U.S. Department of Transportation
Federal Highway Administration

South Carolina

1835 Assembly Street, Suite 1270
Columbia, South Carolina 29201
803-765-5411
803-253-3989

October 11, 2016

In Reply Refer To:
HDA-SC

Ms. Heather Robbins
Director, Environmental Services Office
South Carolina Department of Transportation
955 Park Street, P.O. Box 191
Columbia, SC 29202

Dear Ms. Robbins:

The South Carolina Department of Transportation (SCDOT) recently submitted a Categorical Exclusion (CE) for the Proposed Key Road (S-68) Bridge Replacement in Edgefield and McCormick Counties, South Carolina (Federal Project Number P035179). The FHWA has determined that the project will not have significant impacts and there will be no effect on threatened or endangered species or cause adverse impacts to historic resources. Enclosed is the approved CE for the project.

Please ensure that the project commitments made during the NEPA process are included in the project construction proposal and ultimately carried out. Please address any questions you may have concerning this project to Mr. J. Shane Belcher at 803-253-3187 or jeffrey.belcher@dot.gov.

Sincerely,

J. Shane Belcher

(for) Emily O. Lawton
Division Administrator

Enclosure

ec: David Kelly, SCDOT NEPA Coordinator RPG 4

NON-PROGRAMMATIC
CATEGORICAL EXCLUSION

Project ID No. 35179
Federal Project No. P035179 — County: Edgefield & McCormick
Route: S-68 (Key Road) — Date: September 28, 2016

To: Federal Highway Administration

From: David Kelly, RPG 4 NEPA Coordinator/Architectural Historian; SCDOT

Description: Proposed S-68 (Key Road) Bridge Replacement over Turkey Creek

(SEE ATTACHMENT)

The Department is proposing to replace the existing structurally deficient and functionally obsolete S-68 (Key Road) bridge over Turkey Creek. The Department's environmental assessment has determined the effects of this project are as described in the "Programmatic Agreement Between the Federal Highway Administration, South Carolina Division and the South Carolina Department of Transportation Regarding Approval of Actions Classified as Categorical Exclusions for Federal-Aid Highway Projects" dated May 23, 2016, and is in compliance with the required findings reflected below. The project has been assessed for possible effects on the human and natural environment with a determination that no significant environmental impact will occur. The class of action and impact determination documented by this statement would qualify this project as a categorical exclusion under 23 CFR 771, Section 115(b).

A determination has been made that the project may effect, but is not likely to adversely affect one (1) federally-listed species, the Carolina heelsplitter, and its critical habitat. Extra precautions have been incorporated into the project to minimize potential impacts to the species and its habitat in the vicinity of the project. The USFWS concurred with the Department's determination and implementation of precautions; therefore, no further investigation under Section 7 of the Endangered Species Act is necessary.

The project will not impact waters of the U.S.; therefore, no permit or further coordination under Section 404 of the Clean Water Act (CWA) is necessary. In accordance with Section 401 of the CWA, a Permit for Construction in Navigable Waters has been issued by SCDHEC for the project, which satisfies the requirements for a Water Quality Certification.

In consultation with the SHPO, the project has been determined to affect one (1) property, the existing S-68 bridge, identified as being on or eligible for inclusion in the National Register of Historic Places. A Section 4(f) Programmatic Evaluation was performed and a Memorandum of Agreement

(MOA) has been developed to resolve adverse effects to the historic resource in accordance with 36 CFR 800.6(b). Therefore, no further coordination under Section 106 of the National Historic Preservation Act or Section 4(f) of the Department of Transportation Act is necessary.

10/11/2016
Date

David P. Kelly
Digitally signed by David P. Kelly
DN: cn=David P. Kelly, o=SCDOT, ou=SCDOT, email=kellydp@scdot.org, c=US
Date: 2016.10.11 12:51:24 -04'00'

South Carolina Department of Transportation

10/11/2016
Date

J. Shane Belcher

Federal Highway Administration

Date: 09/28/2016	SCDOT NEPA ENVIRONMENTAL COMMITMENTS FORM	

Project ID : 35179 | County : Edgefield | District : District 2 | Doc Type: CE-C | Total # of Commitments: 11

Project Name: Proposed S-68 (Key Road) Bridge Replacement over Turkey Creek

The Environmental Commitment **Contractor Responsible** measures listed below **are to be included in the contract and must be implemented**. It is the responsibility of the Program Manager to make sure the Environmental Commitment **SCDOT Responsible** measures are adhered to. If there are questions regarding the commitments listed please contact:

CONTACT NAME: Mr. Chris Jordan, P.E. **PHONE #:** (803) 737-9939

ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Non-Standard Commitment Responsibility: SCDOT

Right-of-Way

In lieu of a federal land transfer, the SCDOT will obtain easements for the necessary right-of-way from the USFS for construction access and future maintenance of the proposed bridge.

Displacements Responsibility: SCDOT

The SCDOT will acquire all new right-of-way and process any relocations in compliance with the Uniform Relocation Assistance and Real Property Acquisition policies Ace of 1970, as amended (42 U.S. C. 4601 et seq.). The purpose of these regulations is to ensure that owners of real property to be acquired for Federal and federally-assisted projects are treated fairly and consistently, to encourage and expedite acquisition by agreements with such owner, to minimize litigation and relieve congestion in the courts, and to promote public confidence in Federal and federally-assisted land acquisition programs.

Non-Standard Commitment Responsibility: CONTRACTOR

Cultural Resources

The following conditions will be implemented to minimize impacts and avoid adverse effects to archaeological site 38MC1945:

1) Identify protected portions of the site on construction plans
2) Erect construction fencing along the protected portion of the site
3) Inform contractors that no staging of equipment or material will be allowed within the protection portion of the site (including notes on construction plans)
4) Provide an archaeological monitor during construction; and
5) Implement a late discovery clause for inadvertent findings.

Project ID : 35179	SCDOT NEPA ENVIRONMENTAL COMMITMENTS FORM	

ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Cultural Resources Responsibility: CONTRACTOR

The contractor and subcontractors must notify their workers to watch for the presence of any prehistoric or historic remains, including but not limited to arrowheads, pottery, ceramics,flakes, bones, graves, gravestones, or brick concentrations during the construction phase of the project, if any such remains are encountered, the Resident Construction Engineer (RCE) will be immediately notified and all work in the vicinity of the discovered materials and site work shall cease until the SCDOT Archaeologist directs otherwise.

Non-Standard Commitment Responsibility: SCDOT

Section 4(f) Memorandum of Agreement (MOA)

MEMORANDUM OF AGREEMENT BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION, THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION, THE UNITED STATES FOREST SERVICE, AND THE SOUTH CAROLINA HISTORIC PRESERVATION OFFICE REGARDING THE BRIDGE REPLACEMENT OF S-68 (KEY ROAD) BRIDGE OVER TURKEY CREEK IN THE SUMTER NATIONAL FOREST

STIPULATIONS: The FHWA and SCDOT will ensure that the following stipulations are implemented:

1. Prior to demolition, the existing bridge will be advertised with a thirty day notice period by the SCDOT for alternative use as long as a responsible party agrees to maintain and preserve the bridge. If no third party agrees to maintain and preserve the existing bridge then stipulations two (2) and three (3) will be carried out.

2. SCDOT's contractors selected to perform the S-68 (Key Road) Bridge Replacement will also perform repair/rehabilitation work on the historic truss bridge carrying the USFS Wine/Turkey Creek Bike Ped Trail located downstream of the S-68 (Key Road) Bridge. This work will take place within the timeframe of the S-68 (Key Road) Bridge Replacement, will be concluded before the S-68 (Key Road) Bridge Replacement is completed, and will include the following items:

a. Replacing/repairing up to thirty percent (30%) of wooden bridge decking.
b. Replacing/repairing damaged sections of handrail as needed.
c. Clearing vegetation from bridge to include clearing tree limbs hanging over bridge or in immediate proximity of bridge.
d. Replacing/repairing northernmost span of bridge.
e. Replacing/refurbishing interpretive signage on the bridge.
f. Providing trailhead signage at the Prices' Bottom Trailhead for Wine/Turkey Creek Trail.
g. Replacing trailhead signage at intersection of Prices' Bottom Trailhead access road with S-68 (Key Road).

3. SCDOT will provide USFS and SHPO plans or detailed work description for the work listed in Stipulation 2 above. USFS and SHPO will have fifteen (15) days to review this information and provide comments.

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ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Stormwater — Responsibility: SCDOT

Stormwater control measures, both during construction and post-construction, are required for SCDOT projects with land disturbance and/or constructed in the vicinity of 303(d), TMDL, ORW, tidal, and other sensitive waters in accordance with the SCDOT's MS4 Permit. The selected contractor would be required to minimize potential stormwater impacts through implementation of construction best management practices, reflecting policies contained in 23 CFR 650 B and SCDOT's Supplemental Specifications on Seed and Erosion Control Measures (latest edition).

Water Quality — Responsibility: SCDOT

The contractor will be required to minimize possible water quality impacts through implementation of construction BMPs, reflecting policies contained in 23 CFR 650B and the Department's Supplemental Specifications on Seeding and Erosion Control Measures (Latest Edition). Other measures including seeding, silt fences, sediment basins, etc. as appropriate will be implemented during construction to minimize impacts to Water Quality.

Migratory Bird Treaty Act (all bridge and box culvert projects) — Responsibility: CONTRACTOR

The federal Migratory Bird Treaty Act, 16 USC § 703-711, states that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not.

The Department will comply with the Migratory Bird Treaty Act of 1918 in regard to the avoidance of taking of individual migratory birds and the destruction of their active nests. Prior to construction/demolition of the bridges the Resident Construction Engineer (RCE) will coordinate with SCDOT Environmental Services Compliance Office to determine if there are any active nests on the bridge. After this coordination, it will be determined whether construction/demolition can begin. After construction/demolition has begun, measures can be taken to prevent birds from nesting, such as screens, noise producers, and deterrents etc. If during construction or demolition a nest is observed on the bridge that was not discovered during the biological surveys, the contractor will cease work and immediately notify the RCE, who will contact SCDOT Environmental Services Compliance Office. SCDOT biologists will determine whether the nest is active and the species utilizing the nest. After this coordination, it will be determined whether construction/demolition can resume or whether a temporary moratorium will be put into effect. All costs for determining the need for, the placing of deterrents, and applying of all special actions including, but not limited to, removing nests and any costs associated with conducting work in compliance with the Migratory Bird Treaty Act as stated herein will not be paid for separately but will be considered to have been included with other items of work.

Project ID : 35179	SCDOT NEPA ENVIRONMENTAL COMMITMENTS FORM	

ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Non-Standard Commitment | Responsibility: CONTRACTOR

Threatened and Endangered Species - Freshwater Mussels

1. The contractor would be required to minimize potential impacts through implementation of construction best management practices, reflecting policies contained in 23 CFR 650 B and the latest SCDOT Supplemental Technical Specifications for seeding and erosion control measures (SC-M-810-3 (7/15)).
2. Additional Erosion Control Measures have been implemented to include triple row of silt fence with a rip-rap filter berm with Class B rip-rap and #57 stone on each end bents. An increased inspection frequency of the silt fences is also an option with an additional inspection after a storm event with ½" or greater accumulation. The Resident Construction Engineer (RCE), in conjunction with SCDOT's Environmental Services Office (ESO) will decide if additional inspections of silt fence are necessary.
3. Sediment and erosion control measures include triple row silt fences, sediment dams, filter berms, ditch checks, slope interrupters, and inlet structure filters. The sediment and erosion control plan will be designed per the SCDOT's Stormwater Quality Design Manual.
4. The contractor will also include with the demolition plan, an oil and gas spill contingency plan. Copies of each shall be supplied to the SCDOT for submittal to the USFWS at least 60 days prior to bridge demolition.
5. The Demolition Plan will address the containment and prevention of debris falling in the creek during demolition.
6. The contractor will not be allowed to place any construction equipment or any materials in Turkey Creek. The contractor also will not be allowed to introduce any silt from the construction site into Turkey Creek. Furthermore, the contractor will ensure no construction items or debris enters Turkey Creek. It is the contractor's responsibility to provide a plan to the RCE to ensure adherence to these restrictions.
7. Stormwater shall be directed away from Turkey Creek and shall not be permitted to drain directly from the bridge deck into the creek via cuppers. Stormwater shall instead be directed through vegetative filter strips before entering Turkey Creek.
8. In the event additional species are listed as federally threatened or endangered prior to the construction of the project, SCDOT will consult with USFWS on the results of the surveys performed, if necessary, and will follow any USFWS regulations/requirements resulting from that consultation.

USTs/Hazardous Materials | Responsibility: SCDOT

If avoidance of hazardous materials is not a viable alternative and soils that appear to be contaminated are encountered during construction, the South Carolina Department of Health and Environmental Control (SCDHEC) will be informed. Hazardous materials will be tested and removed and/or treated in accordance with the United States Environmental Protection Agency and the SCDHEC requirements, if necessary.

Project ID : 35179	SCDOT NEPA ENVIRONMENTAL COMMITMENTS FORM	

ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Lead-Based Paint	Responsibility:	CONTRACTOR

The existing structures shall be removed and disposed of by the Contractor in accordance with Subsection 202.4.2 of the Standard Specifications. The Contractor's attention is called to the fact that this project may require removal and disposal of structural components containing lead-based paints. Removal and disposal of structural components containing lead-based paints shall comply with all applicable Federal, State, and Local requirements for lead as waste, lead in air, lead in water, lead in soil, and worker health and safety.

	Responsibility:	

	Responsibility:	

Project Description: The South Carolina Department of Transportation (SCDOT) proposes to replace the existing S-68/S-227 (Key Road) bridge over Turkey Creek in Edgefield and McCormick Counties, South Carolina. Specifically, the project is located within the Sumter National Forest, approximately 12 miles west of the Town of Edgefield and 12 miles southeast of the Town of McCormick (**Appendix A, Figure 1**). The proposed project would include the replacement of the existing bridge with a modern structure on its existing alignment. The project would also improve the existing roadway approaches to the bridge.

S-68/S-227 (Key Road) and the existing bridge over Turkey Creek currently accommodate two (2) lanes of one-way traffic. The existing bridge is approximately 304 feet in length and 20.2 feet in width, consisting of eleven (11) spans. The main span is a 150'-3" riveted Parker steel truss and is flanked by two (2) 16'-8" precast concrete slab spans and nine (9) 15' precast concrete approach spans. The existing bridge provides approximately 39'-8" of vertical clearance over Turkey Creek. Additionally, the existing bridge spans Turkey Creek; no bents or other bridge supports are located within the stream channel.

Minor amounts of new right-of-way, totaling approximately 0.01 acre would be necessary to accommodate the wider bridge (**Appendix A, Figure 2**); however, no displacements would result from the project. The project proposes to close the bridge during construction and utilize an off-site detour, approximately 11.3 miles in length (**Appendix A, Figure 3**).

Purpose and Need: The purpose of the project is to replace the structurally deficient and functionally obsolete S-68/S-227 (Key Road) bridge over Turkey Creek. The bridge was built in 1925 and relocated from Georgetown to its current location in 1961. The bridge has a sufficiency rating of 34.7 out of 100, classifying the bridge as structurally deficient and making it eligible for replacement through the Federal Highway Bridge Replacement and Rehabilitation Program. Additionally, the bridge is classified as functionally obsolete due to substandard lane and shoulder widths. Existing (2015) average daily traffic (ADT) on S-68/S-227 (Key Road) is approximately 200 vehicles per day (vpd). By 2035, the ADT is expected to increase to 300 vpd.

Project Funding: The funding for this project is referenced in the Statewide Transportation Improvement Program, or STIP, (Statewide), Revision 32 (Correction), 08/18/2016, page 24, Bridge Program – line item BRP-10; S-19-68 over Turkey Creek. The total cost for the project is listed as $5,502,000.00 [1].

Proposed Action: The proposed project involves the replacement of the existing S-68/S-227 (Key Road) bridge over Turkey Creek in Edgefield and McCormick Counties, South Carolina; please see **Appendix A** for project location figures. The proposed project would include replacement of the existing bridge with a modern structure located on its existing alignment. The project would also improve the existing roadway approaches to the bridge.

The new bridge would measure 320 feet in length and 37'-3" in width. The structure would accommodate two (2) 11-foot travel lanes, one (1) in each direction, and 6-foot shoulders (see **Appendix B** for preliminary design plans of the proposed bridge structure). The proposed bridge is comprised of two (2) spans, including a 215-foot main span and a 105-foot span. The 215-foot main span would be a simply supported steel girder span with an expansion joint at the interior bent. The second span would be constructed of concrete beams. Two (2) 20-foot approach slabs are also proposed, one on each end of the bridge.

[1] STIP (Statewide), Revision 32 (Correction), 08/18/2016, page 24-1, Bridge Program – BRP-10; S-19-68 over Turkey Creek line item. Referenced on September 26,2016 at: http://www.scdot.org/inside/pdfs/STIP/Statewide/Bridge.pdf

Approximately 38 feet of vertical clearance will be provided by the new bridge, a slight reduction from the existing clearance. The minimum horizontal clearance would be expanded to approximately 215 feet, completely spanning Turkey Creek and providing a greater hydraulic opening. No bents would be located in Turkey Creek.

Roadway approaches would be improved for a total of 2,180 feet, including approximately 1,030 feet on the Edgefield County side of the bridge and approximately 1,150 feet on the McCormick County side of the bridge. Including the proposed bridge, the total project length is approximately 2,500 feet in length.

Alternatives Analysis: Five (5) alternatives were developed and considered for the project. The alternatives considered for the project are the (1) "No-Build", (2) Rehabilitation Alternative, (3) Replacement Upstream, (4) Replacement Downstream, and (5) Replacement on Existing Alignment. Each build alternative would be designed to maintain two (2) lanes of traffic and meet SCDOT current safety and design standards. Additionally, each of the build alternatives has been designed to transition to the existing horizontal roadway alignment as quickly as possible to minimize the length of the project while maintaining the desired design criteria. For safety and navigational reasons, each build alternative would also require the demolition of the existing bridge prior to construction of the new bridge, and would therefore result in an adverse effect to a historic resource eligible for listing on the National Register of Historic Places, the S-68/S-227 (Key Road) Bridge over Turkey Creek.

(1) The "No-Build" Alternative was considered in place of the bridge replacement project. This alternative would neither improve the bridge's sufficiency rating nor address the bridge's structurally deficient and functionally obsolete status. If the "No-Build" Alternative was selected, only routinely scheduled maintenance operations would occur on the bridge and it would continue to age and deteriorate. It is likely that SCDOT would eventually be required to post weight restrictions on the bridge, substantially reducing its ability to serve the motoring public. In future years, the bridge could be closed to vehicular traffic due to its deteriorated condition, requiring a permanent detour of approximately 11.3 miles for motorists and area residents. Due to future maintenance challenges and safety hazards posed by the existing bridge, and the potential intolerable restrictions placed on travel and the transport of goods, the "No-Build" Alternative was deemed an unacceptable alternative.

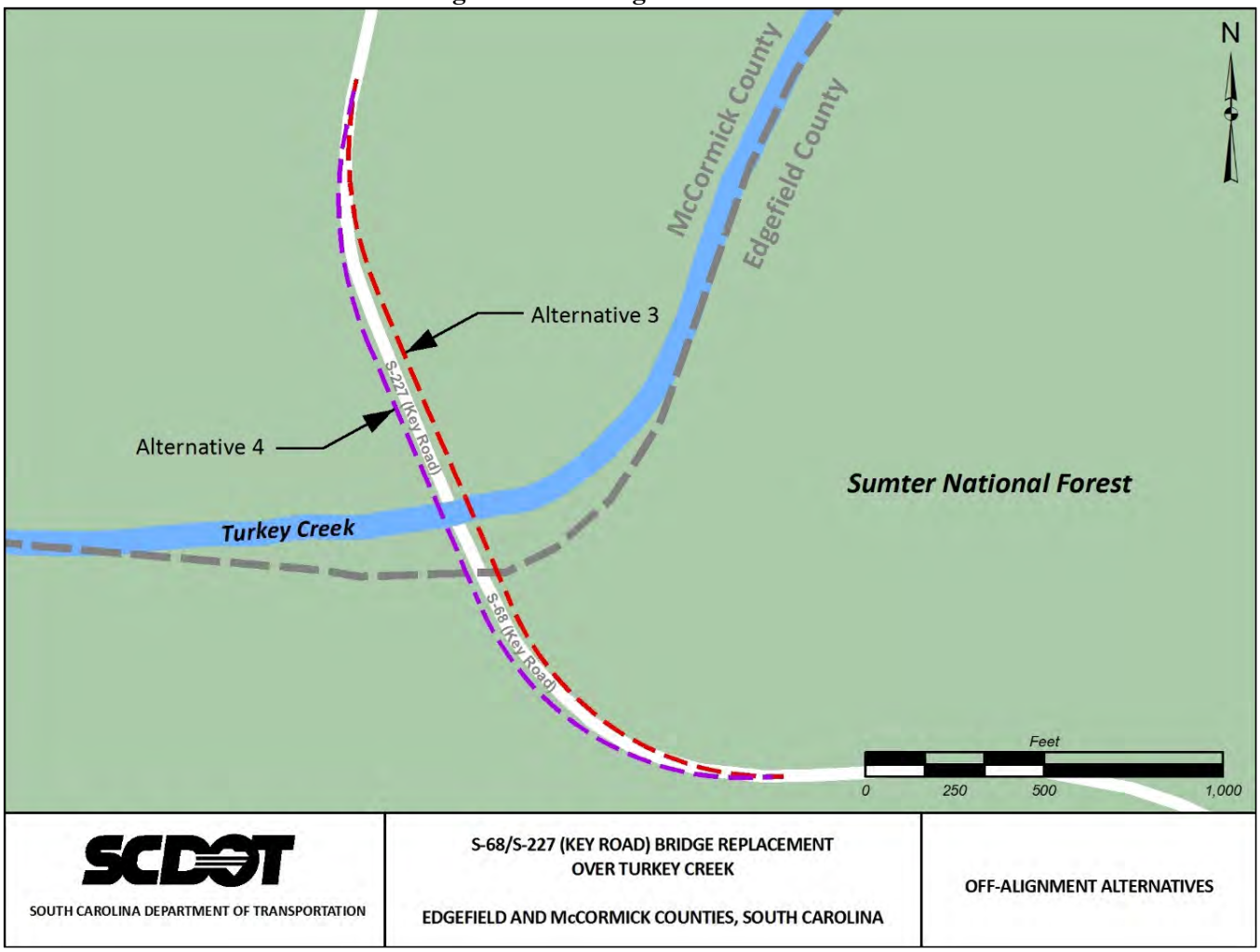
(2) The Rehabilitation Alternative was also considered in place of the proposed bridge replacement. Rehabilitation includes measures that address the structural condition of the bridge in order to maintain the carrying capacity rating without affecting the historic integrity of the bridge. This would require ongoing inspections, maintenance, and repairs to allow the bridge to be structurally sufficient without posting a vehicle weight limit. The rehabilitation measures would not address the functional obsolescence of the bridge, including the substandard width of travel lanes and absence of adequate roadway shoulders. Due to the age of and structural condition of the bridge and inability to address the functional obsolescence of the bridge, the rehabilitation alternative is not the most prudent and feasible alternative.

(3) The Replacement Upstream Alternative would replace the S-68/S-227 bridge with a new structure upstream, or east, of the existing alignment (**Figure 1**). Alternative 3 would involve constructing a new bridge 50 feet upstream of the existing alignment and realigning the approach roadways to tie in to the new bridge. Alternative 3 would shift the roadway to the inside of the existing roadway curve, presenting design challenges, and would likely require a reduction in the design speed of the roadway. This could result in safety concerns for the motoring public and would not be the best available option for meeting

design requirements. Alternative 3 would require additional roadway construction to realign the roadway approaches to the bridge and approximately 1.60 acres of additional right-of-way. These factors would increase the overall project costs and encroachment into the Sumter National Forest. In light of these factors, Alternative 3 was not considered the most prudent or feasible alternative when compared to replacement on existing alignment.

(4) The Replacement Downstream Alternative would replace the S-68/S-227 bridge downstream, or west, of the existing alignment (**Figure 1**). Alternative 4 would involve constructing a new bridge 50 feet downstream of the existing alignment and realigning the approach roadways to tie in to the new bridge. Alternative 4 would shift the roadway to the outside of the existing roadway curve, further increasing right-of-way acquisition (1.90 acres) and encroachment into the Sumter National Forest. Alternative 4 would also require additional roadway construction to realign the roadway approaches to the bridge, increasing overall project costs. In light of these factors, Alternative 4 was not considered the most prudent or feasible alternative when compared to replacement on existing alignment.

Figure 1: Off-Alignment Alternatives



(5) The Replacement on Existing Alignment Alternative would replace the S-68/S-227 bridge on existing alignment. Replacement of the bridge on existing alignment would require minimal right-of-way acquisition (0.10 acre) and the least roadway construction. Alternative 5 would also have the lowest project costs of the three (3) build alternatives, and would have the least encroachment on the Sumter National Forest.

Alternatives 1 and 2 do not meet the purpose and need of the project, either failing to address the structural deficiencies and/or the functional obsolescence of the existing bridge. None of the Build Alternatives would impact Jurisdictional Waters of the U.S., protected species, archaeological resources, or result in any displacements. Alternatives 3, 4, and 5 would adversely impact one (1) historic resource eligible for listing on the NRHP. However, the demolition of the resource reduces the likelihood of conflict with the existing bridge during construction and provides for easier constructability and safer traffic operations during construction.

Of the build alternatives, Alternatives 3 and 4 would result in the greatest encroachment on the Sumter National Forest and have the highest project costs. Alternative 5 was selected as the Preferred Alternative for the project due to its compatibility with design requirements, its minimal right of way acquisition (0.10 acre), its lower total project cost and minimal encroachment on the Sumter National Forest.

Acquisitions / Displacements: After careful review of the proposed projects plans (**Appendix B**), it has been determined that the project would not result in the relocation/displacement of any commercial or residential establishments.

The Preferred Alternative would acquire a minor amount (0.10 acre) of new right-of-way (ROW) from one (1) parcel in the immediate vicinity of the proposed bridge (**Appendix A, Figure 2**). This parcel is part of the Sumter National Forest and managed by the U.S. Forest Service (USFS). In lieu of a federal land transfer, the SCDOT will obtain easements for the necessary ROW from the USFS for construction access and future maintenance of the proposed bridge. No additional ROW is necessary for roadway approach improvements.

The SCDOT will acquire all new right-of-way in compliance with the Uniform Relocation Assistance and Real Property Acquisition policies Ace of 1970, as amended (42 U.S. C. 4601 et seq.). The purpose of these regulations is to ensure that owners of real property to be acquired for Federal and federally-assisted projects are treated fairly and consistently, to encourage and expedite acquisition by agreements with such owner, to minimize litigation and relieve congestion in the courts, and to promote public confidence in Federal and federally-assisted land acquisition programs.

Public Involvement: Due to the proposed project's limited environmental impacts, minimal ROW acquisition, and the low Average Daily Traffic (ADT) of the route (200 vehicle per day), it was determined that no public meetings for the project would be held. Signs notifying the public of the upcoming bridge replacement project will be placed in the project area prior to construction. These signs will be posted after the completion of the environmental document for a period of 15 days, which coincides with SCDOT policy for advertising an opportunity for a public meeting. The signs will indicate that a bridge closure and detour are anticipated and contact information will be provided.

Section 106 - Cultural Resources (Archaeological/Historic): In accordance with 36 CFR 800.4, archival research and coordination with the State Historic Preservation Office (SHPO) was performed to identify and help predict the locations of significant cultural resources in the vicinity of the proposed project. The archaeological

and architectural surveys performed were designed to provide the necessary management data to allow for the sites and properties to be evaluated for recommendations of eligibility to the National Register of Historic Places (NRHP). The project location and findings were coordinated with SHPO, the Catawba Indian Nation Tribal Historic Preservation Office (CIN-THPO), the Eastern Band of the Cherokee Indians, the United Keetoowah Band of Cherokee Indians (UKB), the Eastern Shawnee Tribe (EST), and the Advisory Council on Historic Preservation (ACHP).

Archaeology

SCDOT archaeologists documented three (3) new archaeological sites during field surveys, identified as 38ED857, 38ED858, and 38MC2653. Two (2) previously recorded sites (38MC254 and 38MC1945) were also revisited during field surveys. Sites 38ED857, 38ED858, and 38MC2653 were recommended not eligible for listing in the NRHP.

Sites 38MC254 and 38MC1945 remain unassessed for NRHP eligibility. The Preferred Alternative would include minor filling, clearing, and grubbing impacts to the perimeter of both sites. Due to previous disturbance to site 38MC254, the SCDOT determined that the project would have no adverse effect upon this site. Impacts to site 38MC1945 are anticipated to be minimal and are not likely to result in the loss of significant information about the site. Furthermore, the SCDOT plans to minimize impacts and avoid adverse effects to the site by implementing specific conditions during construction. A list of these conditions can be found in the Environmental Commitments Form.

Concurrence documents from the CIN-THPO, UKB, and EST regarding the above findings and avoidance measures are included in **Appendix C**.

The contractor and subcontractors must notify their workers to watch for the presence of any prehistoric or historic remains, including but not limited to arrowheads, pottery, ceramics, flakes, bones, graves, gravestones, or brick concentrations during the construction phase of the project, if any such remains are encountered, the Resident Construction Engineer (RCE) will be immediately notified and all work in the vicinity of the discovered materials and site work shall cease until the SCDOT Archaeologist directs otherwise.

Historic Architecture

One (1) historic architectural resource was identified in the architectural survey universe and recommended eligible for NRHP. This site, the S-68/S-227 (Key Road) Bridge over Turkey Creek was constructed in 1925 and determined to be "historically and technologically significant" as part of the 2013-14 statewide survey of historic bridges conducted by Transystems (McCahon).

The Preferred Alternative proposes the demolition and replacement of the S-68/S-227 bridge over Turkey Creek; therefore the project would result in an adverse effect to the resource. Notification of the proposed action was provided to the SHPO and ACHP in accordance with 36 CFR 800. The SHPO concurred with this determination on July 25, 2016. On August 10, 2016, the ACHP determined that the *Criteria for Council Involvement in Reviewing Individual Section 106 Cases* does not apply to the proposed action and ACHP participation in the consultation to resolve the adverse effect is not necessary.

As a facility eligible for the NRHP, the S-68/S-227 bridge over Turkey Creek is afforded protection under Section 4(f); please see the Section 4(f)/6(f) chapter of this document for more details. Copies of SHPO's concurrence and coordination with ACHP is included in the Programmatic Section 4(f) Evaluation in **Appendix D**.

Section 4(f)/6(f): No Section 6(f) properties were identified within the project boundaries. Two Section 4(f) resources are documented within the PSA.

The Wine-Turkey Creek Trail is a 12 mile (one-way) unpaved public-use trail within the Sumter National Forest. The trail crosses S-68/S-227 (Key Road) approximately 800 feet north of the bridge over Turkey Creek. As a facility located within the Sumter National Forest, the trail is afforded protections under Section 4(f). Each alternative was evaluated for the potential impact to the resource. Due to the location of the trail crossing, it was determined that each build alternative would result in a temporary closing of approximately 60 feet of the trail in the vicinity of Key Road. The Wine-Turkey Creek Trail bridge over Turkey Creek would also be closed while being rehabilitated as part of the overall S-68 Bridge Replacement scope.

It is proposed that these portions of the trail be closed during construction and reopened following construction. It is the intent of SCDOT to fully restore access to the trail; therefore, the project would have no permanent impact on the use or function of the trail. A concurrence letter from the U.S. Forest Service enables the FHWA to make a *de minimis* (minimal impact) finding, which satisfies the requirements of Section 4(f). *De minimis* impacts on publicly-owned parks, recreation areas, and wildlife and waterfowl refuges are defined as those that do not "adversely affect the activities, features and attributes" of the Section 4(f) resource. A copy of the *de minimis* determination, and associated agency coordination, is included in **Appendix E**.

As included in the **Section 106 - Cultural Resources (Archaeological/Historic)** chapter of this document, one (1) historic architectural resource was identified in the architectural survey universe and recommended eligible for the NRHP. This site, the S-68/S-227 (Key Road) Bridge over Turkey Creek was constructed in 1925 and determined to be "historically and technologically significant" as part of the 2013-14 statewide survey of historic bridges conducted by Transystems (McCahon). As a facility eligible for the NRHP, the resource is afforded protection under Section 4(f).

A Programmatic Section 4(f) Evaluation was conducted to consider various alternatives based on potential affects to the resource as well as the surrounding human and natural environment. The evaluation documents that all alternatives propose the demolition of the existing S-68/S-227 bridge for safety and navigational reasons prior to construction of the new bridge. However, replacing the existing bridge on the existing alignment would have the least impact on the surrounding environment, and was therefore selected as the Preferred Alternative. Based on the above considerations, there is no prudent and feasible alternative to the Section 4(f) use of the S-68/S-227 (Key Road) bridge over Turkey Creek, and the Preferred Alternative includes all possible planning to minimize harm to the resource resulting from such use.

The SCDOT and the SHPO considered several potential options for mitigation to offset the adverse effect the project would have on the Key Road bridge. A Memorandum of Agreement (MOA) was developed and outlines recommendations concerning mitigation for the bridge. Final approval on the MOA was received on August 25, 2016 and was signed by representatives from the SCDOT, the SHPO, the USFS, and the FHWA. The approved MOA and supporting documentation were filed with the ACHP in September 2016, thus completing the Section 106 consultation process. The approved mitigation recommendations can be found in the Environmental

Commitments Form and attached MOA. The FHWA and SCDOT will ensure that the agreed-upon stipulations are implemented.

A copy of the Programmatic Section 4(f) Evaluation, including the MOA, is included in **Appendix E**.

Water Quality: The project is located in the Lower Savannah River Basin (USGS Hydrologic Unit Code [HUC] 03060107), which consists of sixteen (16) watersheds and approximately 2,500 square miles of South Carolina. Specifically, the PSA lies within the Turkey Creek Watershed (HUC 03060107-02), and drains to SCDHEC water quality monitoring station SV-352. Station SV-352 is located on Turkey Creek at S-68/S-227 (Key Road), within the PSA.

The SCDHEC's Notice of Intent Water Quality Information Tool was accessed on March 17, 2016 to determine if the project drains to an impaired waterbody. According to SCDHEC's report, Station SV-352 is impaired based on Escherichia coli (ECOLI) levels. A Total Maximum Daily Load (TMDL) has not been established for ECOLI or any other impairment in the project watershed; please see **Appendix F** for a copy of the SCDHEC Watershed and Water Quality Information Report.

Stormwater control measures, both during construction and post-construction, are required for SCDOT projects constructed in the vicinity of 303(d), TMDL, ORW, tidal, and other sensitive waters in accordance with the SCDOT's MS4 Permit. Due to the existing water quality impairment within the project watershed, SCDHEC may require additional water quality protection and stormwater treatment measures during and after construction. However, the proposed project is not anticipated to contribute to the existing ECOLI impairment or have long term impacts on water quality within the watershed.

The contractor would also be required to minimize potential impacts through implementation of construction best management practices, reflecting policies contained in 23 CFR 650 B and the latest SCDOT Supplemental Technical Specifications for seeding and erosion control measures (SC-M-810-3 (7/15)).

Wetlands and Streams: Field reviews were conducted within the PSA for the presence of wetlands and other waters of the U.S. in February 2015. One (1) stream, Turkey Creek, was delineated during these field reviews. Jurisdictional determination and verification of delineated waters of the U.S. has been received by the U.S. Army Corps of Engineers (USACE) and issued SAC 2015-00468-DJJ (**Appendix G**).

Permitting: A Clean Water Act Section 404 permit is required for impacts to waters of the U.S., including wetlands. Section 404 is administered by the U.S. Army Corps of Engineers (USACE). Depending on the type and extent of waters of the U.S., including wetlands, to be impacted, Section 404 permitting requirements can range from activities that are considered exempt or preauthorized to those requiring pre-construction notification (PCN) for a Nationwide Permit (NWP) or Individual Permit (IP) from the USACE. For SCDOT projects, an USACE General Permit (GP) (SAC 2015-1280, SAC 2015-1281, SAC 2015-1282, SAC 2015-1283, SAC 2015-1284, SAC 2015-1285, or SAC 2015-1286) may be applicable depending on the anticipated impacts of the project.

Based on preliminary engineering, the project proposes to span Turkey Creek in its entirety; therefore, a Section 404 Permit is not anticipated. In accordance with Section 401 of the Clean Water Act, a Permit for Construction in Navigable Waters has been issued by SCDHEC for the project, which satisfies the requirements for a Water

Quality Certification. This permit was issued on May 29, 2015 and referenced authorization number SC GP 95-002 16-001.

Compensatory mitigation is not anticipated to be required due to the avoidance of impacts to waters of the U.S. In the event project plans are modified and would result in impacts to waters of the U.S., permitting requirements will be reevaluated and addressed accordingly.

Floodplains: Floodplain and floodway protection is required under several federal, state, and local laws, including Executive Order 11988, entitled "Floodplain Management," which requires federal agencies to avoid making modifications to and supporting development in floodplains wherever practical. Floodplains subject to inundation by the one-percent-annual-chance (100 year) flood event are regulated by the Federal Emergency Management Agency (FEMA).

Based upon a review of the floodplain mapping (FIRM Map ID 45065C0300D) of the project study area, the proposed project crosses the FEMA-regulated Zone A floodplain of Turkey Creek. SCDOT requires all Zone A crossings to be analyzed for the 100-year flood to insure that the floodplain encroachment does not cause one (1) foot or more of backwater when compared to unrestricted or natural conditions. A Bridge Scope and Risk Assessment Form was completed to evaluate potential impacts to the floodplain and indicates that the project would not impact the Turkey Creek floodplain; please see **Appendix H** for a copy of the Bridge Scope and Risk Assessment Form.

Threatened and Endangered Species: Pursuant to Section 7 of the Endangered Species Act (ESA), field surveys were conducted for federally protected species within the project study area. A search of the U.S. Fish and Wildlife Service (USFWS) database identified five (5) federally threatened or endangered species known to occur or to have formerly occurred in Edgefield and/or McCormick Counties, as listed in Table 1. Please note: Table 1 also includes nine (9) at-risk species (ARS) and the bald eagle (*Haliaeetus leucocephalus*). The bald eagle is no longer protected under the ESA, but is afforded protection through the Bald and Golden Eagle Protection Act (BGEPA) of 1940.

Animal species that are on the South Carolina state protected species list receive protection under the South Carolina Nongame and Endangered Species Conservation Act (South Carolina Code, Title 50). One (1) additional species is currently listed as state threatened or endangered in Edgefield and/or McCormick Counties. This species is listed as Webster's salamander (*Plethodon websteri*), as listed in Table 1 below.

Methodology

An area approximately 300 feet in width and 4,200 feet in length, generally centered on the S-68/S-227 (Key Road) bridge over Turkey Creek, was reviewed for protected species on July 10, 2015 and April 27, 2016. Areas that matched the descriptions of preferred habitat for protected species were classified as protected species habitat and were surveyed for the presence of the species. A one-half mile buffer around the PSA was also reviewed for potential red-cockaded woodpecker nesting habitat. Additionally, a survey was also conducted in December 2015 to identify the presence or absence of freshwater mussels, including Carolina heelsplitter (*Lasmigona decorata*), in the vicinity of the project. Mussel surveys were conducted from approximately 400 meters downstream of the existing bridge crossing to approximately 100 meters upstream of the crossing for a total distance of approximately 500 meters.

At-Risk Species (ARS) do not receive legal protection from the ESA; therefore, surveys for these species were not conducted as part of Section 7 compliance.

TABLE 1
THREATENED, ENDANGERED, AND AT-RISK SPECIES

Protected Species		County Listed	Protection Status	
Common Name	**Scientific Name**		**Federal**	**State**
Bird Species				
American wood stork	*Mycteria americana*	McCormick	T	-
Bald eagle	*Haliaeetus leucocephalus*	Edgefield & McCormick	BGEPA	T
Red-cockaded woodpecker	*Picoides borealis*	Edgefield & McCormick	E	E
Fish Species				
American eel	*Anguilla rostrata*	Edgefield & McCormick	ARS	-
Blueback herring	*Alosa aestivalis*	Edgefield & McCormick	ARS	-
Robust redhorse	*Moxostoma robustum*	Edgefield & McCormick	ARS	-
Insect Species				
Septima's clubtail	*Gomphus septima*	McCormick	ARS	-
Mammal Species				
Tri-colored bat	*Perimyotis subflavus*	Edgefield & McCormick	ARS	-
Mollusk Species				
Brook floater	*Alasmidonta varicosa*	Edgefield & McCormick	ARS	-
Carolina heelsplitter	*Lasmigona decorata*	Edgefield & McCormick	E,CH	E
Plant Species				
Carolina-birds-in-a-nest	*Macbridea caroliniana*	Edgefield	ARS	-
Georgia aster	*Symphyotrichum georgianum*	Edgefield & McCormick	ARS	-
Miccosukee gooseberry	*Ribes echinellum*	Edgefield & McCormick	T	-
Ocmulgee skullcap	*Scutellaria ocmulgee*	Edgefield	ARS	-
Relict trillium	*Trillium reliquum*	Edgefield	E	-
Reptile Species				
Webster’s salamander	*Plethodon websteri*	Edgefield & McCormick	-	E

BGEPA = Bald and Gold Eagle Protection Act; T = Threatened, E = Endangered, CH= Critical Habitat, ARS = At Risk Species

Results / Biological Conclusions

Based on the literature and field reviews, it is determined that the proposed project will have a biological conclusion of 'no effect' on American wood stork, bald eagle, red-cockaded woodpecker, Miccosukee gooseberry, or relict trillium.

Freshwater mussel surveys identified one (1) individual Carolina heelsplitter approximately 70 feet upstream of the existing S-68/S-227 (Key Road) bridge. The proposed project is also adjacent to a segment of Turkey Creek designated as Critical Habitat for the species. The project does not propose bridge supports within the stream channel, and there will be no temporary disturbance to the stream bottom from in-stream construction causeways, work pads, or construction within the Turkey Creek. Therefore, a biological conclusion of "May Affect, Not Likely to Adversely Affect" was provided for both the Carolina heelsplitter and Critical Habitat Unit 5. Based on the information provided and additional environment commitments (see Environmental Commitments) agreed to by USFHWA and SCDOT to protect the species and its critical habit, the USFWS concurred with the determination that the proposed project may affect, but is not likely to adversely affect, the species or its critical habitat. A copy of the freshwater mussel survey is included in the Natural Resources Technical Memorandum (NRTM), dated May 2016. The NRTM as well as the USFWS concurrence letter, dated April 20, 2016, can be found within **Appendix I**.

No individuals Webster's salamander were directly observed within the PSA during the July 2015 field reviews; however, a population of the species was identified in 1983 approximately 250 feet downstream of the PSA. Due to the proximity of the known population downstream and the similar habitat found within the PSA, it was determined that Webster's salamander may inhabit the area of mixed hardwoods along the southern banks of Turkey Creek. Only one bridge support is proposed in the vicinity of the potential habitat for the species. This end bent will be constructed at the top of the hill slope, in a transitional area between mixed hardwoods and pine forest, and within the disturbed footprint of the existing bridge. If present, individuals of Webster's salamander may experience temporary disturbance during construction due to noise and vibration associated with the demolition of the existing bridge and construction of the new bridge. Any individuals of the species temporarily impacted by these activities would likely reinhabit the area following construction. Therefore, a biological conclusion of "May Affect, Not Likely to Adversely Affect" was provided for Webster's salamander.

Federally proposed, endangered, or threatened species, and USFS sensitive (PETS) species: The proposed project is located within the Sumter National Forest; therefore, the USFHWA and SCDOT are required to consider PETS species during the project development. The USFS defines sensitive species as species identified by the Regional Forester as showing significant declines in population numbers, density, or habitat capability that could reduce the species' existing distribution.

The USFS provided information regarding PETS species of the Sumter National Forest (last updated September 2015). This database identifies 20 PETS species with potential occurrence within the Long Cane Ranger District, as listed in Table 2. Please note: Table 2 also includes the Carolina Heelsplitter (*Lasmigona decorata*), Miccosukee gooseberry (*Ribes echinellum*), relict trillium (*Trillium reliquum*), wood stork (*Mycteria americana*), bald eagle (*Haliaeetus leucocephalus*), and Webster's salamander (*Plethodon websteri*). Please see the Threatened and Endangered Species section of this document for additional details regarding these species, including the biological conclusion of the project's construction on each species.

To analyze potential impacts to PETS species associated with the proposed project, SCDOT provided areas of new right-of-way/easements and potential ground disturbance, including construction limits, clearing/grubbing limits, and bridge construction access. According to these limits, an area approximately 150 feet in width and 2,200 feet in length, generally centered on the S-68/S-227 (Key Road) bridge over Turkey Creek was reviewed for PETS species on April 27, 2016.

TABLE 2
PROPOSED, ENDANGERED, THREATENED, AND SENSITIVE (PETS) SPECIES

PETS Species		**Potential Habitat**	**Protection Status**
Common Name	**Scientific Name**		
Carolina heelsplitter	*Lasmigona decorata*	Yes	FE
Miccosukee gooseberry	*Ribes echinellum*	Yes	FT
Relict trillium	*Trillium reliquum*	Yes	FE
American wood stork	*Mycteria americana*	No	FT
Bachman's sparrow	*Peucaea aestivalis*	No	Sensitive
Bald eagle	*Haliaeetus leucocephalus*	No	Sensitive
Brook floater	*Alasmidonta varicosa*	Yes	Sensitive
Carolina darter	*Etheostoma collis*	Yes	Sensitive
Georgia Aster	*Symphyotrichum georgianus*	Yes	Sensitive
Indigo bush	*Amorpha schwerini*	Yes	Sensitive
Lanceleaf trillium	*Trillium lancifolium*	Yes	Sensitive
Migrant loggerhead shrike	*Lanius ludovicia migrans*	No	Sensitive
Nodding trillium	*Trillium rugelii*	No	Sensitive
Oglethorpe oak	*Quercus oglethorpensis*	Yes	Sensitive
Piedmont aster	*Eurybia mirabilis*	Yes	Sensitive
Rayed pink fatmucket	*Lampsilis splendida*	Yes	Sensitive
Robust redhorse	*Moxostoma robustrum*	Yes	Sensitive
Shoal's spider lilly	*Hymenocallis coronaria*	No	Sensitive
Sweet pinesap	*Monotropsis odorata*	No	Sensitive
Webster's Salamander	*Plethodon websteri*	Yes	Sensitive

FE = Federally Endangered; FT = Federally Threatened

No potential habitat for Bachman's sparrow, migrant loggerhead shrike, nodding trillium, shoal's spider lily, or sweet pinesap were identified within the PETS survey limits.

The project does not propose bridge supports within the stream channel, and there will be no temporary disturbance to the stream bottom from in-stream construction causeways, work pads, or construction within the

stream; therefore, adverse impacts to Carolina darter and robust redhorse are not expected to result from the project.

Three (3) individual brook floaters were identified during the freshwater mussel survey conducted in December 2015. No bridge supports will be located within the stream channel, and there will be no temporary disturbance to the stream bottom from in-stream construction causeways, work pads, or construction within the stream. Additionally, SCDOT has committed to take extra precautions during construction (see Environmental Commitments) in order to prevent the degradation of the habitat from sedimentation. As such, adverse impacts to brook floater are not expected to result from the project.

Field surveys did not identify any populations of Georgia aster, indigo bush, lanceleaf trillium, Oglethorpe oak, or piedmont aster within the PETS species survey limits; therefore, construction of the project will have no effect on these species. Additionally, no individuals of Rayed pink fatmucket were identified during the freshwater mussel survey; therefore construction of the project will have no effect on the species.

Additional surveys for Webster's salamander were conducted within the PETS species survey limits on April 27, 2016. The probability of detection during these field reviews was determined to be low due to the lack of recent rainfall and higher temperatures during field reviews. Additionally, potential habitat within the PETS species survey limits is not ideal habitat for the species. The PETS species survey limits are primarily comprised of areas previously disturbed for the construction of the existing roadway and bridge. The soils in these areas consist of compacted, clayey fill material with few rocks. This area also lacks an abundance of limbs and other natural debris favored by the species due to past construction of the bridge and maintenance clearing of vegetation immediately adjacent to the bridge. No individuals of the species were identified during surveys. As earlier stated, adverse impacts to this species are not expected to result from the project.

Noise: The proposed improvements do not represent a Substantial Horizontal Alteration. 23 CFR 772 states, "A substantial horizontal alteration would occur on a project that halves the distance between the traffic noise source and the closest receptor between the existing condition to the future build condition." Also, this project does not include the addition of through traffic lanes, a significant change in vertical alignment or any other conditions that would qualify it as a Type I project. Therefore, the requirements for conducting noise studies under 23 CFR 772 do not apply.

Air Quality / Mobile Source Air Toxics (MSATs): Edgefield and McCormick Counties are in attainment for National Ambient Air Quality Standards (NAAQS). As a result, Edgefield and McCormick Counties meet or exceed the standards established by the Environmental Protection Agency (EPA) for criteria pollutants and air quality.

The purpose of this project is to replace the existing Key Road bridge over Turkey Creek on its existing alignment. This project has been determined to generate minimal air quality impacts for Clean Air Act Amendments (CAAA) criteria pollutants and has not been linked with any special Mobile Source Air Toxic (MSAT) concerns. As such, this project will not result in any meaningful changes in traffic volumes, vehicle mix, location of the existing facility, or any other factor that would cause an increase in MSAT impacts of the project from that of the no-build alternative.

Moreover, EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on an FHWA analysis using EPA's MOVES2010b model even

if vehicle-miles travelled (VMT) increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period. This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project.

Land Use: The proposed bridge replacement is located in the Sumter National Forest, within a rural portion of South Carolina. Land use in the surrounding areas is dominated by undeveloped woodlands and sparse residential establishments. The bridge replacement is not expected to modify existing land use or change the timing or density of development in the area. The project is not in conflict with any plan, existing land use, or zoning regulation.

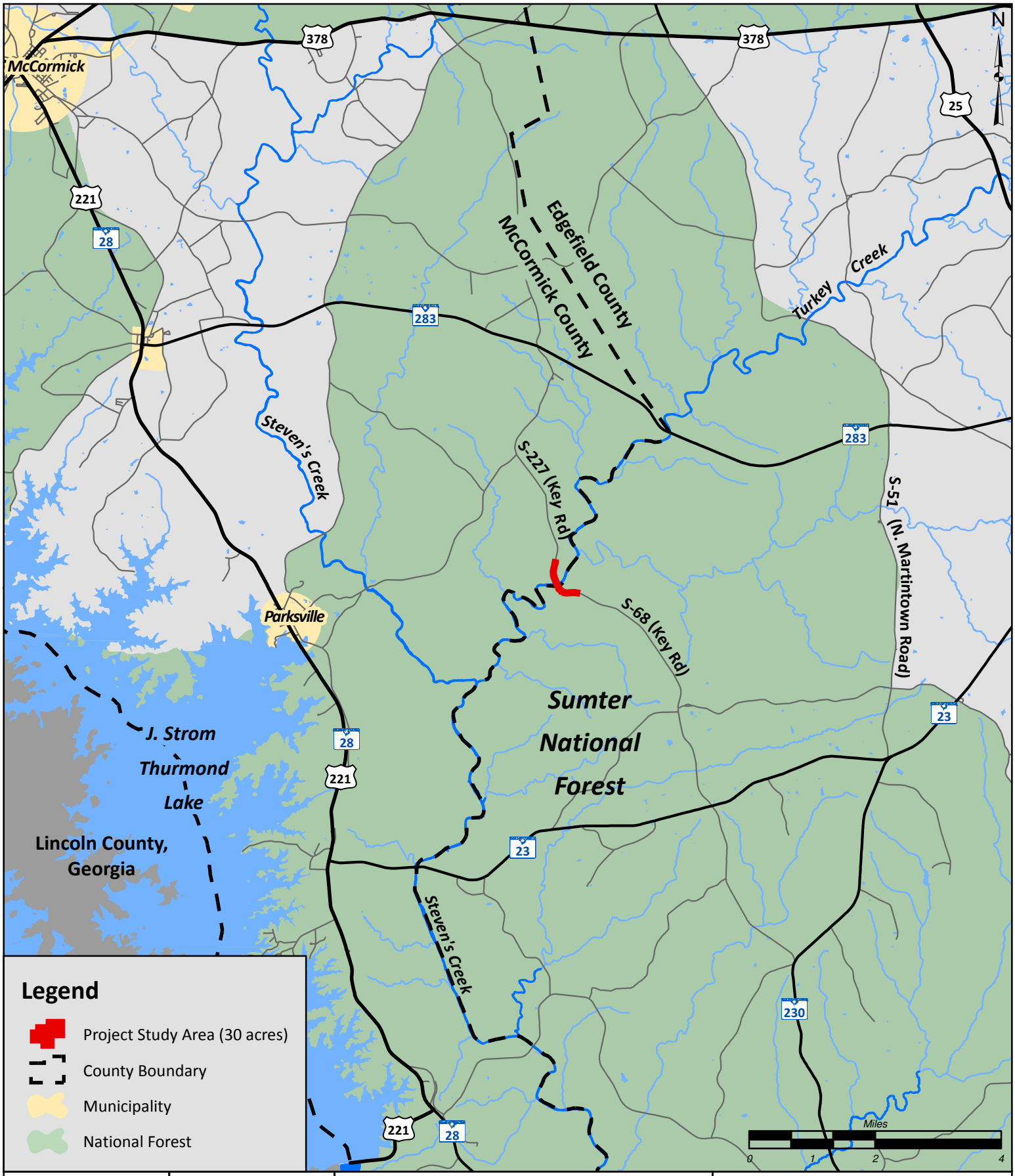
Hazardous Materials: The area directly adjacent to the project predominately consists of undeveloped woodland associated with the Sumter National Forest and has low potential for underground storage tanks (USTs). Therefore, there is low potential for uncovering USTs or other hazardous-material-containing sites during construction activities.

