviewed each resource category to identify key information relied on to support the findings and conclusions in the FEIS, including:

- Characteristics of the affected environment for each environmental resource.
- Continued operation characteristics and any design or facility needs to support continued operation.

Using their experience and expertise, resource subject matter experts (SMEs) reviewed the affected environment, assessed impacts to respective resources, and compared their findings to those used in the FEIS. Assessment of environmental impacts for each resource followed a typical analysis of reasonably foreseeable effects of the proposed alternative on environmental resources. As appropriate, this analysis considered the relevant context (geographic reference areas), sensitivity or rarity of the resource, and magnitude (intensity) of effect. Use of BMPs and measures to avoid, minimize, and mitigate potential impacts were also considered in the impact assessment process.

SMEs determined whether the information relevant to the SEIS was either consistent with the previous information included in the FEIS or notably different, as described below:

- Consistent: information that was effectively the same or substantially similar to that considered in the FEIS.
- Notably different: information that was new and not previously considered or substantially different from that considered in the FEIS.

Information determined to be “consistent” corresponds to topics or analyses that are incorporated by reference from the FEIS; whereas information determined to be “notably different” is discussed in relevant sections within this chapter, as appropriate.

### 3.1.3 Resources Incorporated by Reference

Information from the FEIS that is substantively unchanged and therefore not notably different is incorporated by reference into this SEIS. Having conducted the review described in Section 3.1.2 of this document, TVA determined several resource sections are fully bounded by the analyses, control measures, and commitments included in the FEIS. Either the information and the related impact analyses for the resource are unchanged or the impacts of any new information were effectively the same as that described for the FEIS. Some resources listed below would not be affected with implementation of Alternative C and, therefore, are not carried forward for further analysis in this SEIS. The following resource analyses are incorporated by reference from the FEIS in their entirety and those with no effects are noted as well:

- Geology, Soils, and Prime Farmland (FEIS Section 3.5.1)

  TVA considered all new information in combination with FEIS Section 3.5.1 to assess the potential effects from continued KIF operation. Minor direct effects to potential subsurface geological resources are anticipated from ground disturbance associated with certain activities described in Section 2.1.2. Vegetation clearing, grading, and other site preparation activities associated with KIF updates have the potential to disturb soil stability and increase erosion. No prime farmland soils are located within the footprint of proposed KIF updates. TVA determined the overall impact on these resources is similar to the impacts assessed in the FEIS. Therefore, the assessment of construction and operational impacts to geology, soils, and prime farmland in FEIS Section 3.5.1 is incorporated by reference, and impacts are minor.

- Natural Areas, Parks, and Recreation (FEIS Section 3.9)

  TVA considered all new information in combination with FEIS Section 3.9 to assess the potential effects from continued KIF operation. TVA determined that the overall impact of Alternative C on these resources is similar to the impacts assessed in the FEIS. As noted in Section 3.9.2.3.7 of the FEIS, minor, temporary adverse effects could occur to recreational uses of the sections of the Emory and Clinch Rivers adjacent to KIF. Public access to the boat launching ramp located in the Kingston Reservation boundary could be temporarily interrupted during activities described in Section 2.1.2. Adverse impacts on boat launching activities would be temporary and minor during activities described in Section 2.1.2. Following construction activities, continued operation of KIF in

conjunction with KIG would not result in additional impacts to natural areas or recreational facilities. Therefore, the assessment of construction and operational impacts to natural areas, parks, and recreation in FEIS Section 3.9 is incorporated by reference, and impacts are minor.

- Land Use (FEIS Section 3.10)

  TVA considered all new information in combination with FEIS Section 3.10 to assess the potential effects from continued KIF operation. The proposed KIF updates are within existing industrial areas of the facility adjacent to similar land uses. As the areas proposed for KIF updates are previously disturbed and would continue to be designated for nonagricultural purposes, no impacts to land use from these updates are anticipated. TVA determined the overall impact on these resources is similar to the impacts assessed in the FEIS. Therefore, the assessment of construction and operational impacts to land use in FEIS Section 3.10 is incorporated by reference.

- Cultural Resources (FEIS Section 3.13)

  TVA considered all new information in combination with FEIS Section 3.13 to assess the potential effects from continued KIF operation. The activities described in Section 2.1.2 are within existing industrial areas of the facility. As these areas are previously disturbed and are not located near known National Register of Historic Places–eligible resources, no impacts to cultural resources from these activities are anticipated. TVA determined the overall impact on these resources is similar to the impacts assessed in the FEIS. Therefore, the assessment of construction and operational impacts to cultural resources in FEIS Section 3.13 is incorporated by reference.

- Safety (FEIS Section 3.15)

  TVA considered all new information in combination with FEIS Section 3.15 to assess the potential effects from continued KIF operation. TVA would continue to operate and maintain the KIF Plant and adhere to all applicable safety standards. TVA determined the overall impact on safety is similar to the impacts assessed in the FEIS. As noted in the FEIS, safety impacts would be mitigated through BMPs and site-specific health and safety plans. The assessment of construction and operational impacts to safety in FEIS Section 3.15 is incorporated by reference. The public health and safety effects of changes to air quality resulting from the continued operation of KIF in conjunction with KIG are discussed in Section 3.4.1 of this SEIS.

- Noise (FEIS Section 3.17)

  TVA considered all new information in combination with FEIS Section 3.17 to assess the potential effects from continued operation of KIF. Noise associated with the activities described in Section 2.1.2 would be similar to those construction noise impacts assessed in the FEIS. Based on the predictive sound modeling for operation of KIG (Appendix G of the FEIS), the distance between the KIF and KIG facilities, their proximity to sensitive noise receptors, and the additive nature of logarithmic decibel levels, concurrent operation of KIF and KIG

is not expected to cause perceptible noise increases at sensitive receptors. Therefore, the assessment of construction and operational impacts to noise in FEIS Section 3.17 is incorporated by reference.

- Visual Resources (FEIS Section 3.18)

  TVA considered all new information in combination with FEIS Section 3.18 to assess the potential effects from continued KIF operation. The activities described in Section 2.1.2 are within existing industrial areas of the facility. As these areas are adjacent to similar industrial facilities, no impacts on visual resources from these updates are anticipated. TVA determined the overall impact on these resources is similar to the impacts assessed in the FEIS. Therefore, the assessment of construction and operational impacts to visual resources in FEIS Section 3.18 is incorporated by reference.

Resources carried forward for analysis are presented in Sections 3.2 through 3.9 below. The resources are presented in the same order as they are discussed in the FEIS.

### 3.1.4 Reasonably Foreseeable Future Actions

Having conducted the review described in Section 3.1.2 of this document, TVA did not identify new information related to the characterization of reasonably foreseeable future actions (RFFAs) included in the FEIS Table 3.1-1. However, in addition to the RFFAs in the FEIS, facilities associated with FEIS Alternative A including construction of the gas plant, pipeline, transmission upgrades, and BESS are underway or will be in the near future. These facilities, while evaluated in the FEIS in conjunction with the RFFAs discussed therein, are now RFFAs for this SEIS. Therefore, Section 3.1.2 of the FEIS is incorporated by reference and with the addition of FEIS Alternative A facilities (except the solar facility) represent the RFFAs for this SEIS.

## 3.2 Floodplains

### 3.2.1 Affected Environment

As described in the FEIS, designated 100- and 500-year floodplains encompass portions of the Kingston Reservation. Floodplain locations are present along the perimeter of the Kingston Reservation along the Clinch River and Emory River. Figure 3-1 shows the designated floodplains in the vicinity of KIF.

Floodplain regulatory framework is provided in FEIS Section 3.5.2.1 and information for the KIF affected environment is provided in FEIS Section 3.5.2.2. TVA identified new information related to the characterization of the affected environment for floodplains: EO 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input*, was revoked January 20, 2025, in EO 14154, *Unleashing American Energy*. The remainder of FEIS Sections 3.5.2.1 and 3.5.2.2 remain valid and are incorporated by reference.

### 3.2.2 Environmental Consequences

Under Alternative C, TVA would continue to operate the KIF coal-fired units, in conjunction with the KIG. Laydown areas, storage areas, construction buildings, geotechnical borings, groundwater monitoring wells, flood-damageable facilities, and any other nonrepetitive action or repetitive action would be located outside the 100-year floodplain (elevation 747.5) and above the 500-year flood elevation (750.0), if practicable. Additional floodplain review would be required for all facilities, activities, or structures proposed below elevation 750.0.

If activities occur above elevation 750.0 at KIF, there would be no effects on the natural and beneficial values of floodplains. If construction is proposed below elevation 750.0 at KIF for any project feature, then further floodplains review would be required as described in Section 2.2.2.1, and would likely result in minor adverse effects.

TVA considered all new information, in combination with FEIS Section 3.5.2, to assess the potential effects on floodplains and flood risk. TVA determined the overall impact on floodplains and flood risk is similar to the impacts assessed in the FEIS, as any activities within floodplains would adhere to EO 11988 and the TVA Flood Storage Loss Guideline (FSLG). Therefore, the assessment of construction impacts to floodplains and flood risk in FEIS Section 3.5.2 is incorporated by reference, and overall impacts are anticipated to be minor.

In addition, specific activities described in Section 2.1.2 are analyzed below.

#### *KIF Powerhouse Interior Updates*

These activities would include repairs and maintenance for existing equipment located within the KIF Powerhouse to support historic levels of operation. They would also be located outside the 100- and 500-year floodplains, which would be consistent with EO 11988 and the TVA FSLG. There would be no indirect effects on floodplains and their natural and beneficial values.

#### *Facility Effluent Limitation Guidelines and Requirements*

TVA would move forward wastewater treatment (WWT) systems to treat FGD, BATW and CRL wastewater to support continued operations of KIF under the current proposed alternative. As shown in Figure 3-1, these activities would occur on the existing KIF reservation in areas located outside the 100- and 500-year floodplains, which would be consistent with EO 11988 and the TVA FSLG.

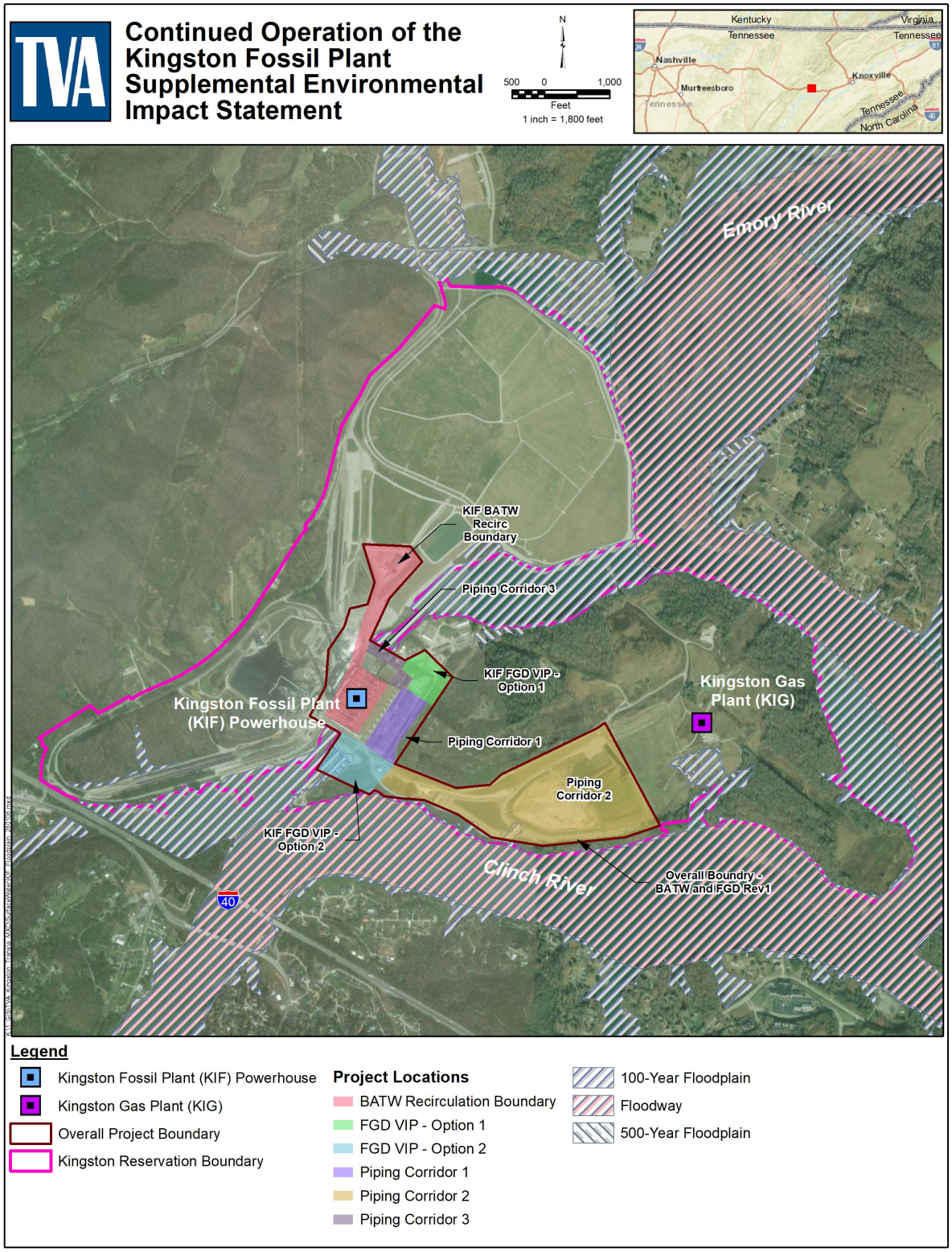


**Figure 3-1. Flood Zones in the Vicinity of the Kingston Reservation**

### *Transmission and Electrical System Components*

Modifications to existing transmission structures on the KIF property could occur below elevation 750.0 or 747.5. These modifications would be considered repetitive actions under TVA's 1981 Class Review of Repetitive Actions in the 100-Year Floodplain (TVA 1981). Modifications would be consistent with EO 11988 provided standard BMPs are used. Additional floodplains review would be required for modifications involving grillage surcharge or any new development below elevation 750.0 or obstructions of any kind within the floodway. New access roads or modifications to existing access roads could be constructed within 100-year floodplains. Such new construction or modifications would be consistent with EO 11988 provided that upstream flood elevations would not be increased by more than 1.0 foot.

### *Water Intake Upgrades*

The specific upgrade for the water intake has not been chosen, and design plans are not yet final. Of the water intake upgrades proposed, only the through-screen velocity of 0.5 foot per second option would result in no physical modifications to the intake structure, which would be consistent with EO 11988 and the FSLG.

Additional floodplain review would be required if the modified traveling screens, a system of technologies, or impingement mortality performance standard were selected as the CWA Section 316(b) compliance option.

### *Coal Combustion Residuals Management*

CCR management would be consistent with EO 11988 and the FSLG provided that the ash products would be stored on site in the existing KIF ash landfill and brine salts would be disposed of in the existing landfill, or in an existing, permitted off-site landfill accessed via existing roadways.

Additional floodplain review would be required for any CCR facilities, activities, or structures proposed below elevation 750.0 or for brine salts that would be disposed of in a facility other than an existing, permitted off-site landfill, or transported to any off-site landfill via a new roadway.

### *Summary of Impacts to Floodplains*

Implementation of Alternative C would result in minor impacts to floodplains from modifications to existing transmission structures and potentially from the selected water intake upgrade. Project elements would be consistent with EO 11988 and TVA FSLG. Any activities proposed below elevation 750.0 would require additional floodplain review. Overall, floodplain and flood-risk impacts would be similar to those previously evaluated in the FEIS. Impacts to floodplains from continued operation of KIF in conjunction with construction and operation of KIG would be minor.

## 3.3 Water Resources

### 3.3.1 Groundwater

#### 3.3.1.1 Affected Environment

TVA did not identify new information related to the federal and state regulatory setting relevant to the Kingston Reservation, which includes all areas considered for continued operation of KIF; therefore, FEIS Section 3.6.1 is incorporated by reference. Additionally, TVA did not identify new information related to the physiographic setting of the Kingston Reservation, regional aquifers underlying the Kingston Reservation, public groundwater supply in Roane County, and groundwater wells within the vicinity of the Kingston Reservation.

TVA identified the following new information, which was determined to be notably different from that considered in the FEIS: 2023 and 2024 groundwater monitoring events.

Since the production of the FEIS, TVA completed additional groundwater monitoring activities in accordance with existing assessment monitoring program requirements. One new, statistically significant increase for boron was observed in well G-5B in 2023 and 2024 (Stantec 2024a, 2024b, 2024c, 2025a, 2025b, 2025c).

#### 3.3.1.2 Environmental Consequences

Groundwater impacts from the construction and operation of KIG, including those from the construction and operation of the CC/aero CT Plant, BESS, transmission upgrades, and natural gas pipeline, are assessed in FEIS Section 3.6.1.2.3.1 and Sections 3.6.1.2.3.3 through 3.6.1.2.3.6. TVA did not identify new information related to these impact assessments; therefore, FEIS Section 3.6.1.2.3.1 and Sections 3.6.1.2.3.3 through 3.6.1.2.3.6 are applicable to Alternative C and are incorporated by reference. Groundwater impacts from the construction and operation of the BADW facility with an additional BATW recirculation system were previously assessed in Section 3.8.2.2 of the KIF Plant Bottom Ash Dewatering Facility EA in 2016 (BADW FEA) and are incorporated by reference (TVA 2016a).

Updates to the KIF Powerhouse would occur within existing facilities and in previously disturbed areas and transmission and electrical system upgrades would not involve ground disturbances. Therefore, no impacts to groundwater would occur from these activities.

***Facility Effluent Limitation Guidelines and Requirements***

Construction activities for the FGD WWT system may directly impact groundwater during excavation. Most excavations associated with the proposed FGD WWT system would be shallow and would not be expected to encounter significant groundwater. Dewatering, if needed, would only be performed when groundwater interferes with excavation and to the extent that groundwater is lowered locally within the footprint of the activity. Indirect impacts to groundwater from construction activities such as

contamination and sediment infiltration from stormwater runoff would be avoided or minimized with mitigation measures such as those listed in Section 2.2 of the SEIS (BMPs and an SWPPP), as well as the production and implementation of a Spill Prevention, Control, and Countermeasure (SPCC) plan and compliance with a Tennessee Construction Stormwater General Permit for construction activities (TNR10000) (TN Construction General Permit [CGP]). Design considerations and the use of BMPs, a SWPPP, and an SPCC plan, would ultimately lead to temporary minor direct and indirect impacts to groundwater from FGD WWT system construction. Operation of the FGD WWT Facility may lead to accidental releases from the FGD WWT transfer pipe system or storage basins which may indirectly impact groundwater quality. These impacts could be sufficiently avoided, minimized, or both with design considerations and BMPs resulting in minor impacts to groundwater from FGD WWT Facility operation.

### *Water Intake Upgrades*

Construction of the water intake upgrades is not expected to impact groundwater levels. Any dewatering required during construction would be confined within the construction footprint and would not affect groundwater levels in adjacent areas. Operational flow reductions may create minor localized changes in surface water levels near the intake, but these changes would have no impact on groundwater.

### *Coal Combustion Residuals Management*

CCR management would involve operation of the existing Gypsum Disposal Area (GDA) with additional bottom ash, pyrite, and fly ash waste streams. To avoid and minimize potential groundwater impacts from leachate from the GDA, the leachate would be collected with a leachate collection system comprised of a drainage blanket and sumps. Additionally, the GDA has a liner system that consists of a 2-foot compacted clay layer (with hydraulic conductivity less than $1 \times 10^{-7}$ centimeters per second) and a 60-millimeter-high density polyethylene flexible membrane layer above the clay. The liner and leachate collection system eliminate downward migration of leachate from the landfill into underlying groundwater, preventing impacts to groundwater. Leachate collected with the collection system is pumped into the lined FGD stormwater impoundment and discharged via NPDES Outfall 01A in accordance with the updated NPDES permit and ELGs. The flow of the leachate waste stream is not expected to change because it is precipitation driven. With implementation of the liner and collection system and with compliance with all federal and state effluent regulations, impacts to groundwater from CCR management would be minor.

For over a decade, TVA has been executing an in-depth investigation of CCR management under Commissioner’s Order No. OGC15-0177 issued by TDEC on August 6, 2015. The scope of this effort includes a thorough analysis of site-specific hydrogeology, ground water flows and quality, and a water use survey to investigate potential impacts to wells and water sources near KIF. This work, executed under the independent oversight of TDEC, identified one parcel located east-southeast of the plant that has a potential of being impacted by CCR management operations as

determined by groundwater flow directions. TVA is the parcel owner, and no wells or springs are associated with that parcel. Therefore, no impact is expected to any wells outside of the Kingston Plant (TVA 2024b).

***Summary of Impacts to Groundwater***

Operation of the FGD WWT would avoid and minimize impacts with design considerations and BMPs, resulting in minor impacts to groundwater. Impacts to groundwater as a result of CCR management would be minor with implementation of measures (e.g., leachate collection system, liner, membrane cap, etc.) and BMPs. Overall impacts to groundwater from continued operation of KIF in conjunction with operation of KIG with implementation of design features and BMPs would be minor.

## 3.3.2 Surface Waters and Water Quality

### 3.3.2.1 Affected Environment

#### 3.3.2.1.1 Surface Waters

The federal and state regulatory setting and classification of surface waters relevant to the Kingston Reservation, which includes all areas considered for continued operations of KIF, are discussed generally in FEIS Section 3.6.2 which is incorporated by reference. Surface water resources within the vicinity and boundary of the Kingston Reservation and KIG are described in FEIS Sections 3.6.2.1.1.1 and 3.6.2.1.2, including the results of field surveys performed within the Kingston Reservation in 2019 and within the FEIS Alternative A limits of disturbance in 2022 and 2023 which now comprise the boundary of KIG.

TVA did not identify new information related to the characterization of the affected environment for surface water resources within the boundaries of the Kingston Reservation and KIG (FEIS Alternative A); therefore, FEIS Sections 3.6.2.1.1.1 and 3.6.2.1.2 are incorporated by reference.

However, TVA identified new regulatory information that was determined to be notably different from that considered in the FEIS: updates made to ELGs since the publication of the FEIS in February 2024 (see SEIS Section 2.1.2.2 for more background) which require additional facilities for wastewater treatment.

Existing surface water features located within the boundary of the proposed activities associated with continued operation of KIF are shown in Figure 3-2 and summarized in Table 3-1 and Table 3-2.

**Table 3-1. Summary of Streams and Open Water Features Present within the Boundary of Proposed FGD WWT Facility Locations**

| Feature | Field ID | Number of Features | Total Extent |
|---|---|---|---|
| **Option 1** | | | |
| Other Wet Weather Conveyances | e001, e002 | 2 | 529 LF |
| **Option 2** | | | |
| Other Wet Weather Conveyances | s001, e001 | 2 | 1,056 LF |
| Ponds | Pond 1, Pond 2, Pond 3 | 3 | 0.08 acres |

Key: LF = linear feet
Note: Other Wet Weather Conveyances were identified in field surveys as TDEC WWCs and ponds are considered non-regulated features as they do not have a continuous downstream connection. Both water feature types are non-jurisdictional and do not require permitting by the U.S. Army Corps of Engineers if impacted.

**Table 3-2. Summary of Streams and Open Water Features Present within the Boundary of Proposed FGD WWT System Pipeline Corridor Locations**

| Feature | Field ID | Number of Features | Total Extent |
|---|---|---|---|
| **Option 1** | | | |
| Other Wet Weather Conveyances | e001 | 1 | 1,085 LF |
| **Option 2** | | | |
| Other Wet Weather Conveyances | e003, e004, e009 | 3 | 1,580 LF |
| **Option 3** | | | |
| None | – | – | – |

Notes: "–" = not applicable; LF = linear feet
Note: Other Wet Weather Conveyances were identified in field surveys as TDEC WWCs and ponds are considered non-regulated features as they do not have a continuous downstream connection. Both water feature types are non-jurisdictional and do not require permitting by the U.S. Army Corps of Engineers if impacted.

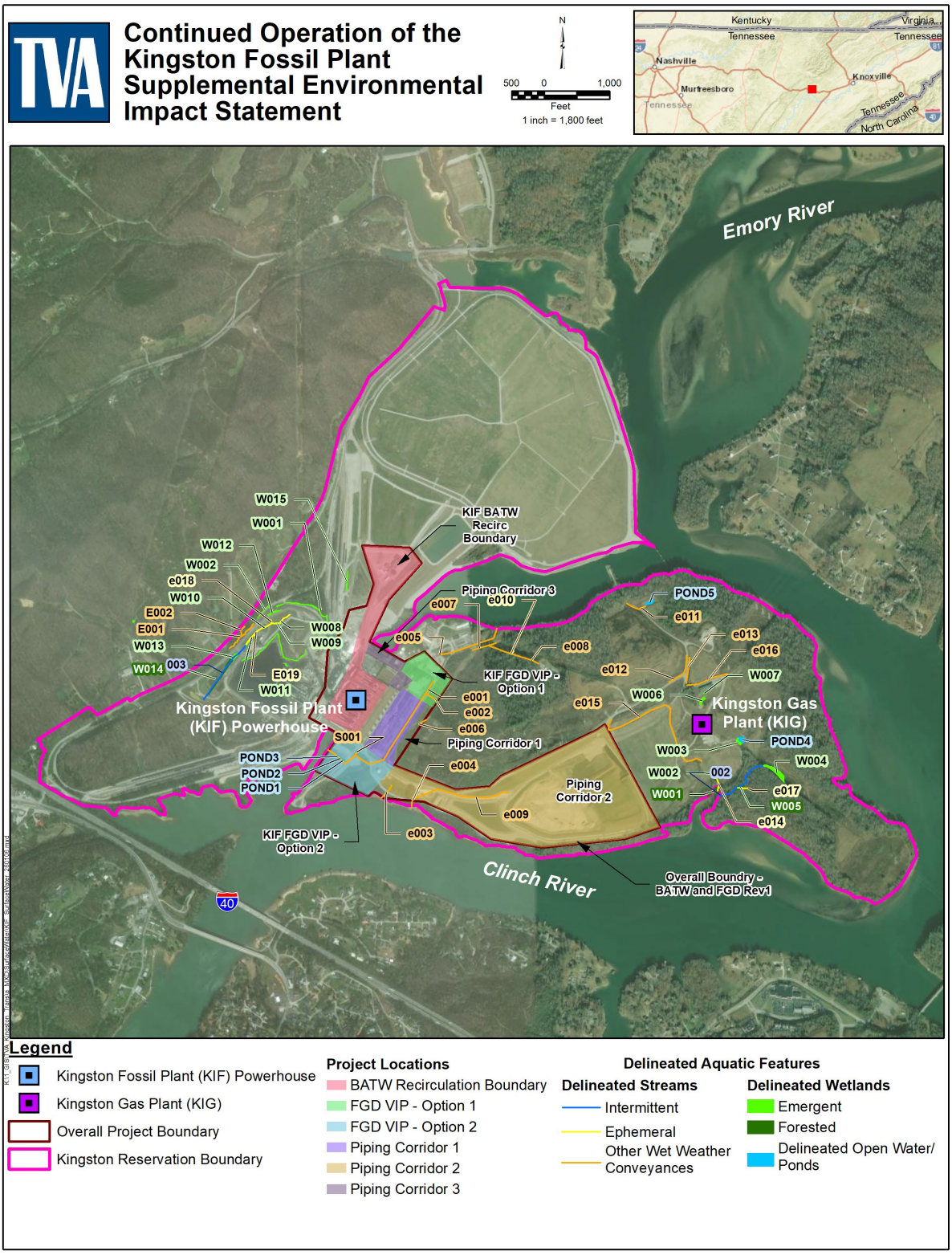


**Figure 3-2. Delineated Aquatic Features within the Kingston Reservation**

#### 3.3.2.1.2 Water Quality

The federal and state regulatory setting, permit requirements, and surface water quality standards applicable to the Kingston Reservation and surrounding water resources are discussed generally in FEIS Section 3.6.2. Surface water withdrawals, discharges (i.e., wastewater, stormwater, thermal), as well as existing permits and their limits associated with the Kingston Reservation are described in FEIS Section 3.6.2.1.1.2 and are incorporated by reference.

