

Document Type: EA-Administrative Record
Index Field: Environmental Assessment
Project Name: 250 Linear Feet of Shoreline
Stabilization - Watts Bar
Reservoir
Project Number: 2019-18

**250 LINEAR FEET OF SHORELINE STABILIZATION -
WATTS BAR RESERVOIR
ENVIRONMENTAL ASSESSMENT**
Roane County, Tennessee

Prepared by:
TENNESSEE VALLEY AUTHORITY
Knoxville, Tennessee

March 2019

This page intentionally left blank

Purpose and Need for Action

The Tennessee Valley Authority (TVA) is proposing to stabilize eroding shoreline using rock riprap on Watts Bar Reservoir in order to address severe erosion and undercutting of the shoreline.

TVA is responsible for the management of public shoreline on Watts Bar Reservoir and for the protection of shoreline and aquatic resources, while providing reasonable public access. The proposal is intended to minimize the destabilization and erosion of the shoreline and banks. Controlling erosion enhances water quality by reducing sedimentation; it improves aesthetics and reduces property loss; and it has a positive impact on aquatic habitat since silt from erosion can cover the graveled bottom where fish spawn. The proposal supports and is consistent with TVA's mission of environmental stewardship, the objectives for water resource management in the 2011 Natural Resources Plan (NRP), and TVA's management goals set forth in the 2009 TVA Watts Bar Reservoir Land Management Plan (RLMP).

Proposed Action

The proposed stabilization project would consist of placing rock riprap along 250 linear feet of shoreline on Watts Bar Reservoir, Tennessee River Mile 548.2 in Roane County, Tennessee. Rock riprap of sufficient size (13-25 inches in diameter) will be installed from the toe (two feet below normal pool) to the top of the eroding bank (745 feet mean sea level). Delivery and placement of the riprap will be conducted by barge, and filter fabric will be applied where practical. The project location map is included in Attachment 1.

Photographs of the area below the shoreline depict nearly vertical cutbanks. The banks are covered with limited grass, forbs, and brush vegetation. Photographs of the area are included in Attachment 3. Disturbed ground not covered by existing shoreline buffer plantings will be seeded and/or planted utilizing woody and herbaceous plants. The shoreline stabilization plan can be found in Attachment 2. TVA proposes to conduct the work in the spring of 2019 and estimates the work would be completed in less than one month. In the future, the riprap installation may periodically require routine, minor maintenance (i.e., the addition of rock riprap at locations where sloughing has occurred).

Riprap is considered fill material and is therefore subject to Sections 401 and 404 of the Clean Water Act (CWA). Before implementing the project, TVA must obtain an Aquatic Resource Alteration Permit (ARAP) from the State of Tennessee, Department of Environment and Conservation (TDEC), under Section 401. TVA must also gain approval for the project from the U.S. Department of Army, Army Corps of Engineers (USACE), under Section 404. This project qualifies for USACE's Nationwide Permit for Bank Stabilization (NWP-13). Such approval is required when the waters of the United States (U.S.) could be altered by a project.

TVA is also considering taking no action (i.e., not placing riprap along 250 feet of Watts Bar to stabilize the streamline erosion issues). Taking no action would not address these resource condition issues nor would it help TVA achieve its goals and objectives for managing the public shoreline. Taking no action is included in this analysis to provide a baseline for comparison of project impacts and benefits. TVA also considered other stabilization methods such as vegetation and bioengineering, but dismissed them from further consideration because the success of those methods in addressing critical erosion of such high banks is limited.

Environmental Impacts

TVA has reviewed the proposed project and documented potential environmental impacts related to the project in the attached categorical exclusion checklist (Checklist, Attachment 4). The Checklist identifies the resources present in the project area and documents TVA's determination that the proposal would not significantly affect these resources.

As documented in the Checklist, the proposal would have no effect to endangered, threatened, or special status plant, aquatic, or wildlife species. TVA conducted a review of its Natural Heritage Database and found that no federally listed species have been documented within three miles of the project footprint. The proposed bank stabilization will not require the removal of trees; therefore, there will be no adverse impacts to *Myotis* species. A number of activities associated with the proposed project 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) completed in April 2018. In the programmatic agreement, TVA committed to implementing specific conservation measures for those activities with potential to affect bats. The conservation measures identified in Attachment 5 would be implemented as part of the proposed project. There are two federal listed and three state listed aquatic species found within 10 miles of the proposed actions; however, habitat at the proposed site is not suitable for the species known to occur in the vicinity. There is one federally listed and seven state listed plant species found within 5 miles of the proposed action. Due to the nature of the action and location, the proposed action will have no effect on any protected plant species. Furthermore, there are no listed terrestrial animals found within three miles of the area of potential effects (APE).

A review of the National Register of Historic Places and the Tennessee Historical Commission Viewer indicated that no historic properties exist within the APE or its viewshed. A review of TVA's land acquisition maps and USGS historical topographic maps indicates there are no otherwise known historic structures within the APE. In 2000, TVA performed an archaeological survey of the project area (Ahlman et al 2000), and no cultural deposits or artifacts were identified. The APE below the shoreline area has been heavily eroded, while the areas above the shoreline consist of a gentle to moderate hillside slope. Given the survey results, terrain characteristics and absence of the properties listed on the National Register of Historic Places and the Tennessee Historical Commission Viewer, TVA finds there is a reliable basis for concluding the project area and its viewshed contain no historic properties. The proposed action would have no effect to historic properties.

A review of the National Wetland Inventory database indicates that there are no wetlands at the location, and there are no expected impacts to water flow or the river channel. The parcel is not located within or adjacent to a wildlife management, park, scenic, or heritage area. Because there are few riprap installations in this area of the reservoir, the riprap may noticeably contrast with the natural appearance of shorelines within view of this section of the reservoir. Such visual impacts would be minor and would lessen over time as the riprap weathers.

In accordance with TVA's previous review of certain repetitive actions in the 100-year floodplain TVA determined there were no practicable alternative that would avoid siting in the floodplain; the bank stabilization project is expected to have insignificant potential effects. Navigation of the river system would not be impacted by the project. During construction, some soil erosion may occur or dredged or fill materials may be discharged and minor and temporary impacts may occur to riparian vegetation along the shoreline as

the riprap is placed. However, TVA would implement standard measures and apply best management practices in implementing the project in order to minimize or mitigate these potential impacts. While some erosion may occur during construction, the primary beneficial effect of the project will be the long-term reduction in erosion of the shoreline and in sloughing of banks.

If TVA does not take action, the shoreline would continue eroding and the undercutting and sloughing of banks would likely worsen. Erosion of the shoreline would continue to increase water turbidity. Banks that are currently vertical or near vertical may be heightened by continued erosion. As portions of the bank slough into the reservoir, some vegetation would also become unstable and fall onto the shoreline. The portions of the shoreline that are more gently sloped may become vertical over time, with greater undercutting of the bank. Continued erosion and degrading conditions of the shoreline, such as an increase of vertical banks is expected to make access to the area more difficult for recreationists, as it is likely the shoreline currently used as access points will become destabilized over time.

The proposal is limited in scope and designed to improve degraded conditions along shoreline in this area of Watts Bar Reservoir. The potential adverse impacts of the project, when added to adverse impacts from other activities within the immediate area, would be insignificant. TVA regularly considers shoreline stabilization projects in Watts Bar reservoir. TVA also regularly considers proposals by property owners on the reservoir for minor structures or docks which may include the installation of riprap to stabilize the shoreline along the property. Cumulatively, these stabilization projects would change the character of small portions of the reservoir's shoreline but would have beneficial overall impacts – though very diffuse in reach – because of decreased erosion and water turbidity and improved recreational access. The cumulative impacts associated with these stabilization projects have also been described in the environmental review of the NRP and RLMP.

Agencies and Persons Consulted

Authorization to begin work is dependent on TVA obtaining the necessary permits. Because this project involves alteration of waters of the U.S., TVA requires a permit from TDEC under Section 401 of the Clean Water Act before implementing the proposal. TVA would obtain USACE's NWP-13 for bank stabilization activities. TVA will secure a permit from TDEC and will notify USACE at least two weeks prior to start of work so that USACE can issue a Notice to Navigation Interests.

TVA Preparers

Freddie Bennett – Land Use and Watershed Specialist
Aaron Bradner – Biologist
Michael Angst – Archaeologist
Sara J. McLaughlin-Johnson – Zoologist
Nicole Berger – Navigation Review
Elizabeth Smith – NEPA Specialist

References

Ahlman, T., S. Frankenberg, N. Herrmann. 2000. *Archaeological Reconnaissance Survey of Tennessee Valley Authority Lands on the Watts Bar Reservoir*. Knoxville: University of Tennessee, Department of Anthropology.