An examination of the project area and records available at the South Carolina Department of Health and Environmental Control (DHEC) by the Department indicated that there are no USTs located along Key Road in Edgefield or McCormick County. It is SCDOT's practice to avoid the acquisition of USTs and other hazardous waste materials, if at all possible. If soils that appear to be contaminated with petroleum products are encountered during construction, SCDHEC would be informed. If avoidance were not a viable alternative, tanks and other hazardous materials would be tested and removed and/or treated in accordance with the USEPA and SCDHEC requirements. Costs necessary for cleanup would be taken into consideration during the right-of-way appraisal and acquisition process.

Community Impacts: The area directly adjacent to the project predominately consists of undeveloped woodland associated with the Sumter National Forest. No commercial or residential developments are located within the project area or surrounding vicinity; therefore, the project would not result in an adverse impact on public facilities, businesses, or services nor is the project expected to adversely affect the social environment or local economy.

Appendix A

Project Figures



Mead & Hunt
878 South Lake Drive
Lexington, SC 29072
Tel. 803.996.2900
www.meadhunt.com

Edgefield and McCormick Counties

S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

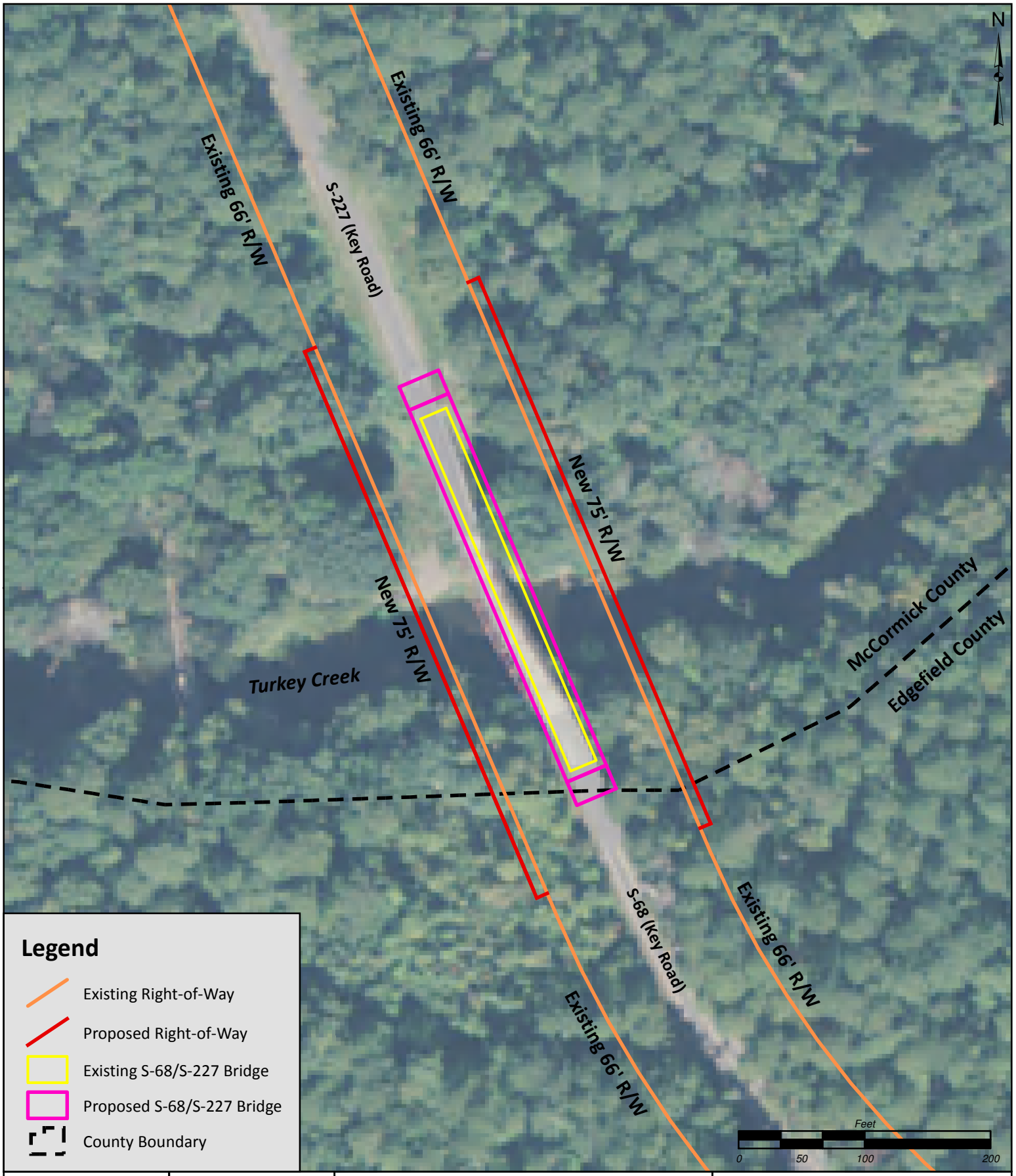
M&H PROJ: R3286900-140626.01
SCDOT PIN: 35179
USACE SAC: 2015-00468-DJJ

SOURCE: TIGER 2010 ROAD, COUNTY, AND MUNICIPALITY DATA

APPLICATION BY:
SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

SITE LOCATION MAP

DRAWN BY: MTD	QAQC BY: JBS
DATE: 03/08/2016	FIGURE 1



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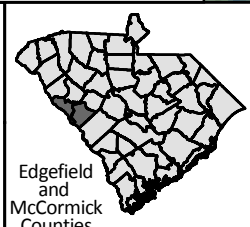


S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

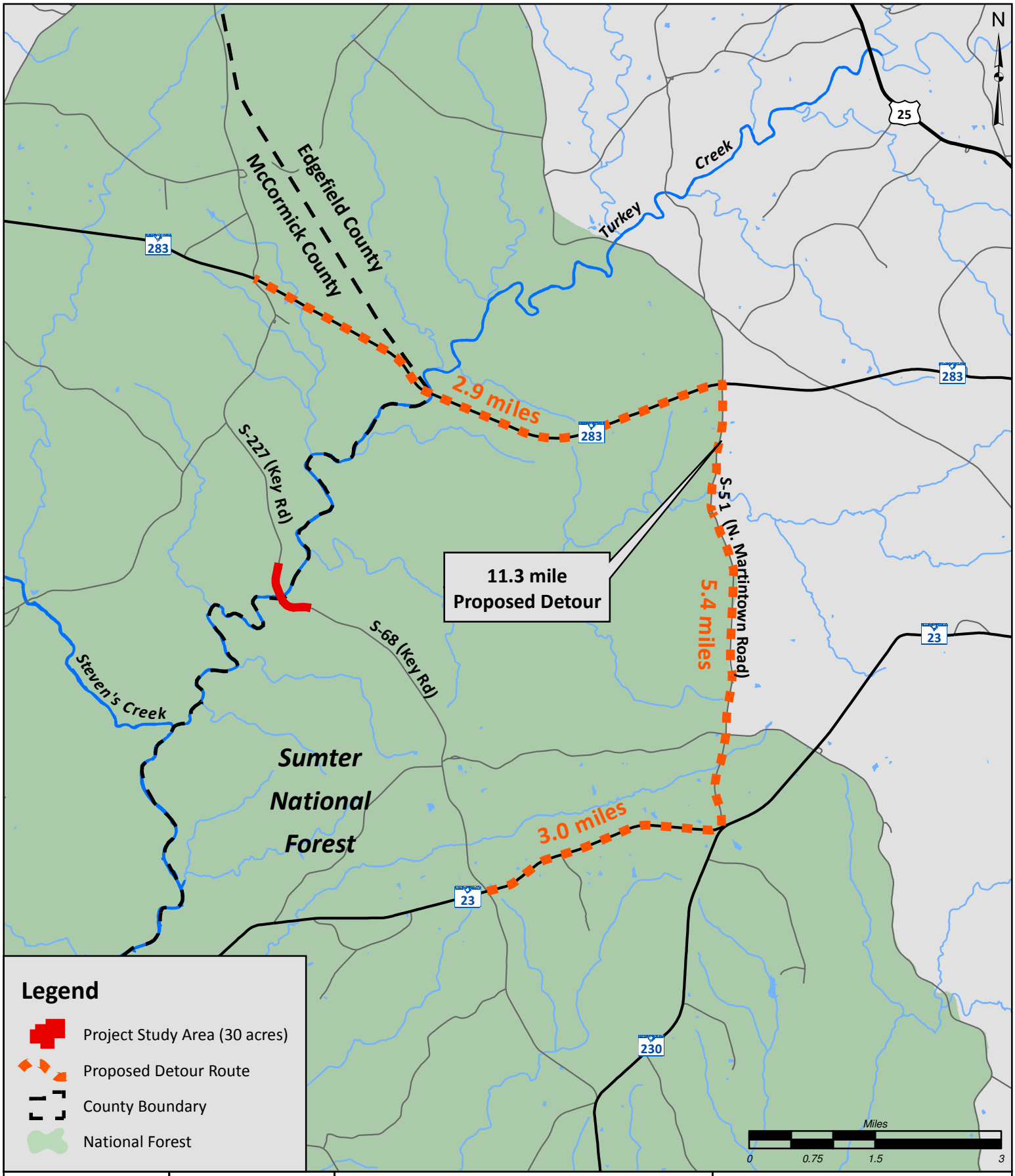
M&H PROJ: R3286900-140626.01
SCDOT PIN: 35179
USACE SAC: 2015-00468-DJJ

SOURCE: SCDOT PRELIMINARY PLANS

APPLICATION BY:
SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROPOSED RIGHT-OF-WAY IMPACTS

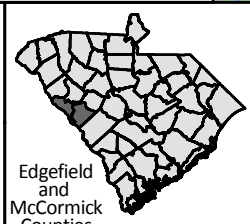
DRAWN BY: MTD
QAQC BY: JBS
DATE: 04/12/2016
FIGURE 2



Legend

- Project Study Area (30 acres)
- Proposed Detour Route
- County Boundary
- National Forest

Mead & Hunt
878 South Lake Drive
Lexington, SC 29072
Tel. 803.996.2900
www.meadhunt.com



S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

APPLICATION BY:
SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROPOSED DETOUR MAP

M&H PROJ: R3286900-140626.01
SCDOT PIN: 35179
USACE SAC: 2015-00468-DJJ

SOURCE: TIGER 2010 ROAD, COUNTY, AND MUNICIPALITY DATA

DRAWN BY: MTD | QAQC BY: JBS

DATE: 03/08/2016 | FIGURE 3

Appendix B

Preliminary Design Plans

b35179ts.dgn

BRIDGE PLANS ID	SHEET NO.
0035179-B01	1

INDEX OF SHEETS

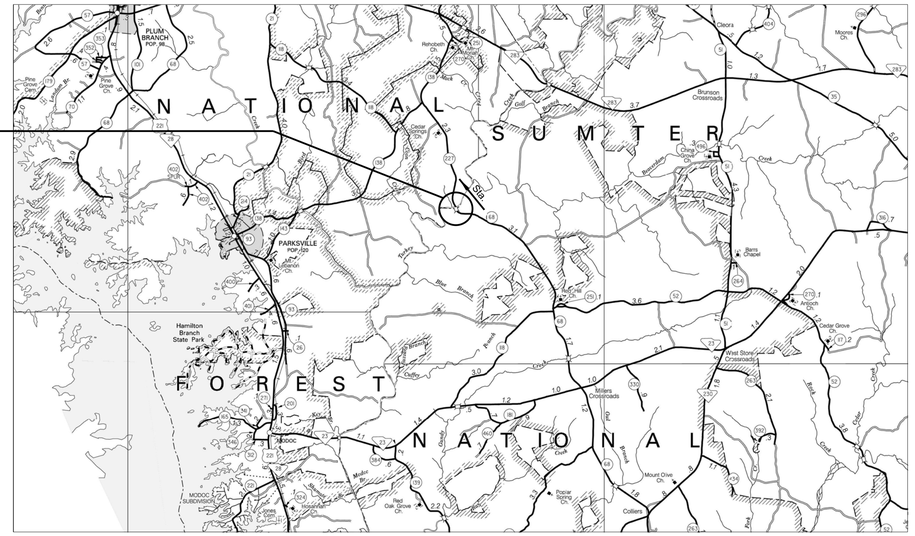
South Carolina Department of Transportation

PROPOSED PLANS FOR

EDGEFIELD / McCORMICK COUNTIES
PROJECT ID 0035179
ROAD S-68 / S-227 (KEY ROAD)
REPLACE BRIDGE OVER TURKEY CREEK

PRELIMINARY PLANS
NOVEMBER 4, 2015

SITE LOCATION



LAYOUT

Submit Shop Plans to:

SCDOT
Preconstruction Support Engineer
Attn: Logistics Coordinator - Shop Plans
955 Park Street - Room 409
Columbia, SC 29201

Approximate Location of Bridge is

Latitude	33° - 47' - 41"
Longitude	82° - 08' - 41"

	FOR CONSTRUCTION	
	INITIAL	DATE
RPG - HYDROLOGY		
RPG - STRUCTURES		
RPG - GEOTECHNICAL		
PRECONSTRUCTION SUPPORT - STRUCTURES		
RPG - DESIGN MANAGER		
RPG - PROGRAM MANAGER		

3 DAYS BEFORE DIGGING IN
SOUTH CAROLINA
CALL 811
SOUTH CAROLINA 811 (SC811)
WWW.SC811.COM
ALL UTILITIES MAY NOT BE A MEMBER OF SC811

ASSET ID 181

TRAFFIC DATA

2015 ADT 150 V.P.D.

2035 ADT 300 V.P.D.

TRUCKS 6 %

NET LENGTH OF ROADWAY	0.000	MILES
NET LENGTH OF BRIDGES	0.060	MILES
NET LENGTH OF PROJECT	0.060	MILES
LENGTH OF EXCEPTIONS	0.000	MILES
GROSS LENGTH OF PROJECT	0.060	MILES

NOTE: EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIALS AND WORKMANSHIP ON THIS PROJECT SHALL CONFORM TO THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2007 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF LETTING.

ENGINEER OF RECORD

FOR CONSTRUCTION : _____ DATE _____

REVIEWED			
DR.	KLS	RUR	10-15
	BY	CHK	DATE

StapletonKi
Printed: Wednesday, November 04, 2015 8:25:18 AM

DRAWING NO. 700-01

MATERIAL & WORKMANSHIP

Provide all material and workmanship in accordance with the South Carolina Department of Transportation 2007 Standard Specifications for Highway Construction, unless otherwise specified on the Plans or in the Special Provisions.

COORDINATION OF PLANS, SPECIFICATIONS, AND SPECIAL PROVISIONS

Generally, in case of discrepancy, this General Notes sheet governs over the Standard Specifications but the remainder of the plans govern over notes on this sheet and Special Provisions govern over all. See Subsection 105.4 of the Standard Specifications.

WATER ELEVATIONS

The water elevations shown in the plans are for information only and the actual water elevation during construction may vary depending on weather conditions and seasonal fluctuations.

COMPLETION DATES

On inside face of right side barrier parapet/railing at beginning of bridge and on left side barrier parapet/railing at end of bridge, place year of completion adjacent to guardrail attachment. Place this completion date so that it will not be covered by the guardrail connector when it is installed. Recess numbers in the concrete using numbers fabricated from reusable/durable material that is approved by the RCE. Provide numbers in accordance with SCDOT Standard Drawing No. 702-305-00.

REINFORCING STEEL

Fabricate reinforcing bars in accordance with the current C.R.S.I. Manual of Standard Practice except for ties, stirrups, and welded hoops.

Provide all ties and stirrups with 135° hooks that have extensions no less than the larger of ten bar diameters or six inches. This 135° hook requirement does not apply to stirrups extending from prestressed concrete beams.

The fabrication tolerance for out-to-out dimension of welded hoop diameter is $\pm$ $^1/_2$ inch.

Do not use lap splices in column and shaft reinforcing steel.

PRESTRESSED CONCRETE BEAMS

Beam lengths given are based on horizontal span only. Increase lengths to correct for concrete shrinkage, concrete shortening when the strands are cut, and for beams being on a grade.

All overhang brackets in the top flange of exterior beams shall be galvanized in accordance with AASHTO M 111, AASHTO M 232, or ASTM F 2329 as appropriate and shall be detailed accordingly in the shop plans.

CONCRETE

Provide the class of concrete as noted in the contract documents. For cast-in-place structural elements, use Class 4000 concrete where the class of concrete is not specified in the contract documents.

When holes are cast in beams to accommodate falsework, fill the holes with a non-shrink structural grout suitable for overhead repairs after falsework is removed.

After erection of the beams and prior to the erection of the deck slab falsework, measure beam cambers. Compare the measured beam cambers to the values shown on the Plans to aid in determining if field adjustments are needed. Submit beam camber measurements and any proposed field adjustments to the RCE for approval. All cost of performing this work is considered incidental to the Contract and no additional compensation is allowed for the performance of this work.

Payment for concrete in slab is based on theoretical plan quantity. No adjustment is made for variation in camber.

Chamfer all exposed edges $^3/_4$" unless otherwise noted.

The minimum acceptable concrete cover for reinforcing steel is $^1/_2$" less than the plan dimensions when required by reinforcing bar fabrication tolerances.

Cast build-ups and shear keys on bent caps monolithic with the cap unless indicated otherwise in these plans. Construct the top of each build-up level.

GRINDING & TEXTURING CONCRETE DECKS

For bridge stage construction projects, grind and texture the bridge decks as necessary near the stage longitudinal construction joints in order to meet the longitudinal and transverse rideability and rolling straightedge requirements of the Contract.

Prior to casting any closure pour, grinding, or texturing, make profile line surveys (2 to 6 as determined by the RCE) of each stage of the bridge decks. Make one of these profile line surveys for each stage along the edge of the deck adjacent to the closure pour. Compare the surveys within each stage and compare the surveys of each stage to surveys of the adjacent stage to aid in determining the amount of grinding and texturing needed to meet the rideability and rolling straightedge requirements. Submit all grinding and texturing procedures, plotted survey profiles, and proposed grinding depths to the RCE for approval. Maintain a final cover of 2"minimum over the bridge deck reinforcing steel.

Follow the above procedures for all stages of the work. For all surveys performed on the same bridge, use identical stations for survey shots in order to facilitate survey comparisons. All costs for performing, evaluating, and submitting the surveys are considered incidental to the Contract and no additional compensation is allowed for the performance of this work.

Payment for grinding and texturing concrete bridge decks at the junction of new and existing bridge deck slabs is determined in accordance with Subsection 702.6 of the Standard Specifications. No payment is made for grinding and texturing of new bridge decks to correct irregularities and excessive deviations.

ALLOWANCE FOR DEAD LOAD DEFLECTION & SETTLEMENT

In setting forms for structural steel or prestressed concrete beam spans, apply an allowance to the design finished grade to compensate for computed dead load deflections.

Prior to making deck pours on any stage construction work, and bridge widening projects, consider and make adjustments as necessary for partially loaded beams adjacent to closure pour areas. Verify that any proposed adjustment on partially loaded beams does not create a change in the deck thickness or a reduction in the concrete cover over the reinforcing steel. Welded studs on steel beams and reinforcing steel extending up out of prestressed beams shall meet the requirements for a composite section (extend up into the deck past the bottom mat of reinforcing steel) regardless of any adjustments.

In setting falsework for reinforced concrete spans, make an allowance for the deflection of the falsework, for any settlement of the falsework, for the instantaneous dead load deflection of the span, and for the long-time dead load deflection of the span such that on removal of the falsework the top of the structure shall conform to theoretical finished grade plus the allowance for long-time deflection.

For instantaneous and long-time dead load deflection, use a camber of $^1/_8$" for concrete flat slab spans 22 feet in length, $^3/_{16}$" for concrete flat slab spans 30 feet in length, and $^3/_8$" for concrete flat slab spans 40 feet in length, unless otherwise directed by the RCE. Adjust these cambers as necessary to allow for falsework deflection, falsework settlement, and vertical curve ordinates.

PERMANENT STEEL BRIDGE DECK FORMS

Permanent stay-in-place steel bridge deck forms for concrete deck slabs may be used at the Contractor's option.

Notify the Department and the Fabricator of the beams if using this option so that shop plans can be properly detailed.

DRIVEN PILE FOUNDATIONS

Where piles occur in fill, place fill before driving piles.

Where prestressed concrete piles are to be driven through fill, install piles in pre-bored holes extending to the original ground. For square prestressed concrete piles, bore holes having a minimum diameter of 1.25 times the nominal pile size. Include all cost of pre-boring fills for pile installation in the unit price bid for the piles.

EXCAVATION FOR END BENTS

Include all cost of excavation necessary to construct end bents and to remove material under superstructure to an elevation twelve inches below tops of end bent caps, in the unit price bid for class of concrete specified in the Plans.

If a concrete footing is used for the end bent, the excavation below that included for the cap and berm in the above paragraph is paid for at the unit price bid for excavation. Include excavation above this in the unit price bid for class of concrete specified in the Plans.

STRUCTURAL STEEL

Layout dimensions and standard lengths of beams shown are horizontal dimensions which must be increased when bridge is on grade.

When holes are placed in webs to accommodate falsework, install high strength bolts in the holes after falsework is removed.

Notify the Department of the name and address of the Fabricator of the structural steel as soon as the Fabricator has been given the contract to fabricate so that the inspection procedure can be set up.

Do not field or shop weld erection hardware to the structural steel members.

Make all bolted connections with $^7/_8$" dia. ASTM A 325 bolts unless otherwise indicated.

Generally, holes for $^7/_8$" dia. bolts shall be $^{15}/_{16}$" dia. However, oversize holes, $^3/_{16}$" larger than bolt dia., may be used in diaphragms and/or crossframes and their connection plates provided hardened washers are installed over oversize holes in the outer ply of the material gripped. Hardened washers are required under DTIs on oversized holes. In every case install a hardened washer under the element turned for each bolt of a bolted connection. Indicate on the Shop Plans which holes are to be oversize and where hardened washers are required. No additional payment is made for the costs associated with the use of oversize holes and furnishing additional hardened washers as necessary.

PAINT FOR STRUCTURAL STEEL

Paint structural steel in accordance with Section 710 of the Standard Specifications.

BEARING ASSEMBLIES

If bearing assemblies support weathering steel beams or girders, fabricate bearing assembly components from weathering steel and paint them using the NS2 Paint System. Galvanize all other bearing assemblies in accordance with AASHTO M 111, AASHTO M 232, or ASTM F 2329 as applicable.

After the required field welding of painted bearing assemblies, field repair the weld areas and/or any damaged areas to the paint in accordance with Subsection 710.4.2 of the Standard Specifications. After the required field welding of galvanized bearing assemblies, field repair the weld areas and/or damaged areas of the galvanized coating in accordance with ASTM A 780.

Include all cost of furnishing and installing steel bearing assembly components in the lump sum price bid for structural steel if a bid item for structural steel is included in the project. Otherwise, include the cost in the unit price bid for prestressed beams.

ANCHOR BOLTS

Galvanize all components of anchor bolt assemblies in accordance with AASHTO M 232 or ASTM F 2329 as applicable. The weight of anchor bolt assemblies is included in the bent quantities for reinforcing steel. Include all costs of furnishing and installing anchor bolt assemblies in the unit price bid for reinforcing steel.

ORIENTATION IN RELATION TO STATIONING

Left and right sides, where referred to in these plans, are in relation to direction of stationing.

SPECIFICATIONS

AASHTO 2012 LRFD Bridge Design Specifications, 6th Edition, with Interim Revisions through 2013.

ANSI/AASHTO/AWS D1.5 Bridge Welding Code (Latest Edition) with additions and revisions as stated in the Standard Specifications.

DESIGN DATA

Load and Resistance Factor Design (LRFD) Method

Live Load: AASHTO HL-93 Loading

The top $^1/_4$" of all concrete slabs is considered as a wearing surface and is not included in the slab depth used for the calculation of section properties.

All bolted connections, except for steel diaphragm members used with prestressed concrete beams, are designed as slip-critical connections having Class "B" contact surfaces.

An extra dead load of 0.016 KSF is incorporated into the design of this structure to accommodate the use of steel stay-in-place forms.

An extra dead load of 0.015 KSF is incorporated into the design of this structure as an allowance for a future wearing surface.

Seismic Design is in accordance with the 2008 SCDOT "Seismic Design Specifications for Highway Bridges", Version 2.0, with the following parameters:

Seismic Design Category: A

Analysis Method: No Detailed Analysis

Operational Classification: II

Site Class: C

Design Acceleration Coefficients:

PGA	(FEE):	0.06 g
S_{DS}	(FEE):	0.10 g
S_{D1}	(FEE):	0.04 g
PGA	(SEE):	0.16 g
S_{DS}	(SEE):	0.25 g
S_{D1}	(SEE):	0.12 g

Values determined from Three-Point Method

FINAL FINISH OF EXPOSED CONCRETE SURFACES

Apply the final surface finish on the bridge(s) only to the following checked and designated bridge areas:

☐ A) Entire surface of all barrier rails, parapet walls, approach slab curbs, concrete utility supports, and wing walls; outside vertical edge of bridge deck slabs and sidewalks.

☐ B) Outside face of exterior prestressed girders.

☐ C) Entire surface of designated substructure units, except top of bent caps and piers.

☐ All Units ☐ Designated Units:

☒ D) No final surface finish required.

REV.	BY	CHK.	DATE
	RUR	KLS	10-15
	0035179-B01		
REV.	GAR	LEM	5-15
	Added PCB note		
REV.	JXY	SAN	3-14
	New Border		
REVIEWED			
QUAN.			
DR.	GFD	SAN	8-07
DES.			

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

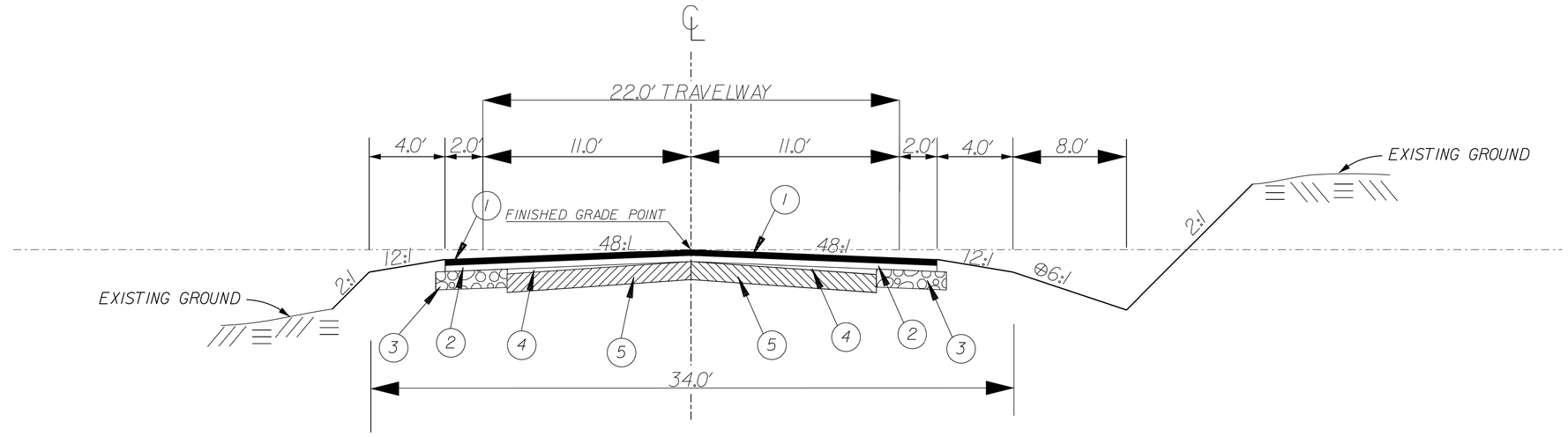
GENERAL NOTES

COUNTY	ROUTE
EDGEFIELD / McCORMICK	S-68 / S-227

DRAWING NO. 700-03

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	~~ROAD~~/ROUTE NO.	SHEET NO.
3	S.C.	EDGEFIELD/ MCCORMICK	0035179	KEY RD.	3

TYPICAL SECTION OF IMPROVEMENT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
COLUMBIA, S.C.



USE THIS SECTION ON S-68 / S-227 (KEY RD.)
FROM STA. 396+18.00 TO STA. 418+00.00

FOR INFORMATION ONLY

NOTE:

1. FILL SLOPES
   6:1------0' TO 5' FILL
   4:1------5' TO 10' FILL
   2:1------OVER 10' FILL
□ WIDEN SHOULDER 3.5' FOR GUARDRAIL

⊘2. THIS SLOPE MAY BE VARIED WHEN A DEEPER DITCH IS NECESSARY FOR DRAINAGE PURPOSES, USING A MINIMUM SLOPE OF 12:1 AND A MAXIMUM SLOPE OF 4:1. WHERE A DEEPER DITCH THAN PROVIDED BY A 4:1 IS NECESSARY, THE DITCH SHALL BE PLACED FARTHER FROM THE ℄ CONTINUING THE 4:1 SLOPE TO PROVIDE FOR THE NECESSARY DEPTH. SEE PROFILE FOR THE SPECIAL DITCH GRADES.

LEGEND

1.
2.
3.
4.
5. EXISTING ASPHALT TO REMAIN

		RTE. S-68 / S-227 DESIGN SPEED		
	SIDE RDS.	MPH	FROM STA.	TO STA.
		45 MPH		
		EXCEPTIONS TO DESIGN SPEED		
FUNCTIONAL CLASSIFICATION				
MINOR ARTERIAL				

PAVEMENT DESIGN

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION
ROAD DESIGN COLUMBIA, S.C.

TYPICAL SECTION

SCALE 1"V= N.T.S. SCALE 1"H= N.T.S. RTE./RD. S-68 / S-227

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19-OCT-2015

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FED. ROAD DIV. NO.	STATE	COUNTY	PROJECT ID	RD. NO.	SHEET NO.
3	S.C.	EDGEFIELD/ McCORMICK	0035179	S-68/ S-227	4

S-68 / S-227 (KEY RD.)

CONSTRUCT SHOULDER PAVING & FLUME AND PLACE 20 TONS RIPRAP (CLASS B) EACH FLUME SEE STD. DWG. 403-210-00 (TYPICAL ALL CORNERS)
CONST. THRIE BEAM BRIDGE CONNECTOR
ERECT 100.0 LF STEEL BEAM GUARDRAIL
CONST. END TREATMENT TYPE - T
CONSTRUCT C.B. TYPE 9
PLACE 54' - 18" SWP
FL IN = 272.9 FL OUT = 271.6
PLACE DITCH CHECKS FROM STA.401+00 TO STA.405+50 LT.PER STD.DWG.815-105-00
SEDIMENT DAM #2
REMOVE 20' - 6" PVC PIPE
NEW 75.0' R/W
TIE EQUALITY:
P.O.T.12+41.84 OLD BRIDGE
P.O.T.15+79.88 TURKEY CREEK
TIE EQUALITY:
P.O.T.408+49.78 S-68 / S-227
P.O.T.13+37.80 TURKEY CREEK
EXISTING 22' X 304' BRIDGE
RETAIN 18' - 18" C.M.PIPE
CONST. THRIE BEAM BRIDGE CONNECTOR
ERECT 587.5 LF STEEL BEAM GUARDRAIL
CONNECT WITH PIPE COLLAR
PLACE 21' - 18" SWP
FL IN 254.2 FL OUT = 254.1
PLACE 8 TONS OF RIPRAP (CLASS B)
CONST. 25.0 LF CURVED GUARDRAIL
AS DIRECT BY ENGINEER
SEE STD. DWG. 805-580-01
ERECT 100.0 LF STEEL BEAM GUARDRAIL
CONST. END TREATMENT TYPE - T
MATCH LINE STA. 402+00.00 SEE SHEET NO. 6
MATCH LINE STA. 417+00.00 SEE SHEET NO. 8
PRES.66.0' R/W (1933,278,1962,SKC)
S-68 / S-227 (KEY RD.)
SEDIMENT DAM #3
CONSTRUCT C.B. TYPE 9
PLACE 43' - 18" SWP
FL IN = 268.2 FL OUT = 268.0
CONSTRUCT TRAPEZOIDAL RIPRAP DITCH WITH 4' BOTTOM WIDTH (OBT. PERM.)
CONST. THRIE BEAM BRIDGE CONNECTOR
ERECT 175.0 LF STEEL BEAM GUARDRAIL
CONST. END TREATMENT TYPE - T
PLACE DITCH CHECKS FROM STA.400+50 TO STA.405+50 RT.PER STD.DWG.815-105-00
PLACE TYPE F (NON-WEIGHTED) SLOPE INTERUPTERS STA. 405+00.00 TO STA. 406+57.00
PLACE RIP RAP FILTER BERM FROM STA. 406+00 LT. TO STA. 405+50 RT. (SEE DETAIL BELOW)
PLACE TRIPLE ROW OF SILT FENCE WITH 4" - 6" OF #57 STONE IN FRONT OF SILT FENCE AND WIRE FENCE BEHIND SILT FENCE (SEE DETAIL)
RIPRAP FILTER BERM DETAIL
SLOPE 2H:1V
NO.57 STONE
ROADWAY FILL SLOPE 2H:1V
CLASS B RIPRAP
PLACE RIP RAP FILTER BERM FROM STA. 410+00 LT. TO STA. 410+00 RT. (SEE DETAIL BELOW)
PLACE TRIPLE ROW OF SILT FENCE WITH 4" - 6" OF #57 STONE IN FRONT OF SILT FENCE AND WIRE FENCE BEHIND SILT FENCE (SEE DETAIL)
PLACE ROCK MATTING (DEPTH 4" - 6") OF RAILROAD TYPE ROCK (D50 = 3 INCHES) WITHIN LIMITS OF RIGHT-OF-WAY
CONST. THRIE BEAM BRIDGE CONNECTOR
ERECT 525.0 LF STEEL BEAM GUARDRAIL
IN PLACE 58' - 18" R.C.PIPE
PLACE 14' - 18" SWP
FL IN = 255.9 FL OUT = 255.8
CONNECT WITH PIPE COLLAR
CONST. 12.5 LF CURVED GUARDRAIL
AS DIRECT BY ENGINEER
SEE STD. DWG. 805-580-01
SEDIMENT DAM #4
ERECT 162.5 LF STEEL BEAM GUARDRAIL
CONST. END TREATMENT TYPE - T
CONSTRUCT 34' X 320' R.C. BRIDGE
STA. 406+57.00 TO 409+77.00
(SEE BRIDGE PLANS)
TRIPLE ROW OF SILT FENCE DETAIL
TRIPLE LINE OF SILT FENCE W/4"-6" OF #57 STONE IN FONT OF SILT FENCE AND WIRE FENCE BEHIND SILT FENCE
FOR INFORMATION ONLY
HYDROLOGY DATA:
D.A.= 275.6 sq.mi.= 176,400 ac.
Q25= 16,170 cfs
Vel.25 = 4.3 ft/sec
25 Year H.W. Elev. = 250.2 ft.
Q100 = 21,580 cfs
Vel100 = 5.1 ft/sec
100 Year H.W. Elev. = 252.8 ft.
NOTE : Data from Bridge Section
OVERTOPPING FLOOD:
Q= 74,000 cfs
Probability = ∠0.0002%
FINISHED GRADE
(-) 1.17%
500' V.C.
(-) 1.17%
(+) 3.63%
VPI = 415+00.00
Elev. = 267.35
283.95
282.80
281.79
280.93
280.23
279.64
279.05
278.47
277.88
277.30
276.71
276.12
275.54
274.95
274.37
273.78
273.20
272.61
272.03
271.44
270.86
269.81
269.58
269.59
269.85
270.34
271.08
272.05
273.26
274.72
402+00
403+00
404+00
405+00
406+00
407+00
408+00
409+00
410+00
411+00
412+00
413+00
414+00
415+00
416+00
417+00

CarrSK
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19-OCT-2015

PLAN		
SURVEYED		
PLOTTED		
ALIGNMENT CHECKED		
RT. OF WAY CHECKED		
NOTE BOOK No.	BY	DATE

PROFILE		
SURVEYED		
PLOTTED		
GRADES CHECKED		
QUALS NOTED		
STRUCTURE NOTATIONS CHECKED		
NOTE BOOK No.	BY	DATE

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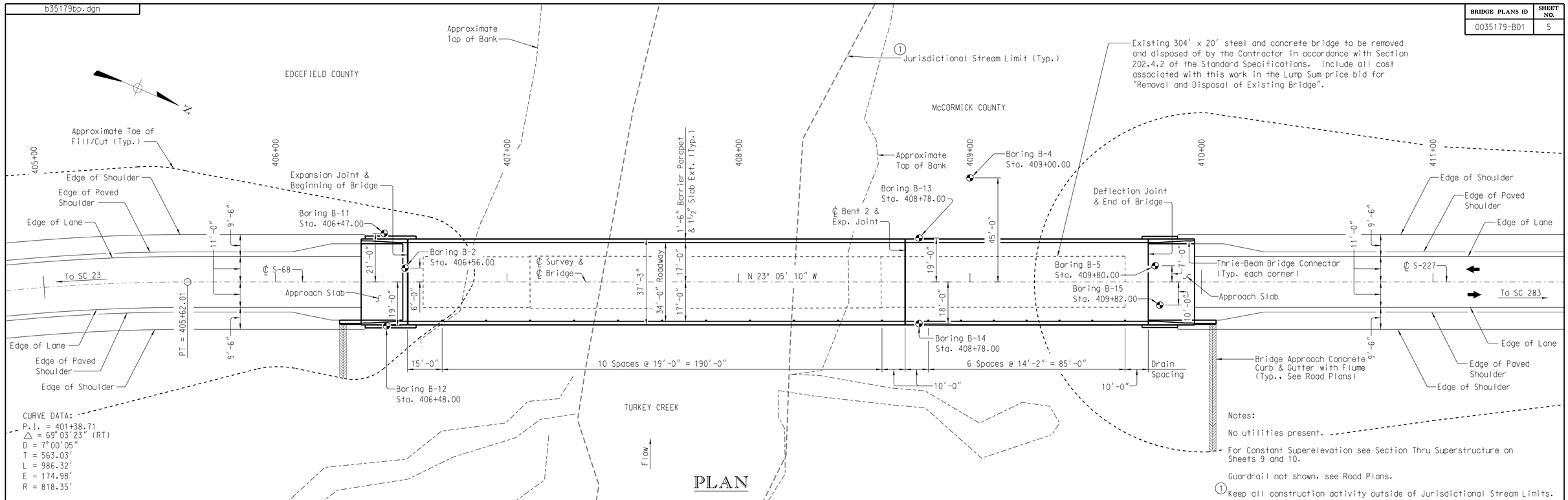
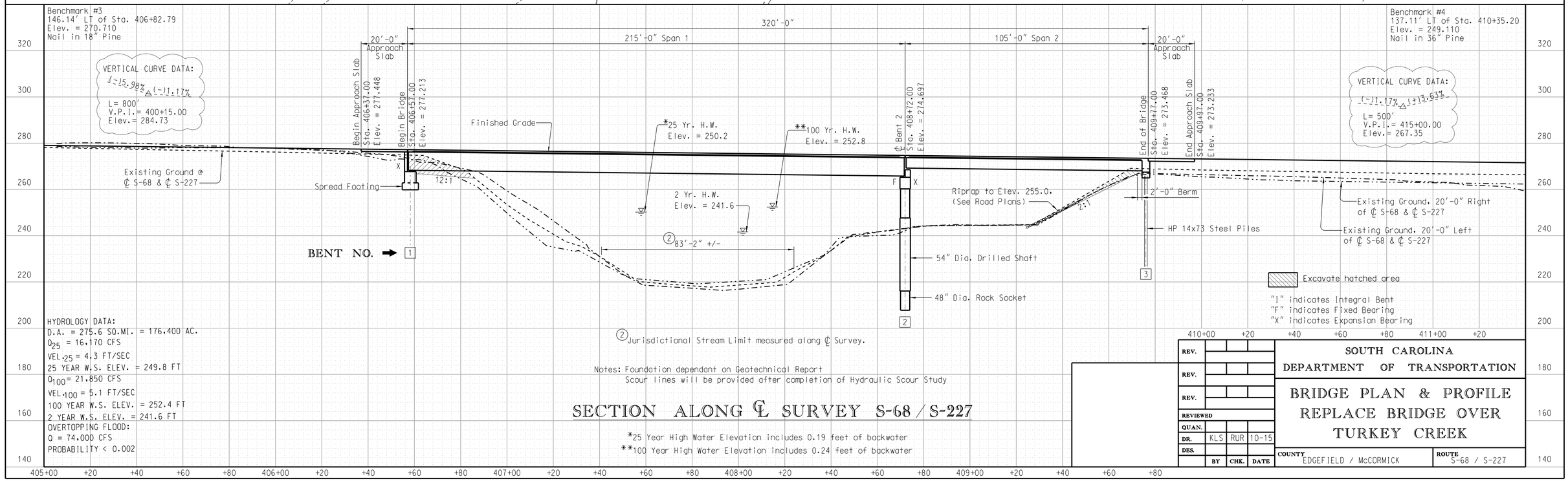
BRIDGE PLANS ID	SHEET NO.
0035179-B01	5



PLAN



HYDROLOGY DATA:
D.A. = 275.6 SQ.MI. = 176,400 AC.
Q_{25} = 16,170 CFS
VEL-25 = 4.3 FT/SEC
25 YEAR W.S. ELEV. = 249.8 FT
Q_{100} = 21,850 CFS
VEL-100 = 5.1 FT/SEC
100 YEAR W.S. ELEV. = 252.4 FT
2 YEAR W.S. ELEV. = 241.6 FT
OVERTOPPING FLOOD:
Q = 74,000 CFS
PROBABILITY < 0.002

(2) Jurisdictional Stream Limit measured along ℄ Survey.

Notes: Foundation dependant on Geotechnical Report
Scour lines will be provided after completion of Hydraulic Scour Study

SECTION ALONG ℄ SURVEY S-68 / S-227

*25 Year High Water Elevation includes 0.19 feet of backwater
**100 Year High Water Elevation includes 0.24 feet of backwater

REV.			
REV.			
REV.			
REVIEWED			
QUAN.			
DR.	KLS	RUR	10-15
DES.			
	BY	CHK.	DATE

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

BRIDGE PLAN & PROFILE
REPLACE BRIDGE OVER
TURKEY CREEK

COUNTY	ROUTE
EDGEFIELD / McCORMICK	S-68 / S-227

Printed: Wednesday, November 04, 2015 10:20 PM

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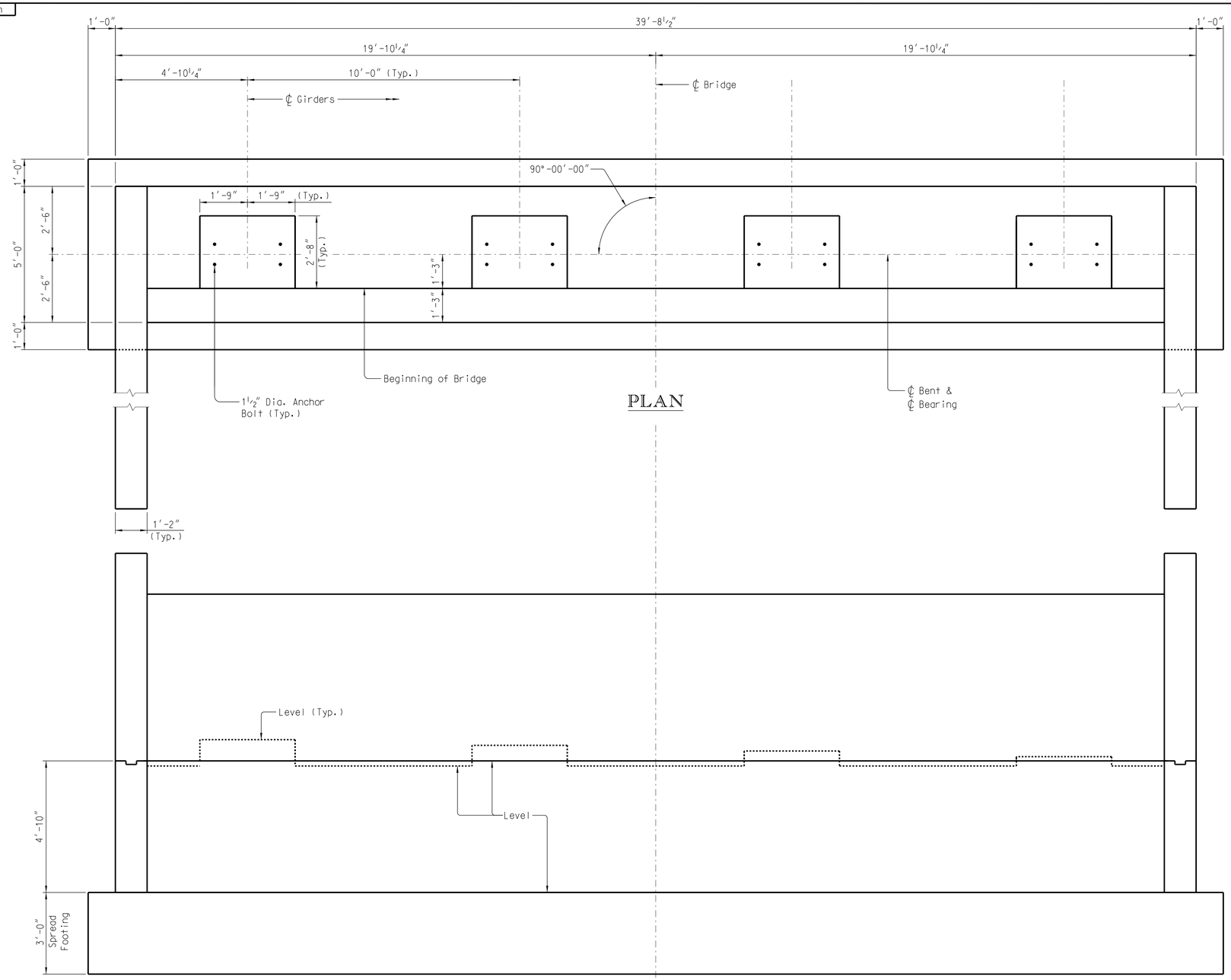
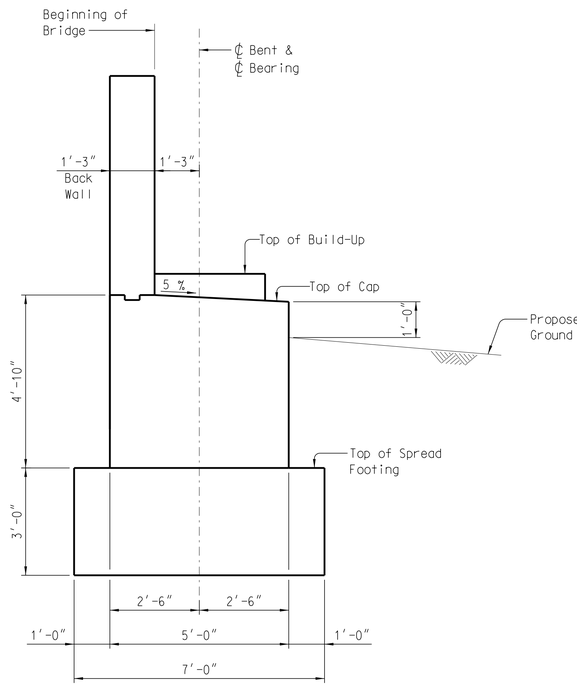
BRIDGE PLANS ID	SHEET NO.
0035179-B01	6



PLAN

ELEVATION



Note: Foundation dependent on Bridge Geotechnical Report

REV.				
REV.				
REV.				
REVIEWED				
QUAN.				
DR.	KLS	RUR	3-15	
DES.				
	BY	CHK.	DATE	

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

END BENT 1

COUNTY	ROUTE
EDGEFIELD / McCORMICK	S-68 / S-227

Printed: Thursday, October 29, 2015 10:06:46 AM

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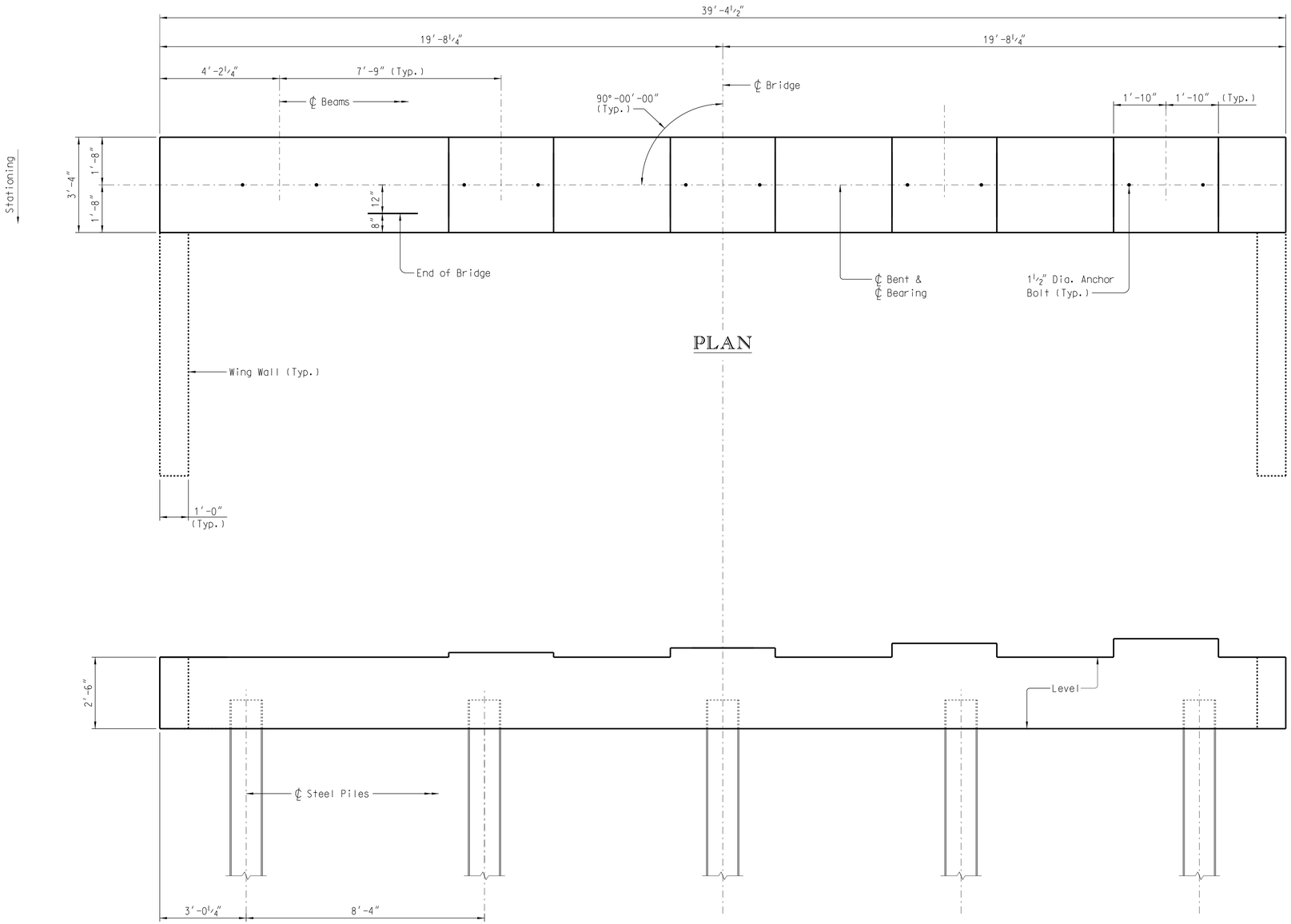
BRIDGE PLANS ID	SHEET NO.
0035179-B01	7



PLAN

ELEVATION

(Looking Opposite Direction of Stationing)

PILE NO. ➡ 5 4 3 2 1

Piles are numbered from right to left looking in the opposite direction of stationing.