TVA identified new information related to surface water quality that remains consistent with that considered in Section 3.6.2.1.1.2 of the FEIS:

- Surface Water Impairments. The updated List of Impaired and Threatened Waters (303d list), approved by the USEPA on April 24, 2024, maintains the Watts Bar Reservoir for impairments consistent with the FEIS (TDEC 2024a). The draft 2026 303d list also maintains the Watts Bar Reservoir for impairments consistent with the FEIS; however, the language associated with impairments of chlordane, mercury, and polychlorinated biphenyls (PCBs) is being updated to include “[contaminant] in fish tissue” to more accurately reflect the nature of the impairment (TDEC 2025a).
- Surface Water Use. TDEC Use Classifications updated in March 2024 are consistent with the FEIS (TDEC 2024b).

TVA also identified new information that was determined to be notably different from that considered in the FEIS:

- Permit Modifications. As a result of updates made to ELGs since the publication of the FEIS in February 2024 (see SEIS Section 2.1.2.2 for more background), TVA submitted a modification request for the individual NPDES wastewater permit (TN0005452) on August 6, 2024, to include all 2024 ELG Rule compliance pathways in KIF’s NPDES permit in addition to the applicability limits of the retirement subcategory (TVA 2024c). Permit modification requests would be submitted to align KIF’s NPDES permit with the newly finalized ELG Deadline Extension rule as well as any forthcoming ELG supplements or revised final rule.

### 3.3.2.2 Environmental Consequences

Impacts from the construction and operation of KIF on surface water, including those from the construction and operation of CC/aero CT Gas Plant and natural gas pipeline are assessed in FEIS Sections 3.6.2.2.3.1 and 3.6.2.2.3.6, respectively. TVA did not identify new information related to these impact assessments, and these sections are incorporated by reference. Impacts from operation of the BADW facility were previously evaluated in 2016 in TVA’s KIF Bottom Ash Dewatering Facility Environmental Assessment and 2023 Determination of NEPA Adequacy and are incorporated by reference. ELG conformance through installation of the BATW high recycle system and FGD membrane treatment would require regulatory approval for an extended timeline to meet compliance. The effluent discharges associated with operating both KIF and KIG would be additive. However, compliance with water quality criteria and ELGs would be

included in regulatory evaluation to ensure permitted discharges meet required standards protective of the aquatic environment. Under current regulations, KIF operations beyond 2034 would require ZLD for BATW and FGD waste streams, which would require further environmental evaluation.

Updates to the KIF Powerhouse would occur within existing facilities and the transmission and electrical system upgrades would not involve ground disturbances; therefore, no impacts to surface waters or quality would occur from these activities.

### *Facility Effluent Limitation Guidelines and Requirements*

The construction and operation of the BADW facility with an additional BATW recirculation system were previously assessed in the BADW FEA, which included the BATW location (TVA 2016a). No jurisdictional surface waters are present within the boundary of the proposed BATW system upgrades and no direct impacts to surface waters would occur. The new BATW recirculation system would be located within the same BADW footprint that was analyzed in the BADW FEA but would require construction of additional facilities that were not included in that analysis. Stormwater runoff associated with the construction of the BATW system upgrades may indirectly affect surface water quality. Compliance with KIF's Tennessee Stormwater Multi-Sector General NPDES Permit for Industrial Activities (TMSP), the implementation of a SWPPP and BMPs as discussed in SEIS Section 2.2.1, compliance with the TN CGP, and development and adherence to a SPCC plan would avoid and minimize indirect impacts from stormwater runoff. Therefore, indirect effects on surface waters and quality from the construction of the BATW system upgrades would be minor.

Impacts to surface waters and quality associated with the operation of the existing BADW system are described in Section 3.7.2.3 of the BADW FEA and are incorporated by reference. The assessment of these impacts in the BADW FEA was based on the 2015 ELGs. Since the completion of the BADW FEA in 2016, the ELGs were revised in 2020 and 2024, including a supplement to the 2024 ELG rule published in 2025 (see Section 2.1.2.2 for more information). As discussed in Sections 2.1.2.2 and 3.3.2.1.2, KIF's individual NPDES wastewater permit (TN0005452) was modified in 2021 to incorporate the 2020 ELG compliance pathways and has submitted a modification request for inclusion of additional compliance pathways in the 2024 ELGs. Ultimately, discharges associated with operation of the BATW system upgrades (those proposed under Alternative C that were not analyzed in the BADW FEA) would comply with all applicable permit limits, including updated NPDES requirements and finalized ELGs, resulting in minor direct impacts to surface waters and water quality.

Construction activities associated with the proposed FGD WWT system would avoid surface water features thereby avoiding direct impacts to surface waters and water quality. Adherence to these permits would minimize potential effects to surface waters such as those presented in Tables 3.3-1 and 3.3-2. Therefore, minor direct impacts to surface waters and water quality would result. Like construction of the BATW system upgrades, stormwater runoff from construction of the FGD WWT system would be avoided and minimized through compliance with the TMSP, the use of measures

discussed in Section 2.2, and the development and adherence to a SPCC plan. Therefore, minor indirect impacts to surface waters and water quality would occur from the construction of the FGD WWT System. Operational discharges from the FGD WWT system would meet all relevant permit requirements, including updated NPDES standards and ELGs, thereby improving the quality of treated wastewater, with only minor direct impacts to surface waters and quality anticipated.

### *Water Intake Upgrades*

Each of the CWA Section 316(b) compliance options would undergo further evaluation during the detailed design phase to assess site-specific environmental impacts and ensure consistency with applicable regulatory requirements as described in Section 2.1.2.4. Any necessary permit modifications, including updates to the NPDES permit, CWA Section 401 and 404, and TDEC ARAP, would be obtained prior to implementation.

#### *Through-Screen Velocity of 0.5 Feet per Second*

No physical modifications to the intake structure are anticipated under this upgrade option, therefore, no direct impacts to surface waters would occur from operational flow reduction. Reduction in flow velocity associated with the operation of this option to minimize fish impingement may lead to indirect beneficial effects to water quality in the form of sediment scour reduction.

#### *Modified Traveling Screens*

The new screens used to replace existing screens as part of this upgrade option would be designed to fit within existing housings, thereby avoiding structural modifications to the CWIS. The type of screen and installation method would be determined during design and dewatering the screens with stop logs may be necessary prior to installation of new screens. In-water construction and dewatering may result in localized and temporary direct impacts to water quality from increased turbidity that would not noticeably alter water quality beyond the duration of in-water activities. This upgrade option would also require the construction of a fish return system consisting of a PVC pipe or flume installed on support piling. Pilings would be installed above the ordinary high-water mark (outside the intake structure) with exact placement determined as part of detailed design. Construction-related impacts would be localized, temporary (limited to the duration of construction), and minor, and all in-water work would be performed in compliance with federal, state, and local regulations and permit requirements.

Operation of the proposed intake would involve ongoing maintenance which may require periodic in-water access resulting in direct impacts like those from construction. Similarly, impacts associated with operation and maintenance would be periodic, temporary, and minor, as potential increases in turbidity would not noticeably alter surface water quality beyond the duration of in-water maintenance activities.

*System of Technologies*

This option would involve a combination of technologies, operational measures, and management practices such as barrier nets, variable speed pumps, and behavioral deterrents, among other possible options. Effects would vary depending on the option retained. If in-water construction is necessary, fill or sediment disturbance can directly and indirectly impact surface waters and water quality. Stormwater runoff during construction may enter surface waters but would be avoided and minimized using BMPs, a SWPPP, and a SPCC plan (Section 2.2.1.1) in compliance with the TN CGP. Ultimately, construction-related impacts would be temporary (limited to the duration of construction) and minor because all in-water work would be performed in compliance with federal, state, and local regulations.

Operational measures and management practices would have no direct impacts to surface waters. Although operational flow changes may indirectly impact surface waters and water quality by altering flow characteristics, scour, and sediment movement within the immediate vicinity of the intake. Maintenance may also require periodic in-water access, resulting in direct impacts to surface water like those of construction. Impacts associated with operation and maintenance would be minor, as potential alterations in flow, scour, and sediment movement would be incorporated into upgrade design considerations. Additionally, maintenance would be periodic and temporary.

*Impingement Mortality Performance Standards*

Like the System of Technologies option, this option may require construction of technologies; however, this option may also require in-water work or vessel activity for monitoring as well as iterative construction or retrofitting. This option would undergo further evaluation during the detailed design phase to assess site-specific environmental impacts and ensure consistency with applicable regulatory requirements. Routine measures, as described in Section 2.2, would be implemented to avoid and minimize potential effects on surface waters and quality. Any necessary permit modifications, including updates to the NPDES permit, would be obtained prior to implementation. Ultimately, the impacts of this upgrade option would be minor and like those associated with the System of Technologies option.

### *Coal Combustion Residuals Management*

The management of CCR under Alternative C may indirectly impact surface water quality through contamination of stormwater runoff. However, stormwater discharges from outfalls would comply with requirements set forth in the individual NPDES wastewater permit (TN0005452) as well as the TMSP for Sectors O (i.e., steam electric power generating facilities, including coal handling areas) and L (i.e., landfills and land application sites). Therefore, impacts from ongoing CCR management to surface waters and water quality would be minor.

### *Summary of Impacts to Surface Waters and Water Quality*

Impacts to surface waters and water quality as a result of construction of the BATW upgrades and FGD WWD systems would be minor with implementation of BMPs. The net benefit of reducing effluent discharges under Alternative A would be negated, and there would be a nominal increase in effluent flows with continued operation of KIF in conjunction with KIG, relative to the FEIS No Action Alternative. However, effluent discharges from KIF and KIG would adhere to NPDES requirements including new ELG requirements and other relevant regulations. Therefore, continued operation of KIF in conjunction with operation of KIG would result in minor impacts to surface water and water quality. Construction impacts from water intake upgrades would be temporary and minor, and the selected water intake option would ultimately result in a net benefit to surface waters compared to existing operations.

## 3.3.3 Wetlands

### 3.3.3.1 Affected Environment

TVA did not identify new information related to the regulatory background or regulatory updates relevant to the Kingston Reservation, which includes all areas considered for continued operation of KIF; therefore, FEIS Sections 3.6.3.1 and 3.6.3.2 are incorporated by reference. Additionally, TVA did not identify new information related to the location or classification of wetlands within the Kingston Reservation or proposed Alternative C study area; therefore, Sections 3.6.3.3.1 and 3.6.3.3.2 are incorporated by reference.

### 3.3.3.2 Environmental Consequences

Updates to the KIF Powerhouse would occur within existing facilities and the transmission and electrical system upgrades would occur within existing facilities and in previously disturbed areas, where wetlands are not present; therefore, no impacts to wetlands would occur. Additionally, water intake upgrades would have no impact to wetlands as no wetlands are located within the footprint of proposed intake upgrades, and sediment disturbances associated with in-water work would be localized, with sediments expected to settle shortly after in-water work is complete.

The construction and operation of the BADW facility with an additional BATW recirculation system were previously assessed in the BADW FEA which included the BATW location (TVA 2016a). For both the BATW and FGD system upgrades under this alternative, no wetlands are present within the boundaries of either the BATW system upgrades or the FGD WWT system, thus no direct impacts to wetlands would result from construction of these components.

Stormwater runoff associated with the construction of the BATW system upgrades proposed under Alternative C and the FGD WWT system may indirectly affect downgradient wetlands. Compliance with KIF's TMSP, the implementation of a SWPPP and BMPs as discussed in Section 2.2.1., development and adherence to a SPCC plan, and compliance with the TN CGP would avoid and minimize indirect impacts from stormwater runoff. Therefore, indirect effects on wetlands from the construction of the

BATW system upgrades and the FGD WWT system would be temporary (limited to the duration of construction) and minor. Wastewater discharges associated with operation of both systems would be routed to existing NPDES permitted outfalls and would comply with all applicable permit limits, including updated NPDES requirements and finalized ELGs, and no direct or indirect impacts to wetlands would occur from operation.

#### *Water Intake Upgrades*

No wetlands are located in the vicinity of the water intakes, so proposed upgrades would have no impacts on wetlands.

#### *Coal Combustion Residuals Management*

The management of CCR under Alternative C would involve the implementation of BMPs, a SWPPP, and a SPCC plan which would prevent indirect impacts to downgradient wetland quality from stormwater runoff from the GDA. Additionally, stormwater effluent would comply with requirements established in the TMSP. Wastewater discharges associated with operation of the GDA would be routed to existing NPDES permitted outfalls and would comply with all applicable permit limits, including updated NPDES requirements and ELGs. Compliance with all applicable effluent requirements for stormwater and wastewater would result in minor indirect impacts to downgradient wetland quality during CCR management.

#### *Summary of Impacts to Wetlands*

Operation of the BATW upgrades and CCR management would adhere to NPDES, CWA Section 401 and 404, TDEC ARAP, and other regulatory requirements. Therefore, impacts to downgradient wetlands from effluent discharges would be minor. Operation of KIG would also adhere to regulatory requirements. With BMPs and permit compliance, overall impacts from continued operation of KIF in conjunction with operation of KIG to wetlands would be minor.

## 3.4 Air Quality and Greenhouse Gases/Climate Change

### 3.4.1 Air Quality

#### 3.4.1.1 Affected Environment

The federal and state regulatory setting, classification, and elements of air quality relevant to the Kingston Reservation are generally discussed in FEIS Sections 3.7.1.1.1 through 3.7.1.1.7, and Section 3.7.1.2.

TVA identified new information related to the characterization of the affected environment for air quality within the boundaries of the Kingston Reservation (FEIS Alternative A). Therefore, FEIS Sections 3.7.1.1.1.1 through 3.7.2.1.1.7 and 3.7.1.2 are incorporated by reference, except where noted as follows:

- FEIS Section 3.7.1.1.1 Ambient Air Quality Standards: Effective May 6, 2024, the USEPA changed the National Ambient Air Quality Standard (NAAQS) for annual particulate matter (PM) less than or equal to 2.5 microns wide ($PM_{2.5}$) from 12 micrograms per cubic meter ($\mu g/m^3$) to 9 $\mu g/m^3$. The USEPA has since filed a motion to vacate the revised standard in the U.S. Court of Appeals for the District of Columbia Circuit, urging the Court to vacate the rule prior to the deadline for nonattainment area designations under the revised standard (February 7, 2026). However, as of the date of this SEIS, the more stringent annual $PM_{2.5}$ standard (9 $\mu g/m^3$) remains in effect.
- FEIS Section 3.7.1.1.3 New Source Performance Standards: On May 9, 2024, after the completion of the FEIS, the USEPA released the Final Rule: New Source Performance Standards for Greenhouse Gas Emissions from New, Modified, and Reconstructed Fossil Fuel–fired Electric Generating Stations (Subpart TTTTa). The rule establishes new carbon pollution standards for modified coal- and new gas-fired power plants that began construction, reconstruction, or modification after May 23, 2023.
- FEIS Section 3.7.1.1.3 New Source Performance Standards: On May 9, 2024, after the completion of the FEIS, the USEPA released the Final Rule: Emission Guidelines for Greenhouse Gas Emissions for Electric Utility Generating Units (Subpart UUUUb). This rule sets emission guidelines for existing fossil fuel–fired EGUs, including coal-fired units built on or before May 23, 2023.
- FEIS Section 3.7.1.2 Kingston Reservation: Monitored air quality in the region of the Kingston Reservation depicted in Table 3.7-2 for ozone and $PM_{2.5}$ has been reviewed for more recent rolling 3-year periods from 2019 to 2024 and have found to be compliant with the corresponding NAAQS for 8-hour ozone, 24-hour $PM_{2.5}$, and annual $PM_{2.5}$ (USEPA 2025b).
- FEIS Section 3.7.1.2 Kingston Reservation: While TVA's Title V renewal application is still pending review, TDEC issued a Permit to Construct for KIG on November 15, 2024 (TDEC 2024c).

Note that on June 11, 2025, USEPA Administrator Lee Zeldin proposed to repeal all "greenhouse gas" emissions standards for the power sector under Section 111 of the CAA (USEPA 2025c), including 40 CFR Part 60, Subparts TTTT, TTTTa and UUUUb. As an alternative, USEPA also proposed to repeal a narrower set of requirements that includes the emission guidelines for existing fossil fuel–fired steam-generating units (Subpart UUUUb), the carbon capture and sequestration/storage (CCS)-based standards for coal-fired steam-generating units undertaking a large modification, and the CCS-based standards for new base load stationary combustion turbines. USEPA has not published a final rule. These regulations (Subparts TTTT, TTTTa, and UUUUb) are currently in effect as of the date of this SEIS.

### 3.4.1.2 Environmental Consequences

The environmental consequences of the air quality resources associated with Alternative C are addressed below in terms of construction, regulatory requirements,

and operational impacts for continued operation of the KIF coal-fired units in conjunction with construction and operation of the KIG.

#### 3.4.1.2.1 Construction Impacts

Construction impacts associated with the KIG are assessed in the Kingston Fossil Plant Retirement FEIS Section 3.7.2.3.1.1. TVA did not identify new information related to this impact assessment for air quality resources; therefore, FEIS Section 3.7.2.3.1.1 is applicable to Alternative C and is incorporated by reference.

In contrast to the added construction for KIG, generation of fugitive particulate matter addressed in FEIS Section 3.7.2.2 relative to demolition of the KIF Plant would no longer occur under Alternative C. FEIS Section 3.7.2.2 describes combined projects of Alternatives A and B as causing cumulative minor, temporary effects to air quality in the area due to the deconstruction and construction activities. Alternative C alleviates the deconstruction aspect of this impact.

Activities that support continued operation of KIF at historical levels of reliability are described in Section 2.1.2. These activities would be relatively small scale and would result in temporary, minor emissions from gasoline and diesel fuel combustion by vehicles and equipment, as well as fugitive dust generated during clearing and grading activities. Fugitive dust produced from these activities would be controlled by BMPs (e.g., wet suppression) as provided in TVA's fugitive dust control plans.

#### 3.4.1.2.2 Operational Impacts – Title V Operating Permit

KIF maintains an existing Title V Operating Permit (No. 572149), which is required for facilities that have emissions exceeding the major source thresholds for criteria pollutants, hazardous air pollutants (HAPs), and in certain cases, GHGs. The existing KIF Title V permit includes emission limits (as established by local/state/federal regulation) as well as the data tracking, recordkeeping, and reporting measures to verify compliance.

Operations associated with Alternative C and support facilities would ultimately require significant modification of the most current Title V permit to incorporate the combined operation of gas and coal at the Kingston Reservation. The requirements set forth in the construction permit issued by TDEC would be incorporated into the Title V permit. As of the date of this SEIS, requirements would include the following, as applicable:

- 40 CFR 60, Subpart KKKK, is applicable to all stationary gas CT units with a heat input at peak load equal to or greater than 10 million British thermal units (MMBtu) per hour for which construction or modification is commenced after February 18, 2005. This subpart regulates nitrogen oxides ($NO_x$) and $SO_2$ emissions. There are options for compliance with the $SO_2$ limit, one of which is a

sulfur content in fuel limit of 0.06 pounds (lb) $SO_2$/MMBtu heat input. The $NO_x$ standard of this subpart would be met.[1]

- 40 CFR 60, Subpart TTTTa is applicable to CT electrical generating units commencing construction after May 23, 2023. Pursuant to Subpart TTTTa, each unit would satisfy the requirements of an “intermediate load” CT of 1,170 lb carbon dioxide ($CO_2$) per megawatt hour and an annual capacity factor of ≤40%. Subpart TTTTa is also applicable to coal-fired steam units that commence modification after May 23, 2023.
- 40 CFR 60, Subpart TTTT establishes emission standards and compliance schedules for the control of GHG emissions from a stationary CT that commences construction after January 8, 2014, but on or before May 23, 2023, or commences reconstruction after June 18, 2014, but on or before May 23, 2023, and has been determined to be applicable to the Kingston CC unit. Each affected stationary CT must not discharge any gases that contain $CO_2$ in excess of 1,000 lb $CO_2$ per megawatt hour.
- 40 CFR 60, Subpart UUUUb is applicable to existing fossil fuel–fired steam-generating units which commenced construction on or before May 23, 2023.
- 40 CFR 60, Subpart IIII is applicable to the black-start generators with requirements, including the use of ultra-low-sulfur diesel, that would be met, as well as certification of engines to appropriate standards and recordkeeping requirements.
- 40 CFR 63, Subpart YYYY establishes national emission limitations and operating limitations for HAP emissions from stationary combustion turbines located at major sources of HAP emissions, and requirements to demonstrate initial and continuous compliance with the emission and operating limitations.

The anticipated repairs and maintenance would be evaluated to determine whether any permit modifications are required. If needed, TVA would apply for and comply with any necessary permit modifications which would include applicable emission standards including analysis of GHG standards applicability for modified coal-fired steam electric generating units. If warranted, additional NEPA studies would be completed.

#### 3.4.1.2.3 Operational Impacts – Regulatory Requirements

With the continued operation of KIF in conjunction with the operation of KIG under Alternative C, the net decrease of regulated pollutants considered in the FEIS would not occur. Prevention of Significant Deterioration (PSD) review for KIG was not required due to this net decrease. TVA is currently in the early stages of preparing a PSD permit application, tentatively targeted for submittal as early as May 2026. The PSD permit application would include modeling analysis, which requires modeling proposed

[1] On January 15, 2026, the USEPA issued a final rule (Subpart KKKKa) for new, modified, or reconstructed combustion turbines that began construction, modification, or reconstruction after December 13, 2024, changing the NOx standards. The final rule would likely not apply to KIG units based on commencement of construction.

emissions for significant impacts and conducting cumulative impact analyses and assessing background concentrations as applicable. For cumulative analysis, models require emission inventories from all the sources in the impacted area, building downwash parameters, five years of representative meteorological data, and terrain data to analyze air quality impacts. PSD modeling would demonstrate that KIG in conjunction with the operation of KIF would not cause or contribute to a violation of NAAQS or exceed allowable increments. The PSD permit issued would set requirements for compliance with all applicable standards. In addition, Best Available Control Technology (BACT) evaluation would be performed in the PSD permit application. TVA would select state-of-the-art controls that will meet BACT for all PSD applicable gas process units. Once issued, the PSD permit would supersede related air permits for KIG.

Through completion and submittal of the PSD permit application, TVA would demonstrate compliance with all required elements of the PSD process, including protection of ambient air quality and adherence to NAAQS primary standards. As required by the CAA (40 CFR part 50), NAAQS are developed to protect human health, including the health of sensitive or at-risk groups, with an adequate margin of safety.

Continued operation under Alternative C would not cause or contribute to exceedances of primary NAAQS standards, as TVA would comply with all applicable federal and state regulations stipulated in current and future permits, thereby ensuring protection of public health.

#### 3.4.1.2.4 Summary of Air Quality Impacts

Implementation of Alternative C would negate the emissions reductions associated with the retirement of KIF as presented in Section 3.7.2.3.1.2 of the FEIS. Regional air quality impacts of Alternative C would remain within the limits set by applicable permits and air quality standards. The coal units would continue to operate at historical emissions levels as discussed in Table 3.7-3 of the FEIS, which is incorporated by reference.

The new gas units would incorporate state-of-the-art emission control technology. Table 3-3 provides a summary of the maximum preliminary annual emission estimates for the new gas units for determining PSD applicability.

Potential emissions from the gas units would exceed PSD significance thresholds, as shown in Table 3-3. Therefore, PSD review and permitting would be triggered.

**Table 3-3. Maximum Project Annual Emission Estimates and Prevention of Significant Deterioration Significant Emission Rates for New Gas Units**

| Pollutant | Emission Increases (tons/year) | Significant Emission Rates (tons/year) | PSD Triggered |
|---|---|---|---|
| CO | 392 | 100 | Yes |
| $NO_x$ | 1,172 | 40 | Yes |
| $SO_2$ | 22 | 40 | Yes |
| Filterable PM | 163 | 25 | Yes |
| $PM_{10}$ | 220 | 15 | Yes |
| $PM_{2.5}$ | 220 | 10 | Yes |
| VOC | 91 | 40 | Yes |
| Pb | 0.02 | 0.6 | No |
| Sulfuric Acid Mist | 0.23 | 7 | No |
| $CO_2e$ | 4,362,492 | 75,000 | Yes |

Note: These are preliminary estimates and may change with the PSD application process.