Attachments

Attachment 1 – Project Location Maps

Attachment 2 – Proposed Project Plans

Attachment 3 – Site Photographs

Attachment 4 – Categorical Exclusion Checklist 39913

Attachment 5 – TVA Bat Strategy Form

Conclusion and Finding

Based on the findings above and the analyses in the attached checklist, we conclude that the proposed action to apply riprap stabilization to 250 linear feet of shoreline on Watts Bar Reservoir, Tennessee River Mile 548.2 in Roane County, Tennessee location would not be considered a major federal action significantly affecting the environment. Accordingly, an environmental impact statement is not required.

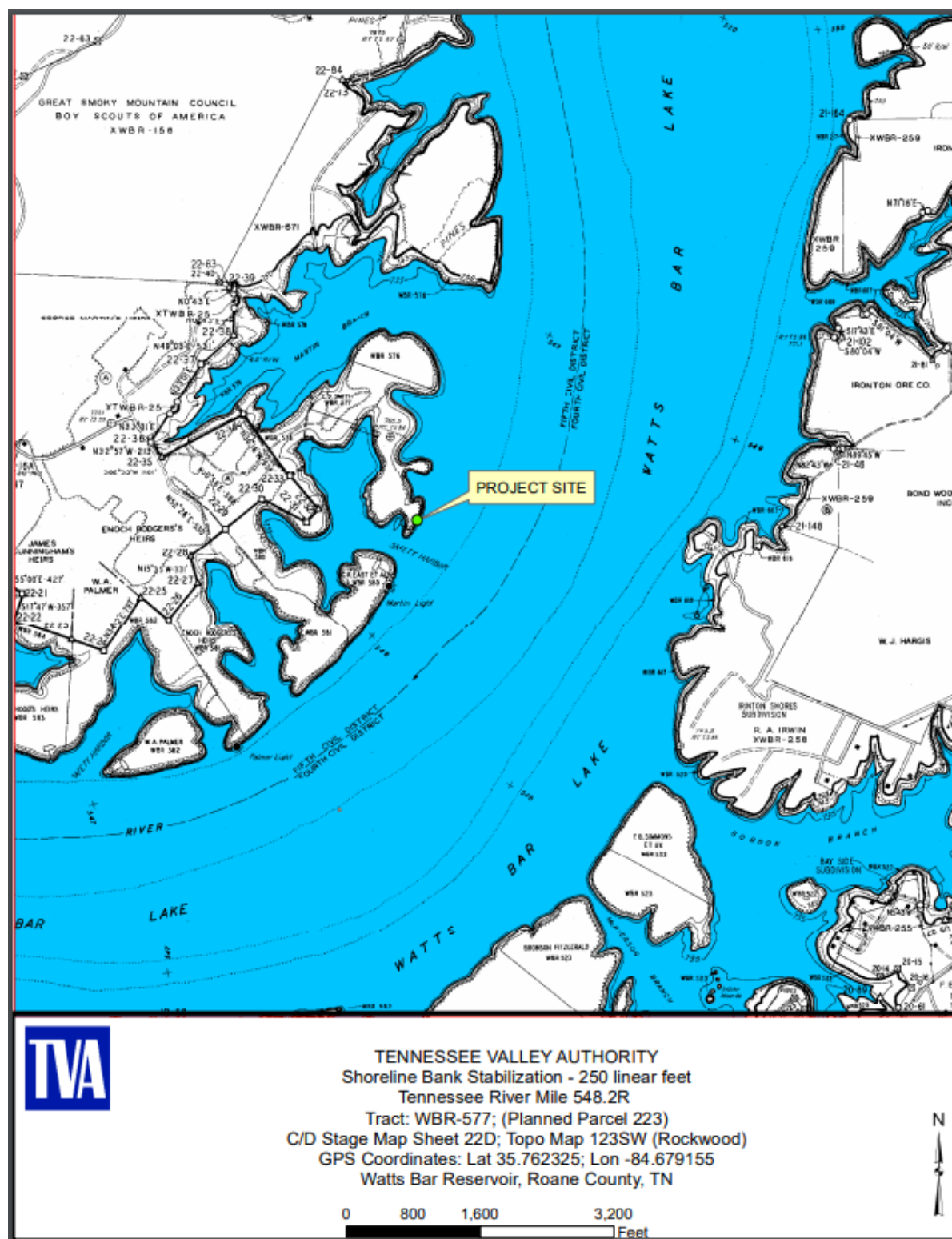


04/03/2019

Lana Bean, Manager
NEPA Program and Valley Projects
Tennessee Valley Authority

Date Signed

Attachment 1 – Project Location Maps





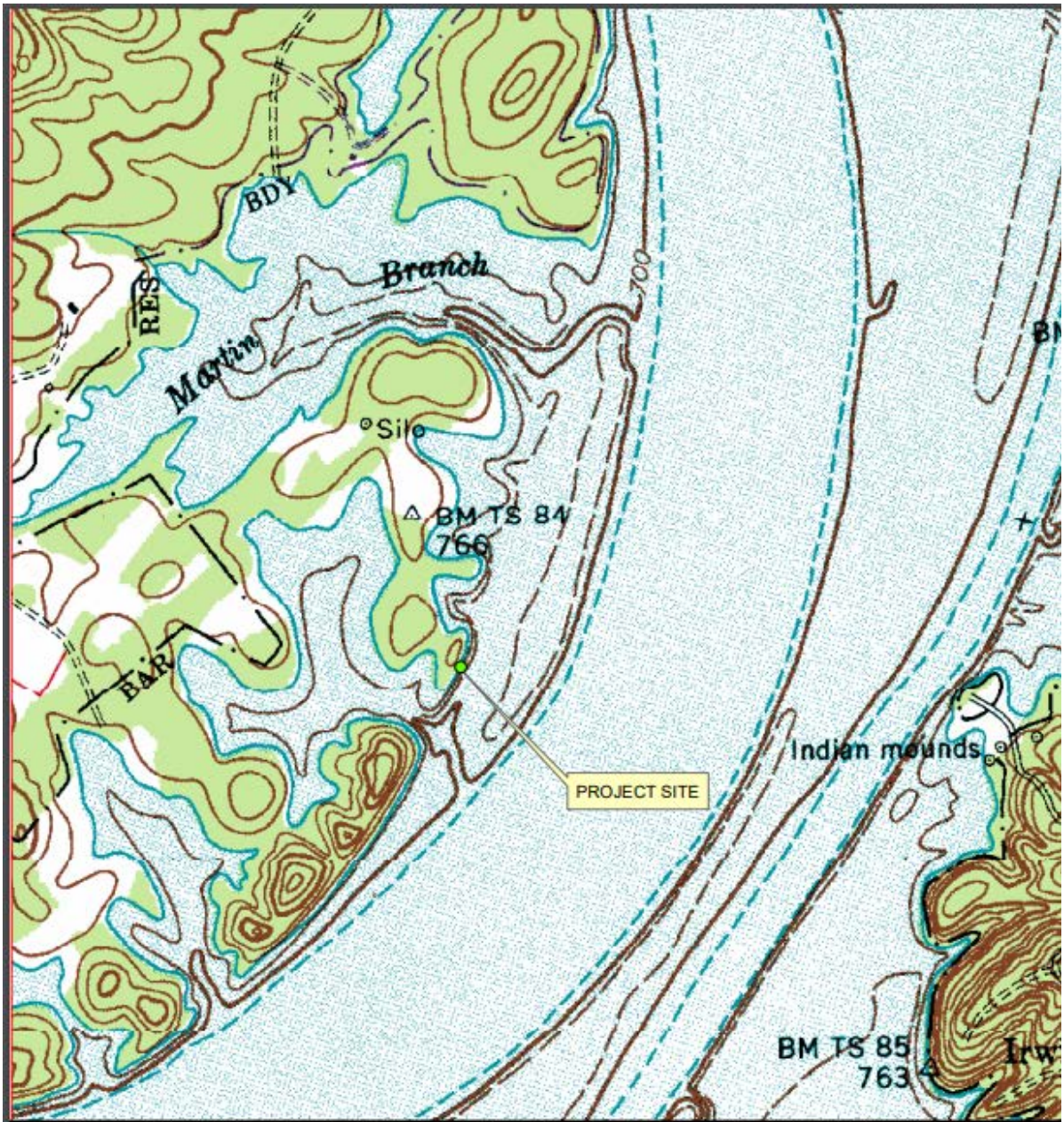
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