Note: Foundation dependent on Bridge Geotechnical Report

REV.				
REV.				
REV.				
REVIEWED				
QUAN.				
DR.	KLS	RUR	3-15	
DES.				
	BY	CHK.	DATE	

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

END BENT 3

COUNTY	ROUTE
EDGEFIELD / McCORMICK	S-68 / S-227

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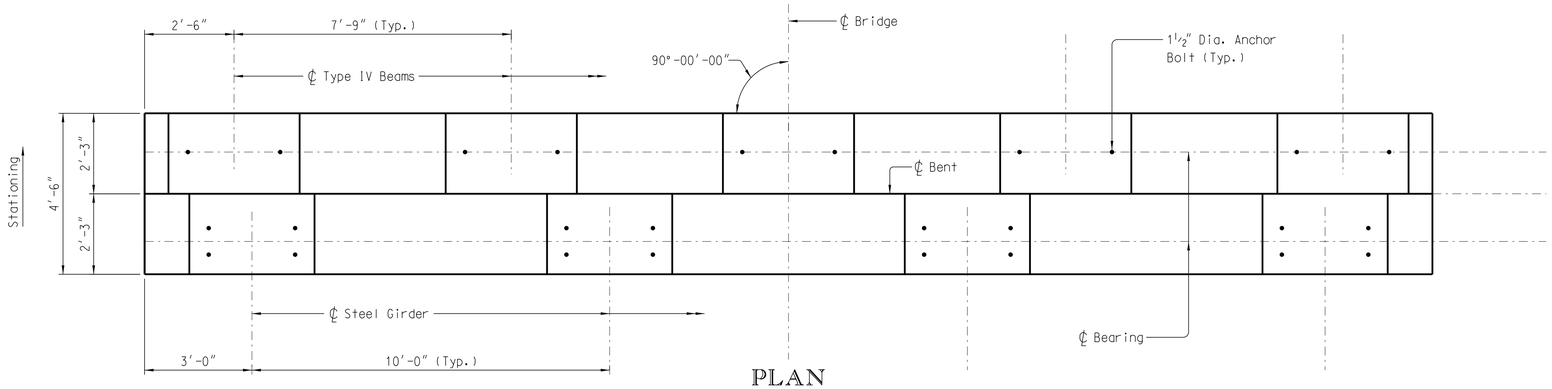
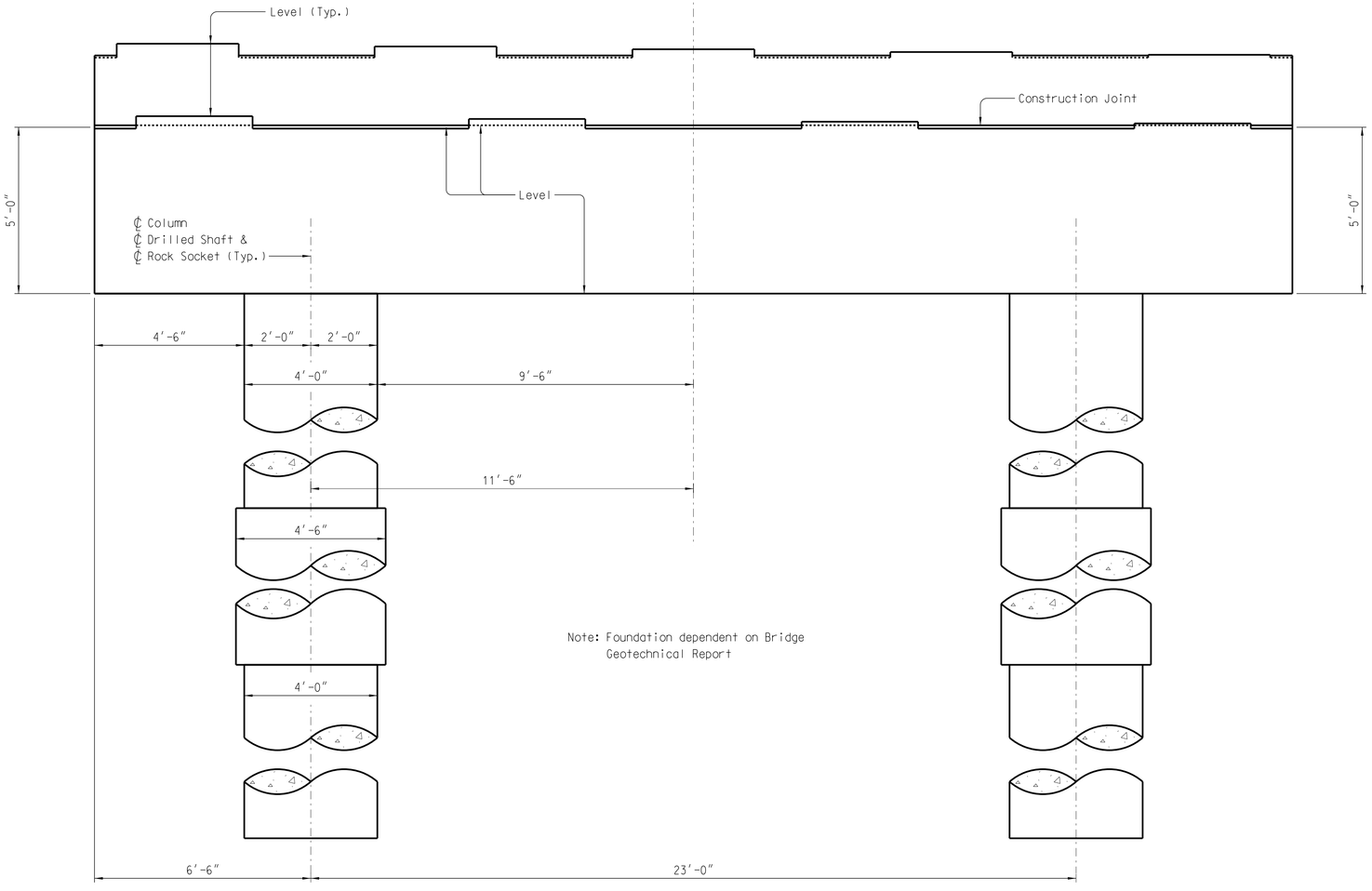
BRIDGE PLANS ID	SHEET NO.
0035179-B01	8



PLAN



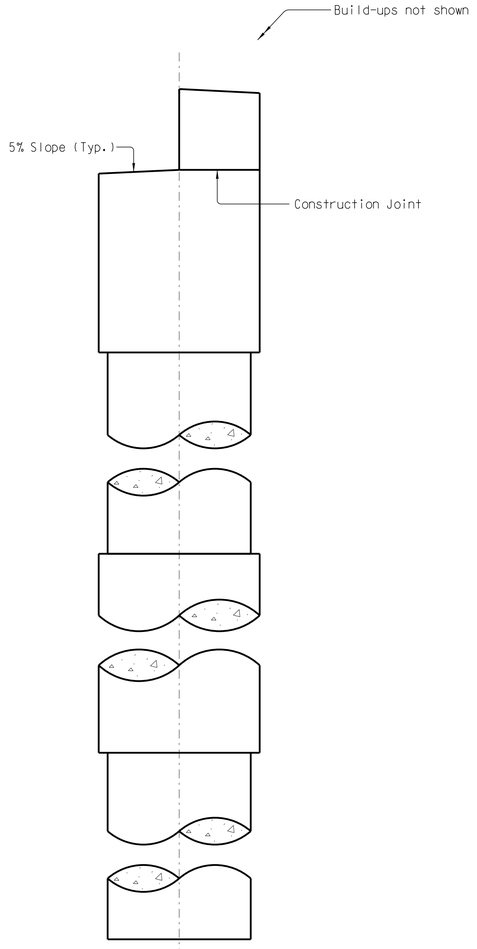
Note: Foundation dependent on Bridge Geotechnical Report

SHAFT NO. ➡ 1 2

Drilled Shafts are numbered from left to right looking in direction of stationing.

ELEVATION

(Looking in Direction of Stationing)



END ELEVATION

REV.				
REV.				
REV.				
REVIEWED				
QUAN.				
DR.	KLS	RUR	2-15	
DES.				
	BY	CHK.	DATE	

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERIOR BENT 2

COUNTY	ROUTE
EDGEFIELD / McCORMICK	S-68 / S-227

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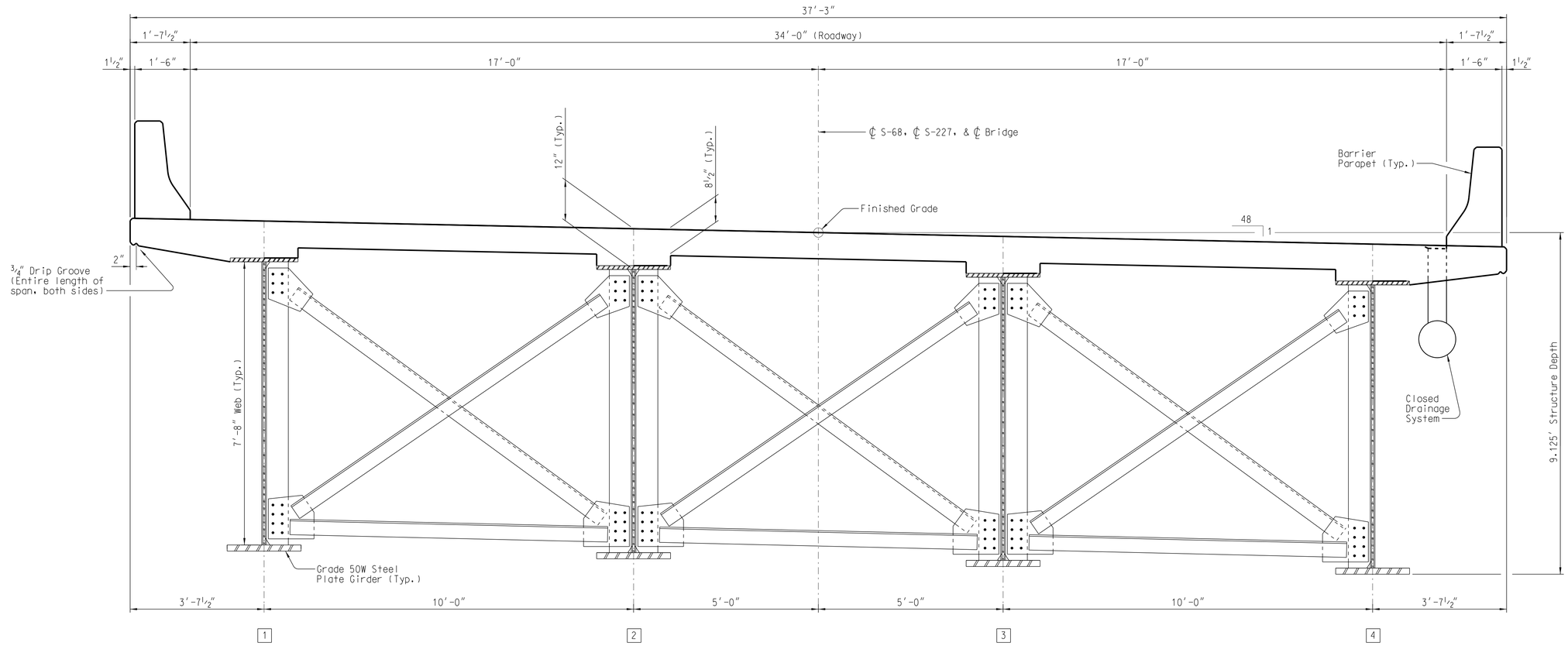
BRIDGE PLANS ID	SHEET NO.
0035179-B01	9



SECTION THRU SUPERSTRUCTURE - SPAN 1

Looking in Direction of Stationing

REV.			
REV.			
REV.			
REVIEWED			
QUAN.			
DR.	KLS	RUR	3-15
DES.			
	BY	CHK.	DATE

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SUPERSTRUCTURE DETAIL (SPAN 1)

COUNTY	ROUTE
EDGEFIELD / McCORMICK	S-68 / S-227

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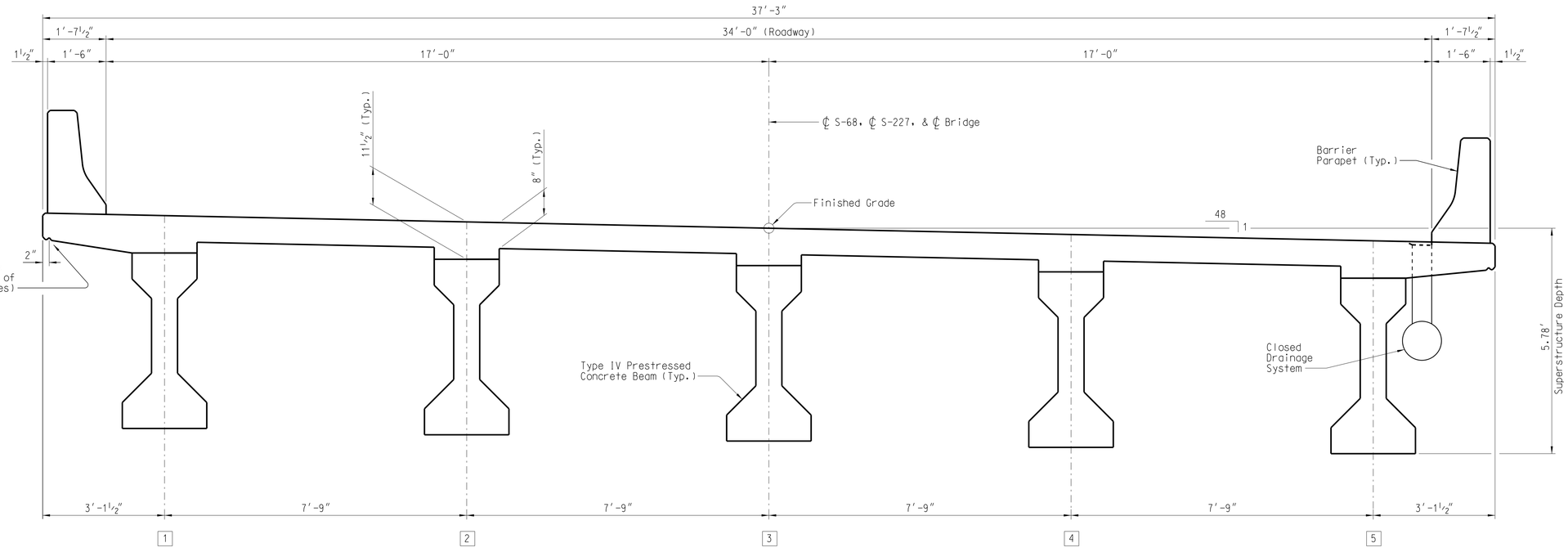
BRIDGE PLANS ID	SHEET NO.
0035179-B01	10



SECTION THRU SUPERSTRUCTURE - SPAN 2

Looking in Direction of Stationing

REV.			
REV.			
REV.			
REVIEWED			
QUAN.			
DR.	KLS	RUR	3-15
DES.			
	BY	CHK.	DATE

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SUPERSTRUCTURE DETAIL (SPAN 2)

COUNTY	ROUTE
EDGEFIELD / McCORMICK	S-68 / S-227

Printed: Monday, November 02, 2015 3:48:51 PM

Appendix C

Concurrence from Tribal Historic Preservation Offices (THPOs)

South Carolina
Department of Transportation

June 10, 2016

Ms. Elizabeth Johnson
Deputy State Historic Preservation Officer
South Carolina Department of Archives & History
8301 Parklane Road
Columbia, South Carolina 29223-4905

Re: ***Draft Report,*** **Cultural Resources Survey of Areas Potentially Affected by the Replacement of the S-68-227 (Key Road) Bridge over Turkey Creek, Edgefield and McCormick Counties, South Carolina**

6/21/16 5 sites in all - below for work for determination

Dear Ms. Johnson:

Please find enclosed a copy of the above-referenced report that describes archaeological investigations conducted for the proposed S-68-227 (Key Road) bridge replacement over Turkey Creek in Edgefield and McCormick Counties, South Carolina. As part of the survey, SCDOT archaeologists documented three new archaeological sites (38ED857, 38ED858, and 38MC2653) and revisited previously recorded sites 38MC254 and 38MC1945. Archaeological sites 38ED857, 38ED858, and 38MC2653 are recommended **not eligible** for listing in the National Register of Historic Places.

The eligibility of previously recorded sites 38MC254 and 38MC1945 remains unassessed after additional testing and boundary delineation. The proposed project would involve minor filling, clearing, and grubbing impacts to the perimeter of both sites. The eastern portion of 38MC254 that would be affected by the project has been previously disturbed by the construction of existing Key Road. Shovel testing within this portion of the site identified modern Ap Horizon soils and no buried deposits. As currently designed, the proposed project would have no adverse effect upon this site.

Buried soil deposits that contained artifacts were identified within the southwestern corner of 38MC1945. This portion of the site would be impacted by filling, clearing, and grubbing activities. Impacts to the site are anticipated to be minimal and are not likely to result in the loss of significant information about the site. However, the Department plans to minimize impacts and avoid adverse effects to the site by implementing the following conditions: identify protected portions of site on construction plans, erect construction fencing along the protected portion of the site, inform contractors that no staging of equipment or materials will be allowed within protected portion of site (including notes on construction plans), provide an archaeological monitor during construction, and implement a late discovery clause for inadvertent findings.

Post Office Box 191
Columbia, South Carolina 29202-0191

Phone: (803) 737-2314
TTY: (803) 737-3870

The Department will provide additional documentation for the replacement of Key Bridge, a historic metal truss bridge that has been determined **eligible** for listing in the National Register of Historic Places under a separate transmittal. The proposed replacement of Key Bridge will result in an **adverse effect** to historic properties and will require the development of a Memorandum of Agreement.

Per the terms of the Section 106 Programmatic Agreement executed on August 18, 2014, the Department is providing this information on behalf of the Federal Highway Administration. It is requested that you review the enclosed material and, if appropriate, indicate your concurrence with SCDOT findings. Please respond within 30 days if you have any objections or if you have need of additional information.

Sincerely,

Chad C. Long
Archaeologist/NEPA Coordinator

CCL:ccl

I (~~do not~~) concur in the above determination.

Signed: Wenonah G Haire, D Date: 6/21/16

ec: Jim Bates, USFS
Shane Belcher, FHWA

cc: Wenonah G. Haire, Catawba Nation THPO
Russell Townsend, EBCI
Lisa Larue-Baker, United Keetowah
Robin Dushane, Eastern Shawnee
Keith Derting, SCIAA

File: ENV/CCL

UNITED KEETOOWAH BAND OF CHEROKEE INDIANS IN OKLAHOMA (UKB)
UKB CORPORATE BOARD

Federally Recognized
October 3, 1950

U16-389
16.0399

July 15, 2016

Mr. Chad C. Long
Archaeologist/NEPA Coordinator
Post Office Box 191
Columbia, South Carolina 29202-0192

Dear Mr. Long,

Thank you for your letter dated June 10, 2016 requesting comments from the United Keetoowah Band of Cherokee Indians in Oklahoma (UKB) regarding the Draft Report, Cultural Resources Survey of Areas Potentially Affected by the Replacement of the S-68-227 (Key Road) Bridge over Turkey Creek, Edgefield and McCormick Counties, South Carolina.

Please be advised that the proposed undertaking lies within the traditional territory of the United Keetoowah Band of Cherokee Indians in Oklahoma (UKB). This opinion is being provided by UKB THPO, pursuant to authority vested by the UKB Corporate Board and under resolution 16-UKB-34. The United Keetoowah Band is a Federally Recognized Indian Nation headquartered in Tahlequah, OK.

We have no concerns with this project. As the project moves forward we request the following conditions be followed:

Condition 1: Inadvertent Discoveries - In the event that human remains, burials, funerary items, sacred objects, or objects of cultural patrimony are found during project implementation, the proponent or his/her authorized agent shall cease work immediately within 200 ft of the find. They shall take steps to protect the find from further damage or disruption. They shall contact the THPO at (918) 458-6717 [desk] or (918) 207-7182 [cell] to report the find. The THPO shall contact the appropriate law enforcement authority if human remains are found. No further work shall be allowed on the project until the THPO has approved a plan for managing or preserving the remains or items.

Condition 2: Post Review Discoveries - In the event that pre-contact artifacts (i.e., arrowheads, spear points, mortars, pestles, other ground stone tools, knives, scrapers, pottery or flakes from the manufacture of tools, fire pits, culturally modified trees, etc.) or historic period artifacts or features (i.e., fragments of old plates or ceramic vessels, weathered glass, dumps of old cans, cabins, root cellars, etc.) are found during project implementation, the proponent or his/her authorized agent shall cease work immediately within 200 ft of the find. They then shall contact the THPO at (918) 458-6717 [desk] or (918) 207-7182 [cell] to report the find. No further work shall be allowed on the project until the THPO has approved a work plan for managing or preserving the artifacts or features.

UNITED KEETOOWAH BAND OF CHEROKEE INDIANS IN OKLAHOMA (UKB)
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Condition 3: Activities that have the potential to disturb cultural resources outside the areas specified in the accompanying document(s) are not approved and will not proceed until cultural resources review of potential adverse effects in the new area has been completed.

Thank you for consulting with the UKB. Please note that these comments are based on information available to us at the time of the project review. We reserve the right to revise our comments as information becomes available. If you have any questions or concerns, please contact me at (918) 458-6715 or kpritchett@unitedkeetoowahband.org or THPO Eric Oosahwee-Voss at (918) 458-6717 or eoosahwee-voss@unitedkeetoowahband.org.

Wa-do, do-na-da-go-hv-i (thank you, until I see you again)

Eric Oosahwee-Voss

Eric Oosahwee-Voss
Tribal Historic Preservation Officer
United Keetoowah Band of Cherokee Indians in Oklahoma
PO Box 1245
Tahlequah, OK 74465
Ph: 918.458.6717
Cell: 918.207.7182
eoosahwee-voss@unitedkeetoowahband.org

cc: Dr. Eric Emerson. Ph.D., Department of Archives & History, South Carolina

Matt DeWitt

From: Long, Chad C. <LongCC@scdot.org>
Sent: Wednesday, July 20, 2016 2:43 PM
To: Belcher, Jeffery - FHWA; Jurgelski, Bill M.; Kelly, David P.
Subject: Fwd: 106 reply

FYI

Begin forwarded message:

From: Robin Dushane <RDushane@estoo.net>
Subject: 106 reply
Date: July 20, 2016 at 12:53:31 PM EDT
To: "longcc@scdot.org" <longcc@scdot.org>

Dear Mr. Long,
In accordance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470f), and implementing regulation, 36 CFR 800, "Protection of Historic Properties" the Eastern Shawnee Tribal Historic Preservation Office is responding to your request for the Draft Report of S-68-227 Bridge over Turkey Creek, in Edgefield and McCormick Counties, SC.

This office has reviewed the report received by our office on June 13, 2016. Thank you for sharing information of sites nearby this project-both newly documented and previously recorded sites. The ESTO THPO values SC DOT's plans to minimize impacts and avoid adverse effects to 38MC1945. Additionally, we concur with SC DOT's finding of adverse effect to historic properties. We offer these comments under 36 CFR 800.13.

In future consultations, please feel free to consult by email. Please refer to my email in the signature below.
Sincerely,

Robin Dushane
Tribal Historic Preservation Officer
Eastern Shawnee Tribe
70500 E 128 Rd.
Wyandotte, OK 74370
918 533 4104-cell
rdushane@estoo.net

Appendix D

Programmatic Section 4(f) Evaluation, State Historic Preservation Office (SHPO) Concurrence, and Advisory Council on Historic Preservation (ACHP) Coordination

FHWA South Carolina Division

DETERMINATION OF A PROGRAMMATIC SECTION 4(F) FOR:
PROJECTS THAT NECESSITATE THE "USE" OF HISTORIC BRIDGES

State File #	Fed Project #	PIN	Date	County
P035179	P035179	N/A	9-13-16	Edgefield

Project Description: S-68/S-227 (Key Road) Bridge Replacement over Turkey Creek

Form Purpose: To determine if a Section 4(f) impact qualifies for a Programmatic 4(f) determination. Any "NO" response will disqualify the project from being processed under FHWA's Programmatic 4(f) for projects that necessitate the "use" of Historic Bridges.

APPLICABILITY:

1.	The scope of the project meets all of the following criteria: a. The bridge is to be replaced or rehabilitated with Federal funds. b. The project will require the use of a historic bridge structure which is on or is eligible for listing on the National Register of Historic Places (NHRP). c. The bridge is <u>not</u> a National Historic Landmark. d. Agreement among the FHWA, the SHPO/THPO, and if participating, the ACHP has been reached through procedures pursuant to Section 106 of the NHPA.	☒ YES ☐ NO

ALTERNATIVES CONSIDERED (all inclusive):

1.	The do nothing alternative has been evaluated and is considered not to be feasible and prudent for reasons of maintenance or safety?	☒ YES ☐ NO
2.	Building a new structure on new location without using the old bridge has been studied and has been determined to not be feasible and prudent for reasons of terrain; and/or adverse social, economic or environmental effects; and/or engineering and economy.	☒ YES ☐ NO
3.	Rehabilitation of the existing bridge without affecting the historic integrity of bridge has been studied and has been determined to not be feasible or prudent for reasons of structural deficiency and/or geometrics.	☒ YES ☐ NO

MEASURES TO MINIMIZE HARM:

1.	For bridges that are to be rehabilitated, the historic integrity of the bridge is preserved, to the greatest extent possible, consistent with unavoidable transportation needs, safety, and load requirements.	☐ YES ☐ NO ☒ N/A
2.	For bridges that are to be rehabilitated to the point that the historic integrity is affected or that are to be moved or demolished, the FHWA ensures that, in accordance with the Historic American Engineering Record (HAER) standards, or other suitable means developed through consultation, fully adequate records are made of the bridge.	☐ YES ☐ NO ☒ N/A

3.	For bridges that are to be replaced, the existing bridge is made available for an alternative use, provided a responsible party agrees to maintain and preserve the bridge.	☒ YES ☐ NO
4.	For bridges that are adversely affected, agreement among the SHPO, ACHP, and FHWA is reached through the Section 106 process of the NHPA on measures to minimize harm and those measures are incorporated into the project.	☒ YES ☐ NO

SUMMARY OF MINIMIZATION EFFORTS:

See attached Section 106 MOA

SUMMARY AND APPROVAL:

The project meets all criteria included in the programmatic Section 4(f) evaluation approved on July 5, 1983.

All required alternatives have been evaluated and the findings made are clearly applicable to this project.

The project includes all possible planning to minimize harm and that there are assurances that the measures to minimize harm will be incorporated into the project.

Environmental Manager (SCDOT): [signature] Date: 9/13/16

FHWA: J. Shane Belcher Digitally signed by JEFFREY S BELCHER DN: c=US, o=U.S. Government, ou=DOT FHWAColumbiaSC, ou=FHWA FHWAColumbiaSC, cn=JEFFREY S BELCHER Date: 2016.09.13 16:01:25 -04'00' Date: 9-13-16

S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK

EDGEFIELD & MCCORMICK COUNTIES SOUTH CAROLINA

PROGRAMMATIC SECTION 4(f) EVALUATION

Submitted by
U.S. Department of Transportation
Federal Highway Administration
and
S.C. Department of Transportation

9/14/16
Date of Approval

S.C. Department of Transportation

9/14/2016
Date of Approval

Federal Highway Administration

The following individuals may be contacted for additional information concerning the project:

Mr. Shane Belcher
Environmental Coordinator
Federal Highway Administration
1835 Assembly Street, Suite 1270
Columbia, S.C. 29202
(803) 253-3187

Mr. Clint Scoville
Project Manager
S.C. Department of Transportation
P.O. Box 191
Columbia, S.C. 29202
(803) 737-9932

SCDOT Project P035179

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1. INTRODUCTION

The South Carolina Department of Transportation (SCDOT) proposes to replace the existing 1922 steel truss bridge located on S-68/S-227 (Key Road) in Edgefield and McCormick Counties, South Carolina. The existing bridge is located within the Sumter National Forest and spans Turkey Creek, a tributary of the Savannah River. The proposed project would also include roadway improvements at the bridge approaches. The proposed bridge replacement would affect one (1) site eligible for inclusion on the National Register of Historic Places (NRHP), the S-68/S-227 (Key Road) bridge over Turkey Creek. This bridge is a 94 year old steel truss determined to no longer meet SCDOT's safety and design requirements for its transportation system. The project and bridge meet the applicability requirements to be processed as a programmatic Section 4(f) evaluation.

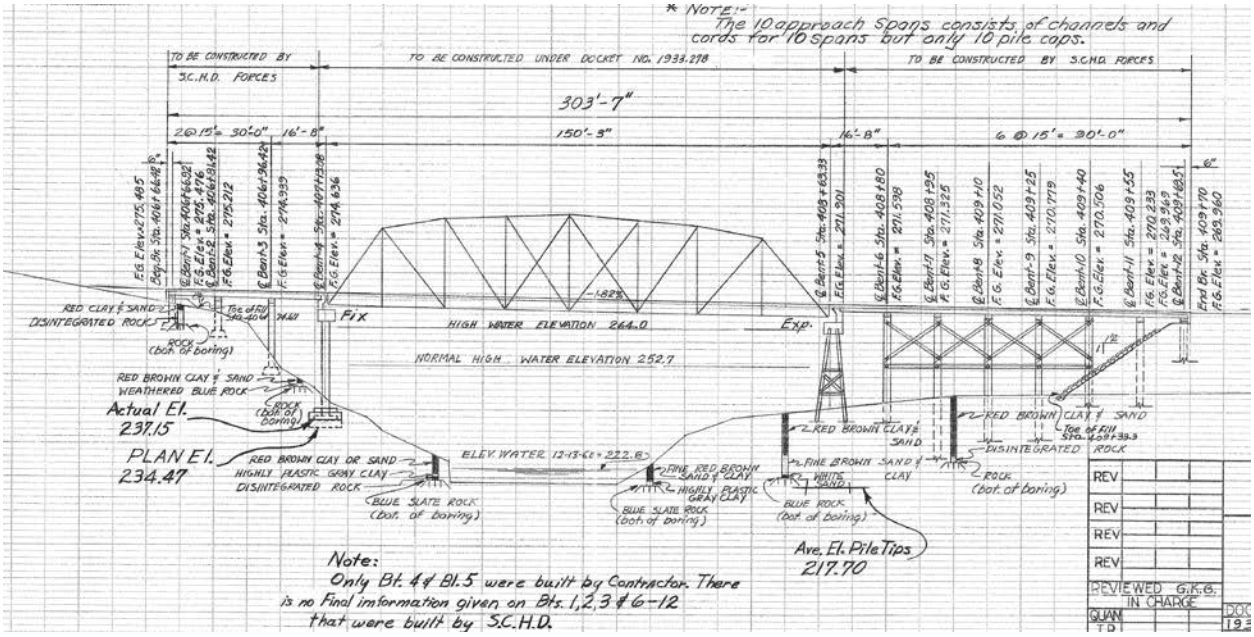
2. EXISTING BRIDGE

S-19-68/S-33-227 (Key Road) provides an important transportation link for the residents of Edgefield and McCormick Counties in meeting daily transportation needs. Currently, both S-19-68 and S-33-227 are two-lane roadways with earthen shoulders and roadside ditches. The S-19-68 roadway in Edgefield County, south of the bridge, is generally oriented in an east-west direction. North of the bridge, in McCormick County, the S-33-227 roadway transitions to a general north-south orientation. The project corridor terrain is sloping to hilly, with the surface runoff drainage flowing to Turkey Creek via roadside ditches. The existing land use along the project boundaries is dominated by the undeveloped woodlands of the Sumter National Forest. In 2015 the existing average daily traffic (ADT) on S-68/S-227 (Key Road) was approximately 200 vehicles per day (vpd) and is expected to increase to 300 vpd in 2035.

Existing S-68/S-227 Bridge

The existing bridge over Turkey Creek is an eleven (11) span structure, 303'-7" long and 20.2' wide bridge. The bridge is comprised of a riveted Parker streel truss main span, 150'-3" in length, flanked by ten (10) precast concrete slab approach spans; please see a portion of the original bridge plans in Figure 2-1 below. The existing structure provides approximately 39.75 feet of vertical clearance over Turkey Creek.

Figure 2-1: Existing Bridge



The existing bridge was built in 1925 and originally located on US 17 over Sampitt River in Georgetown County. In 1961, the bridge was salvaged and relocated to its current location over Turkey Creek. The existing channel of Turkey Creek is approximately 83'-2" in width at normal water elevation. The existing right-of-way to either side of the bridge and roadway approaches is currently 33 feet.

The S-68/S-227 (Key Road) bridge over Turkey Creek was determined to no longer meet the State's safety and design requirements for its transportation system. The existing bridge was evaluated in terms of its structural and functional efficiency and found to be structurally deficient and functionally obsolete, receiving a sufficiency rating of 34.7 out of 100.

Structures given a sufficiency rating of 50 or less are placed in the state bridge replacement program and are eligible for replacement through the Federal Highway Bridge Replacement and

Rehabilitation Program. Due to the age and condition of the bridge, SCDOT continues to incur above average maintenance costs to keep the structure protected from natural elements and its mechanical parts fully functional.

3. ADJACENT HISTORICAL PROPERTIES

In accordance with 36 CFR 800.4, archival research and coordination with the State Historic Preservation Officer (SHPO) was performed to identify and help predict the locations of significant cultural resources in the vicinity of the proposed study area. The archaeological and architectural surveys performed were designed to provide the necessary management data to allow for the sites and properties to be evaluated for recommendations of eligibility to the National Register of Historic Places (NRHP).

Cultural resources studies in the vicinity of the S-68/S-227 (Key Road) bridge over Turkey Creek have been conducted, including areas of potential new right-of-way for the bridge replacement project. The cultural resources survey was designed to identify and assess all historic architectural resources, archaeological sites, and underwater sites in the Area of Potential Effects (APE).

The archaeological and architectural terrestrial surveys documented three (3) new archaeological sites and revisited two (2) previously recorded archaeological sites. One (1) historic architectural resource was identified in the architectural survey universe and recommended eligible for NRHP. This site, the S-68/S-227 (Key Road) Bridge over Turkey Creek was constructed in 1925 and determined to be “historically and technologically significant” as part of the 2013-14 statewide survey of historic bridges conducted by Transystems (McCahon). Its replacement will be an adverse effect to the resource.

4. ALTERNATIVES AND FINDINGS

Various alternatives were developed and considered for the roadway and bridge as it traverses Turkey Creek. The roadway approaches to the new bridge would be designed to maintain two (2) lanes of traffic and improved to meet SCDOT current safety and design standards. Based

upon this concept, alternatives were developed for consideration and evaluation. All of the alternatives were transitioned to match the existing horizontal roadway alignment as quickly as possible to minimize the length of the project while maintaining the desired design criteria. The proposed structure will maintain the existing horizontal clearance and completely span Turkey Creek. Approximately 38 feet of vertical clearance will be provided by the new bridge, a slight reduction from the existing clearance.

4.1. Do Nothing Alternative

The Do Nothing Alternative was considered in place of the bridge replacement project. This alternative would neither improve the bridge's sufficiency rating nor address the bridge's structurally deficient and functionally obsolete status. If the Do Nothing Alternative was selected, only routinely scheduled maintenance operations would occur on the bridge and it would continue to age and deteriorate. It is likely that SCDOT would eventually be required to post weight restrictions on the bridge, substantially reducing its ability to serve the motoring public. In future years, the bridge could be closed to vehicular traffic due to its deteriorated condition, requiring a permanent detour of approximately 11.3 miles for motorists and area residents. Due to future maintenance challenges and safety hazards posed by the existing bridge, and the potential intolerable restrictions placed on travel and the transport of goods, the Do Nothing Alternative was deemed an unacceptable alternative.

4.2. Rehabilitation Alternative

The Rehabilitation Alternative was also considered in place of the proposed bridge replacement project. Rehabilitation includes measures that address the structural condition of the bridge in order to maintain the carrying capacity rating without affecting the historic integrity of the bridge. This would require ongoing inspections, maintenance, and repairs to allow the bridge to be structurally sufficient without posting a vehicle weight limit. The rehabilitation measures would not address the functional obsolescence of the bridge, including the substandard width of travel lanes and absence of roadway shoulders. Due to the age of and structural condition of the bridge, the rehabilitation alternative is not the most prudent and feasible alternative.

4.3. Build Alternatives

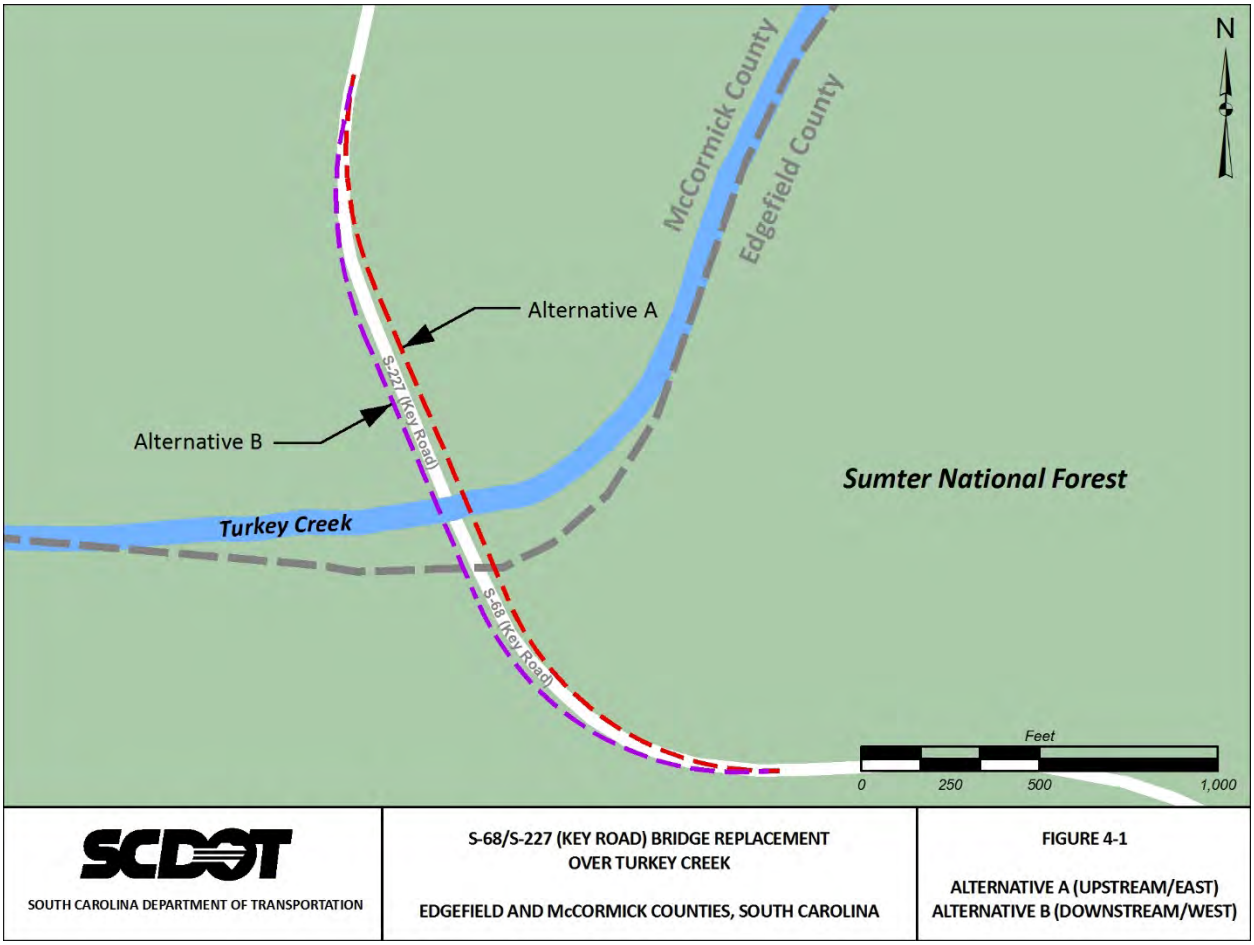
Three (3) Build Alternatives were also considered for the replacement of the S-68/S-227 (Key Road) Bridge over Turkey Creek. Those alternatives, referenced herein as "Alternative A, B, and C", were analyzed as three (3) corridors due to necessary roadway approach work.

Replacing the bridge with a new structure upstream, or east, of the existing alignment (Alternative A, Figure 4-1) was an alternative considered. Alternative A would involve constructing a new bridge 50 feet upstream of the existing alignment and realigning the approach roadways to tie in to the new bridge. Alternative A would shift the roadway to the inside of the existing roadway curve, presenting design challenges, and would likely require a reduction in the design speed of the roadway. This could result in safety concerns for the motoring public and would not be the best available option for meeting design requirements. Alternative A would require additional roadway construction to realign the roadway approaches to the bridge and approximately 1.60 acres of additional right-of-way acquisition. These factors would increase the overall project costs and encroachment into the Sumter National Forest. In light of these factors, Alternative A was not considered the most prudent or feasible alternative when compared to Alternative C (replacing on existing alignment).

Replacing the bridge downstream, or west, of the existing alignment (Alternative B, Figure 4-1) was another alternative considered. Alternative B would involve constructing a new bridge 50 feet downstream of the existing alignment and realigning the approach roadways to tie in to the new bridge. Alternative B would shift the roadway to the outside of the existing roadway curve, further increasing right-of-way acquisition (1.90 acres) and encroachment into the Sumter National Forest. Alternative B would also require additional roadway construction to realign the roadway approaches to the bridge, increasing overall project costs. In light of these factors, Alternative B was not considered the most prudent or feasible alternative when compared to Alternative C (replacing on existing alignment).

Replacing on existing alignment was another alternative considered (Alternative C). Replacement of the bridge on existing alignment would require minimal right-of-way acquisition (less than one-tenth of an acre) and the least roadway construction. Alternative C would also have the lowest project costs of the three (3) build alternatives, and would have the least encroachment on the Sumter National Forest. Alternative C would result in an adverse effect to a historic resource eligible for listing on the National Register of Historic Places, the S-68/S-227 (Key Road) Bridge over Turkey Creek. Despite the adverse effect to the historic bride, Alternative C was selected as the preferred alternative for the project due to its compatibility with design requirements, its minimal right of way acquisition (less than one-tenth of an acre), its lower total project cost, and its minimal encroachment on the Sumter National Forest.

Figure 4-1: Alternatives A (Upstream Replacement) and B (Downstream Replacement)



Corridor Evaluation

As shown in Table 4-1, Alternative C has fewer impacts to the surrounding human and natural environment when compared to Alternative A or B. Alternative C also reduces the likelihood of conflict with the existing bridge during construction, provides for easier constructability and safer traffic operations during construction, and is less expensive than either Alternative A or B. Based on this analysis, Alternative C was selected as the best alternative to replace the existing S-68/S-227 Bridge over Turkey Creek. While Alternative C would have the least impact on the surrounding environment, all alternatives proposed the demolition of the existing S-68/S-227 (Key Road) Bridge over Turkey Creek for safety and navigational reasons prior to construction of the new bridge. The demolition of the existing bridge upon the completion of new bridge will be an adverse effect to the resource.

Table 4-1: Alternative Corridor Comparison Matrix

CATEGORY	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
New Right of Way Acquisition (acres)	1.60	1.90	0.09
Wetlands (acres)	0	0	0
Relocations	0	0	0
Cultural Resource Impacts	1	1	1

Preferred Alternative

The preferred alternative (Alternative C) will replace the existing bridge on the existing alignment with a two (2) span bridge with a total length of 320 feet. The main 215-foot main span will be a simply supported steel girder span with an expansion joint at the interior bent. The second span will be 105 feet in total length and be constructed of concrete beams. The preferred alternative would span Turkey Creek; therefore there will be no change in horizontal clearance. Approximately 38 feet of vertical clearance will be provided by the new bridge, a slight reduction from the existing clearance.

The proposed bridge would be supported by a single interior bent, providing a greater hydraulic opening. No bents or other structures will be placed in Turkey Creek. The bridge would be approximately 37 feet wide in order to accommodate two (2) travel lanes. The roadway and bridge improvements would extend a total of approximately 2,180 feet, including 1,030 feet on the Edgefield County side of the bridge and approximately 1,150 feet on the McCormick County side of the bridge.

The new bridge is proposed to be built on alignment to reduce surrounding impacts on the human and natural environment.

5. MEASURES TO MINIMIZE HARM / MITIGATION

SCDOT and the SHPO considered several potential options for mitigation to offset the adverse effect the project would have on the bridge. Below are the recommendations approved in the Memorandum of Agreement (MOA) concerning mitigation for the bridge. Final approval on the MOA was received on August 25, 2016 and was signed by representatives from SCDOT, SHPO, the United States Forest Service (USFS), and FHWA (See Appendix). The FHWA and SCDOT will ensure that the following stipulations are implemented:

1. Prior to demolition, the existing bridge will be advertised with a thirty day notice period by the SCDOT for alternative use as long as a responsible party agrees to maintain and preserve the bridge. If no third party agrees to maintain and preserve the existing bridge then stipulations two (2) and three (3) will be carried out.

2. SCDOT's contractors selected to perform the S-68 (Key Road) Bridge Replacement will also perform repair/rehabilitation work on the historic truss bridge carrying the USFS Wine/Turkey Creek Bike Ped Trail located downstream of the S-68 (Key Road) Bridge. This work will take place within the timeframe of the S-68 (Key Road) Bridge Replacement, will be concluded before the S-68 (Key Road) Bridge Replacement is completed, and will include the following items:

a. Replacing/repairing up to thirty percent (30%) of wooden bridge decking.
b. Replacing/repairing damaged sections of handrail as needed.
c. Clearing vegetation from bridge to include clearing tree limbs hanging over bridge or in immediate proximity of bridge.
d. Replacing/repairing northernmost span of bridge.
e. Replacing/refurbishing interpretive signage on the bridge.
f. Providing trailhead signage at the Prices' Bottom Trailhead for Wine/Turkey Creek Trail.
g. Replacing trailhead signage at intersection of Prices' Bottom Trailhead access road with S-68 (Key Road).

3. SCDOT will provide USFS and SHPO plans or detailed work description for the work listed in Stipulation 2 above. USFS and SHPO will have fifteen (15) days to review this information and provide comments.

6. COORDINATION

Section 106 consultation with the State Historic Preservation Office (SHPO) and SCDOT is ongoing with regard to the implementation of the proposed mitigation in accordance with the MOA.

On July 20, 2016 a letter was sent to the SHPO to initiate the Section 106 consultation process. The letter recommended the S-68/S-227 (Key Road) Bridge over Turkey Creek as eligible for the National Register of Historic Places. Additionally, the letter recommended that the proposed bridge replacement project would have an adverse effect on this site. SHPO concurred with these findings on July 25, 2016. A Memorandum of Agreement (MOA) to address the adverse effect to the historic bridge was approved on August 25, 2016. The stipulations of this MOA are listed in the preceding section of this document.

Due to the proposed project's low environmental impacts, minimal right of way acquisition, and the low Average Daily Traffic (ADT) of the route (see Section 2 of this document), it was determined that no public meetings for the project would be held. However, signs notifying the public of the upcoming bridge replacement project will be placed in the project area prior to construction. These signs will be posted after the completion of the environmental document for a period of 15 days, which coincides with SCDOT policy for advertising an opportunity for a public meeting. The signs will indicate that a bridge closure and detour are anticipated and contact information will be provided.

Appendix

South Carolina
Department of Transportation

July 20, 2016

Dr. Adrianne Daggett
Department of Transportation Project Liaison
South Carolina Department of Archives & History
8301 Parklane Road
Columbia, South Carolina 29223-4905

Re: *Final Report,* Cultural Resources Survey of Areas Potentially Affected by the Replacement of the S-68-227 (Key Road) Bridge over Turkey Creek, Edgefield and McCormick Counties, South Carolina

Dear Dr. Daggett:

Please find enclosed a copy of the above-referenced report that describes archaeological investigations conducted for the proposed S-68-227 (Key Road) bridge replacement over Turkey Creek in Edgefield and McCormick Counties, South Carolina. The final report addresses comments made by your office on June 20, 2016 (see attached responses). As part of the survey, SCDOT archaeologists documented three new archaeological sites (38ED857, 38ED858, and 38MC2653) and revisited previously recorded sites 38MC254 and 38MC1945. Archaeological sites 38ED857, 38ED858, and 38MC2653 are recommended **not eligible** for listing in the National Register of Historic Places (NRHP). Archaeological sites 38MC254 and 38MC1945 remain unassessed for NRHP eligibility.

The Department has determined that the proposed undertaking will result in an **adverse effect** to Key Bridge, a NRHP eligible property. The existing Key Bridge was determined to be "historically and technologically significant" as part of the 2013-14 statewide survey of historic bridges conducted by Transystems (McCahon). The enclosed Memorandum of Agreement (MOA) has been developed to resolve adverse effects to historic properties in accordance with 36 CFR Part 800.6(b).

Per the terms of the Section 106 Programmatic Agreement executed on August 18, 2014, the Department is providing this information on behalf of the Federal Highway Administration. It is requested that you review the enclosed material and, if appropriate, indicate your concurrence with SCDOT findings. The Department will circulate a copy of the MOA for signature once the Advisory Council on Historic Properties has been notified of the adverse effect determination. Please respond within 30 days if you have any objections or if you have need of additional information.

Sincerely,

David P. Kelly
RPG 4 NEPA Coordinator

I (~~do not~~) concur in the above determination.

Signed: _____ Date: 7/25/2016

ec: Shane Belcher, FHWA
Russell Townsend, EBCI
Lisa Larue-Baker, United Keetowah
Robin Dushane, Eastern Shawnee

cc: Wenonah G. Haire, Catawba Nation THPO
Keith Derting, SCIAA

Preserving America's Heritage

August 10, 2016

Mr. J. Shane Belcher
Environmental Coordinator
Federal Highway Administration
1835 Assembly Street, Suite 1270
Columbia, SC 29201

Ref: *Proposed S-68 (Key Road) Bridge Replacement over Turkey Creek*
Edgefield and McCormick Counties, South Carolina

Dear Mr. Belcher:

The Advisory Council on Historic Preservation (ACHP) has received your notification and supporting documentation regarding the adverse effects of the referenced undertaking on a property or properties listed or eligible for listing in the National Register of Historic Places. Based upon the information provided, we have concluded that Appendix A, *Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, of our regulations, "Protection of Historic Properties" (36 CFR Part 800), does not apply to this undertaking. Accordingly, we do not believe that our participation in the consultation to resolve adverse effects is needed. However, if we receive a request for participation from the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (THPO), affected Indian tribe, a consulting party, or other party, we may reconsider this decision. Additionally, should circumstances change, and it is determined that our participation is needed to conclude the consultation process, please notify us.