Key: CO = carbon monoxide; $CO_2e$ = carbon dioxide equivalent; $NO_x$ = nitrogen dioxide; Pb = lead; PM = particulate matter; $PM_{2.5}$ = particulate matter less than 10 microns in diameter; $PM_{10}$ = particulate matter less than 10 microns in diameter; PSD = Prevention of Significant Deterioration; $SO_2$ = sulfur dioxide; VOC = volatile organic compounds.

Compliance with permit requirements would be protective of ambient air quality and would ensure the operation of KIG along with the continued operation of KIF does not cause or contribute to NAAQS violations.

### 3.4.2 Greenhouse Gases / Climate Change

#### 3.4.2.1 Affected Environment

GHGs and climate change elements relevant to the Kingston Reservation are generally discussed in FEIS Section 3.7.1.1.8. TVA identified new information related to the characterization of the affected environment for GHGs / climate change. Therefore, FEIS Section 3.7.1.1.8 is incorporated by reference, except as noted below:

- FEIS Section 3.7.1.1.8.1, Greenhouse Gas Emissions: Updated Global Warming Potential (GWP) as per 40 CFR 98, Table A-1 to Subpart A: $CH_4$ (methane) GWP = 28, $N_2O$ (nitrous oxide) GWP = 265, and $SF_6$ (sulfur hexafluoride) GWP = 23,500.
- FEIS Section 3.7.1.1.8.3, GHG and Climate Assessment Methodology, regarding specific references to GHG Life Cycle Analysis (LCA) for FEIS alternatives: This analysis is not applicable to this SEIS due to recent executive actions, detailed in the next bullet point.
- FEIS Section 3.7.1.1.8.4, Executive Orders Addressing GHG Emissions Reductions:

- Since the completion of the FEIS in 2024, there have been updates to EOs and other actions under the Trump Administration. On January 20, 2025, President Trump issued a series of Presidential Actions related to climate change and GHGs. EO 14148, Initial Recension of Harmful Executive Orders, revoked EOs 13990 and 14008. EO 14154, Unleashing American Energy, directed the Council on Environmental Quality (CEQ) to propose rescinding its NEPA-implementing regulations. On February 25, 2025, CEQ published an Interim Final Rule to remove its NEPA regulations from the CFR; the rule became effective on April 11, 2025.
- EO 14154 also disbanded the Interagency Working Group (IWG) on the Social Cost of Greenhouse Gases, which was established pursuant to EO 13990, as well as any guidance, instruction, recommendation, and documents issued by the IWG. EO 14154 directs the administrator of the USEPA to issue guidance to address the Social Cost of Carbon, including consideration of eliminating the calculation from any federal permitting or regulatory decision. Prior to further guidance issued by the USEPA, EO 14154 directs agencies to "ensure estimates to assess the value of changes in greenhouse gas emissions resulting from agency actions, including with respect to the consideration of domestic versus international effects and evaluating appropriate discount rates, are, to the extent permitted by law, consistent with the guidance contained in Office of Management and Budget's Circular A-4 of September 17, 2003 (Regulatory Analysis)."

#### 3.4.2.2 Environmental Consequences

Climate change is a global issue that results from several factors, including the release of GHGs, land use management practices, and the albedo effect (the reflectivity of various surfaces, including reflectivity of clouds). Climate change may result in altered weather patterns, including increases in storm intensity and frequency. This can lead to increased precipitation, which can result in more frequent and larger flooding events. The KIF facility is located along the Clinch and Emory Rivers. Although facilities are outside the 100-year floodplain, larger flooding events that may result from climate change could result in flooding outside the 100-year floodplain. In addition, these same storm events may result in more frequent and longer sustained wind events that can result in downed power lines and impacts to transmission.

For the purposes of this assessment, the evaluation of climate change impacts focuses on the net change in GHG emissions resulting from the proposed alternative.

Under Alternative C, TVA would continue to operate KIF coal-fired units in conjunction with the construction and operation of KIG and the BESS. Based on operational emissions data from Table 3.7-3 of the FEIS and current GWPs established in Table A-1 of 40 CFR 98, the estimated change in annual GHG emissions and the associated $CO_2e$ emissions increase at the Kingston Reservation from implementation of Alternative C is summarized below. The net emissions increase would occur in the first full year after KIG would begin operation (anticipated in 2028) and is characterized as

the net change from existing baseline conditions resulting from Alternative C, with the change being the combined operation of KIF and KIG:

- Increase of approximately 1,668,738.5 tons per year of $CO_2$, 117.8 tons per year of $CH_4$, and 40.9 tons per year of $N_2O$.
- Based on emissions conversions using GWPs, an increase of approximately 10,839 tons per year $CO_2e$ from $N_2O$ and an increase of 3,298 tons per year $CO_2e$ from $CH_4$.
- Total net increase of 1,682,875.4 tons per year $CO_2e$ from GHGs.

The values above are derived from the "Total Kingston CC/aero CT Plant Operational Emissions" column in Table 3.7-3 of the FEIS and do not include the operational emissions from KIF because they are integrated into the current baseline condition. The PSD requirements for NAAQS pollutants may affect GHG emissions estimates, potentially resulting in reduced emissions from those reported for KIF in Table 3.7-3 of the FEIS. The net GHG emissions increases also do not reflect any fluctuations in operation of KIG with respect to capacity factors or compliance with 40 CFR 60, Subpart TTTT and TTTTa.

Emissions of $CO_2$ from energy consumption are being used as an operational GHG emissions geographic comparison analysis, as those data are most readily available and consistent across state, U.S., and global data sources. Based on the most recent estimates of $CO_2$ emissions by the U.S. Energy Information Administration (USEIA), total emissions of $CO_2$ for Tennessee were 88.5 million metric tons in 2023 (USEIA 2025a). The most recent data for emissions of $CO_2$ from all TVA-owned and operated units, including TVA's purchased power, and Renewable Energy Credit retirement adjustments, which reduce $CO_2$ emissions, were approximately 49 million metric tons (TVA 2024d).

The most recent annual $CO_2$ emissions for the U.S. caused by energy consumption were 4,772 million metric tons of $CO_2$ in 2024 (USEIA 2025b). The most recent annual global $CO_2$ emissions caused by energy consumption were 37,079 million metric tons of $CO_2$ in 2023 (USEIA 2025c). The net near-term increase in emissions of approximately 1.51 million metric tons of $CO_2$ per year associated with implementation of Alternative C (as converted from 1,668,738.5 tons $CO_2$ per year identified above) would represent an increase of approximately 3.08 percent of total TVA system-wide $CO_2$ emissions, approximately 1.71 percent of total statewide emissions, approximately 0.03 percent of the total U.S. emissions, and approximately 0.004 percent of the total global GHG emissions. Implementation of Alternative C would negate the emissions reductions associated with the retirement of KIF as presented in Section 3.7.2.3.1.3 of the FEIS. Therefore, the continued operation of KIF in conjunction with the operation of KIG under Alternative C would represent an increase in future estimated GHG emissions, particularly in the context of its contribution to TVA's system-wide GHG emissions and Tennessee's GHG emissions.

## 3.5 Biological Environment

### 3.5.1 Vegetation

The federal and state regulatory setting for vegetation relevant to the Kingston Reservation are discussed generally in FEIS Section 3.8.1, which is incorporated by reference.

#### 3.5.1.1 Affected Environment

Vegetation communities in the Kingston Reservation are described in Section 3.8.1.1.1 of the FEIS. TVA did not identify new information related to the characterization of the affected environment for vegetation. Therefore, FEIS Section 3.8.1.1.1 is incorporated by reference.

Vegetation communities in and around the Kingston Reservation are largely a function of the land use history of the facility, which has been heavily disturbed by the construction, operation, and maintenance of the generation and transmission infrastructure present. The dominant community is ruderal vegetation, characterized by sparse, weedy species colonizing highly disturbed areas. Other vegetation communities in the reservation include herbaceous cover (including a small extent of herbaceous wetland), manicured lawn, early successional vegetation, and forest cover (including deciduous, mixed, early successional, mesic, and forested wetlands).

As described in Section 3.8.1.1.1 and Appendix F of the FEIS, most of the Kingston Reservation consists of herbaceous vegetation dominated by nonnative plant species that possess little conservation value and have no potential to support state or federally listed plant species or unique plant communities. Nine nonnative invasive plant species classified by the Tennessee Invasive Plant Council as ‘Established Threats’ (TIPC 2017) occur on the reservation, including autumn olive (*Elaeagnus umbellata*), Chinese privet (*Ligustrum sinense*), Japanese honeysuckle (*Lonicera japonica*), Japanese stiltgrass (*Microstegium vimineum*), Johnson grass (*Sorghum halepense*), kudzu (*Pueraria montana*), multiflora rose (*Rosa multiflora*), sericea lespedeza (*Lespedeza cuneata*), and tree-of-heaven (*Ailanthus altissima*).

Similarly, as described in the FEIS, forested vegetation communities on the Kingston Reservation are considered degraded habitats. They are heavily fragmented by developed/industrial areas, contain small diameter trees (a result of previous site disturbance), and are degraded by nonnative species infestations.

#### 3.5.1.2 Environmental Consequences

The proposed alternative would have minimal impacts on native vegetation communities because:

- Updates to the KIF Powerhouse would occur inside the existing building.
- Upgrades to WWT systems mainly involve constructing new facilities on developed (disturbed) lands.

- Modifications to transmission and electrical systems would be restricted to areas within existing TVA facilities or ROWs where vegetation has been previously disturbed.
- Water intake upgrade options under consideration do not involve physical land disturbance.
- CCR and brine salts would be disposed of at existing facilities and would not generate new land disturbance. CCR ash products would be stored in the existing KIF ash landfill and brine salts would be disposed of in the existing landfill or at a permitted off-site landfill.
- Vegetated areas in the preliminary limits of disturbance mainly include vegetation types of low ecological sensitivity, such as ruderal vegetation, degraded herbaceous vegetation, and manicured lawns.

Although the boundaries for the limits of disturbance overlap with small amounts of areas with trees (less than 1 acre), TVA would avoid direct impacts to these areas, to the extent practicable. Specifically, TVA would seek to avoid tree removal in limits of disturbance for the FGD to VIP piping (Option 2) and Piping Corridor 2 on Figure 2-1.

Alternative C would result in minor direct and indirect impacts to vegetation as a result of ground disturbance and placement of facilities and structures.

### 3.5.2 Wildlife

#### 3.5.2.1 Affected Environment

Terrestrial wildlife communities in the Kingston Reservation are described in Section 3.8.2.1.1 and Appendix F of the FEIS. TVA did not identify new information related to the characterization of the affected environment for wildlife. Therefore, FEIS Section 3.8.2.1.1 is incorporated by reference.

Wildlife species assemblages of the Kingston Reservation are shaped by the types of habitat present, and the condition of those habitats. Vegetation communities in the reservation are largely fragmented and degraded. The herbaceous and forested habitats are representative of ecosystems that are widely distributed in the region. Habitats are predominantly suitable for generalist species.

Field surveys conducted periodically between 2011 and 2020 show that the Kingston Reservation supports a diverse assemblage of common wildlife species, as documented in the FEIS. Forty-two bird species, five turtle species, and two mammals have been recorded in the vicinity of the Kingston Reservation (refer to Table 3.8-12 in the FEIS). The most frequently detected bird species include rock dove (*Columba livia*), double-crested cormorant (*Nannopterum auritum*), American coot (*Fulica americana*), American crow (*Corvus brachyrhynchos*), mallard (*Anas platyrhynchos*) and blue jay (*Cyanocitta cristata*). Several other species likely occur on the Kingston Reservation, including common amphibians, snakes, woodland birds, and small- to medium-sized mammals.

One osprey (*Pandion haliaetus*) nest is within the limits of disturbance for the BATW, located west of the CWIS on a transmission line structure (refer to Figure 3.8-5 and Section 3.8.4.1.1.1 in the FEIS). Two other osprey nests are near the limits of disturbance, including one on a lighting structure near the coal pile and another on a transmission line structure on the edge of the Clinch River (refer to Figure 3.8-5 and Section 3.8.4.1.1.1 in the FEIS).

#### 3.5.2.2 Environmental Consequences

The proposed alternative would have negligible direct impacts on terrestrial wildlife because the small reduction in wildlife habitat involves habitat types of low ecological value (ruderal vegetation, degraded herbaceous vegetation, and manicured lawns). As described in Section 3.5.1.2 (Vegetation), TVA would avoid forested areas, to the extent practicable.

Activities associated with the proposed alternative would not interfere with the structures (transmission and lighting) that support osprey nests in the limits of disturbance for Alternative C. Upgrades to achieve facility ELG would mainly involve the construction of new facilities on previously disturbed lands and would avoid forested areas, as described in Section 3.5.2. Additionally, ospreys nesting in the Kingston Reservation occupy an industrial area and are considered tolerant to potential disturbance from construction noise and increased presence of people. Therefore, no direct or indirect impacts to ospreys or their habitat would be expected.

Overall, short-term indirect effects may occur during construction because of construction noise and increased presence of workers. Effects could include short-term displacement and localized avoidance of work areas. These effects would be minor due to the low quality of adjacent habitats that are occupied by adaptable, disturbance tolerant species.

No additional direct or indirect impacts would be anticipated during continued operation of KIF.

### 3.5.3 Aquatic Life

The federal and state regulatory setting for aquatic life relevant to the Kingston Reservation are discussed generally in FEIS Section 3.8.3, which is incorporated by reference.

#### 3.5.3.1 Affected Environment

Aquatic communities and surface water habitats in and around the Kingston Reservation are described in Section 3.8.3.1.1 and Appendix E of the FEIS. Delineations of surface waters were completed in 2023, and a jurisdictional determination was received from the U.S. Army Corps of Engineers in December 2023 (Appendix E of the FEIS). TVA did not identify new information related to the characterization of the affected environment for aquatic life. Therefore, FEIS Section 3.8.3.1.1 is incorporated by reference.

The Kingston Reservation is on a peninsula formed by the confluence of the Clinch and Emory Rivers. As described in Section 3.8.3.1.1.1 of the FEIS, other aquatic habitats on the reservation include intermittent streams, ephemeral streams, wet weather conveyances (WWCs), and ponds (FEIS Figure 3.6-3). Other WWCs include features such as non-jurisdictional ditches and swales. Surface water features in the limits of disturbance are shown in Figure 3-2 and described in Table 3-1 and Table 3-2.

There is an existing cooling water intake, north of the KIF on the Emory River, and a cooling water discharge into the Clinch River, south of the fossil plant. The cooling water intake channel forms an approximately 49-acre embayment of the Emory River (Cory Chapman, TVA, personal communication, November 14, 2025). The northern end of the embayment is entirely concrete and riprap. The southern end of the embayment contains habitat similar to the surrounding reservoir, a mix of hard pan clay banks, gravel, and sand with occasional root wads from a strip of undeveloped wooded area along the bank. Because of the embayment's orientation relative to the flow of the surrounding reservoir, benthic habitat would consist of a substrate with higher concentrations of detritus and silt than the reservoir. Aquatic habitat within the intake channel is characterized as poor because more than half of the embayment is riprap and concrete, macrophytes are absent, and in-stream cover is limited. Direct samples of the aquatic community in the intake channel have not been conducted due to presence of the intake skimmer wall; however, the fish composition of this area would generally reflect the surrounding area, which has been routinely sampled. Species richness and abundance would likely be lower in the intake channel due to the poor habitat condition.

Fish and benthic macroinvertebrate surveys were conducted on the Clinch River, in the vicinity of the Kingston Reservation, in summer and fall 2020. Field survey results are summarized in Section 3.8.3.1.1.2 of the FEIS and are incorporated by reference. Multi-metric reservoir indices for fish and benthic macroinvertebrate assemblages on the Emory and Clinch Rivers in the vicinity of the reservation generally correspond to scores that are indicative of "good" ecological health. However, three species of aquatic nuisance species have become established in the Tennessee River system and have been observed upstream and downstream of the Kingston Reservation: hydrilla (*Hydrilla verticillata*), Eurasian milfoil (*Myriophyllum spicatum*), and spiny naiad (*Najas marina*).

Previous impingement and entrainment studies conducted by TVA are described in Section 3.8.3.1.1.3 of the FEIS and are incorporated by reference.

### 3.5.3.2 Environmental Consequences

No temporary or permanent effects to aquatic life would occur from the updates to the KIF Powerhouse, the modifications to transmission and electrical systems, and the ongoing disposal of CCR and brine salts at existing facilities. These activities do not interact with surface water features, and do not involve ground-disturbing activities.

The new BATW recirculation system upgrades to achieve facility ELG are new facilities that would mainly involve the construction of infrastructure on previously disturbed lands located within the same BADW footprint that was analyzed in the BADW FEA. As part of these upgrades, TVA would be required to install wastewater treatment technologies on

the FGD, BATW, and CRL wastewater discharges. These activities would require new piping to connect the FGD, BATW, and CRL facilities to the proposed VIP water treatment footprint. Although the boundaries for the limits of disturbance overlap with some surface water features, TVA would avoid direct impacts to these features, to the extent practicable. Specifically, TVA would seek to avoid:

- Two WWCs in the limits of disturbance for the FGD to VIP piping (Option 1) on Figure 2-1.
- One WWC in the limits of disturbance for Piping Corridor 1.
- Two WWCs and three man-made stormwater ponds in the limits of disturbance for the FGD to VIP piping (Option 2). As described in Section 3.8.3.1.1.1 of the FEIS, one of these WWCs (exempted perennial reach) can support aquatic life due to persistent flow originating from leakage in the fire protection system of the switchyard. It discharges to the three ponds before being returned to the Clinch River. Snail eggs and leaches were observed in this reach during previous field surveys.
- Three WWCs in the limits of disturbance for Piping Corridor 2.

No direct impacts to aquatic life would be expected from required facility upgrades to achieve ELG compliance with implementation of avoidance and minimization measures. Should avoidance measures be infeasible, TVA would undertake the required consultation and obtain necessary permits, prior to construction. Temporary, indirect impacts could occur during ground-disturbing construction activities in proximity to WWCs, but these would be minimized by implementing standard BMPs from the project SWPPP and TVA's Guide for Environmental Protection and Best Management Practices (TVA 2022). Minor indirect effects to aquatic life would occur given the low ecological sensitivity of WWCs in the limits of disturbance.

Depending on the option selected to achieve CWA Section 316(b) compliance, upgrades to the CWIS could result in disturbance of aquatic habitat in proximity to the intake during retrofitting and construction. However, the upgrades are intended to reduce the risk of impingement and entrainment for aquatic organisms, which would correspond to a permanent, positive effect for aquatic life compared to existing operations. Although compliance options would undergo a thorough evaluation of site-specific impacts, possible adverse effects from the CWIS upgrades are listed below.

*Through-Screen Velocity of 0.5 Feet per Second*

This option would involve either a reduction in operation flow or the replacement of existing pumps to reduce the intake flow rates. Physical modification of the CWIS would not be required to implement either of these options; therefore, no effects to aquatic habitats or aquatic life would occur.

*Modified Traveling Screens*

This option would involve replacing existing screens with new traveling screens during a scheduled outage. The new screens would fit within the CWIS' housing, thus avoiding the need for structural modifications. However, dewatering the screens with stop logs would likely be required prior to installation of new screens. This option would also require the construction of a fish return system, which would consist of a PVC pipe or flume installed on support pilings. Pilings would be installed above the ordinary high-water mark (outside the intake structure) and exact placement of the pilings and location of discharge would be confirmed as part of detailed design. Localized, temporary disturbance and degradation of aquatic habitat within the intake channel would result from construction activities and dewatering. Small, localized but permanent flow alterations could also occur in the intake channel, at the discharge site. Impacts to aquatic life would be minor.

*System of Technologies*

This option would involve a combination of technologies, operational measures, and management practices. TVA would consider measures such as barrier nets, variable speed pumps, and behavioral deterrents, among other possible options. Effects would vary depending on the option retained. In general, short-term temporary disturbance and degradation of aquatic habitat would be expected if dewatering or construction/retrofitting activities are required in the intake channel. The use of barrier nets and deterrents (e.g., strobe lights, air bubble curtains, or acoustic devices) would result in functional aquatic habitat loss within the intake channel due to physical exclusion or avoidance behavior. Impacts to aquatic life would be minor given the low ecological sensitivity of the intake channel.

*Impingement Mortality Performance Standard*

This option would require TVA to demonstrate that KIF has a 12-month average impingement mortality rate of no more than 24 percent for non-fragile species. Monitoring requirements would likely necessitate the deployment of monitoring infrastructure, such as fish collection and sampling systems, as well as in-water inventory work or vessel activity. The need for updated technologies, operational measures, or management practices would be informed by monitoring results. Depending on the study's findings, iterative retrofitting and upgrades could be implemented as part of an adaptive management approach. In general, if upgrades are deemed necessary, they would likely entail one or more of the options described above. Accordingly, impacts to aquatic life would be minor. Effects are likely to extend over a longer duration, which would include a minimum 12-month monitoring period and possibly the iterative implementation of the CWIS updates.

Alternative C is likely to have minor adverse effects to aquatic life from retrofitting or construction activities associated with the CWIS upgrades. Anticipated adverse effects would be short-term and reversible, except for a possible small permanent flow alteration in the intake channel if a modified traveling screens and fish return system is

retained as the compliance solution. Regardless of the option retained, upgrades to the CWIS would result in permanent benefits (compared to existing operations) by reducing the risk of impingement and entrainment.

### 3.5.4 Threatened and Endangered Species

The federal and state regulatory setting for threatened and endangered species relevant to the Kingston Reservation are discussed generally in FEIS Section 3.8.4, which is incorporated by reference.

#### 3.5.4.1 Affected Environment

Threatened, endangered, and other protected species with potential to occur on the Kingston Reservation are described in Section 3.8.4.1.1 of the FEIS, which is incorporated by reference. Appendix D provides an updated summary of the 77 state and federally threatened, endangered, and other protected species identified from a desktop review of the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) tool (USFWS 2025a), the TDEC rare species list (TDEC 2025b), and TVA's Regional Natural Heritage Database (TVA 2025b). Appendix D includes an assessment of the likelihood of occurrence of each species in the Kingston Reservation. For aquatic species, this assessment also considered the potential for species to occur within the cooling water intake channel. The cooling water intake channel extends from the skimmer wall (at the junction with the Emory River) to the CWIS. Table 3-4 summarizes the listed and protected species with potential to occur in the Kingston Reservation.

**Table 3-4. Threatened, Endangered, and Other Protected Species With Potential to Occur in the Kingston Reservation**

| Common Name | State Rank and Listing Status[1] | Federal Listing Status[1] | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel and Impact | Reference |
|---|---|---|---|---|---|
| **Birds** | | | | | |
| Bachman's Sparrow *Peucaea aestivalis* | S1B, E | -- | Dry open pine or oak woods; nests on the ground in dense cover. | **Possible**; suitable habitat present, no individuals observed, not documented in TVA's Natural Heritage Database. Would be found in dense deciduous forested areas around the perimeter of the reservation. **No impacts would be anticipated.** | TDEC 2025b; Appendix F in FEIS |
| Swainson's Warbler *Limnothlypis swainsonii* | S3, D | -- | Mature, rich, damp, deciduous floodplain and swamp forests. | **Possible**; forested habitats adjacent to the Clinch and Emory Rivers may provide suitable habitat, but no individuals observed during field surveys**.** Not documented in TVA's Natural Heritage Database. **No impacts would be anticipated.** | TDEC 2025b; Appendix F in FEIS |
| Bald Eagle[2] *Haliaeetus leucocephalus* | -- | DL | Forested areas adjacent to large bodies of water for nesting habitat. Tall, mature coniferous or deciduous trees that afford a wide view of the surroundings are used as nest trees and roost trees. | **Likely**; suitable perching/foraging habitat along the boundary of the reservation, including trees and structures along Clinch and Emory Rivers. An active nest is found along the southeastern edge of reservation near the KIG construction site and is being routinely monitored. Others are observed nearby in shoreline trees and flying over the Clinch River. TVA's Natural Heritage Database includes one verified extant population in county and within a 3-mile radius of KIF. TVA would continue to carry out monitoring and conservation measures in accordance with site-specific bald eagle permitting for KIG and the Bald and Golden Eagle Protection Act. **Minor to no impacts would be anticipated.** | USFWS 2025a; TVA 2025b; Appendix F in FEIS |
| **Mammals** | | | | | |
| Gray bat *Myotis grisescens* | S2, E | LE | Cave obligate year-round; frequents forested areas; migratory. | **Not Likely**; Phase 2 presence/absence survey conducted in 2023 did not detect the species on the reservation. However, roosting and foraging habitat observed during field surveys. Verified extant within Roane County. **No effect would be anticipated.** | USFWS 2025a; TVA 2025b; TVA 2024e, Appendix F in FEIS |

| Common Name | State Rank and Listing Status[1] | Federal Listing Status[1] | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel and Impact | Reference |
|---|---|---|---|---|---|
| Indiana bat<br>*Myotis sodalis* | S1, E | LE | Wet meadows, damp woods, and uplands, including abandoned structures and sinkhole fissures/karst features; statewide. | **Not Likely**; Phase 2 presence/absence survey conducted in 2023 with sufficient effort to determine probable absence on the reservation. There are no records of the species within 3 miles of the reservation in the TVA Natural Heritage Database, and there are no known hibernacula for the species within Roane County. However, roosting and foraging habitat observed during field surveys. **No effect would be anticipated.** | USFWS 2025a; TVA 2024e, Appendix F in FEIS |
| Northern long-eared bat<br>*Myotis septentrionalis* | S1S2, E | LE | A forest bat whose summer roosts may include caves, mines, live trees, and snags; hibernates in caves and mines, often using small cracks and fissures. | **Not Likely**; Phase 2 presence/absence survey conducted in 2023 with sufficient effort to determine probable absence on the reservation. However, roosting and foraging habitat observed during field surveys, and species is verified extant within Roane County (outside the reservation). **No effect would be anticipated.** | USFWS 2025a; TVA 2025b; Appendix F in FEIS |
| Tricolored bat<br>*Perimyotis subflavus* | S2S3, T | PE | Generally associated with forested landscapes but may roost near openings. | **Not likely**; Phase 2 presence/absence survey conducted in 2023 with sufficient effort to determine probable absence on the reservation. However, roosting and foraging habitat was observed during field surveys. Occurs outside the reservation, in Roane County. **No effect would be anticipated.** | UFWS 2025a; TVA 2025b; TVA 2024e, Appendix F in FEIS |
| **Reptiles** | | | | | |
| Eastern Slender Glass Lizard<br>*Ophisaurus attenuatus longicaudus* | S3, T | -- | Dry upland areas including brushy, cut-over woodlands and grassy fields; nearly statewide but obscure; fossorial. | **Possible**; suitable habitat observed, but no incidental observations of the lizard were made during field surveys, and no records are documented in TVA's Natural Heritage Database. Would be found in areas with dense grass/herbaceous vegetation. **No impacts would be anticipated.** | TDEC 2025b; Appendix F in FEIS |

| Common Name | State Rank and Listing Status[1] | Federal Listing Status[1] | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel and Impact | Reference |
|---|---|---|---|---|---|
| **Fish** | | | | | |
| Lake Sturgeon *Acipenser fulvescens* | S1, T | -- | Inhabits riverbeds and lakes. | **Possible**; highly mobile species, recorded 0.4 and 2.7 river miles downstream of the fossil plant discharge. Habitat in the intake channel is of marginal ecological value. TVA's Natural Heritage Database includes one verified extant population in watershed boundary. Species would be found in main sections of Clinch and Emory Rivers. Minor impacts from temporarily altered water quality during water intake structure upgrade; potential benefit compared to existing operations from permanent reduction in impingement risk. | TVA 2025b; TVA 2024a, Appendix F in FEIS |
| **Plants** | | | | | |
| Schreber's Aster *Eurybia schreberi* | S1, S | -- | Mesic woods and seepage slopes. | **Possible**; limited suitable habitat potentially present, no individuals observed during field surveys. TVA Natural Heritage Database includes one verified viable population within a 5-mile radius of reservation. Would be found in mesic woods, near Clinch River. **No impacts would be anticipated.** | TVA 2025b; Appendix F in FEIS; iNaturalist 2025 |
| **Crustacean** | | | | | |
| Valley Flame Crayfish *Cambarus deweesae* | S1, E | -- | Primary burrower; open areas with high-water tables; northern Ridge & Valley. | **Possible**; potentially suitable habitat, no individuals observed during field surveys. Occurrence of a possibly historical record of *Cambarus sp.* is documented in the TVA Natural Heritage Database. Would be found adjacent to Clinch and Emory Rivers where water table is high. **No impacts would be anticipated.** | TVA 2025b; Appendix F in FEIS |

| Common Name | State Rank and Listing Status[1] | Federal Listing Status[1] | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel and Impact | Reference |
|---|---|---|---|---|---|
| **Insect** | | | | | |
| Monarch Butterfly *Danaus plexippus* | -- | PT | Milkweeds and flowering plants. | **Possible**; suitable habitat, but no individuals observed during field surveys and no occurrences recorded in TVA Natural Heritage Database. Identified in IPaC. Would be found near roadsides, open areas such as fields, transmission ROWs, and wet areas with flowering species. **Minor impacts, if any, from clearing herbaceous or early successional vegetation – not likely to jeopardize continued existence of the monarch butterfly**. | USFWS 2025a; USFWS 2025b; Appendix F in FEIS |

Key:
[1] S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Apparently Secure; S5 = Secure; SX = Presumed Extirpated; D= Deemed in Need of Management; DM= Delisted, still being monitored; E= Endangered; LE= Listed Endangered; LT= Listed Threatened; C= Candidate; PS= Partial Status; T= Threatened; EXPN = Experimental Population, Non-Essential; E-P= Endangered/Possibly Extirpated.; E-PT= Endangered/Proposed Threatened; RARE= Rare; SLNS= State listed, no status; S= Special Concern; S-P= Special Concern/Possibly Extirpated.; S-CE= Special Concern/Commercially Exploited; T-CE= Threatened/Commercially Exploited
[2] Protected under Bald Eagle and Golden Eagle Protection Act.