TENNESSEE VALLEY AUTHORITY
Shoreline Bank Stabilization - 250 linear feet
Tennessee River Mile 548.2R
Tract: WBR-577; (Planned Parcel 223)
C/D Stage Map Sheet 22D; Topo Map 123SW (Rockwood)
GPS Coordinates: Lat 35.762325; Lon -84.679155
Watts Bar Reservoir, Roane County, TN

0 800 1,600 3,200
Feet



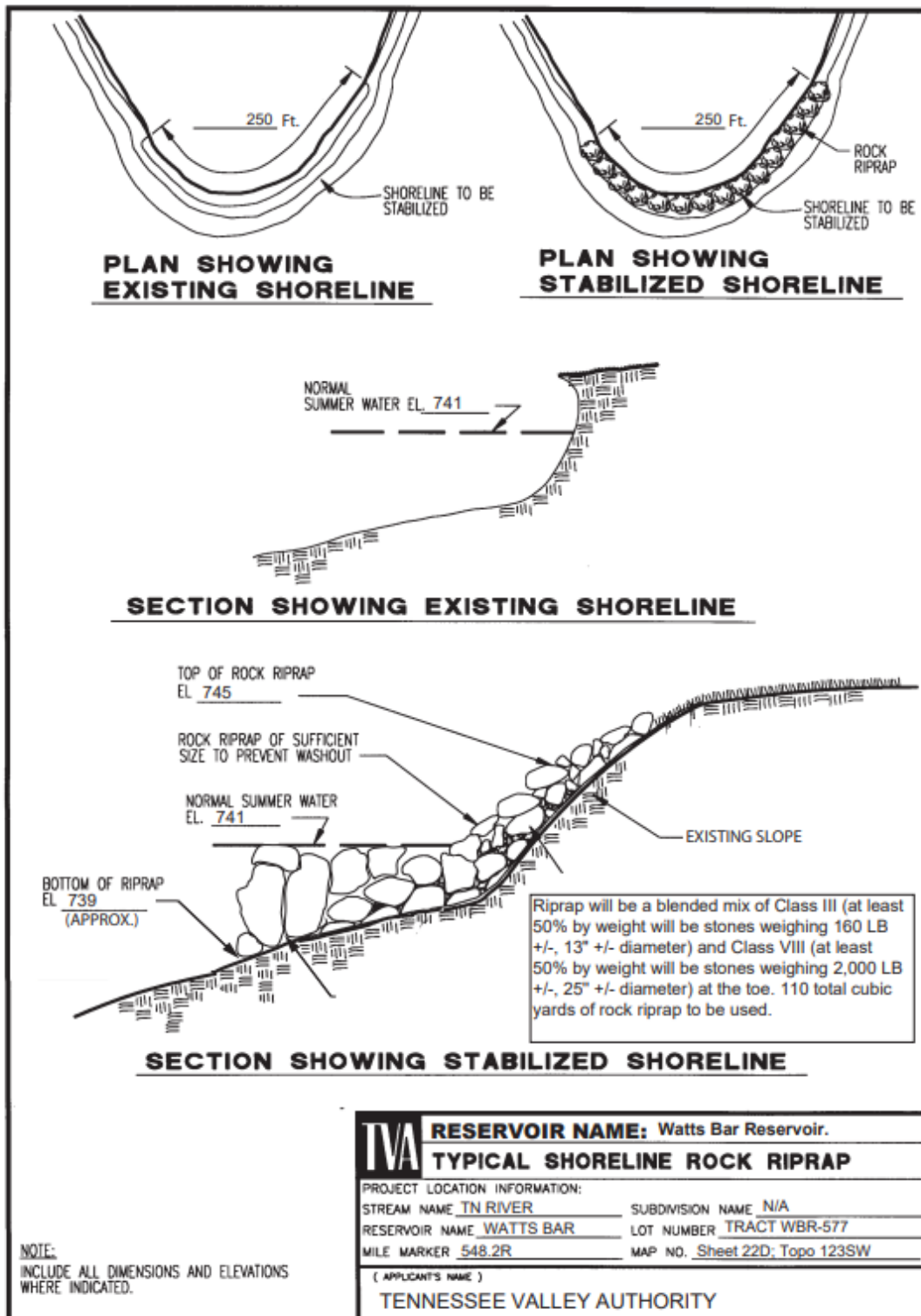


TENNESSEE VALLEY AUTHORITY
 Shoreline Bank Stabilization - 250 linear feet
 Tennessee River Mile 548.2R
 Tract: WBR-577; (Planned Parcel 223)
 C/D Stage Map Sheet 22D; Topo Map 123SW (Rockwood)
 GPS Coordinates: Lat 35.762325; Lon -84.679155
 Watts Bar Reservoir, Roane County, TN

0 500 1,000 2,000
 Feet



Attachment 2 – Proposed Project Plans



Attachment 3 – Site Photographs



Attachment 4 – Categorical Exclusion Checklist 39913

Categorical Exclusion Checklist for Proposed TVA Actions

Categorical Exclusion Number Claimed	Organization ID Number NRM Need Tri ID 4000628	Tracking Number (NEPA Administration Use Only) 39913
Form Preparer Freddie C Bennett	Project Initiator/Manager W S Ledford	Business Unit P&NR - Reservoir Property & Resource Mgmt
Project Title 250 LINEAR FEET OF SHORELINE BANK STABILIZATION - WATTS BAR RESERVOIR - ROANE COUNTY, TN		Hydrologic Unit Code
Description of Proposed Action (Include Anticipated Dates of Implementation) <input type="checkbox"/> Continued on Page 3 (if more than one line) For Proposed Action See Attachments and References		
Initiating TVA Facility or Office		TVA Business Units Involved in Project
Location (City, County, State) For Project Location see Attachments and References		

Parts 1 through 4 verify that there are no extraordinary circumstances associated with this action:

Part 1. Project Characteristics

Is there evidence that the proposed action...	No	Yes	Commitment	Information Source for Insignificance
1. Is major in scope?	X			Bennett, Freddie C. 11/21/2018
2. Is part of a larger project proposal involving other TVA actions or other federal agencies?	X			Bennett, Freddie C. 11/21/2018
* 3. Involves non-routine mitigation to avoid adverse impacts?	X		No	Bennett, Freddie C. 11/21/2018
4. Is opposed by another federal, state, or local government agency?	X			Bennett, Freddie C. 11/21/2018
* 5. Has environmental effects which are controversial?	X			Bennett, Freddie C. 11/21/2018
* 6. Is one of many actions that will affect the same resources?	X			Bennett, Freddie C. 11/21/2018
7. Involves more than minor amount of land?	X			Bennett, Freddie C. 11/21/2018

*If "yes" is marked for any of the above boxes, consult with NEPA Administration on the suitability of this project for a categorical exclusion.

Part 2. Natural and Cultural Features Affected

Would the proposed action...	No	Yes	Permit	Commitment	Information Source for Insignificance
1.Potentially affect endangered, threatened, or special status species?	X		No	No	For comments see attachments
2.Potentially affect historic structures, historic sites, Native American religious or cultural properties, or archaeological sites?		X	No	No	For comments see attachments
3.Potentially take prime or unique farmland out of production?	X		No	No	Bennett, Freddie C. 11/21/2018
4.Potentially affect Wild and Scenic Rivers or their tributaries?	X		No	No	Bennett, Freddie C. 11/21/2018
5.Potentially affect a stream on the Nationwide Rivers Inventory?	X		No	No	Bennett, Freddie C. 11/21/2018
6.Potentially affect wetlands?	X		No	No	For comments see attachments
7.Potentially affect water flow, stream banks or stream channels?		X	No	No	For comments see attachments
8.Potentially affect the 100-year floodplain?		X	No	No	For comments see attachments
9.Potentially affect ecologically critical areas, federal, state, or local park lands, national or state forests, wilderness areas, scenic areas, wildlife management areas, recreational areas, greenways, or trails?	X		No	No	For comments see attachments
10.Contribute to the spread of exotic or invasive species?	X		No	No	For comments see attachments
11.Potentially affect migratory bird populations?	X		No	No	For comments see attachments
12.Involve water withdrawal of a magnitude that may affect aquatic life or involve interbasin transfer of water?	X		No	No	Bennett, Freddie C. 11/21/2018
13.Potentially affect surface water?	X		No	No	Bennett, Freddie C. 02/08/2019
14.Potentially affect drinking water supply?	X		No	No	Bennett, Freddie C. 11/21/2018
15.Potentially affect groundwater?	X		No	No	Bennett, Freddie C. 11/21/2018
16.Potentially affect unique or important terrestrial habitat?	X		No	No	For comments see attachments
17.Potentially affect unique or important aquatic habitat?	X		No	No	For comments see attachments