Pursuant to 36 CFR §800.6(b)(1)(iv), you will need to file the final Memorandum of Agreement (MOA), developed in consultation with the South Carolina State Historic Preservation Office (SHPO), and any other consulting parties, and related documentation with the ACHP at the conclusion of the consultation process. The filing of the MOA, and supporting documentation with the ACHP is required in order to complete the requirements of Section 106 of the National Historic Preservation Act.

Thank you for providing us with the notification of adverse effect. If you have any questions or require further assistance, please contact Ms. MaryAnn Naber at 202-517- 0218 or via e-mail at mnaber@achp.gov.

Sincerely,

LaShavio Johnson

LaShavio Johnson
Historic Preservation Technician
Office of Federal Agency Programs

**MEMORANDUM OF AGREEMENT BETWEEN
THE FEDERAL HIGHWAY ADMINISTRATION,
THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION,
THE UNITED STATES FOREST SERVICE,
AND THE SOUTH CAROLINA STATE HISTORIC PRESERVATION OFFICE**

REGARDING BRIDGE REPLACEMENT OF S-68 (KEY ROAD) BRIDGE OVER TURKEY CREEK IN THE SUMTER NATIONAL FORST AT THE EDGEFIELD/McCORMICK COUNTY LINE, SOUTH CAROLINA

WHEREAS, the Federal Highway Administration (FHWA) plans to approve this undertaking pursuant to Title 23 United States Code; and

WHEREAS, the FHWA has defined the undertaking's area of potential effects (APE) as the area shown in the attached map. The bridge replacement project limits begin approximately 1650 feet (503 meters) south of Turkey Creek and end approximately 1505 feet (459 meters) north of the creek, for a total distance of approximately 3,155 feet (962 meters). Within this project corridor the current and proposed new road right-of-way varies between 66 feet and 75 feet from centerline to either side of roadway.

WHEREAS, the FHWA has determined that the bridge replacement of the S-68 (Key Road) Bridge over Turkey Creek at the Edgefield/McCormick County Line in South Carolina, will have an adverse effect upon the S-68 (Key Road) Bridge over Turkey Creek a property determined eligible for inclusion in the National Register of Historic Places, and

WHEREAS, the FHWA has notified the Advisory Council on Historic Preservation of the adverse effect determination in accordance with Section 106 of the National Historic Preservation Act (36 CFR Part 800.6 (a)) and the Council has elected not to participate; and

WHEREAS, the FHWA has delegated responsibility to the South Carolina Department of Transportation (SCDOT) to coordinate with the South Carolina State Historic Preservation Officer (SHPO) on routine matters related to Section 106 of the National Historic Preservation Act (54 U.S.C. 306108); and

WHEREAS, the SCDOT has consulted with the South Carolina SHPO in accordance with Section 106 of the National Historic Preservation Act (54 U.S.C. 306108) and its implementing regulations (36 CFR Part 800) to resolve adverse effects; and

WHEREAS, the SCDOT has consulted with the United States Forest Service (USFS), the entity owning the property in which the project area is located, regarding

the effects of the undertaking on historic properties and has invited them to sign this Memorandum of Agreement (MOA); and

NOW, THEREFORE, the FHWA, the SCDOT, the USFS, and the South Carolina SHPO agree that the undertaking will be implemented according to the following stipulations in order to take into account the effects of the undertaking on the National Register eligible S-68 (Key Road) Bridge over Turkey Creek at the Edgefield/McCormick County line in South Carolina.

I. STIPULATIONS

The FHWA and the SCDOT will ensure that the following stipulations are implemented:

1. Prior to demolition, the existing bridge will be advertised with a thirty day (30) notice period by the SCDOT for alternative use as long as a responsible party agrees to maintain and preserve the bridge. If no third party agrees to maintain and preserve the existing bridge then stipulations two (2) and three (3) below will be carried out.

2. SCDOT's contractors selected to perform the S-68 (Key Road) Bridge Replacement will also perform repair/rehabilitation work on the historic truss bridge carrying the USFS Wine/Turkey Creek Bike Ped Trail located downstream of the S-68 (Key Road) Bridge. This work will take place within the timeframe of the S-68 (Key Road) Bridge Replacement, will be concluded before the S-68 (Key Road) Bridge Replacement is completed, and will include the following items:

    a. Replacing/repairing up to thirty percent (30%) of wooden bridge decking.
    b. Replacing/repairing damaged sections of handrail as needed.
    c. Clearing vegetation from bridge to include clearing tree limbs hanging over bridge or in immediate proximity of bridge.
    d. Replacing/repairing northernmost span of bridge.
    e. Replacing/refurbishing interpretive signage on the bridge.
    f. Providing trailhead signage at the Prices' Bottom Trailhead for Wine/Turkey Creek Trail.
    g. Replacing trailhead signage at intersection of Prices' Bottom Trailhead access road with S-68 (Key Road).

3. SCDOT will provide USFS and SHPO plans or detailed work description for the work listed in Stipulation 2 above. USFS and SHPO will have fifteen (15) days to review this information and provide comments.

II. Duration

This MOA shall be null and void if its terms are not carried out within five (5) years from the date of its execution, unless the signatories agree in writing to an extension for carrying out its terms.

III. Late Discoveries

If unanticipated cultural materials (e.g., large, intact artifacts or animal bones; large soils stains or patterns of soil stains; buried brick or stone structures; clusters of brick or stone) or human skeletal remains are discovered during construction activities, then the Resident Construction Engineer shall be immediately notified and all work in the vicinity of the discovered materials shall cease until an evaluation can be made by the SCDOT archaeologist in consultation with the South Carolina SHPO.

IV. Monitoring and Reporting

Each year following the execution of this MOA until it expires or is terminated, the SCDOT shall provide all parties to this MOA a summary report detailing work carried out pursuant to its terms. Such report shall include any scheduling changes proposed, any problems encountered, and any disputes and objections received in FHWA's and SCDOT's efforts to carry out the terms of this MOA

V. Dispute Resolution

The FHWA, the SCDOT, and the South Carolina SHPO will attempt to resolve any disagreement arising from the implementation of the MOA. This will include any disputes that arise concerning the contents of the report(s), including but not limited to its merit as a cultural resource management document.

In the event that the terms of this agreement cannot be carried out, the FHWA and SCDOT will submit a new (or amended) MOA to the South Carolina SHPO and the Council for review. If consultation to prepare a new MOA or amendments proves unproductive, the FHWA will seek Council comment in accordance with 36CFR Part 800.6(b)(1).

VI. Amendment and Modification

Any party to this MOA may request that it be amended or modified at any time, whereupon the parties will consult with each other to consider such amendment or modification.

VII. Termination

If any signatory to this MOA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment per Stipulation VI above. If within thirty (30) days an amendment cannot be reached, any signatory may terminate the MOA upon written notification to the other signatories.

Once the MOA is terminated, and prior to work continuing on the undertaking, the FHWA and the SCDOT must either (a) execute an MOA pursuant to 36 CFR Part 800.6, or (b) request comments from the ACHP under 36 CFR Part 800.7. The FHWA and the SCDOT will notify the signatories as to the course of action they will pursue.

Execution of this Memorandum of Agreement by the Federal Highway Administration, the South Carolina Department of Transportation, and the South Carolina State Historic Preservation Office and implementation of its terms, is evidence that the FHWA has taken into account the effects of the undertaking on the National Resister eligible S-68 (Key Road) Bridge over Turkey Creek and afforded the ACHP an opportunity to comment in accordance with Section 106 of the National Historic Preservation Act (16 U.S.C. Sec. 470f) and its implementing regulations (36 CFR Part 800).

SIGNATORIES:

Federal Highway Administration

By: J. Shane Belcher Date: 8/22/2016

South Carolina Department of Transportation

By: [signature] Date: 8/11/16

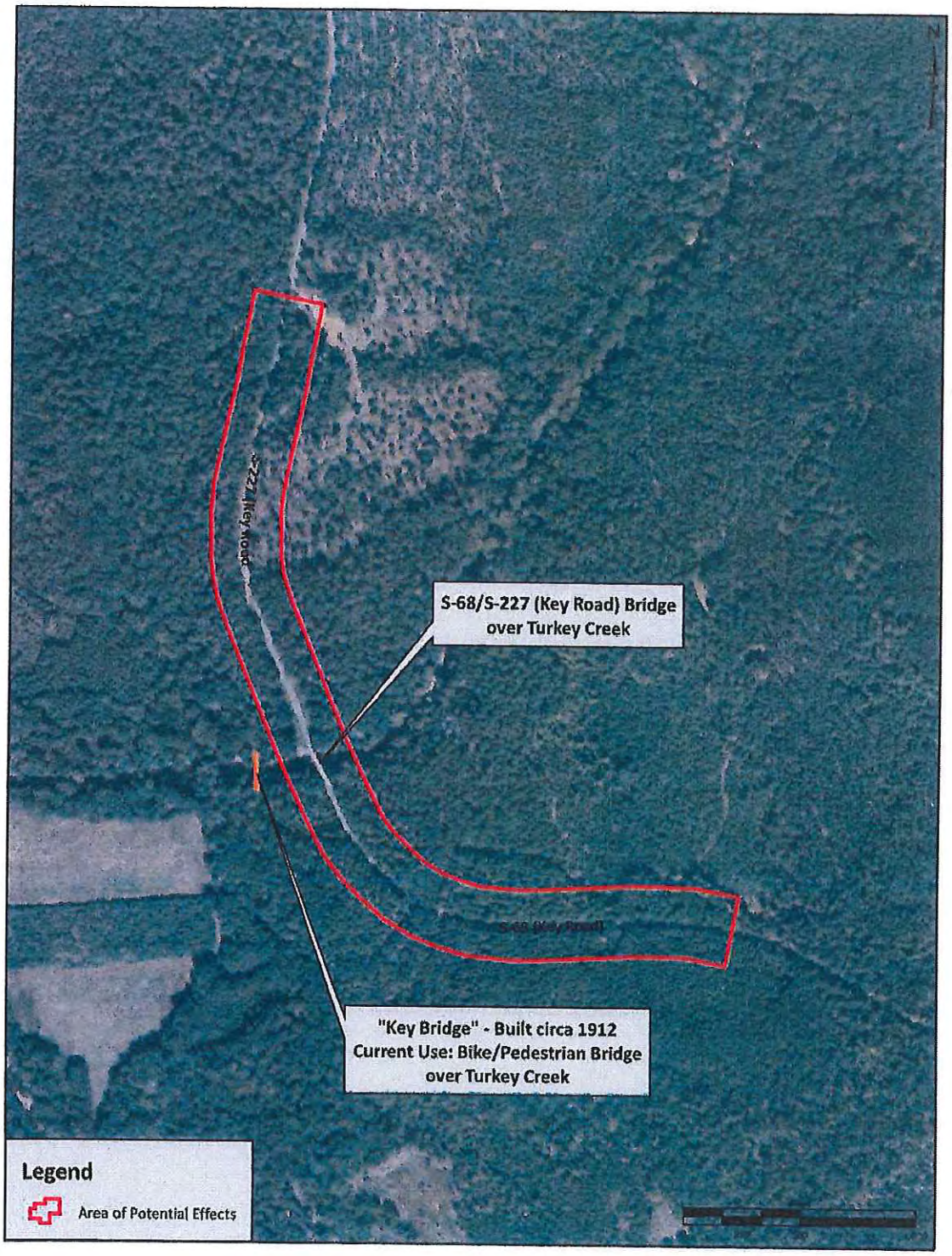
South Carolina State Historic Preservation Office

By: Elizabeth M. Johnson Date: 8/16/2016

United States Forest Service

By: [signature] Date: 8/25/2016

AREA of POTENTIAL EFFECTS



Preserving America's Heritage

September 16, 2016

Mr. J. Shane Belcher
Environmental Coordinator
Federal Highway Administration
1835 Assembly Street, Suite 1270
Columbia, SC 29201

Ref: *Proposed S-68 (Key Road) Bridge Replacement over Turkey Creek*
Edgefield and McCormick Counties, South Carolina

Dear Mr. Belcher:

The Advisory Council on Historic Preservation (ACHP) has received the Memorandum of Agreement (MOA) for the above referenced project. In accordance with Section 800.6(b)(1)(iv) of the ACHP's regulations, the ACHP acknowledges receipt of the MOA. The filing of the MOA, and execution of its terms, completes the requirements of Section 106 of the National Historic Preservation Act and the ACHP's regulations.

We appreciate you providing us with a copy of the MOA and will retain it for inclusion in our records regarding this project. Should you have any questions or require additional assistance, please contact Ms. MaryAnn Naber at (202) 517- 0218 or via e-mail at mnaber@achp.gov.

Sincerely,

LaShavio Johnson

LaShavio Johnson
Historic Preservation Technician
Office of Federal Agency Programs

Appendix E

De minimis determination for the Wine-Turkey Creek Trail

FHWA South Carolina Division

Determination of Section 4(f) *De minimis* Use

State File #		Fed Project #		PIN	P035179	Date	August 9, 20	County	Edgefield/McCormic

Project Description: S-68 (Key Road) Bridge Replacement over Turkey Creek.

Form Purpose: This form is based on FHWA regulations regarding Section 4(f) found at 23 CFR 774. The form is to be used when a determination of *de minimis* use is to be made for a Section 4(f) property.

Form Instructions: Fill out the form completely based on type of impact and attach the approval from the agency with jurisdiction over the Section 4(f) resource to the form. When multiple 4(f) properties are impacted by a project and a *de minimis* finding is to be made for each property, a separate form must be filled out for each property affected.

Document Type: ☐ EIS ☐ EA ☒ CE

Description of the Section 4(f) Resource:

The Wine-Turkey Creek Trail is a 12 mile (one-way) unpaved public-use trail within the Sumter National Forest. The trail crosses S-68/S-227 (Key Road) approximately 800 feet north of the Key Road bridge over Turkey Creek. The trail is managed by the U.S. Forest Service Long Cane Ranger District and is included in the South Carolina State Trails Program. The trail originates at SC 283, near Wade Morgan Road, approximately 3.25 miles north of the proposed project. The trail roughly parallels Wine Creek south to Turkey Creek and continues to Stevens Creek. The trail then parallels Stevens Creek and terminates at an unnamed local road, approximately 2.5 miles west of the proposed project. The USDA provides a paved parking lot at the SC 283 trailhead and lists a gravel parking area at Key Bridge as an amenity.

Brief Description of Project Scope:

The proposed project involves the replacement of the existing S-68/S-227 (Key Road) bridge over Turkey Creek on its existing alignment. The project would also improve the existing roadway approaches to the bridge for a total of 2,180 feet, including approximately 1,030 feet on the Edgefield County side of the bridge and approximately 1,150 feet on the McCormick County side of the bridge. The project proposes to close the bridge and roadway approaches to the bridge during construction.

Applicability Determination:

(to be applicable answers to all questions must be "yes")

I. For Public Parks, Recreation Areas, and Wildlife and/or Waterfowl Refuge:

1. Does the project involve a minor take of land from the resource? ☒ Yes ☐ No

a. Identify the total acreage of the resource: Acres 12 miles (approx. 30 acres)

b. Describe the use of the land from the resource and identify amount of the resource to be used (acres):

Preliminary plans indicate the project would impact approximately 60 feet of the Wine-Turkey Creek Trail as well as the Wine-Turkey Creek Trail bridge over Turkey Creek, which would be closed while being rehabilitated as part of the overall S-68 Bridge Replacement scope. It is proposed that these portions of the trail be closed during construction and reopened following construction. Therefore, the project would have no permanent impact on the use or function of the trail.

2. Does the project not adversely affect the qualities, activities, features, or other attributes of the resource that qualify it for protection under Section 4(f)? ☒ Yes ☐ No

3. Has the agency with jurisdiction over the resource concurred in writing with the FHWA's and/or SCDOT's determination that the project will not adversely affect the resource and is the concurrence attached? ☒ Yes ☐ No

a. Identify the agency with jurisdiction: U.S. Forest Service

4. Has the agency with jurisdiction over the resource been informed of FHWA's and/or SCDOT's intent to make a *de minimis* finding? ☒ Yes ☐ No

b. If yes, attach the correspondence. Correspondence attached? ☒ Yes ☐ No

5. Has the public been afforded an opportunity to review and comment on the effects of the project on the protected activities, features, and attributes of the resource? ☒ Yes ☐ No

a. Identify the opportunity for public comment:

Notice of opportunity for public hearing was advertised in local newspaper (attached). No replies to the notice were received.

II. For Historic Properties:

1. Does the project have a "No Adverse Effect" or a "No Historic Properties Affected" on the historic property as defined by Section 106 of the National Historic Preservation Act and its regulations? ☐ Yes ☐ No

a. Identify the effects determination for the resource:

b. Describe the use of land from resource and identify the amount of the resource to be used (acres):

2. Has the SHPO and ACHP, if participating in the Section 106 consultation, concurred in writing with the effects determination? ☐ Yes ☐ No

a. If so, attach the written concurrence. Concurrence attached? ☐ Yes ☐ No
(Receipt of the SHPO's concurrence with the FHWA's finding, or a non-response after the specific time qualifies as the necessary correspondence from the official with jurisdiction over Section 106 properties).

3. Has the SHPO and ACHP, if participating in the Section 106 consultation, been informed of FHWA's and/or SCDOT's intent to make a *de minimis* impact/no adverse finding based on their written concurrence in the Section 106 determination? ☐ Yes ☐ No

a. If yes, attach correspondence. Correspondence attached? ☐ Yes ☐ No

4. Have the views of the consulting parties participating in the Section 106 consultation been considered? ☐ Yes ☐ No

a. Attach any relevant correspondence and any necessary responses to consulting party comments. Correspondence attached? ☐ Yes ☐ No

III. Alternatives Analysis:

1. Summarize why the use of the property from the resource cannot be avoided.

☒ Project needs would not be met.

Explain:

The purpose of the proposed project is to replace the S-68/S-227 (Key Road) bridge over Turkey Creek. Improvements to the roadway approaches to the bridge are also necessary to tie into the new bridge. Due to the location of the Key Road trail crossing (approximately 800 feet north of the bridge), this portion of the resource cannot be avoided.

☐ Substantial impacts to other environmental/cultural/social resources would result.

Explain:

☐ Project complexity would increase resulting in greater construction and maintenance costs.

Explain:

☐ Other.

Explain:

2. Summarize the measures to minimize harm. This would include, if applicable, any mitigation measures.

Although not directly tied to the need to close the trail during construction, the Wine-Turkey Creek Trail Bridge over Turkey Creek will be repaired/rehabilitated as part of the mitigation package for adverse effects to the National Register of Historic Places eligible S-68 Bridge Replacement over Turkey Creek. This repair/rehab effort will provide a benefit for the trail.

IV. Summary and Determination:

The project involves a *de minimis*/no adverse use on the Section 4(f) property as evidence with a "No Adverse Effect" finding from the SHPO or as evidence through the minimization of harm to a public park, recreation land or wildlife and waterfowl refuge as a result of mitigation to or avoidance of impacts to the qualifying characteristics and/or the functions of the resource.

Based on the scope of the undertaking; the fact that the undertaking does not adversely affect the function/qualities of the Section 4(f) resource on a permanent or temporary basis; and with agreement from the official with jurisdiction, the proposed action constitutes a *de minimis*/no adverse use and the alternatives analysis is considered satisfied.

Preparer: _____ Date: _____

Program Manager: _____ Date: _____

Environmental Manager: David P. Kelly Date: 8/9/2016

FHWA: J. Shane Belcher Date: 8/30/2016

South Carolina
Department of Transportation

August 11, 2016

John R. Kirkaldie
Long Cane District Ranger
United States Forest Service
810 Buncombe Street
Edgefield, South Carolina
29824

Re: Temporary closure of a section of the Wine Turkey Creek Trail in McCormick County during construction of the new S-68 (Key Road) Bridge over Turkey Creek at the Edgefield/McCormick County line. PIN: 35179

Dear Mr. Kirkaldie:

The South Carolina Department of Transportation (SCDOT) plans to replace the S-68 (Key Road) Bridge over Turkey Creek on existing alignment. This bridge is located at the Edgefield/McCormick County Line and roadway approach work will occur in both counties (see attached location map). An environmental document (Categorical Exclusion) is being developed that will document the potential for impacts to both the human and natural environment due to the project. The potential impacts of the project are also being evaluated pursuant to Section 4(f), a provision of federal transportation law at Title 49, USC 303 that affords certain protections to public parks, historic sites, and wildlife refuges.

The proposed project involves the replacement of S-68 (Key Road) Bridge on existing alignment due to the bridge's structural deficiencies and functional obsolescence. The alternatives considered for this project were the "no-build" (not pursuing the project and leaving the bridge as is), rehabilitation of the existing bridge, replacement on new alignment upstream, replacement on new alignment downstream, and the "preferred build" (proposed project as described above). The preferred build alternative was selected due to having the lowest cost, least environmental impacts, smallest additional right-of-way acquisition, best roadway geometry, and shortest construction duration. The preferred build alternative would require temporary closure of sections of the Wine Turkey Creek Trail during construction.

On June 3, 2016 a meeting was held with representatives of the United States Forest Service (USFS), the State Historic Preservation Office (SHPO), and SCDOT. The primary purpose of this meeting was to discuss the project and mitigation options relative to the demolition of the S-68 Bridge over Turkey Creek, a resource eligible for the National Register of Historic Places. During this meeting, the proposed temporary closure of the trail was also discussed with the USFS. The sections of trail that would be closed during the SCDOT bridge replacement project are the portion of the trail crossing and immediately adjacent to the S-68 (Key Road) roadway and the trail bridge over Turkey Creek. See the attached map for closure locations.

An opportunity for a public meeting to discuss the temporary closure of the trail was advertised in a local paper ("The Edgefield Advertiser") in July 2016. SCDOT received no meeting requests or other feedback as a result of this advertisement. A copy of the advertisement is attached.

Post Office Box 191
Columbia, South Carolina 29202-0191

Phone: (803) 737-2314
TTY: (803) 737-3870

As a recreation area resource, the Wine Turkey Creek Trail is afforded special protection under Section 4(f). If the proposed transportation facility could result in adverse effects to the trail, the transportation agency must conduct an evaluation to demonstrate that there is no prudent and feasible alternative to the use of the property under the provisions of Section 4(f). Because this evaluation can potentially result in project delays, an exemption is provided in cases where the official with jurisdiction over the park/recreation area/historic site/wildlife refuge concurs in a demonstration that the impacts are not adverse. This concurrence enables FHWA to make a *de minimis* (minimal impact) finding, which satisfies the requirements of Section 4(f) and eliminates the need for a full-scale 4(f) Evaluation. *De minimis* impacts on publicly-owned parks, recreation areas, and wildlife and waterfowl refuges are defined as those that do not "adversely affect the activities, features and attributes" of the Section 4(f) resource. Thus, the purpose of this letter is to request your concurrence that the proposed replacement of the S-68 (Key Road) Bridge over Turkey Creek will not adversely affect the activities, features, and attributes of the Wine Turkey Creek Trail, thus allowing the FHWA to make a *de minimis* impact finding.

SCDOT is seeking your concurrence with the *de minimis* finding for inclusion in the Categorical Exclusion Type C environmental document for the proposed project. If you concur that the minimal impact on the Wine Turkey Creek Trail as shown on the attached exhibits would not adversely affect the recreational activities, features, and attributes that qualify the trail under Section 4(f), SCDOT requests that you please sign and date this letter in the spaces below.

As the official with jurisdiction over the Wine Turkey Creek Trail, I concur with the determination that the proposed transportation project as described in this letter and shown on the accompanying attachments would not adversely affect the activities, features, and attributes that qualify the Wine Turkey Creek Trail for protection under Section 4(f). I have also been informed that, based on my concurrence, the FHWA intends to make a de minimis finding regarding impacts to the Wine Turkey Creek Trail, thus satisfying the requirements of Section 4(f).

Signature: _____ Date: 8/25/2016

Print Name and Title: John Richard Lint, Forest Supervisor

Following signing and dating of this letter, please return a copy within 15 days of the date of this letter to the following contact/address below:

South Carolina Department of Transportation
Attn: David P. Kelly
P.O. Box 191
Columbia, SC 29202

Your expeditious handling of this concurrence will be appreciated. Should you have any immediate questions, please contact me at 803-737-1645.

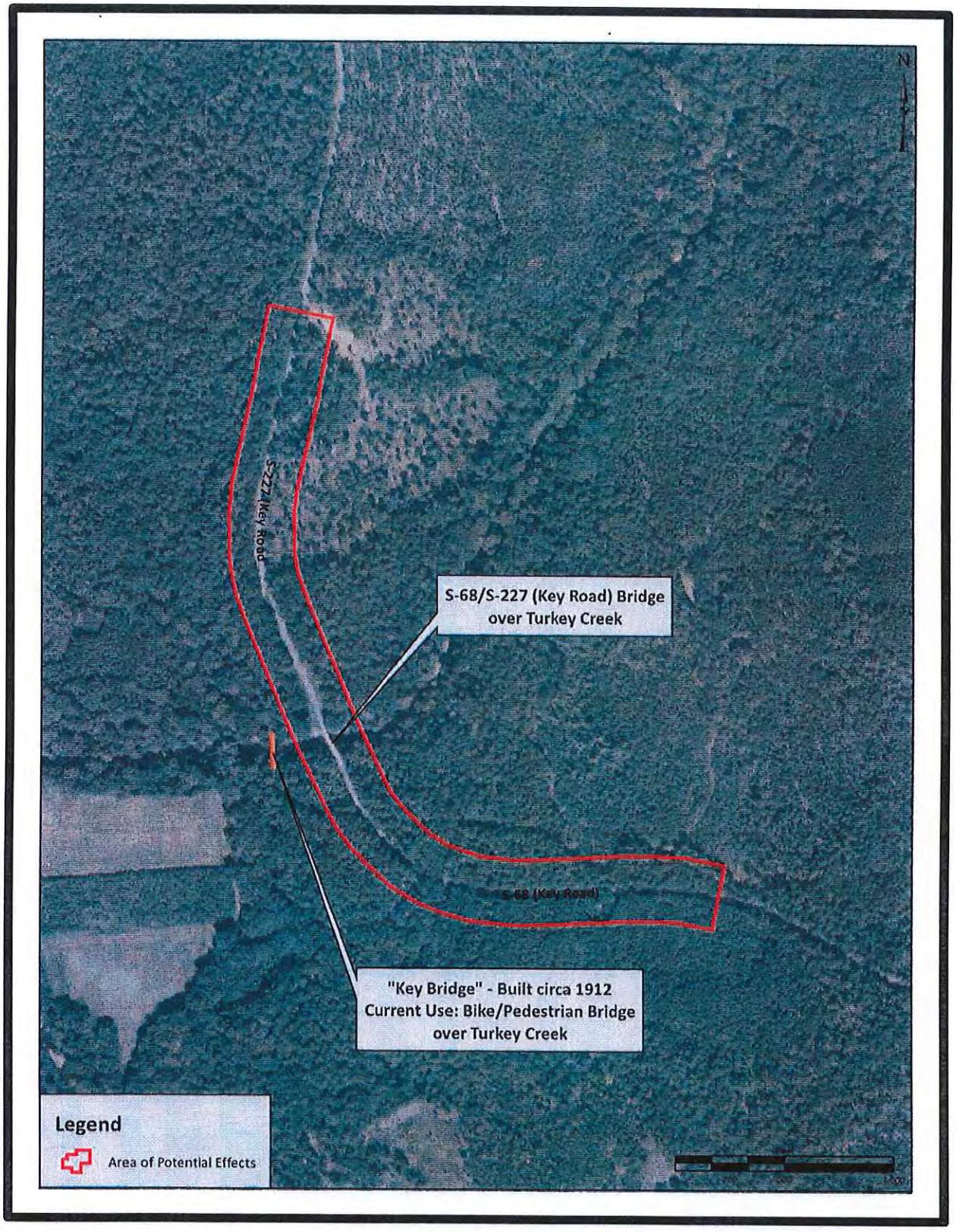
Sincerely,

David P. Kelly
NEPA Coordinator—RPG 4/Upstate Region

cc: Chris Jordan, SCDOT
Shane Belcher, FHWA

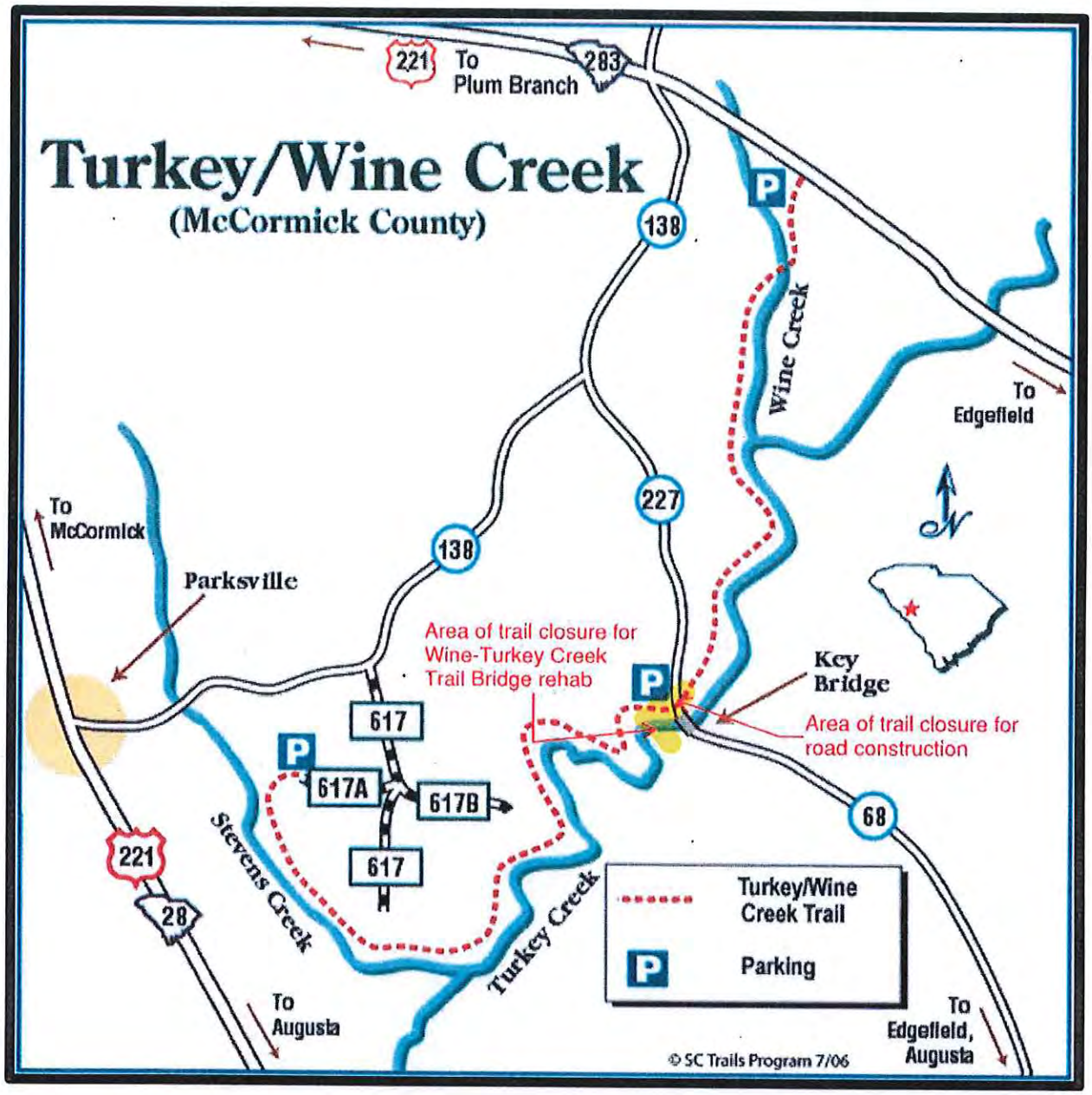
Enclosure: Location Map, Trail Closure Location Map

Project Location Map



Page 3 - Temporary closure of a section of the Wine Turkey Creek Trail in McCormick County during construction of the new S-68 (Key Road) Bridge over Turkey Creek at the Edgefield/McCormick County line.
PIN: 35179

Segments of Wine-Turkey Creek Trail subject to temporary closure during SCDOT project construction



Page 4 - Temporary closure of a section of the Wine Turkey Creek Trail in McCormick County during construction of the new S-68 (Key Road) Bridge over Turkey Creek at the Edgefield/McCormick County line. PIN: 35179

Opportunity for Public Meeting on Trail Closure Advertisement

Opportunity for Public Meeting Notice

NOTICE TO CITIZENS OF EDGEFIELD & McCORMICK COUNTIES:

All interested persons are advised that the South Carolina Department of Transportation (SCDOT) proposes to replace the S-68 (Key Road) Bridge over Turkey Creek at the Edgefield/McCormick County line near Parksville, SC. New right-of-way will be needed for the proposed improvements. Preliminary plans indicate the project would impact approximately 60 feet of the Wine-Turkey Creek Trail, a facility owned and maintained by the United States Forest Service (USFS). It is proposed that this portion of the trail be closed during construction and reopened following construction. Therefore, the project would have no permanent impact on the use or function of the trail. Based on the project's proposed use of the Wine-Turkey Creek Trail, the Federal Highway Administration (FHWA) intends to make a Section 4(f) *de minimis* finding for the project. SCDOT has coordinated with the USFS to address concerns related to the trail and will improve the trail by repairing elements of the Wine-Turkey Creek Trail bridge over Turkey Creek during construction of the new S-68 Bridge over Turkey Creek.

Any interested person may request that a public meeting be held on the project with respect to the proposed *de minimis* finding on the Wine-Turkey Creek Trail; or any possible social, economic and environmental effect of the proposal on the community. This request must be submitted in writing to Mr. Clint Scoville, Program Manager, South Carolina Department of Transportation, P.O. Box 191, Columbia, SC, 29202, and received by the Department no later than August 4, 2016. It is requested that your letter contain a telephone number where you may be contacted between 8:30 a.m. and 5:00 p.m. In the event such a request is received and a meeting held, a future notice of the time and place of the meeting will be published. Related maps, drawings, documents, and other pertinent information are available for public review at the SCDOT Headquarters, 955 Park Street, Columbia, SC. Additional information regarding this project may also be obtained by calling Program Manager Clint Scoville in Columbia at telephone number 803-737-2085.

****

Edgefield Advertiser Date of Issue – July 20, 2016

****

Appendix F

Watershed and Water Quality Information Report

D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

3/17/2016

Watershed and Water Quality Information

Genaral Information

Applicant Name: SCDOT

Permit Type: Construction

Latitude: 33.7946

Longitude: -82.1444

MS4 Designation: Not in designated area

Monitoring Station: SV-352

Within Coastal Critical Area: NO

Water Classification (Provisional): FW

Waterbody Name: TURKEY CREEK

Entered Waterbody Name:

Parameter Descriptions

NH3N	Ammonia	FC	Fecal Coliform
CR	Chromium	FCB	Fecal Coliform (Shellfish)
CU	Copper	BIO	Macroinvertebrates (Bio)
HG	Mercury	TP	(Lakes) Phosphorus
NI	Nickel	TN	(Lakes) Nitrogen
PB	Lead	CHLA	(Lakes) Chlorophyll a
ZN	Zinc	ENTERO	(Beach) Enterococcus
DO	Dissolved Oxygen	HGF	Mercury (Fish)
PH	pH	PCB	PCB (Fish)

Impaired Status (downstream sites)

Station	NH3N	CR	CU	HG	NI	PB	ZN	DO	PH	TURBIDITY	ECOLI	FCB	BIO	TP	TN	CHLA	ENTERO	HGF	PCB
SV-352	F	F	F	F	F	X	F	F	F	F	N	A	X	X	X	X	X	X	X
SV-063	A	A	A	A	A	X	A	A	A	A	A	A	F	X	X	X	X	X	X

F = Standards Fully Supported
N = Standards Not Supported
A = Assessed at Upstream Station
X = Parameter Not Assessed at Station
T = Within TMDL Approved Watershed

Parameters to be addressed (those not supporting standards)

ECOLI

Fish Consumption Advisory

TMDL Information - TMDL Parameters to be addressed

In TMDL Watershed: No

TMDL Site:

TMDL Report No:

TMDL Parameter:

TMDL Document Link:

Appendix G

Jurisdictional Determination Letter and Mapping (SAC 2015-00468-DJJ)

DEPARTMENT OF THE ARMY
CHARLESTON DISTRICT, CORPS OF ENGINEERS
69A HAGOOD AVENUE
CHARLESTON, SOUTH CAROLINA 29403-5107

REPLY TO
ATTENTION OF

April 16, 2015

Regulatory Division

RECEIVED
APR 23 2015
Environmental Management
SCDOT

Mr. Sean Connolly
South Carolina Department of Transportation
P.O. Box 191
Columbia, South Carolina 29202-0191

Dear Mr. Connolly:

This is in response to your letter of March 27, 2015, requesting a Preliminary Jurisdictional Determination (Preliminary) for a 30 acre project area, located where S-68/ S-227 (Key Road) crosses Turkey Creek in Edgefield and McCormick Counties, South Carolina. The project area is depicted on the enclosed three drawings (Figures 6, 7, and 8) entitled "S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK" and dated February 19, 2015. A preliminary jurisdictional determination is used to indicate that this office has identified wetlands or other waters on the property and believes these waters may be jurisdictional waters of the United States. Since the Preliminary does not verify the actual jurisdictional status of wetlands and/or waters of the United States on the property, it relies on the presumption of jurisdiction for the purpose of expediting the request for a Preliminary.

Based on a review of aerial photography, topographic maps, National Wetland Inventory maps and soil survey information, it has been concluded that the boundaries shown on the referenced drawings are a reasonable approximation of the location and boundaries of the waters found on this site. The area in question contains approximately 308 linear feet/ 0.549 acre of federally defined freshwater wetlands or other waters. You are cautioned that this delineation is approximate, subject to change, and should be used for planning purposes only. This office should be contacted prior to performing any work in or around these wetlands or other waters. In order for a definitive determination to be provided, these areas should be located and marked on-site, sketched or surveyed, platted on a map, and should be accompanied by a request for an Approved Jurisdictional Determination. Upon receipt of such a request, this office can then issue an approved determination as to jurisdiction (rather than the presumption of jurisdiction). You should also be aware that the areas identified as wetlands or other waters may be subject to restrictions or requirements of other state or local government entities.

Please note that since this jurisdictional determination is a Preliminary, it is subject to change and therefore is not an appealable action under the Corps of Engineers administrative appeal procedures defined at 33 CFR 331. If a permit application is forthcoming as a result of this Preliminary, a copy of this letter, as well as the attached sketch or plat should be submitted as part of the application. Otherwise, a delay could occur in confirming that a preliminary jurisdictional determination was performed for the permit project area.

This preliminary jurisdictional determination is a non-binding action and as such has no expiration until it is superseded by an Approved Jurisdictional Determination. If you intend to

request an Approved Jurisdictional Determination in the future, you are advised not to commence work in these wetlands and/or waters prior to receiving the Approved Jurisdictional Determination.

In future correspondence concerning this matter, please refer to SAC 2015-00468-DJJ. You may still need state or local assent. Prior to performing any work, you should contact the South Carolina Department of Health and Environmental Control. A copy of this letter is being forwarded to them for their information.

Enclosed are two copies of the Preliminary Jurisdictional Determination Form signed by our office. Please sign both copies, retain one copy for your records and return one signed copy to this office in the enclosed self-addressed envelope.

If you have any questions concerning this matter, please contact Elizabeth Williams at 843-329-8044 or toll free at 1-866-329-8187.

Sincerely,

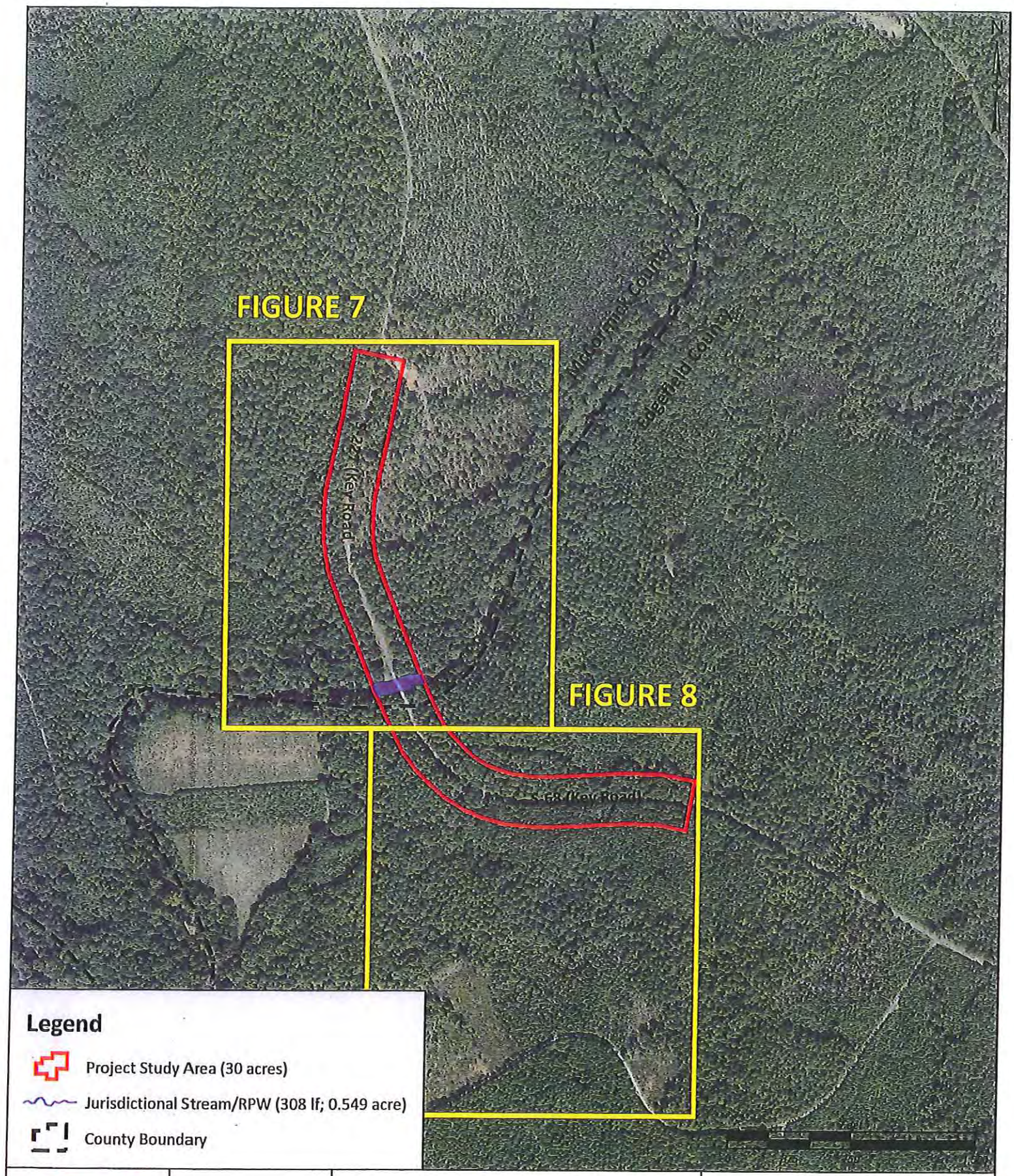
Travis G. Hughes
Chief, Special Projects Branch

Enclosures

Preliminary Jurisdictional Determination Form

Copy Furnished:

Mr. Matt DeWitt
Mead and Hunt
307 West Main Street
Lexington, South Carolina 29072



Mead & Hunt
307 W. Main Street
Lexington, SC 29072
Tel. 803.996.2900
www.meadhunt.com

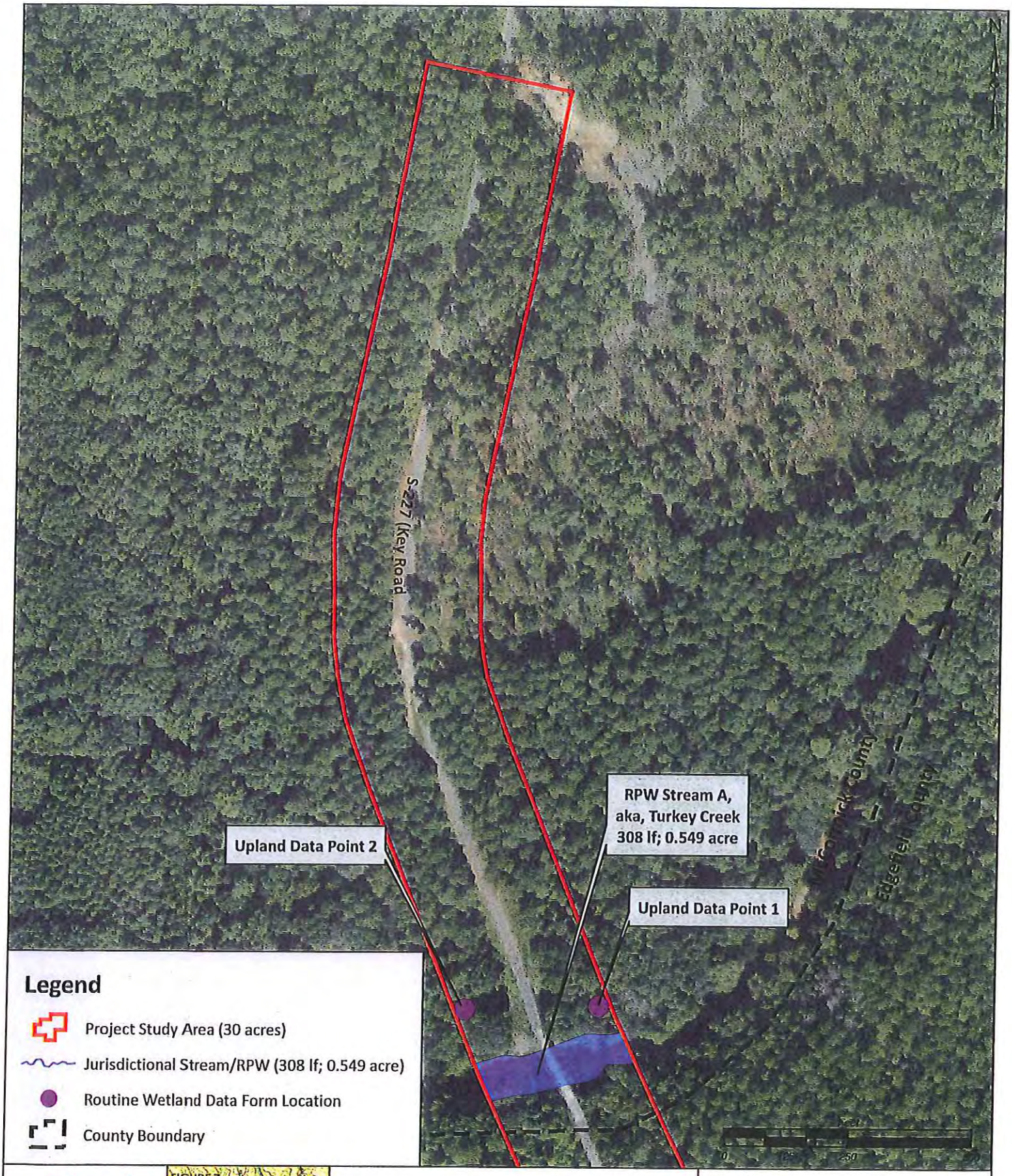
S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

APPLICATION BY: SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

JURISDICTIONAL WATERS OF THE U.S. INDEX

M&H PROJ: R3286900-140626.01 SCDOT PIN: 35179 USACE SAC: NOT YET ASSIGNED	SOURCE: NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) AERIAL PHOTOGRAPHY (MCCORMICK COUNTY (2013))	DRAWN BY: MTD	QAQC BY: JBS
		DATE: 02/19/2015	FIGURE 6



Mead & Hunt
Mead & Hunt
307 W. Main Street
Lexington, SC 29072
Tel. 803.996.2900
www.meadhunt.com

FIGURE 7

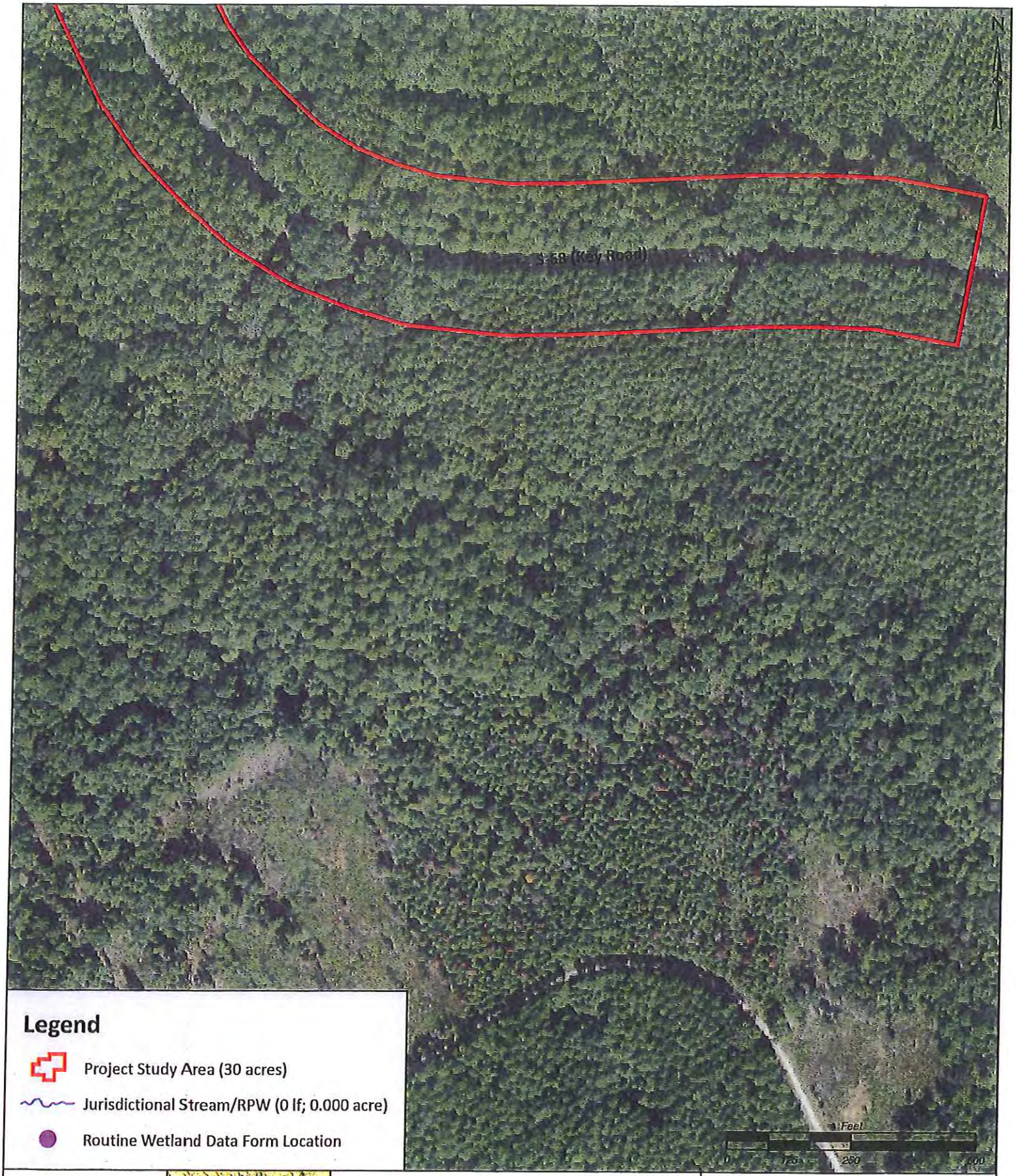
S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT
OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

APPLICATION BY: SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

JURISDICTIONAL WATERS OF THE U.S. MAP

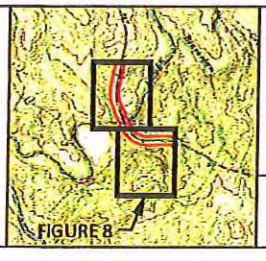
M&H PROJ: R3286900-140626.01 SCDOT PIN: 35179 USACE SAC: NOT YET ASSIGNED	SOURCE: NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) AERIAL PHOTOGRAPHY (MCCORMICK COUNTY (2013))
DRAWN BY: MTD	QAQC BY: JBS
DATE: 02/19/2015	FIGURE 7



Legend

- Project Study Area (30 acres)
- Jurisdictional Stream/RPW (0 lf; 0.000 acre)
- Routine Wetland Data Form Location

Mead & Hunt
Mead & Hunt
307 W. Main Street
Lexington, SC 29072
Tel. 803.996.2900
www.meadhunt.com



S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT
OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

APPLICATION BY: SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

JURISDICTIONAL WATERS OF THE U.S. MAP

M&H PROJ: R3286900-140626.01 SCDOT PIN: 35179 USACE SAC: NOT YET ASSIGNED	SOURCE: NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) AERIAL PHOTOGRAPHY (MCCORMICK COUNTY (2013))	DRAWN BY: MTD	QAQC BY: JBS
		DATE: 02/19/2015	FIGURE 8

ATTACHMENT

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD): April 16, 2015

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD: SC DOT PO Box 191, Columbia SC 29202

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: SAC 2015-00468 S-68 / S-227 (Key Road) Bridge Replacement Project Over Turkey Creek

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION: S-68 / S-227 (Key Road) Bridge Over Turkey Creek. Turkey Creek acts as the county line between McCormick and Edgefield Counties and therefore the project falls in both Counties.