#### 3.5.4.1.1 Terrestrial Species

Bald eagle (*Haliaeetus leucocephalus*) is likely to occur periodically, having been observed nearby perched in shoreline trees or flying over the Clinch River (as noted in the FEIS). A bald eagle nest was found in 2024 on the Kingston Reservation along the southeast perimeter of the KIG site. In August 2025, TVA submitted an application to the U.S. Fish and Wildlife Service for a bald eagle disturbance permit, which includes conservation measures and monitoring throughout the nesting season, in accordance with the Bald and Golden Eagle Protection Act.

The whooping crane (*Grus americana*) population that overlaps the Kinston Reservation is categorized as a nonessential experimental population. Migration habitat (shallow marshes) does not exist within the reservation (as noted in the FEIS); therefore, it is unlikely that individuals are present.

Bachman's sparrow (*Peucaea aestivalis*) and Swainson's warbler (*Limnothlypis swainsonii*) could occur on the reservation during the breeding season. If present, they would occur in forested habitats around the periphery of the reservation. Forested areas in the limits of disturbance for Alternative C may represent potential suitable habitat for these species.

As depicted in Figure 3.8-5 of the FEIS, suitable roosting and foraging habitats are available on the Kingston Reservation for Indiana bat, northern long-eared bat, and tricolored bat, and suitable foraging habitat may be available for gray bat. Suitable roosting habitat is not available for gray bat, which typically do not roost in trees. Less than 1 acre (0.6 acres) of forest is located within the limits of disturbance for Alternative C. This patch of forest is unsuitable roosting habitat for Indiana bat and northern long-eared bat but is suitable for tricolored bat. Presence/absence mist net surveys were conducted in 2023, with sufficient survey effort to determine the probable absence of Indiana bat, northern long-eared bat, and tricolored bat on the Kingston Reservation (as noted in the FEIS). Gray bats were not detected during presence/absence surveys, and there are none known within 3 miles of the Reservation (TVA 2025b).

Occurrence of eastern slender grass lizard (*Ophisaurus attenuatus longicaudus*) is possible in the Kingston Reservation because of the presence of suitable habitats, which include cut-over woodlands and grassy fields. Patches of grassy and early-successional vegetation around the Kingston Reservation could provide potentially suitable habitat. However, there are no records of the eastern slender glass lizard within 10 miles of the Kingston Reservation. Because of the heavy disturbance within the limits of disturbance for Alternative C, it is unlikely that this species is present in the affected area.

Occurrence of monarch butterfly (*Danaus plexippus*) in the Kingston Reservation is possible because of the presence of suitable habitat, which include milkweed and other herbaceous flowering plants. These habitats mainly occur within the reservation’s transmission line corridors (as noted in the FEIS) but could also occur along roads

within the limits of disturbance for Alternative C, in particular in areas identified for the FGD to VIP piping (Option 2) and Piping Corridor 2.

As described in Section 3.8.4.1.1.5 and Appendix F of the FEIS, field surveys conducted in 2019 and 2023 determined that most vegetated habitats on the Kingston Reservation have no potential to support state-listed or federally listed plant species. Although no observations have been documented in the Kingston Reservation, occurrence of Schreber's aster (*Eurybia schreberi*) is possible in patches of mesic forest. The limits of disturbance for Alternative C do not include mesic forest; therefore, it is unlikely that Schreber's aster is present in the affected area.

#### 3.5.4.1.2 Aquatic Species

As described in Section 3.8.4.1.1 of the FEIS, state and federally listed fish species are likely to occur in the vicinity of the Kingston Reservation, in the Clinch and Emory Rivers where suitable habitat is present. Recent fish surveys conducted in proximity to the Kingston Reservation recorded only one listed species, the state-listed lake sturgeon (*Acipenser fulvescens*). Lake sturgeon were caught at two sites on the Clinch River, approximately 0.4 and 2.7 river miles downstream of the fossil plant discharge. Available evidence from past field surveys suggests that no additional listed fish species occur upstream or downstream of the KIF Plant (TVA 2021). Listed species may appear periodically in the intake channel (i.e., between the skimmer wall at the junction with the Emory River and the CWIS). However, habitat is considered poor (refer to Section 3.5.3.1 of this SEIS for a description) and the intake channel would be of limited ecological value for the species.

Among aquatic invertebrates, suitable habitat is potentially present on the Kingston Reservation for the valley flame crayfish (*Cambarus deweesae*), per information included in Section 3.8.4.1.1.6 of the FEIS. The valley flame crayfish could be present along the margins of the Clinch and Emory Rivers, but these areas are outside of the limits of disturbance for Alternative C. It is unlikely that the species is present in the affected area.

The FEIS determined that suitable habitat for federally or state-listed mollusks, which predominantly consists of sand and gravel substrates, is not present in the Kingston Reservation (Section 3.8.4.1.1.6 in the FEIS). The presence of federally or state-listed freshwater mollusks in the limits of disturbance for Alternative C is therefore considered very unlikely.

Anthony’s riversnail (*Athearnia anthonyi*) could occur near the Kingston Reservation in shallow areas of the Clinch and Emory Rivers with sand and gravel substrates; however, no potentially suitable habitat is present in the limits of disturbance for Alternative C.

### 3.5.4.2 Environmental Consequences

#### 3.5.4.2.1 Terrestrial Species

As described in Section 3.5.2 of this SEIS, TVA would avoid forested areas to the extent possible. Accordingly, no effects are anticipated for avian species associated with forested habitats, including Bachman's sparrow and Swainson's warbler.

Although the project boundaries include a small amount of forested area that has been identified as potentially suitable roosting and foraging habitat for tricolored bat, and suitable foraging habitat for Indiana bat and northern long-eared bat, TVA would avoid direct impacts to trees to the extent practicable. Specifically, TVA would seek to avoid tree removal in limits of disturbance for the FGD to VIP piping (Option 2) and Piping Corridor 2. Based on the lack of suitable roosting habitat for Indiana bat and northern long-eared bat within the limits of disturbance for Alternative C, the negative results during the 2023 presence/absence surveys (in accordance with USFWS survey guidelines), and the abundance of foraging habitat surrounding the Kingston Reservation, TVA has determined that Alternative C would have no effect on Indiana bat, northern long-eared bat, or gray bat. TVA has also determined that Alternative C is not likely to jeopardize the continued existence of the tricolored bat, given the amount of potentially suitable habitat to be removed. Relevant project-specific conservation measures that were identified during analysis of proposed activities are reflected in the TVA Bat Strategy Project Screening Form (Appendix C), and they would be implemented as part of the proposed alternative.

Considering the conclusions presented in Sections 3.8.4.2.2 and 3.8.4.2.3 of the FEIS, which are incorporated by reference, even if a small amount (0.6 acre) of tree removal is deemed unavoidable, the change would not affect federally listed bats under TVA's bat programmatic consultation with the USFWS on routine actions (TVA 2024e; USFWS 2023) because these trees are unsuitable for roosting by these species and presence/absence surveys in this area were negative.

The monarch butterfly could be found in herbaceous or early successional habitat within the limits of disturbance. However, as noted in the FEIS, potential habitat for the monarch butterfly occurs primarily within an existing on-site transmission line corridor, where new vegetation clearing is not proposed as part of Alternative C. Impacts to monarch butterfly would be very limited, if any. The proposed alternative would not jeopardize the continued existence of the monarch butterfly.

#### 3.5.4.2.2 Aquatic Species

Small temporary effects to lake sturgeon could occur from changes in water quality in the intake channel during retrofitting and construction activities associated with the CWIS upgrades. Adverse effects to lake sturgeon would only occur if these species were present near the CWIS during the brief time required for retrofitting or construction of the intake structure upgrades. Impacts on these fish species from altered water quality would be minor, if any. Upgrades to the CWIS would also result in a permanent reduction in impingement risk, which would constitute a potential benefit for lake sturgeon, compared to existing operations.

Activities under Alternative C would result in minor impacts to threatened and endangered species. For terrestrial species, forested habitats would largely be avoided, and surveys indicate that federally listed bat species are unlikely to be affected based on incorporated conservation measures. Minor effects are expected for monarch butterfly habitat, with no anticipated risk to the species' continued existence. Aquatic impacts would be limited, with only minor effects to lake sturgeon during intake-structure upgrades and long-term benefit from reduced impingement risk compared to existing operations.

## 3.6 Transportation

### 3.6.1 Affected Environment

The transportation network in the vicinity of the Kingston Reservation is characterized in Section 3.11.1.1 of the FEIS. TVA did not identify new information related to the characterization of the affected environment for transportation, except for the 2024 Tennessee Department of Transportation (TDOT) average annual daily traffic (AADT) volumes for the key roadways that serve the Kingston Reservation. Therefore, FEIS Section 3.11.1.1 is incorporated by reference, with the exception of Table 3.11-1, which is updated below as Table 3-5.

Table 3-5 presents updated AADT volumes for three key roadways near the Kingston Reservation, comparing the FEIS data from 2020 to 2021 to the most recent 2024 figures.

**Table 3-5. Average Daily Traffic Volume on Major Roadways Near Kingston**

| Location (Station Number) | 2020–2021 AADT (vehicles/day) | 2024 AADT (vehicles/day) |
|---|---|---|
| Steam Plant Road (73000013) | 2,556 | 2,321 |
| I-40 south of the Kingston Reservation (73000062) | 49,070 | 58,578 |
| Highway 70 south of the Kingston Reservation (73000038) | 11,173 | 10,265 |

Source: TVA 2024a, Table 3.11-1; TDOT 2024

### 3.6.2 Environmental Consequences

Under Alternative C, activities described in Section 2.1.2 would take place during scheduled outages, over a period of 4 to 5 years. Vehicular traffic on public roads near the Kingston Reservation would increase during this time because of worker vehicles and materials moving to and from KIF. TVA estimates that the peak on-site workforce at the Kingston Reservation could include up to 2,550 personnel. This estimate represents a conservative upper limit and includes all KIF operational staff, outage personnel, and the KIG construction workforce.

Workforce traffic would mainly consist of a mix of passenger cars and light duty trucks. Traffic is expected to be distributed during a peak morning period (to the Kingston Reservation) and a peak evening period (away from the Kingston Reservation). Assuming one person per commuting vehicle, there would be a daily average morning

inbound traffic volume of up to 2,550 vehicles and a daily outbound traffic volume of up to 2,550 vehicles, for a total of up to 5,100 vehicles per day. Anticipated changes in traffic volume on nearby roadways from the peak on-site workforce under Alternative C are provided in Table 3-6 These volumes include KIF operational staff and outage personnel, as well as the KIG construction workforce.

**Table 3-6. Changes in Traffic on Nearby Roadways From Peak On-Site Workforce**

| Location (Station Number) | Existing AADT (vehicles/day) | Existing AADT Plus Peak Workforce Traffic (vehicles/day) | Temporary Traffic Increase from Peak Workforce (%) |
|---|---|---|---|
| Steam Plant Road (73000013) | 2,321 | 7,421 | 220% |
| I-40 south of the Kingston Reservation (73000062) | 58,578 | 63,678 | 9% |
| Highway 70 south of the Kingston Reservation (73000038) | 10,265 | 15,365 | 50% |

Source: TDOT 2024

The increase in traffic during the peak workforce period may cause some delays, particularly around turning movements on to Steam Plant Road, which could experience a more than 200-percent increase in vehicle traffic. However, the greatest impacts would be localized to the roadways immediately adjacent to the Kingston Reservation entrance and would be limited to peak periods when worker vehicles are entering and leaving.

Additional truck traffic would also occur in the area during the outage and construction phase due to material and equipment deliveries. However, as this increase would primarily occur during the mobilization and demobilization phases, impacts to the surrounding transportation network would be minimal. Consistent with the FEIS, most construction materials, equipment, and plant components are anticipated to be delivered by truck; however, larger components may be delivered to the site by barge or rail.

TVA would mitigate congestion or delays near the project site by implementing appropriate traffic controls such as staging of trucks, spacing logistics, staggering work shifts, or timing truck traffic to occur during lighter traffic hours, as needed. With implementation of these mitigation measures, impacts of the proposed alternative to transportation are expected to be localized, moderate, and limited to the 4- to 5-year outage and KIG construction period.

Following this peak workforce period, existing KIF operations jobs would be maintained, and the operation of KIG would require an operations staff of approximately 25 to 35 employees. This would represent a small increase in long-term operations workforce traffic compared to current baseline conditions. Additionally, brine salts may be transported to an off-site landfill at a rate of up to 160 tons, or eight truckloads, per day.

Thus, following construction, continued operations of KIF, in conjunction with KIG, would result in minor impacts to transportation and the local roadway network.

## 3.7 Utilities

### 3.7.1 Affected Environment

Existing utilities serving the Kingston Reservation are described in Section 3.12.1.1 of the FEIS. TVA did not identify new information related to the characterization of the affected environment for utilities. Therefore, FEIS Section 3.12.1.1 is incorporated by reference.

### 3.7.2 Environmental Consequences

Activities described in Section 2.1.2 of this SEIS, including piping and utility work, would be limited to the Kingston Reservation, specifically within the BATW recirculation, FGD WWT, and piping corridor footprints depicted in Figure 2-1. Prior to construction, existing utility lines would be located and marked to prevent accidental damage. Current water use associated with operation of KIF would continue and would not notably increase with the concurrent operation of KIG because TVA has elected to use air cooling at the gas plant. However, the long-term beneficial effects due to decreased water use described for FEIS Alternative A would be negated. Therefore, impacts to existing utilities are anticipated to be minor, and there would be no impact on the greater utility systems in the surrounding area.

Modification to existing transmission infrastructure would occur within existing TVA facilities and ROWs. If future studies indicate improvements are required to the regional transmission system to maintain system stability and reliability, TVA may need to provide operating guides for KIF or identify additional transmission projects, for which additional site-specific NEPA reviews would be completed.

As described in Section 1.1, TVA's PSA has experienced notable load growth in recent years, which is expected to continue. The added dispatchable generation capacity resulting from the concurrent operation of KIF and KIG would have potential long-term beneficial impacts by helping to ensure that TVA can reliably meet required year-round generation, maximum capacity system demands, and planning reserve margin targets.

## 3.8 Solid and Hazardous Waste

### 3.8.1 Affected Environment

TVA did not identify any information related to the characterization of the affected environment for solid and hazardous waste that was determined to be notably different from that considered in the FEIS. Therefore, FEIS Section 3.14.2 is incorporated by reference. As described in FEIS Section 2.1.2.1, TVA currently markets gypsum produced at KIF for wallboard manufacturing (or other approved uses). Additionally, TVA markets ash for specific approved uses.

### 3.8.2 Environmental Consequences

TVA identified information related to operation impacts to solid and hazardous waste that was determined to be notably different from that considered in the FEIS, as discussed below.

Wastes that would have been generated from retirement, decommissioning, decontamination, and deconstruction of the KIF Plant described in FEIS Section 3.14.3.2 would not occur. TVA would continue to operate KIF. TVA would implement all planned actions related to the current and future management and storage of CCR at KIF, which have been reviewed in previous NEPA analyses. Under continued operation of KIF, existing solid and hazardous waste management would not change from current operations.

In addition to ash and gypsum products that would be stored in the existing KIF landfill, brine salts from the membrane treatment of the FGD effluent would also result from the continued operation of KIF. These salts could be stored in a separate cell within the existing landfill to avoid commingling, which would render CCR materials unsuitable for beneficial use, or they could be disposed of in an existing, permitted, off-site landfill.

TVA considered all new information in combination with FEIS Section 3.14.3 to assess the potential effects from continued KIF operation on solid and hazardous wastes. Continued operation of KIF in conjunction with operation of KIG would result in solid and hazardous waste generation impacts similar to that assessed in the FEIS. Continued operation of KIF in conjunction with operation of KIG would result in minor impacts to the production and disposal of hazardous and solid waste.

## 3.9 Socioeconomics

### 3.9.1 Affected Environment

Demographic characteristics of the Kingston labor market area, defined as Roane County, where the Kingston Reservation is located, and Anderson, Cumberland, Knox, Loudon, McMinn, Meigs, Monroe, Morgan, and Rhea Counties, are described in Sections 3.4.2.1 and 3.16.1.1 of the FEIS. Demographic and economic characteristics of potentially affected populations were assessed in the FEIS using data from the 2020 Census and 2017–2021 American Community Survey (ACS) 5-year estimates. The identification of minority and low-income populations within a 10-mile radius of the Kingston Reservation are shown in Figures 3.4-3 and 3.4-4 of the FEIS, respectively, and are incorporated by reference. Characterization of the direct employment at KIF, the indirect and induced effects of KIF operation on the local economy, and TVA's payments in lieu of taxes are described in Section 3.16.1.1.2 of the FEIS and are also incorporated by reference.

TVA identified the following information that has been updated since that considered in the FEIS: 2019–2023 ACS 5-year estimates (USCB 2023).

The most recent population data for the Kingston labor market and the State of Tennessee (USCB 2023) are provided in Table 3-7, shown in relation to population

statistics from the 2010 and 2020 Census. Between 2020 and 2023, every county in the Kingston labor market saw population growth, with most counties growing at a faster rate than the state as a whole.

**Table 3-7. Population Change for the Kingston Labor Market Area**

| Geography | 2010 Total Population | 2020 Total Population | Percent Change 2010-2020 | 2023 Total Population | Percent Change 2020-2023 |
|---|---|---|---|---|---|
| *Tennessee* | *6,346,105* | *6,910,840* | *8.9* | *6,986,082* | *1.1* |
| Roane County (Kingston) | 54,181 | 53,404 | -1.4 | 54,403 | 1.9 |
| Anderson County | 75,129 | 77,123 | 2.7 | 78,175 | 1.4 |
| Cumberland County | 56,053 | 61,145 | 9.1 | 62,529 | 2.3 |
| Knox County | 432,226 | 478,971 | 10.8 | 487,401 | 1.8 |
| Loudon County | 48,556 | 54,886 | 13.0 | 56,996 | 3.8 |
| McMinn County | 52,266 | 53,276 | 1.9 | 54,135 | 1.6 |
| Meigs County | 11,753 | 12,758 | 8.6 | 13,076 | 2.5 |
| Monroe County | 44,519 | 46,250 | 3.9 | 47,054 | 1.7 |
| Morgan County | 21,987 | 21,035 | -4.3 | 21,193 | 0.8 |
| Rhea County | 31,809 | 32,870 | 3.3 | 33,299 | 1.3 |

Sources: TVA 2024a, Table 3.16-1; USCB 2023

The most recent demographic characteristics for the Kingston labor market counties, as compared with Tennessee, are shown in Table 3-8 (USCB 2023). Consistent with the FEIS, the populations of counties in the Kingston labor market were generally older than the state, with Knox County, which includes the city of Knoxville, as the sole exception. Since publication of the FEIS, the populations of both the state and the Kingston labor market have aged (except in Meigs County), reflected by increases in median age and the proportion of residents age 65 and older. Roane County, where the Kingston Reservation is located, has one of the lowest proportions of minority residents in the Kingston labor market and is notably lower than the minority percentage in Tennessee. However, four census block groups in a 10-mile radius, including the one that encompasses the Kingston Reservation, were previously identified as having concentrations of minority residents (FEIS Figure 3.4-3).

Anderson and Knox Counties were the only counties in the Kingston labor market with higher percentages of people who are high school graduates or higher, compared to the state. Consistent with the FEIS, all labor market counties except Knox County had lower percentages of renter-occupied housing units than the state. In four of the labor market counties, including Roane County, housing units were generally older than those found statewide.

Table 3-9 summarizes the most recent data on employment and income for the Kingston labor market counties, as compared with Tennessee (USCB 2023). Consistent

with the FEIS, every county in the Kingston labor market, with the exception of Knox County, had a smaller share of its population in the labor force than the state. Unemployment rates in the labor market were also typically higher than those of the state, with exceptions in Knox and Loudon Counties. In 2023, unemployment rates had declined across all geographies when compared to the statistics from the FEIS.

Consistent with the FEIS, manufacturing, education services, and healthcare remain the leading industries for employment in the Kingston labor market area. Although per capita incomes rose in 2023 compared to those reported in the FEIS, most counties in the labor market still have per capita incomes below that of the state, with Knox and Loudon Counties as the exceptions. The percentage of low-income residents in Roane County falls within the mid-range for the Kingston labor market and is consistent with that of the state. Eight census block groups with concentrations of low-income residents were previously identified within a 10-mile radius of the Kingston Reservation (FEIS Figure 3.4-4).

**Table 3-8. Demographic Characteristics for the Kingston Labor Market Area**

| Geography | Percent of Population 65 Years and Older | Median Age | Percent Minority[1] | Percent High School or Higher[2] | Percent of Occupied Housing Units, Renter Occupied | Median Year Housing Units Built |
|---|---|---|---|---|---|---|
| *Tennessee* | *16.8* | *38.9* | *28.5* | *89.6* | *33.0* | *1986* |
| Roane County (Kingston) | 23.2 | 47.4 | 8.8 | 89.3 | 22.4 | 1979 |
| Anderson County | 20.1 | 42.0 | 13.0 | 91.3 | 29.0 | 1977 |
| Cumberland County | 31.8 | 53.0 | 6.6 | 89.6 | 19.8 | 1993 |
| Knox County | 16.1 | 37.3 | 20.4 | 92.3 | 35.1 | 1985 |
| Loudon County | 27.0 | 48.7 | 14.2 | 88.9 | 19.1 | 1991 |
| McMinn County | 20.1 | 42.5 | 13.3 | 86.2 | 25.3 | 1983 |
| Meigs County | 21.3 | 45.5 | 9.6 | 82.9 | 23.1 | 1993 |
| Monroe County | 21.8 | 44.8 | 12.6 | 86.3 | 27.8 | 1991 |
| Morgan County | 18.9 | 42.5 | 8.0 | 83.4 | 15.7 | 1986 |
| Rhea County | 19.3 | 41.0 | 12.5 | 84.1 | 27.0 | 1991 |

Source: USCB 2023
Notes:
1) Percent of population that identify themselves as Asian or Pacific Islander; American Indian or Alaskan Native; Black or African American; Hispanic or Latino; or two or more races.
2) Percent of population over 25 years that have graduated from high school; includes high school equivalency

**Table 3-9. Employment and Income Characteristics for the Kingston Labor Market Area**

| Geography | Percent of Civilian Population in Labor Force[1] | Unemployment Rate | Percent Employed in Education Services, Healthcare, and Social Services | Percent Employed in Manufacturing | Per Capita Income | Percent Low-Income[2] |
|---|---|---|---|---|---|---|
| *Tennessee* | *61.7* | *4.7* | *22.3* | *12.8* | *$37,866* | *32.1* |
| Roane County (Kingston) | 53.4 | 4.8 | 22.2 | 11.7 | $36,357 | 32.2 |
| Anderson County | 56.6 | 5.0 | 21.7 | 11.7 | $35,460 | 34.2 |
| Cumberland County | 45.6 | 4.9 | 17.3 | 14.2 | $32,517 | 38.0 |
| Knox County | 64.5 | 3.6 | 24.2 | 8.0 | $41,957 | 29.4 |
| Loudon County | 54.3 | 2.7 | 17.5 | 15.3 | $42,817 | 27.5 |
| McMinn County | 55.3 | 5.3 | 18.6 | 26.1 | $30,669 | 36.3 |
| Meigs County | 49.6 | 6.8 | 15.2 | 26.3 | $30,197 | 38.2 |
| Monroe County | 51.2 | 5.3 | 19.9 | 24.9 | $29,107 | 38.5 |
| Morgan County | 46.5 | 6.0 | 24.1 | 10.3 | $30,576 | 36.0 |
| Rhea County | 53.7 | 6.3 | 15.1 | 27.9 | $28,160 | 42.5 |

Source: USCB 2023
Notes:
1) Percent of civilian population aged 16 years and older who are either employed or actively looking for work.
2) Percent of population below the low-income threshold, which is defined as two times the national poverty level (ratio of income to poverty level ≤1.99).