Part 3. Potential Pollutant Generation

Would the proposed action potentially (including accidental or unplanned)...	No	Yes	Permit	Commitment	Information Source for Insignificance
1.Release air pollutants?	X		No	No	Bennett, Freddie C. 11/21/2018
2.Generate water pollutants?	X		No	No	Bennett, Freddie C. 11/21/2018
3.Generate wastewater streams?	X		No	No	Bennett, Freddie C. 11/21/2018
4.Cause soil erosion?	X		No	No	For comments see attachments
5.Discharge dredged or fill materials?		X	Yes	No	For comments see attachments
6.Generate large amounts of solid waste or waste not ordinarily generated?	X		No	No	Bennett, Freddie C. 11/21/2018
7.Generate or release hazardous waste (RCRA)?	X		No	No	Bennett, Freddie C. 11/21/2018
8.Generate or release universal or special waste, or used oil?	X		No	No	Bennett, Freddie C. 11/21/2018
9.Generate or release toxic substances (CERCLA, TSCA)?	X		No	No	Bennett, Freddie C. 11/21/2018
10.Involve materials such as PCBs, solvents, asbestos, sandblasting material, mercury, lead, or paints?	X		No	No	Bennett, Freddie C. 11/21/2018
11.Involve disturbance of pre-existing contamination?	X		No	No	Bennett, Freddie C. 11/21/2018
12.Generate noise levels with off-site impacts?	X		No	No	Bennett, Freddie C. 11/21/2018
13.Generate odor with off-site impacts?	X		No	No	Bennett, Freddie C. 02/08/2019
14.Produce light which causes disturbance?	X		No	No	Bennett, Freddie C. 11/21/2018
15.Release of radioactive materials?	X		No	No	Bennett, Freddie C. 11/21/2018
16.Involve underground or above-ground storage tanks or bulk storage?	X		No	No	Bennett, Freddie C. 11/21/2018
17.Involve materials that require special handling?	X		No	No	Bennett, Freddie C. 11/21/2018

Part 4. Social and Economic Effects

Would the proposed action...	No	Yes	Permit	Commitment	Information Source for Insignificance
1. Potentially cause public health effects?	X			No	Bennett, Freddie C. 11/21/2018
2. Increase the potential for accidents affecting the public?	X			No	Bennett, Freddie C. 11/21/2018
3. Cause the displacement or relocation of businesses, residences, cemeteries, or farms?	X			No	Bennett, Freddie C. 11/21/2018
4. Contrast with existing land use, or potentially affect resources described as unique or significant in a federal, state, or local plan?	X			No	Bennett, Freddie C. 11/21/2018
5. Disproportionately affect minority or low-income populations?	X			No	Bennett, Freddie C. 11/21/2018
6. Involve genetically engineered organisms or materials?	X			No	Bennett, Freddie C. 11/21/2018
7. Produce visual contrast or visual discord?	X			No	Bennett, Freddie C. 11/21/2018
8. Potentially interfere with recreational or educational uses?	X			No	Bennett, Freddie C. 11/21/2018
9. Potentially interfere with river or other navigation?		X	No	No	For comments see attachments
10. Potentially generate highway or railroad traffic problems?	X			No	Bennett, Freddie C. 11/21/2018

Part 5. Other Environmental Compliance/Reporting Issues

Would the proposed action...	No	Yes	Commitment	Information Source for Insignificance
1. Release or otherwise use substances on the Toxic Release Inventory list?	X		No	Bennett, Freddie C. 11/21/2018
2. Involve a structure taller than 200 feet above ground level?	X		No	Bennett, Freddie C. 11/21/2018
3. Involve site-specific chemical traffic control?	X		No	Bennett, Freddie C. 11/21/2018
4. Require a site-specific emergency notification process?	X		No	Bennett, Freddie C. 11/21/2018
5. Cause a modification to an existing environmental permit or to existing equipment with an environmental permit or involve the installation of new equipment/systems that will require a permit?	X		No	Bennett, Freddie C. 11/21/2018
6. Potentially impact operation of the river system or require special water elevations or flow conditions??	X		No	Bennett, Freddie C. 02/08/2019
7. Involve construction or lease of a new building or demolition or renovation of existing building (i.e. major changes to lighting, HVAC, and/or structural elements of building of 1000 sq. ft. or more)?	X		No	Bennett, Freddie C. 11/21/2018

Parts 1 through 4: If "yes" is checked, describe in the discussion section following this form why the effect is insignificant. Attach any conditions or commitments which will ensure insignificant impacts. Use of non-routine commitments to avoid significance is an indication that consultation with NEPA Administration is needed.

An ☐ EA or ☐ EIS Will be prepared.

Based upon my review of environmental impacts, the discussion attached, and/or consultations with NEPA Administration, I have determined that the above action does not have a significant impact on the quality of the human environment and that no extraordinary circumstances exist. Therefore, this proposal qualifies for a categorical exclusion under Section 5.2. _____ of TVA NEPA Procedures.

Project Initiator/Manager W S Ledford	Date 02/11/2019
TVA Organization RSO&E	E-mail wsledfor@tva.gov
	Telephone

Environmental Concurrence Reviewer

Preparer Closure

Travis Adam Giles

Signature

Signature

Other Environmental Concurrence Signatures (as required by your organization)

Signature

Signature

Signature

Signature

Other Review Signatures (as required by your organization)

Freddie C Bennett 02/08/2019

Signature

Signature

Signature

Signature

Signature

Signature

Attachments/References

Description of Proposed Action Continued from Page 1

TVA is proposing to stabilize 250 linear feet of eroding shoreline at Tennessee River Mile 548.2R on Watts Bar Reservoir using rock riprap. The rock will be installed from the toe (two feet below normal pool) to top of the eroding bank by crane operating from a floating barge. No trees will be removed and fallen trees will be left in place with rock being placed over them. Filter fabric to be used where needed and practical for structural support of the bank. Ground above the stabilized area not covered by existing shoreline buffer vegetation will be seeded and/or planted utilizing woody and herbaceous plantings. Reviewers' comments will be used in preparation of an abbreviated EA as this proposed action does not qualify as a Categorical Exclusion under our current environmental procedures for permitting TVA projects.

Project Location Continued from Page 1

Roane County, TN, Watts Bar Reservoir: TRM 548.2R; GPS coordinates Lat 35.762325, Lon -84.679155; C/D Stage Map 22D; Topo 123SW (Rockwood); Roane County, Tennessee.

CEC General Comment Listing

1.	Project Plan		
	By: Freddie C Bennett	11/21/2018	
	Files: 1_Stabilization Plan.pdf	11/21/2018	109.04 Bytes
2.	Site Map - Aerial		
	By: Freddie C Bennett	11/21/2018	
	Files: Site Map_Aerial.pdf	11/21/2018	1,087.27 Bytes
3.	Site Map -C/D Stage		
	By: Freddie C Bennett	11/21/2018	
	Files: Site Map_D-Stage.pdf	11/21/2018	527.59 Bytes
4.	Site Map - Topo		
	By: Freddie C Bennett	11/21/2018	
	Files: Site Map_Topo.pdf	11/21/2018	754.04 Bytes
5.	Photo		
	By: Freddie C Bennett	11/21/2018	
	Files: Photo 1.pdf	11/21/2018	225.62 Bytes
6.	Photo 2		
	By: Freddie C Bennett	11/21/2018	
	Files: Photo 2.pdf	11/21/2018	204.76 Bytes
7.	Bat Strategy Form		
	By: Freddie C Bennett	11/21/2018	
	Files: Project-Review-Form_TVA-Bat-Strategy_2018-09-14.docx	11/21/2018	66.55 Bytes
8.	Project Description		
	By: Freddie C Bennett	02/12/2019	
	Files: Project Description.pdf	02/12/2019	99.95 Bytes

CEC Comment Listing

Part 2 Comments

1.	No state or federally listed species have been documented within three miles of the project footprint. One federally protected species and three federally listed species are known from Roane County, Tennessee. Proposed actions would have no impact on bald eagle, gray bat, Indiana bat or northern long-eared bat. See attached input for a full species impact analysis.		
	By: Sara J McLaughlin-Johnson	01/08/2019	
	Files: CEC39913_TerrZoo_Part2Que1.docx	01/08/2019	16.87 Bytes

1. A number of activities associated with the proposed project 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. For those activities with potential to affect bats, TVA committed to implementing specific conservation measures. These activities and associated conservation measures are identified on pages 4-10 of the TVA Bat Strategy Project Screening Form (attached) and need to be reviewed/implemented as part of the proposed project.
By: Sara J McLaughlin-Johnson 01/08/2019
Files: TerrZoo_CEC39913_TVA-Bat-Strategy_2019-01-08.docx 01/08/2019 66.10 Bytes
1. There are two federally listed and three state listed aquatic species found within 10 miles of the proposed actions. Habitat at the proposed site is not suitable for the various state and federally listed aquatic species known to occur in the vicinity. Due to the location of the proposed actions there would be no effects on any protected aquatic species.