(USE THE ATTACHED TABLE TO DOCUMENT MULTIPLE WATERBODIES AT DIFFERENT SITES)

State: SC County/parish/borough: McCormick and Edgefield City: Rural setting, approx 4 miles west of Parksville.

Center coordinates of site (lat/long in degree decimal format):

Lat. 33.794781°N, Long. -82.144490°W. Universal Transverse Mercator:

Name of nearest waterbody: Turkey Creek

Identify (estimate) amount of waters in the review area:

Non-wetland waters: 308 linear feet: 80 width (ft) and/or 0.549 acres.

Cowardin Class: Stream Flow:

Wetlands: acres. Cowardin Class:

Name of any water bodies on the site that have been identified as Section 10 waters:

Tidal:

Non-Tidal:

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date: 4-16-15 ☐ Field Determination. Date(s):

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which

does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
- ☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps: .
- ☐ Corps navigable waters' study: .
- ☐ U.S. Geological Survey Hydrologic Atlas: .
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☐ U.S. Geological Survey map(s). Cite scale & quad name: .
- ☒ USDA Natural Resources Conservation Service Soil Survey. Citation: McCormick and Edgefield Counties.
- ☒ National wetlands inventory map(s). Cite name: McCormick and Edgefield Counties.
- ☐ State/Local wetland inventory map(s): .
- ☐ FEMA/FIRM maps: .
- ☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- ☒ Photographs: ☒ Aerial (Name & Date):'99, 2006 SCDNR aerial infrared.

or ☒ Other (Name & Date):Site photographs provided by Matt DeWitt.

☐ Previous determination(s). File no. and date of response letter: .

☐ Other information (please specify): .

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and date of
Regulatory Project Manager
(REQUIRED)

4/24/15

Signature and date of
person requesting preliminary JD
(REQUIRED, unless obtaining the signature is impracticable)

Site number	Latitude	Longitude	Cowardin Class	Estimated amount of aquatic resource in review area	Class of aquatic resource
RPW A	33.794747	-82.144536	R	308LF/ 0.549AC	non-section 10 – non-wetland

Appendix H

Bridge Scope and Risk Assessment Form

BRIDGE SCOPE AND RISK ASSESSMENT FORM

COUNTY: Edgefield DATE: 08/24/2016

ROAD #: S-68 / S-227 STREAM CROSSING: Turkey Creek

Purpose & Need for the Project:

Replace structurally deficient existing bridge with a proposed new 2-span, 320-foot concrete bridge.

I. FEMA Acknowledgement

Is this project located in a regulated FEMA Floodway? ☐ Yes ☑ No

Panel Number: _____ Effective Date: _____ (See Attached)

II. FEMA Floodmap Investigation

FEMA Flood Profile Sheet Number _____ illustrates the existing 100 year flood:

☐ Passes under the existing low chord elevation.
☐ Is in contact with the existing low chord elevation.
☐ Overtops the existing bridge finished grade elevation.

III. No Rise/CLOMR Preliminary Determination

☐ Preliminary assessment indicates this project may be constructed to meet the "No-Rise" requirements. A detailed hydraulic analysis will be performed to verify this assessment.

Justification:

☐ Preliminary assessmnet indicates this project may require a CLOMR/LOMR. Impacts will be determined by a detailed hydraulic analysis.

Justification:

BRIDGE SCOPE AND RISK ASSESSMENT FORM

IV. Preliminary Bridge Assessment

A. Locate Existing Plans

a. Bridge Plans [✓] Yes [ ] No File No. 1933.278 Sheet No. 7 (See Attached)

b. Road Plans [✓] Yes [ ] No File No. 1933.278 Sheet No. 5-6 (See Attached)

B. Historical Highwater Data

a. USGS Gage [ ] Yes [✓] No Gage No. _____ Results: _____

b. SCDOT/USGS Documented Highwater Elevations

[✓] Yes [ ] No Results: Normal=252.7 - Historical=264.0

c. Existing Plans [✓] Yes [ ] No See Above

V. Field Review

A. Existing Bridge

Length: 304 ft. Width: 22 ft. Max. span Length: 151 ft.

Alignment: [✓] Tangent [ ] Curved

Bridge Skewed: [ ] Yes [✓] No Angle: _____

End Abutment Type: Spill-through

Riprap on End Fills: [✓] Yes [ ] No Condition: Good

Superstructure Type: Concrete w/ steel truss

Substructure Type: steel

Utilities Present: [ ] Yes [✓] No

Describe:

Debris Accumulation on Bridge: Percent Blocked Horizontally: 5 %

Percent Blocked Vertically: 5 %

Hydraulic Problems: [ ] Yes [✓] No

Describe:

BRIDGE SCOPE AND RISK ASSESSMENT FORM

V. Field Review (cont.)

B. Hydraulic Features

a. Scour Present: ☐ Yes ☑ No Location: _____

b. Distance from F.G. to Normal Water Elevation: 49.1 ft.

c. Distance from Low Steel to Normal Water Elev.: 46.6 ft.

d. Distance from F.G. to High Water Elevation: 7.9 ft.

e. Distance from Low Steel to High Water Elev.: 5.4 ft.

f. Channel Banks Stable: ☑ Yes ☐ No

Describe:

g. Soil Type: Fine - Cartecay, Gundy, & Riverview

h. Exposed Rock: ☐ Yes ☑ No Location: _____

i. Give Description and Location of any structures or other property that could be damaged due to additional backwater.

C. Existing Roadway Geometry

a. Can the existing roadway be closed for an On-Alignment Bridge Replacement

☑ Yes ☐ No

Describe:

If "yes", does the existing vertical and horizontal curves meet the proposed design speed criteria?

Yes.

If "No", will the proposed bridge be:

☐ Staged Constructed

☐ Replaced on New Alignment

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

VI. Field Review (cont.)

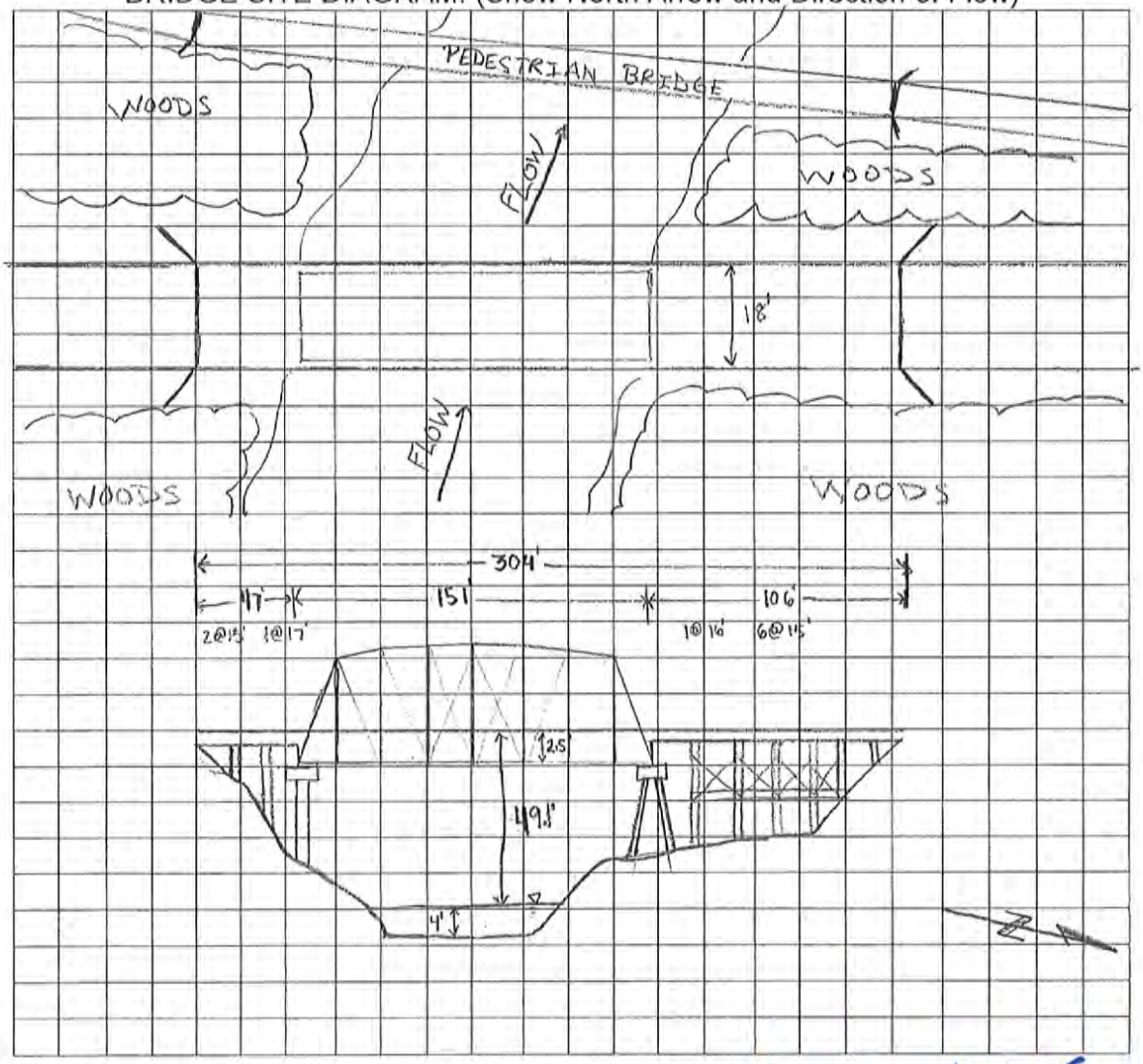
A. Proposed Bridge Recommendation:

Length: 320 ft. Width: 34 ft. Elevation: 273.5 ft.

Span Arangement: 215'-105'

Notes: Steel plate-girder (215') and Type IV concrete beam (105')

BRIDGE SITE DIAGRAM: (Show North Arrow and Direction of Flow)



Performed By: [signature]

Title: RPG #4 HYDRAULIC ENGINEER

Appendix I

Natural Resources Technical Memorandum (NRTM) and U.S. Fish and Wildlife Service (USFWS) Concurrence

United States Department of the Interior

FISH AND WILDLIFE SERVICE
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407

April 20, 2016

Ms. Nicole Riddle
South Carolina Department of Transportation
P.O. Box 191
Columbia, SC 29202-0191

Re: S-68/S-227 (Key Road) Bridge Replacement over Turkey Creek
Edgefield and McCormick Counties, South Carolina
FWS Log No. 2016-I-0367

Dear Ms. Riddle:

The U.S. Fish and Wildlife Service (Service) has reviewed the information in your March 31, 2016, letter as well as the attached Biological Assessment (BA), regarding the proposed Federal Highway Administration (FHWA)/South Carolina Department of Transportation (SCDOT) replacement of the Key Road bridge over Turkey Creek within the Long Cane Ranger District of Sumter National Forest. The current bridge was built in 1925 and is considered structurally deficient and functionally obsolete.

The federally endangered Carolina heelsplitter (*Lasmigona decorata*) and its designated critical habitat are known to occur within the project area. A freshwater mussel survey was conducted by Three Oaks Engineering, Inc., in December of 2015; the associated report documented one individual Carolina heelsplitter was found approximately 70 feet upstream of the bridge. Therefore, bridge replacement activities have the potential to affect both critical habitat and individual heelsplitter located within and downstream of the project area. However, based on information provided in the BA, no bridge supports will be located within the stream channel, and there will be no temporary disturbance to the stream bottom from in-stream construction causeways, work pads, or construction within the stream. Additionally, SCDOT has committed to take extra precautions during construction and demolition (page 8 of the BA) in order to prevent the degradation of downstream habitat from sedimentation.

Based upon the information provided, including the additional environmental commitments agreed to by FHWA and SCDOT to protect the Carolina heelsplitter and its critical habitat in Turkey Creek, the Service concurs with the determination that the proposed project may affect, but is not likely to adversely affect, the Carolina heelsplitter or its designated critical habitat. Please note that obligations under the Endangered Species Act must be reconsidered if: (1) new information reveals impacts of this identified action may affect any listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a

manner, which was not considered in this assessment; or (3) a new species is listed or critical habitat is designated that may be affected by the identified action.

For informational purposes only, the Service has included a list of species that have been petitioned for listing under the Endangered Species Act as well as Candidate Species. These species are collectively referred to as "At-Risk Species" (ARS). We have included a list of the ARS that may occur in Edgefield and McCormick Counties, South Carolina. Although there are no Federal protections afforded to ARS, please consider including them in your survey efforts. Incorporating proactive measures to avoid or minimize harm to ARS may improve their status and assist with precluding the need to list these species. Additional information on ARS can be found at:

http://www.fws.gov/southeast/candidateconservation

If you need further assistance, please contact Ms. Morgan Wolf at (843) 727-4707 ext. 219, and reference FWS Log No. 2016-I-0367.

Sincerely,

Thomas D. McCoy

Thomas D. McCoy
Field Supervisor

TDM/MKW

South Carolina List of At-Risk, Candidate, Endangered, and Threatened Species - McCormick County

CATEGORY	COMMON NAME/STATUS	SCIENTIFIC NAME	SURVEY WINDOW/ TIME PERIOD	COMMENTS
Amphibian	None Found			
Bird	American wood stork (T)	*Mycteria americana*	February 15-September 1	Nesting season
	Bald eagle (BGEPA)	*Haliaeetus leucocephalus*	October 1-May 15	Nesting season
	Red-cockaded woodpecker (E)	*Picoides borealis*	April 1-July 31	Nesting season
Crustacean	None Found			
Fish	American eel (ARS)	*Anguilla rostrata*	March 1-May 30; October 1-December 15	Temperature dependent: normally (17-20°C); can be found between 13-25°C
	Blueback herring (ARS)	*Alosa aestivalis*	Mid-January-mid May	Peak: March-April
	Robust redhorse (ARS)	*Moxostoma robustum*	Late April-early May	Temperature dependent: 16-24°C
Insect	Septima's clubtail (ARS)	*Gomphus septima*	Year round	Active: May-August
Mammal	Tri-colored bat (ARS*)	*Perimyotis subflavus*	Year round	Found in mines and caves in the winter
Mollusk	Brook floater (ARS)	Alasmidonta varicosa	March 1-September 30	
	Carolina heelsplitter (E, CH)	*Lasmigona decorata*	March 1-September 30	Optimal survey window
Plant	Georgia aster (ARS*)	*Symphyotrichum georgianum*	Early October-mid November	
	Miccosukee gooseberry (T)	*Ribes echinellum*	June-September	Year round
Reptile	None Found			

*	Contact National Marine Fisheries Service (NMFS) for more information on this species
**	The U.S. Fish and Wildlife Service (FWS) and NMFS share jurisdiction of this species
ARS	Species that the FWS has been petitioned to list and for which a positive 90-day finding has been issued (listing may be warranted); information is provided only for conservation actions as no Federal protections currently exist.
ARS*	Species that are either former Candidate Species or are emerging conservation priority species
BGEPA	Federally protected under the Bald and Golden Eagle Protection Act
C	FWS or NMFS has on file sufficient information on biological vulnerability and threat(s) to support proposals to list these species
CH	Critical Habitat
E	Federally Endangered
P or P - CH	Proposed for listing or critical habitat in the Federal Register
S/A	Federally protected due to similarity of appearance to a listed species
T	Federally Threatened

These lists should be used only as a guideline, not as the final authority. The lists include known occurrences and areas where the species has a high possibility of occurring. Records are updated as deemed necessary and may differ from earlier lists.

For a list of State endangered, threatened, and species of concern, please visit https://www.dnr.sc.gov/species/index.html.

2/10/2015

South Carolina List of At-Risk, Candidate, Endangered, and Threatened Species - Edgefield County

CATEGORY	COMMON NAME/STATUS	SCIENTIFIC NAME	SURVEY WINDOW/ TIME PERIOD	COMMENTS
Amphibian	None Found			
Bird	Bald eagle (BGEPA)	*Haliaeetus leucocephalus*	October 1-May 15	Nesting season
	Red-cockaded woodpecker (E)	*Picoides borealis*	April 1-July 31	Nesting season
Crustacean	None Found			
Fish	American eel (ARS)	*Anguilla rostrata*	March 1-May 30; October 1-December 15	Temperature dependent: normally (17-20°C); can be found between 13-25°C
	Blueback herring (ARS)	*Alosa aestivalis*	Mid-January-mid May	Peak: March-April
	Robust redhorse (ARS)	*Moxostoma robustum*	Late April-early May	Temperature dependent: 16-24°C
Insect	None Found			
Mammal	Tri-colored bat (ARS*)	*Perimyotis subflavus*	Year round	Found in mines and caves in the winter
Mollusk	Brook floater (ARS)	*Alasmidonta varicosa*	March 1-September 30	
	Carolina heelsplitter (E, CH)	*Lasmigona decorata*	March 1-September 30	Optimal survey window
Plant	Carolina-birds-in-a-nest (ARS)	*Macbridea caroliniana*	July-November	
	Georgia aster (ARS*)	*Symphyotrichum georgianum*	Early October-mid November	
	Miccosukee gooseberry (T)	*Ribes echinellum*	June-September	Year round
	Ocmulgee skullcap (ARS)	*Scutellaria ocmulgee*	Late June-early October	
	Relict trillium (E)	*Trillium reliquum*	Mid March-April	
Reptile	None Found			

*	Contact National Marine Fisheries Service (NMFS) for more information on this species
**	The U.S. Fish and Wildlife Service (FWS) and NMFS share jurisdiction of this species
ARS	Species that the FWS has been petitioned to list and for which a positive 90-day finding has been issued (listing may be warranted); information is provided only for conservation actions as no Federal protections currently exist.
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These lists should be used only as a guideline, not as the final authority. The lists include known occurrences and areas where the species has a high possibility of occurring. Records are updated as deemed necessary and may differ from earlier lists.

For a list of State endangered, threatened, and species of concern, please visit https://www.dnr.sc.gov/species/index.html.

2/10/2015

NATURAL RESOURCES TECHNICAL MEMORANDUM

PROPOSED S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK

EDGEFIELD AND MCCORMICK COUNTIES, SOUTH CAROLINA
SCDOT PROJECT P035179

PREPARED FOR

South Carolina Department of Transportation

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
COLUMBIA, SOUTH CAROLINA

PREPARED BY:

MEAD & HUNT, INC.
878 SOUTH LAKE DRIVE
LEXINGTON, SOUTH CAROLINA 29072

CONTACT: MATT DEWITT, PWS

MAY 2016

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Project Description

The South Carolina Department of Transportation (SCDOT) proposes to replace the existing S-68/S-227 bridge over Turkey Creek in Edgefield and McCormick Counties, South Carolina. Specifically, the project is located within the Sumter National Forest, approximately 12 miles west of the Town of Edgefield and 12 miles southeast of the Town of McCormick; please see **Appendix A, Figure 1** for a Site Location Map.

The proposed project would include the replacement of the existing bridge on or near its existing alignment. At the request of SCDOT, a Categorical Exclusion Type C (CE-C), is being performed, which outlines potential alignment alternatives. These alternatives are being assessed to determine the least damaging practicable alternative with respect to construction impacts on the human and natural environment, while maintaining appropriate design criteria.

In association with the CE-C, Mead & Hunt, Inc. (Mead & Hunt) has been contracted to provide an environmental review of the proposed project study area (PSA), including documentation of existing natural resources within the PSA. This Natural Resources Technical Memorandum (NRTM) summarizes the findings of the environmental review.

Mead & Hunt reviewed a PSA totaling approximately thirty (30) acres in size, and is defined as follows: Approximately 2,000 feet in length from each end of the existing S-68/S-227 (Key Road) bridge over Turkey Creek. Furthermore, the PSA is approximately 300 feet in total width, generally centered along the centerline of the existing roadway. Please see **Appendix A, Figures 1 through 8** for the approximate location and extent of the reviewed area and **Appendix B** for representative photographs.

This report provides an overall description of the project vicinity, and specifically describes natural resources within the PSA, including wetlands, water resources, plant communities, and protected species. The qualifications of the Mead & Hunt personnel involved in the preparation of this report are located in **Appendix F**.

1.2 Purpose

The purpose of this project is to replace the structurally deficient and functionally obsolete Key Road bridge. The existing bridge was built in 1925 and was relocated to its current location from Georgetown County in 1961. The bridge has a sufficiency rating of 34.7 out of 100, classifying the bridge as structurally deficient and making it eligible for replacement through the Federal Highway Bridge Replacement and Rehabilitation Program. Additionally, the bridge is classified as functionally obsolete due to substandard lane and shoulder widths.

1.3 Methodology

Prior to conducting fieldwork, Mead & Hunt reviewed the following reference material:

- U.S. Geological Survey (USGS). 7.5 minute topographic quadrangle Parksville, SC (1986).
- USGS. National Hydrography Database (NHD). Subregion 0306. (Last Updated January 2016).
- U.S. Department of Agriculture (USDA). Natural Resource Conservation Service (NRCS). Soil Survey Geographic (SSURGO) Database. Statewide, South Carolina (2015).
- USDA-NRCS. National List of Hydric Soils Database; National List, All States. (Last updated December 2015).
- USDA. Soil Conservation Service (SCS). Soil Survey of Edgefield County, South Carolina (1981).
- USDA-SCS. Soil Survey of Greenwood and McCormick Counties, South Carolina (1980).
- U.S. Fish and Wildlife Service (USFWS). Continental United States (CONUS) National Wetlands Inventory (NWI) Data. Statewide, South Carolina (2015).
- USFWS. South Carolina Field Office. Endangered, Candidate, and At-Risk Species. County Listings. Edgefield County (Last Updated: February 2015).
- USFWS. South Carolina Field Office. Endangered, Candidate, and At-Risk Species. County Listings. McCormick County (Last Updated: February 2015).
- S.C. Department of Natural Resources (SCDNR). Rare, Threatened, and Endangered Species and Communities Known to Occur in Edgefield County (Last Updated June 2014).
- SCDNR. Rare, Threatened, and Endangered Species and Communities Known to Occur in McCormick County (Last Updated June 2014).
- SCDNR. South Carolina Heritage Trust (SCHT). Geographic Database of Rare, Threatened, and Endangered Species Inventory Species Found in Edgefield County (Last Updated January 2006).
- SCDNR-SCHT. Geographic Database of Rare, Threatened, and Endangered Species Inventory Species Found in McCormick County (Last Updated January 2006).
- USDA. National Agriculture Imagery Program (NAIP) Aerial Photography. Edgefield County (2013).
- USDA. NAIP Aerial Photography. McCormick County (2013).

Mead & Hunt environmental scientists conducted field reviews of the PSA for the presence of wetlands and other jurisdictional "waters of the U.S.", community types, and protected species habitat on February 10th, February 13th, and July 10th, 2015. In addition, the boundaries of potential jurisdictional waters of the U.S. were flagged (delineated) in the field at that time. Wetlands were determined using the Routine On-Site Determination Method as defined in the Corps of Engineers Wetland Delineation Manual (Environmental Laboratory, 1987) and the Eastern Mountains and Piedmont Regional Supplement to the Manual (USACE, 2012). Streams, or tributaries, were delineated with a combination of pink flagging tape, pre-printed

with the words "Wetland Delineation" in black letters, and solid blue flagging tape. Delineated waters were subsequently located using a handheld Trimble GeoXH Global Positioning System (GPS) unit capable of sub-meter accuracy. The GPS was used to collect point features with a minimum of 20 counts, using a five-second logging interval and were validated using GPS Analyst and ArcGIS 10.2 software.

2.0 PHYSICAL RESOURCES

2.1 Land Use

The proposed project is located within the Sumter National Forest, in a primarily rural portion of South Carolina between the Towns of Edgefield and McCormick. Land use within the project vicinity, an area defined as extending one mile on all sides of the proposed project, is comprised primarily of undeveloped woodland, small areas of agricultural land, and spare residential development.

Land use directly within the project limits is primarily comprised of undeveloped forestland and roadway rights-of-way (R/Ws). Undeveloped forestland within the project limits primarily consist of planted pine, mixed pine-hardwoods, bottomland hardwoods, oak-hickory, and successional scrub-shrub.

2.2 Physiography and Topography

The PSA is located in the Piedmont physiographic province of South Carolina, and is specifically situated within the Piedmont (45) Level III Ecoregion (Griffith, et al., 2002). The Piedmont is a transitional area between the mostly mountainous ecoregions of the Appalachian Mountains to the northwest and the relatively flat coastal plain to the southeast. The landform of the ecoregion is comprised of moderately dissected irregular plains and some hills. Once largely cultivated, much of this ecoregion is in planted pine or has reverted to successional pine and hardwood woodlands.

The PSA is further characterized as being situated within the Carolina Slate Belt (45c) Level IV Ecoregion (Griffith, et al., 2002). The Carolina Slate Belt region is characterized by dissected irregular plains, some low hills, and rounded hills and ridges. Streams in the region are typically low to moderate gradient and comprised of mostly cobble, gravel, and sandy substrates.

Based on USGS topographic mapping (**Appendix A, Figure 2**), elevations in the study area range from approximately 220 feet above National Geodetic Vertical Datum (NGVD) to 350 feet NGVD. The highest elevations in the PSA are located along Key Road in the southeastern extent of the PSA. The lowest elevations in the PSA are located within Turkey Creek, in the central portion of the PSA. Hydrology within the PSA drains inward, or towards the center of the PSA, towards Turkey Creek. Turkey Creek flows in a southwesterly direction through the PSA and discharges to Stevens Creek approximately two (2) aerial miles southwest of the PSA. Stevens Creek flows in a general southeasterly direction and discharges to the Savannah River approximately 17 aerial miles southeast of the PSA.

2.3 Geology and Soils

The origins of soil parent materials in Edgefield and McCormick Counties are formed from three sources; material weathered from rock (i.e., residuum), alluvium deposited by streams, and marine deposits. Soils derived from weathered rock comprise the majority of the soil in the county, and are underlined by a variety of rock types, including gneissic granite and rocks known as "Carolina slates." Carolina slates are metamorphosed shale, dominantly argillite, fine-grained sandstone, and muscovite mica. Weathered products of these rocks are high in silt and very fine sands. Soils derived from alluvium, consist of a mixture of gravel, sand, silt and clay. Marine deposits consist of a mixture of sand, silt and clay, and were deposited by the Atlantic Ocean several thousand years ago. (USDA, 1981).

The Farmland Protection Policy (FPPA) Act of 1981 requires evaluation of farmland conversions to nonagricultural uses. Farmland can be prime farmland, unique farmland, or farmland of statewide importance. The proposed project would likely require the acquisition of farmland soils; therefore, the project will be assessed under the provisions of the FPPA during the development of the Environmental Assessment.

According to the USDA NRCS Soil Survey Geographic (SSURGO) Database (USDA, 2015), two (2) soil map units (SMUs) are mapped within the Edgefield County portion of the PSA. An additional three (3) SMUs are mapped within the McCormick County portion of the PSA. The SMUs mapped within the PSA are depicted in **Appendix A, Figure 3**. Farmland Classification and Hydric Rating for each SMU is located in Table 1.

TABLE 1
SOIL MAP UNITS WITHIN THE PROJECT STUDY AREA

Symbol	Soil Unit Name	Farmland Classification*	Hydric Rating*
Edgefield County			
GeC	Georgeville silt loam, 6 to 10 percent slopes	Farmland of statewide importance	Non-hydric
GuE	Gundy silt loam, 15 to 25 percent slopes	Not prime farmland	Non-hydric
McCormick County			
Ca	Cartecay and Toccoa soils	Prime farmland if drained, not frequently flooded, or protected from frequent flooding	Predominantly nonhydric
HwC	Hiwassee sandy loam, 6 to 10 percent slopes	Not prime farmland	Non-hydric
TaD	Tatum silt loam, 10 to 15 percent slopes	Not prime farmland	Non-hydric

** Reference: USDA-NRCS Web Soil Survey. (http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx).*

A description of each SMU mapped within the PSA can be found below:

Georgeville silt loam, six (6) to ten (10) percent slopes, (GeC), is a deep, well-drained soil found on smooth, narrow ridges and side slopes adjacent to drainageways. GeC soils formed in material weathered from slate rocks. The soil has moderate permeability, and the available water capacity is medium (NRCS, 1981). Within the PSA, GeC soil is mapped in two (2) areas in the southeastern portion of the PSA. The SMU comprises approximately 33 percent of the PSA. GeC soil is classified as farmland of statewide importance, and is not included on the hydric soils list for Edgefield County, South Carolina (USDA, 2015).

Gundy silt loam, fifteen (15) to 25 percent slopes, (GuE), is a deep, well-drained soil found on short, smooth slopes adjacent to medium and large streams. GuE soils formed in material weathered from slate rocks. The soil has moderate permeability, and the available water capacity is medium (NRCS, 1981). Within the PSA, GuE soil is mapped in one (1) area adjacent to Turkey Creek and a shallow drainageway in the southeastern portion of the PSA. The SMU comprises approximately 18 percent of the PSA. GuE soil is not classified as a farmland soil, and is not included on the hydric soils list for Edgefield County, South Carolina (USDA, 2015).

Cartecay and Toccoa soils, (Ca), are deep, moderately well-drained to somewhat poorly drained soils found adjacent to medium and large streams. Ca soils formed in alluvial sediment deposited by streams that carried residuum soil from granite, gneiss, schist, and basic rocks. The soil has moderately rapid permeable, and the available water capacity is medium (NRCS, 1980). Within the PSA, Ca soils are mapped in one (1) area adjacent to Turkey Creek in the north-central portion of the PSA. The SMU comprises approximately four (4) percent of the PSA. Ca soil is classified as prime farmland if drained, not frequently flooded, or protected from frequent flooding, and is included on the hydric soils list for McCormick County, South Carolina (USDA, 2015).

Hiwassee sandy loam, six (6) to ten (10) percent slopes, (HwC), is a deep, well-drained soil found on gently sloping to strongly sloping slopes. HwC soils formed in material weathered from gneiss, schist, and old alluvium. The soil has moderate permeability, and the available water capacity is medium (NRCS, 1980). Within the PSA, HwC soil is mapped in one (1) area in the northernmost portion of the PSA. The SMU comprises approximately 31 percent of the PSA. HwC soil is not classified as a farmland soil, and is not included on the hydric soils list for McCormick County, South Carolina (USDA, 2015).

Tatum silt loam, ten (10) to fifteen (15) percent slopes, (TaD), is a moderately deep, well-drained soil found on strongly sloping or moderately steep slopes. TaD soils formed in material weathered from slate rocks. The soil has moderate permeability, and the available water capacity is medium (NRCS, 1980). Within the PSA, TaD soil is mapped in one (1) area in the north-central portion of the PSA. The SMU comprises approximately 12 percent of the PSA. TaD soil is not classified as a farmland soil, and is not included on the hydric soils list for McCormick County, South Carolina (USDA, 2015).

The project will also have both short-term construction related impacts as well as long-term operational impacts on soils in the PSA; however, these impacts are not considered significant.

Water, (W), is also mapped within the PSA and accounts for approximately two (2) percent of the PSA.

2.4.1 Water Resources and Water Quality

2.4.2 Water Resources

River Basin

The PSA is located in the Savannah River Basin, as defined by the SC Department of Health and Environmental Control (SCDHEC). The Savannah River Basin extends across Georgia, North Carolina, and South Carolina. Within South Carolina, the Basin flows from the Blue Ridge, through the Piedmont, Sandhills, Upper Coastal Plain, Lower Coastal Plain, and Coastal Zone regions. Mead & Hunt reviewed the Basinwide Watershed Water Quality Assessment Report for the Savannah River Basin (SCDHEC, 2010) and the S.C. List of 303(d) Impaired Waters (SCDHEC, 2014) for information pertaining to water resources and water quality.

Sub-Basin

Within South Carolina, the Savannah River Basin is subdivided into three (3) major sub-basins, including the Tugaloo/Seneca Rivers, Upper Savannah River, and Lower Savannah River. Of these, the PSA is located within the Lower Savannah River Sub-Basin. (USGS Hydrologic Unit Code [HUC] 03060107).

Lower Savannah River Sub-Basin

In South Carolina, the Lower Savannah River Sub-Basin is located in Edgefield, Aiken, Barnwell, Allendale, Greenwood, McCormick, Saluda, Hampton, Jasper, and Beaufort Counties, and encompasses 2,524 square miles. Of these approximately 1,600,000 acres, 56.4% is forested land, 16.4% is forested wetland (swamp), 14.0% is agricultural land, 6.3% is urban land, 3.9% is nonforested wetland (marsh), 2.3% is water, and 0.7% is barren land. The urban land percentage is comprised primarily of North Augusta, Aiken, Bluffton, and a portion of Hilton Head Island. Federal lands, such as the Savannah River Site and the Savannah National Wildlife Refuge, are sizable portions of this basin.

There are approximately 6,010 stream miles, 19,349 acres of lake waters, and 24,788 acres of estuarine areas in the sub-basin. The Savannah River flows out of the Thurmond Dam and is restricted again by the Stevens Creek dam, forming Stevens Creek Reservoir. Stevens Creek accepts drainage from Turkey Creek and enters the Savannah River prior to the dam. Downstream of the Stevens Creek dam, the Savannah River accepts drainage from Horse Creek, Hollow Creek, Upper Three Runs, and Lower Three Runs. At the base of the Savannah River Basin, the Calibogue Sound accepts drainage from the May River, the Cooper River, and Broad Creek before joining with the Savannah River as it flows into the Atlantic Ocean near Savannah, Georgia. The Atlantic Intracoastal Waterway (AIWW) connects Calibogue Sound to Port Royal

Sound and to the Savannah River crossing the New River (Great Swamp) and the Wright River (SCDHEC, 2010). Hydrology from the PSA drains into the Sub-Basin through Turkey Creek.

Watersheds

Within the Lower Savannah River Sub-Basin, the PSA is located in the Turkey Creek Watershed (HUC 03060107-02). The Turkey Creek Watershed is located in Greenwood, McCormick, Edgefield, and Saluda Counties and consists primarily of Turkey Creek and its tributaries. The watershed occupies 182,781 acres of the Piedmont and Upper Coastal regions of South Carolina. Land use/land cover in the watershed includes: 76.3% forested land, 16.4% agricultural land, 4.4% urban land, 1.9% forested wetland (swamp), 0.6% barren land, and 0.4% water (SCDHEC, 2010).

Within the PSA, the Turkey Creek Watershed incorporates Turkey Creek, the only waterbody identified in the PSA. Please see Section 4.0 for complete details of Delineated Waters of the U.S. identified within the PSA.

Hydrology from the PSA drains to SCDHEC water-quality monitoring station SV-352. Please see **Appendix A, Figure 4** for the location of watershed boundaries and the associated water-quality monitoring station.

Station SV-352 is located on Turkey Creek at S-68/S-227 (Key Road), within the PSA. At Station SV-352, aquatic life uses are fully supported; however, there is a significant increasing trend in five-day biochemical oxygen demand. There is also a significant increasing trend in pH at Station SV-352. Recreational uses are partially supported due to fecal coliform bacteria excursions (SCHEC, 2010).

Mead & Hunt did not conduct any quantitative water quality sampling within the PSA.

2.4.3 303 (d) List of Impaired Waters

In accordance with Section 303(d) of the 1972 Federal Clean Water Act (CWA), SCDHEC evaluates water bodies identified as impaired for appropriate inclusion on the Section 303(d) list. The 303(d) list is a State list of waters that are not meeting water quality standards or have impaired uses. The 303(d) list targets water bodies that do not meet water quality standards set for the state for water quality management, as well as identifying the cause(s) of the impairment and the designated classifications.

According to SCDHEC's 2014 Section 303(d) List of Impaired Waters, Station SV-352 is impaired for recreation uses based on Eschericia coli (ECOLI) levels.

2.4.4 Total Maximum Daily Loads

A TMDL, or Total Maximum Daily Load, is the amount of a single pollutant (e.g., bacteria, nutrients, metals) that can enter a waterbody on a daily basis and still meet water quality

standards set forth by the State. "TMDL" refers to both a calculation of a pollutant entering a waterbody as well as a document which includes this calculation along with source assessments, watershed and land use information, reductions and allocations information, implementation and other relevant information, maps, figures and pictures (SCDHEC, 2007).

TMDLs are a requirement found in Section 303(d) of the 1972 Federal Clean Water Act (CWA). Once a site is included on the 303(d) list of impaired waters, a TMDL must be developed within two (2) to 13 years of initial listing. In South Carolina, TMDLs are developed and proposed by SCDHEC and then forwarded to EPA Region 4 for final approval.

TMDLs are calculated by adding all the point and nonpoint sources for the pollutant causing the impairment. After a TMDL is calculated, the amount of load entering from point and nonpoint sources is compared to the water quality standards for that waterbody. Then this total loading is reduced to the levels where the water quality standards can be met. This reduced loading is then divided among all the point and nonpoint sources.

The goal of a TMDL is to identify potential pollution sources, calculate and quantify the reduction of those sources, and provide general implementation information needed in order to meet water quality standards and improve water quality. After the approval of the TMDL, an implementation plan can be developed to realize the goals of the written TMDL document. Implementation of a TMDL has a potential to reduce sources of pollution within a watershed and a potential to restore the full use of the waterbody.

According to the Basinwide Watershed Water Quality Assessment Report for the Savannah River Basin (SCDHEC, 2010), no TMDLs have been established for the Turkey Creek Watershed (HUC 03060107-02).

2.4.5 National Pollutant Discharge Elimination System

Point source discharge is a discharge which is released to the waters of the State by a discernible, confined and discrete conveyance, including but not limited to a pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel, or other floating craft from which waste is or may be discharged. The National Pollutant Discharge Elimination System (NPDES) Permit Program was created by Section 402 of the CWA. In 1975, the Bureau of Water received authority from the EPA to administer the NPDES Permit Program in South Carolina. The SCDHEC Bureau of Water is responsible for the permitting, compliance, monitoring and enforcement activities of the program.

Persons with point source discharges to surface waters are required to have NPDES permits. Typical regulated point source discharges are:

- discharges from wastewater treatment systems owned by municipalities, industries, private utilities, State and Federal government, etc.;
- discharges such as cooling water, boiler blow down, etc.;
- stormwater discharges from municipal separate storm sewer systems (MS4s);

- stormwater discharges associated with industrial activity; and,
- stormwater dischargers from construction sites.

According to the Basinwide Watershed Water Quality Assessment Report for the Savannah River Basin (SCDHEC, 2010), no NPDES permitted facilities are authorized within the PSA. A total of four (4) NPDES facilities are authorized to discharge to the Turkey Creek Watershed. Each of these facilities are located upstream of the PSA, and include one (1) minor domestic facility and three (3) minor industrial facilities. The closest of these is the Boral Bricks Turkey Creek Mine, located approximately 14 river miles upstream of the PSA.

2.4.6 Water Quality Summary

Mead & Hunt reviewed SCDHEC's Watershed and Water Quality Information, provided by an online query in March 2016. According to these reports, Station SV-352 is impaired based on Escherichia coli (ECOLI) levels. Furthermore, the S-68/S-227 (Key Road) bridge proposed for replacement is not located with an approved TMDL watershed, according to these reports. Please see **Appendix C** for a copy of the SCDHEC Watershed and Water Quality Information Report.

Due to the existing water quality impairment within the PSA watershed, SCDHEC may require additional water quality protection and stormwater treatment measures during and after construction. However, the proposed project is not anticipated to contribute to these impairments or have long term impacts on water quality within the watershed (HUC 03060107).

During construction activities, temporary siltation may occur in adjacent waters and erosion will be of a greater degree than presently occurring. It is recommended that the contractor minimize this impact through implementation of construction best management practices, reflecting policies contained in 23 CFR 650 B and S.C. Code of Regulations 72-400. The SCDOT has also issued an Engineering Directive Memorandum (Number 23), dated March 10, 2009, regarding Department procedures to be followed in order to ensure compliance with S.C. Code of 72-400, Standards for Stormwater Management and Sediment Reduction. Exposed areas may be stabilized by following the Department's Supplemental Technical Specification for Seeding (SCDOT Designation SC-M-810 (11-08).

3.0 BIOTIC RESOURCES

3.1 Terrestrial Plant Communities

Vegetative terrestrial communities in the PSA were distinguished by plant species, location in the landscape, past disturbances, and hydrologic characteristics. For the purpose of this report, only habitats located directly within the PSA are summarized. Based on the field review, six (6) terrestrial habitat community/land use types, are present within the PSA, including Mixed Pine/Hardwood Forest, Pine Forest, Oak-Hickory Forest, Successional Forest, Bottomland Hardwood Forest, and Maintained and Disturbed Roadside.

A brief summary of the terrestrial habitat communities found within the PSA follows:

Mixed Pine/Hardwood Forest

Mixed Pine/Hardwood Forest is the dominant forested community type located throughout much of the PSA, and comprises approximately 37 percent of the PSA. Dominant vegetation consists of pine and hardwood tree species, including sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), loblolly pine (*Pinus taeda*), water oak (*Quercus nigra)*, eastern redcedar (*Juniperus virginiana*), and American holly (*Ilex opaca*). A dense understory is also present and primarily consists of Chinsee privet (*Ligustrum sinense*) and saplings of overstory species.

Pine Forest

Pine Forests consist of areas planted for the production of pine trees, and comprise approximately 26 percent of the PSA. The dominant vegetation in pine forests is loblolly pine. Opportunistic tree species, such as red maple and sweetgum, are also present in low densities in the understory. A sparse shrub layer consisting of Chinsee privet and ryegrass is also present. Groundcover vegetation is sparse but may also include a more diverse array of herbaceous and shrub species.

Oak-Hickory Forest

Oak-Hickory Forests are located throughout portions of the PSA, primarily along the banks of Turkey Creek and other sloping areas that have not been previously converted to pine forests. Approximately 12 percent of the PSA is oak-hickory forest. The dominant vegetation includes white oak (*Quercus alba*), northern red oak (*Quercus rubra*), post oak (*Quercus stellata*), pignut hickory (*Carya glabra*), mockernut hickory (*Carya tomentosa*), white ash (*Fraxinus americana*), tulip-poplar (*Liriodendron tulipifera*), and American beech (*Fagus grandifolia).* The understory is sparse and primarily contains saplings of overstory species.

Successional Forest

A Successional Forest is located in the northern portion of the PSA, east of Key Road. This area has been logged within the past five years and is in the primary stages of forest succession. This community type makes up a small portion of the PSA, approximately five (5) percent. Vegetation in successional forests primarily consists of saplings and shrubs, and include the same species found in a mixed pine/hardwood forest. Successional forests also include a more diverse array of herbaceous species.

Bottomland Hardwood Forest

A Bottomland Hardwood Forest is located in the floodplain of Turkey Creek, northwest of the S-68/S-227 (Key Road) bridge. This area makes up approximately three (3) percent of the PSA. Dominant vegetation consists of hardwood tree species, including red maple, water oak, tulip poplar, and sweetgum. A sparse shrub layer consisting of Chinese privet and giant cane (*Arundinaria gigantea*) is also present. Groundcover vegetation is sparse but include a diverse array of herbaceous species and grasses.

Maintained and Disturbed Roadside

Maintained and Disturbed Roadside is a dominant community type throughout the PSA, and occurs immediately alongside Key Road. This community type comprises approximately 17 percent of the PSA. Most of the disturbed roadway edges are comprised of herbaceous species and a few shrubs, including various grasses such as common fescue (*Festuca* sp.), ryegrass (*Lolium perenne*) and bluegrass (*Poa* sp.).

3.2 Wetland Plant Communities

No wetland plant communities were observed in the PSA during the field reviews.

3.3 Aquatic Plant Communities

No aquatic plant communities, including submerged aquatic vegetation (SAV), were observed in the PSA during the field reviews.

4.0. WATERS OF THE U.S.

Waters of the U.S. are defined by 33 CFR 328.3(b) and protected by Section 404 of the Clean Water Act (33 U.S.C. 1344), which is administered and enforced in South Carolina by the U.S. Army Corps of Engineers (USACE), Charleston District. The term "waters of the U.S." is defined in 33 CFR Part 328 as:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
    - Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
    - From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    - Which are used or could be used for industrial purpose by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under the definition;
5. Tributaries of waters identified in paragraphs 1 – 4 above;
6. The territorial seas; and
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in 1 – 6 above.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the Clean Water Act (other than cooling ponds as defined in 40 CFR 123.11(m)

which also meet the criteria of this definition) are not waters of the United States. Waters of the U.S. do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the Environmental Protection Agency.

Wetlands are defined as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands are defined in the field as areas that display positive evidence of three environmental parameters including dominance of hydrophytic vegetation, wetland hydrology, and hydric soils (Environmental Laboratory, 1987).

The boundaries of waters of the U.S. were delineated on February 10th and 13th, 2015. Potential wetland areas were evaluated using the Routine On-Site Determination Method as defined in the Corps of Engineers Wetland Delineation Manual (Environmental Laboratory, 1987) and the Eastern Mountains and Piedmont Regional Supplement to the Manual (US Army Corps of Engineers, 2012). Streams, or tributaries, were delineated with a combination of the pink pre-printed "Wetland Delineation" flagging tape and solid blue flagging. Furthermore, delineated waters were subsequently located using a handheld Trimble GeoXH Global Positioning System (GPS) unit capable of sub-meter accuracy. Jurisdictional determination and verification of delineated waters of the U.S. has been received by the U.S. Army Corps of Engineers (USACE) and issued SAC 2015-00468-DJJ. A copy of this correspondence is included in **Appendix E**.

4.1 Wetlands

Prior to conducting fieldwork, Mead & Hunt reviewed National Wetlands Inventory (NWI) Seamless Wetlands Data provided by the U.S. Fish and Wildlife Service (USFWS, 2015). No NWI elements are mapped within the PSA; please see **Appendix A, Figure 5** for the location and extent of NWI elements in the vicinity of the PSA. Furthermore, no wetland communities were identified within the PSA during site reviews.

4.2 Streams or Tributaries

One stream was identified within the PSA during site reviews. This stream was identified as Turkey Creek (RPW Stream A), a tributary of the Savannah River; please see **Appendix A, Figure 6** for the location and extent of streams delineated in the PSA.

RPW Stream A

RPW Stream A, aka, Turkey Creek, is a tributary of Stevens Creek and the Savannah River, and crosses S-68/S-227 (Key Road) in the central portion of the PSA. Turkey Creek originates northeast of the PSA and drains in an easterly direction through the PSA. Beyond the PSA, Turkey Creek drains approximately three (3) river miles and discharges to Stevens Creek. Within the PSA, Turkey Creek is approximately 55 to 80 feet in width, with bank heights of six (6) to 12 feet. Approximately 308 linear feet (0.549 acre) of the stream are located within the

PSA. During field investigations, the stream channel exhibited moderate to high flow, weak sinuosity and a substrate consisting of silt, sand and gravel. Turkey Creek exhibits an ordinary high water mark, inundation, and aquatic life such as fish and amphibians. Within the PSA, the stream accepts drainage from the surrounding upland forests and roadside drainage. Turkey Creek is depicted on USGS topographic mapping as a solid blue-line stream, and is included in the National Hydrography Dataset. Representative photographs of Turkey Creek are included in **Appendix B**.

4.3 Ponds / Open Waters

No ponds, or other open waters, were identified within the PSA during site reviews.

4.4 Permitting

A Clean Water Act Section 404 permit is required for impacts to waters of the U.S., including wetlands. Section 404 is administered by the U.S. Army Corps of Engineers (USACE). Depending on the type and extent of waters of the U.S., including wetlands, to be impacted, Section 404 permitting requirements can range from activities that are considered exempt or preauthorized to those requiring pre-construction notification (PCN) for a Nationwide Permit (NWP) or Individual Permit (IP) from the USACE. For SCDOT projects, USACE General Permit (GP) 2010-01346 may be applicable if impacts do not exceed 3.0 acres of freshwater wetlands, 0.5 acre of tidal wetlands, and/or 300 linear feet of stream.

In addition to the Section 404 permit, SCDHEC must grant, deny, or waive a Water Quality Certification (WQC), in accordance with Section 401 of the Clean Water Act. Waters considered by SCDHEC to be sensitive may also require additional consideration during the 401 WQC process. These include, but are not limited to, Outstanding Resource Waters (ORW), Shellfish Harvesting Waters (SFH), trout waters, areas draining to waters included on the 303(d) list of impaired waters, and areas draining to waters with an approved TMDL. As discussed in Section 2.4.1, the PSA drains to water listed as a water with an EPA approved TMDL. Depending on the type of impairments, extent of the project, and other factors, SCDHEC may require additional water quality protection and stormwater treatment measures during and after construction.

The SCDOT GP has been approved by SCDHEC, therefore separate approval for Section 401 WQC is not required. If impacts exceed the GP threshold limits, an IP from the USACE would be required which involves a more rigorous, time-consuming review process. It is not uncommon for the regulatory processing of an IP application to take close to a year.

Preliminary design for the project proposes to span Turkey Creek in its entirety; therefore, a Section 404 Permit is not anticipated. In accordance with Section 401 of the Clean Water Act, a Permit for Construction in Navigable Waters has been issued by SCDHEC for the project, which satisfies the requirements for a Water Quality Certification. This permit was issued on May 29, 2015 and references authorization number SC GP 95-002 16-001. A copy of permit is included in **Appendix E**.

Compensatory Mitigation

Compensatory mitigation is normally required to offset unavoidable losses of waters of the U.S. The Council on Environmental Quality (CEQ) has defined mitigation in 40 CFR Part 1508.20 to include: avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts. Three general types of mitigation include avoidance, minimization and compensatory mitigation. Compensatory mitigation consists usually of the restoration of existing degraded wetlands or waters, or the creation of wetlands/waters of equal or greater value than those to be impacted. This type of mitigation is only undertaken after avoidance and minimization actions are exhausted and should be undertaken, when practicable, in areas near the impact site (i.e., on-site compensatory mitigation). The USACE typically requires compensatory mitigation for any wetland impacts for which a Section 404 permit application is submitted.

Preliminary design for the project proposes to span Turkey Creek in its entirety; therefore, compensatory mitigation is not necessary.

5.0 FLOODPLAINS

Floodplains are low-lying areas adjacent to rivers, streams, and other waterbodies that are susceptible to inundation during rain events. These areas provide important functions in the natural environment such as providing storage for flood waters, protecting the surrounding environment from erosion, and providing habitat for wildlife. As such, agencies are required to take actions that reduce the risk of impacts to floodplains and their associated floodway, or main channel of flow.

Floodplain and floodway protection is required under several federal, state, and local laws, including Executive Order 11988, entitled “Floodplain Management,” which requires federal agencies to avoid making modifications to and supporting development in floodplains wherever practical. Floodplains subject to inundation by the one-percent-annual-chance (100 year) flood event are regulated by the Federal Emergency Management Agency (FEMA).

FEMA publishes maps which depict areas of regulated floodplains and floodways. The Flood Insurance Rate Map (FIRM) is the most common of these flood maps. FIRMs depict the boundaries of flood hazard areas and differentiates them by Zone.

Zone A floodplains are areas subject to inundation by the 1-percent-annual-chance flood event and are generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, Base Flood Elevations (BFEs) or flood depths are not available for Zone A floodplains.

Zone AE floodplains are areas subject to inundation by the 1-percent-annual-chance flood event and are determined by detailed methods. BFEs are available for Zone AE floodplains and are provided on FIRMs.

