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**SAULPAW MILL DAM REMOVAL
DRAFT ENVIRONMENTAL ASSESSMENT
McMinn County, Tennessee**

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Symbols, Acronyms, and Abbreviations

Acronym	Description
AADT	Average Annual Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ACS	American Community Survey
AQCR	Air Quality Control Region
ARAP	Aquatic Resource Alteration Permit
BMP	Best Management Practices
CAA	Clean Air Act
CCUD	Calhoun-Charleston Utility Water District
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CEQ	Council On Environmental Quality
CO	Carbon Monoxide
CR	County Road
CWA	Clean Water Act
dB	Decibel
dBA	A-Weighted Decibel
DOJ	U.S. Department of Justice
EA	Environmental Assessment
ECHO	Enforcement and Compliance History Online
EO	Executive Order
EJ	Environmental Justice
ESA	Endangered Species Act
E&SCP	Erosion and Sediment Control Plan
FEMA	Federal Emergency Management Agency
FPPA	Farmland Protection Policy Act
FRA	Federal Railroad Administration
FSLG	Flood Storage Loss Guideline
FSZ	Flood Storage Zone
FTA	Federal Transit Administration
GHG	Greenhouse gas
HDR	HDR Engineering, Inc.
HUC	Hydrologic Unit Code
HUD	U.S. Department of Housing and Urban Development
in/sec	Inches Per Second
Ldn	Day-Night Sound Level
LEP	Limited English Proficiency
MBTA	Migratory Bird Treaty Act
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
NAVD88	North American Vertical Datum- 1988
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NLCD	National Landcover Dataset
NO ₂	Nitrogen Dioxide
NPDES	National Pollutant and Discharge Elimination System
NRHP	National Register of Historic Places
O ₃	Ozone
OSHA	Occupational Safety and Health Administration
PAH	Polycyclic Aromatic Hydrocarbon
Pb	Lead
PCB	Polychlorinated Biphenyls
PM	Particulate Matter

Saulpaw Mill Dam Removal

PPV	Peak Particle Velocity
RCRA	Resource Conservation and Recovery Act
RFFA	Reasonably Foreseeable Future Action
RM	River Mile
SAIPE	Small Area Income and Poverty Estimates
SCC	Social Cost of Carbon
SCN	Social Cost of Nitrous Oxide
SCM	Social Cost of Methane
SHPO	State Historic Preservation Office
SO ₂	Sulfur Dioxide
SPCC	Spill Prevention, Control, and Countermeasures Plan
SR	State Route
TDEC	Tennessee Department of Environment and Conservation
TDOT	Tennessee Department of Transportation
THC	Tennessee Historic Commission
TNC	The Nature Conservancy
TSCA	Toxic Substances Control Act
TVA	Tennessee Valley Authority
TVAR	Tennessee Valley Archaeological Research
TWRA	Tennessee Wildlife Resource Agency
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USDOJ	US Department of The Interior
USEPA	U.S. Environmental Protection Agency
USFWS	US Fish and Wildlife Service
OSHA	Occupational Safety and Health Administration
VOC	Volatile Organic Compounds

CHAPTER 1 – PURPOSE AND NEED FOR ACTION

1.1 Background

The Project Site (also referred to as “Site”) is the Tennessee Valley Authority’s (TVA) Saulpaw Mill Dam in the Town of Calhoun, in McMinn County, Tennessee. Saulpaw Mill Dam is a run-of-river low head dam and is located within TVA property at confluence of Oostanaula Creek and the Hiwassee River at Hiwassee River Mile (HiRM) 19.8, on the right descending bank of Chickamauga Reservoir (Figure 1.3-1). Constructed in 1869, the dam is eligible for listing on the National Register of Historic Places (NRHP) and is associated with an old flourmill that was removed by TVA in 1940 for construction of Chickamauga Reservoir for flood control. The dam is a masonry gravity structure constructed from large-cut limestone blocks quarried from rock bluffs nearby. The length of the dam is approximately 60 feet, and the total height is approximately 16 feet. The dam ties into retaining walls at both abutments, which are constructed of similar quarried block masonry as the dam. A CSX railroad crossing and the County Road 950 (Hiwassee Road) crossing of Oostanaula Creek are located approximately 30 feet and 80 feet north of the dam, respectively (Figure 1.3-2).

The Saulpaw Mill Dam is no longer being used for its intended purpose (operation of the flour mill) and serves no other practical purpose. The Saulpaw Mill Dam presents a hazard to recreational users at the Site. Although TVA is not aware of any fatalities associated with the Saulpaw Mill Dam, according to the Brigham Young University Department of Civil and Environmental Engineering, more than 440 deaths have occurred as a result of the currents created by small dams since the 1950s (BYU 2015). Additionally, TVA Natural Resources staff, in collaboration with the U.S. Fish and Wildlife Service (USFWS), The Nature Conservancy (TNC), and Tennessee Wildlife Resources Agency (TWRA), hereafter “Partners”, are identifying stream barriers in the Tennessee Valley watershed that impede the movement of fish and other aquatic organisms. Saulpaw Mill Dam was identified as a barrier; therefore, TVA is evaluating the feasibility of removal of the dam.

1.2 Purpose and Need

The purpose of the proposed project is to provide safer conditions for the recreating public and improve aquatic habitat and habitat connectivity for stream fishes. The project is needed because Saulpaw Mill Dam creates hazardous conditions by acting as an uncontrolled spillway capable of producing dangerous recirculating currents, large hydraulic forces, and other hazardous conditions sufficient to trap and drown victims immediately downstream from the continuously flowing water over the crest of the dam. Additionally, the project is needed because Saulpaw Mill Dam is presently acting as a barrier to aquatic life passage upstream.

1.3 Decision to be Made

This environmental assessment (EA) has been prepared to inform TVA decision makers and the public about the environmental consequences of the Proposed Action. TVA must decide whether to take no action and leave Saulpaw Mill Dam in place or to remove Saulpaw Mill Dam.

TVA will use this EA to support the decision-making process and to determine whether an Environmental Impact Statement should be prepared or whether a Finding of No Significant Impact may be issued.

Saulpaw Mill Dam Removal

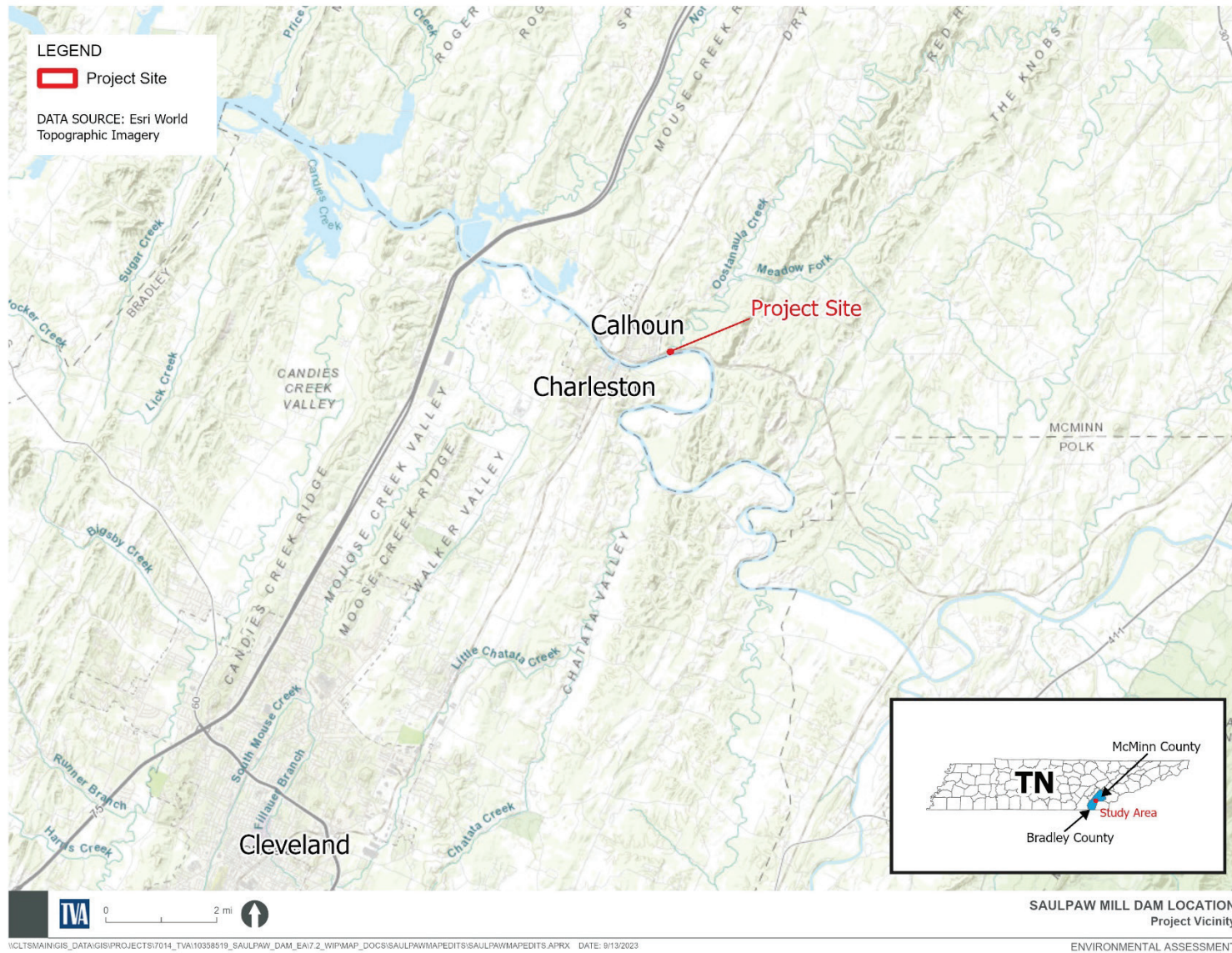


Figure 1.3-1. Saulpaw Mill Dam Location Map



Figure 1.3-2. Saulpaw Mill Dam Project Site and Components

1.4 Related Environmental Reviews and Consultation Requirements

Available environmental documents and materials were reviewed related to this assessment. These include studies performed in support of the Saulpaw Mill Dam Removal Project (Project). The contents of these documents help describe the Project Site and are incorporated by reference as appropriate. Documents reviewed are listed below and, in the references, provided in Section 5.

- NRHP Assessment and Assessment of Effects for the Saulpaw Mill Dam, McMinn County, Tennessee (Karpyneec and Weaver 2017). This report details the methods and results of a NRHP evaluation of the Saulpaw Mill Dam and the conclusions of an assessment of potential effects. The report concludes with a recommendation that Saulpaw Mill Dam is eligible for the NRHP under Criterion A for local significance in industry and commerce associated with the mid-to-late nineteenth-century mill complex. The report also recommended TVA consult with the Tennessee Historical Commission (THC) to explore mitigation alternatives for the proposed undertaking to minimize the adverse effect to the resource.
- Saulpaw Mill Dam Removal CSX Railroad Bridge Pier Impact Analysis Report – Condensed (Geosyntec Consultants 2021). This report documents the results of a hydraulic model and scour analyses performed by Geosyntec Consultants for TVA. The report summarizes the results and implications of the modeling and scour analyses performed on proposed dam removal scenarios, including potential immediate and permanent risks to the CSX pier that could occur if the dam were removed without implementation of mitigation measures. This report presents recommendations of pier scour mitigation strategies based on a comparison between existing conditions and proposed conditions in Oostanaula Creek.

The description of the affected environment and the assessment of impacts contained in the documents listed above were used in support of this analysis, and are incorporated, as appropriate, into analyses for each environmental resource in Chapter 3.

1.5 Scope of the Environmental Assessment

TVA has prepared this EA to comply with the National Environmental Policy Act (NEPA) and associated implementing regulations. TVA considered the possible environmental effects of the proposed action and determined that potential effects to the environmental resources listed below were relevant to the decision to be made. Thus, potential effects to the following environmental resources are addressed in detail in this EA:

- Land Use
- Soils and Prime Farmland
- Geology and Groundwater
- Surface Water and Water Quality
- Floodplains
- Wetlands
- Vegetation
- Wildlife
- Aquatic Ecology
- Threatened and Endangered Species
- Natural Areas, Parks, and Recreation
- Air Quality
- Greenhouse Gases and Climate Change
- Noise and Vibration
- Transportation
- Cultural Resources
- Visual Resources
- Solid and Hazardous Waste
- Socioeconomics and Environmental Justice
- Safety

1.6 Necessary Permits or Licenses

The environmental permits to be obtained for the activities related to TVA's action include:

- Coverage under Tennessee General National Pollutant and Discharge Elimination System (NPDES) Permit for discharges of stormwater associated with construction activities
- Coverage under a Division of Solid Waste Management Special Waste Determination Letter authorizing the disposal of special waste at a Tennessee permitted disposal facility
- Coverage under Tennessee Department of Environment and Conservation (TDEC) Aquatic Resource Alteration Permit (ARAP) for temporary and permanent impacts to the Oostanaula Creek and/or Hiwassee River
- Coverage under an U.S. Army Corps of Engineers (USACE) Permit for permanent impacts to the Oostanaula Creek and/or Hiwassee River

TVA would be responsible for ensuring necessary permits are obtained and implemented, manifests completed, and hazardous waste disposal (if generated or identified) properly reported.

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CHAPTER 2 – ALTERNATIVES

Descriptions of the no action and action alternatives, a brief comparison of their environmental effects, and TVA's preferred alternative are presented in this chapter.

2.1 Description of Alternatives

TVA has determined that there are two potential alternatives: an Action Alternative and a No Action Alternative. These alternatives were evaluated in this EA and are described below.

2.1.1 Alternative A – No Action Alternative

Under the No Action Alternative, TVA would not perform any modification of the Saulpaw Mill Dam and would continue to maintain the dam as needed. This alternative would not eliminate potentially unsafe conditions created by the Saulpaw Mill Dam or remove barriers to aquatic life movement. This alternative would not meet the purpose and need of the proposed action; however, it is included in this evaluation as it represents current conditions against which the action alternative will be compared.

2.1.2 Alternative B – Removal of the Saulpaw Mill Dam

Under Alternative B, TVA would remove Saulpaw Mill Dam. Alternative B would utilize an approximately 0.7-acre area encompassing Saulpaw Mill Dam, the adjacent riverbanks on either side of the dam, the CSX railroad, and the confluence of Oostanaula Creek and the Hiwassee River. The Project Site would be accessed using the adjacent Hiwassee Road for trucks and the Hiwassee River for barges. Dam removal would consist of three phases over seven days, subject to weather, as described below.

Phase I would consist of establishing temporary equipment staging, material storage, and construction access areas on the Project Site. Materials and equipment would also be staged on the work barges. Oil booms would be deployed around the work barge and anchored to the abutments to minimize risk of spills and to restrict recreational boat access to the work area. Minor grading and vegetation removal would be performed as required to establish these areas. For the purposes of this EA, it is assumed that construction would require vegetation removal and/or disturbance of the whole Project Site. Sediment and erosion control measures would be installed in accordance with Tennessee Stormwater Best Management Practices.

To stabilize the streambanks at the CSX railroad abutments, approximately 35 cubic yards of riprap would be installed along approximately 15 linear feet of the right and left streambanks and 15 feet back towards each railroad abutment (approximately 225 square feet on each bank).

To prevent potential head cutting and scour around the CSX railroad pier, approximately 30 cubic yards of stone and 200 concrete jacks (riprap, articulated concrete blocks, or other equivalent protection measures may be utilized) would be installed along approximately 30 linear feet (and up to 540 square feet) of creek bed around the railroad pier. Approximately 8 truckloads would be required to bring construction materials on site. A cofferdam may be required for in-water work, dewatering approximately 1,500 square feet (0.03 acres) of Oostanaula Creek. The in-water work may also be performed in the wet using divers and airlift dredging procedures. Airlift dredging utilizes a pipe and short injections of air to create a vacuum that pulls the water and sediment through the pipe. To install the protection

measures, approximately 130 CY of silt would be excavated and may be placed in the stream channel to disperse naturally, the right abutment to be graded to drain and stabilized with vegetation or disposed offsite at a TVA Environmental approved permitted landfill in accordance with state and Federal solid waste procedures. This equates to 10 truckloads if the material is disposed offsite.

Once the CSX railroad pier and streambanks around the railroad abutment are stabilized, the Saulpaw Mill Dam liftgate would be removed.

Phase 2 would consist of removal of the pier and main dam blocks utilizing a crane or excavator located on the work barges.

Phase 3 would consist of removing the remaining pier and dam blocks to an elevation of approximately 672 feet utilizing the crane or excavator on the work barges. The right abutment and existing left abutment would be the only above water dam structures remaining after deconstruction. Pier and dam blocks extending below the creek bed would be left in place. Minor silt removal near the confluence of the Hiwassee River may be required to access all the blocks to be removed.

Unless otherwise requested by the SHPO, the existing dam blocks would be staged on the right abutment or would be disposed offsite at a TVA Environmental approved permitted landfill in accordance with state and Federal solid waste procedures. An estimated 158 blocks would be removed from the dam, resulting in a staging area approximately 1,000 square feet in size.

Based on a sediment survey conducted in May 2022 (TVA 2022a), 83 cubic yards of sediment has accumulated behind the dam. Following removal of the dam and cofferdam, the accumulated sediments would be allowed to naturally disperse.

Following construction, the Project Site would be re-vegetated with a mixture of native and non-invasive species.

2.1.3 Alternatives Considered but Eliminated from Further Discussion

TVA considered partial removal of the dam; however, after discussion with the project Partners it was decided that removing the entire dam would be the best option to allow for full stream connectivity and support free movement of aquatic organisms and to ensure the remains of the dam would not pose a public safety risk.

2.2 Comparison of Alternatives

The potential environmental effects that could result from the No Action Alternative (Alternative A) and Removal of Saulpaw Mill Dam (Alternative B) are evaluated in this EA. 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 Site and within the surrounding areas. Impact severity is dependent upon their relative magnitude and intensity and resource sensitivity. In this document, four descriptors are used to characterize the level of impacts in a manner that is consistent with TVA's current practice.

In order of 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.
- Large – Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

A comparison of the environmental consequences associated with each alternative is presented in Table 2.2-1.

Table 2.2-1. Summary and Comparison of Alternatives by Resource Area

Resource Area	Impacts From No Action - Alternative A	Impacts From Proposed Action - Alternative B
Land Use	No impacts.	Minor permanent impacts. No cumulative impacts.
Soils and Prime Farmland	No impacts.	Minor, temporary impacts to soils due to site preparation (i.e., grading) and minor, permanent impacts due to placement of gravel and/or riprap. No impact to prime farmlands. Minor, temporary cumulative effects during the period of construction if overlapping with RFFAs. No cumulative impacts to prime farmland.
Geology and Groundwater	No impacts.	No impacts to geological or groundwater resources. No cumulative impacts to geological or groundwater resources.
Surface Water and Water Quality	No impacts.	Minor temporary impacts due to in-stream disturbance and sediment passage downstream; large permanent benefit due to restoration of natural hydraulics. Potential minor to moderate, temporary cumulative impacts due to in-stream disturbance and water quality impacts with proximity to RFFAs on Oostanaula Creek or Hiwassee River.
Floodplains	No impacts.	Minor, temporary adverse impact due to staging and construction access areas within the 100-year floodplain. Minor, permanent impacts due to grading and construction within 500- and 100-year floodplains with implementation of proper BMPs and mitigation efforts. Minor, permanent benefit to capacity of 100-year floodplain of Oostanaula Creek and the Hiwassee River. No cumulative impacts.
Wetlands	No impacts.	No impacts. No cumulative impacts.
Vegetation	No impacts.	Minor, temporary impacts due to herbaceous vegetation clearing and minor, permanent impacts due to the removal of

Resource Area	Impacts From No Action - Alternative A	Impacts From Proposed Action - Alternative B
		woody vegetation. Minor beneficial effect from revegetation with native and non-invasive species across the Project Site. Minor, temporary cumulative impacts if site clearing overlaps with development of nearby RFFAs.
Wildlife	No impacts.	Minor temporary and permanent impacts to common species during construction due to disturbance and/or loss of habitat. Minor, temporary cumulative impacts if Project activities or the site restoration period overlaps with nearby RFFAs.
Aquatic Ecology	Moderate adverse impacts due to the continued accumulation of sediments and the presence of a barrier to aquatic life movement. Minor cumulative impacts with consideration of other aquatic life barriers in the watershed.	Minor, temporary effects due to disturbance of aquatic habitat and impacts to water quality; large beneficial, permanent effects of dam removal and increased access to aquatic habitat in Oostanaula Creek. Minor, temporary cumulative impacts during the period of construction due to proximity to potential RFFAs on Oostanaula Creek and Hiwassee River.
Threatened and Endangered Species	No impacts.	Project may affect but is not likely to adversely affect the gray bat, Indiana bat, and northern long-eared bat due to removal of potential summer roosting habitat and construction noise disturbance. Project would not jeopardize the continued existence of tricolored bat. No effects to state and federally listed plant or aquatic. No cumulative impacts.
Natural Areas, Parks and Recreation	Minor adverse impact due to the unresolved risk of hazardous conditions at the Saulpaw Mill Dam.	Minor, temporary impacts due to restrictions on recreation during construction. Minor, beneficial effects due to enhanced fish community. No impacts to natural or managed areas. Minor, temporary cumulative impacts due to proximity to potential RFFAs on Oostanaula Creek and Hiwassee River.
Air Quality	No impacts.	Minor, temporary impacts due to fugitive dust and combustion-related emissions during construction expected to be contained on site. No cumulative impacts due to the limited geographic extent of fugitive dust emissions (primarily remaining on site) and no new operational air emission sources.
Greenhouse Gases (GHG) and Climate Change	No impacts.	Minor, temporary impacts due to the operation of construction equipment/vehicles. No cumulative impacts.

Resource Area	Impacts From No Action - Alternative A	Impacts From Proposed Action - Alternative B
Noise and Vibration	No impacts.	Minor, temporary impacts to the ambient noise environment and vibration levels during construction. Minor, temporary cumulative impacts due to noise if construction period overlaps with RFFAs in the area.
Transportation	No impacts.	Minor, temporary impacts to traffic during construction that would be mitigated through traffic controls if necessary. Minor, temporary cumulative impacts if overlapping construction periods with a nearby RFFA.
Cultural Resources	No impacts.	Large, permanent impact due to the removal of the NRHP-eligible dam. Mitigation alternatives would be explored. No cumulative impacts.
Visual Resources	No impacts.	Minor, temporary impacts during construction due to equipment onsite. Minor, permanent impact due to the removal of the dam. Minor cumulative effects if overlapping during the construction period with a nearby RFFA.
Solid and Hazardous Waste	No impacts.	No impacts during construction due to BMPs and implementation of a Waste Management Plan. No impacts from the generation of wastes from demolition activities. No cumulative effects.
Socioeconomics and EJ	Minor adverse impact due to the unresolved risk of hazardous conditions at the Saulpaw Mill Dam.	Permanent beneficial impact to safety and recreation which could benefit local socioeconomic conditions and EJ communities. Minor, temporary beneficial impacts during construction due to workers spending money locally. Minor, temporary adverse impacts due to traffic during construction within areas identified as EJ populations along US 11. Minor, temporary cumulative effects to EJ communities due to increased traffic if overlapping with nearby RFFAs.
Safety	Minor, adverse impact due to the unresolved risk of hazardous conditions at the Saulpaw Mill Dam.	Minor, temporary impacts to public and occupational health and safety from potentially increasing restrictive access areas and increased traffic. Permanent beneficial effects from the improved safety for recreational users and improved fish passage opportunities. Minor, temporary impact to safety due to increased traffic if overlapping during the same time period as nearby RFFAs.

2.3 Summary of Commitments and Proposed Mitigation Measures

TVA would acquire all applicable permits prior to the start of Project construction (see Section 1.6). Therefore, TVA would implement all permit-related mitigation measures and BMPs during Project construction to minimize impacts to the environment. TVA would also implement the following mitigation measures to ensure that adverse impacts to environmental resources listed above are avoided, minimized, or mitigated.

2.3.1 Best Management Practices and Routine Measures

2.3.1.1 Soils

- TVA would install BMPs for sediment and erosion control prior to implementation of any land disturbance activities. These controls would remain in place until the site is permanently stabilized. Erosion and sediment controls would be installed or implemented in accordance with the provisions of the Tennessee Erosion and Sediment Control Handbook.
- TVA would develop a Stormwater Pollution Prevention Plan that identifies mitigation measures and BMPs that would be implemented during construction to reduce stormwater runoff if greater than one acre of ground disturbance is expected.
- Fugitive air and dust emission from construction activities would be reduced and controlled through the implementation of construction BMPs, including the following:
 - wetting demolition areas, covering waste or debris piles, using covered containers to haul waste and debris as appropriate; and
 - maintaining engines and equipment in good working order to improve fuel efficiency and reduce potential carbon monoxide (CO) emissions from poorly operating engines and equipment.

2.3.1.2 Water Resources

- TVA would comply with TDEC regulations regarding the proper management of hazardous materials (not expected to be encountered) and disposal of waste materials.

2.3.1.3 Waste Management

- Any reportable spills and subsequent cleanup related to the Project would be addressed in accordance with the requirements outlined in the Project Spill Prevention, Control, and Countermeasures Plan (SPCC Plan) and Waste Management Plan. Fill materials would be clean and free of contaminants.

2.3.1.4 Transportation/Navigation

- Construction activities would primarily occur during daylight hours. A traffic plan would be established if needed including measures such as posting a flag person during heavy commute periods to manage traffic flow and prioritizing access for local residents to minimize potential adverse impacts to traffic and transportation.
- All work on, over, or adjacent to the CSX right-of-way would be done in accordance with the CSX special provisions found within the CSX public projects manual.
- Barges/equipment would be lit or have reflective tape for nighttime visibility.
- Flagging protection would be required whenever construction personnel or equipment are within or likely to be within 50 feet of the live track or other track clearances specified by CSX or over tracks.

2.3.1.5 Biological Resources

- TVA would return areas of temporary disturbance within the Project Site to pre-construction conditions and would stabilize these areas with native or non-invasive plant species vegetation upon construction completion.
- Only the minimum quantity of riprap and jacks would be used that would still meet project objectives.

2.3.1.6 Floodplains

- An evacuation plan would be developed for removal of flood-damageable equipment and materials from the floodplain in the event of a flood or high-flow event.
- Only the minimum amount of grading would be done, and excavated material would be spoiled on land lying and being outside the 500-year floodplain and above the 500-year flood elevation of the Hiwassee River.

2.3.2 Minimization and Mitigation Measures

2.3.2.1 Threatened and Endangered Species

- Tree removal would occur in winter (November 15 to March 30) when listed bat species are not expected to be on the landscape. Removal of suitable habitat in winter would avoid direct impacts to bat species as bats are roosting in caves at that time. Conservation measures would be implemented, as identified in TVA's 2018 programmatic consultation with the USFWS on routine actions and federally listed bats in accordance with ESA Section 7(a)(2) and updated in May 2023. The Bat Strategy Project Screening Form is provided in Appendix A.

2.3.2.2 Natural Areas, Parks, and Recreation

- Adjacent recreational areas would be notified of construction commencement and duration.

2.3.2.3 Transportation

- CSX would be notified a minimum of 30 days prior to construction to allow for scheduling of the railroad flagman.
- Oil booms would be deployed around the work barge and anchored to the abutments for spill protection and restriction of recreational boat access.
- Barges/equipment would be lit or have reflective tape for nighttime visibility.
- TVA would notify the USACE and USCG so that a Notice to Navigation and a Broadcast Notice to Mariners can be issued to the commercial navigation industry.

2.3.2.4 Cultural Resources

- If feasible, unless otherwise requested by the SHPO, the existing dam blocks may be reused on the Project Site.

2.4 The Preferred Alternative

TVA's preferred alternative is Alternative B (Removal of Saulpaw Mill Dam). The No Action Alternative (Alternative A) would not meet the purpose and need for action. Alternative B would meet the purpose and need by returning the currently impounded portion of Oostanaula Creek to a free-flowing stream and allowing safer recreational use of the area.