There are no listed terrestrial animal species found within 3 miles of the proposed actions. No listed terrestrial animal species occur in the vicinity of the proposed actions. The proposed actions do not include the removal of trees. Therefore, there would be no effects to *Myotis* species.

There is one federally listed and seven state listed plant species found within 5 miles of the proposed actions. Due to the nature of action and location, the proposed actions would have no effect on any protected plant species.

By: Kelvin Young 12/07/2018
Files: Heritage_Species_List2.pdf 12/07/2018 384.16 Bytes
bat form.pdf 12/07/2018 820.00 Bytes
1. TVA is proposing to stabilize 250 linear feet of eroding shoreline at Tennessee River Mile 548.2R on Watts Bar Reservoir using rock riprap. The rock will be installed from the toe (two feet below normal pool) to top of the eroding bank by crane operating from a floating barge. No trees will be removed and fallen trees will be left in place with rock being placed over them. Filter fabric to be used where needed and practical for structural support of the bank. Ground above the stabilized area not covered by existing shoreline buffer vegetation will be seeded and/or planted utilizing woody and herbaceous plantings. Reviewers' comments will be used in preparation of an abbreviated EA as this proposed action does not qualify as a Categorical Exclusion under our current environmental procedures for permitting TVA projects.

A query of the TVA Natural Heritage Database (1/4/2019) for records of listed aquatic animal species indicated that two state-listed fish species (flame chub and lake sturgeon) have been documented to occur within the Tennessee River (0601020106) 10-digit HUC watershed encompassing the proposed project area (Aquatics Table 1). One federally-listed mussel species, dromedary pearlymussel, was also listed but is believed to be extirpated from this section of its former range.
The preferred habitat of flame chub is springs and spring fed streams; the preferred habitat of lake sturgeon is the bottom of clean rivers and lakes. The area where the proposed shoreline stabilization work is not representative of either of these habitats. All work would be conducted in accordance to BMPs as outlined in TVA's General and Standard Conditions. These BMPs are designed in part to minimize erosion and subsequent sedimentation in streams. Therefore, with proper implementation of BMPs, no adverse impacts to species listed in aquatic table 1 are anticipated to occur.

By: Aaron Bradner 01/09/2019
Files: 39913_CEC_AQUAT_Table.docx 01/09/2019 18.35 Bytes
2. A review of the National Register of Historic Places and the Tennessee Historical Commission Viewer indicates that there are no historic properties within the area of potential effects (APE) or its watershed. A review of TVA's land acquisition maps and USGS historical topographic maps indicates that there are no otherwise known historic structures within the APE.

TVA conducted an archaeological survey of the project area (Ahiman et al. 2000) and no archaeological sites, materials, or deposits were encountered. There are a number of sites identified by the 2000 survey within 1/2 mile, however these will not be affected by the proposed undertaking.

Photographs of the APE below the shoreline indicate that the area has been heavily eroded, while the areas above the shoreline consist of a gentle to moderate hillside slope. Both of the factors reduce the likelihood of intact cultural deposits.

Based on the absence of historic properties and archaeological sites, as well as the ground conditions and terrain, it can be reliably concluded that the APE contains no historic properties that will be affected.

The proposed undertaking will have no effect on historic properties.

See attachment for further details.
By: Michael Angst 12/27/2018
Files: CEC39913 Section106.pdf 12/27/2018 13.67 Bytes
8. In accordance with TVA's previous review of certain repetitive actions in the 100- year floodplain which was determined there were no practicable alternative that would avoid siting in the floodplain, the bank stabilization project is expected to have insignificant potential effects.
By: Freddie C Bennett 11/21/2018
9. There are eight Managed areas (MABR) and Heritage Sites (SBR) located in the vicinity. However, due to the nature and location of the proposed actions these sites would not be affected.
By: Kelvin Young 12/07/2018

10.	The proposed actions would not contribute to the spread of exotic or invasive species.		
	By: Kelvin Young	12/07/2018	
10.	Construction activities would not involve moving aquatic species or water from different locations, and equipment and materials used for the project would be clean and free of debris that could introduce exotic species and adversely affect aquatic habitat. Thus, the project would not contribute to the spread of exotic or invasive aquatic species.		
	By: Aaron Bradner	01/09/2019	
11.	Two osprey nests and two wading bird colonies are known within three miles of the project area. The nearest osprey record occurs approximately 2.1 miles from the project footprint. The nearest wading bird colony occurs approximately 1.4 miles from the project footprint. Proposed project activities would not impact known osprey nests or wading bird colonies. Suitable foraging or nesting habitat may be present within the potential area of impact for several species of migratory birds. These individuals could be impacted by the proposed actions if nests are active in the action area at the time of vegetation removal. However, similarly suitable habitat is ample across the adjacent landscape such that disturbed/displaced individuals could easily find alternative habitat nearby. Proposed project activities would not impact populations or aggregations of migratory birds.		
	By: Sara J McLaughlin-Johnson	01/08/2019	
11.	There are historical records known in the vicinity for osprey and colonial wading birds. Due to the nature of actions the proposed actions would have no effect on migratory birds.		
	By: Kelvin Young	12/07/2018	
16.	There are no caves located in the vicinity. Due to the nature of the proposed actions there will be no effect on these sites.		
	By: Kelvin Young	12/07/2018	
17.	No unique aquatic habitat areas are known from the vicinity of the proposed actions.		
	By: Kelvin Young	12/07/2018	
17.	There is no designated critical habitat in the Tennessee River 10-digit HUC watershed where the proposed work will occur. Furthermore, ground disturbance would be minimized, and all work conducted in accordance to BMPs as outlined in TVA'S General and Standard Conditions. These BMPs are designed in part to minimize erosion and subsequent sedimentation in streams. Therefore, with proper implementation of BMPs, no adverse modifications to unique or important aquatic habitats would occur.		
	By: Aaron Bradner	01/09/2019	
6.	No wetlands occur at the site. No wetland species are present.		
	By: Kelvin Young	12/07/2018	
7.	There would be no negative effects on water flow or existing condition of the stream channel or stream bank. Rip rap stabilization is needed to reduce the loss of shoreline due to erosion from wave action.		
	By: Kelvin Young	12/07/2018	
7.	A January 2019 desktop review and review of provided photographs indicated eroding bank along the proposed work area. Riprap would be placed along the shore for 250 feet where flow is typically less than two feet deep to minimize this erosion. Any potential ground disturbance would be minimized, and all work conducted in accordance to BMPs as outlined in TVA'S General and Standard Conditions. These BMPs are designed in part to minimize erosion and subsequent sedimentation. Therefore, with proper implementation of BMPs, no adverse modifications from the associated action are anticipated to water flow, stream channels, or stream banks.		
	By: Aaron Bradner	01/09/2019	
Part 3 Comments			
4.	Rock riprap, placed on the stream banks, will be beneficial in controlling erosion which enhances water quality by reducing sedimentation. It has a positive impact on aquatic habitat since silt from erosion can cover the graveled bottom where fish spawn.		
	By: Freddie C Bennett	11/21/2018	
5.	Rock riprap, placed on the stream banks, will be beneficial in controlling erosion which enhances water quality by reducing sedimentation. It has a positive impact on aquatic habitat since silt from erosion can cover the graveled bottom where fish spawn. It will be constructed in accordance with Best Management Practices and General Standards and Conditions and is expected to have insignificant potential effects.		
	By: Freddie C Bennett	11/21/2018	
Part 4 Comments			
9.	Please see attached navigation comments.		
	By: Nicole Berger	02/08/2019	
	Files: 4000628wbr - 26a - TRM 548.2R - TVA.docx	02/08/2019	14.40 Bytes
CEC Permit Listing			
Part 3 Permits			
5.	State Water Quality Certification (401 Clean Water Act)		
	By: Freddie C Bennett	11/21/2018	

5. Section 404 Permit (Clean Water Act)

By: Freddie C Bennett

11/21/2018

CEC Commitment Listing



Attachment 5 – Bat Strategy Survey Form

Project Review Form - TVA Bat Strategy (09/14/2018)

NOTE: 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. 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!