Based upon a review of the floodplain mapping (FIRM Map ID 45065C0300D) and a GIS analysis of the project study area, the proposed project crosses the FEMA-regulated Zone A floodplain of Turkey Creek; please see **Appendix A, Figure 7** for the location and extent of regulated floodplains in the vicinity of the PSA.

In accordance with Executive Order 11988, a hydraulic analysis must be conducted for an encroachment of a FEMA-regulated floodplain. The hydraulic analysis is used to determine if the project is likely to increase the risk of flooding within the floodplain. In order to meet the requirements of a "No-Rise" condition, FEMA requires projects which would encroach on Regulated Floodways and Zone AE floodplains to result in a change no greater than 0.1 feet from the established 100-year flood elevations. Furthermore, SCDOT requires all Zone A crossings to be analyzed for the 100-year flood to insure that the floodplain encroachment does not cause one (1) foot or more of backwater when compared to unrestricted or natural conditions.

The encroachment of the FEMA-regulated Zone A floodplain of Turkey Creek is not anticipated to increase the risk of flooding within these floodplains and the proposed project would be designed to meet the "No-Rise" requirements. A preliminary hydraulic analysis will be performed for each encroachment of a FEMA-regulated floodplain and a detailed hydraulic analysis will be performed during final design.

6.0 THREATENED AND ENDANGERED SPECIES

The Federal Endangered Species Act (ESA) of 1973, as amended, is the federal regulatory tool that serves to administer permits, implement recovery plans, and monitor federally protected (endangered and threatened) species. The ESA is administered and regulated by the USFWS and/or National Oceanic and Atmospheric Administration-National Marine Fisheries Service (NOAA-NMFS).

Because of the federal nexus of the proposed project, consultation with the USFWS is required under Section 7 of the ESA, as amended (16 USC 1531-1534), for proposed projects that "may affect" federally endangered and threatened species. This assessment analyzes potential impacts to federally endangered and threatened species associated with the proposed project, and is intended to initiate informal consultation, as needed.

Federal Protected Species - Species with the federal classification of Endangered (E) or Threatened (T), or Threatened due to Similarity of Appearance (T [S/A]) are protected under the ESA of 1973, as amended (16 U.S.C. 1531 et seq.). The term "endangered species" is defined as "any species which is in danger of extinction throughout all or a significant portion of its range", and the term "threatened species" is defined as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range" (16 U.S.C. 1532).

The term "Proposed" (P) is defined as "any species proposed for official listing as endangered or threatened." "Candidate" (C) species are taxons under consideration for which there is sufficient information to support listing but development of a proposed listing regulation is precluded by

other higher priority listing activities. "At-Risk Species" (ARS) is an informal term that refers to those species which may be in need of concentrated conservation actions, and have been petitioned for listing as threatened or endangered. The USFWS designations P, C, and ARS do not provide federal protection and require no Section 7 consultation under the ESA.

State Protected Species – Animal species that are on the South Carolina state protected species list receive protection under the South Carolina Nongame and Endangered Species Conservation Act (South Carolina Code, Title 50). State endangered species are defined as any species or subspecies of wildlife whose prospects of survival or recruitment within the state are in jeopardy or are likely within the foreseeable future to become so. It is unlawful for any person to take, possess, transport, export, process, sell or offer for sale or ship, and for any common or contract carrier knowingly to transport or receive for shipment any species or subspecies of wildlife appearing on the state list of protected species without appropriate authorization.

A search of the USFWS database provided existing information concerning the potential occurrence of threatened or endangered species within Edgefield and McCormick Counties. This database identifies four (4) federally threatened or endangered species known to occur or to have formerly occurred in Edgefield and McCormick Counties, as listed in Table 2 (USFWS, 2015). Please note: Table 2 also includes the bald eagle (*Haliaeetus leucocephalus*). The bald eagle is no longer protected under the ESA, but is afforded protection through the Bald and Golden Eagle Protection Act (BGEPA) of 1940.

The South Carolina Department of Natural Resources (SCDNR) Rare, Threatened and Endangered Species Inventory database, updated June 11, 2014, was also reviewed for information regarding species with state endangered or threatened status. One (1) additional species is currently listed as state threatened or endangered in Edgefield and McCormick Counties. This species is listed as Webster's salamander (*Plethodon websteri*), as listed in Table 2 below.

TABLE 2
ENDANGERED/THREATENED SPECIES

Protected Species		County Listed	Protection Status	
Common Name	**Scientific Name**		**Federal**	**State**
Bird Species				
American wood stork	*Mycteria americana*	McCormick	T	-
Bald eagle	*Haliaeetus leucocephalus*	Edgefield & McCormick	BGEPA	T
Red-cockaded woodpecker	*Picoides borealis*	Edgefield & McCormick	E	E

Mollusk Species				
Carolina heelsplitter	*Lasmigona decorata*	Edgefield & McCormick	E,CH	E
Plant Species				
Miccosukee gooseberry	*Ribes echinellum*	Edgefield & McCormick	T	-
Relict trillium	*Trillium reliquum*	Edgefield	E	-
Reptile Species				
Webster's Salamander	*Plethodon websteri*	Edgefield & McCormick	-	E

BGEPA = Bald and Gold Eagle Protection Act; T = Threatened, E = Endangered, CH= Critical Habitat

State and/or federally-listed endangered and threatened species and their respective habitats are briefly described below:

American wood stork (*Mycteria americana*) – Federal Threatened
The American wood stork is a large, long-legged wading bird, approximately 45 inches in height with a wingspan of 60 to 65 inches. The species has mostly white plumage excluding the black trailing edges of the wings and tail. The neck and head is primarily un-feathered with grayish black skin. The bill is black, thick at the base, and curves downward. The American wood stork prefers freshwater and estuarine wetlands for breeding, feeding, and roosting. These birds are colonial nesters with colonies that range from less than 12 to more than 500 nests. Nests can be located in small or large trees, but these nests typically occur in trees found in standing water or on small islands. Feeding often occurs in water six (6) to ten (10) inches deep.

Bald eagle (*Haliaeetus leucocephalus*) – Bald and Golden Eagle Protection Act
The bald eagle is a large raptor, with a wingspan of about seven (7) feet, and mainly dark brown in color. Adults have a pure white head and tail. It nests in large, mature live pine or cypress trees. Nests are typically large, up to six (6) feet in width, and constructed of sticks and soft materials, such as dead vegetation, grass, and pine needles. Nesting trees are usually found within two (2) miles of coasts, rivers, and lakes, near the bodies of water in which it feeds. The bald eagle primarily feeds on fish but also takes a variety of bird, mammals and turtles when fish are not readily available. In South Carolina, bald eagles will nest from October 1 through May 15.

Red-cockaded woodpecker (*Picoides borealis*) - Federal/State Endangered
Adult red-cockaded woodpeckers are approximately 18 to 20 centimeters (cm) long with a wingspan of 35 to 38 cm. Adults have a black cap, throat, and stripe on the side of the neck and white cheeks and underparts. The back is barred with black and white horizontal stripes. Adult males have a small red spot on each side of the black cap. The bird is native to southern pine forests and typically nests within open pine stands with trees 80 years or older. Roosting cavities are excavated within live pines, which are often infected with a fungus which causes what is

known as red-heart disease. Foraging may occur in pine and/or mixed pine/hardwood stands 30 years or older with trees ten (10) inches or larger in diameter at breast height (dbh).

Carolina heelsplitter (*Lasmigona decorata*) - Federal/State Endangered & Critical Habitat
The Carolina heelsplitter is a federally and state listed endangered mussel with an ovate, trapezoid shaped shell. The surface of this species is yellowish, greenish, or brownish with greenish, blackish rays. The inner shell ranges from iridescent to mottled pale orange. The average size of the Carolina heelsplitter is 78 millimeters (mm). The Carolina heelsplitter is found in small to large streams and rivers as well as ponds over a variety of substrates usually near stable, well-shaded stream banks. Most individuals are found in undercuts and along shaded banks stabilized with extensive tree roots, a buried log, or rocks. The Carolina heelsplitter requires waterways with well oxygenated clean water. Six (6) populations of this mussel are presently known to exist, four of which occur within South Carolina.

Miccosukee gooseberry (*Ribes echinellum*) - Federal Threatened
Miccosukee gooseberry is a low, spiny shrub growing to approximately 3.5 feet tall and forming small thickets. The shrub is only known to occur only in two (2) counties in the U.S., Jefferson County, Florida and McCormick County, South Carolina. The stems exhibit shredding bark, rooting at the tips where they touch the soil. The leaves are typically less than one (1) inch long. The leaves are simple, alternate and 3-lobbed, with each lobe toothed. Veins within the leaves will spread outward from the top of the leaf stalk into the lobes. Miccosukee gooseberry is deciduous in summer, with new leaves appearing in fall and overwintering. The flowers are pale green, hanging from stalks and usually solitary, with five (5) small petals and five (5) conspicuous, spreading sepals. Stamens of the flower will dangle well below the petals and sepals. The floral tube is a round, granular-hairy structure, and matures into a spiny berry that is less than one (1) inch wide. The Miccosukee gooseberry's typical habitat is mixed hardwood forest or beech-magnolia forest in bottomlands. Flowers are present in March and fruit is mature in April and May. Leaves (except during summer), spines, and stems are distinctive year round.

Relict trillium (*Trillium reliquum*) - Federally Endangered
Relict trillium is a perennial herb with mottled leaves at the top of an S-shaped, somewhat flat stem, approximately five (5) to 25 cm in length, often with the leaf whorl resting on the leaf litter. A sessile, three (3) petaled flower appears at the apex of the stem in early spring. The flowers are 22 to 60 mm in length and are less than half as long as the leaves. The flowers range in color from greenish to brownish-purple and, occasionally, to pure yellow. The leaves of relict trillium are elliptic and orbicular, five (5) to 14 cm in length and almost as wide. The leaves have five (5) shades of color ranging from green through blue-green to silver, with a silver colored stripe along the upper central vein. Relict trillium prefers mature, moist, undisturbed hardwood forests with an understory free of thick shrubs and vines. The species occupies soils ranging from alluvial sands to rocky clays, which have high organic content in their upper layer. Habitat is found on slopes of various aspects, inclinations or on bottomlands and floodplains.

Webster's salamander (*Plethodon websteri*) - State Endangered
Webster's salamander is a small woodland salamander. The species reaches lengths of seven (7) to 82 cm. The species can be striped or unstriped. Striped individuals typically have a wavy

yellowish brown to orange red dorsal stripe extending from the head to the tail tip. Unstriped specimens are usually evenly colored, ranging from brown to reddish-orange. The belly of this species is blotchy with black, white or reddish-orange. Webster's salamander has a limited range in South Carolina. It is readily identifiable compared to other salamanders in its range because of size and coloration. Webster's salamander is usually found in moist, mixed hardwoods on steep north-facing slopes. Preferred habitat for this species has rocky substrate with abundant coarse woody debris. The habitat make-up will also consists of a forest with a relatively dense canopy, which prevents drying of the forest floor substrate.

6.1 Methodology

Mead & Hunt environmental scientists performed literature and field reviews to determine the likelihood of protected species within the PSA and the potential for project-related impacts. The lists of protected species known to occur in Edgefield and McCormick Counties were reviewed, and field reviews were conducted for terrestrial species within the PSA on July 10th, 2015 and April 27, 2016. Areas that matched the descriptions of preferred habitat for protected species were classified as protected species habitat and were surveyed for the presence of protected species.

Mead & Hunt reviewed a PSA approximately 300 feet in width and 4,200 feet in length, generally centered on the S-68/S-227 (Key Road) bridge over Turkey Creek. Mead & Hunt also reviewed a one-half mile buffer around the PSA for potential red-cockaded woodpecker nesting habitat; please see **Appendix A, Figure 8** for the location and extent of the PSA and buffer area. The natural communities observed in the PSA consisted of mixed pine/hardwood forest, pine forest, oak-hickory forest, successional forest, and bottomland hardwood forest. In addition, the PSA consists of some maintained and disturbed roadside areas.

Mussel surveys were conducted from approximately 400 meters downstream of the S-68/S-227 (Key Road) bridge crossing to approximately 100 meters upstream of the crossing for a total distance of approximately 500 meters.

The SCDNR South Carolina Heritage Trust (SCHT) Geographic Database of Rare and Endangered Species was also reviewed to determine the presence of known populations of protected species within the vicinity of the project.

6.2 Results

Information obtained from the SCDNR-SCHT database indicates one (1) known population of Carolina heelsplitter (*Lasmigona decorata*) within the PSA. According to the SCDNR-SCHT records, this occurrence was observed in 1993. The SCDNR-SCHT provides the following description of the occurrence:

> SUMTER NATIONAL FOREST, LONG CANE AND EDGEFIELD DISTRICT. TURKEY CREEK. FOUND IN RIVER RUN JUST ABOVE POOL, IN SUBSTRATE COMPRISED PRIMARILY OF SAND AND GRAVEL, BETWEEN COBBLE AND

> BEDROCK. RELATIVELY LITTLE FINE SILT PRESENT. OBSERVED WITH LASMIGONA DECORATA, LAMPSILIS CARIOSA, VILLOSA DELUMBIS, AND ELLIPTIO (COMPLANATA AND ICTERINA COMPLEXES). IN TURKEY CREEK ABOVE CR 68 (EDGEFIELD COUNTY)/CR 227 (MCCORMICK COUNTY) BRIDGE (KEY BRIDGE).

The SCDNR-SCHT database also identifies 13 occurrences of Webster's salamander (*Plethodon websteri*) within two miles of the PSA. The closest of these populations is located immediately downstream of the existing S-68/S-227 (Key Road), in the vicinity of "Key Bridge." Key Bridge, originally built in 1912, is now a pedestrian bridge located approximately 250 feet downstream (west) of S-68/S-227 (Key Road). According to the SCDNR-SCHT records, this occurrence was observed in 1983. The SCDNR-SCHT provides the following description of the occurrence:

> SUMTER NATIONAL FOREST, EDGEFIELD DISTRICT. TURKEY CREEK. GOOD POPULATIONS. PLOTTED NEAR KEY BRIDGE.

The SCDNR-SCHT database does not indicate any other known populations of threatened or endangered species within two (2) miles of the PSA, as of January 17, 2006.

No suitable habitat for American wood stork is present within the PSA due to the lack of persistent, shallow waterbodies for wading/feeding, or the presence of trees within standing water for nesting.

No potential nesting or foraging habitat for bald eagle is present within the PSA due to a lack of any large river or body of water within two (2) miles of the PSA.

Potential foraging habitat for red-cockaded woodpecker is found within some portions of pine forests within the PSA. Based on this finding, a one-half mile buffer area was mapped and reviewed for potential roosting habitat for the species. No preferred roosting habitat was identified within the PSA or within the one-half mile buffer area. Habitat is unsuitable due to the age of pine trees in the area, mechanical silvicultural practices, and the relatively dense subcanopy of pine forests. Additionally, no cavities or evidence of the species was identified in the PSA or buffer area. According to SCDNR-SCHT records, no known populations of red-cockaded woodpecker are located within five (5) miles of the PSA.

Potential habitat for Carolina heelsplitter (*Lasmigona decorata*) was identified within one (1) tributary in the PSA, Turkey Creek. The proposed project is also adjacent to a segment of Turkey Creek designated as Critical Habitat for the species. According to 67 FR 44501 – 44522, Critical Habitat Unit 5 includes approximately 11.4 miles of Turkey Creek, from the SC 36 Bridge in Edgefield County, downstream to the S-68/S-227 (Key Road) bridge in Edgefield and McCormick Counties. A freshwater mussel survey was conducted by Three Oaks Engineering, Inc. in December 2015 to identify the presence or absence of the species within the PSA. An associated report entitled *Freshwater Mussel Survey Report and Biological Assessment for the*

Carolina Heelsplitter was completed on March 7, 2016 (**Appendix D**). The report documented one (1) individual Carolina heelsplitter found approximately 70 feet upstream of the bridge.

Potential habitat for Miccosukee gooseberry (*Ribes echinellum*) exists in one small (0.89 acre) bottomland hardwood forest located within in the floodplain along the northern banks of Turkey Creek. No individuals of the species were identified during field reviews. Additionally, Miccosukee gooseberry is only known to be found in three (3) locations in South Carolina. The closest of these is located along Stevens Creek, approximately ten (10) miles downstream of the PSA.

No potential habitat for relict trillium (*Trillium reliquum*) exists within the PSA, due to the lack of bottomland hardwood forests in the Edgefield County portion of the PSA.

Potential habitat for Webster's salamander (*Plethodon websteri*) exists in an area of mixed hardwoods along the southern banks of Turkey Creek. As stated above, a population of the species was identified in 1983, approximately 250 feet downstream of the PSA. No individuals of the species were directly observed within the PSA during field reviews; however, due to the proximity of the known population downstream and the similar habitat found within the PSA, it was determined that Webster's salamander may inhabit the area of mixed hardwoods along the southern banks of Turkey Creek.

6.3 Biological Conclusions

Based on the literature and field reviews, it is determined that the proposed project will have a biological conclusion of 'no effect' on American wood stork, bald eagle, red-cockaded woodpecker, Miccosukee gooseberry, or relict trillium.

The Carolina Heelsplitter is present in the project area. However, no bridge supports will be located within the stream channel, and there will be no temporary disturbance to the stream bottom from in-stream construction causeways, work pads, or construction within the stream. Additionally, SCDOT has committed to take extra precautions during construction (Environmental Commitments, Section 6.4) in order to prevent the degradation of the downstream habitat from sedimentation. As such, adverse impacts to this species and its Critical Habitat are not expected to result from project construction.

Biological Conclusion-Carolina Heelsplitter: May Affect, Not Likely to Adversely Affect

Given that there will be no substrate disturbance, and stringent erosion control measures (Environmental Commitments, Section 6.4) will be taken to avoid/minimize impacts resulting from sedimentation, potential adverse impacts to instream habitat and the Carolina Heelsplitter are considered insignificant, or discountable (very unlikely to occur).

Biological Conclusion-Critical Habitat Unit 5: May Affect, Not Likely to Adversely Affect

The proposed bridge replacement occurs within designated Critical Habitat (Unit 5) for the Carolina Heelsplitter. As discussed above, there will be no in-stream habitat disturbance from project construction. Additionally, adverse impacts to Critical Habitat Unit 5 resulting from

sedimentation are very unlikely to occur due to the avoidance/minimization measures that have been discussed, plus the fact that if sedimentation into Turkey Creek was to occur, it would likely occur downstream of the bridge, which is not designated as Critical Habitat.

The Webster's salamander may be present in the project area. However, only one bridge support is proposed in the vicinity of the potential habitat for the species (mixed hardwoods along the southern banks of Turkey Creek). This end bent will be constructed at the top of the hill slope, in a transitional area between mixed hardwoods and pine forest, and within the disturbed footprint of the existing bridge. If present, individuals of Webster's salamander may experience temporary disturbance during construction due to noise and vibration associated with the demolition of the existing bridge and construction of the new bridge. Any individuals of the species temporarily impacted by these activities would likely reinhabit the area following construction. As such, adverse impacts to this species are not expected to result from the project.

Biological Conclusion-Webster's salamander: May Affect, Not Likely to Adversely Affect

Concurrence of the determination that the proposed project may affect, but is not likely to adversely affect, the Carolina heelsplitter or its designated critical habitat was received by the USFWS on April 20, 2016 and issued FWS Log No. 2016-I-0367. A copy of this correspondence is included in Appendix E.

6.4 Environmental Commitments

The contractor would be required to minimize potential impacts through implementation of construction best management practices, reflecting policies contained in 23 CFR 650 B and the latest SCDOT Supplemental Technical Specifications for seeding and erosion control measures (SC-M-810-3 (7/15)).

Additional Erosion Control Measures have been implemented to include triple row of silt fence with a rip-rap filter berm with Class B rip-rap and #57 stone on each end bents. An increased inspection frequency of the silt fences is also an option with an additional inspection after a storm event with ½" or greater accumulation.

Sediment and erosion control measures include triple row silt fences, sediment dams, filter berms, ditch checks, slope interrupters, and inlet structure filters. The sediment and erosion control plan will be designed per the SCDOT's Stormwater Quality Design Manual.

The contractor will also include with the demolition plan, an oil and gas spill contingency plan. Copies of each shall be supplied to the USFWS.

The Demolition Plan will address the containment and prevention of debris falling in the creek during demolition.

The contractor will not be allowed to place any construction equipment or any materials in Turkey Creek. He also will not be allowed to introduce any silt from the construction site into

Turkey Creek. Furthermore, the contractor will ensure no construction items or debris enters Turkey Creek. It is the contractor's responsibility to provide a plan to the RCE to ensure adherence to these restrictions.

Stormwater shall be directed away from Turkey Creek and shall not be permitted to drain directly from the bridge deck into the creek via cuppers. Stormwater shall instead be directed through vegetative filter strips before entering Turkey Creek.

In the event additional species are listed as federally threatened or endangered prior to the construction of the project, SCDOT will consult with USFWS on the results of the surveys performed, if necessary, and will follow any USFWS regulations/requirements resulting from that consultation.

7.0 PROPOSED, ENDANGERED, THREATENED, AND SENSITIVE (PETS) SPECIES

The Land Revision Act of 1891 established the National Forest System, a collective of forested and woodland areas owned by the American people and managed by the U.S. Forest Service (USFS). In July, 1936, President Franklin D. Roosevelt proclaimed the Sumter a National Forest in South Carolina.

The Sumter National Forest is an area comprised of nearly 371,000 acres, and is divided into three non-contiguous sections known as Ranger Districts (Enoree, Long Cane and Andrew Pickens). Each ranger district provides habitat for a unique list of federally proposed, endangered, or threatened species, and USFS sensitive (PETS) species. The USFS cooperates with the USFWS in conserving PETS species by conducting activities and programs to assist in the identification and recovery of these species. Sensitive species are species identified by the Regional Forester as showing significant declines in population numbers, density, or habitat capability that could reduce the species' existing distribution. The management goal for a sensitive species is to prevent it from becoming so rare that it is federally listed.

Because of the proposed project's location within the Sumter National Forest, the USFHWA and SCDOT are required to consider PETS species during the project development. This assessment analyzes potential impacts to PETS species associated with the proposed project.

The USFS provided information regarding PETS species of the Sumter National Forest (last updated September 2015). This database identifies 20 PETS species with potential occurrence within the Long Cane Ranger District, as listed in Table 3 (USFS, 2015). Please note: Table 3 also includes the Carolina Heelsplitter (*Lasmigona decorata*), Miccosukee gooseberry (*Ribes echinellum*), relict trillium (*Trillium reliquum*), wood stork (*Mycteria americana*), bald eagle (*Haliaeetus leucocephalus*), and Webster's salamander (*Plethodon websteri*). Please see Section 6.0 for additional details regarding these species, including the biological conclusion of the project's construction on each species.

To analyze potential impacts to PETS species associated with the proposed project, SCDOT

provided areas of new right-of-way/easements and potential ground disturbance, including construction limits, clearing/grubbing limits, and bridge construction access. Mead & Hunt environmental scientists subsequently performed field reviews to determine the likelihood of PETS species within the areas of potential ground disturbance. Areas that matched the descriptions of preferred habitat provided by the USFS were identified and surveyed for the presence of PETS species.

Mead & Hunt reviewed an area approximately eight (8) acres in size and measuring approximately 150 feet in width and 2,200 feet in length, generally centered on the S-68/S-227 (Key Road) bridge over Turkey Creek; please see **Appendix A, Figure 9** for the location and extent of the PETS species survey limits. The natural communities observed in the PETS species survey limits consisted of mixed pine/hardwood forest, pine forest, oak-hickory forest, successional forest, and bottomland hardwood forest. In addition, the survey area includes a considerable amount of maintained and disturbed roadside areas.

Mussel surveys were conducted from approximately 400 meters downstream of the S-68/S-227 (Key Road) bridge crossing to approximately 100 meters upstream of the crossing for a total distance of approximately 500 meters.

TABLE 3
PROPOSED, ENDANGERED, THREATENED, AND SENSITIVE (PETS) SPECIES

PETS Species		Potential Habitat	Protection Status
Common Name	**Scientific Name**		
Carolina heelsplitter	*Lasmigona decorata*	Yes	FE
Miccosukee gooseberry	*Ribes echinellum*	Yes	FT
Relict trillium	*Trillium reliquum*	Yes	FE
American wood stork	*Mycteria americana*	No	FT
Bachman's sparrow	*Peucaea aestivalis*	No	Sensitive
Bald eagle	*Haliaeetus leucocephalus*	No	Sensitive
Brook floater	*Alasmidonta varicosa*	Yes	Sensitive
Carolina darter	*Etheostoma collis*	Yes	Sensitive
Georgia Aster	*Symphyotrichum georgianus*	Yes	Sensitive
Indigo bush	*Amorpha schwerini*	Yes	Sensitive
Lanceleaf trillium	*Trillium lancifolium*	Yes	Sensitive
Migrant loggerhead shrike	*Lanius ludovicia migrans*	No	Sensitive

Nodding trillium	*Trillium rugelii*	No	Sensitive
Oglethorpe oak	*Quercus oglethorpensis*	Yes	Sensitive
Piedmont aster	*Eurybia mirabilis*	Yes	Sensitive
Rayed pink fatmucket	*Lampsilis splendida*	Yes	Sensitive
Robust redhorse	*Moxostoma robustrum*	Yes	Sensitive
Shoal's spider lilly	*Hymenocallis coronaria*	No	Sensitive
Sweet pinesap	*Monotropsis odorata*	No	Sensitive
Webster's Salamander	*Plethodon websteri*	Yes	Sensitive

FE = Federally Endangered; FT = Federally Threatened

No potential habitat for American wood stork, Bachman's sparrow, bald eagle, migrant loggerhead shrike, nodding trillium, shoal's spider lily, or sweet pinesap were identified within the PETS survey limits.

The project does not propose bridge supports within the stream channel, and there will be no temporary disturbance to the stream bottom from in-stream construction causeways, work pads, or construction within the stream; therefore, adverse impacts to Carolina darter and robust redhorse are not expected to result from the project.

Field surveys did not identify any populations of Miccosukee gooseberry, relict trillium, Georgia aster, indigo bush, lanceleaf trillium, Oglethorpe oak, or piedmont aster within the PETS species survey limits; therefore, construction of the project will have no effect on these species. Please note: Section 6.2 states that "no potential habitat for relict trillium exists within the PSA, due to the lack of bottomland hardwood forests in the Edgefield County portion of the PSA." While no habitat was identified in conjunction with Section 7 compliance, potential habitat for the species is found in the McCormick County portion of the PETS species survey limits. Therefore, field surveys were conducted during PETS species surveys.

One (1) individual Carolina heelsplitter found approximately 70 feet upstream of the bridge; please see Section 6.0 for complete details regarding USFWS consultation regarding the species. Additionally, three (3) individual brook floaters were identified during the freshwater mussel survey conducted in December 2015. No bridge supports will be located within the stream channel, and there will be no temporary disturbance to the stream bottom from in-stream construction causeways, work pads, or construction within the stream. Additionally, SCDOT has committed to take extra precautions during construction (Environmental Commitments, Section 6.4) in order to prevent the degradation of the habitat from sedimentation. As such, adverse impacts to Carolina Heelsplitter or brook floater are not expected to result from the project. Additionally, no individuals of Rayed pink fatmucket were identified during the freshwater mussel survey; therefore construction of the project will have no effect on the species.

Potential habitat for Webster's salamander (*Plethodon websteri*) exists in an area of mixed hardwoods along the southern banks of Turkey Creek. As stated in Section 6.2, a population of the species was identified approximately 250 feet downstream of the PSA in 1983. No individuals of the species were directly observed within the PSA during field reviews in July 2015.

Additional surveys for Webster's salamander were conducted within the PETS species survey limits on April 27, 2016. Two (2) man-hours were committed to surveys for the species within the approximate 0.4 acre of potential habitat. The probability of detection during these field reviews was determined to be low due to the lack of recent rainfall and higher temperatures during field reviews. Additionally, potential habitat within the PETS species survey limits is not ideal habitat for the species. The PETS species survey limits are primarily comprised of areas previously disturbed for the construction of the existing S-68/S-227 roadway and bridge. The soils in these areas consist of compacted, clayey fill material with few rocks. This area also lacks an abundance of limbs and other natural debris favored by the species due to past construction of the bridge and maintenance clearing of vegetation immediately adjacent to the bridge. No individuals of the species were identified during surveys.

Although no individuals of Webster's salamander were observed within the PETS species survey limits, it was determined that the species may inhabit the project area due to the proximity of the known population downstream. However, only one bridge support is proposed in the vicinity of the potential habitat for the species. This end bent will be constructed at the top of the hillslope, in a transitional area between mixed hardwoods and pine forest, and within the disturbed footprint of the existing bridge. If present, individuals of Webster's salamander may experience temporary disturbance during construction due to noise and vibration associated with the demolition of the existing bridge and construction of the new bridge. Any individuals of the species temporarily impacted by these activities would likely reinhabit the area following construction. As such, adverse impacts to this species are not expected to result from the project.

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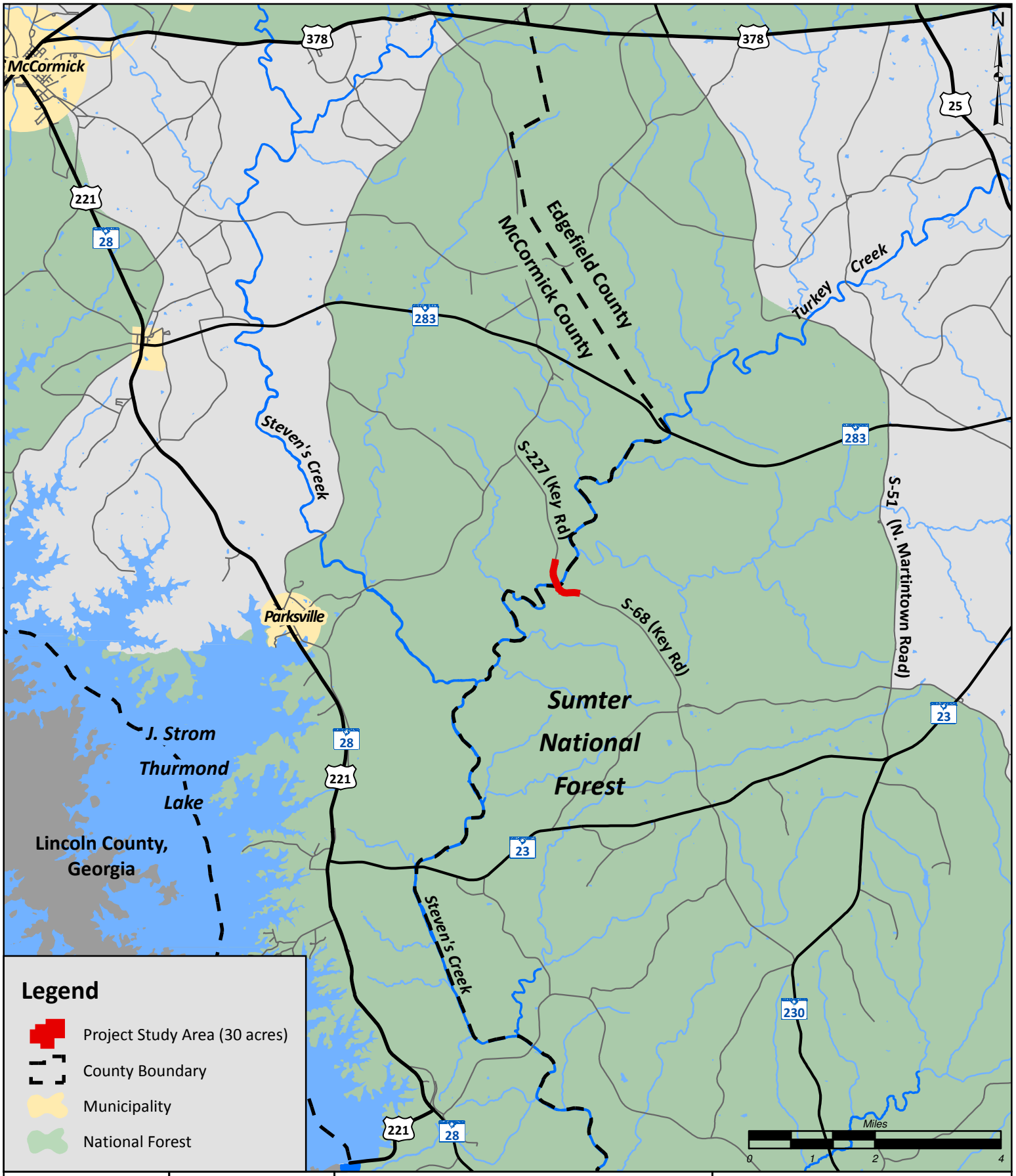
APPENDIX A

FIGURES



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Edgefield and McCormick Counties

S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

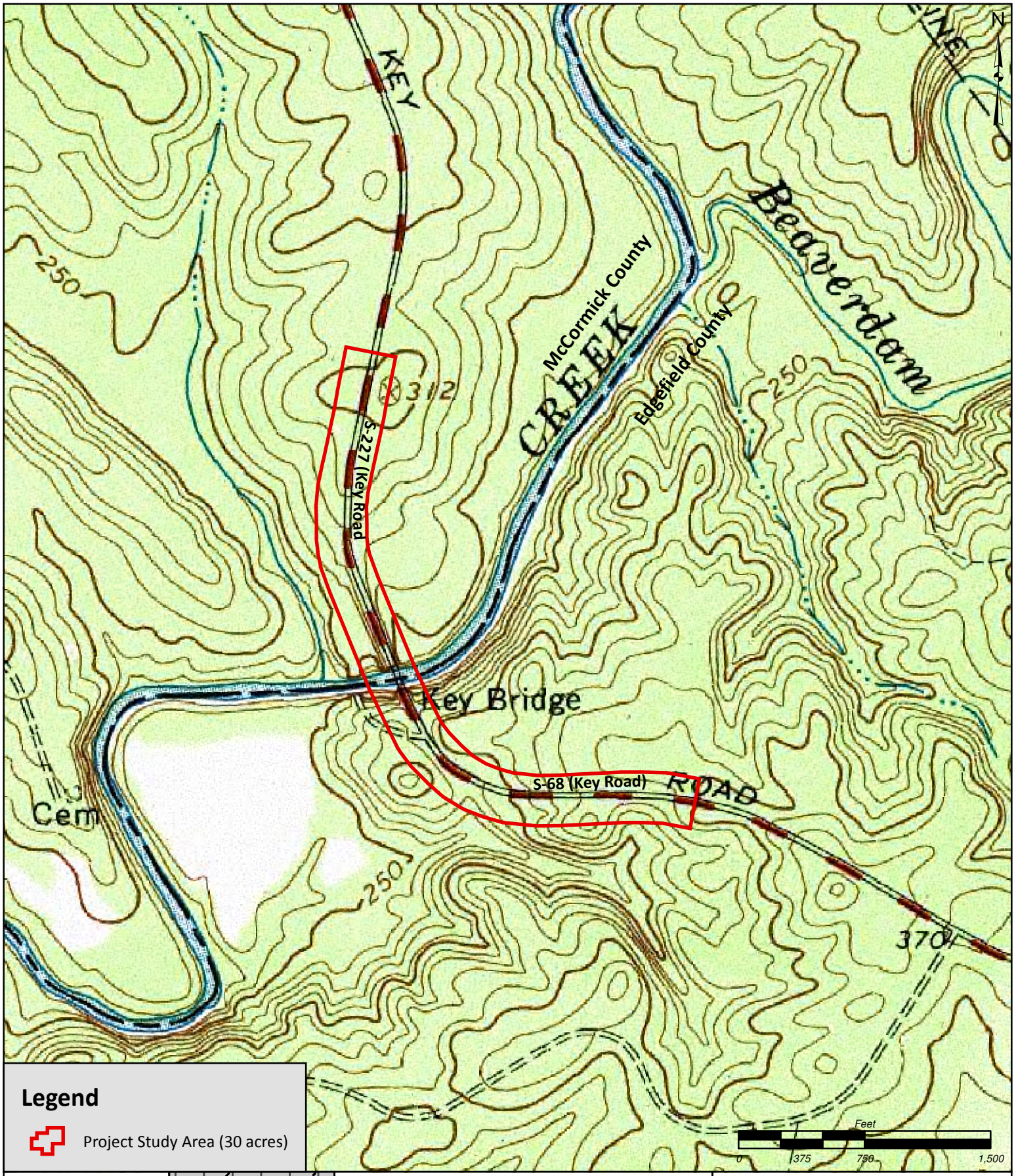
M&H PROJ: R3286900-140626.01
SCDOT PIN: 35179
USACE SAC: 2015-00468-DJJ

SOURCE: TIGER 2010 ROAD, COUNTY, AND MUNICIPALITY DATA

APPLICATION BY:
SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

SITE LOCATION MAP

DRAWN BY: MTD
QAQC BY: JBS
DATE: 03/15/2016
FIGURE 1



Legend

Project Study Area (30 acres)

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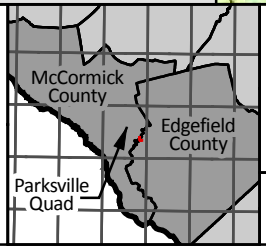
Tel. 803.996.2900
www.meadhunt.com



S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

APPLICATION BY: SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

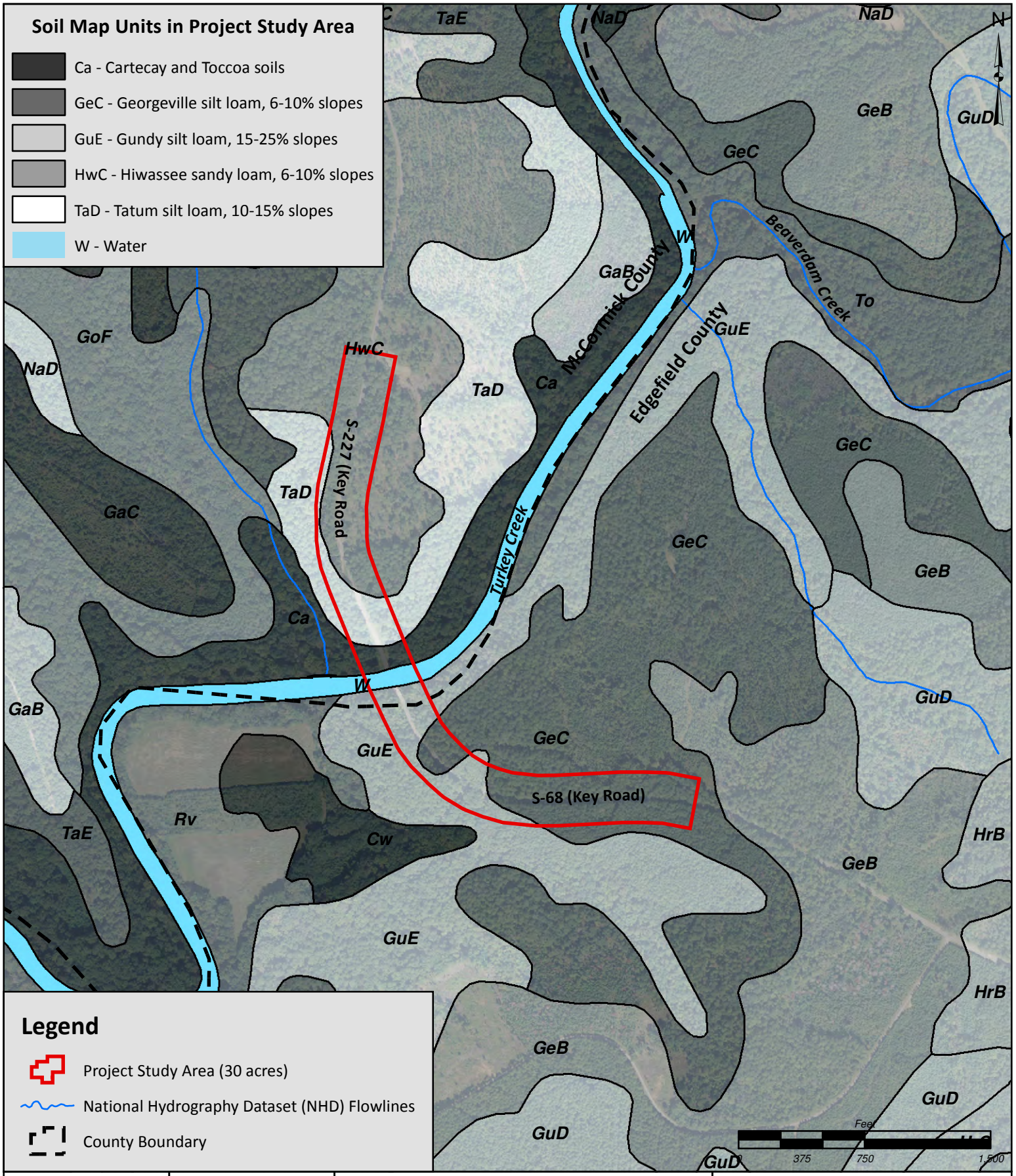
USGS TOPOGRAPHY MAP

M&H PROJ: R3286900-140626.01
SCDOT PIN: 35179
USACE SAC: NOT YET ASSIGNED

SOURCE: USGS 7.5 MINUTE QUAD MAP [PARKSVILLE (1986)]

DRAWN BY: MTD | QAQC BY: JBS

DATE: 03/15/2016 | FIGURE 2



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CA SOILS ARE CATEGORIZED AS PREDOMINANTLY NONHYDRIC.

ALL OTHER SOILS WITHIN THE PSA ARE CATEGORIZED AS NONHYDRIC.

S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

M&H PROJ: R3286900-140626.01
SCDOT PIN: 35179
USACE SAC: NOT YET ASSIGNED

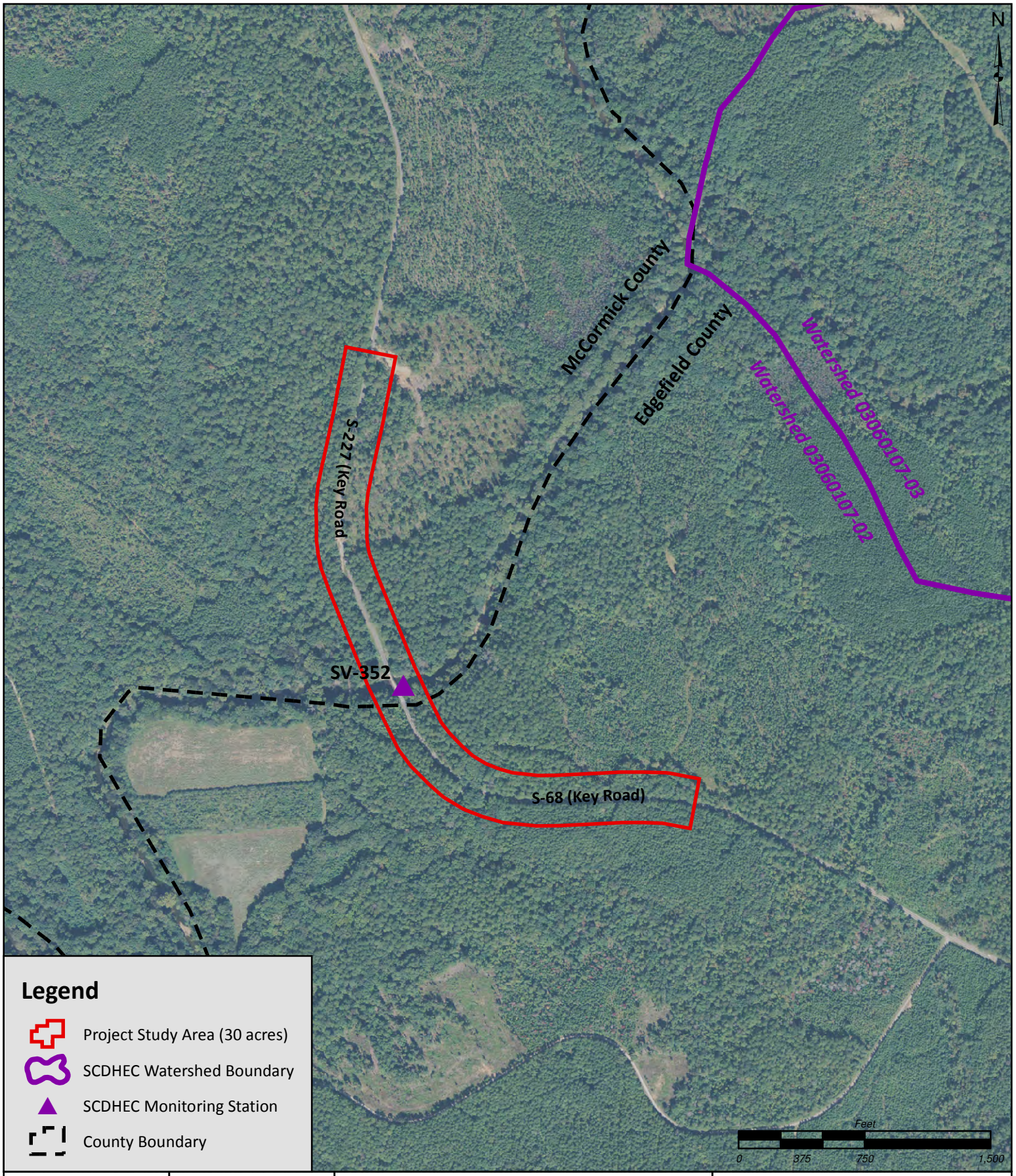
SOURCE: NRCS SOIL MAP UNIT DATA [EDGEFIELD COUNTY (2002) AND MCCORMICK COUNTY (2002)]

APPLICATION BY:
SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

NRCS SOIL MAP UNIT MAP

DRAWN BY: MTD | QAQC BY: JBS

DATE: 03/15/2016 | FIGURE 3



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S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

APPLICATION BY: SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

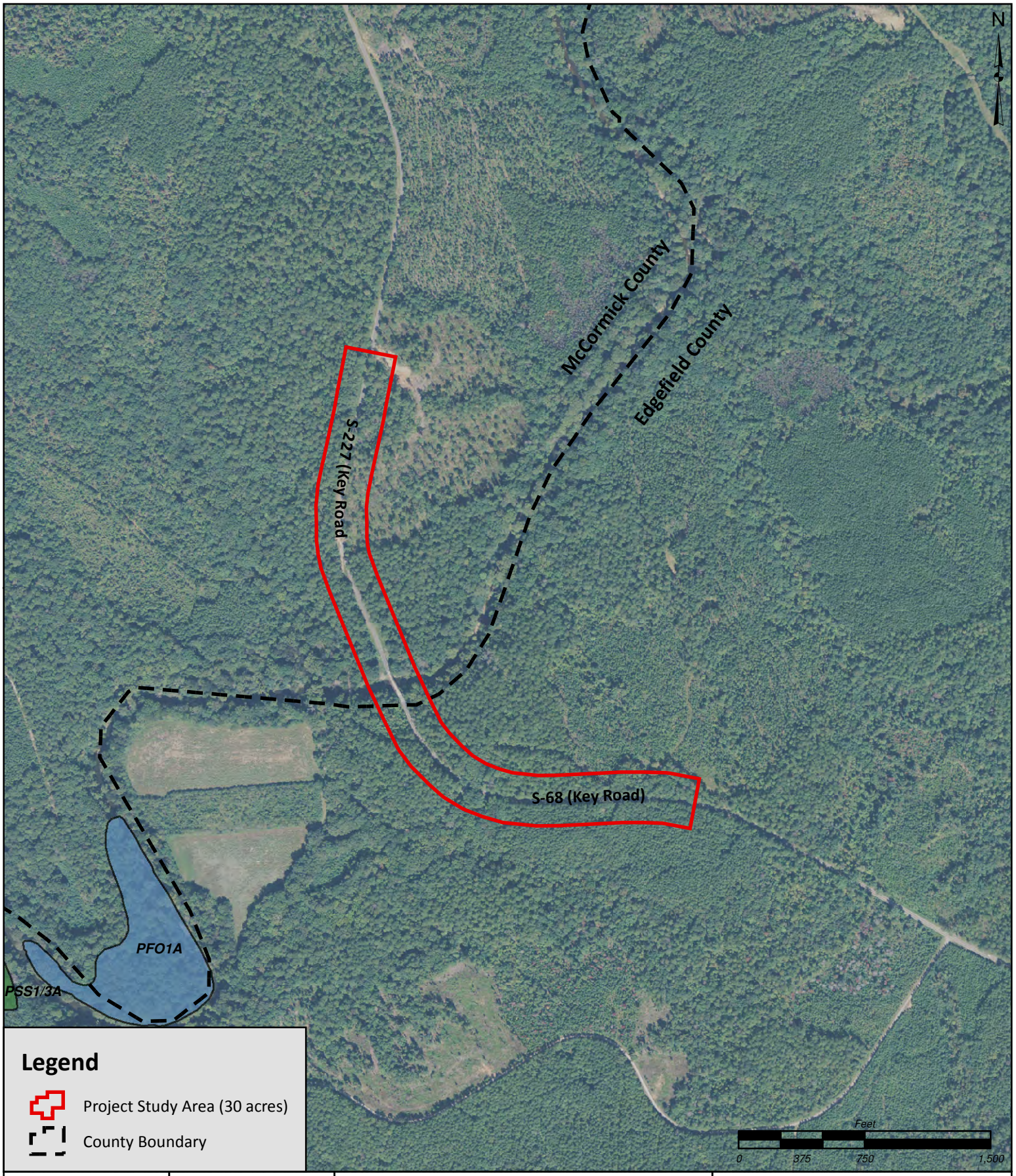
WATER QUALITY MONITORING STATION MAP

M&H PROJ: R3286900-140626.01
SCDOT PIN: 35179
USACE SAC: NOT YET ASSIGNED

SOURCE: SCHEC WATERSHED WATER QUALITY ASSESSMENT REPORT FOR THE SALUDA RIVER BASIN (2011)

DRAWN BY: MTD | QAQC BY: JBS

DATE: 03/15/2016 | FIGURE 4



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S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

APPLICATION BY:
SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

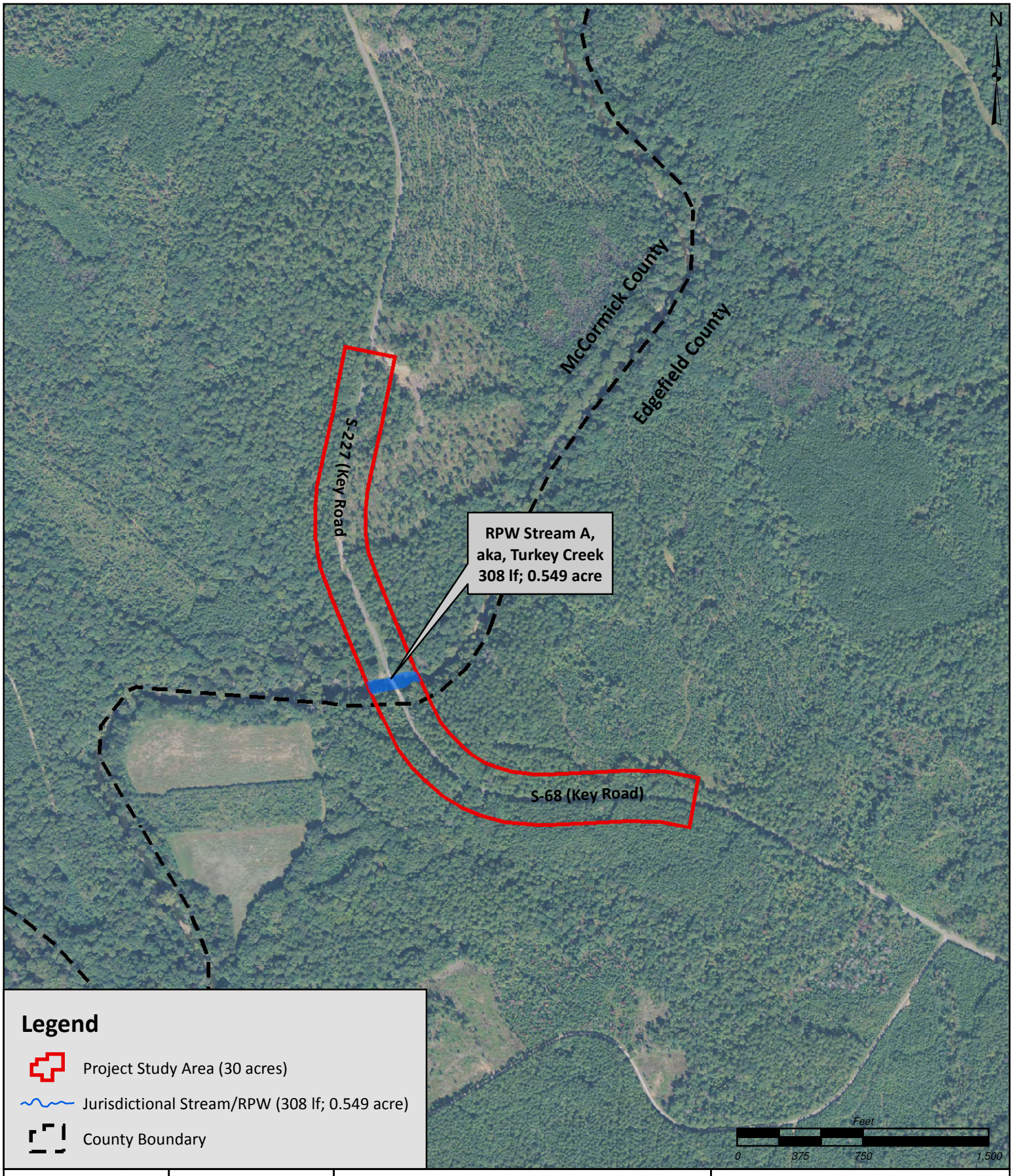
NATIONAL WETLAND INVENTORY (NWI) MAP

M&H PROJ: R3286900-140626.01
SCDOT PIN: 35179
USACE SAC: NOT YET ASSIGNED

SOURCE: USFWS CONUS WETLAND DATA [STATEWIDE (OCTOBER 2015)]