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CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the affected environment (existing conditions) of environmental resources in the Project Site identified during project scoping (see Section 1.5) as having potential for effects to occur from adoption of the alternatives. The information contained in this chapter establishes the baseline conditions against which TVA and the public can compare the potential effects of the alternatives under consideration, as provided in Chapter 2. The affected environment descriptions below are based on surveys conducted from 2018 (TVA 2018b) to 2023 (New South Associates, Inc. [NSA] 2023), published and unpublished reports, and personal communications with resource experts.

3.1 Land Use

3.1.1 Affected Environment

Land use is defined as the way people use and develop land, including leaving land undeveloped and using land for agricultural, residential, commercial, and industrial purposes. The TVA Saulpaw Mill Dam is located on a reach of Oostanaula Creek in the Town of Calhoun, Tennessee in McMinn County (see Figure 1.3-1 and Figure 1.3-2). The dam includes earthen embankments on both the left (west) and right (east) sides of Oostanaula Creek. Oostanaula Creek is popular for informal recreational use, including bank fishing and swimming. Saulpaw Mill Dam has also become a common area for recreational users as an informal access point for kayaking, paddling, and canoeing (Hiwassee River Blueway 2023). No relevant land use or zoning plans were identified from McMinn County or the Town of Calhoun.

Images generated with the National Land Cover Database (NLCD) evaluation, visualization, and analysis tool show the Project Site as mixed forest, developed open space, developed low intensity, and open water (Table 3.1-1, Figure 3.1-1).

Table 3.1-1. Land Cover Within the Project Site (Source: NLCD 2019)

Land Cover Type	Area (Acres)	% of Total Land
Mixed Forest	0.3	39.5
Developed, Low Intensity	0.3	39.8
Developed/Open Space	<0.1	2.1
Open Water	0.1	18.6
Total	0.7	100.0

The 0.7-acre Project Site consists of flat terrain with elevation of approximately 700 feet above mean sea level with a minor drop in elevation to 680 ft on the open water portion of the site. Topography surrounding the Project Site is low and flat where there is open water and increases to 796 feet above sea level to the northwest of the Project Site.

Saulpaw Mill Dam Removal

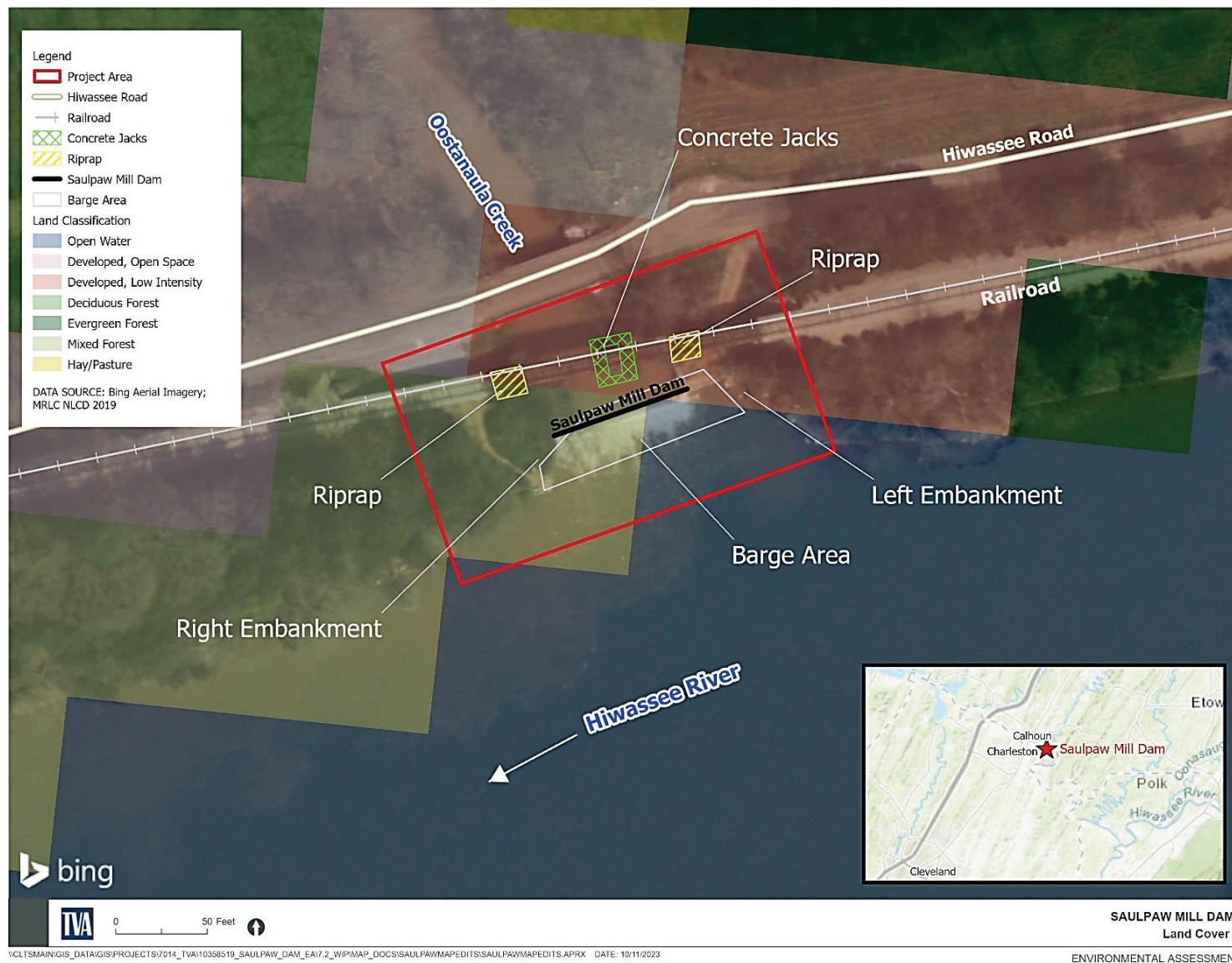


Figure 3.1-1. Land Cover within the Saulpaw Mill Dam Removal Project

Forested land to the northeast, agricultural land to the south, and developed areas (Town of Calhoun) to the west make up a majority of the land within two miles surrounding the Project Site. There are two boat ramps to the west of the Site along the Hiwassee River and Calhoun Elementary School is located 0.4 mi west on Sherwood Ave within a residential area.

Available historical aerial photographs and USGS topographic quadrangles document that land use near the Project Site was largely rural in 1886 (the first available map), with a railroad running in a north-south orientation to the west of the Project Site, across the Hiwassee River. The 1935 map of Calhoun, Tennessee shows the emergence of a Riverside Mill at the Project Site along with the development of nearby roads and residences. The addition of the Saulpaw Mill Dam can first be seen in USGS maps in 1943, and substantial increases in nearby development of the area can be seen in the 1964 Calhoun, Tennessee map with the addition of the railroad running in an east-west orientation along the Hiwassee River.

3.1.2 Environmental Consequences

3.1.2.1 Alternative A

Under the No Action Alternative, the Saulpaw Mill Dam would not be removed, and the dam would continue to be maintained in its current state. Leaving the dam in place would require long-term monitoring and maintenance by TVA to maintain the existing dam structures. Existing land uses in the area surrounding the dam would likely remain unchanged, residential, and rural.

3.1.2.2 Alternative B

Under Alternative B, approximately 0.3 acre of mixed forested area would be cleared, and the remaining area (0.3 acre of developed or open space) graded as needed to establish temporary equipment staging, material storage, and construction access. Sediment and erosion control measures would be installed and left in place until the site is permanently stabilized; these measures would be removed after the project is completed as part of the demobilization process. Disturbed areas would be stabilized with permanent vegetation upon construction completion with potential for a minor increase in vegetated cover in areas that were previously unvegetated. These areas would be first considered as herbaceous land cover, followed by shrub/scrub, and eventually mixed or deciduous forested. Approximately 0.1 acre of waters on the Project Site, according to the NLCD (2019), would experience permanent and temporary impacts due to pier, dam, and dam blocks removal and placement of fill for streambed and bank stabilization. No substantial change in spatial extent of surface waters is anticipated, therefore no change of this land cover type is expected.

Removal of the existing dam would temporarily alter the vegetation on the Project Site and the addition of the rock and gravel fill would result in minor permanent alterations of the landscape of Project Site; however, due to the limited spatial scope of the project it would not substantially change the overall land use of the area. Furthermore, following construction and restoration, the site would still serve recreational users. Thus, Alternative B would have no effect on land use and consequently, no cumulative effects to land use would occur under Alternative B.

3.2 Soils and Prime Farmland

3.2.1 Affected Environment

3.2.1.1 Soils

Based on a review of the U.S. Department of Agriculture (USDA) Web Soil Survey (USDA 2019a), 0.4 acre (69 percent) of the Saulpaw Mill Dam Project Site consists of Hamblen silt loam, characterized as clayey substratum, zero to three percent slopes, and occasionally flooded (USDA 2019a) (Figure 3.2-1). The Hamblen silt loam soil has a hydric rating of five percent. Hydric rating is an indicator of the percentage of a map unit that meets the criteria for hydric soils (USDA 2019b). Hydric soils are formed under conditions of saturation, flooding, or ponding, during the growing season, for a sufficient duration to develop anaerobic conditions in the upper soil layer. The Hamblen series soils consist of very deep, moderately well drained soils that formed in loamy alluvium from watersheds dominated by limestone, shale, and sandstone. These soils are on floodplains and are used for crops, hay, and pasture (USDA 2022).

3.2.1.2 Prime Farmland

The term “prime farmland” is assigned by the USDA to land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for such uses. The Farmland Protection Policy Act (FPPA; 7 U.S.C. § 4201 et seq.), requires federal agencies to consider the adverse effects of their actions on prime or unique farmland. Farmland subject to FPPA requirements does not have to be currently used for cropland. The land can be forested land, pastureland, cropland, or other land, but it cannot be water or urban built-up land. The purpose of the FPPA is “to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses.” Hamblen silt loam soil, (clayey substratum, zero to three percent slopes, occasionally flooded) is classified as prime farmland (USDA 2019a) and comprises 0.4 acre (69 percent) of the Project Site (Figure 3.2-2).

3.2.2 Environmental Consequences

3.2.2.1 Alternative A

Under the No Action Alternative, the Saulpaw Mill Dam would not be removed, and the dam would continue to be maintained in its current state. Therefore, no project-related impacts on soils or prime farmlands would result.

3.2.2.2 Alternative B

3.2.2.2.1 Soils

Under Alternative B, the Saulpaw Mill Dam would be removed. During construction, 0.4 acre of soils would be temporarily impacted during site preparation and construction activities. Approximately 225 square feet of soils would be permanently impacted on each streambank (approximately 15 linear feet of the right and left streambanks and 15 feet back towards each railroad abutment) due to placement of fill material (riprap) for stabilization. Fill material would be selected based on its ability to provide adequate drainage as well as stabilize soils; thus, permanent impacts would be minor.

Temporary soil impacts would be mitigated through the installation of BMPs for sediment and erosion control prior to mobilization to the Project Site and any land disturbance activities. These controls would remain in place until the site is permanently stabilized. Erosion and sediment controls would be installed or implemented in accordance with the

provisions of the Tennessee Erosion and Sediment Control Handbook and TVA's NPDES permit. Areas of temporary impact would be stabilized and/or revegetated with native or non-invasive species upon completion of the dam removal activities.

The reasonably foreseeable future actions (RFFAs) discussed in Table 3.21-1, when combined with potential Project impacts, may result in minor cumulative permanent and temporary impacts to soils.

Saulpaw Mill Dam Removal

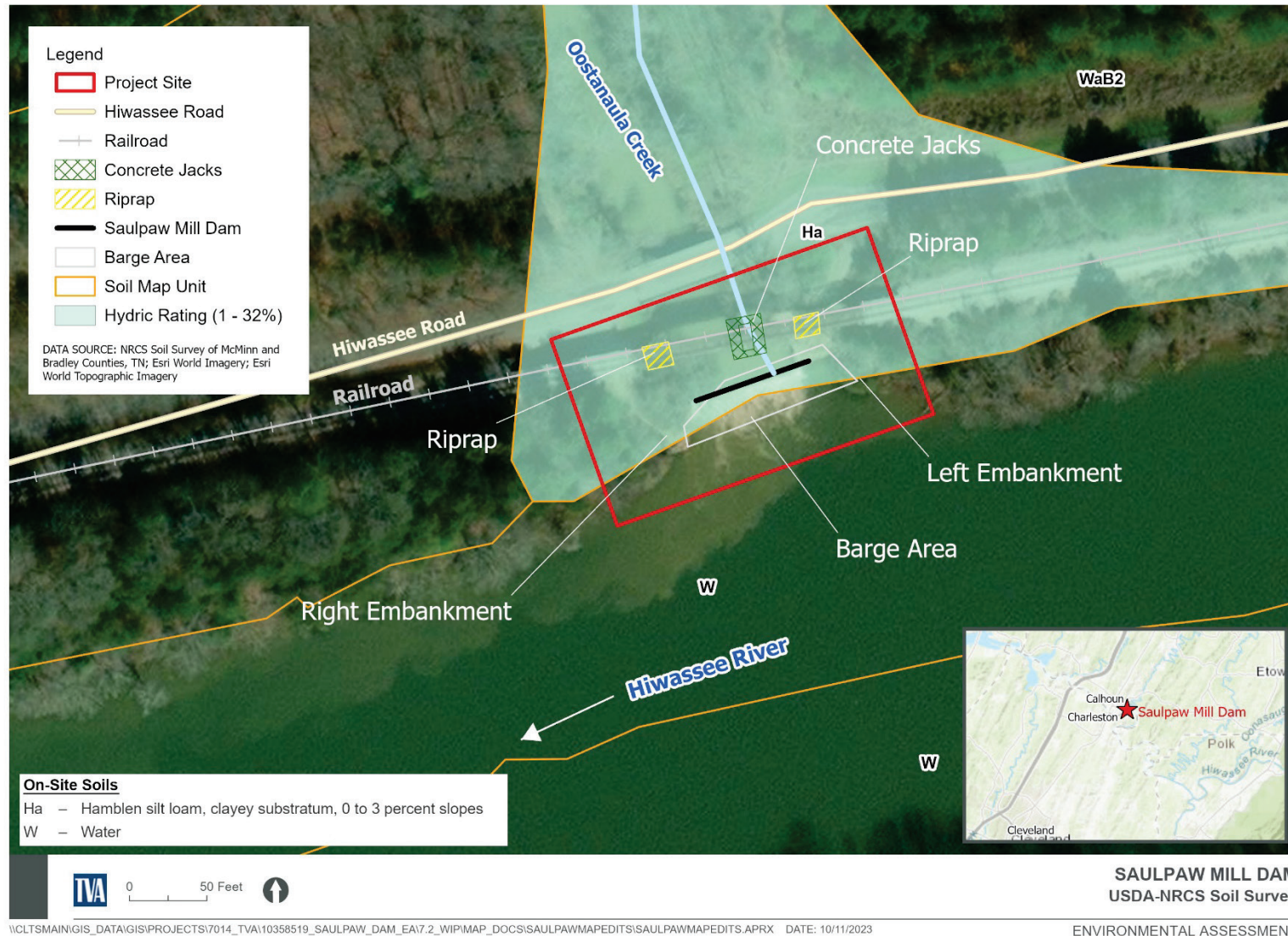


Figure 3.2-1. Soils in the Vicinity of the Saulpaw Mill Dam Removal Project

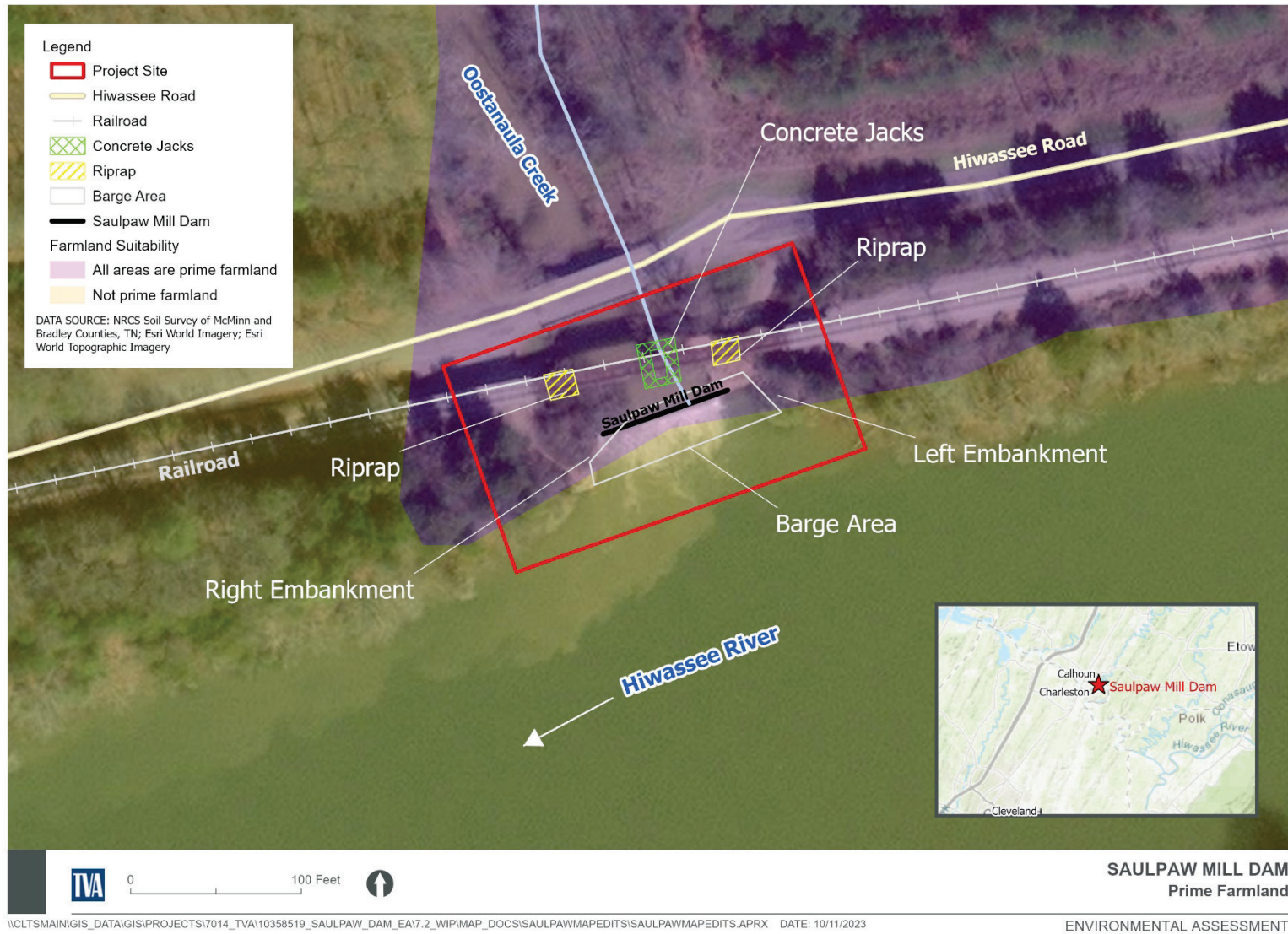


Figure 3.2-2. Prime farmland in the Vicinity of the Saulpaw Mill Dam Removal Project

3.2.2.2 Prime Farmland

Under Alternative B, the Saulpaw Mill Dam would be removed. Based on soils data obtained from the USDA Web Soil Survey (USDA 2019a), there are 0.4 acre of soils classified as prime farmland within the Project Site (Figure 3.2-2). However, the entire Project Site is located on land owned and managed by TVA; therefore, the Project Site is already considered to be converted to nonagricultural uses. Thus, Alternative B would not directly affect prime farmland and as such, there would be no cumulative impacts to prime farmland.

3.3 Geology and Groundwater

3.3.1 Affected Environment

The alternative actions considered in this EA would occur in the Valley and Ridge physiographic province (Figure 3.3-1) (Fenneman 1938, Miller 1974) which is characterized by northeast-trending ridges underlain by resistant rock separated by valleys underlain by less resistant rock. The rock formations are steeply tilted and crop out in long, narrow belts parallel to the trend of ridges and valleys; some belts are bounded by faults (Zurawski 1978).

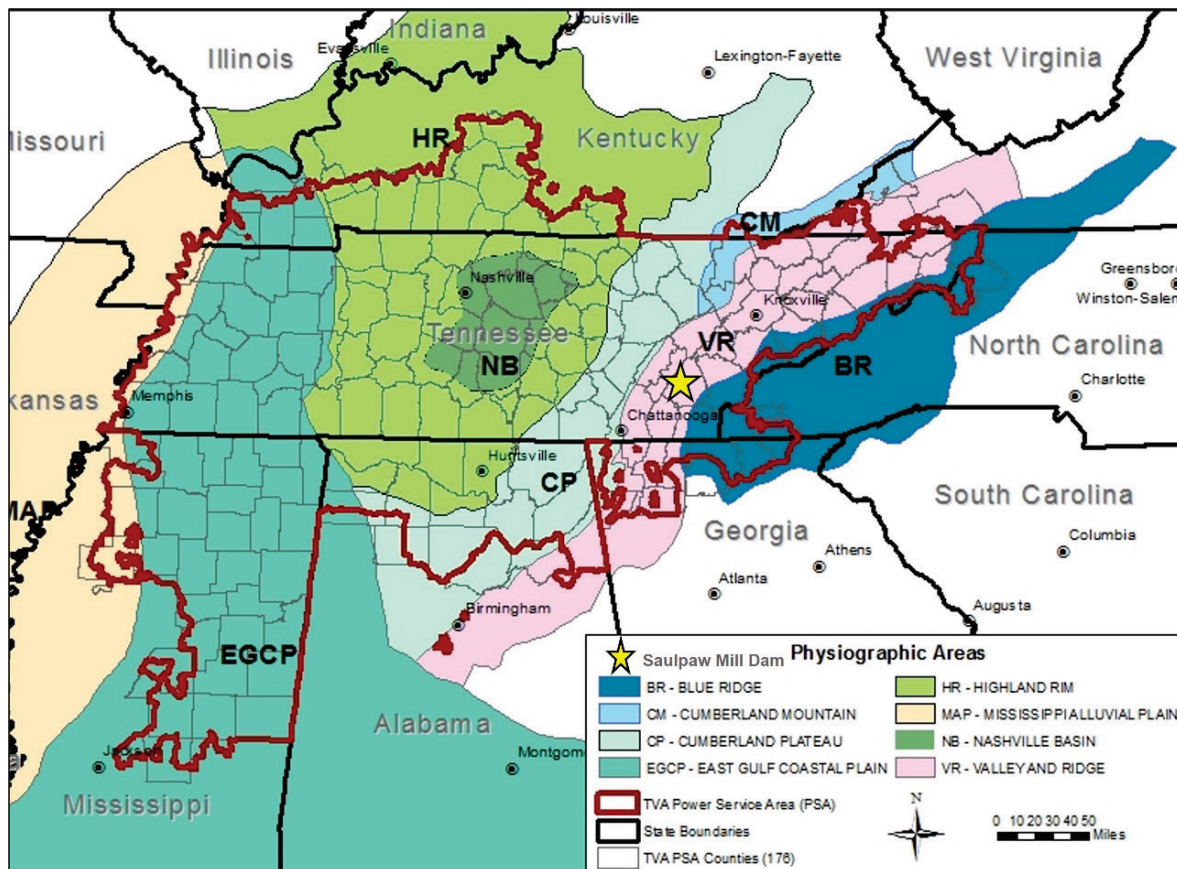


Figure 3.3-1. Physiographic Areas of TVA region

The Project Site is underlain by the Longview Dolomite on the east side of Oostanaula Creek and the Chepultepec Dolomite on the west side of the creek. These dolomites are of Ordovician age and approximately 800 feet thick. The Longview and Chepultepec dolomites make up the lower portion of the Newala Formation, which is part of the Lower

Chickamauga Group. The area is heavily faulted, and the Saulpaw Mill Dam site is approximately one mile east of the Knoxville Fault, a major thrust fault (Rodgers 1993).

Principal aquifers in the Valley and Ridge Physiographic Province are carbonate rocks of Cambrian and Ordovician age. The Knox Dolomite, which underlies about 60 percent of the province, is the most significant water-bearing formation (Zurawski 1978). Geology and topography across the valley suggest that groundwater in the surficial water table likely flows into Oostanaula Creek from the surrounding ridges and ultimately discharges into the Hiwassee River via the Saulpaw Mill Dam. A review of water wells within 0.5 mi of the Project Site identified one water well (Number 3079) across the Hiwassee River from the site (Figure 3.3-2).

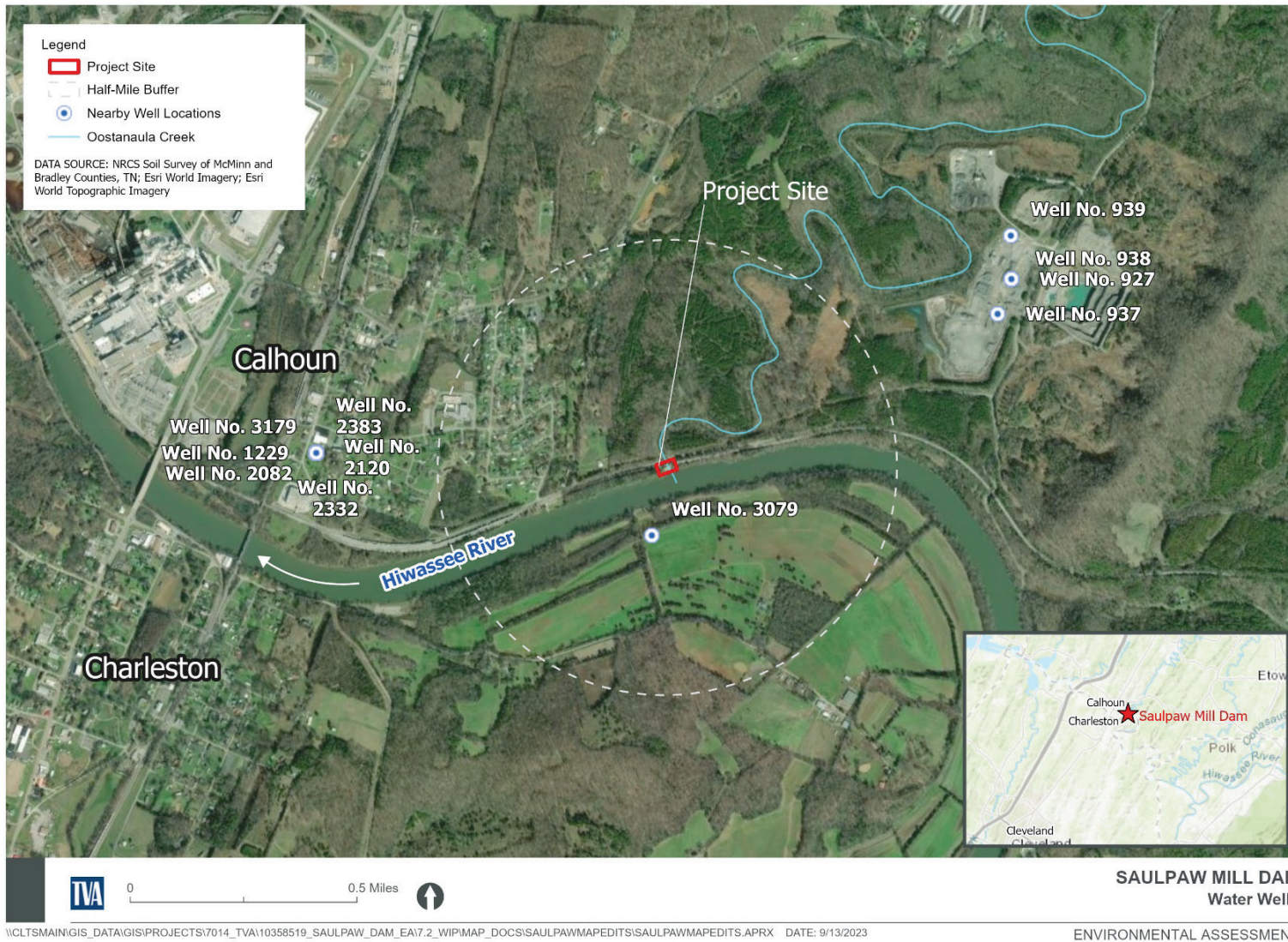


Figure 3.3-2. Water Wells within 0.5 mile of the Saulpaw Mill Dam

3.3.2 Environmental Consequences

3.3.2.1 Alternative A

Under the No Action Alternative, the Saulpaw Mill Dam would not be removed, and the dam would continue to be maintained in its current state. There would be no adverse effects or adverse cumulative effects to the geology and groundwater at the site.