### 3.9.2 Environmental Consequences

Under Alternative C, activities described in Section 2.1.2 would take place during scheduled outages. Outages would last for approximately 90 to 100 days at a time, over a period of four to five years, until all activities are completed. The outage workforce would consist of approximately 500 workers, in addition to approximately 300 workers (plant employees, TVA support staff, and contractors) employed for regular KIF operations. The combined peak on-site workforce at the Kingston Reservation could include up to 2,550 personnel. This estimate represents a conservative upper limit and includes all KIF operational staff, outage personnel, and the KIG construction workforce. The increased on-site workforce needed during the estimated four- to five-year period during which KIG plant construction and KIF outage activities would occur would result in temporary, beneficial impacts to employment in the Kingston labor market.

Following the outages and KIG construction phase, KIF operations jobs would be maintained, and the reduction of employment associated with plant retirement under FEIS Alternative A would not occur. Additionally, the operation of KIG would require an operations staff of approximately 25 to 35 employees, resulting in operational employment of approximately 330 workers between both KIF and KIG. This would represent a small increase in long-term staffing compared to current baseline conditions, resulting in a minor benefit to employment and the local economy.

Based on the temporary nature of peak workforce activities, and the small increase in long-term employment associated with Alternative C, impacts to local demographics, housing availability, and community resources would be minor.

As described in Section 1.1, in recent years TVA's PSA has experienced notable load growth, which is expected to continue. Without the additional generation capacity afforded by continued operation of KIF, TVA would meet peak demand by purchasing available electricity from the market, potentially reducing grid reliability and increasing electricity costs to customers, as reliance on purchased power is generally less cost-effective than using TVA's own generation resources. Thus, continued operation of KIF in conjunction with the operation of KIG would support TVA's ability to reliably meet year-round generation requirements, system peak demands, and planning reserve margin targets, using least-cost planning principles to provide electricity at the lowest feasible rate for customers.

Impacts to minority and low-income communities resulting from the continued operation of KIF were assessed in Section 3.4.3.1 of the FEIS, while impacts resulting from the construction and operation of KIG were assessed in each applicable resource section and summarized in Section 3.4.3.3 and Table 3.4-21 of the FEIS; this content is incorporated by reference. Under Alternative C, impacts to minority and low-income communities near the Kingston Reservation would be consistent with those analyzed in the FEIS, as the concurrent operation of KIF and KIG would not result in notable changes to physical impacts such as increased noise, traffic, or fugitive dust. Combined air emissions would remain within the limits set by applicable permits and air quality standards, which are protective of ambient air quality and human health.

## 3.10 Unavoidable Adverse Environmental Impacts

The unavoidable adverse impacts from the additional activities supporting the continued operation of KIF would be consistent with the impacts from construction activities described in the FEIS. These impacts are primarily attributed to activities involving land disturbance that in the FEIS are the result of gas plant, pipeline, and transmission line construction. These activities would result in vegetation clearing, excavation, grading, crossing streams and waterways and adding impervious surfaces. Section 3.19.1 of the FEIS includes an analysis of unavoidable adverse impacts and is hereby incorporated by reference with the exception of the deconstruction and decommissioning components of the KIF and the solar facility.

Alternative C would result in similar, unavoidable adverse effects to resources such as surface water and wetlands.

Alternative C would result in new unavoidable, adverse impacts related to air quality and greenhouse gas emissions as a result of concurrent operation of KIF and KIG, and to transportation during the peak workforce for on-site activities.

## 3.11 Relationship of Short-Term Uses and Long-Term Productivity

NEPA requires a discussion of the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity. This SEIS focuses on the analyses of environmental effects associated with continued operation of KIF and associated activities as described in Section 2.1.2. These activities are considered short-term uses of the environment for the purposes of this section. In contrast, long-term productivity is considered to be that which occurs beyond the conclusion of decommissioning the plants and associated infrastructure. This section includes an evaluation of the extent to which the short-term uses preclude any options for future long-term use of the project site.

Construction of upgrades to the BATW recirculation system, FGD WWT system, and water intake system would occur within the existing Kingston Reservation. Short-term effects to wildlife, aquatic life, water resources, and air quality may occur; however, construction of the facilities would not result in effects to the long-term productivity of the land or its resources. Continued operation of KIF would preclude the long-term productivity of the land for other purposes while these facilities are in operation. Operational impacts on air quality would be noticeable but not destabilizing. Impacts would remain within the limits set by applicable permits and air quality standards. Compliance with permit requirements would protect ambient air quality and ensure the proposed alternative does not cause or contribute to NAAQS violations. Therefore, Alternative C would not change regional air quality and attainment status within Roane County. Operational impacts to climate change would increase but would not affect the enhancement of long-term productivity related to air quality or climate change.

## 3.12 Irreversible and Irretrievable Commitments of Resources

The term “irreversible commitments of resources” describes environmental resources that are potentially changed by the construction or operation of the proposed projects

that could not be restored to their prior state by practical means at some later time. Irreversible commitments generally occur to nonrenewable resources such as minerals or cultural resources and to those resources that are renewable only over long timespans, such as soil productivity. A resource commitment is considered irretrievable when the use or consumption is neither renewable nor recoverable for use until reclamation is successfully applied. Irretrievable commitments generally apply to the loss of production, harvest, or other natural resources and are not necessarily irreversible.

Resources required for the activities supporting continued operation of KIF, including labor and fossil fuels, would be irretrievably lost. Nonrenewable fossil fuels would be irretrievably lost through the use of gasoline and diesel-powered equipment. However, their limited use would not adversely affect the overall future availability of these resources.

Land used for the continued operation of KIF is not irreversibly committed because once coal operations cease and the plant is deconstructed and decommissioned, the land could be returned to other industrial or nonindustrial uses. The use of the coal that supplies power generation at KIF is an irreversible commitment of this resource because of the geologic timescale necessary to produce fossil fuels.

## 3.13 NEPA Compliance Certification

Consistent with 18 CFR 1318.106(e) and 1318.401(g), the Tennessee Valley Authority certifies that this document represents TVA's good-faith effort to fulfill the requirements of NEPA within the Congressional timeline established at NEPA Section 107(g) and according to page limits established at NEPA Section 107(e). In this document, TVA prioritizes documentation of the most important considerations based on its expert judgment. Any considerations addressed briefly or unaddressed are, in TVA's judgment, comparatively less substantive. In TVA's expert opinion, the factors mandated by NEPA have been thoroughly considered, and the analysis contained in this document is adequate to inform and reasonably explain TVA's final decision regarding the proposed federal action.

_____ _____

Dawn Booker, Senior Manager
NEPA Compliance
Environment and Stewardship
Tennessee Valley Authority

Date Signed

# CHAPTER 4 – LITERATURE CITED


Business Insider. 2024. The South is Booming, Beating Out the West as the Fastest-Growing Region in the Country Again Last Year. Retrieved from Americans and Immigrants Moving to the South; Texas, Georgia Are Booming - Business Insider (accessed November 2025).

iNaturalist. 2025. Schreber's Wood Aster (Eurybia schreberi). Available at [URL]: https://www.inaturalist.org/taxa/143889-Eurybia-schreberi#cite_note-flora-7. (Accessed November 2025).

Stantec. 2024a. 2023 Annual Groundwater Monitoring and Corrective Action Report, Kingston Fossil Plant Peninsula Disposal Area CCR Unit, January 31, 2024. Available at [URL]: https://www.tva.com/docs/default-source/ccr/kif/landfill---peninsula-disposal-area/groundwater-monitoring/annual-groundwater-report/257-90(e)_annual_groundwater_monitoring_report_kif_peninsula_disposal_area_2023.pdf?sfvrsn=b1e99ee5_4. (Accessed November 2025).

_____. 2024b. 2023 Annual Groundwater Monitoring and Corrective Action Report, Kingston Fossil Plant Stilling pond CCR Unit, January 31, 2024. Available at [URL]: https://www.tva.com/docs/default-source/ccr/kif/surface-impoundment---stilling-pond/groundwater-monitoring/annual-groundwater-report/257-90(e)_annual_groundwater_monitoring_report_kif_stilling_pond_2023.pdf?sfvrsn=760be668_4. (Accessed November 2025).

_____. 2024c. 2023 Annual Groundwater Monitoring and Corrective Action Report, Kingston Fossil Plant Sluice Trench and Area East of Sluice Trench CCR Unit, January 31, 2024. Available at [URL]: https://www.tva.com/environment/environmental-stewardship/coal-combustion-residuals/kingston/surface-impoundment---sluice-trench-and-area-east-of-sluice-trench-documents. (Accessed November 2025).

_____. 2025a. 2024 Annual Groundwater Monitoring and Corrective Action Report, Kingston Fossil Plant Peninsula Disposal Area CCR Unit, January 31, 2025. Available at [URL]: https://www.tva.com/docs/default-source/ccr/kif/landfill---peninsula-disposal-area/groundwater-monitoring/annual-groundwater-report/257-90(e)_annual_groundwater_monitoring_report_kif_peninsula_disposal_area_2024.pdf?sfvrsn=3615603e_4. (Accessed November 2025).

_____. 2025b. 2024 Annual Groundwater Monitoring and Corrective Action Report, Kingston Fossil Plant Stilling Pond CCR Unit, January 31, 2025. Available at [URL]: https://www.tva.com/docs/default-source/ccr/kif/surface-impoundment---stilling-pond/groundwater-monitoring/annual-groundwater-report/257-90(e)_annual_groundwater_monitoring_report_kif_stilling_pond_2024.pdf?sfvrsn=bc0e5ce_4. (Accessed November 2025).

_____. 2025c. 2024 Annual Groundwater Monitoring and Corrective Action Report, Kingston Fossil Plant Sluice Trench and Area East of Sluice Trench CCR Unit, January 31, 2025. Available at [URL]: https://www.tva.com/environment/environmental-stewardship/coal-combustion-residuals/kingston/surface-impoundment---sluice-trench-and-area-east-of-sluice-trench-documents. (Accessed November 2025).

Tennessee Department of Environment and Conservation (TDEC). 2012. Tennessee Erosion and Sediment Control Handbook: A Stormwater Planning and Design Manual for Construction Activities. Fourth Edition. Tennessee Department of Environment and Conservation, Division of Water Resource. Nashville, Tennessee.

_____. 2024a. 2024 List of Impaired and Threatened Waters in Tennessee. Available at [URL]: https://www.tn.gov/environment/program-areas/wr-water-resources/water-quality/water-quality-reports---publications.html. (Accessed November 2025).

_____. 2024b. Chapter 0400-40-04 Use Classifications for Surface Waters. Rules of the Tennessee Department of Environment and Conservation. Available at [URL]: https://publications.tnsosfiles.com/rules/0400/0400-40/0400-40-04.20240317.pdf. (Accessed November 2025).

_____. 2024c. Permit to Construct / Modify Air Contaminant Source(s), Permit Number: 981915, Tennessee Department of Environment and Conservation, Air Pollution Control Division. Effective November 15, 2024.

_____.2025a. 2026 List of Impaired and Threatened Waters in Tennessee [Draft]. Available at [URL]: https://www.tn.gov/environment/calendar-of-events/2026/1/14/public-hearing-on-the-draft-2026-list-of-impaired---threatened-waters-in-tennessee.html. (Accessed December 19, 2025).

_____. 2025b. Rare Species by County. TDEC, Natural Heritage Program, Nashville, Tennessee. Available at [URL]: https://dataviewers.tdec.tn.gov/dataviewers/f?p=9014:3:118904174220701. (Accessed November 2025).

Tennessee Department of Transportation (TDOT). 2024. Traffic Count Data. Available at [URL]: https://tdot.public.ms2soft.com/tcds/tsearch.asp?loc=Tdot&mod=TCDS. (Accessed November 2025).

Tennessee Invasive Plant Council (TIPC). 2017. TN-IPC 2017 List Revision, Overview and Request for Public Comments. Available at [URL]: https://www.tnipc.org/revised-list-of-invasive-plants/. (Accessed November 2025).

Tennessee Valley Authority (TVA). 1981. Class Review of Repetitive Actions in the 100-Year Floodplain, Federal Register Vol. 46, No. 76, April 21, 1981. pp. 22845-22846. Available at [URL]: https://www.govinfo.gov/content/pkg/FR-1981-04-21/pdf/FR-1981-04-21.pdf. (Accessed November 2025).

_____. 1999. Kingston Fossil Plant Alternative Coal Receiving Systems New Rail Spur Construction near the Cities of Kingston and Harriman, Roane County, TN. April 1999.

_____. 2006. Installation Of Flue Gas Desulfurization System At Kingston Fossil Plant, Final Environmental Assessment, Roane County, Tennessee, April 2006. Available at [URL]: https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/default-document-library/site-content/environment/environmental-stewardship/environmental-reviews/proposed-landfill-expansion-at-kingsion-fossil-plant/for-webposting_fea_flue-gas-desulfurization-system-at-kingston_2006.pdf?sfvrsn=60268613_2. (Accessed November 2025).

_____. 2016a. Kingston Fossil Plant Bottom Ash Dewatering Facility Final Environmental Assessment Roane County, Tennessee. Available at [URL]: https://www.tva.com/environment/environmental-stewardship/environmental-reviews/nepa-detail/Kingston-Fossil-Plant-Bottom-Ash-Dewatering-Facility. (Accessed November 2025).

_____. 2016b. Ash Impoundment Closure, Final Environmental Impact Statement. June 2016.

_____. 2019a. 2019 Integrated Resource Plan Volume I - Final Resource Plan. 2019 Integrated Resource Plan Volume I - Final Resource Plan.

_____. 2019b. 2019 Integrated Resource Plan, Volume II - Final Environmental Impact Statement 2019 Integrated Resource Plan Volume II - Final Environmental Impact Statement. June 2019.

_____. 2019c. Flue Gas Desulfurization System at Kingston Fossil Plan Final Supplemental Environmental Assessment, Roane County, Tennessee, August 2019. Available at [URL]: https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/default-document-library/site-content/environment/environmental-stewardship/environmental-reviews/proposed-landfill-expansion-at-kingsion-fossil-plant/201718_kif_landfill_final_supplemental_ea.pdf?sfvrsn=75049c3d_2. (Accessed November 2025).

_____. 2020. Kingston Fossil Plant Borrow Site #3 Final Environmental Assessment. Available at [URL]: https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/default-document-library/site-content/environment/environmental-stewardship/environmental-reviews/kingston-fossil-plant-borrow-site-3/kingston_borrow_site_no_3_ea_127_20.pdf?sfvrsn=52e8a7db_6. (Accessed January 2020).

_____. 2021. Evaluating the Presence and Maintenance of a Balanced Indigenous Population of Fish and Wildlife in the Tennessee River Downstream of TVA's Kingston Fossil Plant. 130 p.

_____. 2022. A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities Revision 4 – 2022.

_____. 2023. TVA Plans to Invest $15 Billion Over the Next Three Years to Meet Region's Growth. Available at [URL]: https://www.tva.com/news-media/releases/tva-plans-to-invest--15-billion-over-the-next-three-years-to-meet-region-s-growth. (Accessed August 2023).

_____. 2024a. Kingston Fossil Plant Retirement Final EIS. Kingston Fossil Plant Retirement Final Environmental Impact Statement. February 2024

_____. 2024b. Environmental Assessment Report, Kingston Fossil Plant. March 2024

_____. 2024c. Tennessee Valley Authority Kingston Fossil Plant NPDES Permit No. TN0005452 Modification Request, August 6, 2024. Division of Water Resources Data Viewer. Available at [URL]: https://dataviewers.tdec.tn.gov/dataviewers/f?p=2005:34051:13462680515495:::34051:P34051_PERMIT_NUMBER:TN0005452. (Accessed November 2025).

_____. 2024d. United States Securities and Exchange Commission Form 10-K. Available at [URL]: https://d18rn0p25nwr6d.cloudfront.net/CIK0001376986/326e734f-0a39-410a-b7d9-d70c412c83c6.pdf. (Accessed September 2025).

_____. 2024e. Reinitiation of the Programmatic Biological Assessment for Evaluation of the Impacts of Tennessee Valley Authority's Routine Actions on Federally Listed Bats to Include Tricolored Bat. Tennessee Valley Authority, Knoxville, TN.

_____. 2025a. Groundwater Corrective Action Final Programmatic Environmental Assessment, Tennessee Valley, Tennessee, December 2025. Available at [URL]: https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/environment/environmental-stewardship/nepa-environmental-reviews/groundwater-corrective-action-final-programmatic-environmental-assessment381f3ce5-c2b1-4b06-8f06-9912deb77a0f.pdf?sfvrsn=4c10945d_1. (Accessed January 2026).

_____. 2025b. TVA Regional Natural Heritage Database. Tennessee Valley Authority. Data exports provided by TVA in support of the KIF Extension Project SEIS. Data Extracted October 21, 2025.

U.S. Census Bureau (USCB). 2023. American Community Survey 2019-2023. Detailed Tables. Available at [URL]: https://data.census.gov/cedsci/. (Accessed November 2025).

_____. 2025. 2020 to 2024 Annual Estimates of the Resident Population for Counties in the United States: Population Estimates Program, 2025. Available at [URL]: https://www.census.gov/data/tables/time-series/demo/popest/2020s-national-total.html. (Accessed October 2025).

U.S. Energy Information Administration (USEIA). 2025a. State Energy $CO_2$ Emissions Estimates, 1960-2023, Table CO2.1. Available at: https://www.eia.gov/state/seds/sep_co2/notes/co2_print.pdf (Accessed November 2025)

_____. 2025b. U.S. Energy-Related Carbon Dioxide Emissions, 2024, Table 1. U.S. Energy Information Administration. Available at: https://www.eia.gov/environment/emissions/carbon/ (Accessed November 2025)

_____. 2025c. International Data, Other Statistics. Available at [URL]: https://www.eia.gov/international/data/world/other-statistics/more-other-statistics-data?. (Accessed November 2025).

U.S. Environmental Protection Agency (USEPA). 2025a. Effluent Guidelines Steam Electric Public Hearing: Proposed Deadline Extension Rule [PowerPoint slides]. U.S. Environmental Protection Agency. Available at [URL]: https://www.epa.gov/system/files/documents/2025-11/steam-electric-public-hearing-slides.pdf. (Accessed February 2026).

_____. 2025b. Air Quality Design Values. 2021-2024 Design Value Reports (Excel files). Available at [URL]: https://www.epa.gov/air-trends/air-quality-design-values#report. (Accessed November 2025).

_____. 2025c. Repeal of Greenhouse Gas Emissions Standards for Fossil Fuel-Fired Electric Generating Units. *Federal Register*, 90(116), 25752–25768. Available at [URL]: https://www.federalregister.gov/documents/2025/06/17/2025-10991/repeal-of-greenhouse-gas-emissions-standards-for-fossil-fuel-fired-electric-generating-units. (Accessed November 2025).

U.S. Fish and Wildlife Service (USFWS). 2023. Biological Opinion: Reinitiation of Consultation on Tennessee Valley Authority's 2018 Programmatic Strategy for Routine Actions that May Affect Endangered or Threatened Bats, FWS Log #04ET1000-2018-F-0017. US Fish and Wildlife Service, Tennessee Ecological Field Services Office, Cookeville, TN. May 2023.

_____. 2025a. Information for Planning and Consultation (IPaC) Tool Resource List. Not for Consultation. (Accessed November 2025).

_____. 2025b. Monarch. Available at [URL]: https://www.fws.gov/species/monarch-danaus-plexippus. (Accessed November 2025).

# APPENDIX A – LIST OF PREPARERS

## NEPA Project Management

| | |
|---|---|
| Name: | **Elizabeth Smith (TVA)** |
| Education: | B.A. Environmental Studies |
| Project Role: | NEPA Specialist |
| Experience: | 17 years in NEPA compliance |

| | |
|---|---|
| Name: | **Carol Butler Freeman (TVA)** |
| Education: | M.S. Geological Science, M.S. Space Studies, B.S. Geology |
| Project Role: | NEPA Specialist |
| Experience: | 18 years in NEPA compliance |

| | |
|---|---|
| Name: | **Christopher Maurice Bone (TVA)** |
| Education: | B.S. Mechanical Engineering |
| Project Role: | Senior Manager Strategic Projects |
| Experience: | 10 years in Project Management |

| | |
|---|---|
| Name: | **Joe Santangelo (TVA)** |
| Education: | M.S. & B.S. Environmental Engineering |
| Project Role: | Environmental Program Manager |
| Experience: | 20 years in Environmental Compliance |

| | |
|---|---|
| Name: | **Whitney Fiore (WSP)** |
| Education: | M.S. Natural Resource Management |
| Project Role: | WSP Project Manager |
| Experience: | 26 years of experience NEPA analysis and Permitting |

| | |
|---|---|
| Name: | **Natalie Reiss (WSP)** |
| Education: | B.A., Biology |
| Project Role: | WSP Deputy Project Manager |
| Experience: | 11 years of experience in NEPA analysis and documentation |

| | |
|---|---|
| Name: | **Jonathan Bourdeau (WSP)** |
| Education: | M.S. Management Science, B.S. Forest Resources |
| Project Role: | WSP Deputy Project Manager |
| Experience: | 29 years in environmental permitting and NEPA analysis |

## Other Contributors

| | |
|---|---|
| Name: | **Taylor Cardin (TVA)** |
| Education: | B.S. Electrical Engineering, M.S. Engineering Management |
| Project Role: | Transmission Interconnection and Interregional Manager |
| Experience: | 13 years in Transmission |

| | |
|---|---|
| Name: | **Cory Chapman (TVA)** |
| Education: | B.S in Wildlife and Fisheries Science |
| Project Role: | Biologist |
| Experience: | 4 years in Biological Compliance |

| | |
|---|---|
| Name: | **Sree Kesaraju (TVA)** |
| Education: | M.S. Civil and Environmental engineering |
| Project Role: | Air Permitting Specialist |
| Experience: | 31 years in Air Permitting and Compliance |

| | |
|---|---|
| Name: | **Britta Lees (TVA)** |
| Education: | M.S. Botany (emphasis: Wetland Ecology and Regulation), B.A. Biology |
| Project Role: | Water Specialist |
| Experience: | 20 years in wetland/water assessment and compliance |

| | |
|---|---|
| Name: | **Callan Pierson (TVA)** |
| Education: | B.S. Civil Engineering |
| Project Role: | Surface Water Quality |
| Experience: | 7 years of experience in surface water regulatory compliance |

| | |
|---|---|
| Name: | **Eric L. Walker (TVA)** |
| Education: | M.S. Environmental Engineering, B.A. Biology |
| Project Role: | Air Program Support Manager |
| Experience: | 25 years in environmental compliance |

| | |
|---|---|
| Name: | **Taylor J. Warden (TVA)** |
| Education: | B.S., Civil Engineering |
| Project Role: | Transmission Siting |
| Experience: | 7 years in Transmission Engineering and Siting |

| | |
|---|---|
| Name: | **Chevales Williams (TVA)** |
| Education: | B.S.E., Environmental Chemical Engineering |
| Project Role: | Water and NEPA Regulatory Policy |
| Experience: | 21 years of experience in water regulatory compliance and permitting and 18 years of NEPA impact assessment and analysis |
| Name: | **Carrie Williamson, P.E. (TN), CFM (TVA)** |
| Education: | M.S. and B.S. Civil Engineering |
| Project Role: | Flood Risk Consultant |
| Experience: | 13 years in Floodplains and Flood Risk |
| Name: | **Sarah Bailey (WSP)** |
| Education: | M.F.A., B.A. English and Comparative Literature |
| Project Role: | Technical Editor |
| Experience: | 10 years editing experience; 5 years technical, scientific, and NEPA editing experience |
| Name: | **Chris Dunay (WSP)** |
| Education: | B.S., Meteorology, M.S., Environmental Science Management |
| Project Role: | Air Quality |
| Experience: | 35 years of experience in Clean Air Act (CAA) permitting and compliance |
| Name: | **Bailey Hickey, E.I. (WSP)** |
| Education: | B.S., Environmental Engineering |
| Project Role: | Groundwater, Surface Water |
| Experience: | 7 years of experience in engineering consulting and NEPA analysis |
| Name: | **Brian Mueller (WSP)** |
| Education: | B.S., Water Resources - Limnology |
| Project Role: | GIS Lead |
| Experience: | 32 years of experience in GIS |
| Name: | **Christine Robichaud (WSP)** |
| Education: | M.S., Ecology |
| Project Role: | Biological Resources |
| Experience: | 16 years of experience in environmental impact assessment |

| | |
|---|---|
| Name: | **Leah Stephens (WSP)** |
| Education: | B.A., Environmental Studies |
| Project Role: | Transportation, Socioeconomics |
| Experience: | 6 years of experience in NEPA analysis and documentation |

| | |
|---|---|
| Name: | **David Tamsky (WSP)** |
| Education: | B.A., Environmental Studies |
| Project Role: | Technical Support |
| Experience: | 2 years of experience in NEPA documentation and environmental consulting |