DRAWN BY: MTD | QAQC BY: JBS

DATE: 03/15/2016 | FIGURE 5



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S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

APPLICATION BY: SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

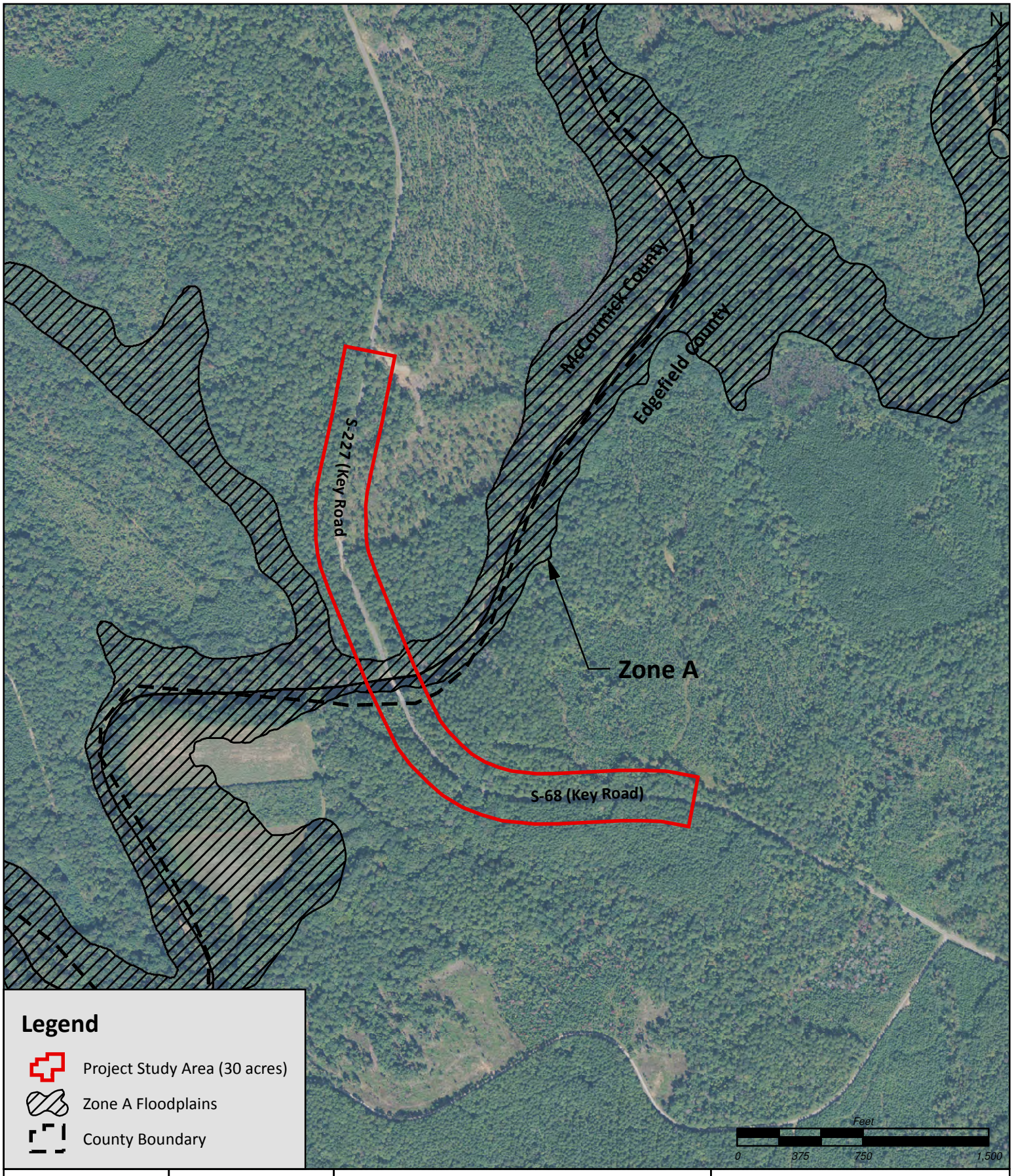
JURISDICTIONAL WATERS OF THE U.S. INDEX

M&H PROJ: R3286900-140626.01
SCDOT PIN: 35179
USACE SAC: NOT YET ASSIGNED

SOURCE: NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) AERIAL PHOTOGRAPHY [MCCORMICK COUNTY (2013)]

DRAWN BY: MTD | QAQC BY: JBS

DATE: 03/15/2016 | FIGURE 6



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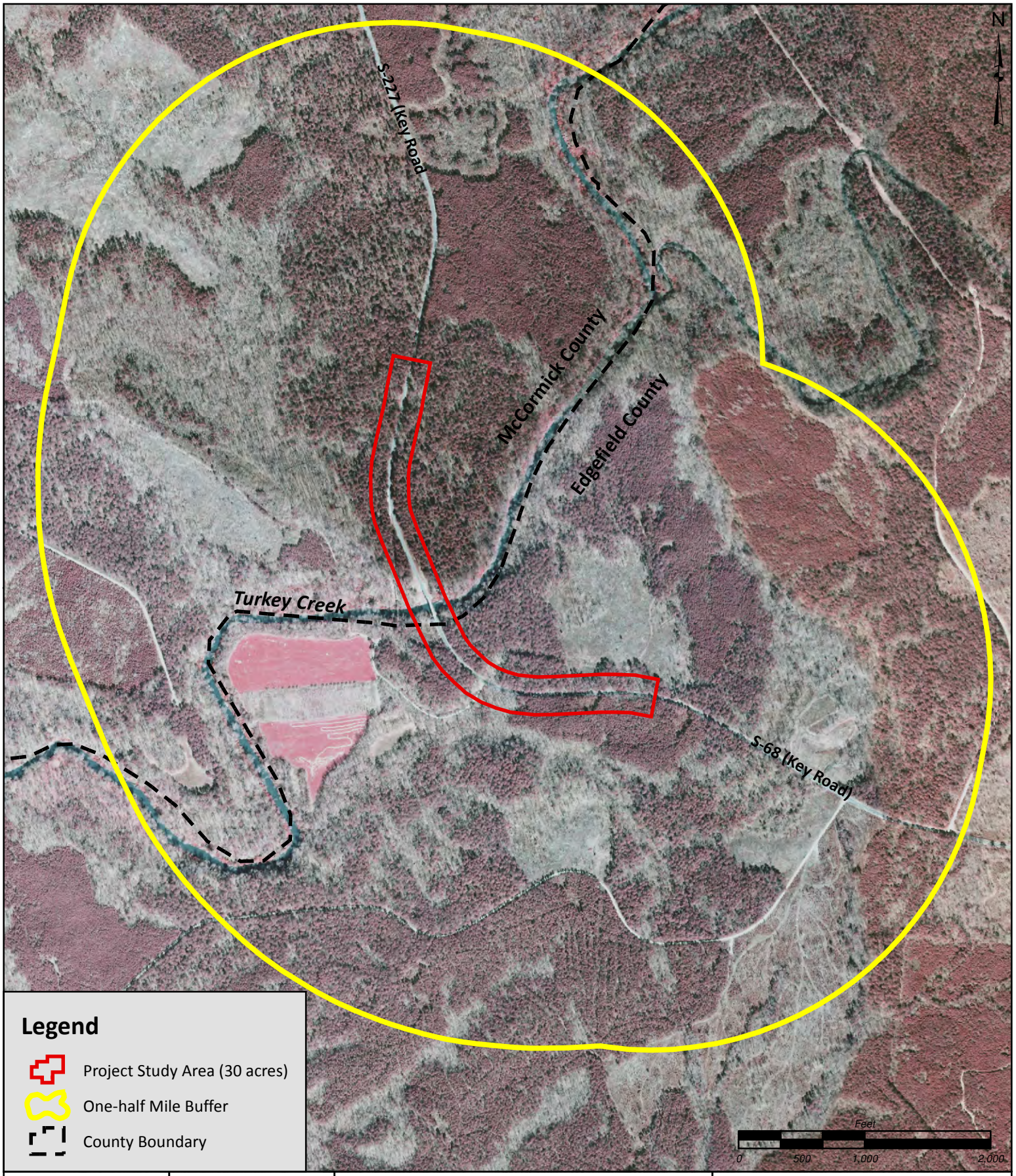
S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

APPLICATION BY: SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

FEMA 100-YEAR FLOODPLAIN MAP

M&H PROJ: R3286900-140626.01 SCDOT PIN: 35179 USACE SAC: NOT YET ASSIGNED	SOURCE: FEMA NATIONAL FLOOD HAZARD DATA [PANEL 45065C0300D (UPDATED 04/04/2011)]
DRAWN BY: MTD	QAQC BY: JBS
DATE: 03/15/2016	FIGURE 7



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S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

APPLICATION BY: SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

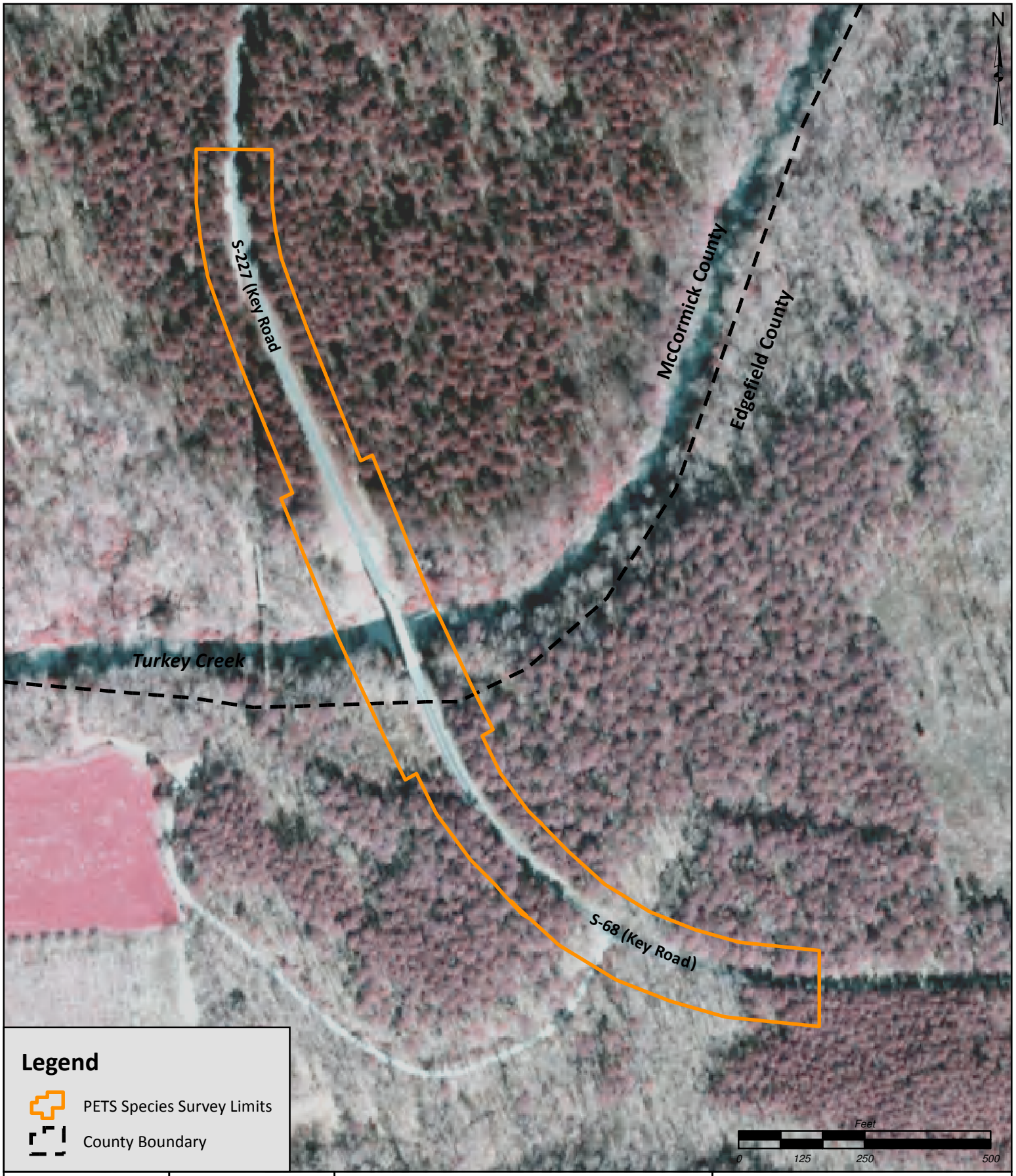
LANDUSE / ONE-HALF MILE BUFFER MAP

M&H PROJ: R3286900-140626.01
SCDOT PIN: 35179
USACE SAC: NOT YET ASSIGNED

SOURCE: SCDNR INFRARED DIGITAL ORTHOPHOTO [PARKSVILLE, SC (2006)]

DRAWN BY: MTD | QAQC BY: JBS

DATE: 03/15/2016 | FIGURE 8



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S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

APPLICATION BY: SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

PETS SPECIES SURVEY LIMITS MAP

M&H PROJ: R3286900-140626.01
SCDOT PIN: 35179
USACE SAC: NOT YET ASSIGNED

SOURCE: SCDNR INFRARED DIGITAL ORTHOPHOTO [PARKSVILLE, SC (2006)]

DRAWN BY: MTD | QAQC BY: JBS

DATE: 04/12/2016 | FIGURE 9

APPENDIX B

REPRESENTATIVE PHOTOGRAPHS

	Date: August 26, 2014 Taken By: Matt DeWitt Photograph 1 Description: View of the S-227 (Key Road) roadway and adjacent mixed pine/hardwood forest north of the bridge over Turkey Creek. Photograph is taken along Key Road, facing south.
	Date: August 26, 2014 Taken By: Matt DeWitt Photograph 2 Description: View of the S-227 (Key Road) roadway and adjacent successional forest and mixed pine/hardwood forest north of the bridge over Turkey Creek. Photograph is taken along Key Road, facing north.

Date:
August 26, 2014

Taken By:
Matt DeWitt

Photograph 3

Description:
View of the S-227 (Key Road) roadway and adjacent mixed pine/hardwood forest north of the bridge over Turkey Creek. Photograph is taken along Key Road, facing south.

Date:
August 26, 2014

Taken By:
Matt DeWitt

Photograph 4

Description:
View of the S-68/S-227 (Key Road) Bridge over Turkey Creek and the mixed hardwood forest along the southern bank of Turkey Creek. Photograph is taken from the northeastern side of the bridge, facing south.

Date:
August 26, 2014

Taken By:
Matt DeWitt

Photograph 5

Description:
View of a bottomland hardwood forest located within the floodplain along the northern bank of Turkey Creek. Photograph is taken within the floodplain, facing northwest.

Date:
August 26, 2014

Taken By:
Matt DeWitt

Photograph 6

Description:
View of the S-68/S-227 (Key Road) Bridge over Turkey Creek. Photograph is taken from the northwestern side of the bridge, facing southeast.

Date:
August 26, 2014

Taken By:
Matt DeWitt

Photograph 7

Description:
View of the S-68/S-227 (Key Road) bridge over Turkey Creek. Photograph is taken from "Key Bridge" (located west of the S-68/S-227 Bridge over Turkey Creek), facing east.

Date:
August 26, 2014

Taken By:
Matt DeWitt

Photograph 8

Description:
View of Turkey Creek, facing west (downstream).

APPENDIX C

WATERSHED AND WATER QUALITY INFORMATION

D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

3/17/2016

Watershed and Water Quality Information

Genaral Information

Applicant Name: SCDOT

Permit Type: Construction

Latitude: 33.7946

Longitude: -82.1444

MS4 Designation: Not in designated area

Monitoring Station: SV-352

Within Coastal Critical Area: NO

Water Classification (Provisional): FW

Waterbody Name: TURKEY CREEK

Entered Waterbody Name:

Parameter Descriptions

NH3N	Ammonia	FC	Fecal Coliform
CR	Chromium	FCB	Fecal Coliform (Shellfish)
CU	Copper	BIO	Macroinvertebrates (Bio)
HG	Mercury	TP	(Lakes) Phosphorus
NI	Nickel	TN	(Lakes) Nitrogen
PB	Lead	CHLA	(Lakes) Chlorophyll a
ZN	Zinc	ENTERO	(Beach) Enterococcus
DO	Dissolved Oxygen	HGF	Mercury (Fish)
PH	pH	PCB	PCB (Fish)

Impaired Status (downstream sites)

Station	NH3N	CR	CU	HG	NI	PB	ZN	DO	PH	TURBIDITY	ECOLI	FCB	BIO	TP	TN	CHLA	ENTERO	HGF	PCB
SV-352	F	F	F	F	F	X	F	F	F	F	N	A	X	X	X	X	X	X	X
SV-063	A	A	A	A	A	X	A	A	A	A	A	A	F	X	X	X	X	X	X

F = Standards Fully Supported
N = Standards Not Supported
A = Assessed at Upstream Station
X = Parameter Not Assessed at Station
T = Within TMDL Approved Watershed

Parameters to be addressed (those not supporting standards)

ECOLI

Fish Consumption Advisory

TMDL Information - TMDL Parameters to be addressed

In TMDL Watershed: No

TMDL Site:

TMDL Report No:

TMDL Parameter:

TMDL Document Link:

APPENDIX D

FRESHWATER MUSSEL SURVEY REPORT AND BIOLOGICAL ASSESSMENT FOR THE CAROLINA HEELSPLITTER

Freshwater Mussel Survey Report and Biological Assessment for the Carolina Heelsplitter

Bridge Replacement of S- 68 (Key Road) over Turkey Creek,
Edgefield and McCormick Counties, South Carolina

Carolina Heelsplitter found at Key Road

Prepared For:

SCDOT

SC Department of Transportation
Columbia, South Carolina

March 7, 2016

Table of Contents

Freshwater Mussel Survey Report and Biological Assessment for the Carolina Heelsplitter for S-68 (Key Road) over Turkey Creek

Edgefield and McCormick Counties

PIN 35179

1.0 INTRODUCTION

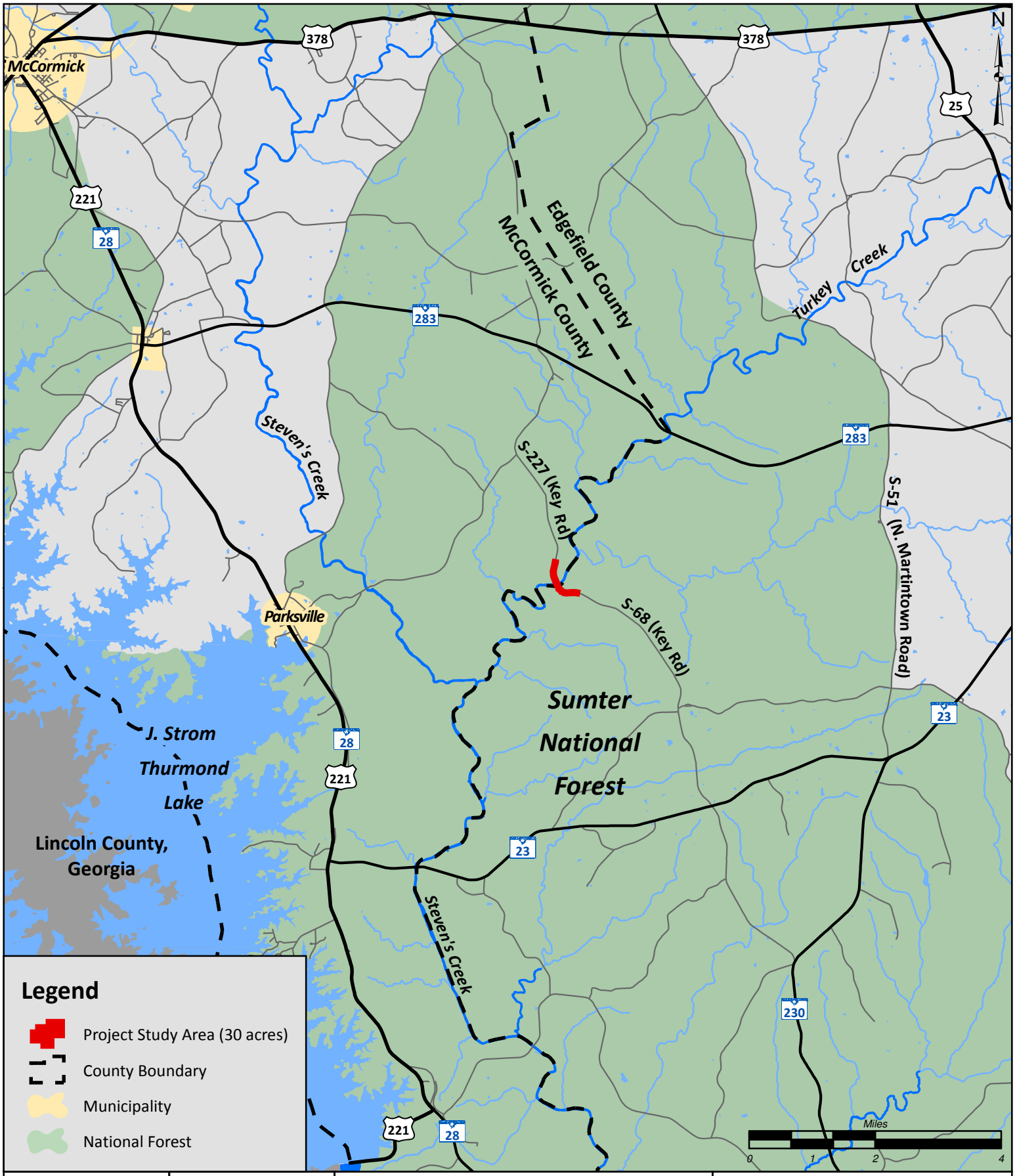
The South Carolina Department of Transportation (SCDOT) proposes to replace the S-68 (Key Road) bridge over Turkey Creek in Edgefield and McCormick Counties (Figure 1) on the existing alignment with road closure and detour. The existing bridge accommodates two lanes of two-way traffic and is classified as a Rural Major Collector. In 2015 the existing average daily traffic (ADT) on S-68 was approximately 200 vehicles per day (vpd) and is expected to increase to 300 vpd in 2035.

The project is located in the Sumter National Forest and will impact Turkey Creek which is part of the Savannah River Basin. The federally Endangered Carolina Heelsplitter (*Lasmigona decorata*) is known to occur within Edgefield and McCormick Counties in the Savannah River Basin, including Turkey Creek. In addition to the Carolina Heelsplitter, there are three other rare freshwater mussel species known to occur in the Savannah River Basin that the Center for Biological Diversity (CBD), a nonprofit conservation organization (www.biologicaldiversity.org), petitioned the USFWS to list as either Threatened or Endangered under the Endangered Species Act (ESA) of 1973, as amended (CBD 2010). Those species are the Atlantic Pigtoe (*Fusconaia masoni*), Brook Floater (*Alasmidonta varicosa*), and Savannah Lilliput (*Toxolasma pullus*).

Much of the Turkey Creek watershed occurs within the Sumter National Forest, Long Cane District, including approximately 13 miles of the main stem Turkey Creek, approximately 8.9 miles of which is designated Critical Habitat for the Carolina Heelsplitter. The Key Road crossing of Turkey Creek occurs at the downstream limits of the Critical Habitat. As part of the federal permitting process that requires an evaluation of potential project-related impacts to federally protected species, Three Oaks Engineering, Inc. (Three Oaks) was contracted by Mead and Hunt to conduct the freshwater mussel surveys targeting the Carolina Heelsplitter, to determine presence/absence of the Carolina Heelsplitter from the immediate project area in order to evaluate potential impacts to this species from project construction. The information collected during this survey is included in this Biological Assessment.

1.1 Purpose and Need

The purpose of this project is to replace a structurally deficient and functionally obsolete bridge. The existing bridge was built in 1925 and was relocated to its current location from Georgetown County in 1961. The bridge has a sufficiency rating of 34.7 out of 100, classifying the bridge as structurally deficient and functionally obsolete, making it eligible for replacement through the Federal Highway Bridge Replacement and Rehabilitation Program. Replacing the bridge will increase safety for the traveling public.



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Edgefield and McCormick Counties

S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

M&H PROJ: R3286900-140626.01
SCDOT PIN: 35179
USACE SAC: 2015-00468-DJJ

SOURCE: TIGER 2010 ROAD, COUNTY, AND MUNICIPALITY DATA

APPLICATION BY:
SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

SITE LOCATION MAP

DRAWN BY: MTD	QAQC BY: JBS
DATE: 03/08/2016	FIGURE 1

1.2 Construction

The existing Key Road bridge over Turkey Creek is a metal truss bridge that is 303 feet long and consists of ten concrete approach spans, each approximately 15 feet in length and founded on steel piles, and one 150-foot steel thru truss main span founded on concrete spread footings on the south bank and a steel pile tower bent on the north bank. During construction, traffic will be detoured onto SC 283 (Plum Branch Road, S-51 (N. Martintown Road), and SC 23. The proposed detour route is 11.3 miles long (Figure 2), and will not require any upgrades, such as shoulder widening to accommodate the increased traffic volume. The bridge will be replaced utilizing top down construction using. There will be no bridge supports constructed in the creek.

1.2.1 Removal of the Existing Bridge

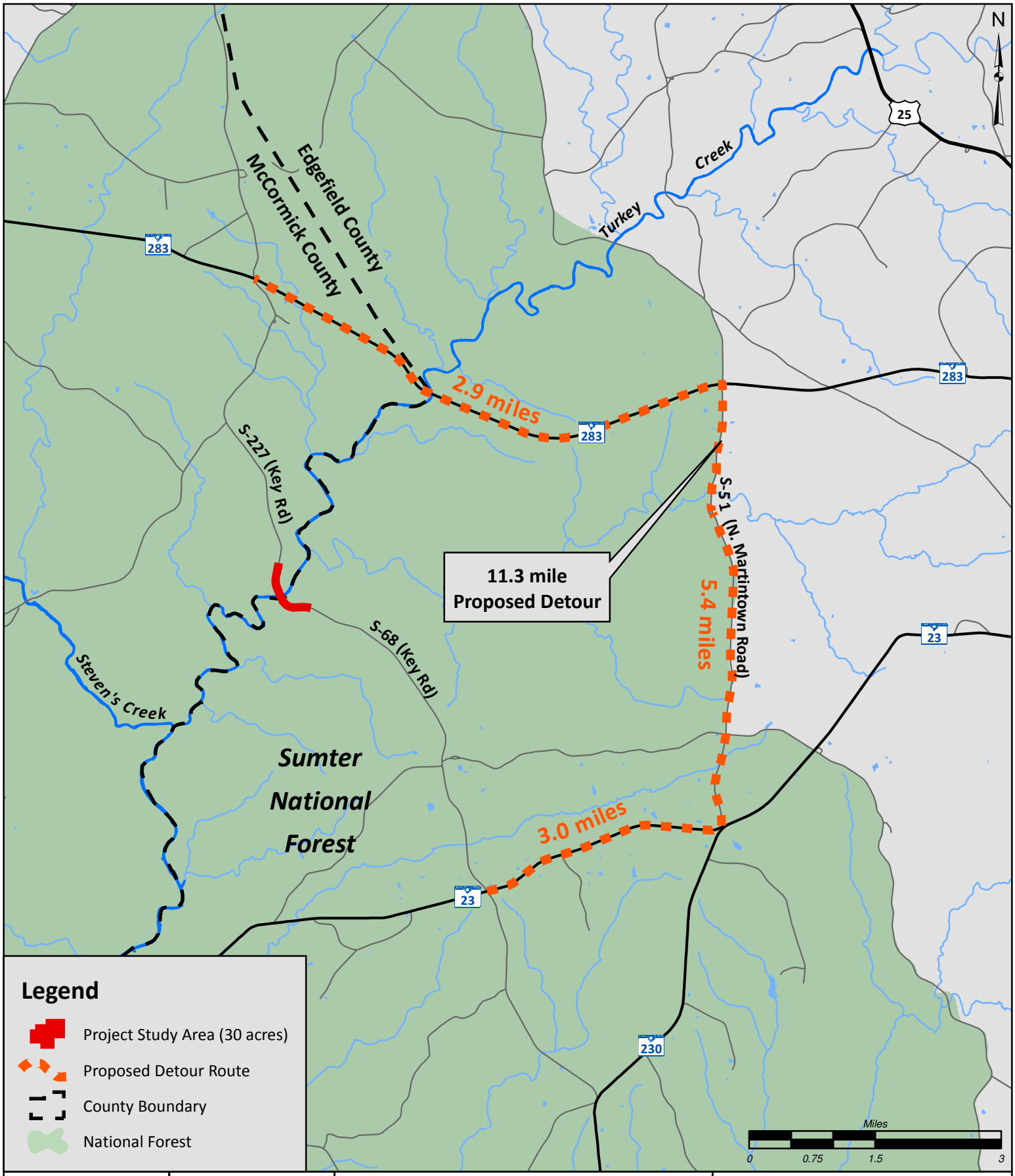
The contractor would likely reverse-launch the truss (existing 150' main span over the creek). The truss will be picked up with two cranes, set on rollers, and rolled (crane-assisted) towards the low-side (McCormick County side) embankment. All existing bridge supports are located outside of the creek limits and will be removed down to 2-feet below the natural ground line in accordance with SCDOT Standard Specifications. There will be no work or equipment within the creek channel.

1.2.2 Construction of New Bridge

The bridge will be replaced utilizing top down construction. There will be no bridge supports constructed in the creek. The new bridge will be approximately 320 feet long and 38 feet wide. It will consist of 3 bents in total the southernmost bent will be supported by a spread footing. The second bent and closest bent to the creek bank will consist of two 54 inch drilled shafts. This bent will be constructed approximately 50 feet from the jurisdictional stream limit. The third bent is also the northern end bent, and will consist of five driven steel piles. Rip Rap will be placed at both end bents to prevent any scour. (Preliminary Plans, Appendix A). As with the demolition component, no work or equipment will occur within the creek channel.

1.2.3 Avoidance and Minimization

Best management practices are being implemented to avoid any debris to enter into the creek and to ensure that there will be no work within the creek. Extra sediment and erosion control measures will be utilized to avoid any sediment from the construction to get into the creek. That will include triple row of silt fencing, sediment dams, ditch checks slope interrupters, inlet structure filters, and filter berms. However, a netting system cannot be used during demolition. There is an existing 150' thru-truss main span over the entire jurisdictional creek limits and it will likely be removed by reverse-launching. It cannot be reverse-launched with a netting system attached. Riprap will be placed on proposed embankments as needed to prevent future erosion, but it will not be placed in the creek itself. See attached environmental commitments for all avoidance and minimization efforts.



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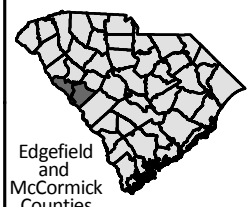


S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT
OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

APPLICATION BY:
SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROPOSED DETOUR MAP

M&H PROJ: R3286900-140626.01
SCDOT PIN: 35179
USACE SAC: 2015-00468-DJJ

SOURCE: TIGER 2010 ROAD, COUNTY, AND MUNICIPALITY DATA

DRAWN BY: MTD
QAQC BY: JBS
DATE: 03/08/2016
FIGURE 2

2.0 WATERS IMPACTED

Turkey Creek is part of the Savannah River basin/ lower Savannah (HUC # 030601070102). Watershed 03060107-02 (formerly 03060107-020, 030) is located in Greenwood, McCormick, Edgefield, and Saluda Counties and consists primarily of Turkey Creek and its tributaries. The watershed occupies 182,781 acres of the Piedmont and Upper Coastal regions of South Carolina. Land use/land cover in the watershed includes: 76.3% forested land, 16.4% agricultural land, 4.4% urban land, 1.9% forested wetland (swamp), 0.6% barren land, and 0.4% water. Turkey Creek originates near the Town of Johnston and accepts drainage from Little Turkey Creek (Bartley Branch), Bubbling Branch, Center Spring Branch, Little Stevens Creek (Rocky Creek), and Sleepy Creek (Flat Rock Branch, Ephriam Branch). Talbert Branch and Mt. Carmel Branch join to form Mountain Creek, which accepts drainage from Catholic Branch, Pickell Branch, Little Mountain Creek, Bell Branch (Quaker Branch), and Hegwood Branch before draining into Turkey Creek. Log Creek (Dunn Creek) enters Turkey Creek next, followed by Jim Branch, Crooked Run, and Rocky Creek (Wiley Branch, Stockman Branch, Wilson Branch, Cartledge Branch, Bailey Branch). Further downstream, Turkey Creek accepts drainage from Pike Branch, Horse Branch, Broadwater Branch, Cyper Creek, Goff Branch, Wine Creek (Church Branch, Mack Branch), Beaverdam Creek (Slade Lake, Little Beaverdam Creek, Chap Branch, White Branch, Moss Branch, Camp Branch, and Red Hill Spring Branch), Coon Creek, Rock Creek, and Blue Branch. Turkey Creek drains into Stevens Creek. There are a total of 626.5 stream miles and 905.4 acres of lake waters in this watershed, all classified FW. The Sumter National Forest extends over a large portion of the watershed.

2.1 303(d) Classification

There are two SCDHEC monitoring stations along Turkey Creek. At the upstream site (SV-729), aquatic life uses are fully supported based on macroinvertebrate community data. At the downstream site (SV-352), aquatic life uses are fully supported; however, there is a significant increasing trend in five-day biochemical oxygen demand. There is a significant increasing trend in pH. Recreational uses are partially supported due to fecal coliform bacteria excursions.

2.2 NDPES dischargers

There is one active, permitted, NPDES discharger located upstream of the survey area on Turkey Creek. Boral Bricks/Turkey Creek (Shale) mine (NPDES permit number SCG730638), a minor industrial discharge. This NPDES discharger is approximately 17 River Miles (RM) upstream. On Beaverdam Creek, which flows into Turkey Creek approximately 0.5 miles upstream of Key Road, there is a minor domestic discharge for the ECW & SA/Brooks St WWTP (NPDES permit number SC 002530), and a minor industrial discharge for Fed. Pacific Electric Co./ Odell Dam (NPDES permit number SC 0047813).

3.0 TARGET FEDERALLY PROTECTED SPECIES DESCRIPTION

3.1 Lasmigona decorata (Carolina Heelsplitter)

3.1.1 Characteristics

The Carolina Heelsplitter (*Lasmigona decorata*), originally described as *Unio decoratus* by (Lea 1852), synonymized with the Green Floater *(Lasmigona subviridis*) (Conrad 1835, Johnson 1970), and later separated as a distinct species (Clarke 1985), is a federally Endangered freshwater mussel, historically known from several locations within the Catawba and Pee Dee River systems in North Carolina and the Pee Dee, Savannah, and possibly the Saluda River systems in South Carolina.

The Carolina Heelsplitter is characterized as having an ovate, trapezoid-shaped, un-sculptured shell. The outer surface of the shell ranges from greenish brown to dark brown in color, with younger specimens often having faint greenish brown or black rays. The shell's nacre is often pearly white to bluish white, grading to orange in the area of the umbo (Keferl 1991). The hinge teeth are well developed and heavy and the beak sculpture is double looped (Keferl and Shelly 1988). Morphologically, the shell of the Carolina Heelsplitter is very similar to the shell of the Green Floater (Clarke 1985), with the exception of a much larger size and thickness in the Carolina Heelsplitter (Keferl and Shelly 1988).

Prior to collections in 1987 and 1990 by Keferl (1991), the Carolina Heelsplitter had not been collected in the 20th century and was known only from shell characteristics. Because of its rarity, very little information of this species' biology, life history, and habitat requirements was known until very recently. Feeding strategy and reproductive cycle of the Carolina Heelsplitter have not been documented, but are likely similar to other native freshwater mussels (USFWS 1996). Nearly all freshwater mussel species have similar reproductive strategies; a larval stage (glochidium) becomes a temporary obligatory parasite on a fish.

Many mussel species have specific fish hosts, which must be present to complete their life cycle. At the time of listing, very little was known about the host species(s) for the Carolina Heelsplitter (USFWS 1996, Bogan 2002). Starnes and Hogue (2005) identified the most likely fish host candidates (15 species) based on fish community surveys in occupied streams throughout the range of the Carolina Heelsplitter. McMahon and Bogan (2001) and Pennak (1989) should be consulted for a general overview of freshwater mussel reproductive biology.

3.1.2 Distribution and Habitat Requirements

Currently, the Carolina Heelsplitter has a very fragmented, relict distribution. Until recently, it was known to be surviving in only six streams and one small river (USFWS 1996); however, recent discoveries have increased the number of known populations to eleven, including:

Pee Dee River Basin:

1. Duck Creek/Goose Creek –Mecklenburg/Union counties, NC
2. Flat Creek/Lynches River –Lancaster/Chesterfield/Kershaw counties, SC

Catawba River Basin:
3. Sixmile Creek (Twelvemile Creek Subbasin) –Lancaster County, SC
4. Waxhaw Creek –Union County, NC and Lancaster County, SC
5. Cane Creek/Gills Creek –Lancaster County, SC
6. Fishing Creek Subbasin –Chester County, SC
7. Rocky Creek Subbasin (Bull Run Creek/UT Bull Run Creek/Beaverdam Creek) –Chester County, SC

Saluda River Basin:
8. Redbank Creek –Saluda County, SC
9. Halfway Swamp Creek –Greenwood/Saluda County, SC

Savannah River Basin:
10. Little Stevens Creek/Mountain Creek/Sleep Creek/Turkey Creek (Stevens Creek Subbasin) – Edgefield/McCormick counties, SC
11. Cuffytown Creek (Stevens Creek Subbasin) –Greenwood/McCormick counties, SC

Habitats for these species have been reported from small to large streams and rivers as well as ponds. These ponds are believed to be millponds on some of the smaller streams within the species' historic range (Keferl 1991). Keferl and Shelly (1988) and Keferl (1991) reported that most individuals have been found along well-shaded stream banks with mud, muddy sand, or muddy gravel substrates. However, numerous individuals in several of the populations have been found in cobble and gravel dominated substrate, usually in close proximity to bedrock outcroppings (Savidge, personal observations). The stability of stream banks appears to be very important to this species (Keferl 1991).

3.1.3 Threats to Species

Habitat degradation, water quality degradation, and changes in stream flow (water quantity) are the primary identified threats to the Carolina Heelsplitter. Specific types of activities that lead to these threats have been documented by the USFWS in the Recovery Plan, Federal Register and other publications (USFWS 1996, 2002a, 2007). These specific threats include the following:

- Siltation resulting from poorly implemented agricultural, forestry, and developmental activities;
- Golf course construction;
- Road construction and maintenance;
- Runoff and discharge of municipal, industrial and agricultural pollutants;
- Habitat alterations associated with impoundments, channelization, dredging, and sand mining operations; and
- Other natural and human-related factors that adversely modify the aquatic environment.

These threats, alone and collectively, have contributed to the loss of the Carolina Heelsplitter in streams previously known to support the species (USFWS 2002a). In addition, many of the remaining populations occur in areas experiencing high rates of urbanization, such as the Charlotte, NC and Augusta, GA greater metropolitan areas. The low numbers of individuals and the restricted range of each of the surviving populations make them extremely vulnerable to extirpation from a single catastrophic event or activity (USFWS 1996). The cumulative effects of several factors, including sedimentation, water quality degradation, habitat modification (impoundments, channelization, etc.), urbanization and associated alteration of natural stream discharge, invasive species, and other causes of habitat degradation have contributed to the decline of this species throughout its range (USFWS 1996).

3.1.4 Designated Critical Habitat

In accordance of Section 4 of the ESA, Critical Habitat for listed species consists of:

(1) The specific areas within the geographical area occupied by the species at the time it is listed in which are found those physical or biological features (constituent elements) that are:

a. essential to the conservation of the species, and

b. which may require special management considerations or protection

(2) Specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of Section 4 of the Act, upon a determination by the Secretary that such areas are "essential for the conservation of the species."

When designating Critical Habitat, the USFWS identifies physical and biological features (primary constituent elements) that are essential to the conservation of the species and that may require special management considerations or protection. The primary constituent elements essential for the conservation of the Carolina Heelsplitter (USFWS 2002) include:

1. permanent flowing, cool, clean water

2. geomorphically stable stream and river channels and banks

3. pool, riffle, and run sequences within the channel

4. stable substrates with no more than low amounts of fine sediment

5. moderate stream gradient

6. periodic natural flooding

7. fish hosts, with adequate living, foraging, and spawning areas for them.

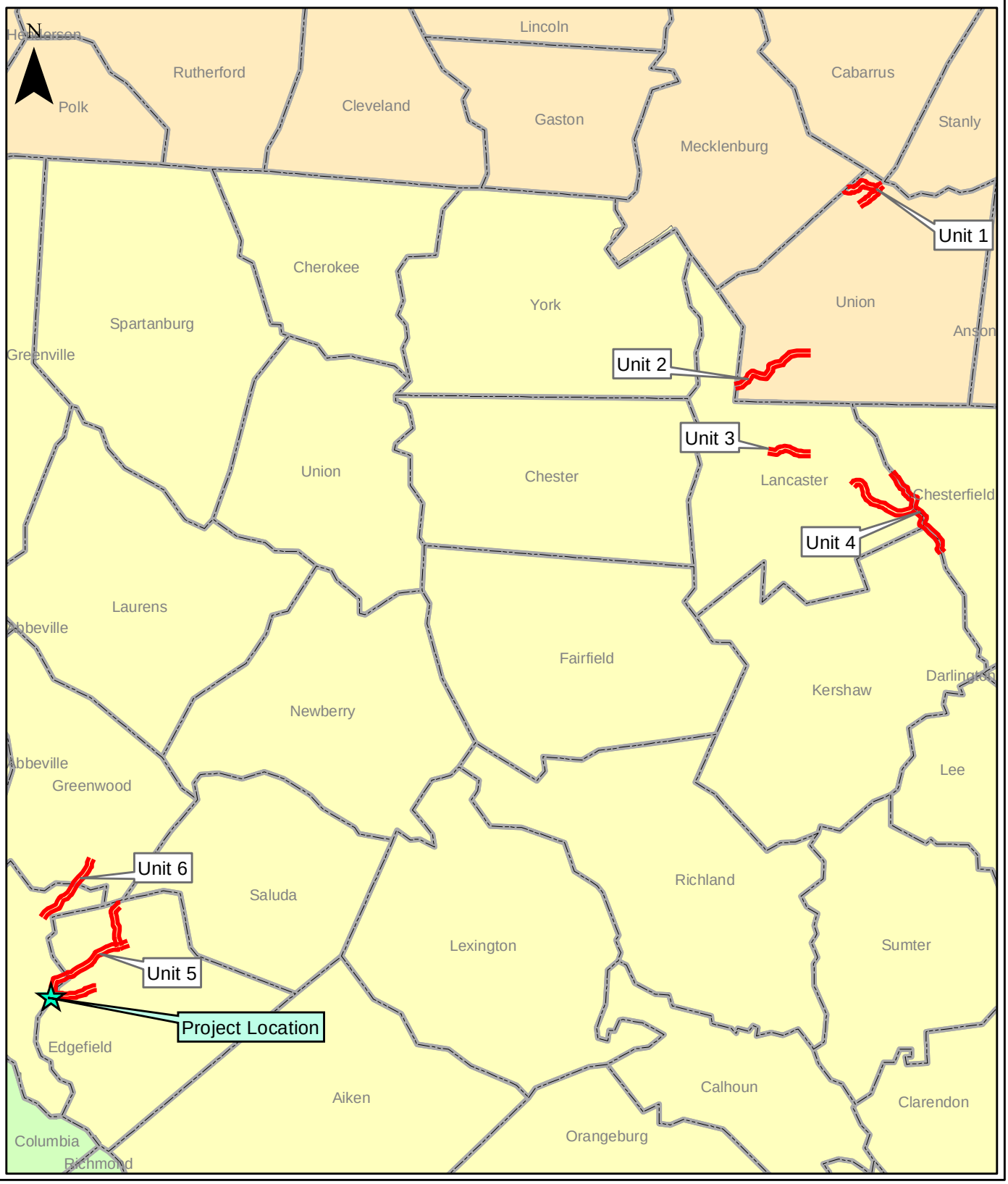
Critical habitat for the Carolina Heelsplitter was designated in 2002 (USFWS 2002). The designated area totals approximately 92 miles (148 kilometers) of nine creeks and one river in North and South Carolina. These areas are considered essential to the conservation and recovery of the Carolina Heelsplitter. Six areas (Units) have been designated as critical habitat, as shown on Figure 3, and a description of each follows.

Unit 1: Goose Creek and Duck Creek (Pee Dee River System), Union County, NC

Unit 1 encompasses approximately 4.5 miles (7.2 km) of the main stem of Goose Creek, Union County, NC, from the N.C. Highway 218 Bridge, downstream to its confluence with the Rocky River, and approximately 6.4 mi (10.3 km) of the main stem of Duck Creek, Union County, NC, from the Mecklenburg/Union County line downstream to its confluence with Goose Creek. The Carolina Heelsplitter was first discovered in Goose Creek in 1987 (Keferl 1991) and in Duck Creek in 2000 (NCWRC Database). Between 1993 and 1999, a total of 15 live individuals had been recorded in Goose Creek. NCWRC surveys in early 2002, found 16 live individuals in Duck Creek (NCWRC Database); however, following extreme drought conditions in late 2002, where much of the streambed in both creeks was dry, status surveys in Duck Creek yielded only four live and more than 40 fresh-dead.

One fresh-dead shell was also found in Goose Creek during the 2002 drought surveys just below US 601. Pools and wet streambeds were much more common in lower Goose Creek, apparently providing refuge from desiccation during the drought. Between 2004 and 2005, four live individuals were found at two locations within Goose Creek, and 12 live individuals were found at six locations within Duck Creek. Prolonged severe drought conditions persisted in the Goose Creek watershed in 2006 through 2007. A total of nine individuals have been found in Duck Creek between 2006 and 2009. Three of the individuals were found on more than one occasion. Four of these individuals were taken into captivity, as much of the stream channel was dry when they were found. A survey conducted in 2011 of the critical habitat portion of Goose Creek, from the Rocky River confluence to the NC 218 crossing, located a total of 12 live individuals and one fresh dead shell (Catena 2012).

All of the live individuals, the majority of which were estimated to be <5 years of age based on shell condition and growth rests, were taken into captivity for a joint propagation effort between North Carolina State University and the North Carolina Wildlife Resources Commission. Some of the propagated individuals have been released back into Goose and Duck Creeks, and are being monitored by the NCWRC. Status surveys and monitoring of released propagated individuals conducted by NCWRC and USFWS in 2015 found three live resident individuals, and several propagated individuals (T. R. Russ, NCWRC personal communication). Repeated survey efforts in Duck Creek in 2011 and 2012 and 2015 have not located any live individuals post drought; however, released propagated individuals have been alive during monitoring surveys (T. R. Russ, NCWRC personal communication).



Prepared For:

SCDOT South Carolina Department of Transportation

Freshwater Mussel Survey: Turkey Creek at Key Road

Carolina Heelsplitter: USFWS Critical Habitat Units

South and North Carolina

Date:	March 2016
Scale:	0 5 10 Miles
Job No.:	15-027
Drawn By:	KMS
Checked By:	TS

Figure

3

Unit 2: Waxhaw Creek (Catawba River System), Union County, NC

Unit 2 encompasses approximately 12.2 mi (19.6 km) of the main stem of Waxhaw Creek, Union County, NC, from the N.C. Highway 200 Bridge, downstream to the North Carolina/South Carolina state line. Very few Carolina Heelsplitter individuals have been found in Waxhaw Creek since they were first discovered in 1987. Keferl (1991) found one live individual in 1987 and two in 1990. Subsequent surveys failed to find any individuals until one weathered shell was found in 1996, followed by one live individual in 1998, one weathered shell in 2005, and three live individuals at three separate sites in 2006 (NCWRC Database). Surveys of Waxhaw Creek in South Carolina, conducted in 2004, documented only two live individuals at a single site – one of only a couple of sites in the stream below the North Carolina/South Carolina state line that appeared to provide suitable substrate for the Heelsplitter (USFWS 2007). On-going surveys conducted in 2015 have yielded ten individuals to date (Tim Savidge, personal observations).

Unit 3: Gills Creek (Catawba River System), Lancaster County, SC

Unit 3 encompasses approximately 6.0 mi (9.6 km) of the main stem of Gills Creek, Lancaster County, SC, from the County Route S-29-875, downstream to the SC Route 51 Bridge, east of the City of Lancaster. One 88.0 mm fresh shell and one 67.0 mm live individual discovered in 1998, represent this population (Alderman 1998). No additional surveys have been completed in this section of Gills Creek since 1998. In 2006, Catena discovered the species (two live and one shell) at three sites in Cane Creek, a tributary to Gills Creek (USFWS 2007). One weathered shell was found in 2015 (Tim Savidge, personal observations). While Cane Creek is not within the boundaries of Unit 3, Gills Creek and Cane Creek are considered a single population from a management perspective, as there are no physical barriers that would isolate the two areas. The discovery of the Carolina Heelsplitter in Cane Creek demonstrates that this population has been reduced to small pockets of habitat in the watershed.

Unit 4: Flat Creek (Pee Dee River System), Lancaster County, SC, and the Lynches River (Pee Dee River System), Lancaster, Chesterfield, and Kershaw Counties, SC

Unit 4 encompasses approximately 11.4 mi (18.4 km) of the main stem of Flat Creek, Lancaster County, SC, from the SC Route 204 Bridge, downstream to its confluence with the Lynches River, and approximately 14.6 mi (23.6 km) of the main stem of the Lynches River, Lancaster and Chesterfield Counties, SC, from the confluence of Belk Branch, Lancaster County, northeast (upstream) of the U.S. Highway 601 Bridge, downstream to the SC Highway 903 Bridge in Kershaw County, SC. Within this unit, the Lynches River local population is represented most recently (2005 to 2007) by 14 live and two fresh dead shells (54-87mm) found above SC 265 Chesterfield/Lancaster Co. SC in 2007 (USFWS 2007, USFWS 2012). Between 1994 and 1997, the Flat Creek local population was represented by 28 live individuals ranging in length from 54.15 to 94.1 mm and by four shells ranging in length from 41.0 to 86.1 mm (Alderman 1998). In 2007, Alderman conducted surveys of two reaches of Flat Creek, one in upper Flat Creek and one in middle-lower Flat Creek, and documented 16 live Carolina Heelsplitter individuals, including several age classes, some likely less than five years of age based on shell measurements (USFWS

2007). In 2010, Alderman found 42 live and one weathered shell in Flat Creek, with a large number of size classes represented (Alderman 2010, pers. comm.).