3.3.2.2 Alternative B

Under Alternative B, approximately 200 concrete jacks would be installed on 30 linear feet (540 square feet) of creek bed around the railroad pier to prevent potential head cutting and scour around the CSX railroad pier. To stabilize the streambanks at the CSX railroad abutments, approximately 35 cubic yards of riprap would be installed along approximately 15 linear feet of the right and left streambanks and 15 feet back towards each railroad abutment (approximately 225 square feet on each bank). Neither of these actions would cause impacts to the underlying geology of the Project Site and would not result in cumulative effects to geological resources.

Demolition of the dam and addition of fill (e.g., gravel or riprap) for bank stabilization would not create impervious surfaces that would limit groundwater infiltration. Removal of Saulpaw Mill Dam and associated work would not require the use of groundwater resources and these activities would not result in the generation of contaminants that could affect groundwater resources. No impacts to groundwater resources are anticipated. As such, there would be no cumulative effects to groundwater resources.

3.4 Surface Water and Water Quality

3.4.1 Affected Environment

Surface water is any water that flows above ground and includes, but is not limited to, streams, ponds, lakes, and wetlands. Streams can be further classified as perennial, intermittent, or ephemeral (or wet weather conveyance) based on the occurrence of surface flow. Wetlands are discussed in Section 3.6.

The Clean Water Act (CWA) regulates discharges of pollutants into waters of the United States and establishes standards for the protection of water quality of surface waters. Section 404 of the CWA prohibits the discharge of dredge and fill material to waters of the United States, which includes wetlands, unless authorized by a permit issued by USACE. Section 401 of the CWA gives states the authority to grant, deny, or waive certification of proposed federal licenses or permits that may discharge into waters of the United States. Tennessee accomplishes the Section 401 Certification through its ARAP program and ensures that the proposed activities comply with the state's applicable effluent limitations, antidegradation, and water quality standards.

Under Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403), permits issued by the USACE are required for structures or work in navigable waters of the United States, which include waters subject to the ebb and flow of the tide and waters that are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Oostanaula Creek is not considered a navigable water however the Hiwassee River is subject to Section 10. Based on a 1985 Memorandum of Understanding between TVA and the USACE, TVA projects within the Tennessee River basin are exempt from Section 10 permitting pursuant to Section 26a of the TVA Act.

In the state of Tennessee, water quality standards are established by the regulations set forth in the TN Water Quality Control Act and the CWA. These standards are then approved by the U.S. Environmental Protection Agency (USEPA); as part of this implementation of water quality standards, the state classifies water bodies according to their uses and establish water quality criteria specific to these uses as directed by Section 303(c) in the CWA. Each state also issues an antidegradation statement containing specific conditions for regulated actions and designed to maintain and protect current uses and water quality conditions.

The proposed Saulpaw Mill Dam removal Project Site is in McMinn County, Tennessee, and is located at the confluence of Oostanaula Creek and the Hiwassee River at Hiwassee River Mile (HiRM) 19.8, on the right descending bank of the Chickamauga Reservoir. The project area falls within the Oostanaula Creek (0602000211) and Chickamauga Lake-Hiwassee River (0602000214) HUC-10 watersheds, in the Southern Shale Valleys level IV sub-ecoregion of the greater Ridge and Valley III ecoregion (Griffith et al. 2009). The dam is associated with a flourmill that was removed by TVA in 1940 as part of flood control for construction of Chickamauga Reservoir. During an October 2022 field survey, certified hydrologic professionals for TVA observed that the Project Site encompasses approximately 0.2 acres of the Hiwassee River and 0.1 acres of the Oostanaula Creek (Figure 3.4-1). USACE considers the Hiwassee River a navigable water and it is therefore subject to Section 10 regulations. Oostanaula Creek is not a navigable water; thus, it is not subject to Section 10 regulations.

3.4.1.1 Water Supply

Based on review of the USEPA Enforcement and Compliance History Online database search for the town of Calhoun, TN (USEPA 2023a) and aerial imagery, two surface water intakes exist within five river miles upstream or downstream of the Project Site on the Hiwassee River and Oostanaula Creek. One intake is part of a paper mill owned by Resolute Forest Products, which is permitted (TN0002356) to withdraw up to 34.98 million gallons per day (MGD) for production for facility design flow (i.e., maximum withdrawal) (USEPA 2023b), with additional permitted withdrawals for drinking water (TN0004313) (TDEC 2023). The other surface water intake is owned by Olin Corp for chlor alkali production, with facility design withdrawals up to 5.63 MGD (USEPA 2023c). Both facilities are located downstream on the Hiwassee River. No surface water intakes were listed within five river miles of Saulpaw Mill Dam on Oostanaula Creek (USEPA 2023a).

3.4.1.2 Water Quality

Pursuant to Section 303(c) of the CWA, the Hiwassee River from RM 0.0 to RM 23.9 is classified for domestic and industrial water supply, fish and aquatic life, recreation, livestock watering and wildlife, irrigation, and navigation uses (TDEC 2019a). Oostanaula Creek from RM 0.0 to RM 26.0 is classified for domestic and industrial water supply, fish and aquatic life, recreation, livestock watering and wildlife, and irrigation.

The CWA requires all states to identify waters where required pollution controls are not sufficient to attain or maintain applicable water quality standards and to establish priorities for the development of limits based on the severity of the pollution and the sensitivity of the established uses of those waters. States are required to submit reports to USEPA with these data. The term “303(d) list” refers to the list of impaired and threatened streams and water bodies identified by the state. The Hiwassee River in the vicinity of Saulpaw Mill Dam (listed as the “Hiwassee River Embayment of Chickamauga Reservoir” on Tennessee’s Final 2022 List of Impaired and Threatened Waters) is listed as impaired for mercury and

Escherichia coli (TDEC 2022). Potential impairment sources of mercury include industrial point-source discharges and atmospheric deposition of toxics; the source of *E. coli* is unknown. Oostanaula Creek in McMinn County is also listed as impaired on the 303(d) final list for 2022, with causes of impairment including sedimentation, nutrients (historically, phosphorus), *E. coli*, and alteration in streamside or littoral vegetative covers. Potential sources of these impairments may include livestock grazing in riparian zones, sanitary sewer overflows (collection system failures), municipal point-source discharges, and non-irrigated crop production.

Water quality data was compiled from the nearest monitoring location to Saulpaw Mill Dam (location HIWAS018.6MM at HiRM 18.6, 1.2 miles downstream of the dam) from the USEPA's Water Quality Data Portal (USEPA 2022b). While this monitoring location is downstream of the Project Site, water quality assessments show that the Hiwassee River fails to meet designated use criteria beginning at its confluence with Oostanaula Creek, which is also shown as not supporting its designated uses. There is one additional (unnamed) tributary which discharges to the Hiwassee River between the confluence of Oostanaula Creek and the water quality monitoring location; this stream is also listed as not supporting its designated uses. Due to the limited distance from Saulpaw Mill Dam and likelihood that Oostanaula Creek is contributing to water quality conditions based on locale of listed impairments, it is likely that this monitoring location reasonably represents water quality of the Hiwassee River at Saulpaw Mill Dam. The water quality parameters summarized in Table 3.4-1 represent those most regularly monitored at this location since 2016. In 2015, only *E. coli* was monitored. No monitoring was completed between 2001 and 2015. Therefore, water temperature, dissolved oxygen, pH, conductivity, turbidity, and *E. coli* are provided below.

As stated above, the Hiwassee River in the vicinity of Saulpaw Mill Dam is listed as impaired for mercury and *E. coli*. Mercury readings were not available from this monitoring location, but according to Rule 0400-40-03-.03 Criteria for Water Uses, mercury in this area may exceed concentration thresholds set for this waterbody's use classifications, which are as low as 0.05 micrograms per liter ($\mu\text{g/l}$) up to 2.0 $\mu\text{g/l}$ depending on classification (TDEC 2019b). The most recent mercury data for this sampling location was collected in 2001, with a result of 0.2 $\mu\text{g/l}$, exceeding requirements for recreational uses (USEPA 2022b).

The water quality data compiled in Table 3.4-1 showed that *E. coli* readings at this monitoring location exceeded thresholds outlined Rule 0400-40-03-.03 Criteria for Water Uses for domestic and industrial water supply, fish and aquatic life, and recreation uses, which ranged 126 to 630 colony forming units (cfu) per 100 milliliters (ml). *E. coli* was exceeded in 2018 and 2022.

The remaining water quality parameters listed in Table 3.4-1 fall within the ranges set forth in Rule 0400-40-03-.03 Criteria for Water Uses for the Hiwassee River which, as stated above, include domestic and industrial water supply, fish and aquatic life, recreation, livestock watering and wildlife, irrigation, and navigation uses.

**Table 3.4-1. Summary of Water Quality Data Collected in the Hiwassee River
1.2 River Miles Downstream of Saulpaw Mill Dam**

Water Quality Parameter	2016			2017			2018			2022		
	Min	Max	Avg*	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
Temperature (°C)	24.8	24.8	24.8	9.4	23.4	18.6	3.4	20.7	11.5	18.8	23.4	22.2
Dissolved Oxygen (mg/l)	7.61	7.61	7.6	8.5	11.46	9.3	9.02	13.42	11.0	8.31	9.37	8.7
pH	7.46	7.46	7.5	7	7.9	7.4	7.11	7.6	7.4	7.51	7.8	7.6
Conductivity (µmhos/cm)	62.7	62.7	62.7	54.3	102.7	66.9	54.7	95.9	72.5	55.5	79.1	67.3
Turbidity	--	--	--	--	--	--	--	--	--	4.2	4.2	4.2
<i>E. coli</i> (cfu/100 ml)	--	--	--	19.5	52.9	38.8	17.5	1,046	178.5	13.0	128	87.3

Source: USEPA 2022b

Bold results indicate exceedance of water quality criteria for one of the Hiwassee River’s designated uses.

*Avg: average.



Figure 3.4-1. Surface Waters within the Saulpaw Mill Dam Project Site

Based on a sediment survey conducted in May 2022 (TVA 2022a), 83 cubic yards of sediment have accumulated behind the dam. A screening level survey of sediment contaminants in Oostanaula Creek was conducted in January 2018. Samples were collected from five random locations in Oostanaula Creek, extending from Saulpaw Mill Dam upstream approximately 0.2 miles. Samples were analyzed for selected metals, organochlorine pesticides, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), total organic carbons, and percent moisture.

Results of the study indicated minimal contamination of Oostanaula Creek sediments. Organochlorine pesticides, PAHs, and PCBs concentrations were below method detection limits in all samples except at the first sampling location upstream of the Oostanaula-Hiwassee confluence (site 44C), where technical chlordane was detected at a concentration below the practical quantitation limit (TVA 2022a). Of the 14 metals analyzed, only cadmium and selenium concentration were less than detection limits in some samples. The highest concentrations of arsenic, chromium, iron, lead, manganese, nickel, and selenium were detected at the sampling location just a few feet upstream of Saulpaw Mill Dam (site 45C).

However, metals concentrations (arsenic, chromium, and lead) were below probable effect concentrations (PECs); thus, effects to benthic biota would be unlikely. PECs were not derived for iron and manganese, but the concentrations of these metals in the Oostanaula sediments were within the expected range for TVA reservoirs. Similarly, the concentrations of all metals were within naturally occurring background levels for soils in the State of Tennessee.

3.4.2 Environmental Consequences

3.4.2.1 Alternative A

Under the No Action Alternative, the Saulpaw Mill Dam would not be removed, and the dam would continue to be maintained in its current state. As such, surface waters and water quantity and quality would not be impacted.

3.4.2.2 Alternative B

Alternative B would consist of the removal of the Saulpaw Mill Dam in three phases, as described in Section 2.1. Removal of the dam would require approximately 540 square feet of permanent fill in Oostanaula Creek associated with the installation of concrete jacks and riprap required to stabilize the railroad pier. Minor temporary impacts would occur to Oostanaula Creek and the Hiwassee River due to streambed disturbance during installation of the concrete piers and released sediments from behind Saulpaw Mill Dam resulting in a temporary increase in turbidity downstream. Sampling of the sediments behind the dam showed minimal contamination, with metals within naturally occurring background levels for soils in the State of Tennessee; therefore, the release of these sediments is not likely to cause substantial impacts to downstream waters. The use of a cofferdam, if necessary, would result in a minor, temporary impact due to dewatering of approximately 1,500 square feet (0.03 acre) of Oostanaula Creek. The in-water work may alternatively be performed in the wet using divers and airlift dredging procedures.

Permanent impacts in the lower reach of Oostanaula Creek from Saulpaw Mill Dam removal would occur from a lowering of the water surface elevation due to the removal of the impoundment, which would ultimately result in a permanent benefit of restoring Oostanaula Creek to its natural hydraulic condition. Appropriate BMPs would be installed for sediment and erosion control prior to mobilization to the Project Site and any land

disturbance activities to prevent in-stream sedimentation from upland areas. These controls would remain in place until the site is permanently stabilized. Erosion and sediment controls would be installed or implemented in accordance with the provisions of the Tennessee Erosion and Sediment Control Handbook and TVA's NPDES permit. Areas of temporary impact would be stabilized and/or revegetated with native or non-invasive species upon completion of the dam removal activities.

Overall, impacts to surface waters and water quality from the project would be minor through the use of BMPs and prior testing of released materials. Ultimately, riverine habitat at the confluence of Oostanaula Creek and the Hiwassee River would experience large, permanent, beneficial effects by the removal of the dam and pier by naturalizing the creek hydraulics and removing an aquatic organism passage barrier. Associated subsequent beneficial impacts from the dam removal could include improvements to water quality, enhanced aquatic animal habitat and plant communities, enhanced recreational activities, and recharge of aquifers.

The Saulpaw Mill Dam removal would result in an overall net-positive effect to Oostanaula Creek and Hiwassee River, however disturbance to surface waters during dam removal and the passage of sediments downstream resulting in elevated turbidity would contribute to minor cumulative impacts to water quality if the periods of deconstruction of Saulpaw Mill Dam overlaps with construction of projects listed in Table 3.21-1 (and if the RFFAs also cause impacts to surface waters and water quality); particularly the Tarver Site or Molpus Site (TVA 2022b,c). The Tarver Site encompasses approximately 2.5 miles of Oostanaula Creek upstream of County Road 950 (Hiwassee Road), and the Molpus site abuts the Hiwassee River approximately 0.9 mile upstream of the Project Site. Impacts to Oostanaula Creek or Hiwassee River as a result of these projects would result in minor to moderate incremental cumulative impacts in combination with the Saulpaw Mill Dam removal.

3.5 Floodplains

3.5.1 Affected Environment

A floodplain is the relatively level land area along a stream or river that is subject to periodic flooding. The area subject to a one percent chance of flooding in any given year is normally called the 100-year floodplain. The area subject to a 0.2-percent chance of flooding in any given year is normally called the 500-year floodplain. It is necessary to evaluate development in the floodplain to ensure that the project is consistent with the requirements of Executive Order (EO) 11988, Floodplain Management.

Saulpaw Mill Dam is located at the confluence of Oostanaula Creek and the Hiwassee River at RM 19.8, on the right descending bank of Chickamauga Reservoir, in McMinn County, Tennessee. The Hiwassee River forms the county boundary between McMinn County to the north and Bradley County to the south. At this location and based on floodway data tables and flood profiles in the Federal Emergency Management Agency (FEMA) flood insurance studies (FEMA 2007; FEMA 2009), the 100- and 500-year flood elevations of Oostanaula Creek and the Hiwassee River at the Project Site would be 698.1 and 701.8 feet, respectively, referenced to North American Vertical Datum 1988 (NAVD88), as illustrated in Figure 3.5-1. The drainage area of the Hiwassee River at the Oostanaula Creek confluence is about 2,227 square miles; the drainage area of Oostanaula Creek at its mouth is about 69 square miles (TVA 1970).

Saulpaw Mill Dam Removal

TVA reservoirs have either power storage or flood storage or both. Power storage is allocated to a range of elevations and water occupying space in that range is used to generate electric power through a dam's hydroturbines. Flood storage is allocated to a range of elevations and water occupying space within that range is used to store flood water during a flood or high-flow rain event. The power storage zone (PSZ) on Chickamauga Reservoir at this location extends from 674.8 to 682.3 feet, and the flood storage zone (FSZ) extends from 674.8 to 701.8 feet.

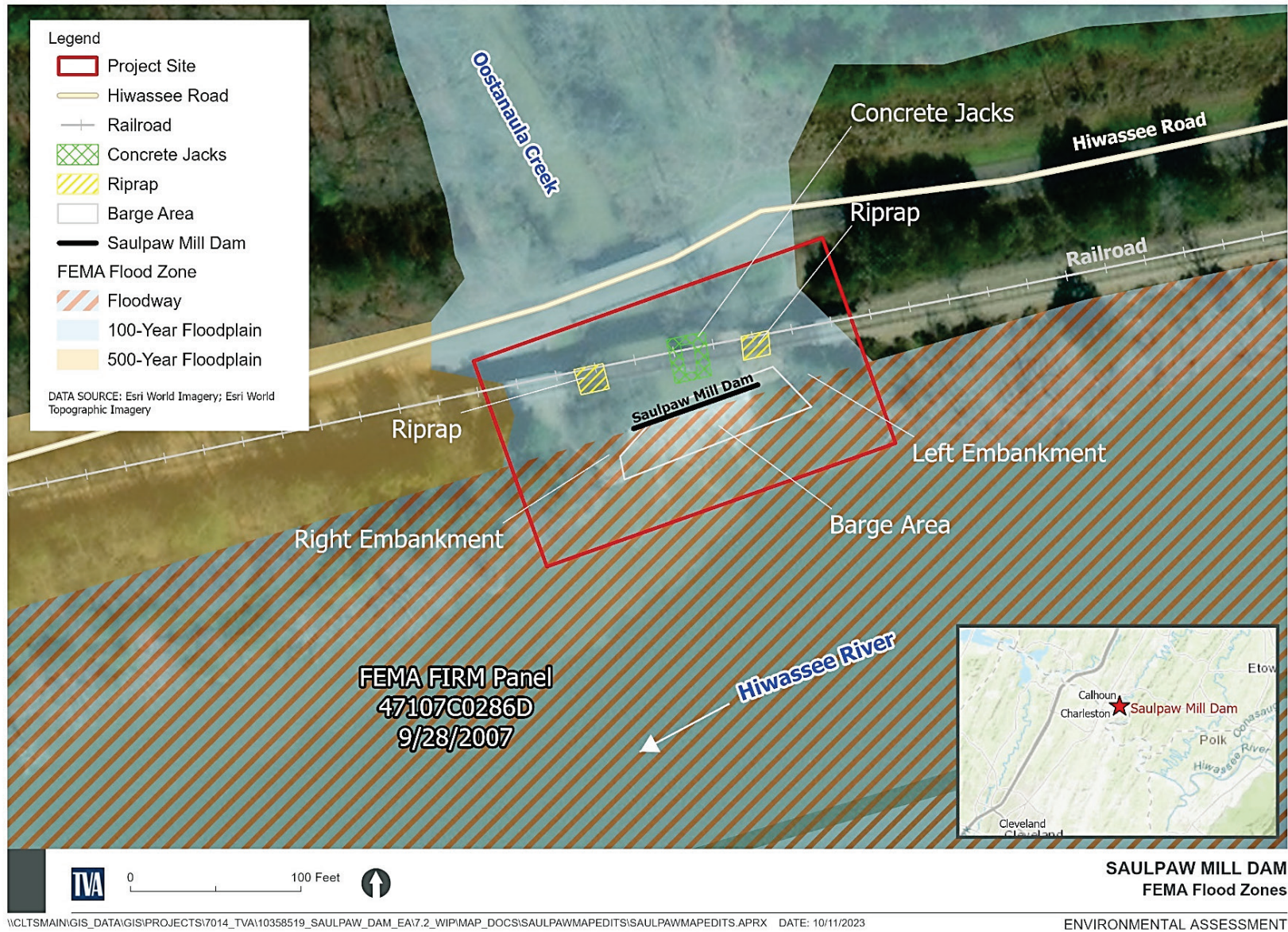


Figure 3.5-1. FEMA 100-Year and 500-Year Floodplains at the Saulpaw Mill Dam Project Site

As shown in Figure 3.5-1, Saulpaw Mill Dam is located within the 100-year floodplain and just outside the Hiwassee River floodway, on McMinn County Flood Insurance Rate Map panel 47107C0286D, effective September 28, 2007. The floodplain on Oostanaula Creek is labeled as Zone AE (areas of the 100-year floodplain where base flood elevations or flood depths have been determined) up to about Oostanaula Creek Mile 1.0, whereupon the flood zone changes to approximate Zone A (areas of the 100-year floodplain where no base flood elevations or flood depths have been determined). The Project Site is also located within the Chickamauga Reservoir FSZ.

The elevation of the base of Saulpaw Mill Dam is 667.7 feet and the top of the dam and steel lift gate are both at 683.5 feet. The elevation of the right abutment of the dam is 690.2 feet. The dam currently functions as a weir because the lift gate is not used. One pier of the railroad bridge is located within the Oostanaula Creek stream channel, and the bridge pier and bridge abutments are located within the Oostanaula Creek 100-year floodplain. The existing headwater and tailwater elevations at Saulpaw Mill Dam are 684.5 and 680.0 feet, respectively. The elevation of the existing stream bed is 677.0 feet.

3.5.2 Environmental Consequences

As a federal agency, TVA adheres to the requirements of EO 11988, Floodplain Management. The objective of EO 11988 is "...to avoid to the extent possible the long- and short-term adverse effects associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative" (EO 11988, Floodplain Management). The EO is not intended to prohibit floodplain development in all cases, but rather to create a consistent government policy against such development under most circumstances (U.S. Water Resources Council 1978). The EO requires that agencies avoid the 100-year floodplain unless there is no practicable alternative.

Additionally, TVA evaluates project activities, facilities, and structures that would be located in the 100-year floodplain in accordance with its 1981 class review of repetitive actions in the 100-year floodplain (TVA 1981). Repetitive actions usually occur adjacent to streams or TVA reservoirs that TVA has evaluated as a class to determine their impacts on natural and beneficial floodplain values.

3.5.2.1 Alternative A

Under the No Action Alternative, the Saulpaw Mill Dam would not be removed, and the dam would continue to be maintained in its current state. As such, no change would occur to current conditions found within the local floodplains, consistent with EO 11988. Flood elevations would remain unchanged.

3.5.2.2 Alternative B

Under Alternative B, the Saulpaw Mill Dam would be removed as described in Section 2.1.2. The Saulpaw Mill Dam Project Site is located within the 100-year floodplain of Oostanaula Creek and the Hiwassee River. Removing the dam would return the currently impounded portion of Oostanaula Creek to a free-flowing stream, thus improving its flood-carrying capacity, and would have an overall slight beneficial impact on floodplains and flood elevations, and thus be consistent with EO 11988.

TVA would place concrete stabilization around the base of the railroad bridge pier just upstream of Saulpaw Mill Dam, as well as replace riprap on the railroad bridge abutments, totaling approximately 540 square feet of material. A negligible amount of the fill would be placed within the Chickamauga Reservoir PSZ. As stated previously, the Project Site is

located within the Chickamauga Reservoir FSZ, which ranges from 674.8 to 701.8 feet. Concrete stabilization in the shape of “jacks” would be placed at the base of the railroad bridge pier. Consistent with EO 11988 and the TVA Flood Storage Loss Guideline (FSLG), less than one acre-foot of stabilization of bridge piers and bridge abutments is considered to be a repetitive action in the 100-year floodplain and FSZ that should result in only minor impacts. To minimize adverse impacts, only the minimum quantity of riprap and jacks would be used that would still meet project objectives.

Temporary staging and construction access areas are proposed on the Project Site and would be located within 100-year floodplain. Material storage areas are not considered to be repetitive actions in the floodplain or FSZ. There is no practicable alternative to locating the staging areas in the floodplain and FSZ because other placement options outside of the floodplain would require cutting of trees, or the land is not suitable due to ground saturation, terrain, or topography challenges and constraints. To minimize adverse impacts, an evacuation plan would be prepared for removal of flood-damageable equipment and materials from the floodplain in the event of a flood or high-flow event. Additionally, upon completion of the project, the temporary areas would be stabilized with vegetation.

Minor grading of the site after vegetation clearing is considered a repetitive action within the 100-year floodplain under EO 11988 and the FSLG, which would result in minor impacts. To minimize adverse impacts, only the minimum amount of grading would be done, and excavated material would be spoiled on land lying outside the 500-year floodplain and above the 500-year flood elevation of the Hiwassee River.

The right abutment of Saulpaw Mill Dam is within the Hiwassee River floodway. McMinn County participates in the National Flood Insurance Program (NFIP), and any development must be consistent with its floodplain regulations. The removal of the dam and right abutment from the floodway and the subsequent grading of the right abutment would be so minor as to not create an encroachment into the Hiwassee River floodway; therefore, the project would comply with the NFIP. The removal of the dam would have a slight beneficial impact on the FSZ because the stream would be returned to free-flowing conditions, allowing the Hiwassee River to flow into Oostanaula Creek during high-flow or flood events.

With implementation of BMPs and minimization and mitigation efforts described in Section 2.3, Alternative B would result in temporary, minor adverse impacts on floodplains. Overall Alternative B would have minor, long term, beneficial effects on floodplains by returning the stream channel to free-flowing conditions and restoring the original ground contours of the Oostanaula Creek streambank.

The removal of Saulpaw Mill Dam would not be likely to cause cumulative positive or negative impacts to floodplains and their natural and beneficial values in relation to the RFFAs discussed in Table 3.21-1 because impacts due to Alternative B would be limited to Oostanaula Creek within the Project Site. Cumulative impacts of the RFFAs are likely to also be limited to those Project Sites and are beyond the scope of this EA.

3.6 Wetlands

3.6.1 Affected Environment

Wetlands are those areas inundated or saturated by surface or groundwater such that vegetation adapted to saturated soil conditions are prevalent. Examples include bottomland forests, swamps, wet meadows, isolated depressions, and fringe wetland along the edges

of watercourses and impoundments. Wetlands provide many societal benefits such as toxin absorption and sediment retention for improved downstream water quality, storm water impediment and attenuation for flood control, shoreline buffering for erosion protection, and provision of fish and wildlife habitat for commercial, recreational, and conservation purposes.

Activities in wetlands are regulated by state and federal agencies to ensure no net loss of wetland resources. Under CWA §404, activities resulting in the discharge of dredge or fill material to waters of the U.S., including wetlands, must be authorized by the USACE under a Nationwide, Regional, or Individual Permit to ensure no more than minimal impacts to the aquatic environment. Section §401 of the Clean Water Act requires state water quality certification for projects in need of USACE approval. In Tennessee, TDEC is responsible for issuance of water quality certifications pursuant to Section 401. Lastly, Executive Order 11990 requires federal agencies to avoid construction in wetlands and minimize wetland degradation to the extent practicable.

A wetland assessment was performed to ascertain wetland presence, condition, and extent to which wetland functions are provided within the proposed Project Site. Field surveys were conducted on October 11, 2022, to delineate wetland areas potentially affected by the proposed Action Alternative. The review footprint included the area immediately surrounding the proposed dam removal and the riparian areas upstream and downstream from the dam.