Project Name: Shoreline Stabilization - Parcel 223 – (Fingers Area) – 250 feet Date: 21 Nov 2018

Contact(s): W. Scott Ledford, Project Lead CEC#:39913 RLR#: N/A Project ID: _

Project Location (City, County, State): Watts Bar Reservoir – TN River Mile 548.2R - GPS coordinates Lat: 35.762325 / Lon -84.679155; Roane County, TN

Project Description: Stabilize 250 feet of eroding stream bank using rock riprap to be installed by barge. No trees will be removed.

SECTION 1: PROJECT INFORMATION – ACTION AND ACTIVITIES

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

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

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

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

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

TABLE 2. Activities not likely to adversely affect bats with implementation of conservation measures. Conservation measures and completion of bat strategy project review form REQUIRED; review of bat records in proximity to project NOT required.

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

Project Review Form - TVA Bat Strategy (09/14/2018)

51. Signage installation	74. Recreational vehicle campsites	95. Recreation License
53. Mooring buoys or posts	75. Utility lines/light poles	96. Land Use Permit
56. Culverts	76. Concrete sidewalks	
Table 3: Activities that may adversely affect federally listed bats. Conservation measures AND completion of bat strategy project review form REQUIRED; review of bat records in proximity of project REQUIRED by OSAR/Heritage eMap reviewer or Terrestrial Zoologist.		
15. Windshield and ground surveys for archaeological resources	34. Mechanical vegetation removal, includes trees or tree branches ≥ 3 inches in diameter	69. Renovation of existing structures
16. Drilling	<input checked="" type="checkbox"/> 35. Stabilization (major erosion control)	70. Lock maintenance/construction
17. Mechanical vegetation removal, does not include trees or branches ≥ 3 " in diameter (in Table 3 due to potential for woody burn piles)	36. Grading	71. Concrete dam modification
21. Herbicide use	37. Installation of soil improvements	73. Boat launching ramps
22. Grubbing	38. Drain installations for ponds	77. Construction or expansion of land-based buildings
23. Prescribed burns	47. Conduit installation	78. Wastewater treatment plants
25. Maintenance, improvement or construction of pedestrian or vehicular access corridors	52. Floating buildings	80. Barge floating areas
26. Maintenance/construction of access control measures	54. Maintenance of water control structures (dewatering units, spillways, levees)	82. Construction of dam/weirs/levees
27. Restoration of sites following human use and abuse	55. Solar panels	83. Submarine pipeline, directional boring operations
28. Removal of debris (e.g., dump sites, hazardous material, unauthorized structures)	62. Blasting	86. Landfill construction
29. Acquisition and use of fill/borrow material	63. Foundation installation for transmission support	89. Structure demolition
31. Stream/wetland crossings	64. Installation of steel structure, overhead bus, equipment, etc.	91. Bridge replacement
32. Clean-up following storm damage	65. Pole and/or tower installation and/or extension	92. Return of archaeological remains to former burial sites
33. Removal of hazardous trees/tree branches		

STEP 3) Project includes one or more activities in Table 3?.... ☒ **YES (Go to STEP 4)** ☐ **NO (Go to STEP 13).**

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

a) If conducting activity 16, 25, 26, 37, 47, 52, 62, 63, 64, 65, 70, 71, 73, 78, 80, 82, 83, 86, or 91, 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);** ☒ **N/A**

b) If conducting activity 15, 26, or 92, will project involve entry into/survey of cave, bridge, other structure (potential bat roost)?..... ☐ **NO (HP1/HP2 do not apply);** ☐ **YES (HP1/HP2 applies, subject to review of bat records);** ☒ **N/A**

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 - Sep 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 - Sep 30	<input type="checkbox"/> Jun 1 - Jul 31

d) If activity 17, 22, 32, 33, 34, 35, or 36, 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);** ☐ **N/A**

e) If tree removal (activity 33 or 34), estimated amount _____ ☐ ac ☐ trees 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 - Sep 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

Project Review Form - TVA Bat Strategy (09/14/2018)

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 - Sep 30	<input type="checkbox"/> Jun 1 - Jul 31

If warranted, does project have flexibility for bat surveys (May 15-Aug 15):..... ☐ MAYBE ☐ YES ☒ NO
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 (If NO and includes Table 3 activities, submit project / relevant information [e.g., maps] for review by Terrestrial Zoologist.

Info below completed by: ☒ Heritage Reviewer (name) Kelvin Young Date: 12/7/2018
☐ OSAR Reviewer (name) _____ Date: _____
☒ Terrestrial Zoologist (name) Sara McLaughlin-Johnson Date: 1/4/2019

Gray bat records: ☒ None; ☐ Within 3 miles*; ☐ Within a cave*
Indiana bat records: ☒ None; ☐ Within 10 miles*; ☐ Within a cave*; ☐ Capture/roost tree*
Northern long-eared bat records: ☒ None; ☐ Within 5 miles*; ☐ Within a cave*; ☐ Capture/roost tree*
Virginia big-eared bat records: ☒ None; ☐ Within 10 miles*
Caves: ☒ None within 3 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
(if amount of suitable habitat removal is greater than 0, submit for review by Terrestrial Zoologist for tracking).

Notes (include effects determinations): _____

STEP 6) If reviewed by Heritage/OSAR reviewer, does records review trigger need for additional review by Terrestrial Zoologist (noted by *)?..... ☒ NO (Go to STEP 13) ☐ YES (Submit for Terrestrial Zoology review).

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.

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

STEP 9) Presence/absence survey results, on _____ **(date):** ☐ NEGATIVE ☐ POSITIVE ☐ N/A

NOTES: _____

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 ☐ NON-VOLANT **bat season (or** ☐ N/A**).**

STEP 11) Available Incidental Take (prior to accounting for this project) as of _____ **(date):**

TVA Action	Total 20-year	Winter	Volant Season	Non-Volant Season

STEP 12) Amount contributed to TVA's Bat Conservation Fund upon activity completion: _____ **or** ☐ N/A

Project Review Form - TVA Bat Strategy (09/14/2018)

SECTION 3: REQUIRED CONSERVATION MEASURES

STEP 13a) If answer to STEP 3 is NO, (*Project Lead* or *OSAR/Heritage Reviewer*) is to select Conservation Measures in Table 4 that include project activity #s selected in STEP 2, are highlighted yellow, and are relevant to Action selected in STEP 1.....Go to STEP 14.

STEP 13b) If answer to STEP 3 is YES, and answer to STEP 6 is NO, *OSAR/Heritage Reviewer* is to select Conservation Measures in Table 4 that: include project activity #s selected in STEP 2 (may include yellow and red measures), reflect results of bat records review, and are relevant to Action selected in STEP 1.....Go to STEP 14.

STEP 13c) If answer to STEP 3 is YES, and answer to STEP 6 is YES, *Terrestrial Zoologist* is to select Conservation Measures in Table 4 that: include project activity #s selected in STEP 2 (may include yellow and red measures), reflect results of bat records/TZ review, and are relevant to Action in STEP 1.....Go to STEP 15.

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

Check if applies to Project	Activities Subject to Conservation Measure	Conservation Measure Description
X	15, 16, 17, 18, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 45, 47, 48, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 90, 91, 92, 93, 94, 95, 96	NV1 - Noise will be short-term, transient, and not significantly different from urban interface or natural events (i.e., thunderstorms) that bats are frequently exposed to when present on the landscape.
	16, 25, 26, 37, 47, 52, 62, 63, 64, 65, 70, 71, 73, 78, 80, 82, 83, 86, 91	NV2 - Drilling, blasting, or any other activity that involves continuous noise (i.e., longer than 24 hours) disturbances greater than 75 decibels measured on the A scale (e.g., loud machinery) within a 0.5 mile radius of documented winter and/or summer roosts (caves, trees, unconventional roosts) will be conducted when bats are absent from roost sites.
	16, 26, 62	NV3 - Drilling or blasting within a 0.5 mile radius of documented cave (or unconventional) roosts will be conducted in a manner that will not compromise the structural integrity or alter the karst hydrology of the roost site.
	16, 26, 62	NV4 - Drilling or blasting within 0.5 miles of a documented roost site (cave, tree, unconventional roost) that needs to occur when bats are present will first involve development of project-specific avoidance or minimization measures in coordination with the USFWS.
	15, 26, 92	HP1 - Site-specific cases in which potential impact of human presence is heightened (e.g., conducting environmental or cultural surveys within a roost) will be closely coordinated with staff bat biologists to avoid/minimize impacts below any potential adverse effect. Any take from these activities would be covered by TVA's Section 10 permit.
	15, 26, 92	HP2 - Entry into roosts known to be occupied by federally listed bats will be communicated to the USFWS when impacts to bats may occur if not otherwise communicated (i.e., via annual monitoring reports per TVA's Section 10 permit). Any take from these activities would be covered by TVA's section 10 permit.
	23	SHF1 - Fire breaks will be used to define and limit burn scope.