# APPENDIX B – USEPA COMMENTS

# USEPA Comments

| Comment No. | Comment Type | Section/ Page/ Paragraph | Background | Recommended Actions | Basis for the Comment (such as law, policy, or guidance) | TVA Response |
|---|---|---|---|---|---|---|
| 1 | Air Quality | Section 3.4.1.2.4 | Section 3.4.1.2.4 includes a very brief discussion of emissions but provides no numerical values of emissions expected from Alternative C. | Pursuant to 42 U.S.C. § 4332(C)(i) and 40 CFR 52.21(m)(1)(i), the expected emission rates (in tons per year) should be included for expected air pollutants when both the coal and gas units will be operating. | 42 U.S.C. § 4332(C)(i), 40 CFR 52.21(m)(1)(i). | TVA has added emission information to Section 3.4.1.2.4. |
| 2 | Air Quality | Section 3.4.1.2.3 | The final Supplemental Environmental Impact Statement (SEIS) mentions modeling for the Prevention of Significant Deterioration (PSD) permit TVA Kingston will require. Section 3.4.1.2.3 also states that "continued operation under Alternative C would not result in exceedances of primary NAAQS standards" but does not contain any data or modeling results to support this claim. | Pursuant to 40 CFR 52.21(k), (l), modeling is required to demonstrate the project's impact on air quality. Per 42 U.S.C. § 4332(C)(i) and (ii), data/modeling results should be included in the SEIS to support the conclusion that Alternative will not result in exceedance of the National Ambient Air Quality Standards (NAAQS). | 40 CFR 52.21(k), (l), and (m), 42 U.S.C. § 4332(C)(i) and (ii). | TVA is in the early stages of preparing a Prevention of Significant Deterioration (PSD) permit application and has not completed modeling. Any PSD permit applications submitted to TDEC would include modeling. TVA has added information about the modeling requirement into Section 3.4.1.2.3. The PSD permit would set requirements for compliance with all applicable standards. |
| 3 | Air Quality | Section 3.4.1 | Section 3.4.1 Air Quality does not discuss Best Available Control Technology (BACT). | Pursuant to 40 CFR 52.21(j), the project will require BACT to reduce air emissions, and these mitigation measures should be included in the SEIS. | 40 CFR 52.21(j). | TVA has added information to Section 3.4.1.2.3. |
| 4 | Air Quality | Section 3.4.1 | The proposed action includes updates to transmission and electrical system components, including modifying two existing switchyards and switch replacements. | Pursuant to 42 U.S.C. § 4332(C)(i), the SEIS should discuss environmental effects of different options for switching station technology. | 42 U.S.C § 4332(C)(i) | The switchgear units that would be utilized for this project are manufactured to meet industry standards. As stated in Section 3.7.2.3.5 of the FEIS, some older existing electrical equipment may contain the GHG sulfur hexafluoride (SF6) gas (e.g., electrical switchgear, circuit breakers), which could have minor leaks, mostly associated with maintenance or long-term equipment degradation. Newer switchgear and breakers, which may also contain the SF6 gas, would be installed with more efficient operation and maintenance techniques and leak detection, and these features would minimize SF6 emissions. TVA is not aware of an SF6 free alternative that is a proven mature technology for these voltage levels. TVA actively monitors evolving technology for future consideration and for demonstrated market experience with proven reliability at these voltages before implementation. |
| 5 | Air Quality | Section 2.1.2.1 | The New Source Performance Standard for Greenhouse Gas Emissions for Modified Coal-Fired Steam Electric Generating Units and New Construction and Reconstruction Stationary Combustion Turbine Electric Generating Units is applicable to Alternative C as of January 23, 2026. Section 2.1.2.1 discusses required updates to KIF but omits discussion of carbon capture and storage. | Discuss potential applicability of carbon capture and storage requirement while ensuring that the preferred alternative meets the purpose and need of the project, i.e. "reliable service to TVA customers at the lowest feasible cost to meet growing demand." | 40 CFR Part 60 Subpart TTTTa - Table 2, 89 FR 39798 [40 CFR 60.22a(a), 40 CFR 60.20a(a)]. | TVA has added information to Section 3.4.1.2.2. |
| 6 | Air Quality | Section 3.4.1.2.3 | In 2024, TVA Kingston was issued conditional major construction permit #981915 by TDEC which requires in term G18 that "All coal-fired units (Source Numbers 01 through 09) shall cease operating upon completion of the shakedown periods for Source Numbers 25, and 27 through 42, but no later than 12/31/2027." Section 3.4.1.2.3 states that "continued operation of KIF [Kingston Fossil Plant] in conjunction with the operation of KIG [Kingston Gas Plant] under Alternative C would trigger a Prevention of Significant Deterioration (PSD) modification" and that "TVA is currently in the early stages of preparing a PSD permit application." | Per 40 CFR 52.21(a)(2), update the language in section 3.4.1.2.3 to include how TVA plans to comply with permitting requirements by superseding the requirements of permit #981915 with a new PSD permit. | 40 CFR 52.21(a)(2). | TVA has added information to Section 3.4.1.2.3. |

# USEPA Comments

| Comment No. | Comment Type | Section/ Page/ Paragraph | Background | Recommended Actions | Basis for the Comment (such as law, policy, or guidance) | TVA Response |
|---|---|---|---|---|---|---|
| 7 | Air Quality | Section 3.4.1 | The retirement of TVA Kingston's coal units was discussed in Tennessee's Regional Haze State Implementation Plan (90 FR 57367). | Discuss the visibility impairment impacts of continued operation pursuant to 40 CFR 52.21(o). | 40 CFR 52.21(o) and 90 FR 57367 | The Regional Haze rule (RHR) and SIP planning process for the second planning period reviewed the visibility impacts from Tennessee plants and did not require additional review or reduction measures for Kingston. EPA has approved the Tennessee regional haze SIP for the second planning period as satisfying the regional haze requirements for the second planning period. TVA will continue to work with TDEC, and any impacts on visibility will be addressed in the future Tennessee SIP planning as required by the RHR. The PSD application process will require analysis of visibility impairment. |
| 8 | Air Quality | Section 3.7.1.1.6 | Section 3.7.1.1.6 of the FEIS for the Kingston retirement discusses general conformity applicability, but the section is omitted from the SEIS. | Determine general conformity applicability for Alternative C and provide a general conformity analysis if the combined emissions of KIG and KIF exceed the general conformity thresholds, pursuant to 40 CFR 93.153(b). | 40 CFR 93.153(b) | Pursuant to 40 CFR 93.153(d)(1), a conformity determination is not required for this Federal action. 40 CFR 93.153(d)(1) state that a conformity determination is not required for Federal actions when "The portion of an action that includes major or minor new or modified stationary sources that require a permit under the new source review (NSR) program (Section 110(a)(2)(c) and Section 173 of the Act) or the prevention of significant deterioration program (title I, part C of the Act)." TVA would submit a PSD permit application to TDEC. |
| 9 | Water Quality | P.4/iii/ Summary | The SEIS states that the "The USEPA has communicated that it is currently reevaluating the 2024 ELG [effluent limitations guidelines] rule." This is no longer correct and should be corrected. | On December 23, 2025, EPA announced a final rule extending several wastewater compliance deadlines for coal-fired powerplants that were finalized by the Biden Administration; see 90 Federal Register 61328 dated December 31, 2025. This final rule is part one of a three-phased approach. The final rule extends seven implementation dates by: 1) providing six more years (to December 31, 2031) for existing steam electric power plants to assess potential compliance pathways for their continued operations; 2) extending compliance deadlines by five years (to December 31, 2034) related to zero-discharge limitations for flue gas desulfurization wastewater, bottom ash transport water, and combustion residual leachate; and 3) providing more time for compliance with three zero-discharge limitations for power plants that send wastewater to wastewater treatment plants for processing. The agency's proposal would align these deadlines with the deadlines for power plants that discharge directly to waterways. Operation beyond 2034 may require additional controls and additional NEPA review, as appropriate. | 90 Federal Register 61328 dated December 31, 2025. See: https://www.epa.gov/eg/steam-electric-power-generating-effluent-guidelines-deadline-extensions-rule#prop-dfr | SEIS Section 2.1.2.2 updated with reference. U.S. Environmental Protection Agency (USEPA). 2025a. Effluent Guidelines Steam Electric Public Hearing: Proposed Deadline Extension Rule [PowerPoint slides]. U.S. Environmental Protection Agency. The language in the SEIS correctly reflects USEPA's reevaluation of the 2024 ELGs, according to USEPA's Office of Water (Washington DC) public hearing presentation held 10/14/2025 and 11/12/2025. USEPA announced a two phased approach, of which the first phase comprised the now final supplemental Deadline Extension Rule. USEPA proposed the second phase to reconsider best available technology for combustion residual leachate and additional wastestreams as warranted. |

# APPENDIX C – TVA BAT STRATEGY PROJECT SCREENING FORM

**Project Review Form - TVA Bat Strategy** *(04/2025)*

*This form should **only** be completed if project includes activities in Tables 2 or 3 (STEP 2 below). This form is not required if project activities are limited to Table 1 (STEP 2) or otherwise determined to have no effect on federally listed bats. If so, include the following statement in your environmental compliance document (e.g., add as a comment in the project CEC): "Project activities limited to Bat Strategy Table 1 or otherwise determined to have no effect on federally listed bats. Bat Strategy Project Review Form NOT required." This form is to assist in determining required conservation measures per TVA's ESA Section 7 programmatic consultation for routine actions and federally listed bats.*[1]

**Project Name:** Continued Operations of the Kingston Fossil Plant **Date:** 10/22/2025

**Contact(s):** Elizabeth Smith, Cory Chapman **CEC#:** 2026-5 **Project ID:** 47274

**Project Location (City, County, State):** Roane County, TN

**Project Description:**

Due to increasing power demand and changes in the regulatory landscape, the Tennessee Valley Authority (TVA) prepared a Supplemental Environmental Impact Statement (SEIS) to assess the environmental impacts associated with the proposed action to continue operations of the Kingston Fossil Plant (KIF) past 2027.

## SECTION 1: PROJECT INFORMATION - ACTION AND ACTIVITIES

**STEP 1) Select TVA Action. If none are applicable, contact environmental support staff, Environmental Project Lead, or Terrestrial Zoologist to discuss whether form (i.e., application of Bat Programmatic Consultation) is appropriate for project:**

| | |
|---|---|
| 1 Manage Biological Resources for Biodiversity and Public Use on TVA Reservoir Lands | 6 Maintain Existing Electric Transmission Assets |
| 2 Protect Cultural Resources on TVA-Retained Land | 7 Convey Property associated with Electric Transmission |
| 3 Manage Land Use and Disposal of TVA-Retained Land | 8 Expand or Construct New Electric Transmission Assets |
| 4 Manage Permitting under Section 26a of the TVA Act | 9 Promote Economic Development |
| ■ 5 Operate, Maintain, Retire, Expand, Construct Power Plants | 10 Promote Mid-Scale Solar Generation |

**STEP 2) Select all activities from Tables 1, 2, and 3 below that are included in the proposed project.**

**TABLE 1. Activities with no effect to bats. Conservation measures & completion of bat strategy project review form NOT required.**

| | | |
|---|---|---|
| 1. Loans and/or grant awards | 8. Sale of TVA property | 19. Site-specific enhancements in streams and reservoirs for aquatic animals |
| 2. Purchase of property | 9. Lease of TVA property | 20. Nesting platforms |
| 3. Purchase of equipment for industrial facilities | 10. Deed modification associated with TVA rights or TVA property | ■ 41. Minor water-based structures (this does not include boat docks, boat slips or piers) |
| 4. Environmental education | 11. Abandonment of TVA retained rights | ■ 42. Internal renovation or internal expansion of an existing facility |
| 5. Transfer of ROW easement and/or ROW equipment | 12. Sufferance agreement | ■ 43. Replacement or removal of TL poles |
| 6. Property and/or equipment transfer | 13. Engineering or environmental planning or studies | ■ 44. Conductor and overhead ground wire installation and replacement |
| 7. Easement on TVA property | 14. Harbor limits delineation | 49. Non-navigable houseboats |

| **TABLE 2. Activities not likely to adversely affect bats with implementation of conservation measures. Conservation measures and completion of bat strategy project review form REQUIRED; review of bat records in proximity to project NOT required.** | | |
|---|---|---|
| ■ 18. Erosion control, minor | 57. Water intake - non-industrial | 79. Swimming pools/associated equipment |
| 24. Tree planting | 58. Wastewater outfalls | 81. Water intakes – industrial |
| 30. Dredging and excavation; recessed harbor areas | 59. Marine fueling facilities | 84. On-site/off-site public utility relocation or construction or extension |
| 39. Berm development | 60. Commercial water-use facilities (e.g., marinas) | 85. Playground equipment - land-based |
| 40. Closed loop heat exchangers (heat pumps) | 61. Septic fields | 87. Aboveground storage tanks |
| 45. Stream monitoring equipment - placement and use | 66. Private, residential docks, piers, boathouses | 88. Underground storage tanks |
| 46. Floating boat slips within approved harbor limits | 67. Siting of temporary office trailers | 90. Pond closure |
| ■ 48. Laydown areas | 68. Financing for speculative building construction | 93. Standard License |
| 50. Minor land based structures | 72. Ferry landings/service operations | 94. Special Use License |
| 51. Signage installation | 74. Recreational vehicle campsites | 95. Recreation License |
| 53. Mooring buoys or posts | 75. Utility lines/light poles | 96. Land Use Permit |
| 56. Culverts | 76. Concrete sidewalks | |

| **Table 3: Activities that may adversely affect federally listed bats. Conservation measures AND completion of bat strategy project review form REQUIRED; review of bat records in proximity of project REQUIRED by OSAR/Heritage eMap reviewer or Terrestrial Zoologist.** | | |
|---|---|---|
| 15. Windshield and ground surveys for archaeological resources | 34. Mechanical vegetation removal, includes trees or tree branches > 3 inches in diameter | ■ 69. Renovation of existing structures |
| 16. Drilling | 35. Stabilization (major erosion control) | 70. Lock maintenance/ construction |
| 17. Mechanical vegetation removal, does not include trees or branches > 3" in diameter (in Table 3 due to potential for woody burn piles) | 36. Grading | 71. Concrete dam modification |
| 21. Herbicide use | 37. Installation of soil improvements | 73. Boat launching ramps |
| 22. Grubbing | 38. Drain installations for ponds | ■ 77. Construction or expansion of land-based buildings |
| 23. Prescribed burns | ■ 47. Conduit installation | 78. Wastewater treatment plants |
| 25. Maintenance, improvement or construction of pedestrian or vehicular access corridors | 52. Floating buildings | 80. Barge fleeting areas |
| 26. Maintenance/construction of access control measures | ■ 54. Maintenance of water control structures (dewatering units, spillways, levees) | 82. Construction of dam/weirs/ levees |
| 27. Restoration of sites following human use and abuse | 55. Solar panels | 83. Submarine pipeline, directional boring operations |
| 28. Removal of debris (e.g., dump sites, hazardous material, unauthorized structures) | 62. Blasting | 86. Landfill construction |
| 29. Acquisition and use of fill/borrow material | 63. Foundation installation for transmission support | 89. Structure demolition |
| 31. Stream/wetland crossings | 64. Installation of steel structure, overhead bus, equipment, etc. | 91. Bridge replacement |
| 32. Clean-up following storm damage | 65. Pole and/or tower installation and/or extension | 92. Return of archaeological remains to former burial sites |
| 33. Removal of hazardous trees/tree branches | | |

**STEP 3) Project includes one or more activities in Table 3?** ◉ **YES (Go to Step 4)** ○ **NO (Go to Step 12)**

**Project Review Form - TVA Bat Strategy** *(04/2025)*

**STEP 4) Answer questions *a* through *e* below (applies to projects with activities from Table 3 ONLY)**

**a)** Will project involve continuous noise (i.e., ≥ 24 hrs) that is greater than 75 decibels measured on the A scale (e.g., loud machinery)?

○ **NO** (NV2 does not apply)
◉ **YES** (NV2 applies, subject to records review)

**b)** Will project involve entry into/survey of cave?

◉ **NO** (HP1/HP2 do not apply)
○ **YES** (HP1/HP2 applies, subject to review of bat records)

**c)** If conducting **prescribed burning** (**activity 23)**, estimated acreage**:** _____ and timeframe(s) below; ■ **N/A**

| STATE | Winter Hibernation | Winter Torpor | Spring Staging, Fall Swarming | Pup Season | Summer Gap | Year |
|---|---|---|---|---|---|---|
| VA, TN, NC | Nov 16 - Mar 31 | **N/A** | Apr 1 - May 14, Aug 16 - Nov 15 | May 15 - Jul 31 | Aug 1 - Aug 15 | |
| KY | Nov 16 - Mar 31 | **N/A** | Apr 1 - May 14, Aug 16 - Nov 15 | May 15 - Jul 31 | Aug 1 - Aug 15 | |
| AL, GA MS (Hibernation Range)* | Nov 16 - Mar 14 | **N/A** | Mar 15 - Apr 30, Sept 1 - Nov 15 | May 15 - Jul 31 | Aug 1 - Aug 30 | |
| MS (Year-round Range)* | **N/A** | Dec 15 - Feb 15 | **N/A** | May 1 - Jul 15 | Feb 16 - Apr 30, Jul 16 - Dec 14 | |

*MS (Year-round Range) = Attala, Wintson, Noxubee, Leake, Neshoba, Kemper, Rankin, Scott, and Newton Counties, Mississippi
*MS (Hibernation Range) = All MS counties in the TVA Region excluding those listed above in the Year-round Range

**d)** Will the project involve vegetation piling/burning?

◉ **NO** (SSPC4/ SHF7/SHF8 do not apply)
○ **YES** (SSPC4/SHF7/SHF8 applies, subject to review of bat records)

**e)** If **tree removal (activity 33 or 34)**, estimated amount: 0.6 ◉**ac** ○**trees** ○**N/A**

| STATE | Winter Hibernation | Winter Torpor | Spring Staging, Fall Swarming | Pup Season | Summer Gap | Year |
|---|---|---|---|---|---|---|
| VA, TN, NC | ■ Nov 16 - Mar 31 | **N/A** | ■ Apr 1 - May 14, Aug 16 - Nov 15 | ■ May 15 - Jul 31 | ■ Aug 1 - Aug 15 | |
| KY | Nov 16 - Mar 31 | **N/A** | Apr 1 - May 14, Aug 16 - Nov 15 | May 15 - Jul 31 | Aug 1 - Aug 15 | |
| AL, GA MS (Hibernation Range)* | Nov 16 - Mar 14 | **N/A** | Mar 15 - Apr 30, Sept 1 - Nov 15 | May 15 - Jul 31 | Aug 1 - Aug 30 | |
| MS (Year-round Range)* | **N/A** | Dec 15 - Feb 15 | **N/A** | May 1 - Jul 15 | Feb 16 - Apr 30, Jul 16 - Dec 14 | |

*MS (Year-round Range) = Attala, Wintson, Noxubee, Leake, Neshoba, Kemper, Rankin, Scott, and Newton Counties, Mississippi
*MS (Hibernation Range) = All MS counties in the TVA Region excluding those listed above in the Year-round Range

**If warranted, does project have flexibility for bat surveys (May 15-Aug 15):** ○ **MAYBE** ○ **YES** ◉ **NO**

**** For **PROJECT LEADS** whose projects will be reviewed by a Heritage Reviewer (Natural Resources Organization only), **STOP HERE**. Click File/ Save As, name form as "ProjectLead_BatForm_CEC-or-ProjectIDNo_Date", and submit with project information. Otherwise continue to Step 5. ****

## SECTION 2: REVIEW OF BAT RECORDS (applies to projects with activities from Table 3 ONLY)

**STEP 5**) **Review of bat/cave records conducted by Heritage Reviewer?** ○ **YES** ○ **NO** (Go to Step 12)

Info below completed by: **Heritage Reviewer** (name) _____ Date _____

■ **Terrestrial Zoologist** (name) Jesse Troxler Date 12/2/20

| Species | None | Within a Distance Of: | Cave/Winter Roost | Capture | Summer Roost / Roost Tree | Within the County |
|---|---|---|---|---|---|---|
| Gray Bat | | 3 mi | | ■ | **N/A** | ■ |
| Indiana Bat | ■ | 10 mi | | | | |
| Northern Long-Eared Bat | | 5 mi | ■ | ■ | | ■ |
| Tricolored Bat | | 3 mi | ■ | ■ | | ■ |
| Virginia Big-Eared Bat | ■ | 6 mi | | | | |

**Amount of SUITABLE habitat to be removed/burned (may differ from STEP 4e)**: 0 **(**◉**ac** ○**trees)*** ○**N/A**

**STEP 6) Provide any additional notes resulting from Heritage Reviewer records review in Notes box below then . . . . . Go to Step 12**

**Notes from Bat Records Review** (e.g., historic record; bats not on landscape during action; DOT bridge survey with negative results):

TVA Biological Compliance mist-netted the KIF Retirement (ESCS 39170) project area on 5/15, 5/17, and 5/18/2023. 27 bats were captured including 12 eastern red bats, 11 big brown bats, and 4 evening bats. No listed species were captured.

## STEPS 7-11 To be Completed by Terrestrial Zoologist (if warranted):

**STEP 7) Project will involve removal of suitable trees within documented habitat?** ○ **YES** ◉ **NO**

| Hibernation Zone | Within Swarming Habitat | Near Post-WNS Captures | Near Post-WNS Summer Roosts |
|---|---|---|---|
| **Indiana Bat** | < 10 mi | < 5 mi | < 2.5 mi |
| **Northern Long-Eared Bat** | < 5 mi | < 1.5 mi | < 0.25 mi |
| **Tricolored Bat** | < 3 mi | < 1.5 mi | < 0.25 mi |

| Year-Round Zone | Near Post-WNS Captures | Near Post-WNS Summer Roost Trees |
|---|---|---|
| **Northern Long-Eared Bat** | < 1.5 mi | < 0.25 mi |
| **Tricolored Bat** | < 1.5mi | < 0.25 mi |

**STEP 8) Presence/absence surveys were/will be conducted:** ◉ **YES** ○ **NO** ○ **TBD**

**STEP 9) Presence/absence survey results, on** 5/15/23-5/18/23 ◉ **NEGATIVE** ○ **POSITIVE** ○ **N/A**

**STEP 10)** Project ○ **WILL** ◉ **WILL NOT** require use of Incidental Take in the amount of ○ **acres or** ○ **trees** proposed to be used during the ○ **WINTER** ○ **VOLANT SEASON** ○ **NON-VOLANT SEASON** ◉ **N/A**

**STEP 11) Remaining Incidental Take (prior to accounting for this project) as of**

| Species | Total Suitable Habitat to be Removed | Winter Season Removal | Winter Season Take Remaining* | Volant Season Removal | Volant Season Take Remaining* | Pup Season Removal | Pup Season Take Remaining* |
|---|---|---|---|---|---|---|---|
| Indiana Bat | | | | | | | |
| NLEB | | | | | | | |
| Tricolored Bat | | | | | | | |

Take Estimates are for TVA Action 5 - Operate, Maintain, Retire, Expand, Construct Power Plants

**Amount contributed to TVA's Bat Conservation Fund upon activity completion: $** **OR** ◉ **N/A**

**TERRESTRIAL ZOOLOGISTS, after completing SECTION 2, review Table 4, modify as needed, and then complete section for Terrestrial Zoologists at end of form.**

## SECTION 3: REQUIRED CONSERVATION MEASURES

**STEP 12) Review Conservation Measures in Table 4 and ensure those selected are relevant to the project. If not, manually override and uncheck irrelevant measures, and explain why in ADDITIONAL NOTES below Table 4.**

Did review of Table 4 result in ANY remaining Conservation Measures in **RED**?

○ **NO** (Go to Step 13)

○ **YES** (STOP HERE; Submit for Terrestrial Zoology Review. Click File/Save As, name form as "ProjectLead_BatForm_CEC-or-ProjectIDNo_Date", and submit with project information).