Wetland field determinations were performed on October 11, 2022, according to the USACE standards, which require documentation of hydrophytic vegetation (wetland adapted vegetation), hydric soil, and wetland hydrology (Environmental Laboratory 1987; Lichvar et al. 2016; USACE 2012). No hydric soil, wetland hydrology, or hydrophytic vegetation were identified in combination during the field survey. Therefore, no wetlands are present.

3.6.2 Environmental Consequences

3.6.2.1 Alternative A

Under the No Action Alternative, the Saulpaw Mill Dam would not be removed, and the dam would continue to be maintained in its current state. No wetlands were identified within the Alternative A footprint, therefore there would be no effects to wetlands.

3.6.2.2 Alternative B

No wetlands were identified within the Alternative B footprint; therefore, there are no impacts anticipated to wetlands. Consequently, there would be no cumulative effects to wetlands. The proposed action would comply with EO 11990 requirements to avoid wetlands to the greatest extent possible and avoid degradation of wetlands.

3.7 Vegetation

3.7.1 Affected Environment

The Saulpaw Mill Dam Project Site is located within the Southern Limestone/Dolomite Valleys and Low Rolling Hills level IV sub-ecoregion of the greater Ridge and Valley III ecoregion (Griffith et al. 2009). Soils in this ecoregion vary in productivity, with land cover including oak-hickory and oak-pine forests, pastures, intensive agriculture, and urban and industrial areas.

The Project Site has been heavily disturbed by its prior land use as a mill and dam. Vegetation has been allowed to persist such that the site is dominated by early successional vegetation dominated by non-native and native weeds, shrubs, and few trees. These areas possess little conservation value and the plant communities that occur there are common and well represented throughout the region.

A desktop survey was performed using historical and recent aerial imagery from Google Earth (Google LLC 2022) to describe vegetation communities within the Project Site (Figure 3.7-1). Results of this desktop analysis varied slightly from the NLCD described in Section 3.1, which is based on an automated decision-tree classification of Landsat satellite data at a lower spatial resolution (30 meters) than the reviewed aerial imagery (generally, 15 meters or less). Vegetation in the 0.7-acre Project Site consists primarily of woody vegetation consisting of shrubs (0.12 acre) and trees (0.02 acre), and 0.03 acre of herbaceous habitat. The remaining areas comprise surface waters (0.3 acre) and unvegetated or developed areas (0.23 acre).

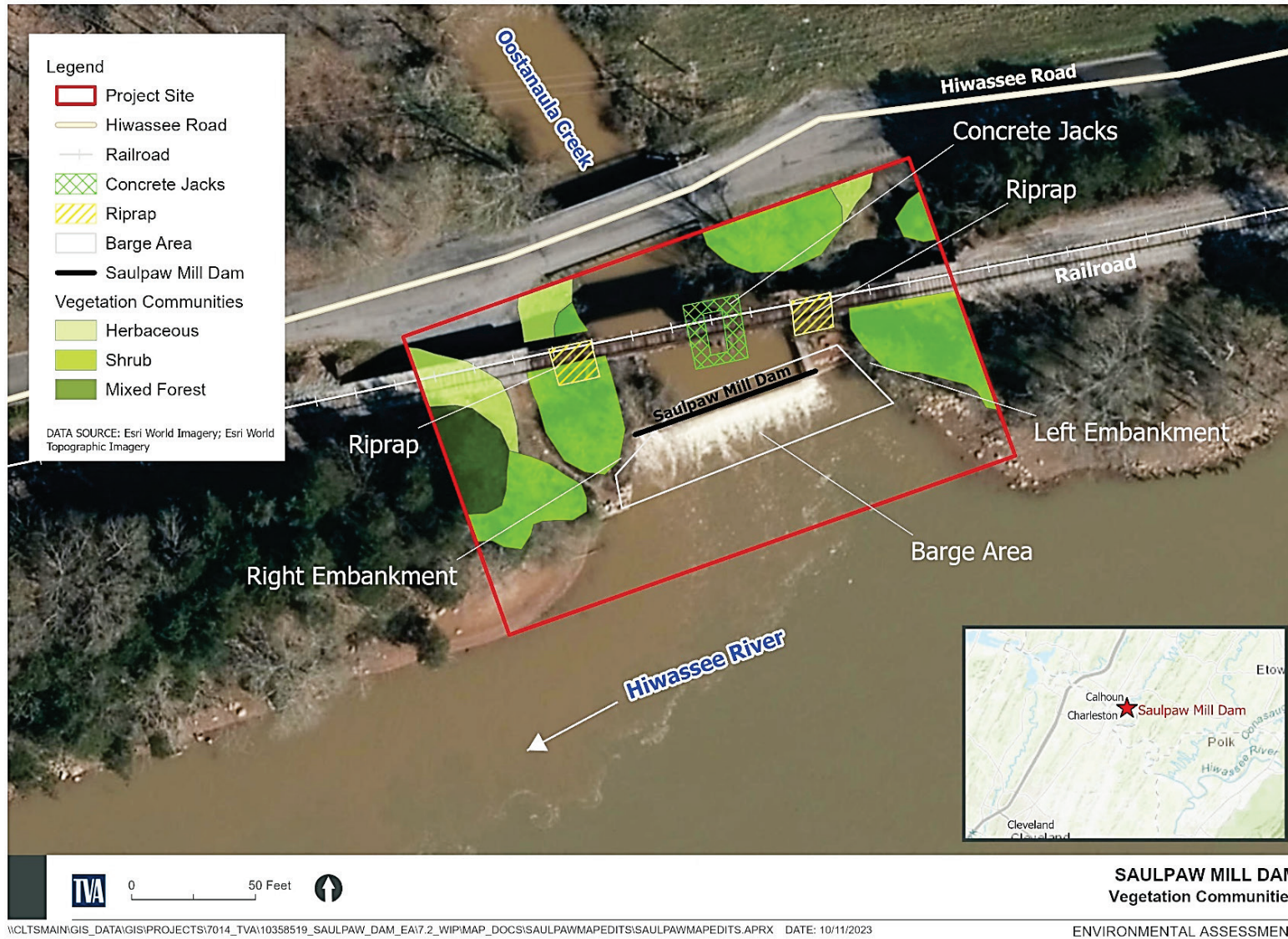


Figure 3.7-1. Vegetation Communities within the Saulpaw Mill Dam Removal Project Site

3.7.2 Environmental Consequences

3.7.2.1 Alternative A

Under the No Action Alternative, the Saulpaw Mill Dam would not be removed, and the dam would continue to be maintained in its current state and no impacts to the vegetation of the site would occur. Any changes occurring in the vegetation on-site would be the result of other natural or anthropogenic factors and would not be the result of the No Action Alternative.

3.7.2.2 Alternative B

Under Alternative B, all vegetation would be cleared from the Project Site, resulting in minor, permanent impacts due to the removal of 0.12 acre of shrubs, 0.02 acre of trees, and minor, temporary impacts due to the removal of 0.03 acre of herbaceous vegetation. Neither the herbaceous vegetation, nor the deciduous trees support unique natural plant communities. Although clearing and grading activities would temporarily remove some limited vegetation, the site would be stabilized as directed by the project-specific Erosion and Sediment Control Plan (ESC&P). At project completion, cleared and graded areas would be stabilized with permanent vegetation.

This alternative would result in temporary cumulative impacts to vegetation with consideration of the RFFAs presented in Table 3.21-1 that may require vegetation removal, particularly the Tarver Site which is located along the Oostanaula Creek upstream of the Project Site (TVA 2022c). The Tarver Site consists of former agricultural land which has regenerated to exhibit all vegetation strata including herbaceous plant communities, scrub/shrub, and forested areas (Google LLC 2022). Although the limited existing vegetation present on the Project Site would be cleared for project activities, the site would be revegetated following completion of the dam removal and associated stabilization measures. At least 0.23 acre of the Project Site would be revegetated, which would result in a minor increase in vegetated area compared to pre-construction conditions. Revegetated areas would be restored with native and non-invasive species.

3.8 Wildlife

3.8.1 Affected Environment

The action area includes the Saulpaw Mill Dam and the shorelines immediately adjacent to the dam at the confluence of the Oostanaula Creek and Hiawassee River in McMinn County, Tennessee.

As described in Section 3.7.1, the plants along the shoreline are comprised of early successional vegetation dominated by non-native and native weeds and small stands of deciduous trees close to the dam and scrub vegetation (including non-native species). The landscape in the surrounding area is a mixture of agricultural, planted pine and mixed deciduous forest, industrial sites, a small municipality, and riverine habitat including riparian forest.

Terrestrial habitats within the action area are restricted to shoreline herbaceous and scrub vegetation with a few deciduous trees. Disturbed riparian habitats along roadways such as these provide habitat for common birds such as Carolina chickadee, Carolina wren, downy woodpecker, northern cardinal, northern flicker, northern mockingbird, tufted titmouse, and yellow-breasted chat. Mammals such as bobcat, coyote, ground hog, and white-tailed deer also are likely to utilize habitat like this in this region (Whitaker 1996). Amphibians likely to use the area include American bullfrog, Cope's gray tree frog, northern cricket frog,

southern leopard frog, and upland chorus frog. Reptiles utilizing these wet areas and the surrounding habitat include garter, northern water, rat and ring-necked snakes (Powell et al. 2016, Gibbons and Dorcas 2005).

No cave records were identified within three miles of the project during a review of the TVA Regional Natural Heritage Database in September 2022.

3.8.1.1 Migratory Birds

No records of heronries or aggregations of other migratory birds have been documented within three miles of the project. Review of the USFWS Information for Planning and Consultation (IPaC) tool in September 2022 identified 11 migratory bird species of conservation concern that could occur within the Project Site: bald eagle, bobolink, chimney swift, eastern whip-poor-will, golden-winged warbler, Kentucky warbler, prairie warbler, prothonotary warbler, red-headed woodpecker, rusty blackbird, and wood thrush. The Project Site could provide a small amount of habitat for golden-winged warbler, prairie warbler, prothonotary warbler, and rusty blackbird. Of these species, rusty blackbird does not nest in the region. Foraging habitat for bald eagle is also present in the Creek and Hiwassee River; however, no bald eagle nests are known within three miles of the action area or in McMinn County. No bald eagle nests or migratory birds of conservation concern were observed by TVA Terrestrial Zoologists during the October 2022 field survey of the Project Site.

3.8.2 Environmental Consequences

3.8.2.1 Alternative A

Under Alternative A (No Action Alternative), the dam would not be removed. Soil, vegetation, and stone blocks would remain in their current state, and tree clearing and earth moving would not occur in association with this project. Terrestrial animals and their habitats would not be affected under Alternative A.

3.8.2.2 Alternative B

Under Alternative B (Action Alternative) the dam would be removed, and the Project Site would be cleared for deconstruction activities and material storage areas. Some areas would be graded, and other areas would receive erosion control and stabilization measures. Approximately 0.02 acre of trees, 0.12 acre of shrubs, and 0.03 acre of herbaceous habitat would be cleared resulting in displacement of wildlife currently using the area. Direct effects to some individuals are possible if those individuals are immobile during the time of habitat removal (e.g., during breeding/nesting seasons). Habitat removal would likely disperse mobile wildlife into surrounding areas in attempts to find new food resources, shelter, and to reestablish territories; thus, the effects would be considered minor. Overall, due to the small amount of already disturbed habitat being impacted, and the amount of similarly suitable habitat in areas immediately adjacent to the Project Site, common wildlife would experience minor, temporary impacts due to the disturbance and loss of herbaceous habitat, and minor, permanent impacts due to the loss of woody vegetated habitat. Long term impacts to common wildlife populations are not expected. Federal and state listed threatened and endangered species are addressed in Section 3.10.

The USFWS IPaC tool identified 11 migratory birds of conservation concern that could occur within the Project Site. No suitable nesting habitat for rusty blackbirds exists within the Project Site. A small amount of nesting habitat exists in the Project Site for prairie warbler, golden-winged warbler, and prothonotary warbler. The Project Site receives regular disturbance due to the road, railroad, and frequently used trails on either side of the

dam. Trash and fire rings were also visible during field surveys as evidence of the frequency with which humans visit this site. Due to the regular disturbance at the site, it is less likely that birds would select this site for successful nesting. Furthermore, vegetation clearing would occur outside of the nesting season during winter. Due to the temporary and short nature of the disturbance, relatively small area of impact, and quality of habitat impacted, with implementation of BMPs, the proposed action would not be expected to impact populations of migratory birds.

No bald eagle nests would be impacted as none are known within three miles. Activities under Alternative B would be performed in compliance with the National Bald Eagle Management Guidelines (USFWS 2007a); thus, effects to bald eagles would be minor.

Based on a review of the RFFAs presented in Table 3.21-1, activities from RFFA in conjunction with Alternative B could result in minor, temporary cumulative impacts to wildlife if the projects include wildlife habitat impacts (e.g., vegetation removal) and if construction periods overlap with the Saulpaw Mill Dam removal. This would be particularly true if the project overlaps with activities associated with the Tarver Site, which is upstream of the Project Site along the Oostanaula Creek (TVA 2022c).

3.9 Aquatic Ecology

3.9.1 Affected Environment

Oostanaula Creek may have historically supported a diverse aquatic community, but generations of poor land use practices have led to elevated levels of sedimentation and phosphorus pollution which greatly impacts the stream's ecological health. As stated in Section 3.4.1.2, Oostanaula Creek is listed as 303(d)-listed as impaired for sedimentation, nutrients (historically, phosphorus), *E. coli*, and alteration in streamside or littoral vegetative covers; many of these impairments are the result of grazing in riparian or shoreline zones and/or crop production, among other contributing sources. The aquatic community of Oostanaula Creek has been surveyed seven times since the mid-1990s under TVA's Index of Biotic Integrity watershed health program and has scored either "poor" or "very poor". These scores characterize a stream of low diversity, in this case only 10 fish species, and dominated by pollution-tolerant species and very few specialized species with hybridization, parasites, and diseases being common. A high proportion of tolerant species in Oostanaula creek such as redbreast sunfish, green sunfish, central stonerollers, and striped shiners are also indicative of a stream imperiled by land use practices (Johnson and Treece 1998). The poor health of the aquatic community currently present in Oostanaula Creek is consistent with numerous other creeks impounded by small mill dams in the southeast, where stream impoundments reduce aquatic connectivity and constrain aquatic ecology (Helms et al. 2011.). The affected reach of the Hiwassee River is impounded by the effects of Chickamauga Dam. The aquatic community consists of tolerant lake-dwelling species such as sunfish, black bass, and suckers. Absent are more sensitive darter and minnow species that would have been historically present in the free-flowing Hiwassee River and still exist in some capacity further upstream. The presence of the Saulpaw Mill Dam presents a barrier to upstream fish and mussel dispersal or as a barrier to spawning refuges for lake-dwelling species in the Hiwassee River portion of Chickamauga Lake such as Smallmouth and Black Buffalo.

3.9.2 Environmental Consequences

3.9.2.1 Alternative A

Under the No Action Alternative, Saulpaw Mill Dam would not be removed, and the dam would continue to be maintained in its current state. The dam would remain in place and continue to function as a barrier to aquatic organism passage. Sediments would continue to accumulate behind the dam, potentially increasing in contaminants. No direct effects would occur to aquatic organisms under Alternative A; however, the continued presence of the dam would result in moderate effects to aquatic organisms that could otherwise access abundant habitat in Oostanaula Creek. Minor cumulative impacts with consideration of other aquatic life barriers in the watershed.

3.9.2.2 Alternative B

Alternative B would consist of the removal of the Saulpaw Mill Dam as described in Section 2.1.2. As discussed in Section 3.4, sediments containing arsenic, chromium, iron, lead, manganese, nickel, and selenium were detected at levels that would not affect benthic biota, within the range of those expected for TVA reservoirs, and within the naturally occurring background levels for soils in the State of Tennessee. In May 2022, TVA Surveying Services (TVA 2018b) developed stream cross sections and estimated 83 cubic yards of sediments have accumulated directly upstream of the dam. Following removal of the dam, these accumulated sediments would be allowed to naturally disperse. The removal of the dam and associated construction activities would temporarily increase the sediment load downstream of the confluence with the Hiwassee River. However, the Hiwassee River typically carries a high bedload contributed from imperiled streams in the Lower Hiwassee River Valley, as such, effects to aquatic ecology from anticipated temporary increases to sediment load would be minor. However, improvements to agricultural practices could improve water quality enough to allow Oostanaula Creek to be recolonized by organisms from the mainstem Hiwassee River once barriers to dispersal such as Saulpaw Mill Dam are removed.

A minor reduction in water levels is anticipated once the impounding effect of the dam is removed, which would eliminate the small amount of lentic habitat created by the impoundment. However, slow-moving or backwater habitats may be found along the shoreline of the Hiwassee River for lentic-associated species, if present. Up to 540 square feet of direct, permanent effects are also proposed to Oostanaula Creek surrounding the railroad pier for the installation of stabilization structures (concrete jacks). This introduction of new complex habitat could result in a positive ecological benefit for aquatic organisms.

Overall, the removal of the Saulpaw Mill Dam would result in large beneficial effects to aquatic life in the Hiwassee River by providing access to up to 116.5 miles of perennial stream habitat within the Oostanaula Creek watershed (assuming no other barriers) (Hagen and Walker 2007).

TVA would adhere to state and federal permit requirements and would commit to implementing provisions and other measures, as identified in Section 2.3, required to mitigate adverse effects anticipated from modifications made to the Project Site. Although dam removals may lead to temporary increases in suspended sediments downstream of the dam, dam removals also provide broad ecological benefits such as increasing watershed connectivity, improved water quality, and the restoration of habitat diversity (Sherman 2013). Additionally, a permanent impact in the lower reach of Oostanaula Creek from Saulpaw Mill Dam removal would occur from a lowering of the water surface elevation

due to the removal of the impoundment. Associated beneficial impacts from the dam removal could include improvements to water quality, improved stream habitat quality for plant and animal communities, increased fish density or diversity, or a shift in species composition; beneficial impacts that could also enhance recreational activities. Like small dam removal efforts on other streams the removal of Saulpaw Mill Dam would enhance stream connectivity and would be expected to result in overall minor ecological benefits in Oostanaula Creek. (Sherman 2013),

The removal of Saulpaw Mill Dam would result in temporary impacts due to disturbance of aquatic habitat and passage of sediments downstream. Removal of silty sediment via airlift dredging and downstream dispersal would only cause temporary impacts due to increases in suspended sediment. Impacts to the ecology of the Hiwassee River portion of Chickamauga Lake would be insignificant due to the high bedload already present in this watershed. This would result in temporary, minor cumulative impacts to aquatic ecology if activities related to RFFAs presented in Table 3.21-1 with potential effects to aquatic ecological resources overlap with the Saulpaw Mill Dam project.

3.10 Threatened and Endangered Species

3.10.1 Affected Environment

Some species of plants and animals are protected under the ESA and related state laws. The ESA was implemented to provide a framework to conserve and protect threatened and endangered species and their habitats. This act authorized the determination and listing of species as endangered and threatened; prohibited unauthorized taking, possession, sale, and transport of endangered species, provided authority to acquire land for the conservation of listed species, and authorized civil and criminal penalties for violating the ESA (among other authorizations). An endangered species is defined by the ESA as any species in danger of extinction throughout all or a sizable portion of its range. Likewise, a threatened species is likely to become endangered within the foreseeable future throughout all or a significant part of its range. Critical habitats, essential to the conservation of listed species, also can be designated under the ESA. The ESA establishes programs to conserve and recover endangered and threatened species and makes their conservation a priority for federal agencies. Under Section 7 of the ESA, federal agencies are required to consider the potential effects of their proposed action on endangered and threatened species and critical habitats. If the proposed action has the potential to affect these resources, the federal agency is required to consult with the USFWS. Fish and game species are also protected by the hunting, fish, and trapping regulations enforced by the TWRA and the USFWS.

The TVA Regional Natural Heritage Database and USFWS IPaC list and were reviewed in September and October 2023, respectively, to identify federal and state-protected species that could potentially occur on the Project Site.

3.10.1.1 Plants

Two state-protected species and one federally listed plant species were reported on the species lists from within a five-mile vicinity of the Project Site (Table 3.10-1). None of the protected species are likely to occur on the Project Site as no supportive habitat is present, such as limestone bluffs (spreading false-foxglove), wetland bogs (white fringeless orchid), or low, moist open pinelands, savannas, or prairies (Maryland milkwort) (Nature Serve 2023; USGS 2023). No federally listed plants have been previously observed in McMinn

County, Tennessee where the Project would be located. No designated critical habitat for plants occurs on the Project Site.

Table 3.10-1. Plant species of conservation concern previously reported from within five miles of the proposed Saulpaw Mill Dam removal project.¹

Common Name	Scientific Name	Federal Status ²	State Status ²	State Rank ³
Plants				
Spreading false-foxglove	<i>Aureolaria patula</i>	–	SPCO	S3
White fringeless orchid	<i>Platanthera integrilabia</i>	THR	END	S2S3
Maryland milkwort	<i>Polygala mariana</i>	–	SPCO	S1

¹ Source: TVA and Tennessee Natural Heritage Database, queried September 2022, and USFWS IPaC resource list (<https://ecos.fws.gov/ipac/>), accessed 9/28/2023.

² Status Codes: END = Listed as Endangered; SPCO = Listed Special Concern; THR = Listed Threatened

³ State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S#S# = Denotes a range of ranks because the exact rarity of the element is uncertain.

3.10.1.2 Wildlife

Review of the TVA Regional Natural Heritage Database in September 2023 resulted in no observation records of state or federally listed terrestrial animal species within three miles of the Project. This same review identified one federally listed species recorded from McMinn County (rusty-patched bumblebee), three federally listed species (gray bat, northern long-eared bat, and whooping crane), one federally proposed endangered species (tricolored bat), and one candidate species for federal listing (monarch butterfly) were listed on the IPaC report that could be expected to occur within the Project Site (Table 3.10-2). The range of the federally listed Indiana bat overlaps the Project Site, therefore impacts to this species are also addressed.

3.10.1.2.1 Insects

The monarch butterfly is a highly migratory species, with eastern U.S. populations overwintering in Mexico. Monarch populations typically return to the eastern U.S. in April (Davis and Howard 2005). Summer breeding habitat requires milkweed plant species, on which adults exclusively lay eggs for larvae to develop and feed on. Adults drink nectar from other blooming wildflowers when milkweeds are not in bloom (Nature Serve 2022). The early successional herbaceous plants in the Project Site may contain some flowering plants that could provide a small amount of suitable foraging habitat for adult monarchs. Milkweed plants were not observed here during terrestrial zoology field reviews on October 19, 2022. Though this species has not been historically tracked by state or federal heritage programs, the USFWS IPaC tool determined that this species could occur within the Project Site (Table 3.10-2).

The rusty-patched bumblebee inhabits grasslands, prairies, woodlands, marshes, agricultural landscapes, and residential parks and gardens. They require both diverse, abundant flowers from April to September and undisturbed nesting sites nearby to have sufficient food and overwintering sites for queens. They often build nests in abandoned, underground rodent cavities or large clumps of grass (USFWS 2016). One record of rusty-patched bumblebee is present in McMinn County, located approximately 14 miles away from the Project Site. This record is possibly historical due to the age of the record (1966). Suitable habitat for this species is not present in the Project Site.

3.10.1.2.2 Birds

Whooping cranes migrate through Tennessee twice per year in small flocks of three- five birds. During this migration they stop to feed and rest in wetland complexes, marshes, ponds, lakes, rivers, and agricultural fields (USFWS 2023). The Project Site provides a very small amount of suitable habitat for whooping crane.

3.10.1.2.3 Mammals

Gray bats roost in caves year-round and migrate between summer and winter roosts during spring and fall (USFWS 1982, Tuttle 1976). Bats disperse over bodies of water at dusk where they forage for insects emerging from the surface of the water (Tuttle 1976). No gray bat records are known from McMinn County, Tennessee. No caves are known within three miles of the Project Site. Field reviews of the bridges immediately adjacent to the action area on October 19, 2022, observed possible guano in the middle of the bridge under Hiwassee Road. The amount of guano visible was relatively small and could not be confirmed due to its location. No bats themselves could be seen or heard. Foraging habitat for gray bat is available over Oostanaula Creek and the Hiwassee River.

Table 3.10-2. Federally listed terrestrial animal species reported from McMinn County, Tennessee and other species of conservation concern documented within three miles of the Saulpaw Mill Dam removal¹

Common Name	Scientific Name	Status ²	
		Federal	State ³ (Rank ³)
Invertebrates			
Monarch butterfly ⁴	<i>Danaus plexippus</i>	C	-(S1)
Rusty-patched bumble bee ⁵	<i>Bombus affinis</i>	E	-(S1)
Birds			
Whooping Crane ^{6,7}	<i>Grus americana</i>	E	EXPN (SX)
Mammals			
Gray bat ⁷	<i>Myotis grisescens</i>	E	E(S2)
Indiana bat ⁸	<i>Myotis sodalis</i>	E	E(S1)
Northern long-eared bat ⁷	<i>Myotis septentrionalis</i>	E	T(S1S2)
Tricolored bat ⁷	<i>Perimyotis subflavus</i>	PE	T(S2S3)

¹Source: TVA Regional Natural Heritage Database, extracted 9/21/2023 and USFWS IPaC resource list (<https://ecos.fws.gov/ipac/>), accessed 10/2/2023 (USFWS 2023).

²Status Codes: C = Candidate species; D = Deemed in Need of Management; DM = Delisted and Monitored; E = Endangered; EXPN = Experimental population; PE = Proposed Endangered; T = Threatened.

³State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Apparently Secure; SX = Presumed Extirpated.

⁴Historically this species has not been tracked by state or federal heritage programs.

⁵Species known from McMinn County, Tennessee but not from within three miles of the Project footprint.

⁶Rare migrant and winter resident in middle and east Tennessee (TWRA 2023).

⁷Species that has not been documented within three miles of the project footprint or within McMinn County, Tennessee; USFWS IPaC indicates this species could occur within the Project Site.

⁸Species listed under ESA whose range includes the project footprint and thus has the potential to occur in the area.

Indiana bats hibernate in caves in winter and use areas around them for swarming (mating) in the fall and staging in the spring, prior to migration back to summer habitat. During the

summer, Indiana bats roost under the exfoliating bark of dead snags and living trees in mature forests with an open understory and a nearby source of water (USFWS 2007b, Kurta et al. 2002). Indiana bats are known to change roost trees frequently throughout the season, while still maintaining site fidelity, returning to the same summer roosting areas in subsequent years (USFWS 2007b). Foraging occurs along riparian areas and along the tops of trees, forested edges, and tree lines. There are no records of Indiana bats in McMinn County, Tennessee or within 10 miles of the Project Site. The closest known record is approximately 30 miles away in Cherokee National Forest. The USFWS has determined that Indiana bats are not likely to occur in the Project Site (ArcGIS 2023).

Northern long-eared bats overwinter predominantly in large hibernacula such as caves, abandoned mines, and cave-like structures. During the fall and spring, they utilize entrances of caves and the surrounding forested areas for swarming and staging. In the summer, northern long-eared bats roost individually or in colonies beneath exfoliating bark or in crevices of both live and dead trees (typically greater than 3 inches in diameter). Roost selection by northern long-eared bat is similar to that of Indiana bat, however, northern long-eared bats are thought to be more opportunistic in roost site selection. This species also roosts in abandoned buildings and under bridges. Northern long-eared bats emerge at dusk to forage below the canopy of mature forests on hillsides and roads, and occasionally over forest clearings and along riparian areas (USFWS 2014). There are no records of northern long-eared bats in McMinn County, Tennessee or within 5 miles of the Project Site. The closest record is approximately 11.3 miles away in Polk County, Tennessee. The USFWS has determined that Indiana bats are not likely to occur on the Project Site (ArcGIS 2023).