Project Review Form - TVA Bat Strategy (09/14/2018)

Check if applies to Project	Activities Subject to Conservation Measure	Conservation Measure Description
	23	SHF2 - Site-specific conditions (e.g., acres burned, transport wind speed, mixing heights) will be considered to ensure smoke is limited and adequately dispersed away from caves so that smoke does not enter cave or cave-like structures.
	23	SHF3 - Acreage will be divided into smaller units to keep amount of smoke at any one time or location to a minimum and reduce risk for smoke to enter caves.
	23	SHF4 - If burns need to be conducted during April and May, when there is some potential for bats to present on the landscape and more likely to enter torpor due to colder temperatures, burns will only be conducted if the air temperature is 55° or greater, and preferably 60° or greater.
	23	SHF5 - Fire breaks will be plowed immediately prior to burning, will be plowed as shallow as possible, and will be kept to minimum to minimize sediment.
	23	SHF6 - Tractor-constructed fire lines will be established greater than 200 feet from cave entrances . Existing logging roads and skid trails will be used where feasible to minimize ground disturbance and generation of loose sediment.
	22, 23, 32, 33, 34, 35, 36	SHF7 - Burning will only occur if site specific conditions (e.g. acres burned, transport wind speed, mixing heights) can be modified to ensure that smoke is adequately dispersed away from caves or cave-like structures. This applies to prescribed burns and burn piles of woody vegetation.
	22, 23, 32, 33, 34, 35, 36	SHF8 - Brush piles will be burned a minimum of 0.25 mile from documented, known, or obvious caves or cave entrances and otherwise in the center of newly established ROW when proximity to caves on private land is unknown.
	23	SHF9 - A 0.25 mile buffer of undisturbed forest will be maintained around documented or known gray bat maternity and hibernation colony sites, documented or known Virginia big-eared bat maternity, bachelor, or winter colony sites, Indiana bat hibernation sites, and northern long-eared bat hibernation sites. Prohibited activities within this buffer include cutting of overstory vegetation, construction of roads, trails or wildlife openings, and prescribed burning. Exceptions may be made for maintenance of existing roads and existing ROW, or where it is determined that the activity is compatible with species conservation and recovery (e.g., removal of invasive species).
	33, 34	TR1* - Removal of potentially suitable summer roosting habitat during time of potential occupancy has been quantified and minimized programmatically. TVA will track and document alignment of activities that include tree removal (i.e., hazard trees, mechanical vegetation removal) with the programmatic quantitative cumulative estimate of seasonal removal of potential summer roost trees for Indiana bat and northern long-eared bat. Project will therefore communicate completion of tree removal to appropriate TVA staff.
	33, 34	TR2 - Removal of suitable summer roosting habitat within 0.5 mile of Priority 1/Priority 2 Indiana bat hibernacula, or 0.25 mile of Priority 3/Priority 4 Indiana bat hibernacula or any northern long-eared bat hibernacula will be prohibited, regardless of season, with very few exceptions (e.g., vegetation maintenance of TL ROW immediately adjacent to a known cave).
	33	TR3* - Removal of suitable summer roosting habitat within documented bat habitat (i.e., within 10 miles of documented Indiana bat hibernacula, within 5 miles of documented northern long-eared bat hibernacula, within 2.5 miles of documented Indiana bat summer roost trees, within 5 miles of Indiana bat capture sites, within 1 mile of documented northern long-eared bat summer roost trees, within 3 miles of northern long-eared bat capture sites) will be tracked, documented, and included in annual reporting. Project will therefore communicate completion of tree removal to appropriate TVA staff.

Project Review Form - TVA Bat Strategy (09/14/2018)

Check if applies to Project	Activities Subject to Conservation Measure	Conservation Measure Description
	33, 34	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.
	33, 34	TR5 - Removal of any trees within 150 feet of a documented Indiana bat or northern long-eared bat maternity summer roost tree during non-winter season, range- wide pup season or swarming season (if site is within known swarming habitat), will first require a site-specific review and assessment. If pups are present in trees to be removed (determined either by mist netting and assessment of adult females, or by visual assessment of trees following evening emergence counts), TVA will coordinate with the USFWS to determine how to minimize impacts to pups to the extent possible. May include establishment of artificial roosts before removal of roost tree(s).
	33, 34	TR6 - Removal of a documented Indiana bat or northern long-eared bat roost tree that is still suitable and that needs to occur during non-winter season, range-wide pup season, or swarming season (if site is within known swarming habitat) will first require a site-specific review and assessment. If pups are present in trees to be removed (determined either by mist netting and assessment of adult females, or by visual assessment of trees following evening emergence counts), TVA will coordinate with USFWS to determine how to minimize impacts to pups to the extent possible. This may include establishment of artificial roosts before removal of roost tree(s).
	33, 34	TR7 (Existing Transmission ROW only) - Tree removal within 100 feet of existing transmission ROWs will be limited to hazard trees. On or adjacent to TLs, a hazard tree is a tree that is tall enough to fall within an unsafe distance of TLs under maximum sag and blowout conditions and/or are also dead, diseased, dying, and/or leaning. Hazard tree removal includes removal of trees that 1) currently are tall enough to threaten the integrity of operation and maintenance of a TL or 2) have the ability in the future to threaten the integrity of operation and maintenance of a TL.
	33, 34	TR8 (TVA Reservoir Land only) - Requests for removal of hazard trees on or adjacent to TVA reservoir land will be inspected by staff knowledgeable in identifying hazard trees per International Society of Arboriculture and TVA's checklist for hazard trees. Approval will be limited to trees with a defined target.
	33, 34	TR9 - If removal of suitable summer roosting habitat occurs when bats are present on the landscape, a funding contribution (based on amount of habitat removed) towards future conservation and recovery efforts for federally listed bats would be carried out. Project can consider seasonal bat presence/absence surveys (mist netting or emergence counts) that allow for positive detections without resulting in increased constraints in cost and project schedule. This will enable TVA to contribute to increased knowledge of bat presence on the landscape while carrying out TVA's broad mission and responsibilities.

Project Review Form - TVA Bat Strategy (09/14/2018)

Check if applies to Project	Activities Subject to Conservation Measure	Conservation Measure Description
	69, 77, 89, 91	<p>AR1 - Projects that involve structural modification or demolition of buildings, bridges, and potentially suitable box culverts, will require assessment to determine if structure has characteristics that make it a potentially suitable unconventional bat roost. If so a survey to determine if bats may be present will be conducted. Structural assessment will include:</p> <ul style="list-style-type: none"> ○ Visual check that includes an exhaustive internal/external inspection of building to look for evidence of bats (e.g., bat droppings, roost entrance/exit holes); this can be done at any time of year, preferably when bats are active. ○ Where accessible and health and safety considerations allow, a survey of roof space for evidence of bats (e.g., droppings, scratch marks, staining, sightings), noting relevant characteristics of internal features that provide potential access points and roosting opportunities. Suitable characteristic may include: gaps between tiles and roof lining, access points via eaves, gaps between timbers or around mortise joints, gaps around top and gable end walls, gaps within roof walling or around tops of chimney breasts, and clean ridge beams. ○ Features with high-medium likelihood of harboring bats but cannot be checked visually include soffits, cavity walls, space between roof covering and roof lining. ○ Applies to box culverts that are at least 5 feet (1.5 meters) tall and with one or more of the following characteristics. Suitable culverts for bat roosts have the following characteristics: <ul style="list-style-type: none"> ▪ Location in relatively warm areas ▪ Between 5-10 feet (1.5-3 meters) tall and 300 ft (100 m) or more long ▪ Openings protected from high winds ▪ Not susceptible to flooding ▪ Inner areas relatively dark with roughened walls or ceilings ▪ Crevices, imperfections, or swallow nests ○ Bridge survey protocols will be adapted from the Programmatic Biological Opinion for the Federal Highway Administration (Appendix D of USFWS 2016c, which includes a Bridge Structure Assessment Guidance and a Bridge Structure Assessment Form). ○ Bat surveys usually are NOT needed in the following circumstances: <ul style="list-style-type: none"> ▪ Domestic garages /sheds with no enclosed roof space (with no ceiling) ▪ Modern flat-roofed buildings ▪ Metal framed and roofed buildings ▪ Buildings where roof space is regularly used (e.g., attic space converted to living space, living space open to rafters) or where all roof space is lit from skylights or windows. Large/tall roof spaces may be dark enough at apex to provide roost space.
	69, 77, 89, 91	AR2 - Additional bat P/A surveys (e.g., emergence counts) conducted if warranted (i.e., when AR1 indicates that bats may be present).
	91	AR3 - Bridge survey protocols will be implemented, either by permittee (e.g., state DOT biologists) or qualified personnel. If a bridge is determined to be in use as an unconventional roost, subsequent protocols will be implemented.
	69, 89	AR4 - Removal of buildings with suitable roost characteristics within six miles of known or presumed occupied roosts for Virginia big-eared bat would occur between Nov 16 and Mar 31. Buildings may be removed other times of the year once a bat biologist evaluates a buildings' potential to serve as roosting habitat and determines that this species is not present and/or is not using structure(s).
	69, 77, 89, 91	AR5 - If evidence of bat use warrants seasonal modification or removal, TVA will carry out or recommend (i.e., to applicants) seasonal modification or removal . Risk to human safety, however, should take priority. For project-specific cases in which project is unable to accommodate seasonal modification or removal, and federally listed bat species are present, TVA will carry out or recommend consultation with the USFWS to determine the best approach in the context of the project-specific circumstance. This may include establishment of artificial roosts before demolition of structures with bats present.