Manual Override

Jesse Troxler

## Table 4. TVA's ESA Section 7 Programmatic Bat Consultation Required Conservation Measures

The Conservation Measures in Table 4 are automatically selected based on your choices in Tables 2 and 3 but can be manually overridden, if necessary. To Manually override, press the button and enter your name.

| Check if Applies to Project | Activities Subject To Conservation Measure | Conservation Measure Description |
|---|---|---|
| ■ | 15, 16, 17, 18, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 45, 47, 48, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 90, 91, 92, 93, 94, 95, 96 | **NV1** - Noise will be short-term, transient, and not significantly different from urban interface or natural events (i.e., thunderstorms) that bats are frequently exposed to when present on the landscape. |
| ■ | 16, 25, 26, 37, 47, 52, 62, 63, 64, 65, 70, 71, 73, 78, 80, 82, 83, 86, 91 | **NV2** - Drilling, blasting, or any other activity that involves continuous noise (i.e., longer than 24 hours) disturbances greater than 75 decibels measured on the A scale (e.g., loud machinery) **within a 0.5 mile radius of documented winter and/or summer roosts** (caves, trees, unconventional roosts) will be conducted when bats are absent from roost sites. |
| | 16, 26, 62 | **NV3** - Drilling or blasting **within a 0.5 mile radius of documented cave** (or unconventional) roosts will be conducted in a manner that will not compromise the structural integrity or alter the karst hydrology of the roost site. |
| | 16, 26, 62 | **NV4** - Drilling or blasting **within 0.5 miles of a documented roost site** (cave, tree, unconventional roost) that needs to occur when bats are present will first involve development of project-specific avoidance or minimization measures in coordination with the USFWS. |
| | 15, 26, 92 | **HP1** - Site-specific cases in which potential impact of human presence is heightened (e.g., conducting environmental or cultural surveys within a roost) will be closely coordinated with staff bat biologists to avoid/ minimize impacts below any potential adverse effect. Any take from these activities would be covered by TVA's Section 10 permit. |
| | 15, 26, 92 | **HP2** - Entry into roosts known to be occupied by federally listed bats will be communicated to the USFWS when impacts to bats may occur if not otherwise communicated (i.e., via annual monitoring reports per TVA's Section 10 permit). Any take from these activities would be covered by TVA's section 10 permit. |
| | 23 | **SHF1** - Fire breaks will be used to define and limit burn scope. |
| | 17, 23, 34 | **SHF2** - Site-specific conditions (e.g., acres burned, transport wind speed, mixing heights) will be considered to ensure smoke is limited and adequately dispersed away from caves so that smoke does not enter cave or cave-like structures. |
| | 23 | **SHF3** - Acreage will be divided into smaller units to keep amount of smoke at any one time or location to a minimum and reduce risk for smoke to enter caves. |
| | 17, 23, 34 | **SHF4** - If burns need to be conducted when there is some potential for bats to present on the landscape and more likely to enter torpor due to colder temperatures, burns will only be conducted if the air temperature is 55° or greater, and preferably 60° or greater. |
| | 23 | **SHF5** - Fire breaks will be plowed immediately prior to burning, will be plowed as shallow as possible, and will be kept to minimum to minimize sediment. |
| | 23 | **SHF6** - Tractor-constructed fire lines will be established **greater than 200 feet from cave entrances**. Existing logging roads and skid trails will be used where feasible to minimize ground disturbance and generation of loose sediment. |
| | 17, 22, 23, 32, 33, 34, 35, 36 | **SHF7** - Burning will only occur if site specific conditions (e.g. acres burned, transport wind speed, mixing heights) can be modified to ensure that smoke is adequately dispersed away from caves or cave-like structures. This applies to prescribed burns and burn piles of woody vegetation. |
| | 17, 22, 23, 32, 33, 34, 35, 36 | **SHF8** - Brush piles will be burned a **minimum of 0.25 mile from documented, known, or obvious caves or cave entrances** and otherwise in the center of newly established ROW when proximity to caves on private land is unknown. |

| | | |
|---|---|---|
| ☐ | 17, 23, 34 | **SHF9** - A **0.25 mile buffer of undisturbed forest** will be maintained around documented or known gray bat maternity and hibernation colony sites, documented or known Virginia big-eared bat maternity, bachelor, or winter colony sites, Indiana bat hibernation sites, northern long-eared bat hibernation sites, and tricolored bat hibernation sites. Prohibited activities within this buffer include cutting of overstory vegetation, construction of roads, trails or wildlife openings, and prescribed burning. Exceptions may be made for maintenance of existing roads and existing ROW, or where it is determined that the activity is compatible with species conservation and recovery (e.g., removal of invasive species). |
| ☐ | 33, 34 | **TR1*** - Removal of potentially suitable summer roosting habitat during time of potential occupancy has been quantified and minimized programmatically. TVA will track and document alignment of activities that include tree removal (i.e., hazard trees, mechanical vegetation removal) with the programmatic quantitative cumulative estimate of seasonal removal of potential summer roost trees for Indiana bat and northern long-eared bat. Project will therefore communicate completion of tree removal to appropriate TVA staff. |
| ☐ | 33, 34 | **TR2** - Removal of suitable summer roosting habitat **within 0.5 mile of Priority 1/Priority 2 Indiana bat hibernacula, 0.25 mile of Priority 3/Priority 4 Indiana bat hibernacula, 0.25 miles of any northern long-eared bat hibernacula, or 0.25 miles of any tricolored bat hibernacula** will be prohibited, regardless of season, with very few exceptions (e.g., vegetation maintenance of TL ROW immediately adjacent to a known cave). |
| ☐ | 33, 34 | **TR3*** - Removal of suitable summer roosting habitat within documented habitat (i.e., within 10 miles, 5 miles, and 3 miles of documented Indiana bat, northern long-eared bat, and tricolored bat hibernacula, respectively; within 5 miles, 1.5 miles, and 1.5 miles of documented post-white-nose syndrome Indiana bat, northern long-eared bat, and tricolored bat capture sites, respectively; and within 2.5 miles, 0.25, and 0.25 miles of documented Indiana bat northern long-eared bat, and tricolored bat post-white-nose syndrome summer roost trees, respectively) will be tracked, documented, and included in annual reporting. |
| ☐ | 33, 34 | **TR4*** - Removal of suitable summer roosting habitat within potential habitat for Indiana bat, northern long-eared bat, and tricolored bat will be tracked, documented, and included in annual reporting. Project will therefore communicate completion of tree removal to appropriate TVA staff. |
| ☐ | 33, 34 | **TR5*** - In areas where northern long-eared bat and tricolored bat remain active year-round, continuing to roost in trees, tree removal within documented habitat (1.5 miles of northern long-eared bat and tricolored bat post-white nose syndrome captures sites, and 0.25 miles of northern long-eared bat and tricolored bat post-white-nose syndrome roosts) will be tracked, documented, and included in annual reporting. |
| ☐ | 33, 34 | **TR6** - Removal of any trees within 0.25 miles of a documented Indiana bat maternity roost tree, or post-white nose syndrome northern long-eared bat or tricolored bat maternity summer roost tree or the roost tree itself during pup season, will first require a site-specific review and assessment. If pups are present in trees to be removed (determined either by mist netting and assessment of pregnant, lactating, or post lactating adult females, or by visual assessment of trees following evening emergence counts for Indiana bats and northern long-eared bats), TVA will coordinate with the USFWS to determine how to avoid direct and minimize indirect impacts to pups to the extent possible. This may include establishment of artificial roosts before loss of roost tree(s). |
| ☐ | 33, 34 | **TR7** - In areas where northern long-eared bat and tricolored bat remain active year-round, continuing to roost in trees, tree removal within 0.25 miles of documented post-white-nose syndrome northern long-eared bat or tricolored bat roosts during winter torpor TVA will coordinate with the USFWS to determine how to avoid direct and minimize indirect impacts to pups to the extent possible. |
| ☐ | 33, 34 | **TR8** (**Existing Transmission ROW only**) - **Tree removal within 100 feet of existing transmission ROWs will be limited to hazard trees**. On or adjacent to TLs, a hazard tree is a tree that is tall enough to fall within an unsafe distance of TLs under maximum sag and blowout conditions and/or are also dead, diseased, dying, and/or leaning. Hazard tree removal includes removal of trees that 1) currently are tall enough to threaten the integrity of operation and maintenance of a TL or 2) have the ability in the future to threaten the integrity of operation and maintenance of a TL. |
| ☐ | 33, 34 | **TR9** (**TVA Reservoir Land only**) - Requests for removal of hazard trees on or adjacent to TVA reservoir land will be inspected by staff knowledgeable in identifying hazard trees per International Society of Arboriculture and TVA's checklist for hazard trees. Approval will be limited to trees with a defined target. |
| ☐ | 33, 34 | **TR10** - If removal of suitable summer roosting habitat occurs when bats are present on the landscape, a funding contribution (based on amount of habitat removed) towards future conservation and recovery efforts for federally listed bats would be carried out. Project can consider seasonal bat presence/absence surveys (mist netting or emergence counts) that allow for positive detections without resulting in increased constraints in cost and project schedule. This will enable TVA to contribute to increased knowledge of bat presence on the landscape while carrying out TVA's broad mission and responsibilities. |

| | | |
|---|---|---|
| ■ | 69, 77, 89, 91 | **AR1** - Projects that involve structural modification or demolition of buildings, bridges, and potentially suitable box culverts, will require assessment to determine if structure has characteristics that make it a potentially suitable unconventional bat roost. If so a survey to determine if bats may be present will be conducted following the USFWS Survey Guidelines. Structural assessment will include:<br>o Visual check that includes an exhaustive internal/external inspection of building to look for evidence of bats (e.g., bat droppings, roost entrance/exit holes); this can be done at any time of year, preferably when bats are active.<br>o Where accessible and health and safety considerations allow, a survey of roof space for evidence of bats (e.g., droppings, scratch marks, staining, sightings), noting relevant characteristics of internal features that provide potential access points and roosting opportunities. Suitable characteristic may include: gaps between tiles and roof lining, access points via eaves, gaps between timbers or around mortise joints, gaps around top and gable end walls, gaps within roof walling or around tops of chimney breasts, and clean ridge beams.<br>o Features with high-medium likelihood of harboring bats but cannot be checked visually include soffits, cavity walls, space between roof covering and roof lining.<br>o Applies to culverts that are at least 23 feet in length with one or more of the following characteristics that make the culvert potentially suitable:<br>• Minimum culvert entrance height/diameter 3 feet<br>• Openings protected from high winds<br>• Not susceptible to enough flooding that the remaining unflooded space would be less than 3 feet.<br>• Inner areas relatively dark with roughened walls or ceilings (this may include corrugated metal culverts with rusting walls)<br>• Crevices, weep holes, imperfections, or swallow nests<br>o Bridge survey protocols will be adapted from the latest USFSW Survey Guidelines.<br>o Bat surveys usually are NOT needed in the following circumstances:<br>• Domestic garages /sheds with no enclosed roof space (with no ceiling)<br>• Modern flat-roofed buildings<br>• Metal framed and roofed buildings<br>• Buildings where roof space is regularly used (e.g., attic space converted to living space, living space open to rafters) or where all roof space is lit from skylights or windows. Large/tall roof spaces may be dark enough at apex to provide roost space |
| ■ | 69, 77, 89, 91 | **AR2** - Additional bat P/A surveys (e.g., emergence counts) conducted if warranted (i.e., when AR1 indicates that bats may be present). |
| | 91 | **AR3** - Bridge survey protocols will be implemented, either by permittee (e.g., state DOT biologists) or qualified personnel. If a bridge is determined to be in use as an unconventional roost per the latest USFWS Guidelines, subsequent protocols will be implemented. |
| | 69, 89 | **AR4** - Removal of buildings with suitable roost characteristics within six miles of known or presumed occupied roosts for Virginia big-eared bat would occur between Nov 16 and Mar 31. Buildings may be removed other times of the year once a bat biologist evaluates a buildings' potential to serve as roosting habitat and determines that this species is not present and/or is not using structure(s). |

| | | |
|---|---|---|
| ■ | 16, 17, 18, 21, 22, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37, 38, 39, 48, 50, 51, 56, 61, 62, 63, 64, 65, 67, 69, 84, 89 | **SSPC1** (**Transmission only**) - Transmission actions and activities will continue to Implement A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities. This focuses on control of sediment and pollutants, including herbicides. Following are key measures:<br>o BMPs minimize erosion and prevent/control water pollution in accordance with state-specific construction storm water permits. BMPS are designed to keep soil in place and aid in reducing risk of other pollutants reaching surface waters, wetlands and ground water. BMPs will undertake the following principles:<br>• Plan clearing, grading, and construction to minimize area and duration of soil exposure.<br>• Maintain existing vegetation wherever and whenever possible.<br>• Minimize disturbance of natural contours and drains.<br>• As much as practicable, operate on dry soils when they are least susceptible to structural damage and erosion.<br>• Limit vehicular and equipment traffic in disturbed areas. Keep equipment paths dispersed or designate single traffic flow paths with appropriate road BMPs to manage runoff.<br>• Divert runoff away from disturbed areas.<br>• Provide for dispersal of surface flow that carries sediment into undisturbed surface zones with high infiltration capacity and ground cover conditions.<br>• Prepare drainage ways and outlets to handle concentrated/increased runoff.<br>• Minimize length and steepness of slopes. Interrupt long slopes frequently.<br>• Keep runoff velocities low and/or check flows.<br>• Trap sediment on-site.<br>• Inspect/maintain control measures regularly & after significant rain.<br>• Re-vegetate and mulch disturbed areas as soon as practical.<br>o Specific guidelines regarding sensitive resources and buffer zones:<br>• Extra precaution (wider buffers) within SMZs is taken to protect stream banks and water quality for streams, springs, sinkholes, and surrounding habitat.<br>• BMPs are implemented to protect and enhance wetlands. Select use of equipment and seasonal clearing is conducted when needed for rare plants; construction activities are restricted in areas with identified rare plants.<br>• Standard requirements exist to avoid adverse impacts to caves, protected animals, unique/ important habitat (e.g., cave buffers, restricted herbicide use, seasonal clearing of suitable habitat). |
| ■ | 16, 17, 18, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 48, 50, 51, 52, 53, 54, 55, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 70, 71, 73, 76, 77, 78, 80, 81, 82, 83, 86, 87, 88, 89, 90 | **SSPC2** - Operations involving chemical/fuel storage or resupply and vehicle servicing will be handled outside of riparian zones (streamside management zones) in a manner to prevent these items from reaching a watercourse. Earthen berms or other effective means are installed to protect stream channel from direct surface runoff. Servicing will be done with care to avoid leakage, spillage, and subsequent stream, wetland, or ground water contamination. Oil waste, filters, other litter will be collected and disposed of properly. Equipment servicing and chemical/fuel storage will be limited to locations greater than 300-ft from sinkholes, fissures, or areas draining into known sinkholes, fissures, or other karst features. |

| | | |
|---|---|---|
| ■ | 16, 17, 18, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 48, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 61, 62, 63, 64, 65, 66, 67, 69, 70, 71, 73, 76, 77, 80, 81, 82, 83, 84, 86, 87, 88, 89, 90, 91 | **SSPC3** (**Power Plants only**) - Power Plant actions and activities will continue to implement standard environmental practices. These include:<br>o Best Management Practices (BMPs) in accordance with regulations:<br>• Ensure proper disposal of waste, ex: used rags, used oil, empty containers, general trash, dependent on plant policy<br>• Maintain every site with well-equipped spill response kits, included in some heavy equipment<br>• Conduct Quarterly Internal Environmental Field Assessments at each sight<br>• Every project must have an approved work package that contains an environmental checklist that is approved by sight Environmental Health & Safety consultant.<br>• When refueling, vehicle is positioned as close to pump as possible to prevent drips, and overfilling of tank. Hose and nozzle are held in a vertical position to prevent spillage<br>o Construction Site Protection Methods<br>• Sediment basin for runoff - used to trap sediments and temporarily detain runoff on larger construction sites<br>• Storm drain protection device<br>• Check dam to help slow down silt flow<br>• Silt fencing to reduce sediment movement<br>o Storm Water Pollution Prevention (SWPP) Pollution Control Strategies<br>• Minimize storm water contact with disturbed soils at construction site<br>• Protect disturbed soil areas from erosion<br>• Minimize sediment in storm water before discharge<br>• Prevent storm water contact with other pollutants<br>• Construction sites also may be required to have a storm water permit, depending on size of land disturbance (>1ac)<br>o Every site has a Spill Prevention and Control Countermeasures (SPCC) Plan and requires training. Several hundred pieces of equipment often managed at the same time on power generation properties. Goal is to<br>• Minimize fuel and chemical use Ensure proper disposal of waste, ex: used rags, used oil, empty containers, general trash, dependent on plant policy<br>• Maintain every site with well-equipped spill response kits, included in some heavy equipment<br>• Conduct Quarterly Internal Environmental Field Assessments at each sight<br>• Every project must have an approved work package that contains an environmental checklist that is approved by sight Environmental Health & Safety consultant.<br>• When refueling, vehicle is positioned as close to pump as possible to prevent drips, and overfilling of tank. Hose and nozzle are held in a vertical position to prevent spillage<br>o Construction Site Protection Methods<br>• Sediment basin for runoff - used to trap sediments and temporarily detain runoff on larger construction sites<br>• Storm drain protection device<br>• Check dam to help slow down silt flow<br>• Silt fencing to reduce sediment movement<br>o Storm Water Pollution Prevention (SWPP) Pollution Control Strategies<br>• Minimize storm water contact with disturbed soils at construction site<br>• Protect disturbed soil areas from erosion<br>• Minimize sediment in storm water before discharge<br>• Prevent storm water contact with other pollutants<br>• Construction sites also may be required to have a storm water permit, depending on size of land disturbance (>1ac)<br>o Every site has a Spill Prevention and Control Countermeasures (SPCC) Plan and requires training. Several hundred pieces of equipment often managed at the same time on power generation properties. Goal is to minimize fuel and chemical use |
| ■ | 17, 22, 32, 33, 34, 35, 36 | **SSPC4** (**Transmission only**) - Woody vegetation burn piles associated with transmission construction will be placed in the center of newly established ROWs to minimize wash into any nearby undocumented caves that might be on adjacent private property and thus outside the scope of field survey for confirmation. Brush piles will be burned a **minimum of 0.25 miles from documented caves** and otherwise in the center of newly established ROW when proximity to caves on private land is unknown. |

| | | |
|---|---|---|
| | 17, 18, 21, 22, 24, 25, 26, 30, 31, 33, 34, 35, 36, 40, 46, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 66, 67, 68, 69, 70, 72, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 87, 88, 91, 93, 95, 96 | **SSPC5** (**26a, Solar, Economic Development only**) - Section 26a permits and contracts associated with solar projects, economic development projects or land use projects include standards and conditions that include standard BMPs for sediment and contaminants as well as measures to avoid or minimize impacts to sensitive species or other resources consistent with applicable laws and Executive Orders. |
| | 21, 54 | **SSPC6** - Herbicide use will be avoided **within 200 ft of portals associated with caves, cave collapse areas, mines and sinkholes** are capable of supporting cave-associated species. Herbicides are not applied to surface water or wetlands unless specifically labeled for aquatic use. Filter and buffer strips will conform at least to federal and state regulations and label requirements. |
| | 17, 21, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37, 38, 54, 55 | **SSPC7** - Clearing of vegetation **within a 200-ft radius of documented caves** will be limited to hand or small machinery clearing only (e.g., chainsaws, bush-hog, mowers). This will protect potential recharge areas of cave streams and other karst features that are connected hydrologically to caves. |
| | 16, 26, 36, 37, 38, 39, 48, 50, 52, 59, 60, 62, 66, 67, 69, 72, 75, 77, 78, 79, 86 | **L1** - Direct temporary lighting away from suitable habitat during the active season. |
| | 16, 26, 36, 37, 38, 39, 48, 50, 52, 59, 60, 62, 66, 67, 69, 72, 75, 77, 78, 79, 86 | **L2** - Evaluate the use of outdoor lighting during the active season and seek to minimize light pollution when installing new or replacing existing permanent lights by angling lights downward or via other light minimization measures (e.g., dimming, directed lighting, motion-sensitive lighting). |

[1]Bats addressed in consultation (04/2018) and updates (05/2023 and 10/2024), which includes gray bat (listed in 1976), Indiana bat (listed in 1967), northern long-eared bat (listed in 2015), tricolored bat (anticipated listing in the future), and Virginia big-eared bat (listed in 1979).

**NOTES** (additional info from field review, explanation of no impact or removal of conservation measures).

**STEP 13) Save completed form (Click File/Save As, name form as "ProjectLead_BatForm_CEC-or-ProjectIDNo_Date") in project environmental documentation (e.g. CEC, Appendix to EA) AND send a copy of form to batstrategy@tva.gov**
**Submission of this form indicates that Project Lead/Applicant:**

Elizabeth Smith (name) is (or will be made) aware of the requirements below.

- Implementation of conservation measures identified in Table 4 is required to comply with TVA's Endangered Species Act programmatic bat consultation.
- TVA may conduct post-project monitoring to determine if conservation measures were effective in minimizing or avoiding impacts to federally listed bats.

***For Use by Terrestrial Zoologist Only***

For projects that require use of Take and/or contribution to TVA's Bat Conservation Fund, Terrestrial Zoologist acknowledges that Project Lead/Contact has been informed that project will result in use of Incidental Take ○ ac ○ trees and that use of Take will require $ contribution to TVA's Conservation Fund upon completion of activity (amount entered should be $0 if cleared in winter).

Terrestrial Zoologist acknowledges that Project Lead/Contact (name) has been informed of any relevant conservation measures and/or provided a copy of this form.

**Terrestrial Zoologist Acknowledgment. Finalize and Print to Non-Editable PDF**

# APPENDIX D – THREATENED AND ENDANGERED SPECIES LIST AND EVALUATION OF LIKELIHOOD OF OCCURRENCE

**Assessment of the Potential for Threatened, Endangered, and Other Protected Species Evaluated to Occur on the Kingston Reservation**

| Common Name | State Rank and Listing Status | Federal Listing Status | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel | Reference |
|---|---|---|---|---|---|
| **Birds** | | | | | |
| Bachman's Sparrow *Peucaea aestivalis* | S1B, E | -- | Dry open pine or oak woods; nests on the ground in dense cover. | **Possible**; suitable habitat present, no individuals observed, not included in TVA Natural Heritage Database. Would be found in dense deciduous forested areas around the perimeter of the reservation. | TDEC 2025; TVA 2024, Appendix F |
| Swainson's Warbler *Limnothlypis swainsonii* | S3, D | -- | Mature, rich, damp, deciduous floodplain and swamp forests. | **Possible**; forested habitats adjacent to the Clinch and Emory Rivers may provide suitable habitat, but no individuals observed during field surveys**.** Not included in TVA Natural Heritage Database. | TDEC 2025; TVA 2024, Appendix F |
| Bald Eagle[1] *Haliaeetus leucocephalus* | S3 | DL | Forested areas adjacent to large bodies of water for nesting habitat. Tall, mature coniferous or deciduous trees that afford a wide view of the surroundings are used as nest trees and roost trees. | **Likely**; suitable perching/foraging habitat along the boundary of the reservation, including trees and structures along Clinch and Emory Rivers. No individuals observed on the reservation during field surveys but observed nearby in shoreline trees and flying over the Clinch River. TVA Natural Heritage Database includes one verified extant population in county and within a 3-mile radius of KIF. | USFWS 2025a; TVA 2025; TVA 2024, Appendix F |
| Osprey *Pandion haliaetus* | S3B | -- | Nests on trees (live and dead), and man-made structures such as lighting towers, utility poles, buildings and channel markers near lakes and rivers where fish are abundant. | **Confirmed**; osprey nest observed on the reservation (on transmission line pole); multiple extant osprey nest points within a 3-mile radius of KIF. Could be found in deciduous forest areas, near lighting tower, on transmission poles in the reservation's transmission corridors, and herbaceous areas. | TVA 2025; TVA 2024, Appendix F |

| Common Name | State Rank and Listing Status | Federal Listing Status | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel | Reference |
|---|---|---|---|---|---|
| Whooping Crane *Grus americana* | SX | EXPN | Breeds, migrates, winters and forages in a variety of habitats, including coastal marshes and estuaries, inland marshes, lakes, open ponds, shallow bays, salt marsh and sand or tidal flats, upland swales, wet meadows and rivers, pastures and agricultural | **Very Unlikely**; no suitable habitat present and no individuals observed during field surveys. Not included in TVA Natural Heritage Database. Would be found in shallow, marshy areas of the Clinch and Emory Rivers (seasonally). | USFWS 2025a; TVA 2024, Appendix F |
| **Mammals** | | | | | |
| Meadow Jumping Mouse *Zapus hudsonius* | S4, D | -- | Open grassy fields; often abundant in thick vegetation near water bodies; statewide. | **Not likely**; one datapoint included in TVA Natural Heritage Database in Roane County (not in reservation); not observed during field surveys. Limited suitable habitat. Species would be found in grassy areas near Emory River. | TVA 2025; TVA 2024, Appendix F |
| Southern Bog Lemming *Synaptomys cooperi* | S4, D | -- | Marshy meadows, wet balds, and rich upland forests. | **Very Unlikely**; No suitable habitat, no individuals observed, not included on TVA Natural Heritage Database. Would be found in upland areas. | TDEC 2025; TVA 2024, Appendix F |
| Long-tailed Shrew *Sorex dispar* | S2, D | -- | Mountainous, forested areas with loose talus; east Tennessee. | **Not likely**; no suitable habitat observed and no individuals observed during field surveys. Not included in TVA Natural Heritage Database. Would be found in deciduous forests near cool damp rocky slopes. | TDEC 2025; TVA 2024, Appendix F; TWRA 2025 |
| Alleghanian Spotted Skunk *Spilogale putorius* | S3, T | -- | Rocky outcrops, open prairies, brushy areas, cultivated fields, and barnyards; more common in east Tennessee; reclusive. | **Very Unlikely**; No suitable habitat, no individuals observed, and no records in TVA Natural Heritage Database. Would be found in dense mature forest stands with extensive shrub cover. | TDEC 2025; TVA 2024, Appendix F; NatureServe 2025 |

| Common Name | State Rank and Listing Status | Federal Listing Status | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel | Reference |
|---|---|---|---|---|---|
| Gray bat *Myotis grisescens* | S2, E | LE | Cave obligate year-round; frequents forested areas; migratory. | **Not Likely**; Phase 2 presence/absence survey conducted in 2023 did not detect the species on the reservation. However, roosting and foraging habitat observed during field surveys. Verified extant within Roane County. | USFWS 2025a; TVA 2025; TVA 2024, Appendix F |
| Indiana bat *Myotis sodalis* | S1, E | LE | Wet meadows, damp woods, and uplands, including abandoned structures and sinkhole fissures/karst features; statewide. | **Not Likely**; Phase 2 presence/absence survey conducted in 2023 with sufficient effort to determine probable absence on the reservation. There are no records of the species within 3 miles of the reservation in the TVA Natural Heritage Database, and there are no known hibernacula for the species within Roane County. However, roosting and foraging habitat observed during field surveys. | USFWS 2025a; TVA 2024, Appendix F |
| Northern long-eared bat *Myotis septentrionalis* | S1S2, E | LE | A forest bat whose summer roosts may include caves, mines, live trees and snags; hibernates in caves and mines, often using small cracks and fissures. | **Not Likely**; Phase 2 presence/absence survey conducted in 2023 with sufficient effort to determine probable absence on the reservation. However, roosting and foraging habitat observed during field surveys, and species is verified extant within Roane County (outside the reservation). | USFWS 2025a; TVA 2025; Appendix F in TVA 2024 |
| Tricolored bat *Perimyotis subflavus* | S2S3, T | PE | Generally associated with forested landscapes but may roost near openings. | **Not likely**; Phase 2 presence/absence survey conducted in 2023 with sufficient effort to determine probable absence on the reservation. However, roosting and foraging habitat was observed during field surveys. Occurs outside the reservation, in Roane County. | UFWS 2025a; TVA 2025; TVA 2024, Appendix F |