Tricolored bats are generally solitary or found in small groups. They are associated with forested landscapes where they forage along forest edges and along waterways. Summer roosts are primarily in live and dead leaf clusters of live or recently dead deciduous hardwood trees. However, this species has also been documented roosting in pines, cedars, and artificial structures such as barns, bridges, bunkers, and residential roofs during summer months. In winter, this species is most commonly found in caves and mines but may also use culverts, abandoned wells, tree cavities, and rock shelters (USFWS 2021). There are no records of tricolored bats in McMinn County, Tennessee or within 5 miles of the Project Site. The closest record is approximately 11.3 miles away in Polk County, Tennessee.

No known caves or suitable winter roosting structures for the federally listed bats exist in the Project Site. Based on the Range-Wide Indiana Bat and Northern Long-eared Bat Survey Guidelines (USFWS 2022), TVA has determined that the 0.02 acre of trees that could be removed may provide suitable summer roosting habitat for Indiana bat, northern long-eared bat, and tricolored bat. The vegetated shorelines along Oostanaula Creek and the Hiwassee River provide suitable foraging habitat for the three bat species as well. Field reviews of the bridges immediately adjacent to the Project Site on October 19, 2022, observed possible guano in the middle of the bridge under Hiwassee Road. The amount of guano visible was relatively small and could not be confirmed due to its location. No bats could be seen or heard.

3.10.1.3 Aquatic Species

A query of the TVA Natural Heritage Database and the USFWS IPaC indicated two federally listed species (one mussel and one fish) as occurring within the 10-digit HUC watershed adjacent to the proposed Project Site (Table 3.10-3). None of these species

occur within Oostanaula Creek itself, but within the mainstem Hiwassee River, upstream of the confluence with Oostanaula Creek. Extant populations of snail darter have been observed in the Hiwassee, but the reach of the Hiwassee near the Oostanaula Creek confluence is not considered optimal habitat for this species, and snail darters were not observed in recent surveys efforts (J. Simmons, Tennessee Valley Authority, personal communication). Additionally, this species was recently removed from the endangered species list. An experimental population of Oyster Mussels was introduced to the Hiwassee River in 2014, but it has yet to be determined if this population is sustainable. The Cumberland bean has been documented in the Hiwassee River upstream of Reliance, Tennessee in recent survey efforts (Ahlstedt et al. 2016), but it is not known from the reach of the Hiwassee near the confluence with Oostanaula Creek. The confluence of Oostanaula Creek and the Lower Hiwassee River are heavily influenced by the impounded conditions of Chickamauga Lake, which reduces aquatic habitat and constrains the ecology of this portion of river.

Table 3.10-3. Records of federal and state-listed aquatic animal species within the Oostanaula Creek (0602000211) and Chickamauga Lake-Hiwassee River (0602000214) 10-digit HUC watershed (TVA EA 2022-19)¹

Common Name	Scientific Name	State Rank ²	State Status ³	Element Rank ⁴	Federal Status ⁵
Fishes					
Snail darter	<i>Percina tanasi</i>	S2S3	T	E	T, DL
Highfin carpsucker	<i>Carpionodes velifer</i>	S2S3	D	E	
Tangerine darter	<i>Percina aurantiaca</i>	S3	D	H?	
Mussels					
Oyster mussel	<i>Epioblasma capsaeformis</i>	S1	E	E	E, XN
Cumberland bean	<i>Vilosa trabilis</i>	-	-	-	E
Crayfish					
Conasauga blue burrower	<i>Cambarus cymatilis</i>	S1	E	E	
Cocoa crayfish	<i>Cambarus stockeri</i>	S1S2	T	E	

¹Source: TVA Natural Heritage and USFWS IPAC databases queried by Cory Chapman, 9/28/2022

²State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; SX = Presumed Extirpated

³State Status Codes: D = Deemed in need of conservation; E = Endangered; T = Threatened

⁴Element Rank (=population) Rank; E = Extant record ≤25 years old; H = Historical record >25 years old; ? = Uncertain status; X – Extirpated; AC - Excellent, good, or fair estimated viability

⁵ Federal Status Code: LT = Listed Threatened; LE = Listed Endangered; DL = Delisted; XN = Experimental Population, Non-Essential

3.10.2 Environmental Consequences

3.10.2.1 Alternative A

3.10.2.1.1 Plants

Under the No Action Alternative, Saulpaw Mill Dam would not be removed and the dam would continue to be maintained in its current state. The proposed Project Site does not currently support state-listed and federally listed plant species due to lack of habitat for those species. Therefore, no impacts would occur to threatened or endangered plant species.

3.10.2.1.2 Wildlife

Under the No Action Alternative, Saulpaw Mill Dam would not be removed and the dam would continue to be maintained in its current state. Soil, vegetation, and stone blocks would remain in their current state, and tree clearing and earth moving would not occur in association with this project. Threatened and endangered wildlife and their habitats would not be affected under Alternative A.

3.10.2.1.3 Aquatic Species

Under the No Action Alternative, Saulpaw Mill Dam would not be removed and the dam would continue to be maintained in its current state and the dam would remain a barrier to upstream fish and mussel dispersal or as a spawning refuge for more lentic species. Oostanaula Creek in its current state does not support aquatic threatened and endangered species. Therefore, no impacts to aquatic threatened and endangered species would occur.

3.10.2.2 Alternative B

3.10.2.2.1 Plants

The proposed project is incapable of supporting state-listed and federally listed plant species due to lack of habitat for those species; therefore, the proposed action would not affect state or federally listed threatened or endangered plant species and would not result in appreciable impacts to the terrestrial ecology of the region. No cumulative effects would occur to state and federally threatened and endangered plant species.

3.10.2.2.2 Wildlife

Insects

No suitable habitat exists for the rusty-patched bumble bee. This species is not present and would not be impacted by proposed actions.

A small amount of monarch butterfly foraging habitat exists along the road, creek, and river where non-native and native flowering herbaceous plants remain. This habitat could be impacted by proposed actions. No milkweed exists in the action area. This species is currently listed under the ESA as a candidate species and is not subject to Section 7 consultation under the ESA. As a result of Alternative B, TVA's proposed actions would not jeopardize the continued existence of the monarch butterfly occur. No cumulative effects to monarch butterfly would occur.

Birds

Whooping cranes migration habitat does exist within the project area, however; the area available is extremely small, receives frequent disturbance by humans, trains, and vehicles on a heavily traveled road. The likelihood that this area would be used by migrating whooping cranes is very low. Whooping cranes in this region are considered a non-essential experimental population by the USFWS. For the purposes of consultation, non-essential experimental populations are treated as threatened species on National Wildlife Refuge and National Park land (require consultation under 7(a)(2) of the ESA) and as a proposed species on private land (no section 7(a)(2) requirements, but Federal agencies must not jeopardize their existence (section 7(a)(4))). TVA's proposed actions would not jeopardize the continued existence of the whooping crane. No cumulative effects to whooping crane would occur.

Mammals

Four federally listed or proposed bat species have the potential to use the Project Site: gray bat, Indiana bat, northern long-eared bat, and tricolored bat. No caves or other hibernacula for gray bat, Indiana bat, northern long-eared bat, or tricolored bat exist in the Project Site or are known within three miles of the Project Site. Approximately 0.02 acres of forest would be removed in association with the proposed actions, which offer suitable summer roosting habitat for Indiana bat, northern long-eared bat, and tricolored bat. Tree removal would occur in winter (between November 15 to March 30) during the period that bats are hibernating in caves. The USFWS has determined that neither Indiana bat nor northern long-eared bat are likely to occur on the Project Site (ArcGIS 2023). Foraging habitats for all four bat species exist in and around the action area over creeks, rivers, and forested areas.

While no direct impacts would occur to the Hiwassee Road Bridge over Oostanaula Creek, there is some evidence that a small number of bats may roost under this bridge during warmer months. The species of bat using the bridge is unknown. This bridge is well traveled, with a railroad track immediately adjacent, and a high volume of loud boat traffic immediately adjacent to that on the Hiwassee River (several loud boats passed during field reviews). Thus, bats selecting this bridge for roosting, would already be acclimated to a considerable amount of disturbance. Proposed dam removal actions would occur in the late summer/early fall when bats would only be expected to use the bridge intermittently and in small numbers, and all young of the year would be volant. Dam removal activities are expected to take seven days, therefore the likelihood that bats would be roosting in the bridge at the time of dam removal is low. If the timing of the proposed actions shifts to earlier months (May-early August) when maternity roost could still be active, depending on the species of bat present, additional surveys of the bridge (e.g., emergence counts or acoustic monitoring) would be performed to determine what species are using the bridge. Additional coordination with the appropriate state and federal agencies would occur as needed to ensure compliance.

A number of activities associated with the proposed project, including tree removal, were addressed in TVA's programmatic consultation with the U.S. Fish and Wildlife Service on routine actions and federally listed bats in accordance with ESA Section 7(a)(2) and completed in April 2018 and updated in May 2023. For those activities with potential to affect bats, TVA committed to implementing specific conservation measures. These activities and associated conservation measures are identified on page 5 of the TVA Bat Strategy Project Screening Form (provided in Appendix A) and would be reviewed and implemented as part of the proposed Project. Considering the scope of the proposed Project actions, distance to known bat records, implementation of BMPs, and adherence to conservation measures including winter tree removal and additional bridge survey if needed, the proposed actions may affect but are not likely to adversely affect gray bat, Indiana bat, and northern long-eared bat. Proposed actions would not jeopardize the continued existence of tricolored bat. Proposed actions would not cumulatively affect federally protected bat species.

3.10.2.3 Aquatic Species

Based on a sediment survey conducted in May 2022 (TVA 2022a), 83 cubic yards of sediment have accumulated behind the dam. Sediment samples were collected in January 2018 from random locations along the segment of the creek extending from Saulpaw Mill Dam upstream approximately 0.2 miles. The results indicate there is minimal contamination of Oostanaula Creek sediments. Following removal of the dam, the accumulated sediments

would be allowed to naturally disperse. The removal of this dam and associated construction actions would temporarily increase the sediment load downstream of the confluence with the Hiwassee River. This river carries a high bedload from imperiled streams in the Lower Hiwassee River Valley so temporary increases to sediment load and effects to aquatic ecology would be minor and temporary.

The confluence of Oostanaula Creek and the Lower Hiwassee River is heavily influenced by the impounded conditions of Chickamauga Lake, which reduces aquatic habitat and constrains the ecology of this portion of river. The recently de-listed snail darter is the only federal species of concern near the Project Site. Therefore, no effects to threatened and endangered aquatic species are anticipated to occur as a result of the proposed dam removal. Thus, no cumulative effects would occur to aquatic threatened and endangered species.

3.11 Natural Areas, Parks, and Recreation

3.11.1 Affected Environment

Managed areas include lands held in public ownership that are managed by an entity (e.g., TVA, USDA, U.S. Forest Service, State of Tennessee) to protect and maintain certain ecological and/or recreational features. Natural areas include ecologically significant sites; federal, state, or local park lands; national or state forests; wilderness areas; scenic areas; wildlife management areas; recreational areas; greenways; trails; Nationwide Rivers Inventory streams; and wild and scenic rivers. Ecologically significant sites are either tracts of privately owned land that are recognized by resource biologists as having significant environmental resources or identified tracts on TVA lands that are ecologically significant but not specifically managed by TVA's Natural Areas program.

Based on a review of the TVA Natural Heritage project database, no natural or managed areas are located within three miles of the Project Site. Saulpaw Mill Dam is located at the confluence of Oostanaula Creek and the Hiwassee River and is an actively used area for recreational activities. Two recreational parks, the Hiwassee River Blueway, and two Hiwassee River Blueway access points occur within three miles of the Saulpaw Mill Dam (Figure 3.11-1).

- Recreational Parks
 - Hiwassee Meadowlands Park
 - Hoyt Berry Municipal Park
- TVA Undeveloped Recreation Area
- Hiwassee River Blueway
- Hiwassee River Blueway Access Points
 - Calhoun Boat Ramp
 - Charleston Boat Ramp

Hoyt Berry Municipal Park (TVA) is located 0.7 miles southwest of the Project Site. Owned by the City of Charleston, the park features a large picnic pavilion with restrooms, an outdoor stage, ballfield, gazebo, fitness area, children's playground, basketball court and picnic tables. The park is the site of the annual International Cowpea Festival which brings

thousands to the park each September, and the park is filled with numerous events throughout the year (City of Charleston 2022).

Hiwassee Meadowlands Park is owned by the Town of Calhoun and was built in 1986. The park features walking trails, softball field, playground, picnic areas, and Calhoun outdoor pavilion that seats 250 patrons. Meadowlands is also historically significant, as it lies adjacent to a section of the original Trail of Tears, and within the park is a Tennessee Civil War Trails marker denoting the “Destruction of the Meeting House”. The park is the site of various festivals and events and is well known for its annual Christmas display of lights (City of Calhoun 2022).

The Hiwassee River Blueway is located adjacent to the Project Site. Oostanaula Creek discharges via Saulpaw Mill Dam into the Hiwassee River at HiRM 19.8 which is part of a 55-mile stretch of the Hiwassee River called the Hiwassee River Blueway. This section of the Hiwassee River flows through the Cherokee National Forest and the historic towns of Reliance, Delano, Charleston, and Calhoun before emptying into the Tennessee River at Blythe’s Ferry. Along the way, the waterway winds through Southeast Tennessee’s scenic landscape and numerous cultural heritage sites, including the Cherokee Removal Memorial Park in Birchwood in Charleston, one of the most significant Trail of Tears sites in the eastern United States. The Hiwassee River Blueway is renowned for its scenic beauty and range of outdoor recreational offerings, from whitewater paddling and trout fishing in the upper and middle sections of the river to motorized water recreation, bass fishing and bird watching. The Hiwassee River Blueway hosts multiple fishing events, festivals, and boating events along this portion of the river throughout the year (Hiwassee River Blueway 2023). Two access points within a one-mile radius of the Project Site are part of the Hiwassee River Blueway. Calhoun Boat Ramp is located 0.25 miles west of the Saulpaw Mill Dam, and Charleston Boat Ramp (TVA) is located 0.72 miles southwest of Saulpaw Mill Dam. Both access points have a concrete boat ramp and gravel parking lot.

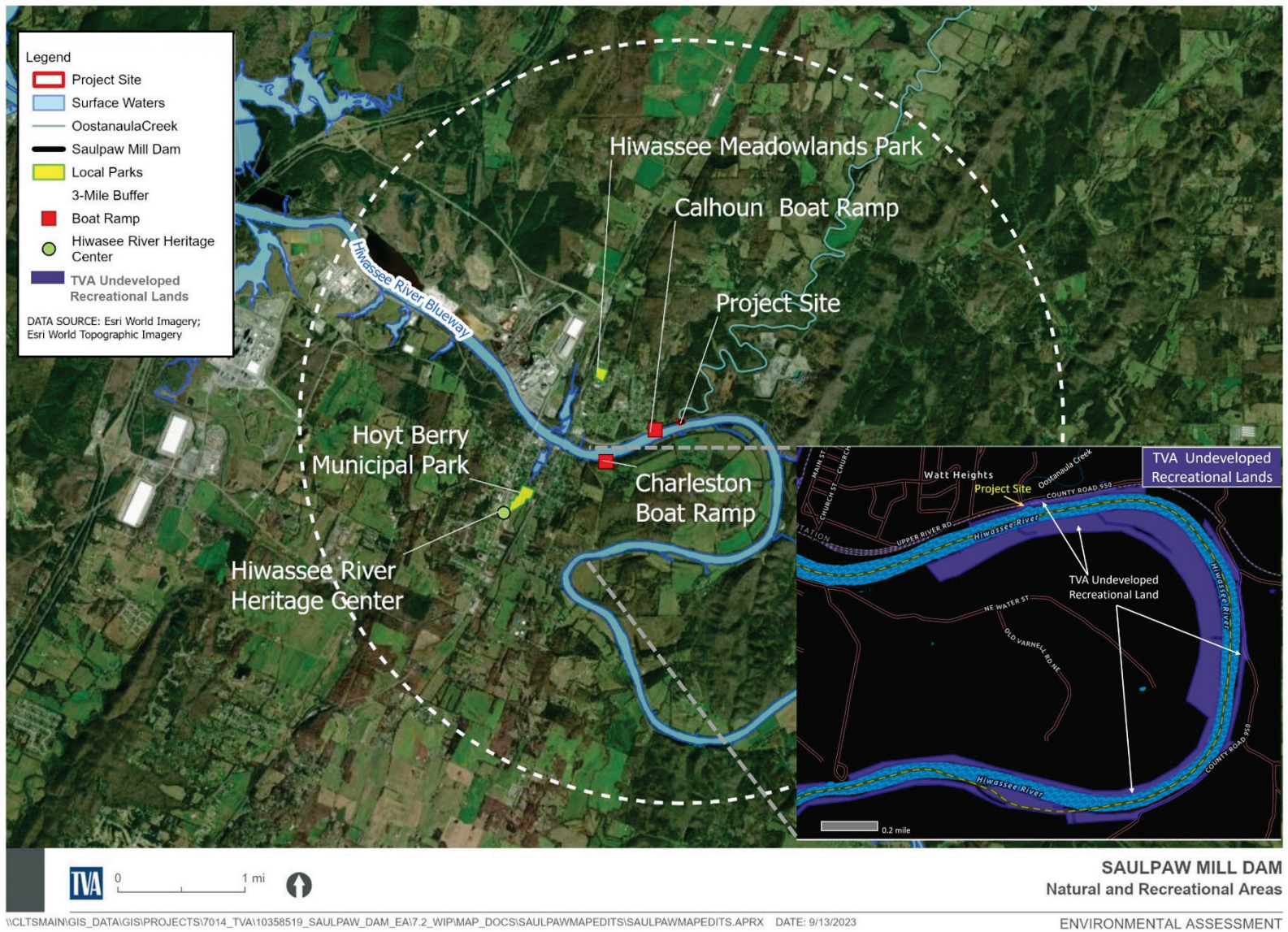


Figure 3.11-1. Recreational and Natural Areas Near the Project Site

The Project Site is located within undeveloped recreational land managed by TVA. Saulpaw Mill Dam lies within 8.16 acres of undeveloped recreation area, and the southside of the river across from the Project Site lies on 99.6 acres of undeveloped recreational area. While there are no formally identified recreational trails, access sites, or other recreational areas connected to Saulpaw Mill Dam, it is important to note that this area is heavy with recreational traffic. Oostanaula Creek is popular for recreational bank fishing and swimming. Saulpaw Mill Dam has also become a common area for recreational users as an informal access point for kayaking, paddling, and canoeing. Other recreational activities that take place onsite include photography and picnicking.

Hiwassee River Heritage Center is located 1.7 miles southwest of Saulpaw Mill Dam. Although located outside the one-mile radius of the Project Site, the center is located on Hiwassee Street, which would serve as an access road during the Project. Owned and operated by Charleston-Calhoun-Hiwassee Historical Society, the center includes a museum that highlights surrounding historical areas such as Fort Cass military camp, Cherokee Nation sites, and the Trail of Tears. Hiwassee River Heritage Center is dedicated to preserving the history of Hiwassee River, and historical communities in the cities of Calhoun and Charleston (Hiwassee River Heritage Center 2022).

3.11.2 Environmental Consequences

3.11.2.1.1 Alternative A

Under the No Action Alternative, the Saulpaw Mill Dam would not be removed and the dam would continue to be maintained in its current state. No impacts on recreational areas would be anticipated; however, the unsafe conditions created as a result of water flowing over the Saulpaw Mill Dam would remain unchanged. Boating and fishing on the Hiwassee River would likely remain unchanged.

3.11.2.1.2 Alternative B

The proposed action under Alternative B, removal of Saulpaw Mill Dam, would not affect natural or managed areas. The removal of Saulpaw Mill Dam would have minor, temporary impacts on recreation at the Project Site, as recreational users would be restricted from this area during construction activities associated with the dam removal.

Due to the nature of the project, and through the use of BMPs and coordination with adjacent recreational areas, minor, temporary impacts to these recreational areas are expected. However, removal of the dam would result in safer conditions and improved fish passage into Oostanaula Creek, thus providing moderate, long-term beneficial effects to recreational users and to aquatic resources. It is possible the change in the aquatic environment may change the density or diversity of the fish community present in this area which could result in minor effects to recreational angling, however generally effects are positive to the aquatic community (see Section 3.9).

Given the scope of this alternative and the distance from nearby natural areas and recreation, cumulative impacts due to the Project are expected to be minor and temporary, and beneficial for recreation in the long-term due to safer dam conditions and improved fish passage.

3.12 Air Quality

3.12.1 Affected Environment

Air quality is measured by the concentration of various pollutants in the atmosphere, typically expressed in units of parts per million (ppm) or in units of micrograms per cubic meter (mg/m^3). Air quality is not only determined by the types and quantities of atmospheric pollutants but also by surface topography, size of the air basin, and prevailing meteorological conditions. Through passage of the Clean Air Act of 1963 (CAA) and its amendments, Congress has mandated the protection and enhancement of our nation's air quality. The USEPA has established both primary and secondary National Ambient Air Quality Standards (NAAQS) for certain pollutants under the provisions of the CAA. Primary standards define levels of air quality necessary to protect public health with an adequate margin of safety. Secondary standards define levels of air quality necessary to protect the public welfare (i.e., soils, vegetation, and wildlife) from any known or anticipated adverse effects from a criteria air pollutant. NAAQS currently are established for six air pollutants (known as "criteria air pollutants"), including carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2), lead (Pb), and particulate matter equal to or less than 10 microns in aerodynamic diameter (PM_{10}). Although O_3 is considered a criteria air pollutant and is measurable in the atmosphere, it is not often considered as an air pollutant when calculating emissions because O_3 typically is not emitted directly from most emission sources. O_3 is formed in the atmosphere from its precursors, NO_2 and volatile organic compounds (VOCs), which are directly emitted from various emission sources. For this reason, NO_2 and VOCs are commonly reported in an air emissions inventory instead of O_3 .

The CAA requires each state to adopt regulatory requirements necessary to attain the NAAQS. The CAA also allows states to adopt air quality standards that are more stringent than the federal standards. The USEPA classifies the air quality within an air quality control region (AQCR) according to whether or not the concentrations of criteria air pollutants in the atmosphere exceed primary or secondary NAAQS. All areas within each AQCR are assigned a designation of "attainment" or "non-attainment" for each criteria air pollutant. An attainment designation indicates that air quality within specific areas of an AQCR is as good as, or better than, NAAQS for individual criteria air pollutants or that the air quality is unclassified. A designation of "unclassified" indicates that air quality within an area cannot be classified and therefore is treated as attainment. A non-attainment designation indicates that the concentration of an individual criteria air pollutant at a specific location exceeds primary or secondary NAAQS.

McMinn County is designated an "attainment" area for all criteria air pollutants (USEPA 2023d). Within the project area there may be occasional vehicle emissions due to automobiles, watercraft, and trains. These emissions are intermittent and temporary.

3.12.2 Environmental Consequences

3.12.2.1 Alternative A

Under the No Action Alternative, the Saulpaw Mill Dam would not be removed and the dam would continue to be maintained in its current state. There would be no temporary or permanent direct or indirect effects to local or regional air quality because there would be no immediate changes in the local area (i.e., no demolition or construction activities would occur due to TVA action).

3.12.2.2 Alternative B

The primary mechanisms for causing potential effects to local air quality considered in this assessment are the demolition and removal of the Saulpaw Mill Dam and associated temporary construction-related activities. Alternative B involves grading, demolition, material/structure removal and other construction activities that could create fugitive dust emissions during removal of the Saulpaw Mill Dam. Fugitive dust is commonly measured by the size of particulate matter. A common unit of measure for dust is PM₁₀ (particulate matter less than 10 microns in diameter). Vehicular traffic over paved and unpaved roads at the site would also result in minor emission of fugitive dust during the above construction activities. Construction materials stored in outdoor piles that are exposed to wind erosion is another source of fugitive dust. Backfilling and grading activities associated with Alternative B would create fugitive dust due to the movement of construction materials and the trucks and other mobile equipment performing these activities.

Theoretical drift distance, as a function of particle diameter and mean wind speed, has been computed for fugitive dust emissions. Results indicate that, for a typical mean wind speed of 10 mph, particles larger than about 100 microns (µm) are likely to settle out within 20 to 30 ft from the edge of the point of emission. Particles that are 30 to 100 µm in diameter are likely to undergo slower settling. These particles, depending upon the extent of atmospheric turbulence, are likely to settle within a few hundred feet of the point of emission. Smaller particles, particularly PM₁₀, and PM_{2.5} have much slower settling velocities and are much more likely to have their settling rate reduced by atmospheric turbulence (USEPA 1995).

Fugitive emissions from demolition activities typically produce particles that are primarily deposited on the property where the structures being demolished are located. Based on the large size of the fugitive particulate expected to be generated by the removal of the Saulpaw Mill Dam, this is likely the case. The potential drift distance of particles is governed by the release point of the particle, the settling velocity of the particle, and the degree of atmospheric turbulence. The vast majority of fugitive dust emissions would be deposited within the construction site boundaries. The remaining fraction of the dust would be subject to transport beyond the property boundary.

In addition to fugitive dust created by the construction activities, mobile equipment used for these activities would exhaust into the atmosphere combustion-related emissions of nitrogen oxides (NO_x), CO, VOC, SO₂, PM₁₀, PM_{2.5} (particulate matter less than 2.5 microns in diameter), and carbon dioxide (CO₂). Exhaust from internal combustion engines used to power trucks and demolition equipment can affect local air quality, especially if the engines are not maintained in proper working condition.

Dust control measures, as regulated under TDEC Air Pollution Control Rule 1200 3-8, would be implemented during demolition and other construction activities to prevent the spread of dust, dirt, and debris. These methods could include wetting equipment and demolition areas, covering waste or debris piles, and using covered containers to haul waste and debris. Wet suppression can reduce fugitive dust emissions from roadways and unpaved areas by as much as 95 percent. With these measures in place, potential effects to local air quality from the proposed construction activities are expected to be minor and temporary.

After completion of the dam removal, all equipment and personnel would be demobilized from the site. The areas disturbed during the removal of the dam would be stabilized with

permanent vegetation, which helps to minimize fugitive dust from bare soil in the long term. Alternative B would not cause any permanent direct or indirect changes to local air quality. The temporary impacts to local air quality are expected to be limited to the immediate area of construction activities. Most of the fugitive dust generated is expected to remain on-site and not impact surrounding areas, therefore no temporary cumulative impacts are anticipated. The Proposed Action would not result in any new operational air emissions sources at the Saulpaw Mill Dam after construction is complete; therefore, cumulative impacts are not anticipated.

3.13 Greenhouse Gases (GHG) and Climate Change

3.13.1 Affected Environment

The EPA defines climate change as “any significant change in the measures of climate lasting for an extended period of time.” In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among others, that occur over several decades or longer. These changes are caused by a number of natural factors as well as anthropogenic (i.e., human-related) activities (EPA 2022b).

Climate change is primarily a function of excessive CO₂ in the atmosphere. CO₂ is the primary greenhouse gas (GHG) emitted through human activities. Activities associated with the proposed action that produce CO₂ are primarily related to emissions from fossil-fuel-powered equipment (e.g., bulldozers, loaders, haulers, trucks, generators) used during the proposed activities. Forested areas that absorb and store CO₂ from the atmosphere via a process known as carbon sequestration help to reduce levels of CO₂ in the atmosphere. Additional GHGs that contribute to climate change include hydrofluorocarbons used in refrigeration equipment; sulfur hexafluoride used as a gaseous dielectric medium for high-voltage (1-kilovolt and above) circuit breakers, switchgears, and other electrical equipment; and methane. These gases can be released to the atmosphere through seal leaks, especially from older equipment, as well as during equipment manufacturing, installation, servicing, and disposal (EPA 2022d)

On January 20, 2021, President Joe Biden issued Executive Order 13990, “Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis.” EO 13990 stated the importance of federal agencies capturing “the full cost of [GHG] emissions as accurately as possible, including by taking global damages into account.” EO 13990 established an Interagency Working Group on the Social Cost of Greenhouse Gases. This working group was tasked with publishing and advising on the social cost of carbon (SCC), social cost of nitrous oxide (SCN), and social cost of methane (SCM). These costs are estimates of the monetized damages associated with incremental increases in GHG emissions (EO 13990).