Project Review Form - TVA Bat Strategy (09/14/2018)

Check if applies to Project	Activities Subject to Conservation Measure	Conservation Measure Description
	16, 17, 18, 21, 22, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37, 38, 39, 48, 50, 51, 56, 61, 62, 63, 64, 65, 67, 69, 84, 89	<p>SSPC1 (Transmission only) - Transmission actions and activities will continue to Implement A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities. This focuses on control of sediment and pollutants, including herbicides. Following are key measures:</p> <ul style="list-style-type: none"> ○ BMPs minimize erosion and prevent/control water pollution in accordance with state specific construction storm water permits. BMPs are designed to keep soil in place and aid in reducing risk of other pollutants reaching surface waters, wetlands and ground water. BMPs will undertake the following principles: <ul style="list-style-type: none"> ▪ Plan clearing, grading, and construction to minimize area and duration of soil exposure. ▪ Maintain existing vegetation wherever and whenever possible. ▪ Minimize disturbance of natural contours and drains. ▪ As much as practicable, operate on dry soils when they are least susceptible to structural damage and erosion. ▪ Limit vehicular and equipment traffic in disturbed areas. Keep equipment paths dispersed or designate single traffic flow paths with appropriate road BMPs to manage runoff. ▪ Divert runoff away from disturbed areas. ▪ Provide for dispersal of surface flow that carries sediment into undisturbed surface zones with high infiltration capacity and ground cover conditions. ▪ Prepare drainage ways and outlets to handle concentrated/increased runoff. ▪ Minimize length and steepness of slopes. Interrupt long slopes frequently. ▪ Keep runoff velocities low and/or check flows. ▪ Trap sediment on-site. ▪ Inspect/maintain control measures regularly & after significant rain. ▪ Re-vegetate and mulch disturbed areas as soon as practical. ○ Specific guidelines regarding sensitive resources and buffer zones: <ul style="list-style-type: none"> ▪ Extra precaution (wider buffers) within SMZs is taken to protect stream banks and water quality for streams, springs, sinkholes, and surrounding habitat. ▪ BMPs are implemented to protect and enhance wetlands. Select use of equipment and seasonal clearing is conducted when needed for rare plants; construction activities are restricted in areas with identified rare plants. ▪ Standard requirements exist to avoid adverse impacts to caves, protected animals, unique/important habitat (e.g., cave buffers, restricted herbicide use, seasonal clearing of suitable habitat).
X	16, 17, 18, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 48, 50, 51, 52, 53, 54, 55, 58, 59, 60, 61, 62, 63, 64, 65, 67, 70, 71, 73, 76, 77, 78, 80, 81, 82, 83, 86, 87, 88, 89, 90	<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>
	16, 17, 18, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 48, 50, 51, 52, 53, 54, 55, 56, 57,	<p>SSPC3 (Power Plants only) - Power Plant actions and activities will continue to implement standard environmental practices. These include:</p> <ul style="list-style-type: none"> ○ Best Management Practices (BMPs) in accordance with regulations: <ul style="list-style-type: none"> ▪ Ensure proper disposal of waste, ex: used rags, used oil, empty containers, general trash, dependent on plant policy ▪ Maintain every site with well-equipped spill response kits, included in some heavy

Project Review Form - TVA Bat Strategy (09/14/2018)

Check if applies to Project	Activities Subject to Conservation Measure	Conservation Measure Description
	58, 59, 61, 62, 63, 64, 65, 67, 69, 70, 71, 73, 76, 77, 80, 81, 82, 83, 84, 86, 87, 88, 89, 90, 91	<p>equipment</p> <ul style="list-style-type: none"> ▪ Conduct Quarterly Internal Environmental Field Assessments at each sight ▪ Every project must have an approved work package that contains an environmental checklist that is approved by sight Environmental Health & Safety consultant ▪ When refueling, vehicle is positioned as close to pump as possible to prevent drips, and overfilling of tank. Hose and nozzle are held in a vertical position to prevent spillage <ul style="list-style-type: none"> o Construction Site Protection Methods <ul style="list-style-type: none"> ▪ Sediment basin for runoff - used to trap sediments and temporarily detain runoff on larger construction sites ▪ Storm drain protection device ▪ Check dam to help slow down silt flow ▪ Silt fencing to reduce sediment movement o Storm Water Pollution Prevention (SWPP) Pollution Control Strategies <ul style="list-style-type: none"> ▪ Minimize storm water contact with disturbed soils at construction site ▪ Protect disturbed soil areas from erosion ▪ Minimize sediment in storm water before discharge ▪ Prevent storm water contact with other pollutants ▪ Construction sites also may be required to have a storm water permit, depending on size of land disturbance (>1 ac) o Every site has a Spill Prevention and Control Countermeasures (SPCC) Plan and requires training. Several hundred pieces of equipment often managed at the same time on power generation properties. Goal is to <ul style="list-style-type: none"> ▪ Minimize fuel and chemical use Ensure proper disposal of waste, ex: used rags, used oil, empty containers, general trash, dependent on plant policy ▪ Maintain every site with well-equipped spill response kits, included in some heavy equipment ▪ Conduct Quarterly Internal Environmental Field Assessments at each sight ▪ Every project must have an approved work package that contains an environmental checklist that is approved by sight Environmental Health & Safety consultant ▪ When refueling, vehicle is positioned as close to pump as possible to prevent drips, and overfilling of tank. Hose and nozzle are held in a vertical position to prevent spillage o Construction Site Protection Methods <ul style="list-style-type: none"> ▪ Sediment basin for runoff - used to trap sediments and temporarily detain runoff on larger construction sites ▪ Storm drain protection device ▪ Check dam to help slow down silt flow ▪ Silt fencing to reduce sediment movement o Storm Water Pollution Prevention (SWPP) Pollution Control Strategies <ul style="list-style-type: none"> ▪ Minimize storm water contact with disturbed soils at construction site ▪ Protect disturbed soil areas from erosion ▪ Minimize sediment in storm water before discharge ▪ Prevent storm water contact with other pollutants ▪ Construction sites also may be required to have a storm water permit, depending on size of land disturbance (>1 ac) o Every site has a Spill Prevention and Control Countermeasures (SPCC) Plan and requires training. Several hundred pieces of equipment often managed at the same time on power generation properties. Goal is to minimize fuel and chemical use
	17, 22, 32, 33, 34, 35, 36	<p>SSPC4 (Transmission only) - Woody vegetation burn piles associated with transmission construction will be placed in the center of newly established ROWs to minimize wash into any nearby undocumented caves that might be on adjacent private property and thus outside the scope of field survey for confirmation. Brush piles will be burned a minimum of 0.25 miles from documented caves and otherwise in the center of newly established ROW when proximity to caves on private land is unknown.</p>

Project Review Form - TVA Bat Strategy (09/14/2018)

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

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).

STEP 14) Save completed form 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:

Freddie Bennett (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.

STEP 15) For Use by Terrestrial Zoologist if Project and Form are Submitted for Review

☒ Terrestrial Zoologist acknowledges that Project Lead/Contact (name) Freddie Bennett has been informed on 1/8/2019 (date) 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 (0 ac ☒ trees) and that use of Take will require \$0 contribution to TVA's Conservation Fund upon completion of activity (amount entered should be \$0 if cleared in winter).