| Common Name | State Rank and Listing Status | Federal Listing Status | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel | Reference |
|---|---|---|---|---|---|
| **Reptiles** | | | | | |
| Eastern Slender Glass Lizard *Ophisaurus attenuatus longicaudus* | S3, T | -- | Dry upland areas including brushy, cut-over woodlands and grassy fields; nearly statewide but obscure; fossorial. | **Possible**; suitable habitat observed, but no incidental observations of the lizard were made during field surveys, and no records are included in TVA Natural Heritage Database. Would be found in areas with dense grass/herbaceous vegetation. | TDEC 2025; TVA 2024, Appendix F |
| Northern Pinesnake *Pituophis melanoleucus melanoleucus* | S3, T | -- | Well-drained sandy soils in pine/pine-oak woods; dry mountain ridges; E portions of west TN, E to lower elevation of the Appalachians. | **Very Unlikely**; No suitable habitat, no individuals observed, no records in TVA Natural Heritage Database. Would be found near evergreen forest stands with well-drained sandy soils. | TDEC 2025; TVA 2024, Appendix F |
| **Amphibians** | | | | | |
| Green Salamander *Aneides aeneus* | S3S4 | -- | Damp crevices in shaded rock outcrops and ledges; beneath loose bark and cracks of trees and sometimes in/or under logs. | **Not Likely**; no suitable habitat and no individuals observed during field surveys. No records included in TVA Natural Heritage Database. Would be found on narrow bands of bottomland forests found on the peninsula along the river margin and within wet sloughs. | TDEC 2025; TVA 2024, Appendix F |
| Eastern Hellbender *Cryptobranchus alleganiensis* | S3, E | PE | Rocky, clear creeks and rivers with large shelter rocks. | **Not likely**; no suitable habitat and no individuals observed during field surveys. Historical occurrence records within Roane County in TVA Natural Heritage Database. Not included on IPaC. Species would be found in rocky, free-flowing areas of the Emory and Clinch Rivers. | TDEC 2025; TVA 2024, Appendix F |
| Berry Cave Salamander *Gyrinophilus gulolineatus* | S1, E | C | Aquatic cave obligate; ridge and valley | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys, no records in TVA Natural Heritage Database or IPaC. Species would be found in caves year-round. | TDEC 2025; TVA 2024, Appendix F |

| Common Name | State Rank and Listing Status | Federal Listing Status | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel | Reference |
|---|---|---|---|---|---|
| Four-toed Salamander *Hemidactylium scutatum* | S3, D | -- | Woodland swamps, shallow depressions, and sphagnum mats on acidic soils; middle and east Tennessee. | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys, no records in TVA Natural Heritage Database. Would be found near inundated moist areas. | TDEC 2025; TVA 2024, Appendix F |
| **Fish** | | | | | |
| Spotfin Chub *Erimonax monachus* | S2, T | LT, EXPN | Clear upland rivers with swift currents & boulder substrates; portions of the Tennessee River watershed. | **Not Likely**; No suitable habitat and no individuals observed during field surveys. TVA Natural Heritage Database includes one verified extant population in watershed boundary, and one unranked population in Roane County. Included on IPaC. Species would be found in non-turbid areas of Clinch and Emory Rivers. | USFWS 2025a; TVA 2025; TVA 2024, Appendix F |
| Tennessee Dace *Chrosomus tennesseensis* | S3, D | -- | First order spring-fed streams of woodlands in Ridge and Valley limestone region; Tennessee River watershed. | **Not likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one verified population within the watershed boundary. | TVA 2025; TVA 2024, Appendix F |
| Blue Sucker *Cycleptus elongatus* | S2, D | -- | Swift waters over firm substrates in big rivers. | **Not likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one possibly historical population within the watershed boundary. Would be found in main sections of Clinch and Emory Rivers. | TVA 2025; TVA 2024, Appendix F |
| Flame Chub *Hemitremia flammea* | S3, T | -- | Springs and spring-fed streams with lush aquatic vegetation; Tennessee & middle Cumberland river watersheds. | **Very Unlikely**; No suitable habitat, no specimens observed during field surveys, no records in TVA Natural Heritage Database. Would be found in springs with high quality vegetation. | TDEC 2025; TVA 2024, Appendix F |

| Common Name | State Rank and Listing Status | Federal Listing Status | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel | Reference |
|---|---|---|---|---|---|
| Slender Chub *Erimystax cahni* | | LT | Restricted to bars and shoals of fine to medium gravel in runs and riffles of medium to large, clear, warm rivers | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one extirpated population within the watershed boundary. Included on IPaC. Species would be found in warm, shallow, and non-turbid areas of Clinch and Emory Rivers. | USFWS 2025a; TVA, 2025; TVA 2024, Appendix F |
| Sickle Darter *Percina williamsi* | | LT | Inhabits flowing pools over rocky, sandy or silty substrates in clear creeks or small rivers | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one possibly historical population within the watershed boundary. Included on IPaC. Species would be found in free-flowing, non-turbid areas of the Clinch and Emory Rivers. | USFWS 2025a; TVA, 2025; TVA 2024, Appendix F |
| Redlips Darter *Etheostoma maydeni* | S2, T | -- | Inhabits slow-moving large creeks and rivers in pools along the banks strewn with boulders and woody debris | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one verified extant population in watershed boundary. Species would be found along the banks of the Clinch and Emory Rivers. | TVA, 2025; TVA 2024, Appendix F |
| Tangerine Darter *Percina aurantiaca* | S3, D | -- | Inhabits large-moderate size headwater tributaries to Tennessee River, in clear, fairly deep, rocky pools, usually below riffles | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one verified extant population in watershed boundary. Species would be found near headwaters of Clinch and Emory Rivers. | TVA, 2025; TVA 2024, Appendix F |
| Longhead Darter *Percina macrocephala* | S2, T | -- | Inhabits the Ohio, Tennessee and Allegheny River drainage. It occurs in moderate to large-sized clear streams with swift currents and bottoms of gravel and boulders. | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one verified extant population in watershed boundary. Species would be found in main sections of Clinch and Emory Rivers. | TVA, 2025; TVA 2024, Appendix F |

| Common Name | State Rank and Listing Status | Federal Listing Status | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel | Reference |
|---|---|---|---|---|---|
| Yellowfin Madtom *Noturus flavipinnis* | | LT | Inhabits pools and backwaters around slab rocks, bedrock ledges, and tree roots in clear creeks and small rivers | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one extirpated population in watershed boundary. Included on IPaC. Species would be found in warm, non-turbid, and low-flow areas of Clinch and Emory Rivers. | USFWS 2025a; TVA, 2025; TVA 2024, Appendix F |
| Lake Sturgeon *Acipenser fulvescens* | S1, E | -- | Inhabits riverbeds and lakes | **Possible**; Highly mobile species, recorded 0.4 and 2.7 river miles downstream of the fossil plant discharge. Habitat in the intake channel is of marginal ecological value. TVA Natural Heritage Database includes one verified extant population in watershed boundary. Species would be found in main sections of Clinch and Emory Rivers. | TVA, 2025; TVA 2024, Appendix F |
| Highfin Carpsucker *Carpiodes velifer* | S2S3, D | -- | Inhabits medium- to large-sized rivers over rocky gravel substrates | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one possibly historical population in watershed boundary. Species would be found in main sections of Clinch and Emory Rivers. | TVA, 2025; TVA 2024, Appendix F |
| **Plants** | | | | | |
| Barrens Silky Aster *Symphyotrichum pratense* | S1, E | -- | Barrens | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys, no records in TVA Natural Heritage Database. | TDEC 2025; TVA 2024, Appendix F |
| Rigid sedge *Carex tetanica* | S1, E | -- | Calcareous seeps | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys, no records in TVA Natural Heritage Database. | TDEC 2025; TVA 2024, Appendix F |

| Common Name | State Rank and Listing Status | Federal Listing Status | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel | Reference |
|---|---|---|---|---|---|
| Slender Blazing-star *Liatris cylindracea* | S2, T | -- | Barrens | **Not likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one possibly historical population within 5-miles of the reservation. Would be found along remnants of sandstone, shallow bedrock, glade and barren like habitat, and chert rock habitat. | TDEC 2025; TVA 2024, Appendix F |
| Fetter-bush *Leucothoe racemosa* | S2, T | -- | Acidic wetlands and swamps | **Not likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one possibly historical population within a 5-mile radius of the reservation. Would be found in acidic wetlands along the Clinch River. | TDEC 2025; TVA 2024, Appendix F |
| Fen Orchis *Liparis loeselii* | S1, T | -- | Calcareous seeps | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys, and no records in TVA Natural Heritage Database. Would be found in floodplain forests, wooded bluffs, and wooded rocky slopes | TDEC 2025; TVA 2024, Appendix F |
| Nuttall's Waterweed *Elodea nuttallii* | S2, S | -- | Aquatic; streams and ponds | **Not Likely**; No suitable habitat, no individuals observed during field surveys, and no records in TVA Natural Heritage Database. Would be found in shallow or low-flow areas of Clinch and Emory Rivers. | TDEC 2025; TVA 2024, Appendix F |
| Prairie Goldenrod *Oligoneuron album* | S1S2, E | -- | Barrens | **Not Likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one verified extant population within a 5-mile radius of the reservation. Would be found along remnants of sandstone, shallow bedrock, glade and barren like habitat, and chert rock habitat. | TVA 2025; TVA 2024, Appendix F |

| Common Name | State Rank and Listing Status | Federal Listing Status | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel | Reference |
|---|---|---|---|---|---|
| Heller's Catfoot *Pseudognaphaliu m helleri* | S2, E | -- | Dry sandy woods | **Not Likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes a fair estimated viability occurrence within a 5-mile radius of the reservation. Would be found in undisturbed and well-drained woodland areas. | TVA 2025; TVA 2024, Appendix F |
| Missouri Gooseberry *Ribes missouriense* | S2, S | -- | Rocky woods | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys, no records in TVA Natural Heritage Database. Would be found in woodland areas. | TDEC 2025; TVA 2024, Appendix F |
| Virginia Spiraea *Spiraea virginiana* | S2, E | LT | Stream bars and ledges; frequently occurs in flood-scoured, high-gradient sections of rocky riverbanks of second and third order streams, often in gorges or canyons | **Not likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes a verified extant population in Roane County and within a 5-mile radius. Identified on IPaC. Species would be found near gravel bars, sandy riverbanks, and riparian areas with seasonal flooding. | USFWS 2025a; TVA 2025; TVA 2024, Appendix F |
| Shining Ladies'-tresses *Spiranthes lucida* | S1S2, T | -- | Alluvial woods and moist slopes | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys, no records in TVA Natural Heritage Database. Would be found in moist woodland areas on the shorelines of Clinch and Emory Rivers. | TDEC 2025; TVA 2024, Appendix F |
| Earleaved False-foxglove *Agalinis auriculata* | S2, E | -- | Barrens | **Not Likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one verified extant population within a 5-mile radius of reservation. Would be found along remnants of sandstone, shallow bedrock, glade and barren like habitat, and chert rock habitat. | TVA 2025; TVA 2024, Appendix F |

| Common Name | State Rank and Listing Status | Federal Listing Status | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel | Reference |
|---|---|---|---|---|---|
| Schreber's Aster *Eurybia schreberi* | S1, S | -- | Mesic woods and seepage slopes | **Possible**; limited suitable habitat potentially present, no individuals observed during field surveys. TVA Natural Heritage Database includes one verified viable population within a 5-mile radius of reservation. Would be found in mesic woods, near Clinch River. | TVA 2025; TVA 2024, Appendix F; iNaturalist 2025a |
| Western Wallflower *Erysimum capitatum* | S1S2, E | -- | Rocky bluffs | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys, no records in TVA Natural Heritage Database. Would be found near remnants of sandstone, shallow bedrock, glade and barren like habitat, and chert rock habitat. | TDEC 2025; TVA 2024, Appendix F |
| Large-flowered Barbara's-buttons *Marshallia grandiflora* | S2, E | -- | Rocky river bars | **Not likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one possibly historical population within a 5-mile radius of reservation. | TVA 2025; TVA 2024, Appendix F |
| Tall Larkspur *Delphinium exaltatum* | S2, E | -- | Glades and barrens | **Not Likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one verified extant population within a 5-mile radius of reservation. Would be found within and below rocky outcrop areas. | TVA 2025; TVA 2024, Appendix F |
| Northern Bush-honeysuckle *Diervilla lonicera* | S2, T | -- | Rocky woodlands and bluffs | **Not Likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one verified extant population within a 5-mile radius of reservation. Would be found near remnants of sandstone, shallow bedrock, glade and barren like habitat, and chert rock habitat. | TVA 2025; TVA 2024, Appendix F |

| Common Name | State Rank and Listing Status | Federal Listing Status | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel | Reference |
|---|---|---|---|---|---|
| Mountain Bush-honeysuckle *Diervilla sessilifolia var. rivularis* | S2, T | -- | Dry cliffs and bluffs | **Not likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one possibly historical population within a 5-mile radius of reservation. Would be found in moist wooded areas and disturbed areas such as roadsides or existing corridors. | TVA 2025; TVA 2024, Appendix F; iNaturalist 2025b |
| Branching Whitlow-grass *Draba ramosissima* | S2, S | -- | Calcareous bluffs | **Very Unlikely**; No suitable habitat, no specimens observed during field surveys, no records in TVA Natural Heritage Database. Would be found near remnants of sandstone, shallow bedrock, glade and barren like habitat, and chert rock habitat. | TDEC 2025; TVA 2024, Appendix F |
| Spreading False-foxglove *Aureolaria patula* | S3, S | -- | Oak woods and edges | **Not Likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one verified extant population within a 5-mile radius of reservation. Would be found in forested (oak) edge habitat. | TVA 2025; TVA 2024, Appendix F |
| River Bulrush *Bolboschoenus fluviatilis* | S1, S | -- | Marshes | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys, no records in TVA Natural Heritage Database. Would be found near shoreline of Clinch and Emory Rivers. | TDEC 2025; TVA 2024, Appendix F |
| Mountain Honeysuckle *Lonicera dioica* | S2, S | -- | Mountain woods and thickets | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys, no records in TVA Natural Heritage Database. Would be found in forest edge habitat around the perimeter of the reservation. | TDEC 2025; TVA 2024, Appendix F; Native Plant Trust 2025 |
| American Ginseng *Panax quinquefolius* | S3S4, S-CE | -- | Rich woods | **Not Likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one verified extant population within a 5-mile radius of reservation. Would be found under deciduous tree canopy with rich, moist, light, and porous rich loam. | TVA 2025; TVA 2024, Appendix F; TDEC n.d. |

| Common Name | State Rank and Listing Status | Federal Listing Status | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel | Reference |
|---|---|---|---|---|---|
| Swamp Lousewort *Pedicularis lanceolata* | S1S2, S | -- | Wet acidic barrens and seeps | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys, no records in TVA Natural Heritage Database. Would be found near dry powerline openings, bog and wet meadows, disturbed prairie habitat. | TDEC 2025; TVA 2024, Appendix F |
| Tubercled Rein-orchid *Platanthera flava var. herbiola* | S2, T | -- | Swamps and floodplains | **Not likely**; No individuals observed during field surveys, no records in TVA Natural Heritage Database. Limited habitat potential in small wetlands on the reservation. | TDEC 2025; TVA 2024, Appendix F |
| White Fringeless Orchid *Platanthera integrilabia* | S2S3, E | LT | Acidic Seeps And Stream Heads | **Not Likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database indicates one possibly extirpated population in Roane County. Identified on IPaC. Would be found in partially shaded boggy headwater streams. | USFWS 2025a; TVA 2025; TVA 2024, Appendix F |
| Naked-stem Sunflower *Helianthus occidentalis* | S2, S | -- | Limestone glades and barrens | **Not Likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database identifies one possibly historical population in Roan County. Would be found near dry powerline openings, bog and wet meadows, disturbed prairie habitat. | TVA 2025; TVA 2024, Appendix F |
| Butternut *Juglans cinerea* | S3, T | -- | Rich woods and hollows | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys, no records in TVA Natural Heritage Database. Would be found near dense forest stands. | TDEC 2025; TVA 2024, Appendix F |
| Small-headed Rush *Juncus brachycephalus* | S2, S | -- | Seeps and wet bluffs | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys, no records in TVA Natural Heritage Database. Would be found adjacent to wetlands, poorly drained areas along the shoreline. | TDEC 2025; TVA 2024, Appendix F |

| Common Name | State Rank and Listing Status | Federal Listing Status | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel | Reference |
|---|---|---|---|---|---|
| Hart's-tongue Fern Asplenium *scolopendrium* var. *americanum* | S1, E | LT | Sinks | **Not Likely**; No suitable habitat, no specimens observed during field surveys. TVA Natural Heritage Database includes one extirpated population in Roane County. No included on IPaC. Would be found in sinks or pit caves. | TVA 2025; TVA 2024, Appendix F |
| **Crustacean** | | | | | |
| Valley Flame Crayfish *Cambarus deweesae* | S1, E | -- | Primary burrower; open areas with high water tables; northern Ridge & Valley. | **Possible**; Potential suitable habitat, no individuals observed during field surveys. Occurrence of a possibly historical record of *Cambarus sp.* is included in the TVA Natural Heritage Database. Would be found adjacent to Clinch and Emory Rivers where water table is high. | TVA 2025; TVA 2024, Appendix F |
| Incurved Cave Isopod *Pseudobaicalasellus incurvus* | S1; Rare, not state listed | -- | Aquatic cave obligate; known from two wet caves in east Tennessee. | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys, no occurrence record in TVA Natural Heritage Database. | TDEC 2025; TVA 2024, Appendix F |
| **Mollusks** | | | | | |
| Tennessee Bean *Venustaconcha trabalis* | S1, E | LE, EXPN | Riffle areas of small rivers and streams in sand, gravel, and cobble substrates with swift current. | **Not Likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes a verified extant population in the watershed boundary, and historical occurrence in Roane County. No included on IPaC. Would be found in clear, free-flowing areas of Clinch and Emory Rivers. | TVA 2025; TVA 2024, Appendix F |
| Rough Rabbitsfoot *Theliderma cylindrica strigillata* | S2, E | LE | Small- to medium-sized rivers, in clear, shallow riffles with sand-gravel substrates; Tennessee and Cumberland river systems. | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys, and no records in TVA Natural Heritage Database or IPaC. Would be found in Clinch and Emory Rivers with sand-gravel substrates. | TDEC 2025; TVA 2024, Appendix F |

| Common Name | State Rank and Listing Status | Federal Listing Status | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel | Reference |
|---|---|---|---|---|---|
| Ring Pink *Obovaria retusa* | S1, E | LE, EXPN | Large rivers in gravel and sand bars; Tennessee and Cumberland river watersheds. | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys, and no records in TVA Natural Heritage Database or IPaC. Would be found in sand and gravel substrates of shallow areas in Clinch and Emory Rivers. | TDEC 2025; TVA 2024, Appendix F |
| Spectaclecase *Cumberlandia monodonta* | S2S3, E | LE | Medium to large rivers; in substrates from mud and sand to gravel, cobble, and boulders; Cumberland and Tennessee River systems. | **Not Likely**; suitable habitat exists in Emory River and Poplar Creek, no individuals observed during field surveys. TVA Natural Heritage Database includes one historical population in Roane County. Identified on IPaC. Would be found in large rivers in areas sheltered from the main force of the current. | USFWS 2025a; TVA 2025; TVA 2024, Appendix F |
| Fanshell *Cyprogenia stegaria* | S1, E | LE, EXPN | Medium to large streams and rivers with coarse sand and gravel substrates; Cumberland and Tennessee River systems. | **Not Likely**; No suitable habitat, no individuals observed during field surveys, and no records in TVA Natural Heritage Database or IPaC. Would be found in sand, gravel, and cobble substrates within the Clinch and Emory Rivers. | TDEC 2025; TVA 2024, Appendix F |
| Shiny Pigtoe *Fusconaia cor* | S1, E | LE, EXPN | Shoals and riffles of small- to medium-sized rivers with mod-fast current over sand-cobble substrates; upper Tennessee River watershed. | **Not Likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one extirpated population in Roane County. Not in IPaC. Would be found near relatively silt free substrates of sand, gravel, and cobble in good flows of smaller streams. | TVA 2025; TVA 2024, Appendix F |
| Finerayed Pigtoe *Fusconaia cuneolus* | S1, E | LE, EXPN | Riffles of fords and shoals of moderate gradient streams in firm cobble and gravel substrates; middle and upper Tennessee River watershed. | **Not Likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one historical population in Roane County. Not in IPaC. Would be found in moderate flowing areas of Clinch and Emory Rivers. | TVA 2025; TVA 2024, Appendix F |

| Common Name | State Rank and Listing Status | Federal Listing Status | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel | Reference |
|---|---|---|---|---|---|
| Orangefoot Pimpleback *Plethobasus cooperianus* | S1, E | LE, EXPN | Large rivers in sand-gravel-cobble substrates in riffles and shoals in deep flowing water; Cumberland and Tennessee river systems. | **Not Likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one historical population in Roane County. Not in IPaC. Would be found in deep free-flowing areas of Clinch and Emory Rivers. | TVA 2025; TVA 2024, Appendix F |
| Sheepnose *Plethobasus cyphyus* | S2S3, E | LE | Large to medium-sized rivers, in riffles and coarse sand/gravel substrate; Tennessee and Cumberland river systems including Kentucky Reservoir. | **Very Unlikely**; No suitable habitat, no individuals observed during field surveys, and no records in TVA Natural Heritage Database or IPaC. Would be found in shallow turbid areas of Clinch and Emory Rivers. | TDEC 2025; TVA 2024, Appendix F |
| Spiny Riversnail *Io fluvialis* | S2, Not State Listed | -- | Shallow waters of shoals that are rapid to moderate and well-oxygenated; Tennessee River and main tributaries. | **Not Likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one verified extant population in Roane County. Would be found in shallow areas of Clinch and Emory Rivers. | TVA 2025; TVA 2024, Appendix F |
| Pink Mucket *Lampsilis abrupta* | S2, E | LE | Generally a large river species, preferring sand-gravel or rocky substrates with moderate-strong currents; Tennessee and Cumberland river systems. | **Not Likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one possibly historical population in Roane County. Identified in IPaC. Would be found in free-flowing areas of Clinch and Emory Rivers. | USFWS 2025a; TVA 2025; TVA 2024, Appendix F |
| Alabama Lampmussel *Lampsilis virescens* | S1, E | LE | Found in sand and gravel substrates in shoal areas of small-medium size rivers; middle and upper Tennessee River system. | **Not Likely**; No suitable habitat, no individuals observed during field surveys. TVA Natural Heritage Database includes one historical population in Roane County. Identified in IPaC. Would be found in shallow areas of Emory River. | USFWS 2025a; TVA 2025; TVA 2024, Appendix F |

| Common Name | State Rank and Listing Status | Federal Listing Status | Habitat Requirement | Potential for Species Occurrence on the Kingston Reservation or the Cooling Water Intake Channel | Reference |
|---|---|---|---|---|---|
| **Snail** | | | | | |
| Anthony's Riversnail *Athearnia anthonyi* | S1 | PT | Inhabit medium to large rivers in sand, gravel, and cobble/boulder substrates. | **Not likely**; No suitable habitat, no individuals observed during field surveys, and no records in TVA Natural Heritage Database. Identified in IPaC. Would be found in sand and gravel substrates in shallow areas of the Clinch and Emory Rivers. | USFWS 2025a; TVA 2024, Appendix F |
| **Insect** | | | | | |
| Monarch Butterfly *Danaus plexippus* | S4 | PT | Milkweeds and flowering plants | **Possible**; suitable habitat, but no individuals observed during field surveys and no occurrences recorded in TVA Natural Heritage Database. Identified in IPaC. Would be found near roadsides, open areas such as fields, transmission ROWs, and wet areas with flowering species. | USFWS 2025a; USFWS 2025b; TVA 2024, Appendix F |

Note:
1) Protected under Bald Eagle and Golden Eagle Protection Act.
Key: C = Candidate; D = Deemed in Need of Management; DM = Delisted, still being monitored; E = Endangered; E-P = Endangered/Possibly Extirpated.; E-PT = Endangered/Proposed Threatened; EXPN = Experimental Population, Non-Essential; IPaC = Information, Planning, and Consultation; KIF = Kingston Fossil Plant; LE = Listed Endangered; LT = Listed Threatened; PS = Partial Status; RARE= Rare; ROW = Right-of-way; S= Special Concern; S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Apparently Secure; S5 = Secure; S-CE= Special Concern/Commercially Exploited; SLNS= State listed, no status; S-P= Special Concern/Possibly Extirpated; SX = Presumed Extirpated; T= Threatened; T-CE= Threatened/Commercially Exploited; TVA = Tennessee Valley Authority

**References**

iNaturalist. 2025a. Schreber's Wood Aster (*Eurybia schreberi*). Available at [URL]: https://www.inaturalist.org/taxa/143889-Eurybia-schreberi#cite_note-flora-7. (Accessed November 2025).

_____. 2025b. Mountain Bush Honeysuckle (*Diervilla rivularis*). Available at [URL]: https://www.inaturalist.org/taxa/52758-Diervilla-rivularis. (Accessed November 2025)

Native Plant Trust. 2025. *Lonicera dioica* — wild honeysuckle. Available at [URL]: https://gobotany.nativeplanttrust.org/species/lonicera/dioica/. (Accessed November 2025)

NatureServe. 2025. *Spilogale putorius* Alleghanian Spotted skunk. Available at [URL]: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.1293683/Spilogale_putorius. (Accessed November 2025).

Tennessee Department of Environment and Conservation (TDEC). N.d. Tennessee Ginseng Program. Available at [URL]: https://www.tn.gov/content/dam/tn/environment/natural-areas/documents/ginseng/na_ginseng_tn-ginseng-program-brochure.pdf. (Accessed November 2025).

_____. 2025. Rare Species by County. TDEC, Natural Heritage Program, Nashville, Tennessee. Available at [URL]: https://dataviewers.tdec.tn.gov/dataviewers/f?p=9014:3:118904174220701. (Accessed November 2025).

Tennessee Valley Authority (TVA). 2024. Kingston Fossil Plant Retirement Final EIS. Kingston Fossil Plant Retirement Final Environmental Impact Statement. February 2024

_____. 2025. TVA Regional Natural Heritage Database. Tennessee Valley Authority. Data exports provided by TVA in support of the KIF Extension Project SEIS. Data Extracted October 21, 2025.

Tennessee Wildlife Resource Authority (TWRA). 2025. Long-tailed Shrew Sorex dispar. Available at [URL]: https://www.tn.gov/twra/wildlife/mammals/small/long-tailed-shrew.html. (Accessed November 2025).

U.S. Fish and Wildlife Service (USFWS). 2025a. Information for Planning and Consultation (IPaC) Tool Resource List. Not for Consultation. (Accessed November 2025).

_____. 2025b. Monarch. Available at [URL]: https://www.fws.gov/species/monarch-danaus-plexippus. (Accessed November 2025).