The Council on Environmental Quality (CEQ) issued a guidance memorandum to assist Federal agencies in considering the effects of GHG emissions when evaluating proposed Federal actions in accordance with NEPA. This guidance recommends that agencies quantify GHG emissions when possible, and if data is not available, to include a qualitative analysis in the NEPA document. The extent of the GHG analysis should align with the quantity of projected emissions (CEQ 2023). In this specific project, a detailed quantification of social costs is not necessary given the limited GHG emissions associated with the project.

3.13.2 Environmental Consequences

3.13.2.1 Alternative A

Under the No Action Alternative, Saulpaw Mill Dam would not be removed and the dam would continue to be maintained in its current state. There would be no fuel-burning construction or demolition equipment used at the Project Site under this Alternative. Therefore, Alternative A would have no impact on GHG emissions or climate change. Climate change has been linked to extreme weather events and increased precipitation. These types of events could increase the risk of damage to, or failure of, the Saulpaw Mill Dam over time. Under the No Action Alternative, TVA would continue to manage and maintain the dam and would make any necessary repairs, therefore, impacts of climate change on the dam would be negligible to minor.

3.13.2.2 Alternative B

Alternative B includes the use of mobile equipment used for demolition and other construction activities. This equipment would generate combustion related GHG emissions (mainly CO₂, CH₄ and N₂O). Therefore, impacts to the local, regional, and global climate are expected to be minor and temporary under Alternative B. As stated for Alternative A, climate change has been linked to extreme weather events and increased precipitation. As Alternative B includes the removal of the Saulpaw Mill Dam, climate change would have no impact on the dam. The removal of the dam would not affect climate change. Cumulative impacts are not anticipated.

3.14 Noise and Vibration

3.14.1 Affected Environment

Noise is unwanted or unwelcome sound that is usually caused by human activity and added to the natural acoustic setting of a locale. It is further defined as sound that disrupts normal activities and diminishes the quality of the environment. Community response to noise is dependent on the intensity of the sound source, its duration, the proximity of noise-sensitive land uses, and the time of day the noise occurs.

Sound is measured in units of decibels (dB) on a logarithmic scale. Because not all noise frequencies are perceptible to the human ear, A-scale weighting decibels (dBA), which filter out sound in frequencies above and below human hearing, are typically used in noise assessments. A noise level change of three dBA or less is barely perceptible to average human hearing, while a 5 dBA change in noise level is clearly noticeable. The noise level associated with a 10 dBA change is perceived as being twice as loud; whereas the noise level associated with a 20 dBA change is perceived to be four times as loud and may represent a “dramatic change” in loudness.

The day-night sound level (L_{dn}) is the 24-hour equivalent sound level, which incorporates a 10 dBA correction penalty for the hours between 10 p.m. and 7 a.m. to account for the increased sensitivity of people to sounds that occur at night. Typical background day-night noise levels for rural areas are anticipated to range between an L_{dn} of 35 and 50 dB, whereas higher-density residential and urban areas background noise levels range from 43 dB to 72 dB (USEPA 1974). Background noise levels greater than 65 dBA can interfere with normal conversation, watching television, using a telephone, listening to the radio, and sleeping. Common indoor and outdoor noise levels from various noise sources are listed in Table 3.14-1.

Table 3.14-1. Common Indoor and Outdoor Noise Levels

Common Outdoor Noises	Sound Pressure Levels (dB)	Common Indoor Noises
	110	Rock Band at 5 meters (16.4 feet)
Jet Flyover at 300 meters (984.3 feet)		
	100	Inside Subway Train (New York)
Gas Lawn Mower at 1 meter (3.3 feet)		
	90	Food Blender at 1 meter (3.3 feet) Garbage Disposal at 1 meter (3.3 feet)
Diesel Truck at 15 meters (49.2 feet)		
	80	Shouting at 1 meter (3.3 feet)
Gas Lawn Mower at 30 meters (98.4 feet)		
	70	Vacuum Cleaner at 3 meters (9.8 feet)
Commercial Area		
	60	Normal Speech at 1 meter (3.3 feet) Large Business Office
Quiet Urban Daytime		
	50	Dishwasher Next Room
Quiet Urban Nighttime Quiet Suburban Nighttime		
	40	Small Theater, Large Conference Room Library
Quiet Rural Nighttime		
	30	Bedroom at Night Concert Hall (Background)
	20	Broadcast and Recording Studio
	10	
	0	Threshold of Hearing

Source: American Association of State Highway and Transportation Officials (AASHTO) 1993

Construction and demolition activities, including the operation of heavy machinery and construction-related vehicles, can create ground vibration. Community response to ground vibration is dependent on the intensity of the vibration source, its duration, distance between the source and receptor, and whether the vibration is continuous or transient. Continuous vibration sources include most heavy machinery and construction-related vehicles, whereas transient vibration sources include single isolated events such as blasting. Ground vibrations can cause annoyance to people who live or work near sources of vibration. Additionally, if the vibration amplitudes are high enough, there is the possibility of physical and cosmetic damage to structures.

There are no buildings or residential structures located within 500 feet of the Project Site; the nearest structure is an agricultural building located 0.12 mile to the east, across Hiwassee Road.

3.14.1.1 Noise

Ambient noise surrounding the Saulpaw Mill Dam consists mainly of water flowing over the dam; vehicle traffic; boat traffic; trains, agricultural sounds, such as noises from farm machinery; and natural sounds, such as from wind and wildlife. Generally, noise levels in these types of areas range from 45 to 55 dBA. A CSX rail line extends east-west through the Project Site, approximately 30 feet north of the Saulpaw Mill Dam. Noise from freight trains traveling at 20 miles per hour measures around 88 dBA at a distance of 50 feet (Southwest LRT 2015). Trains using horns must not exceed 110 dB to be in compliance with Federal Railroad Administration (FRA) requirements (FRA 2020). Overall, the area surrounding the Saulpaw Mill Dam is primarily rural residential, agricultural, suburban, and undeveloped land. The nearest noise receptors are an agricultural building 0.12 mile to the east and a private residence 0.18 mile to the northeast, across Hiwassee Road.

3.14.1.2 Vibration

Ground vibration is measured in terms of peak particle velocity (PPV) in units of inches per second (in/sec). Continuous and transient vibration criteria for structural damage and human annoyance are listed in Table 3.14-2 and Table 3.14-3, respectively. The threshold at which there is a risk to older residential structures is 0.3 in/sec PPV from continuous vibrations and 0.5 in/sec PPV from transient vibrations. Vibration levels would become distinctly perceptible at 0.04 in/sec PPV from continuous vibrations and 0.25 in/sec PPV from transient vibrations (Caltrans 2020).

Table 3.14-2. Vibration Criteria for Structural Damage

Structure and Condition	Maximum Vibration Level (in/sec PPV)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
Newer residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Source: Caltrans 2020

Table 3.14-3. Vibration Criteria for Human Annoyance

Human Response	Maximum Vibration Level (in/sec PPV)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.1
Severe	2.0	0.4

Source: Caltrans 2020

Table 3.14-4 presents typical levels of ground-borne vibration at 25 feet for a variety of common construction equipment. Ground vibration generated by most construction equipment would be approximately 0.2 in/sec PPV or less at 25 feet, decreasing to a distinctly perceptible 0.04 in/sec PPV at 125 feet. For typical pile driving activities, ground vibration would decrease to a distinctly perceptible 0.04 in/sec PPV at 400 feet (Federal Transit Administration [FTA] 2006). For additional reference, vibration generated by train is comparable to the vibratory roller at approximately 0.2 in/sec; the CSX rail line running through the Project Site would be expected to be around this range on a regular basis.

Table 3.14-4. Vibration Source Levels for Construction Equipment

Equipment	Maximum Vibration Level (in/sec PPV)
Pile driver	0.5
Vibratory roller	0.2
Train	0.2
Large bulldozer	0.09
Caisson drilling	0.09
Loaded trucks	0.08
Jackhammer	0.04
Small bulldozer	<0.01

Sources: FTA 2006; Caltrans 2020

3.14.2 Environmental Consequences

3.14.2.1 Alternative A

Under the No Action Alternative, Saulpaw Mill Dam would not be removed and the dam would continue to be maintained in its current state. Therefore, no project-related impacts on the ambient sound environment would occur.

3.14.2.2 Alternative B

Under Alternative B, the Saulpaw Mill Dam would be removed. Subject to weather, construction activities would take approximately seven days to complete using a crew of six workers. Work would generally occur during daylight hours. During construction, noise would be generated by haul trucks and heavy equipment such as a backhoe. Typical noise levels from construction equipment are expected to be 85 dBA or less at a distance of 50 feet (USDOT 2006; Table 3.14-5). These noise levels would typically diminish with distance from the dam at a rate of approximately 6 dBA per each doubling of distance. Based on straight line noise attenuation, it is estimated that noise levels from these sources would attenuate to approximately 60 dBA or less at the nearest residences along Little Mountain Acres Road (approximately 860 feet or further from the Project Site). These noise levels are below the U.S. Department of Housing and Urban Development (HUD) guideline of 65 dBA, but greater than the USEPA guideline of 55 dBA.

Two to three construction equipment and material vehicles would visit the Project Site each day during the construction period, resulting in increased noise levels along Hiwassee Road, Cherokee Crossing, Main Street, and Tennessee State Route (SR) 163 if the Project Site is accessed from the west. If accessed from the east, increased noise levels would occur along Hiwassee Road, County Road (CR) 971, and SR 163. Overall, construction noise would cause minor, temporary adverse impacts to the ambient sound environment in the vicinity of the dam.

Table 3.14-5. Maximum Noise Levels at 50 feet for Common Construction Equipment

Equipment	Maximum Noise Level at 50 feet (dBA)
Air compressor	80
Auger drill rig	85
Backhoe	80
Boring jack power unit	80
Bulldozer	85
Compactor (ground)	80
Concrete truck	85
Excavator	85
Jackhammer	85

Source: USDOT 2006

Vibrations from heavy machinery use and most construction activities would be temporary and minor, and due to the distance to the nearest receptors (over 950 feet), would not cause structural or cosmetic damage or be perceptible to members of the community.

The RFFAs discussed in Table 3.21-1 may, when combined with the proposed activities under Alternative B, result in minor, temporary cumulative impacts on noise levels in the area if the construction periods overlap with the Saulpaw Mill Dam removal. This would be especially true if the Project overlaps with activities associated with the Tarver or Molpus sites, which are nearest to the Project Site (TVA 2022b,c).

3.15 Transportation

3.15.1 Affected Environment

A CSX rail line extends east-west through the Project Site, approximately 30 feet north of the Saulpaw Mill Dam. County Road 950 (Hiwassee Road) is a two-lane paved public road that extends east-west along the northern boundary of the Project Site, approximately 80 feet north of the dam. From the west the site would be accessed from U.S. Route 11 (US 11) via SR 163 east to Main Street, Cherokee Crossing, and Hiwassee Road to the dam. From the east the site would be accessed from US 11 via SR 163 east to Reece McAmish Road (CR 971) and Hiwassee Road to the dam. SR 163 in the project vicinity is a two-lane undivided state highway that extends east-west approximately 0.5 mile north of the dam. Table 3.15-1 shows the 2021 average annual daily traffic counts (Tennessee Department of Transportation [TDOT] 2022a; TDOT 2022b).

The project area is located at the confluence of Oostanaula Creek and the Hiwassee River. The Hiwassee River is a navigable water regulated under Section 10 of the Rivers and Harbor Act (USACE 2023).

Table 3.15-1. 2021 Average Annual Daily Traffic (AADT) Counts on Major Roadways Near Saulpaw Mill Dam

Station	Roadway	Distance from Saulpaw Mill Dam Project Boundary	AADT
159	SR 163 (East of US 11)	1.3 miles northwest	5,965
128	US 11 (North of Hiwassee River)	1.7 miles northwest	6,465
52	SR 163 (West of US 11)	2.5 miles northwest	3,001

Station	Roadway	Distance from Saulpaw Mill Dam Project Boundary	AADT
54	SR 163 (East of Reece McAmish Rd)	2.5 miles northeast	4,241
4	US 11 (South of Hiwassee River)	3.0 miles southwest	7,653

Sources: TDOT 2022a; TDOT 2022b

3.15.2 Environmental Consequences

3.15.2.1 Alternative A

Under the No Action Alternative, Saulpaw Mill Dam would not be removed and the dam would continue to be maintained in its current state. Therefore, no Project-related impacts on transportation resources would result.

3.15.2.2 Alternative B

TVA consulted with the McMinn County Highway Department and CSX Transportation regarding removal of the dam. The Hiwassee Road Bridge was inspected by the Tennessee Department of Transportation bridge inspector, and it was determined that removal of the dam would not affect the bridge; thus, the McMinn County Highway department did not object to removal of the Saulpaw Mill Dam (personal communication April 25, 2023).

Removal of the dam would increase water velocities and potential hydraulic erosive forces. In September 2021, TVA performed a hydrologic and hydraulic (H&H) study and pier scour analysis to evaluate the short- and long-term impacts of the dam removal on the upstream CSX pier. The study results indicated that removal of the dam would result in increased velocities and shear stress near the CSX pier, which could result in uncontrolled head cutting of the channel bed upstream towards the pier. Due to the potential impacts to the CSX railroad crossing, pier scour mitigation was recommended. To prevent adverse impacts to the CSX railroad crossing, TVA would install concrete jacks to prevent scour around the CSX railroad pier.

CSX reviewed and approved the project plans in July of 2022. In addition to the concrete jacks, per CSX requirements, flagging protection would be required when work is performed within 50 feet of the track and no materials or equipment would be stored within the CSX right of way without prior approval. Additionally, all work on, over, or adjacent to the railroad crossing would be conducted in accordance with CSXT Public Projects Manual. TVA would notify and coordinate construction activities with the CSXT General Engineering Consultant Designate. A construction agreement would be executed prior to construction.

Under Alternative B, the removal of the Saulpaw Mill Dam would result in minor impacts to road traffic due to an increase in construction related traffic in the vicinity of the Project Site. Subject to weather, construction activities would take approximately seven days to complete using a crew of 10 workers. Work would occur during daylight hours. Most of these workers would come from the local area or region. Other workers could come from outside the region, and if so, would stay in local hotels in the vicinity. It is anticipated that workers would drive personal vehicles to the dam. Construction workers and TVA staff would be expected to drive passenger vehicles to and from the site which would be parked onsite. The removal team would drive work trucks to and from the site which would also be parked onsite. Additionally, transport of gravel and stone fill would require eight truckloads of material to the site. The individual workers and work teams would visit local restaurants and other businesses during the construction phase of the project.

Due to the proximity of the Project Site to the cities of Calhoun, Charleston, and Cleveland, traffic impacts along Hiwassee Road, Cherokee Crossing, Main Street, Reece McAmish Road, SR 163, and US 11 could occur, as a portion of the construction workers would be expected to commute to the Project Site from Cleveland and through Charleston and Calhoun. Traffic flow around the Project Site would be heaviest at the beginning of the workday, at lunch, and at the end of the workday. Two to three construction equipment and material vehicles would visit the Project Site each day during the construction period. These vehicles would be easily accommodated by existing roadways; therefore, impacts to transportation resources in the vicinity of the Project Site would be minor. If necessary, mitigation measures such as posting a flag person during heavy commute periods to manage traffic flow and prioritizing access for local residents, could be implemented to minimize potential adverse impacts to traffic and transportation.

During removal of the Saulpaw dam, materials and equipment would also be staged on the work barges. Oil booms would be deployed around the work barge and anchored to the abutments to prevent spills from occurring and to restrict recreational boat access; however, this would not extend into the Hiwassee River commercial navigation channel. Thus, no more than minor impacts to commercial and recreational navigation would occur. The barges/equipment would be lit or have reflective tape for nighttime visibility. Additionally, TVA would notify the USACE and USCG so that a Notice to Navigation and a Broadcast Notice to Mariners can be issued to the commercial navigation industry.

Overall, with implementation of the above-described mitigation measures, Alternative B would result in minor, temporary impacts to traffic volumes and avoid adverse impacts to transportation infrastructure and river navigation. Alternative B would not result in any indirect impacts to transportation.

The RFFAs discussed in Table 3.21-1 may, when combined with activities under Alternative B, result in minor, temporary cumulative impacts on traffic levels in the area if the construction periods overlap with the Saulpaw Mill Dam removal. This would be especially true if the project overlaps with activities associated with the Tarver Site, which encompasses Oostanaula Creek just upstream of the Project Site (TVA 2022c).

3.16 Cultural Resources

3.16.1 Affected Environment

Cultural resources include pre-contact and historic archaeological sites, districts, buildings, structures, and objects, as well as locations of important historic events that lack material evidence of those events. Cultural resources are considered historic properties if included in, or considered eligible for inclusion in, the NRHP maintained by the National Park Service. The eligibility of a resource for inclusion in the NRHP is based on the Secretary of the Interior's criteria for evaluation (36 CFR § 60.4), which state that significant cultural resources possess integrity of location, design, setting, materials, workmanship, feeling and association, and:

1. are associated with important historical events; or
2. are associated with the lives of significant historic persons; or
3. embody distinctive characteristics of a type, period, or method of construction or represent the work of a master, or have high artistic value; or
4. have yielded or may yield information (data) important in history or prehistory.

Because of their importance to the Nation's heritage, historic properties are protected by multiple laws. Federal agencies, including TVA, have a statutory obligation to facilitate the preservation of historic properties, stemming primarily from NHPA (16 U.S.C. §§ 470 et seq.). Other relevant laws include the Archaeological and Historic Preservation Act (16 U.S.C. §§ 469-469c), Archaeological Resources Protection Act (16 U.S.C. §§ 470aa-470mm) and the Native American Graves Protection and Repatriation Act (25 U.S.C. §§ 3001- 3013).

Section 106 of the NHPA requires federal agencies to consider the potential effects of their actions on historic properties and to allow the Advisory Council on Historic Preservation an opportunity to comment on the action. Section 106 involves four steps: 1) initiate the process; 2) identify historic properties; 3) assess adverse effects; and 4) resolve adverse effects. This process is conducted in consultation with the State Historic Preservation Office of the state in which the action would occur and with any other interested consulting parties, including federally recognized Indian tribes.

Section 110 of the NHPA sets out the broad historic preservation responsibilities of federal agencies and is intended to ensure that historic preservation is fully integrated into their ongoing programs. Federal agencies are responsible for identifying and protecting historic properties and avoiding unnecessary damage to them. Section 110 also charges each federal agency with the affirmative responsibility for considering projects and programs that further the purposes of the NHPA, and it declares that the costs of preservation activities are eligible project costs in all undertakings conducted or assisted by a federal agency.

The Saulpaw Mill Dam is within the footprint of Alternative B. There are 10 recorded archaeological sites within 0.5 mile of the Project Site. These sites are summarized in Table 3.16-1. Except for the Saulpaw Mill Dam, there are no other previously recorded historic architectural resources within the 0.5-mile buffer of the Project Site.

Table 3.16-1. Recorded Archaeological Sites Within 0.5 mile of the Project Site

Site Number	Site Type	NRHP Recommendation
40BY56	Woodland open habitation	Undetermined
40BY57	Pre-Contact nondiagnostic open habitation	Undetermined
40BY58	Woodland open habitation; mid-19 th century artifact scatter	Undetermined
40BY59	Early Archaic and Mississippian open habitation	Undetermined
40BY60	Woodland open habitation	Undetermined
40BY80	Archaic open habitation	Undetermined
40BY81	Middle to Late Archaic and Mississippian open habitation	Undetermined
40BY86	Late to Terminal Archaic open habitation	Undetermined
40BY87	Pre-Contact nondiagnostic open habitation	Undetermined
40MN5	Unknown	Undetermined

In 2017, Tennessee Valley Archaeological Research (TVAR) (Karpyniec and Weaver 2017), at the request of TVA, conducted an architectural NRHP evaluation of the Saulpaw Mill Dam to evaluate its eligibility for the NRHP and to assess potential effects of the proposed removal of the dam to the resource. Based on the results of the evaluation, TVAR recommended the Saulpaw Mill Dam as eligible for the NRHP under Criterion A “for its local significance in the areas of industry and commerce for its association with a mid-to-late-nineteenth century mill complex” and that the proposed undertaking would have an adverse physical effect to the resource. TVAR recommended that TVA consult with the THC to explore mitigation alternatives for the proposed undertaking to minimize the adverse effect to the resource (Karpyniec and Weaver 2017).

A subsequent archaeological field survey of the Project Site was performed by New South Associates, Inc. (NSA) in November 2022 to evaluate the Saulpaw Mill Dam site archaeologically under Criterion D, which applies to sites that “have yielded or may be likely to yield, information important in history or -pre-history”. (NSA 2023). The fieldwork consisted of judgmental shovel testing, auger testing, probing, mapping, and documentation of features within the area of potential effect (APE), a 0.7-acre area of proposed ground disturbance which includes the dam, extant stonework, and surrounding area. Results of the survey within the APE demonstrated that the site is heavily disturbed, and no intact subsurface deposits are present. As such, NSA recommended that the Saulpaw Mill Dam site is not eligible for listing to the NRHP under Criterion D and that no archaeological further work is recommended (NSA 2023).

3.16.2 Environmental Consequences

3.16.2.1 Alternative A

Under the No Action Alternative, Saulpaw Mill Dam would not be removed and the dam would continue to be maintained in its current state. Therefore, no project-related changes to the Saulpaw Mill Dam or any other cultural resources would result.

3.16.2.2 Alternative B

Cultural resources under Alternative B would experience a large impact due to the removal of the Saulpaw Mill Dam, which is eligible for listing to the NRHP under Criterion A. TVA is consulting with the THC and Tribes to explore mitigation alternatives for the proposed undertaking to minimize the adverse effect to the resource (Karpyniec and Weaver 2017). Mitigation could include, but may not necessarily be limited to, signage detailing the historic significance of the property.

Although the Tarver property listed as a potential RFFA in Table 3.21-1 may contain an archaeological site (40MN5) (TVA 2022c), it is unlikely that the purchase and development of the Tarver property would overlap with the expected timeline of the Saulpaw Mill Dam removal, therefore no cumulative impacts to cultural resources are anticipated.

3.17 Visual Resources

3.17.1 Affected Environment

Visual resources compose the visible character of a place and include both natural and human-made attributes. Visual resources influence how an observer experiences a particular location and distinguishes it from other locations. Such resources are important to people living in or traveling through an area and can be an essential component of historically and culturally significant settings.

The Saulpaw Mill Dam is in a rural-residential area in the Town of Calhoun in McMinn County, Tennessee. The surrounding topography ranges from gently sloping near the banks of the Hiwassee River to moderately and steeply sloping ranges at Eledge Ridge to the east. Dense forest is visible along the slopes leading up from the valley floor to the hilltops above. Rural-residential concentrations and businesses adjacent to highways, and agricultural operations are present in the vicinity (within 0.25 mi) of the Project Site.

There are no sensitive viewing receptors within the foreground (0.5 mile) of the Saulpaw Mill Dam project boundary. The Saulpaw Mill Dam could be viewed by recreational boaters and other users along the Hiwassee River.

3.17.2 Environmental Consequences

3.17.2.1 Alternative A

Under the No Action Alternative, Saulpaw Mill Dam would not be removed and the dam would continue to be maintained in its current state. Therefore, no project-related changes to the appearance of the Saulpaw Mill Dam would result.

3.17.2.2 Alternative B

Under Alternative B, the Saulpaw Mill Dam would be removed. During construction, heavy machinery would be present, changing the visual aspects from vantage points along the Hiwassee River. Visual resource impacts on recreational boaters and other users along the Hiwassee River observing Saulpaw Mill Dam would be minor and temporary, as these observations could be made only from a distance given the restricted access in the vicinity of the dam. Adverse visual impacts could also occur on roads in the vicinity of the Project Site from trucks or other large vehicles travelling on the local roadway network. However, this disturbance would be momentary and present only as the vehicle passes the observer. Therefore, these adverse impacts on visual resources would be temporary and minor. Removal of the dam would improve the aesthetics of the Project Site returning it to a more natural effect. It is possible some viewers may consider the removal of the waterfall effect of the dam as an adverse visual impact; however, the overall effect to visual resources is expected to be minor.

Based on a review of the Saulpaw Project and other RFFAs, as summarized in Table 3.21-1, minor and temporary cumulative impacts on visual resources to those passing through on Hiwassee Road or to recreational boaters on the Hiwassee River would occur due to the presence of construction equipment on the site and on adjacent roadways if the construction periods overlap with the Saulpaw Mill Dam removal. This would be especially true if the project overlaps with activities associated with the Molpus Site, as it is within one mile of the Project Site and potentially located abutting the Hiwassee River (TVA 2022b).

3.18 Solid and Hazardous Waste

3.18.1 Affected Environment

In general, hazardous materials include substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health or the environment when released into the environment. Hazardous materials are regulated under a variety of federal laws including Occupational Safety and Health Administration (OSHA) standards, Emergency Planning and Community Right to Know Act, the Resource Conservation and Recovery Act (RCRA), the Comprehensive

Environmental Response, Compensation and Liability Act (CERCLA) of 1980 and the Toxic Substances Control Act (TSCA).

RCRA regulations define what constitutes a hazardous waste and establishes a “cradle to grave” system for management and disposal of hazardous wastes. Subtitle C of RCRA includes separate, less stringent regulations for certain potentially hazardous wastes. Used oil, for example, may be regulated as hazardous waste if it is disposed of, but it is separately regulated if it is recycled. Specific requirements are provided under RCRA for generators, transporters, processors, and burners of used oil that are recycled. Universal wastes are a subset of hazardous wastes that are widely generated. Universal wastes include batteries, lamps and high intensity lights, and mercury thermostats. Universal wastes may be managed in accordance with the RCRA requirements for hazardous wastes or by special, less stringent provisions.

Solid waste consists of a broad range of materials that include refuse, sanitary wastes, contaminated environmental media, scrap metals, nonhazardous wastewater treatment plant sludge, nonhazardous air pollution control wastes, various nonhazardous industrial waste, and other materials (solid, liquid, or contained gaseous substances). Solid waste is regulated by the USEPA and RCRA Subtitle D. Each state is required to ensure the federal regulations for solid waste are met and may implement more stringent requirements.

Special waste is a solid waste, other than a hazardous waste, which requires special handling and management to protect public health or the environment. In some states, special wastes may include sludges, bulky wastes, pesticide wastes, industrial wastes, combustion wastes, friable asbestos, and certain hazardous wastes exempted from RCRA Subtitle C requirements. Any of these wastes, if generated, would be disposed as required by state and federal regulations. In Tennessee, requirements for solid wastes are focused on solid waste processing and disposal under Rule 0400-11-.01.

Solid and hazardous waste is not generated on the proposed Project Site. Additionally, there is no known solid or hazardous waste stored on the Project Site.

Based on a review of the TDEC Division of Remediation database, permitted Tennessee landfill sites, solid waste processors, transfer or convenience centers, and UST database accessed through the TDEC Data Viewer and the USEPA ECHO database (USEPA 2022a), the nearest site regulated by the TDEC Division of Remediation is located approximately two miles west of the Saulpaw Mill Dam and the nearest regulated UST site is located approximately 0.5 miles west of the dam.

3.18.2 Environmental Consequences

3.18.2.1 Alternative A

Under the No Action Alternative, Saulpaw Mill Dam would not be removed and the dam would continue to be maintained in its current state. As such, no solid or hazardous waste would be produced.

3.18.2.2 Alternative B

Under Alternative B, deconstruction and removal of the Saulpaw Mill Dam would generate typical construction debris and solid waste associated with the removal of materials from the structure. Unless otherwise requested by the SHPO, the existing dam blocks may be reused on site or would be disposed of offsite at a permitted landfill in accordance with state and Federal (special) solid waste procedures. Solid wastes would be managed in

accordance with applicable state regulations and applicable BMP procedures. TVA would comply with TDEC regulations regarding the proper management of hazardous materials and disposal of waste materials. These wastes would be temporarily stored in properly managed storage areas on-site. TVA would dispose of all waste generated during the demolition activities in accordance with the Waste Management Plan. Although no contaminated demolition debris or hazardous wastes are anticipated, if generated, it would be hauled by truck to a permitted waste disposal facility/landfill designed to receive such wastes. Therefore, there would be no impacts as a result of generation of waste through implementation of the Proposed Action.

A May 2022 sediment survey reported that approximately 83 cubic yards of sediment has accumulated behind the Saulpaw Mill Dam (TVA 2022a) which would be released to the Hiwassee River during Phase 2 and Phase 3 work. As discussed in Section 3.4, sediments behind the dam contain levels of arsenic, chromium, iron, lead, manganese, nickel, and selenium that were detected at levels that would not affect benthic biota, within the range of those expected for TVA reservoirs, and within the naturally occurring background levels for soils in the State of Tennessee. Thus, release of the sediments would not result in adverse effects to the aquatic environment.

No hazardous wastes would be expected on the Project Site, however appropriate spill prevention, containment, and disposal requirements would be implemented to protect construction workers, the public, and the environment as necessary if hazardous wastes are identified. Any reportable spills and subsequent cleanup related to the Project would be addressed in accordance with the requirements outlined in the Project Spill Prevention, Control, and Countermeasures Plan (SPCC Plan) and Waste Management Plan. In addition, TVA would develop a Project Erosion & Sediment Control Plan (E&SCP), which would incorporate the requirements of applicable federal and state permit conditions. Designated environmental personnel would be responsible for daily inspection, cleanup, and proper labeling, storage, and disposal of all refuse and debris produced. Disposal containers such as dumpsters or roll-off containers would be obtained from a proper waste disposal company as appropriate and would minimize risk of spills or adverse effects related to waste disposal. No hazardous wastes would be expected and no long-term effects associated with solid waste would be anticipated; thus, no cumulative effects are anticipated.

3.19 Socioeconomics and Environmental Justice

3.19.1 Affected Environment

Social, economic, and sociocultural characteristics of potentially affected populations, as well as Environmental Justice (EJ) populations, including minority and low-income populations, are assessed in this section using the U.S. Census Bureau (USCB) 2010 decennial census (2010 Census), USCB 2020 decennial census (2020 Census), and the 2016 to 2020 American Community Survey (ACS) 5-year estimates (2020 ACS), depending on availability of data (USCB 2022a). The communities being studied include the Project Site and block groups within a 3-mile radius of the Saulpaw Mill Dam plus the nearby City of Cleveland. This area is referred to as the EJ Study Area, or the 3-mile buffer as presented in Figure 3.19-1; the City of Cleveland is also denoted on figures. The Town of Calhoun and City of Charleston are not considered separately because of their small size and location within the block groups within the 3-mile radius. State and county-level USCB data are included for comparison purposes. Where appropriate, additional data from USCB and other federal and state agencies are employed.

Potential beneficial and adverse effects to socioeconomics are also evaluated in this section, as are effects to identified EJ populations, in accordance with EO 12898, to identify and address disproportionately high and adverse human health or environmental effects of each alternative on minority populations and low-income populations. While not subject to this EO, TVA routinely considers EJ during its NEPA review processes.

The CEQ guidance for applying EO 12898 under NEPA directs identification of minority populations when the total minority population of the affected area exceeds 50 percent, or the minority population percentage of the study area is meaningfully greater than the minority population percentage in the general population or through another appropriate unit of geographic analysis (CEQ 1997). For purposes of this analysis, meaningfully greater minority percentages were defined as those that were 10 percentage points above the minority percentage of the associated county. CEQ defines minority populations as people who identify themselves as Asian or Pacific Islander, American Indian or Alaskan Native, Black (not of Hispanic origin), or Hispanic. Those indicating two or more races are also considered minorities due to necessarily including one of these minorities. Tribal populations were identified using the US HUD Tribal Directory Assessment Tool and the US Department of the Interior (USDOI) Tribal Affairs mapping (HUD 2022; USDOI 2022).

The CEQ guidance specifies that low-income populations be identified using the annual statistical poverty threshold from the USCB Current Population Reports Series P-60 on Income and Poverty. The current (2021) USCB-provided poverty threshold for individuals under age 65 is \$14,097, and the official poverty rate for the US is currently 11.6 percent (USCB 2022b). Low-income populations may also be identified by comparing study area income and poverty rates with the county and/or state data using current USCB Small Area Income and Poverty Estimates (SAIPE) (USCB 2022c), as recommended by USCB. For purposes of this analysis, low-income populations were defined as areas where poverty rates are less than two times the poverty level (i.e., those with poverty ratios defined in the 2020 ACS as 1.99 or lower) and those rates exceed the associated county's rate, calculated in the same manner. While this criterion is more encompassing than the use of base poverty levels from the USCB Current Population Reports Series P-60 or the USCB SAIPE, this low-income threshold, also used by USEPA in their delineation of low-income populations, is an appropriate measure for EJ consideration because current poverty thresholds are often too low to adequately capture the populations adversely affected by low-income levels, especially in high-cost areas (USEPA 2019). According to USEPA, the effects of income on baseline health and other aspects of susceptibility are not limited to those below the poverty thresholds. For example, populations having an income level from one to two times the poverty level also have worse health overall than those with higher incomes (Centers for Disease Control and Prevention 2011).

Saulpaw Mill Dam Removal

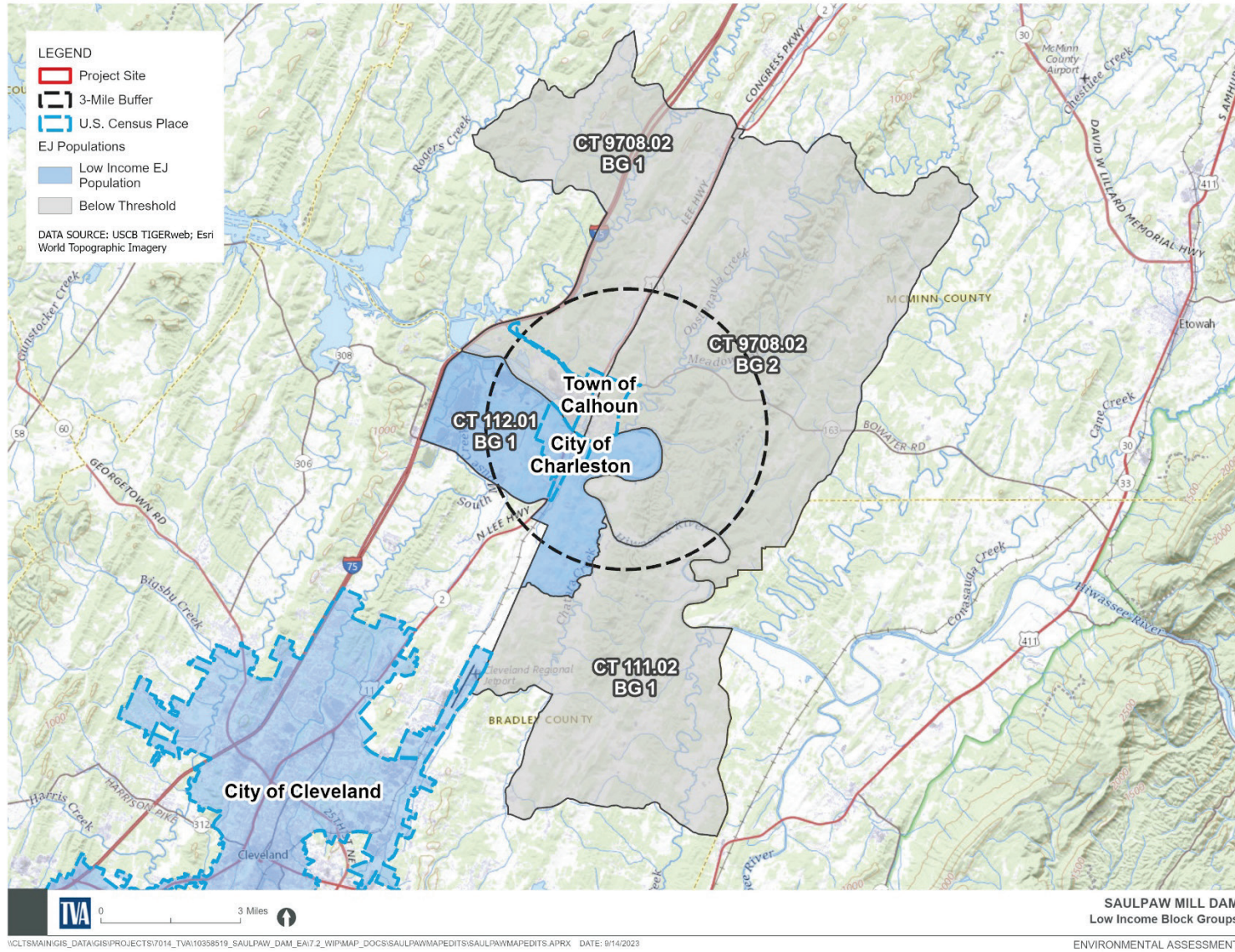


Figure 3.19-1. Low Income Block Groups Identified in the Saulpaw Mill Dam Removal EJ Study Area

3.19.1.1 Socioeconomics

Population change data for Tennessee, McMinn County, Bradley County, CT 112.01 BG 1, and the City of Cleveland is provided in Table 3.19-1, based on the 2010 Census and 2020 ACS. As shown, from 2010 to 2020, these geographic boundaries experienced an increase in population. McMinn County and CT 112.01 BG 1, however, grew at a much slower pace than the other geographic boundaries, at just 1.9 percent and 2.4 percent, respectively. The City of Cleveland grew at the fastest rate of 14.7 percent. Bradley County's rate of 9.8 percent was similar to that of the state at 8.9 percent. The percent change in population for the remaining three census block groups is not provided; because the geographic boundaries of these block groups changed between 2010 and 2020, therefore, a calculation of population change was not possible.

Additional socioeconomic data for the various geographic boundaries is included in Table 3.19-2. While generally most of the geographies are not substantially different from one another, a few data are noteworthy. For example, CT 9708.02 BG 1 demonstrates the highest percent of its population age 65 years old and over at 22.8 percent. Correspondingly, it demonstrates the highest median age at 53.4 years. It also has the lowest percent of its civilian population (age 16+) in the labor force at 49.2 percent; this percentage ties with that of CT 112.01 BG 1. Estimates for CT 112.01 BG 1 are also noteworthy. This block group has the second highest median age (49.2 years) and the lowest percent of high school or higher completion at 81.0 percent.

Further, although all geographies have lower per capita income than that of the state at \$30,869, CT 9708.02 BG 2, the block group encompassing Saulpaw Mill Dam, has the lowest per capita income of the geographic areas at \$22,270. Of all geographies, the City of Cleveland has the highest percent of poverty ratio at 41.3 percent. Cleveland also has a high percentage of renter occupied housing units at just over half at 52.7 percent. Other area geographies renter occupied housing units range from a low of 12.5 percent (CT 111.02 BG 1) to 33.2 percent (Bradley County); state's percentage is 33.5 percent.

3.19.1.2 Environmental Justice

3.19.1.2.1 Minority Populations

Neither the City of Cleveland nor any census block groups within the Saulpaw Mill Dam EJ Study Area were identified as qualifying minority EJ populations (USCB 2022a, 2022b, 2022c, 2022d). No census block groups in the EJ Study Area nor Cleveland had minority percentages that were 10 percentage points or more above their respective county's percentage. Based on the 2020 Decennial Census, all census block groups in the EJ Study Area, counties, and City of Cleveland demonstrated lower proportions of persons identifying as minorities than that of the state. Only Cleveland approached that of the state at 25.6 percent compared to Tennessee at 27.8 percent. The City of Cleveland also shows elevated percentages of Some Other Race (5.9 percent), Two or More Races (9.1 percent), and Hispanic/Latino (11.8 percent), the latter of whom may overlap the previous two ethnicities.

Table 3.19-1. Socioeconomic Data for the Saulpaw Mill Dam Study Area

Geography	% Minority	% Change Population 2010 to 2020 Census	% of Population 65 Years and Over	Median Age	% High School or Higher*	% of Occupied Housing Units, Renter Occupied	Median Year Housing Units Built	% of 16+ Civilian Population in Labor Force	Unemployment Rate	Poverty Ratio, Two Times US Threshold	Per Capita Income
<i>Tennessee</i>	27.8	8.9	16.4	38.8	88.2	33.5	1984	61.1	5.3	33.8	\$30,869
<i>McMinn County</i>	12.6	1.9	19.8	42.4	85.0	25.7	1982	54.1	6.2	40.7	\$25,637
CT 9708.02 BG 1	10.9	N/A	22.8	53.4	89.7	23.0	1983	49.2	0.0	38.5	\$26,855
CT 9708.02 BG 2 (Saulpaw)	12.4	N/A	13.8	39.0	91.1	23.1	1986	59.8	4.4	33.3	\$22,270
<i>Bradley County</i>	17.6	9.8	17.1	39.7	87.1	33.2	1985	61.2	5.4	34.6	\$26,743
CT 111.02 BG 1	7.3	N/A	20.8	43.9	88.7	12.5	1992	60.1	0.0	19.4	\$26,428
CT 112.01 BG 1	16.1	2.4	16.8	49.2	81.0	19.4	1976	49.2	2.3	38.6	\$24,026
<i>Cleveland City</i>	25.6	14.7	16.7	34.1	86.8	52.7	1981	61.5	4.4	41.3	\$25,561

Sources: 2010 Census; 2020 Census; 2020 ACS

N/A – Not Available. Census boundaries changed between 2010 and 2020; as such no % Change in Population was calculated.

Table 3.19-2. Minority Percentages and Ethnicities in the Saulpaw Mill Dam EJ Study Area

Geography	% Minority	% White¹	% Black / African Am.	% Am. Indian / AK Native	% Asian	% Native Hawaiian / Pacific Islander	% Some Other Race	Two or More Races	% Hispanic / Latino²
<i>Tennessee</i>	27.8	72.2	15.8	0.4	2.0	0.1	3.6	6.0	6.9
<i>McMinn County</i>	12.6	87.4	3.5	0.3	0.8	0.0	1.7	6.2	4.1
CT 9708.02 BG 1	10.9	89.1	1.8	0.0	0.4	0.0	1.5	7.2	3.5
CT 9708.02 BG 2 (Saulpaw)	12.4	87.6	2.0	0.5	0.4	0.0	1.6	8.0	3.2
<i>Bradley County</i>	17.6	82.4	4.8	0.4	1.1	0.1	3.6	7.5	7.8
CT 111.02 BG 1	7.3	92.7	1.2	0.6	0.1	0.1	1.9	3.5	3.4
CT 112.01 BG 1	16.1	83.9	7.9	0.3	0.7	0.0	0.6	6.6	2.8
<i>Cleveland City</i>	25.6	74.4	8.2	0.5	1.8	0.2	5.9	9.1	11.8

Source: 2020 Decennial Census

¹ Race percentages are provided for those reporting a particular race alone or in combination.

² This group is calculated separately from the other ethnicities and may include overlap from the other categories, as the USCB does not consider Hispanic or Latino a “race.”

3.19.1.2.2 Low-Income Populations

The census block groups, and City of Cleveland, emboldened in Table 3.19-3 represent areas with qualifying low-income EJ populations. Based on the 2021 SAIPE, a slightly higher proportion of the population of McMinn County was living in poverty when compared with the state as a whole, although the proportion of population living in poverty for both McMinn and Bradley counties is close to that of the state.

Poverty ratios of block groups and the City of Cleveland were compared to that of the county in which each is located. Based on the 2020 ACS, one of the four census block groups, i.e., CT 112.01 BG 1, within the Saulpaw Mill Dam EJ study area had a higher percentage of people living in poverty than Bradley County. The City of Cleveland also exceeded the percentage of Bradley County. Bradley County had 34.6 percent of its population at less than two times the US poverty threshold, compared to CT 112.01 BG 1 at 38.6 percent and Cleveland at 41.3 percent. This census block group and the city of Cleveland, emboldened in Table 3.19-3, are defined as the areas where the chance for disproportionate environmental and human health effects may be the greatest.

Table 3.19-3. Poverty Rates for the Saulpaw Mill Dam EJ Study Area

Geography	2021 SAIPE	2020 ACS	
	Poverty %	Poverty %, Households	Poverty Ratio, Two Times US Threshold *
<i>Tennessee</i>	13.7	14.4	33.8
<i>McMinn County</i>	14.5	16.5	40.7
CT 9708.02 BG 1		24.9	38.5
CT 9708.02 BG 2 (Saulpaw)		9.6	33.3
<i>Bradley County</i>	11.7	15.0	34.6
CT 111.02 BG 1		19.1	19.4
CT 112.01 BG 1		7.8	38.6
<i>Cleveland City</i>		19.9	41.3

*Calculated based on percent of population with a ratio of income to poverty threshold ≤ 1.99
 Source: 2021 SAIPE, 2020 ACS

Note: Emboldened census block groups represent identified EJ populations as compared with the county percentage.

3.19.1.2.3 Tribal Populations

According to US Department of the Interior Bureau of Indian Affairs mapping, no Federally Recognized Tribes exist within the study area or nearby vicinity, and no State Recognized Tribal or Urban Communities exist within Bradley or McMinn Counties. TVA has established formal consultation with over 20 federally recognized Indian tribes. The following federally recognized Indian tribes have informed TVA that Hawkins County, Tennessee is in their area of interest: Absentee Shawnee Tribe of Indians of Oklahoma, Cherokee Nation, Coushatta Tribe of Louisiana, Eastern Band of Cherokee Indians, Eastern Shawnee Tribe of Oklahoma, Kialegee Tribal Town, The Muscogee (Creek) Nation, Shawnee Tribe, Thlopthlocco Tribal Town, and the United Keetoowah Band of Cherokee Indians in Oklahoma.

As presented above in Table 3.19-2, some individuals living in the study area identify as either American Indian or Alaska Native. Based on the location of the study area within the country, it is likely that most of those individuals are American Indian rather than Alaska

Native. According to the 2020 ACS, one census block group has a higher percentage of its population identifying as American Indian or Alaska Native as compared to its associated county. CT 111.02 BG 1 has an estimated 0.6 percent American Indian or Alaska Native as compared to Bradley County at 0.4 percent.

3.19.1.2.4 Subsistence Populations

No specific subsistence populations have been identified in the Study area. However, recreational uses such as fishing have been identified as prevalent in the area of Saulpaw Mill Dam. Such fishing activities may support different patterns of consumption of natural resources among minority and low-income individuals in the area.

3.19.2 Environmental Consequences

3.19.2.1 Alternative A

Under the No Action Alternative, Saulpaw Mill Dam would not be removed and the dam would continue to be maintained in its current state. Consequently, no project-related impacts on socioeconomic resources or EJ communities would result.

3.19.2.2 Alternative B

Alternative B would result in permanent beneficial impacts as well as minor, temporary beneficial impacts for both the general socioeconomic community and identified EJ populations. The Saulpaw Mill Dam, due to the uncontrolled spillway, is capable of producing dangerous recirculating currents, large hydraulic forces, and other hazardous conditions sufficient to trap and drown victims immediately downstream from the overflowing water. Users could also suffer falls if climbing on or walking across the dam structure in the water or from steep sloped banks. A primary purpose for removal of the dam is to improve safety at the dam location as well as improve habitat conditions for aquatic organisms through the return of a free-flowing creek and removal of an existing barrier to their movement; and as such, Alternative B would result in permanent beneficial impacts for all recreational users of the area. The improved aquatic habitat may provide a beneficial effect to local fishing in the area, which could benefit local socioeconomic conditions and EJ communities.

Temporary, minor beneficial impacts are expected to occur during the period of dam removal. Site preparation, removal of the dam structure, and cleanup are expected to occur over approximately seven days. The removal of the dam is anticipated to require six workers for Project completion. The workers would be expected to bring increased spending to the area as a result of short-term housing and associated needs. If they are not within commuting distance, they would be expected to stay at local hotels and frequent local restaurants during the period of dam removal. These worker expenditures would increase sales as well as provide temporary, albeit very minor increases in lodging and sales taxes. Workers would be anticipated to stay in nearby Cleveland, which is the nearest location with hotels. The City of Cleveland has been identified as a qualifying EJ population. It is also possible that any minor beneficial effects would extend to EJ populations if the businesses patronized are owned by members of the EJ community.

Alternative B would not cause any permanent direct or indirect changes to local air quality as described in Section 3.12.2. Temporary impacts to local air quality are expected to be limited to the immediate area of the construction access road and the construction activities. Most of the fugitive dust generated is expected to be limited to the immediate removal area, which is not within an identified EJ population area.

As described in Section 3.14.2, during the dam removal period, Alternative B would generate noise as a result of construction. Construction equipment would generate noise levels that are estimated to diminish to approximately 60 dBA or less at the nearest residences (approximately 900 ft or 0.18-mile or more from the equipment) along Little Mountain Acres Road. These noise levels are below the HUD guideline of 65 dBA but greater than the USEPA guideline of 55 dBA. The nearest residences are not within a census block group or other area identified as an EJ population.

Minor adverse impacts on traffic would also impact the socioeconomic community during the anticipated seven-day period of dam removal. As described in Section 3.15.2, temporary, minor adverse impacts associated with increased traffic would be expected along Hiwassee Road, Cherokee Crossing, Main Street, Reece McAmish Road, SR 163, and US 11 as a portion of the construction workers would be expected to commute to the Project Site from Cleveland and through Charleston and Calhoun. Impacts occurring along US 11 are within areas identified as an EJ population. However, these impacts would be temporary, minor, and these roads are capable of handling the additional two to three construction equipment and materials vehicles and one to two passenger vehicles that are anticipated to visit the site each day during the period of construction. If necessary, traffic controls such as staging of trucks or use of a flagger would mitigate any impacts. Therefore, traffic impacts to EJ communities would be negligible. No cumulative effects are anticipated.

The temporary increase in traffic during the period of construction would result in minor cumulative impacts if the period of construction overlaps with any potential RFFAs, particularly the Tarver Site or Molpus Site which are nearest to the Project Site (TVA 2022b,c). Overall, minor, beneficial impacts are anticipated to socioeconomic conditions and EJ communities as a result of implementation of Alternative B.

3.20 Safety

3.20.1 Affected Environment

This section provides an overview of existing public and occupational (worker) health and safety regarding the Saulpaw Mill Dam and the potential impacts on public health and safety associated with the proposed Alternatives. Public health and safety topics include emergency response and preparedness to ensure that project construction and operation do not pose a threat to public health and safety. Occupational health and safety issues include worker safety in compliance with OSHA standards.

Public emergency services in the area include various medical centers, law enforcement services, and fire protection services. Health care institutions include a walk-in clinic, the Preferred Family Medical Care located in Calhoun, Tennessee approximately 1.5 miles west of the Saulpaw Mill Dam, and the CHI Memorial Hospital in Cleveland, Tennessee approximately 11 miles SW of the Saulpaw Mill Dam. Law enforcement services within the vicinity of Saulpaw Mill Dam include the Calhoun Police Department located in Calhoun, Tennessee.

Fire departments within the vicinity of the Saulpaw Mill Dam include the Calhoun Fire Department located in Calhoun, Tennessee. Additionally, the Tennessee Emergency Management Agency is available for assistance by reaching out for mutual aid from local jurisdictions, Tennessee agencies and departments, and the federal government for assistance in the event of disasters and emergencies.

3.20.2 Environmental Consequences

3.20.2.1 Alternative A

Under the No Action Alternative, Saulpaw Mill Dam would not be removed and it would continue to be maintained in its current state. Therefore, there would be no additional occupational health and safety impacts on the workers associated with the proposed construction activities.

However, the existing public safety concerns with the Saulpaw Mill Dam associated with current conditions would remain and therefore, the purpose and need of the project to address these concerns would not be met.

3.20.2.2 Alternative B

Construction activities associated with both Alternative B would expose workers to hazards associated with most large construction projects including falls and heavy equipment accidents. Additionally, due to the proximity of the proposed construction areas to the reservoir, there is the possibility that falling into the water could lead to injury or death. Environmental hazards of construction projects include working in extreme temperatures (primarily heat stress) and potential exposures to biological hazards such as mosquitoes, ticks, poisonous spiders, and venomous snakes.

Workers would follow all applicable federal and state regulations with respect to worker safety, comply with all applicable health and safety procedures. As construction work has known hazards, standard practice is to establish and maintain health and safety plans in compliance with OSHA regulations. Such health and safety plans emphasize implementation of BMPs for site safety management to minimize risks to workers. Based on the nature of the proposed construction activities and their proximity to water, the risk of potential temporary minor adverse impacts related to occupational health and safety are increased but would be mitigated through implementation of a rigorous site health and safety plan.

The water level of Oostanaula Creek is anticipated to decrease marginally at the Saulpaw Mill Dam site following removal, and while it is unlikely, subsurface or surface hazards that were not present prior to the removal may emerge. While these hazards could negatively affect recreational public safety in the near term, this negative impact would diminish over time as boaters become aware of the location and nature of these hazards.

Fishing, kayaking, paddling, canoeing, swimming and other common recreational activities within the vicinity of the Saulpaw Mill Dam would be restricted during construction to eliminate safety risks to recreational users during the construction phase. Removal of the dam would create safer passage through the area, as current high-water levels over the dam could cause danger to recreational users that utilize the area for kayaking, paddling, canoeing, swimming, and fishing. By removing the dam, the site becomes safer and more enjoyable for recreational users resulting in a beneficial impact.

Potential public and occupational health and safety hazards could result from the flow of construction traffic along the public roadways. Although the proposed number of trucks is not anticipated to adversely affect traffic in the region, the presence of these trucks on the local roadway network throughout the duration of the construction could negatively affect the traveling public and workers operating project-related trucks and vehicles. Traffic control methods as listed in the Manual on Uniform Traffic Control Devices (USDOT 2022) would

be implemented during the construction phase, such as advanced warning signs, reducing speed limit, and work zones, and would minimize traffic safety concerns.

Overall, implementation of Alternative B would result in minor, temporary impacts to public and occupational health and safety during construction, and long-term beneficial permanent impacts to public and occupational health and safety due to the removal of the Saulpaw Mill Dam. The temporary increase in traffic during the period of construction would result in minor cumulative impacts if the period of construction overlaps with any potential RFFAs, particularly the Tarver Site or Molpus Site which are nearest to the Project Site (TVA 2022b,c).

3.21 Cumulative Impacts

3.21.1 Identification of Other Actions

The CEQ regulations (40 CFR §§ 1500-1508) implementing the procedural provisions of the NEPA of 1969, as amended (42 USC § 321 et seq.) define cumulative impact as: "...the impact on the environment which results from the incremental impact of the action when added to other past, present and RFFAs regardless of what agency (federal or nonfederal) or person undertakes such other actions." (40 CFR § 1508.7).

A cumulative impact analysis must consider the potential impact on the environment that may result from the incremental impact of a project when added to other past, present and RFFAs (40 CFR § 1508.7). Baseline conditions reflect the impacts of past and present actions. The impact analyses summarized in preceding sections are based on baseline conditions and, therefore, incorporate the cumulative impacts of past and present actions.

RFFAs were identified within a 10-mile radius of the project as having the potential to, in aggregate, result in larger and potentially adverse impacts to environmental resources in the Project Site (Table 3.21-1).

Table 3.21-1. Summary of other RFFAs within a 10-mile radius of the Project Site

Action	Description
Molpus Site	A proposed 2,407-acre industrial site off SR 163, approximately 0.8 mile east of the Project Site.
Tarver Site	A proposed 300-acre industrial site off Reece McAmish Rd, approximately 1.2 miles northeast of the Project Site.
Wright-Simpson Property	A proposed 307-acre industrial site off Wacker Blvd, approximately 2.2 miles west of the Project Site.
Molpus Interstate Site	A proposed 700-acre industrial site off Interstate 75, approximately 4.2 miles northwest of the Project Site.
Pinnacle Industrial Park	A proposed 35-acre industrial site off 20 th St NE, approximately 9.8 miles southwest of the Project Site.
Benton Industrial Park	A proposed 13.2-acre industrial site off Parksville Rd, approximately 10 miles southeast of the Project Site.

Source: TVA 2022d

3.21.2 Analysis of Cumulative Effects

To address cumulative impacts, the existing affected environment surrounding the Project Site was considered in conjunction with the environmental impacts presented in Chapter 3. These combined impacts are defined by the CEQ as "cumulative" in 40 CFR Section

1508.7 and may include individually minor, but collectively significant actions taking place over a period of time. Most cumulative impacts are considered temporary in nature and would be most applicable if nearby RFFAs take place concurrently with the proposed action. The potential for cumulative effects to the identified environmental resources of concern are analyzed below.

Under the No Action Alternative, leaving the dam in place would not resolve the existing risk of hazardous conditions due to the recirculating currents created by Saulpaw Mill Dam and absence of guard rails or other protections. Current conditions have potential to result in serious injury or fatality from users climbing on or walking across the dam structure in the water or from a fall from steep sloped banks or dam structure. Leaving the dam in place would also require long-term monitoring and maintenance by TVA to maintain the existing dam structures. Cumulative impacts of the No Action Alternative would include the continued presence of an aquatic life barrier to movement in the watershed, and the dam continuing to present a safety hazard to recreationalists.

Under the Action Alternative, no substantive cumulative impacts are expected for land use; prime farmland; geology and groundwater; floodplains; wetlands; threatened and endangered species; air quality; GHGs and climate change; cultural resources; and solid and hazardous waste. The proposed action would have temporary minor impacts and beneficial permanent effects to aquatic ecology. If the construction periods of RFFAs discussed in Table 3.21-1 overlap with the Saulpaw Mill Dam removal activities, minor to moderate cumulative impacts may occur to surface water and water quality, and minor cumulative impacts soils; vegetation; wildlife; natural areas, parks, and recreation; noise receptors; transportation; visual resources; socioeconomic and EJ communities; and safety. This would be especially true if the project overlaps with activities associated with the Molpus Site or Tarver Site, which are nearest to the Project Site (TVA 2022b,c).

3.22 Unavoidable Adverse Environmental Impacts

The No Action Alternative (Alternative A) has no direct adverse environmental impacts as this alternative does not involve construction activities. Direct adverse environmental impacts from the No Action Alternative, such as minor impacts to surface waters and water quality; aquatic ecology; threatened and endangered species; natural areas, parks, and recreation; socioeconomic and EJ; and safety, may occur because of the current safety hazards associated with the dam and presence of a barrier to aquatic life movement.

The proposed Action Alternative (Alternative B) could cause minor unavoidable adverse environmental impacts to surface water and water quality, and minor impacts to soils, vegetation, wildlife, natural areas, parks, and recreation; air quality, noise receptors, transportation, visual resources, and safety, and socioeconomic and EJ communities.

Selection of the Action Alternative would result in a minor permanent impact to soils on the Project Site due to the placement of riprap for streambank stabilization, and minor grading for construction activities, material storage, etc. The placement of concrete jacks on the streambed would be used to prevent further stream degradation (e.g., erosion and headcutting) and would be utilized by aquatic life as habitat. The Project Site would be cleared of vegetation, resulting in the temporary loss of herbaceous and forested areas and thus a reduction in wildlife habitat. Tree clearing would be performed during the fall or winter to avoid adversely affecting bat species and disturbed areas would be returned to pre-construction conditions and stabilized with permanent vegetation. The Project Site may have a small increase in habitat following revegetation, which would provide a minor

beneficial effect to wildlife. The passage downstream of the sediments accumulated behind the dam would result in a temporary adverse effect to surface water quality due to temporary elevated turbidity, however effects to the aquatic ecology of the system would be negligible. Overall effects to aquatic ecology would be beneficial with the removal of the dam due to the removal of a barrier and additional access to habitat in Oostanaula Creek.

Construction activities associated with the Action Alternative would generate fugitive air and dust emissions immediately within the Project Site as well as increased noise levels and traffic levels on nearby roads. However, during the construction period, TVA would implement the appropriate control methods and mitigation measures, as discussed in Section 2.3, to minimize these effects resulting in only minor, temporary impacts. Recreation onsite would be temporarily halted during construction activities, which would have a temporary minor impact on socioeconomics and EJ population that use the area recreationally. Beneficial impacts would occur to safety in the area, which would have a positive impact on recreation (fishing) and, as a result, local EJ and non-EJ populations that use the area recreationally. Temporary, beneficial impacts to socioeconomics would occur during the construction period due to local spending from construction employees.

Lastly, as the Saulpaw Mill Dam is NRHP-eligible, its removal would be considered an adverse impact to cultural resources. TVA would coordinate with the TN SHPO and associated Tribes and develop a Memorandum of Agreement (MOA) detailing the mitigation measures to be implemented prior to initiation of onsite construction.

A summary of BMPs, routine measures, and minimization and mitigation measures to reduce potential adverse environmental effects is provided in Section 2.3.

3.23 Relationship of Short-Term Uses and Long-Term Productivity

NEPA requires consideration of the “relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity” (40 CFR §1502.16). For implementation of Alternative B, short-term uses are those that are expected to occur within the construction period, while long-term uses refer to the post-construction period lasting for several decades.

Implementation of the action alternative would have various short- and long-term consequences. Short-term (construction related) impacts caused by the project would occur during and immediately after construction and would result in adverse effects. Long-term impacts caused by the project would be permanent. However, long-term beneficial effects to Oostanaula Creek and the Hiwassee River of the Action Alternative would begin to accrue after completion of the dam removal project.

Temporarily adversely affected resources include land use; soils; surface water and water quality; floodplains; vegetation; aquatic ecology; threatened and endangered species; recreation; air quality; noise and vibration; transportation; visual resources; solid and hazardous waste; and safety. Most impacts to these resources would be temporary, lasting only the duration of the construction activities expected to be seven days (with the exception of vegetation, which would take a longer time period for regeneration). Unavoidable long-term impacts would occur to cultural resources due to the permanent removal of Saulpaw Mill Dam, a NHRP-eligible structure. Beneficial long-term effects would occur from improvements to aquatic ecology (removal of a barrier to aquatic life movement), floodplains (increase in floodplain capacity and restoration of hydraulic connection between Oostanaula Creek and the Hiwassee River), and safety (removal of a

safety hazard). Short-term beneficial effects from this project would be seen through a minor increase in local revenue due to spending by workers on the project.

Implementation of Alternative B would result in beneficial long-term impacts and thus productivity for Oostanaula Creek. Only Alternative B would address the purpose and need of the project. Not taking action would continue to place human safety at risk from hazardous conditions created by the uncontrolled spillway at the dam, which is capable of producing dangerous currents sufficient to trap and drown victims immediately downstream from the spillway. The dam would also continue to serve as a barrier to aquatic life moving upstream into Oostanaula Creek. Therefore, implementation of the Proposed Action would enhance the long-term productivity of the Creek by restoring the site to a more natural condition.

3.24 Irreversible and Irretrievable Commitments of Resources

The Preferred Alternative, Alternative B, would result in an irreversible and irretrievable commitment of resources as the existing Saulpaw Mill Dam would be demolished and removed because of the proposed Project. As such, the dam as a cultural or recreational resource would be permanently eliminated and once the Project Site work is initiated could not be reversed. Removal of existing vegetation onsite, the use of fuels and oils for construction vehicles, equipment, and worker vehicles, and the landfill space necessary for disposal of dam components would also constitute an irreversible and irretrievable commitment of resources.

The No Action Alternative would not result in an irretrievable or irreversible commitment of resources but would require continued monitoring and maintenance activities, as needed, to maintain existing conditions.

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CHAPTER 4 – LIST OF PREPARERS

4.1 NEPA Project Management

4.1.1 Tennessee Valley Authority

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Education: B.S Marine Biology
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4.2 Other Contributors

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4.2.2 HDR Engineering, Inc.

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CHAPTER 5 – LITERATURE CITED

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Appendix A – Bat Strategy Form

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Project Review Form - TVA Bat Strategy (06/2019)

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: Saulpaw Dam Removal **Date:** Nov 9, 2023
Contact(s): Erica McLamb, Freddie Bennett **CEC#:** _____ **Project ID:** 41474
Project Location (City, County, State): Calhoun, McMinn County, TN

Project Description:

Removal of Saulpaw Dam that was built in 1869. Establishing staging and construction access areas, grading, left embankment terracing, and removal of the lift gate. Removing the dam and remaining pier and dam blocks to an elevation of approximately 678 feet. Approximately 0.02 acres of trees would be removed.

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:

- | | |
|---|--|
| <input type="checkbox"/> 1 Manage Biological Resources for Biodiversity and Public Use on TVA Reservoir Lands | <input type="checkbox"/> 6 Maintain Existing Electric Transmission Assets |
| <input type="checkbox"/> 2 Protect Cultural Resources on TVA-Retained Land | <input type="checkbox"/> 7 Convey Property associated with Electric Transmission |
| <input checked="" type="checkbox"/> 3 Manage Land Use and Disposal of TVA-Retained Land | <input type="checkbox"/> 8 Expand or Construct New Electric Transmission Assets |
| <input type="checkbox"/> 4 Manage Permitting under Section 26a of the TVA Act | <input type="checkbox"/> 9 Promote Economic Development |
| <input type="checkbox"/> 5 Operate, Maintain, Retire, Expand, Construct Power Plants | <input type="checkbox"/> 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.

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

<input checked="" type="checkbox"/> 18. Erosion control, minor	<input type="checkbox"/> 57. Water intake - non-industrial	<input type="checkbox"/> 79. Swimming pools/associated equipment
<input type="checkbox"/> 24. Tree planting	<input type="checkbox"/> 58. Wastewater outfalls	<input type="checkbox"/> 81. Water intakes – industrial
<input type="checkbox"/> 30. Dredging and excavation; recessed harbor areas	<input type="checkbox"/> 59. Marine fueling facilities	<input type="checkbox"/> 84. On-site/off-site public utility relocation or construction or extension
<input type="checkbox"/> 39. Berm development	<input type="checkbox"/> 60. Commercial water-use facilities (e.g., marinas)	<input type="checkbox"/> 85. Playground equipment - land-based
<input type="checkbox"/> 40. Closed loop heat exchangers (heat pumps)	<input type="checkbox"/> 61. Septic fields	<input type="checkbox"/> 87. Aboveground storage tanks
<input type="checkbox"/> 45. Stream monitoring equipment - placement and use	<input type="checkbox"/> 66. Private, residential docks, piers, boathouses	<input type="checkbox"/> 88. Underground storage tanks
<input type="checkbox"/> 46. Floating boat slips within approved harbor limits	<input type="checkbox"/> 67. Siting of temporary office trailers	<input type="checkbox"/> 90. Pond closure
<input checked="" type="checkbox"/> 48. Laydown areas	<input type="checkbox"/> 68. Financing for speculative building construction	<input type="checkbox"/> 93. Standard License
<input type="checkbox"/> 50. Minor land based structures	<input type="checkbox"/> 72. Ferry landings/service operations	<input type="checkbox"/> 94. Special Use License
<input type="checkbox"/> 51. Signage installation	<input type="checkbox"/> 74. Recreational vehicle campsites	<input type="checkbox"/> 95. Recreation License
<input type="checkbox"/> 53. Mooring buoys or posts	<input type="checkbox"/> 75. Utility lines/light poles	<input type="checkbox"/> 96. Land Use Permit
<input type="checkbox"/> 56. Culverts	<input type="checkbox"/> 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.

<input type="checkbox"/> 15. Windshield and ground surveys for archaeological resources	<input checked="" type="checkbox"/> 34. Mechanical vegetation removal, includes trees or tree branches > 3 inches in diameter	<input type="checkbox"/> 69. Renovation of existing structures
<input type="checkbox"/> 16. Drilling	<input checked="" type="checkbox"/> 35. Stabilization (major erosion control)	<input type="checkbox"/> 70. Lock maintenance/ construction
<input type="checkbox"/> 17. Mechanical vegetation removal, does not include trees or branches > 3" in diameter (in Table 3 due to potential for woody burn piles)	<input checked="" type="checkbox"/> 36. Grading	<input checked="" type="checkbox"/> 71. Concrete dam modification
<input checked="" type="checkbox"/> 21. Herbicide use	<input type="checkbox"/> 37. Installation of soil improvements	<input type="checkbox"/> 73. Boat launching ramps
<input checked="" type="checkbox"/> 22. Grubbing	<input type="checkbox"/> 38. Drain installations for ponds	<input type="checkbox"/> 77. Construction or expansion of land-based buildings
<input type="checkbox"/> 23. Prescribed burns	<input type="checkbox"/> 47. Conduit installation	<input type="checkbox"/> 78. Wastewater treatment plants
<input type="checkbox"/> 25. Maintenance, improvement or construction of pedestrian or vehicular access corridors	<input type="checkbox"/> 52. Floating buildings	<input type="checkbox"/> 80. Barge fleeting areas
<input type="checkbox"/> 26. Maintenance/construction of access control measures	<input type="checkbox"/> 54. Maintenance of water control structures (dewatering units, spillways, levees)	<input type="checkbox"/> 82. Construction of dam/weirs/ levees
<input type="checkbox"/> 27. Restoration of sites following human use and abuse	<input type="checkbox"/> 55. Solar panels	<input type="checkbox"/> 83. Submarine pipeline, directional boring operations
<input type="checkbox"/> 28. Removal of debris (e.g., dump sites, hazardous material, unauthorized structures)	<input type="checkbox"/> 62. Blasting	<input type="checkbox"/> 86. Landfill construction
<input type="checkbox"/> 29. Acquisition and use of fill/borrow material	<input type="checkbox"/> 63. Foundation installation for transmission support	<input checked="" type="checkbox"/> 89. Structure demolition
<input checked="" type="checkbox"/> 31. Stream/wetland crossings	<input type="checkbox"/> 64. Installation of steel structure, overhead bus, equipment, etc.	<input type="checkbox"/> 91. Bridge replacement
<input type="checkbox"/> 32. Clean-up following storm damage	<input type="checkbox"/> 65. Pole and/or tower installation and/or extension	<input type="checkbox"/> 92. Return of archaeological remains to former burial sites
<input type="checkbox"/> 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 13)

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	SWARMING	WINTER	NON-WINTER	PUP
GA, KY, TN	<input type="checkbox"/> Oct 15 - Nov 14	<input type="checkbox"/> Nov 15 - Mar 31	<input type="checkbox"/> Apr 1 - May 31, Aug 1 - Oct 14	<input type="checkbox"/> Jun 1 - Jul 31
VA	<input type="checkbox"/> Sep 16 - Nov 15	<input type="checkbox"/> Nov 16 - Apr 14	<input type="checkbox"/> Apr 15 - May 31, Aug 1 - Sept 15	<input type="checkbox"/> Jun 1 - Jul 31
AL	<input type="checkbox"/> Oct 15 - Nov 14	<input type="checkbox"/> Nov 15 - Mar 15	<input type="checkbox"/> Mar 16 - May 31, Aug 1 - Oct 14	<input type="checkbox"/> Jun 1 - Jul 31
NC	<input type="checkbox"/> Oct 15 - Nov 14	<input type="checkbox"/> Nov 15 - Apr 15	<input type="checkbox"/> Apr 16 - May 31, Aug 1 - Oct 14	<input type="checkbox"/> Jun 1 - Jul 31
MS	<input type="checkbox"/> Oct 1 - Nov 14	<input type="checkbox"/> Nov 15 - Apr 14	<input type="checkbox"/> Apr 15 - May 31, Aug 1 - Sept 30	<input type="checkbox"/> Jun 1 - Jul 31

- 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: **ac** **trees** **N/A**

STATE	SWARMING	WINTER	NON-WINTER	PUP
GA, KY, TN	<input type="checkbox"/> Oct 15 - Nov 14	<input checked="" type="checkbox"/> Nov 15 - Mar 31	<input type="checkbox"/> Apr 1 - May 31, Aug 1 - Oct 14	<input type="checkbox"/> Jun 1 - Jul 31
VA	<input type="checkbox"/> Sep 16 - Nov 15	<input type="checkbox"/> Nov 16 - Apr 14	<input type="checkbox"/> Apr 15 - May 31, Aug 1 - Sept 15	<input type="checkbox"/> Jun 1 - Jul 31
AL	<input type="checkbox"/> Oct 15 - Nov 14	<input type="checkbox"/> Nov 15 - Mar 15	<input type="checkbox"/> Mar 16 - May 31, Aug 1 - Oct 14	<input type="checkbox"/> Jun 1 - Jul 31
NC	<input type="checkbox"/> Oct 15 - Nov 14	<input type="checkbox"/> Nov 15 - Apr 15	<input type="checkbox"/> Apr 16 - May 31, Aug 1 - Oct 14	<input type="checkbox"/> Jun 1 - Jul 31
MS	<input type="checkbox"/> Oct 1 - Nov 14	<input type="checkbox"/> Nov 15 - Apr 14	<input type="checkbox"/> Apr 15 - May 31, Aug 1 - Sept 30	<input type="checkbox"/> Jun 1 - Jul 31

- 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/OSAR reviewer?

- YES** **NO** (Go to Step 13)

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

OSAR Reviewer (name) Date

Terrestrial Zoologist (name) Elizabeth Hamrick Date

- Gray bat records: None Within 3 miles* Within a cave* Within the County
- Indiana bat records: None Within 10 miles* Within a cave* Capture/roost tree* Within the County
- Northern long-eared bat records: None Within 5 miles* Within a cave* Capture/roost tree* Within the County
- Virginia big-eared bat records: None Within 6 miles* Within the County
- Caves: None within 3 mi Within 3 miles but > 0.5 mi Within 0.5 mi but > 0.25 mi* Within 0.25 mi but > 200 feet* Within 200 feet*

- Bat Habitat Inspection Sheet completed? **NO** **YES**

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

STEP 6) Provide any additional notes resulting from Heritage Reviewer records review in Notes box below then
 **Go to Step 13**

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

Based on USFWS ArcGIS Endangered Bats of Tennessee map, queried Oct 2023, Indiana bat and NLEB are not likely to occur in the project area.

STEPS 7-12 To be Completed by Terrestrial Zoologist (if warranted):

STEP 7) Project will involve:

- Removal of suitable trees within 0.5 mile of P1-P2 Indiana bat hibernacula or 0.25 mile of P3-P4 Indiana bat hibernacula or any NLEB hibernacula.
- Removal of suitable trees within 10 miles of documented Indiana bat (or within 5 miles of NLEB) hibernacula.
- Removal of suitable trees > 10 miles from documented Indiana bat (> 5 miles from NLEB) hibernacula.
- Removal of trees within 150 feet of a documented Indiana bat or northern long-eared bat maternity roost tree.
- Removal of suitable trees within 2.5 miles of Indiana bat roost trees or within 5 miles of Indiana bat capture sites.
- Removal of suitable trees > 2.5 miles from Indiana bat roost trees or > 5 miles from Indiana bat capture sites.
- Removal of documented Indiana bat or NLEB roost tree, if still suitable.
- N/A

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

STEP 9) Presence/absence survey results, on 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) Available Incidental Take (prior to accounting for this project) as of

TVA Action	Total 20-year	Winter	Volant Season	Non-Volant Season
3 Manage Land Use and Disposal of TVA-Retained Land				

STEP 12) 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 13) 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 14)
- 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).

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.

Manual Override

Name: Elizabeth Hamrick

Check if Applies to Project	Activities Subject To Conservation Measure	Conservation Measure Description
		<p>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.</p>
		<p>TR4* - Removal of suitable summer roosting habitat within potential habitat for Indiana bat or northern long-eared bat will be tracked, documented, and included in annual reporting. Project will therefore communicate completion of tree removal to appropriate TVA staff.</p>
		<p>AR2 - Additional bat P/A surveys (e.g., emergence counts) conducted if warranted (i.e., when AR1 indicates that bats may be present).</p>
		<p>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, subsequent protocols will be implemented.</p>
		<p>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.</p>
		<p>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.</p>
		<p>L1 - Direct temporary lighting away from suitable habitat during the active season.</p>
		<p>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).</p>

¹Bats addressed in consultation (02/2018), which includes gray bat (listed in 1976), Indiana bat (listed in 1967), northern long-eared bat (listed in 2015), and Virginia big-eared bat (listed in 1979).

Hide All Unchecked Conservation Measures

- HIDE
- UNHIDE

Hide Table 4 Columns 1 and 2 to Facilitate Clean Copy and Paste

- HIDE
- UNHIDE

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

Field review by TVA TZ observed a small amount of possible guano under the middle of the bridge under Hiawasse Rd (80 ft from the dam). Due to location, confirmation of guano was not possible. Concrete seams under bridge are over 1 ft deep. No bats were audible or visible at the time of survey (mid October 2022). Bridge is well traveled, next to RR tracks, and next to loud boats speeding by.

STEP 14) 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:

(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

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

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).

For Terrestrial Zoology Use Only. Finalize and Print to Noneditable PDF.

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Appendix B – Permitting and Agency Coordination

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400 West Summit Hill Drive, Knoxville, Tennessee 37902

October 23, 2023

Mr. E. Patrick McIntyre, Jr.
Executive Director
and State Historic Preservation Officer
Tennessee Historical Commission
2941 Lebanon Road
Nashville, Tennessee 37243-0442

Dear Mr. McIntyre:

TENNESSEE VALLEY AUTHORITY (TVA), SAULPAW MILL DAM REMOVAL,
CHICKAMAUGA RESERVOIR, MCMINN COUNTY, TENNESSEE, (35.29102, -84.73623),
(TVA TRACKING NUMBER – CRMS 34346177546)

TVA proposes to remove the historic Saulpaw Mill Dam in Calhoun, McMinn County, Tennessee. Saulpaw Mill Dam is a run-of-river low head dam located on TVA property at the confluence of Oostanaula Creek and the Hiwassee River at Hiwassee river mile 19.8, on the right descending bank of Chickamauga Reservoir. Constructed in 1869, the dam is associated with a historic sawmill and flourmill that was removed by TVA in 1940 for flood control during the construction of Chickamauga Reservoir. The dam is a masonry gravity structure constructed from large-cut limestone blocks quarried from rock bluffs nearby. The dam is approximately 60 feet long and approximately 16 feet high. The dam ties into retaining walls at both abutments, which are constructed of similar quarried block masonry as the dam. A CSX railroad crossing and the County Road 950 (Hiwassee Road) crossing of Oostanaula Creek are located approximately 30 feet and 80 feet north of the dam, respectively.

The Saulpaw Mill Dam is no longer being used for its intended purpose (operation of the mills) and serves no other practical purpose. The Saulpaw Mill Dam presents a hazard to recreational users at the site. Although TVA is not aware of any fatalities associated with the Saulpaw Mill Dam, according to the Brigham Young University Department of Civil and Environmental Engineering, more than 440 deaths have occurred as a result of the currents created by small dams since the 1950s (BYU 2015). Additionally, TVA Natural Resources staff, in collaboration with the U.S. Fish and Wildlife Service (USFWS), The Nature Conservancy (TNC), and Tennessee Wildlife Resources Agency (TWRA), hereafter "Partners", are identifying stream barriers in the Tennessee Valley watershed that impede the movement of fish and other aquatic organisms. Saulpaw Mill Dam was identified as a barrier; therefore, TVA is evaluating the feasibility of removal of the dam.

TVA has determined that the proposed permit approval is an undertaking (as defined at 36 CFR § 800.16(y)) that has the potential to cause effects to historic properties. TVA recommends that the area of potential effects (APE) for this project be considered as the 0.6 acres where ground disturbing activities would take place, as well as areas within a half-mile radius of the project

within which the proposed undertaking would be visible, where visual effects on above-ground resources could occur.

In 2017, as part of TVA's initial review of the proposed removal of the Saulpaw Dam, Tennessee Valley Archaeological Research (TVAR) conducted an architectural assessment of the dam to determine its eligibility for inclusion on the National Register of Historic Places (NRHP). TVAR documented the results in the attached report, titled *An NRHP Assessment and Assessment of Effects for the Saulpaw Mill Dam, McMinn County, Tennessee*. TVAR's report provided a historical overview of the property and recommended the dam as eligible for inclusion on the NRHP under Criteria A "for its local significance in the areas of industry and commerce for its association with a mid-to-late-nineteenth century mill complex" (Karpynec and Weaver 2017).

Although the project footprint was included in the shoreline surveys of Chickamauga Reservoir (Smith, et al. 1990), no mention is made of the dam, nor any indication given that any survey was completed on either side of the creek. As such, TVA completed a field reconnaissance of the property in September 2022. The dam is extant, along with stone retaining walls and stone piers associated with the sawmill on the east side of Oostanaula Creek. The area has been extensively disturbed by the construction of the CSX Railroad trestle across the creek. The area is frequented by fisherman and other members of the public. A footpath has been worn into the ground on the west side of the creek where erosion along this path has exposed what appears to be a millstone. Auger testing within the foundation of the sawmill revealed no intact deposits. However, a slightly raised area covered by dense brush on the west side of the creek had not been examined. To determine if intact deposits or features related to the mill are present in that area, TVA contracted with New South Associates (NSA) to perform an archaeological survey of the APE. NSA documented the results in the attached report, titled *Phase I Archaeological Resources Survey for the Proposed Removal of Saulpaw Dam, Chickamauga Reservoir, McMinn County, Tennessee*. As a result of NSA's survey, Saulpaw Dam was assigned state site number 40MN62 by the Tennessee Division of Archaeology (TDOA). NSA recommends that site 40MN62 is not eligible under Criterion D for listing on the NRHP, as it "lacks the potential to provide further significant historical information beyond what has already been documented" (Walls 2023).

TVA has read both TVAR's and NSA's reports and agrees with their findings and recommendations.

Pursuant to 36 CFR Part 800.5(d)(2), we are seeking your concurrence with TVA's eligibility determinations for resources identified within the APE and TVA's finding of adverse effect for the proposed undertaking.

Pursuant to 36 CFR Part 800.6(c), TVA proposes to enter into a Memorandum of Agreement (MOA) with your office to mitigate the effects of this undertaking. The MOA would stipulate measures that TVA would complete as mitigation for the adverse effect.

Mr. E. Patrick McIntyre, Jr.
Page 3
October 23, 2023

Pursuant to 36 CFR § 800.6(a)(1), TVA will be notifying the Advisory Council on Historic Preservation of the adverse effect and is providing the documentation specified in 36 CFR § 800.11(e).

Please contact Derek Reaux by email, djreaux@tva.gov with your comments.

Sincerely,



Michaelyn Harle
Supervisor, Cultural Project Reviews
Cultural Compliance

DJR: ERB

Enclosures

cc (Enclosures):

Ms. Jennifer Barnett
Tennessee Division of Archaeology
1216 Foster Avenue, Cole Bldg. #3
Nashville, Tennessee 37210

Reference Cited:

Karpynek, Ted, and Meghan Weaver

2017 *An NRHP Assessment and Assessment of Effects for the Saulpaw Mill Dam, McMinn County, Tennessee.* Prepared for TVA, Knoxville, by Tennessee Valley Archaeological Research, Nashville.

Smith, Marvin T., Guy G. Weaver, and Charles H. McNutt, Jr.

1990 *A Survey Report of Archaeological Resources in Portions of the Chickamauga Reservoir, Tennessee, 1987, 1988 and 1989 Field Seasons.* Submitted to Tennessee Valley Authority, Norris, Tennessee, by Garrow and Associates, Inc.

Walls, Lauren A.

2023 *Phase I Archaeological Resources Survey for the Proposed Removal of Saulpaw Dam, Chickamauga Reservoir, McMinn County, Tennessee.* Prepared for TVA, Knoxville, by New South Associates, Inc, Nashville

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