Multiple survey efforts have been conducted in 2014 and 2015 in this unit and numerous individuals were found in both Flat Creek and the Lynches River. This data is not readily available at the time of writing this report (Tim Savidge, John Fridell, personal communication).

Unit 5: Mountain and Beaverdam Creeks (Savannah River System), Edgefield County, SC, and Turkey Creek (Savannah River System), Edgefield and McCormick Counties, SC

Unit 5 encompasses approximately 7.0 mi (11.2 km) of the main stem of Mountain Creek, Edgefield County, SC, from the SC Route 36 Bridge, downstream to its confluence with Turkey Creek; approximately 6.7 mi (10.8 km) of Beaverdam Creek, Edgefield County, from the SC Route 51 Bridge, downstream to its confluence with Turkey Creek; and approximately 11.4 mi (18.4 km) of Turkey Creek, from the SC. Route 36 Bridge, Edgefield County, downstream to the SC Route 68 Bridge, Edgefield and McCormick Counties, SC.

The Mountain Creek local population is represented by 15 live individuals ranging in length from 38.7 to 84.9 mm and by 15 shells ranging in length from 53.0 to 98.0 mm (Alderman 1998, 2002). During 2002, two additional local populations of Carolina Heelsplitter were discovered within the Turkey Creek Subbasin, one in Little Stevens Creek represented by a shell fragment, and one in Sleepy Creek represented by seven live individuals ranging in length from 51.1 to 73.0 mm and by three shells ranging in length from 61.4 to 71.0 mm (Alderman 2002). Seven live and one moribund individuals were documented in Little Stevens Creek in 2007 (USFWS 2007).

The Turkey Creek local population is represented by a few shells discovered in 1995, and by one live individual discovered in 1997 (McDougal 1997). Ten 10 individuals were found at eight locations in 2012-2013 (Catena 2013), and one individual was found just above the SC 68 bridge in December 2015 (Tim Savidge, personal communication). Within this unit, only a single shell of the Carolina Heelsplitter has been found in Beaverdam Creek (Alderman 1995) and additional surveys of the stream have failed to locate any individuals (USFWS 2007). This portion of the population may be extirpated or exist only in very low numbers (USFWS 2007).

A single shell of the Carolina Heelsplitter was found in Beaverdam Creek (Alderman 1995) and additional surveys of the stream failed to locate any individuals, and it was suggested that this portion of the population may have extirpated or exist only in very low numbers (USFWS 2007). However, two live individuals and three fresh shells were found in 2015 (Tim Savidge, personal communication).

Unit 6: Cuffytown Creek (Savannah River System), Greenwood and McCormick Counties, SC

Unit 6 encompasses approximately 12.9 mi (20.8 km) of the main stem of Cuffytown Creek, from the confluence of Horsepen Creek, northeast (upstream) of the SC Route 62 Bridge in Greenwood County, SC, downstream to the U.S. Highway 378 Bridge in McCormick County. Within this unit, the population is represented by five live individuals (three discovered in 1998 and two

discovered in 2001) with lengths ranging from 53.5 to 71.5 mm and by one shell discovered in 1998 with a length of 63.0 mm (Alderman 1998, 2002).

Five of the eleven Carolina Heelsplitter populations listed in Section 2.2: Sixmile Creek, Fishing Creek, Rocky Creek, Redbank Creek, and Halfway Swamp Creek, were discovered after Critical Habitat was designated. Like most of the other Carolina Heelsplitter populations, these populations are also limited in size and distribution. Live individuals have been found in 2015 in the Sixmile Creek (Tom Dickinson, personal communication), Fishing Creek and Rocky Creek populations (Tim Savidge, personal communication).

Five of the eleven Carolina Heelsplitter populations: Sixmile Creek, Fishing Creek, Rocky Creek, Redbank Creek, and Halfway Swamp Creek, were discovered after Critical Habitat was designated. Like most of the other Carolina Heelsplitter populations, these populations are also limited in size and distribution. Live individuals have been found in 2015 in the Sixmile Creek (Tom Dickinson, personal communication), and in 2015 and 2016 in Fishing Creek and Rocky Creek populations (Tim Savidge, personal communication).

3.2 Survey Efforts

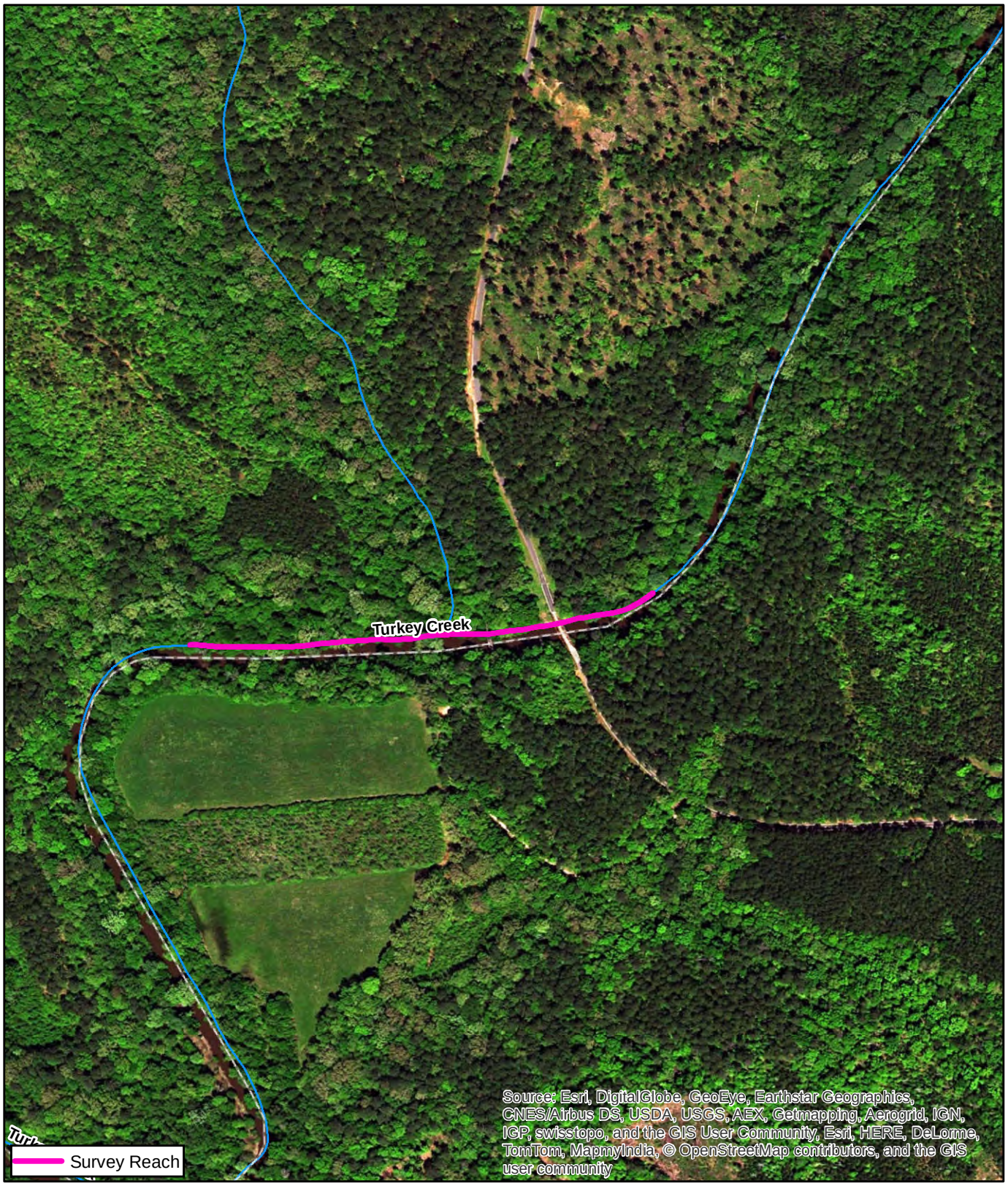
The project site was visited on December 12, 2015, by Tim Savidge, John Roberts and Nathan Howell, and mussel surveys were conducted within Turkey Creek.

3.3 Stream Conditions at Time of Survey: Turkey Creek

The majority of the surveyed reach consisted of run habitat, with a small riffle and pool sequence in the upstream limits. The channel ranged from 36 to 42 feet wide with seven to nine feet high banks. The substrate was dominated by sand and cobble, with scattered bedrock outcrops. Water levels ranged from six inches to three feet, with the exception of the area under the bridge which ranged from six to nine feet in depth.

3.4 Methodology

Mussel surveys were conducted from approximately 1,312 feet (400 meters) downstream of the respective bridge crossing to approximately 328 feet (100 meters) upstream of the crossing for a distance of approximately 1,640 feet (500 meters) (Figure 4). Areas of appropriate habitat were searched, concentrating on the stable habitats preferred by the target species. The survey team spread out across the creek into survey lanes. Visual surveys were conducted in areas three feet or less deep using glass bottom view buckets (bathyscopes). Tactile methods were employed, particularly in streambanks under submerged rootmats. The deep areas under the bridge were surveyed using SCUBA. All freshwater bivalves were recorded and returned to the substrate. Timed survey efforts provided Catch Per Unit Effort (CPUE) data for each species. Relative abundance for freshwater snails and freshwater clam species were estimated using the following criteria:



THREE OAKS ENGINEERING · THREE OAKS ENGINEERING ·

Prepared For:

Freshwater Mussel Survey: Turkey Creek at Key Road

Survey Reach

Edgefield and McCormick Counties, South Carolina

Date:	March 2016
Scale	15-027
Job No.:	0 100 200 Feet
Drawn By:	KMS
Checked By:	TS

Figure

4

- (VA) Very abundant > 30 per square meter
- (A) Abundant 16-30 per square meter
- (C) Common 6-15 per square meter
- (U) Uncommon 3-5 per square meter
- (R) Rare 1-2 per square meter
- (P-) Ancillary adjective "Patchy" indicates an uneven distribution of the species within the sampled site.

3.5 Results

A total of 10.22 person hours of survey time were spent in the reach, with seven freshwater mussel species, including one individual Carolina Heelsplitter that was found approximately 70 feet upstream of the bridge (Table 1). Additionally, the introduced Asian Clam, and two aquatic snail species were found.

Table 1. CPUE for Freshwater Mussels in Turkey Creek

Freshwater Mussels			**Abundance/ CPUE**
Scientific Name	**Common Name**	**# live**	**CPUE**
Alasmidonta varicosa	Brook Floater	3	0.29/hr
Elliptio complanata	Eastern Elliptio	97	9.49/hr
Elliptio icterina	Variable Spike	16	1.57
Elliptio product	Atlantic Spike	4	0.39
Strophitus undulates	Creeper	3	0.29/hr
Lasmigona decorata	Carolina Heelsplitter	1	0.10/hr
Villosa delumbis	Eastern Creekshell	20	1.96/hr
Freshwater Snails and Clams			**Relative Abundance**
Scientific Name	**Common Name**		
Corbicula fluminea	Asian Clam	~	A
Campeloma decisum	Pointed Campeloma	~	P/U
Villosa delumbis	Gravel Elimia	~	P/U

Mussels that were found immediately under the bridge included nine Eastern Elliptio and two Eastern Creekshell. Representative photographs of mussel species found during the survey are included in Appendix B.

4.0 PROJECT EFFECTS ON CAROLINA HEELSPLITTER AND CRITICAL HABITAT

As discussed in Section 3.0, and reinforced by the surveys conducted for this project, the Carolina Heelsplitter is known to occur within the project action area. Project-related threats to the Carolina Heelsplitter can be separated into direct, indirect, and cumulative effects. Direct effects refer to consequences that are directly attributed to the construction of the project, such as substrate disturbance, habitat loss (in-stream pilings), land clearing, stream channelization, and erosion.

Indirect effects are those effects that are caused by or will result from the proposed action and are later in time, but are still reasonably certain to occur. Cumulative effects are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation [50 CFR §402.02]. Potential direct, indirect, and cumulative effects to the Carolina Heelsplitter which may result from project construction.

4.1 Direct Effects

Under normal conditions, impacts to stream habitat associated with the replacement of a bridge over a stream are relatively minor and temporary, particularly like the case with this project, when the structure can span the streambed; however, construction activities can invariably have some adverse effect on the aquatic habitat by increasing the amount of erosion, siltation, and chemical pollution to the impacted waters. The previously mentioned conservation measures will be incorporated by SCDOT to avoid/minimize effects to Turkey Creek and Critical Habitat for the Carolina Heelsplitter. Strict implementation of these measures will reduce the chance that the effects will be detrimental to the Carolina Heelsplitter or its Critical Habitat.

Given the fact that there will be no construction, equipment, or materials allowed in the creek there should be very minimal direct impacts if any.

4.2 Indirect Effects

The indirect effects of bridge replacement are not well known. The initial construction of a bridge is known to cause changes in the flow of the stream and corresponding erosive processes that can alter the adjacent habitat. Adding, removing, or altering bents and abutments during replacement is likely to change the flow patterns which would require the stream to erode and deposit until reaching a state of semi-equilibrium. These changes are not expected to be as drastic as those caused by initial construction of new structures. With regards to this project, the existing and replacement structures do not contain bents within the stream bed, thus alterations of flow patterns are unlikely to occur.

Because this project involves the replacement of an existing structure with a similar size structure on the same alignment there are no anticipated land use changes associated with this project. Additionally, traffic volume is not expected to change due to project construction.

4.3 Cumulative Effects

No other planned projects, State or private, are known to exist within the action area of this project.

5.0 CONCLUSION OF EFFECTS: CAROLINA HEELSPLITTER/CRITICAL HABITAT

The Carolina Heelsplitter is present in the project area. However, no bridge supports will be located within the stream channel, and there will be no temporary disturbance to the stream bottom from in-stream construction causeways, work pads, or construction within the stream. Additionally, SCDOT has committed to take extra precautions during construction in order to prevent the degradation of the downstream habitat from sedimentation. As such, adverse impacts to this species and its Critical Habitat are not expected to result from project construction.

Biological Conclusion-Carolina Heelsplitter: May Affect, Not Likely to Adversely Affect

Given that there will be no substrate disturbance, and stringent erosion control measures will be taken to avoid/minimize impacts resulting from sedimentation, potential adverse impacts to in-stream habitat and the Carolina Heelsplitter are considered insignificant, or discountable (very unlikely to occur).

Biological Conclusion-Critical Habitat Unit 5: May Affect, Not Likely to Adversely Affect

The proposed bridge replacement occurs within designated Critical Habitat (Unit 5) for the Carolina Heelsplitter (See Section 3.1.4). As discussed above, there will be no in-stream habitat disturbance from project construction. Additionally, adverse impacts to Critical Habitat Unit 5 resulting from sedimentation are very unlikely to occur due to the avoidance/ minimization measures that have been discussed, plus the fact that if sedimentation into Turkey Creek was to occur, it would likely occur downstream of the bridge, which is not designated as Critical Habitat.

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7.0 ENVIRONMENTAL COMMITMENTS

The contractor would be required to minimize potential impacts through implementation of construction best management practices, reflecting policies contained in 23 CFR 650 B and the latest SCDOT Supplemental Technical Specifications for seeding and erosion control measures. (SC-M-810-3 (7/15))
Additional Erosion Control Measures have been implemented to include triple row of silt fence with a rip-rap filter berm with Class B rip-rap and #57 stone on each end bents. An increased inspection frequency of the silt fences is also an option with an additional inspection after a storm event with ½" or greater accumulation.
Sediment and erosion control measures include triple row silt fences, sediment dams, filter berms, ditch checks, slope interrupters, and inlet structure filters. The sediment and erosion control plan will be designed per the SCDOT's Stormwater Quality Design Manual.
The contractor will also include with the demolition plan, oil and gas spill contingency plan. Copies of each shall be supplied to the USFWS.
The Demolition Plan will address the containment and prevention of debris falling in the creek during demolition.
The contractor will not be allowed to place any construction equipment or any materials in Turkey Creek. He also will not be allowed to introduce any silt from the construction site into Turkey Creek. Furthermore, the contractor will ensure no construction items or debris enters Turkey Creek. It is the contractor's responsibility to provide a plan to the RCE to ensure adherence to these restrictions.
Stormwater shall be directed away from Turkey Creek and shall not be permitted to drain directly from the bridge deck into the creek via cuppers. Stormwater shall instead be directed through vegetative filter strips before entering Turkey Creek.

APPENDIX A

Preliminary Plans

b35179ts.dgn

BRIDGE PLANS ID	SHEET NO.
0035179-B01	1

INDEX OF SHEETS

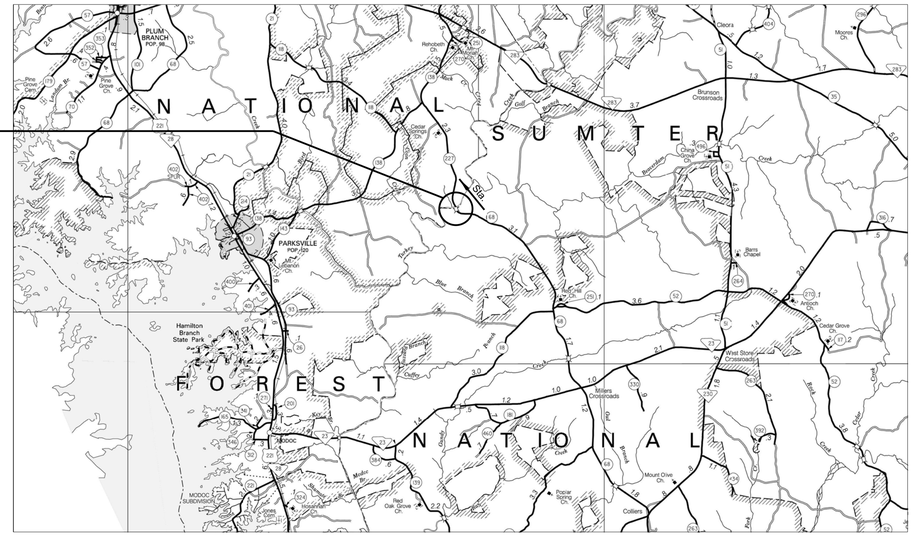
South Carolina Department of Transportation

PROPOSED PLANS FOR

EDGEFIELD / McCORMICK COUNTIES
PROJECT ID 0035179
ROAD S-68 / S-227 (KEY ROAD)
REPLACE BRIDGE OVER TURKEY CREEK

PRELIMINARY PLANS
NOVEMBER 4, 2015

SITE LOCATION



LAYOUT

Submit Shop Plans to:

SCDOT
Preconstruction Support Engineer
Attn: Logistics Coordinator - Shop Plans
955 Park Street - Room 409
Columbia, SC 29201

Approximate Location of Bridge is

Latitude	33° - 47' - 41"
Longitude	82° - 08' - 41"

	FOR CONSTRUCTION	
	INITIAL	DATE
RPG - HYDROLOGY		
RPG - STRUCTURES		
RPG - GEOTECHNICAL		
PRECONSTRUCTION SUPPORT - STRUCTURES		
RPG - DESIGN MANAGER		
RPG - PROGRAM MANAGER		

3 DAYS BEFORE DIGGING IN
SOUTH CAROLINA
CALL 811
SOUTH CAROLINA 811 (SC811)
WWW.SC811.COM
ALL UTILITIES MAY NOT BE A MEMBER OF SC811

ASSET ID 181

TRAFFIC DATA

2015 ADT 150 V.P.D.

2035 ADT 300 V.P.D.

TRUCKS 6 %

NET LENGTH OF ROADWAY	0.000	MILES
NET LENGTH OF BRIDGES	0.060	MILES
NET LENGTH OF PROJECT	0.060	MILES
LENGTH OF EXCEPTIONS	0.000	MILES
GROSS LENGTH OF PROJECT	0.060	MILES

NOTE: EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIALS AND WORKMANSHIP ON THIS PROJECT SHALL CONFORM TO THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2007 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF LETTING.

ENGINEER OF RECORD

FOR CONSTRUCTION : _____ DATE _____

REVIEWED			
DR.	KLS	RUR	10-15
	BY	CHK	DATE

StapletonKi
Printed: Wednesday, November 04, 2015 8:25:18 AM

DRAWING NO. 700-01

MATERIAL & WORKMANSHIP

Provide all material and workmanship in accordance with the South Carolina Department of Transportation 2007 Standard Specifications for Highway Construction, unless otherwise specified on the Plans or in the Special Provisions.

COORDINATION OF PLANS, SPECIFICATIONS, AND SPECIAL PROVISIONS

Generally, in case of discrepancy, this General Notes sheet governs over the Standard Specifications but the remainder of the plans govern over notes on this sheet and Special Provisions govern over all. See Subsection 105.4 of the Standard Specifications.

WATER ELEVATIONS

The water elevations shown in the plans are for information only and the actual water elevation during construction may vary depending on weather conditions and seasonal fluctuations.

COMPLETION DATES

On inside face of right side barrier parapet/railing at beginning of bridge and on left side barrier parapet/railing at end of bridge, place year of completion adjacent to guardrail attachment. Place this completion date so that it will not be covered by the guardrail connector when it is installed. Recess numbers in the concrete using numbers fabricated from reusable/durable material that is approved by the RCE. Provide numbers in accordance with SCDOT Standard Drawing No. 702-305-00.

REINFORCING STEEL

Fabricate reinforcing bars in accordance with the current C.R.S.I. Manual of Standard Practice except for ties, stirrups, and welded hoops.

Provide all ties and stirrups with 135° hooks that have extensions no less than the larger of ten bar diameters or six inches. This 135° hook requirement does not apply to stirrups extending from prestressed concrete beams.

The fabrication tolerance for out-to-out dimension of welded hoop diameter is $\pm$ $^1/_2$ inch.

Do not use lap splices in column and shaft reinforcing steel.

PRESTRESSED CONCRETE BEAMS

Beam lengths given are based on horizontal span only. Increase lengths to correct for concrete shrinkage, concrete shortening when the strands are cut, and for beams being on a grade.

All overhang brackets in the top flange of exterior beams shall be galvanized in accordance with AASHTO M 111, AASHTO M 232, or ASTM F 2329 as appropriate and shall be detailed accordingly in the shop plans.

CONCRETE

Provide the class of concrete as noted in the contract documents. For cast-in-place structural elements, use Class 4000 concrete where the class of concrete is not specified in the contract documents.

When holes are cast in beams to accommodate falsework, fill the holes with a non-shrink structural grout suitable for overhead repairs after falsework is removed.

After erection of the beams and prior to the erection of the deck slab falsework, measure beam cambers. Compare the measured beam cambers to the values shown on the Plans to aid in determining if field adjustments are needed. Submit beam camber measurements and any proposed field adjustments to the RCE for approval. All cost of performing this work is considered incidental to the Contract and no additional compensation is allowed for the performance of this work.

Payment for concrete in slab is based on theoretical plan quantity. No adjustment is made for variation in camber.

Chamfer all exposed edges $^3/_4$" unless otherwise noted.

The minimum acceptable concrete cover for reinforcing steel is $^1/_2$" less than the plan dimensions when required by reinforcing bar fabrication tolerances.

Cast build-ups and shear keys on bent caps monolithic with the cap unless indicated otherwise in these plans. Construct the top of each build-up level.

GRINDING & TEXTURING CONCRETE DECKS

For bridge stage construction projects, grind and texture the bridge decks as necessary near the stage longitudinal construction joints in order to meet the longitudinal and transverse rideability and rolling straightedge requirements of the Contract.

Prior to casting any closure pour, grinding, or texturing, make profile line surveys (2 to 6 as determined by the RCE) of each stage of the bridge decks. Make one of these profile line surveys for each stage along the edge of the deck adjacent to the closure pour. Compare the surveys within each stage and compare the surveys of each stage to surveys of the adjacent stage to aid in determining the amount of grinding and texturing needed to meet the rideability and rolling straightedge requirements. Submit all grinding and texturing procedures, plotted survey profiles, and proposed grinding depths to the RCE for approval. Maintain a final cover of 2"minimum over the bridge deck reinforcing steel.

Follow the above procedures for all stages of the work. For all surveys performed on the same bridge, use identical stations for survey shots in order to facilitate survey comparisons. All costs for performing, evaluating, and submitting the surveys are considered incidental to the Contract and no additional compensation is allowed for the performance of this work.

Payment for grinding and texturing concrete bridge decks at the junction of new and existing bridge deck slabs is determined in accordance with Subsection 702.6 of the Standard Specifications. No payment is made for grinding and texturing of new bridge decks to correct irregularities and excessive deviations.

ALLOWANCE FOR DEAD LOAD DEFLECTION & SETTLEMENT

In setting forms for structural steel or prestressed concrete beam spans, apply an allowance to the design finished grade to compensate for computed dead load deflections.

Prior to making deck pours on any stage construction work, and bridge widening projects, consider and make adjustments as necessary for partially loaded beams adjacent to closure pour areas. Verify that any proposed adjustment on partially loaded beams does not create a change in the deck thickness or a reduction in the concrete cover over the reinforcing steel. Welded studs on steel beams and reinforcing steel extending up out of prestressed beams shall meet the requirements for a composite section (extend up into the deck past the bottom mat of reinforcing steel) regardless of any adjustments.

In setting falsework for reinforced concrete spans, make an allowance for the deflection of the falsework, for any settlement of the falsework, for the instantaneous dead load deflection of the span, and for the long-time dead load deflection of the span such that on removal of the falsework the top of the structure shall conform to theoretical finished grade plus the allowance for long-time deflection.

For instantaneous and long-time dead load deflection, use a camber of $^1/_8$" for concrete flat slab spans 22 feet in length, $^3/_{16}$" for concrete flat slab spans 30 feet in length, and $^3/_8$" for concrete flat slab spans 40 feet in length, unless otherwise directed by the RCE. Adjust these cambers as necessary to allow for falsework deflection, falsework settlement, and vertical curve ordinates.

PERMANENT STEEL BRIDGE DECK FORMS

Permanent stay-in-place steel bridge deck forms for concrete deck slabs may be used at the Contractor's option.

Notify the Department and the Fabricator of the beams if using this option so that shop plans can be properly detailed.

DRIVEN PILE FOUNDATIONS

Where piles occur in fill, place fill before driving piles.

Where prestressed concrete piles are to be driven through fill, install piles in pre-bored holes extending to the original ground. For square prestressed concrete piles, bore holes having a minimum diameter of 1.25 times the nominal pile size. Include all cost of pre-boring fills for pile installation in the unit price bid for the piles.

EXCAVATION FOR END BENTS

Include all cost of excavation necessary to construct end bents and to remove material under superstructure to an elevation twelve inches below tops of end bent caps, in the unit price bid for class of concrete specified in the Plans.

If a concrete footing is used for the end bent, the excavation below that included for the cap and berm in the above paragraph is paid for at the unit price bid for excavation. Include excavation above this in the unit price bid for class of concrete specified in the Plans.

STRUCTURAL STEEL

Layout dimensions and standard lengths of beams shown are horizontal dimensions which must be increased when bridge is on grade.

When holes are placed in webs to accommodate falsework, install high strength bolts in the holes after falsework is removed.

Notify the Department of the name and address of the Fabricator of the structural steel as soon as the Fabricator has been given the contract to fabricate so that the inspection procedure can be set up.

Do not field or shop weld erection hardware to the structural steel members.

Make all bolted connections with $^7/_8$" dia. ASTM A 325 bolts unless otherwise indicated.

Generally, holes for $^7/_8$" dia. bolts shall be $^{15}/_{16}$" dia. However, oversize holes, $^3/_{16}$" larger than bolt dia., may be used in diaphragms and/or crossframes and their connection plates provided hardened washers are installed over oversize holes in the outer ply of the material gripped. Hardened washers are required under DTIs on oversized holes. In every case install a hardened washer under the element turned for each bolt of a bolted connection. Indicate on the Shop Plans which holes are to be oversize and where hardened washers are required. No additional payment is made for the costs associated with the use of oversize holes and furnishing additional hardened washers as necessary.

PAINT FOR STRUCTURAL STEEL

Paint structural steel in accordance with Section 710 of the Standard Specifications.

BEARING ASSEMBLIES

If bearing assemblies support weathering steel beams or girders, fabricate bearing assembly components from weathering steel and paint them using the NS2 Paint System. Galvanize all other bearing assemblies in accordance with AASHTO M 111, AASHTO M 232, or ASTM F 2329 as applicable.

After the required field welding of painted bearing assemblies, field repair the weld areas and/or any damaged areas to the paint in accordance with Subsection 710.4.2 of the Standard Specifications. After the required field welding of galvanized bearing assemblies, field repair the weld areas and/or damaged areas of the galvanized coating in accordance with ASTM A 780.

Include all cost of furnishing and installing steel bearing assembly components in the lump sum price bid for structural steel if a bid item for structural steel is included in the project. Otherwise, include the cost in the unit price bid for prestressed beams.

ANCHOR BOLTS

Galvanize all components of anchor bolt assemblies in accordance with AASHTO M 232 or ASTM F 2329 as applicable. The weight of anchor bolt assemblies is included in the bent quantities for reinforcing steel. Include all costs of furnishing and installing anchor bolt assemblies in the unit price bid for reinforcing steel.

ORIENTATION IN RELATION TO STATIONING

Left and right sides, where referred to in these plans, are in relation to direction of stationing.

SPECIFICATIONS

AASHTO 2012 LRFD Bridge Design Specifications, 6th Edition, with Interim Revisions through 2013.

ANSI/AASHTO/AWS D1.5 Bridge Welding Code (Latest Edition) with additions and revisions as stated in the Standard Specifications.

DESIGN DATA

Load and Resistance Factor Design (LRFD) Method

Live Load: AASHTO HL-93 Loading

The top $^1/_4$" of all concrete slabs is considered as a wearing surface and is not included in the slab depth used for the calculation of section properties.

All bolted connections, except for steel diaphragm members used with prestressed concrete beams, are designed as slip-critical connections having Class "B" contact surfaces.

An extra dead load of 0.016 KSF is incorporated into the design of this structure to accommodate the use of steel stay-in-place forms.

An extra dead load of 0.015 KSF is incorporated into the design of this structure as an allowance for a future wearing surface.

Seismic Design is in accordance with the 2008 SCDOT "Seismic Design Specifications for Highway Bridges", Version 2.0, with the following parameters:

Seismic Design Category: A

Analysis Method: No Detailed Analysis

Operational Classification: II

Site Class: C

Design Acceleration Coefficients:

PGA	(FEE):	0.06 g
S_{DS}	(FEE):	0.10 g
S_{D1}	(FEE):	0.04 g
PGA	(SEE):	0.16 g
S_{DS}	(SEE):	0.25 g
S_{D1}	(SEE):	0.12 g

Values determined from Three-Point Method

FINAL FINISH OF EXPOSED CONCRETE SURFACES

Apply the final surface finish on the bridge(s) only to the following checked and designated bridge areas:

☐ A) Entire surface of all barrier rails, parapet walls, approach slab curbs, concrete utility supports, and wing walls; outside vertical edge of bridge deck slabs and sidewalks.

☐ B) Outside face of exterior prestressed girders.

☐ C) Entire surface of designated substructure units, except top of bent caps and piers.

☐ All Units ☐ Designated Units:

☒ D) No final surface finish required.

REV.	BY	CHK.	DATE
	RUR	KLS	10-15
	0035179-B01		
REV.	GAR	LEM	5-15
	Added PCB note		
REV.	JXY	SAN	3-14
	New Border		
REVIEWED			
QUAN.			
DR.	GFD	SAN	8-07
DES.			

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

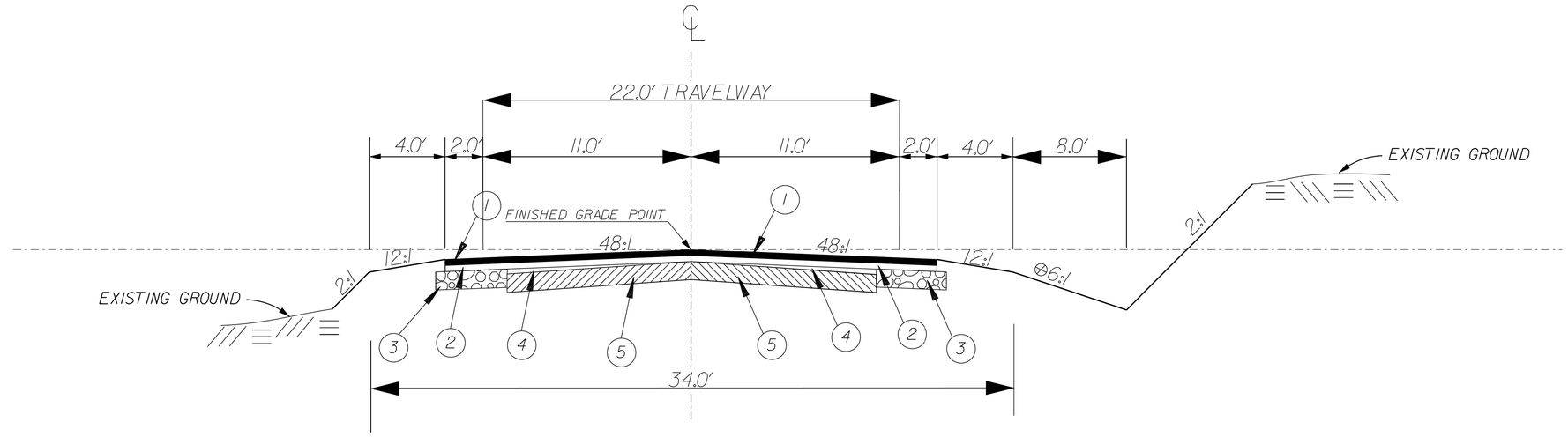
GENERAL NOTES

COUNTY	ROUTE
EDGEFIELD / McCORMICK	S-68 / S-227

DRAWING NO. 700-03

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	~~ROAD~~/ROUTE NO.	SHEET NO.
3	S.C.	EDGEFIELD/ MCCORMICK	0035179	KEY RD.	3

TYPICAL SECTION OF IMPROVEMENT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
COLUMBIA, S.C.



USE THIS SECTION ON S-68 / S-227 (KEY RD.)
FROM STA. 396+18.00 TO STA. 418+00.00

FOR INFORMATION ONLY

NOTE:

1. FILL SLOPES
   6:1------0' TO 5' FILL
   4:1------5' TO 10' FILL
   2:1------OVER 10' FILL
□ WIDEN SHOULDER 3.5' FOR GUARDRAIL

⊘2. THIS SLOPE MAY BE VARIED WHEN A DEEPER DITCH IS NECESSARY FOR DRAINAGE PURPOSES, USING A MINIMUM SLOPE OF 12:1 AND A MAXIMUM SLOPE OF 4:1. WHERE A DEEPER DITCH THAN PROVIDED BY A 4:1 IS NECESSARY, THE DITCH SHALL BE PLACED FARTHER FROM THE ℄ CONTINUING THE 4:1 SLOPE TO PROVIDE FOR THE NECESSARY DEPTH. SEE PROFILE FOR THE SPECIAL DITCH GRADES.

LEGEND

1.
2.
3.
4.
5. EXISTING ASPHALT TO REMAIN

		RTE. S-68 / S-227 DESIGN SPEED		
	SIDE RDS.	MPH	FROM STA.	TO STA.
		45 MPH		
		EXCEPTIONS TO DESIGN SPEED		
FUNCTIONAL CLASSIFICATION				
MINOR ARTERIAL				

PAVEMENT DESIGN

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION
ROAD DESIGN COLUMBIA, S.C.

TYPICAL SECTION

SCALE 1"V= N.T.S. SCALE 1"H= N.T.S. RTE./RD. S-68 / S-227

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FED. ROAD DIV. NO.	STATE	COUNTY	PROJECT ID	RD. NO.	SHEET NO.
3	S.C.	EDGEFIELD/ McCORMICK	0035179	S-68/ S-227	4

S-68 / S-227 (KEY RD.)

CONSTRUCT SHOULDER PAVING & FLUME AND PLACE 20 TONS RIPRAP (CLASS B) EACH FLUME SEE STD. DWG. 403-210-00 (TYPICAL ALL CORNERS)

CONST. THRIE BEAM BRIDGE CONNECTOR
ERECT 100.0 LF STEEL BEAM GUARDRAIL
CONST. END TREATMENT TYPE - T

CONSTRUCT C.B. TYPE 9
PLACE 54' - 18" SWP
FL IN = 272.9 FL OUT = 271.6
405

PLACE DITCH CHECKS FROM STA. 401+00 TO STA. 405+50 LT. PER STD. DWG. 815-105-00

SEDIMENT DAM #2

REMOVE 20' - 6' P.V.C. PIPE

NEW 75.0' R/W

PRES. 66.0' R/W (1933.278, 1962. SKC)

MATCH LINE STA. 402+00.00 SEE SHEET NO. 6

S-68 / S-227 (KEY RD.)

SEDIMENT DAM #3

CONSTRUCT C.B. TYPE 9
PLACE 43' - 18" SWP
FL IN = 268.2 FL OUT = 268.0

CONSTRUCT TRAPEZOIDAL RIPRAP
DITCH WITH 4' BOTTOM WIDTH (OBT. PERM.)

CONST. THRIE BEAM BRIDGE CONNECTOR
ERECT 175.0 LF STEEL BEAM GUARDRAIL
CONST. END TREATMENT TYPE - T

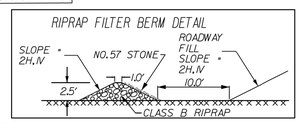
PLACE DITCH CHECKS FROM STA. 400+50 TO STA. 405+50 RT. PER STD. DWG. 815-105-00

PLACE TYPE F (NON-WEIGHTED) SLOPE INTERUPTERS STA. 405+00.00 TO STA. 406+57.00

PLACE RIP RAP FILTER BERM FROM STA. 406+00 LT. TO STA. 405+50 RT. (SEE DETAIL BELOW)

PLACE TRIPLE ROW OF SILT FENCE WITH 4" - 6" OF #57 STONE IN FRONT OF SILT FENCE AND WIRE FENCE BEHIND SILT FENCE (SEE DETAIL)

RIPRAP FILTER BERM DETAIL



TIE EQUALITY:
P.O.T. 12+41.84 OLD BRIDGE
P.O.T. 15+79.88 TURKEY CREEK

TIE EQUALITY:
P.O.T. 408+49.78 S-68 / S-227
P.O.T. 13+37.80 TURKEY CREEK

EXISTING 22' X 304' BRIDGE
410

RETAIN 18' - 18" C.M.PIPE

CONST. THRIE BEAM BRIDGE CONNECTOR
ERECT 587.5 LF STEEL BEAM GUARDRAIL

NEW 75.0' R/W

PLACE RIP RAP FILTER BERM FROM STA. 410+00 LT. TO STA. 410+00 RT. (SEE DETAIL BELOW)

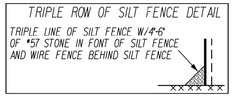
PLACE TRIPLE ROW OF SILT FENCE WITH 4" - 6" OF #57 STONE IN FRONT OF SILT FENCE AND WIRE FENCE BEHIND SILT FENCE (SEE DETAIL)

PLACE ROCK MATTING (DEPTH 4" - 6") OF RAILROAD TYPE ROCK (D50 = 3 INCHES) WITHIN LIMITS OF RIGHT-OF-WAY

CONST. THRIE BEAM BRIDGE CONNECTOR
ERECT 525.0 LF STEEL BEAM GUARDRAIL

CONSTRUCT 34' X 320' R.C. BRIDGE
STA. 406+57.00 TO 409+77.00
(SEE BRIDGE PLANS)

TRIPLE ROW OF SILT FENCE DETAIL



CONNECT WITH PIPE COLLAR
PLACE 21' - 18" SWP
FL IN 254.2 FL OUT = 254.1
PLACE 8 TONS OF RIPRAP (CLASS B)
415

CONST. 25.0 LF CURVED GUARDRAIL
AS DIRECT BY ENGINEER
SEE STD. DWG. 805-580-01

ERECT 100.0 LF STEEL BEAM GUARDRAIL
CONST. END TREATMENT TYPE - T

PRES. 66.0' R/W (1933.278, 1962. SKC)

S-68 / S-227 (KEY RD.)

MATCH LINE STA. 417+00.00 SEE SHEET NO. 8

IN PLACE 58' - 18" R.C. PIPE

PLACE 14' - 18" SWP
FL IN = 255.9 FL OUT = 255.8
CONNECT WITH PIPE COLLAR

CONST. 12.5 LF CURVED GUARDRAIL
AS DIRECT BY ENGINEER
SEE STD. DWG. 805-580-01

SEDIMENT DAM #4

ERECT 162.5 LF STEEL BEAM GUARDRAIL
CONST. END TREATMENT TYPE - T

FOR INFORMATION ONLY

HYDROLOGY DATA:

D.A. = 275.6 sq.mi. = 176,400 ac.
Q_{25} = 16,170 cfs
$Vel._{25}$ = 4.3 ft/sec
25 Year H.W. Elev. = 250.2 ft.
Q_{100} = 21,580 cfs
Vel_{100} = 5.1 ft/sec
100 Year H.W. Elev. = 252.8 ft.
NOTE : Data from Bridge Section
OVERTOPPING FLOOD:
Q= 74,000 cfs
Probability = ∠0.0002%

FINISHED GRADE

(-) 1.17%

500' V.C.

(+) 1.17%

(+) 2.63%

VPI = 415+00.00
Elev. = 267.35

280.05 VPT

270.22 VPC

	402+00	403+00	404+00	405+00	406+00	407+00	408+00	409+00	410+00	411+00	412+00	413+00	414+00	415+00	416+00	417+00
	283.95	282.80	281.79	280.93	280.23	279.64	279.05	278.47	277.88	277.30	276.71	276.12	275.54	274.95	274.37	273.78
	273.20	272.61	272.03	271.44	270.86	270.27	269.81	269.58	269.59	269.85	270.34	271.08	272.05	273.26	274.72	

PLAN
SURVEYED
PLOTTED
NOTE BOOK
NO.
CHECKED
R/W'S NOTED
STRUCTURE NOTATIONS CHECKED
RT. OF WAY CHECKED

PROFILE
SURVEYED
PLOTTED
NOTE BOOK
NO.
CHECKED
R/W'S NOTED
STRUCTURE NOTATIONS CHECKED

DATE
BY

CarrSK
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19-OCT-2015

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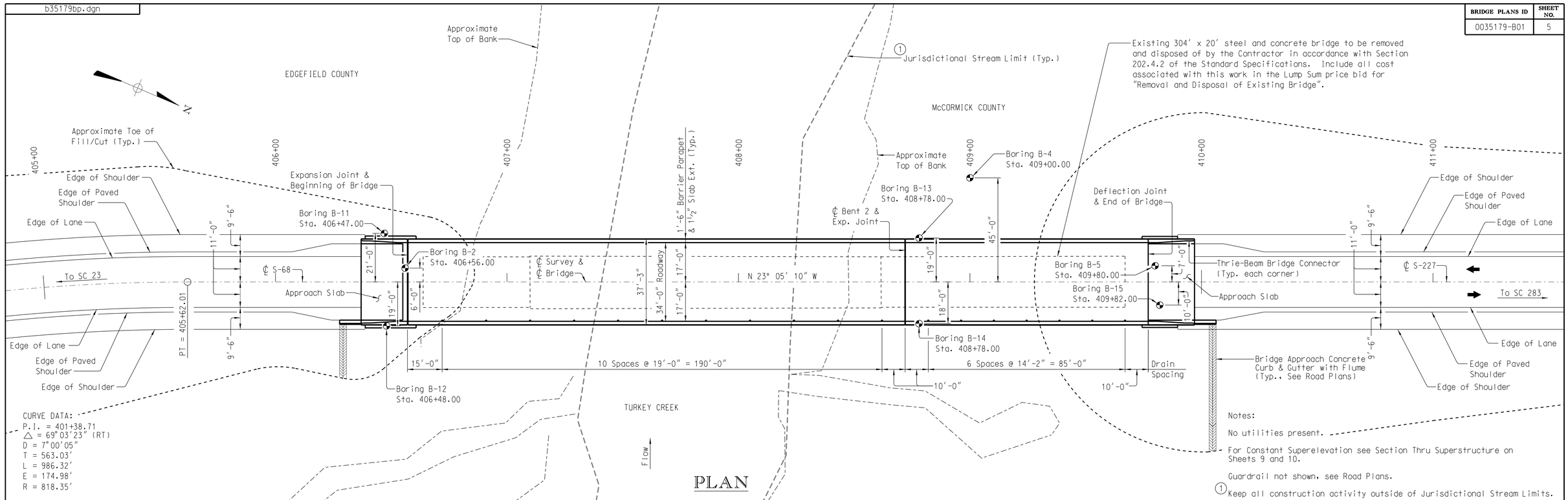
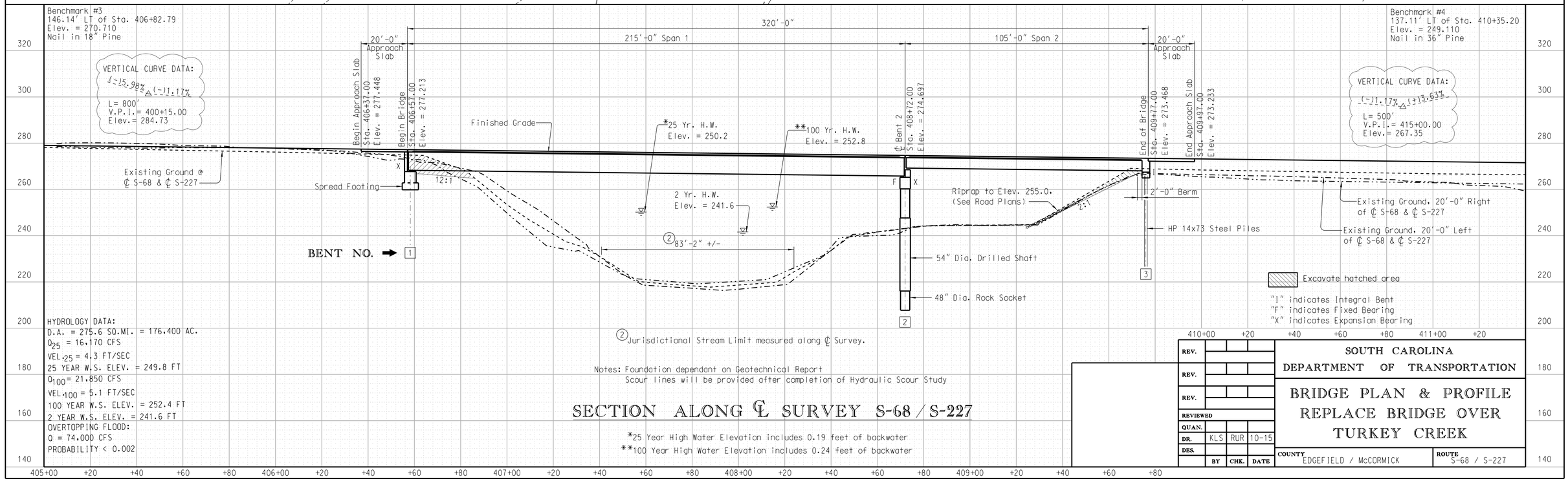
BRIDGE PLANS ID	SHEET NO.
0035179-B01	5



PLAN



HYDROLOGY DATA:
D.A. = 275.6 SQ.MI. = 176,400 AC.
Q_{25} = 16,170 CFS
VEL-25 = 4.3 FT/SEC
25 YEAR W.S. ELEV. = 249.8 FT
Q_{100} = 21,850 CFS
VEL-100 = 5.1 FT/SEC
100 YEAR W.S. ELEV. = 252.4 FT
2 YEAR W.S. ELEV. = 241.6 FT
OVERTOPPING FLOOD:
Q = 74,000 CFS
PROBABILITY < 0.002

(2) Jurisdictional Stream Limit measured along ℄ Survey.

Notes: Foundation dependant on Geotechnical Report
Scour lines will be provided after completion of Hydraulic Scour Study

SECTION ALONG ℄ SURVEY S-68 / S-227

*25 Year High Water Elevation includes 0.19 feet of backwater
**100 Year High Water Elevation includes 0.24 feet of backwater

REV.			
REV.			
REV.			
REVIEWED			
QUAN.			
DR.	KLS	RUR	10-15
DES.			
	BY	CHK.	DATE

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

BRIDGE PLAN & PROFILE
REPLACE BRIDGE OVER
TURKEY CREEK

COUNTY	ROUTE
EDGEFIELD / McCORMICK	S-68 / S-227

Printed: Wednesday, November 04, 2015 10:20 PM

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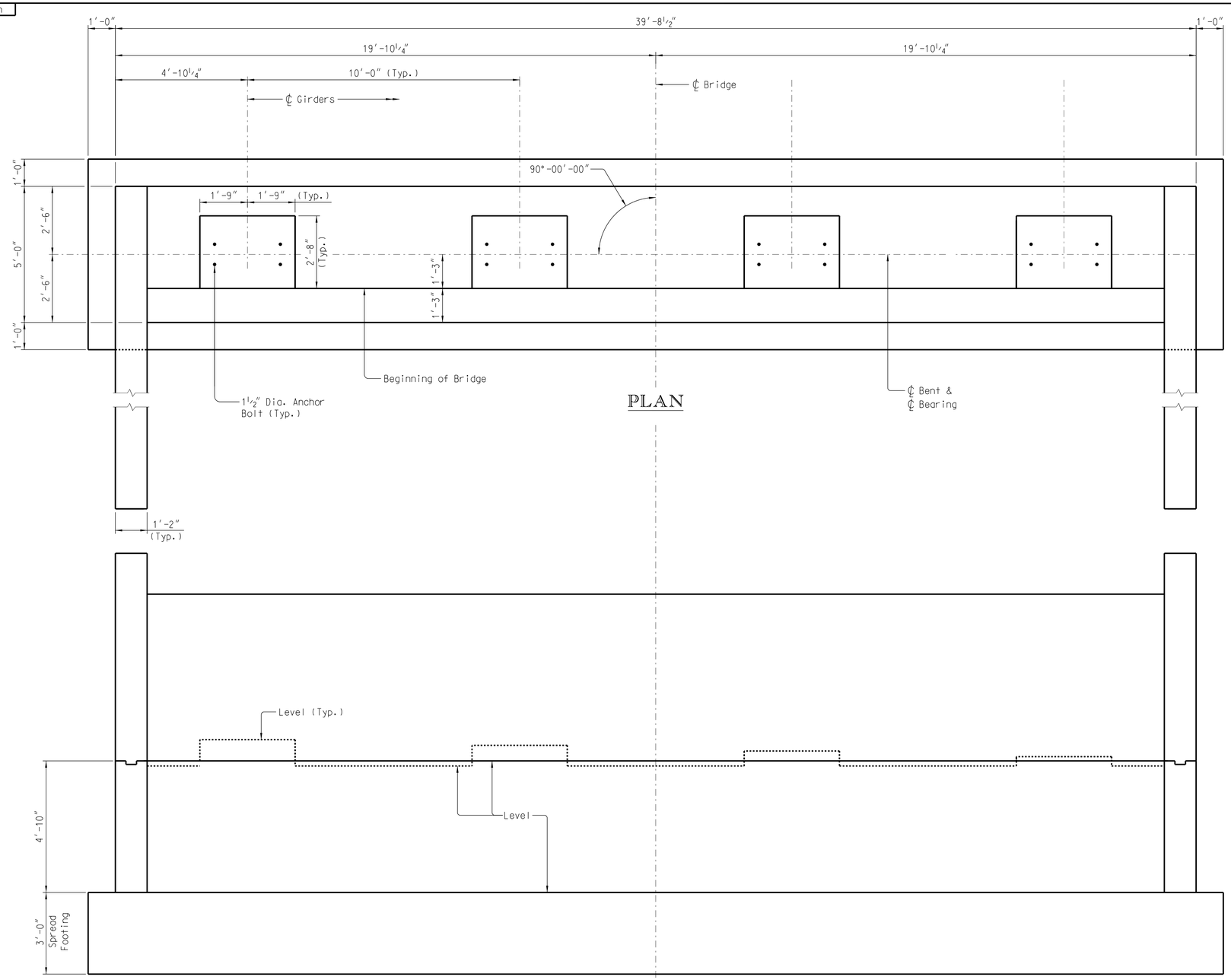
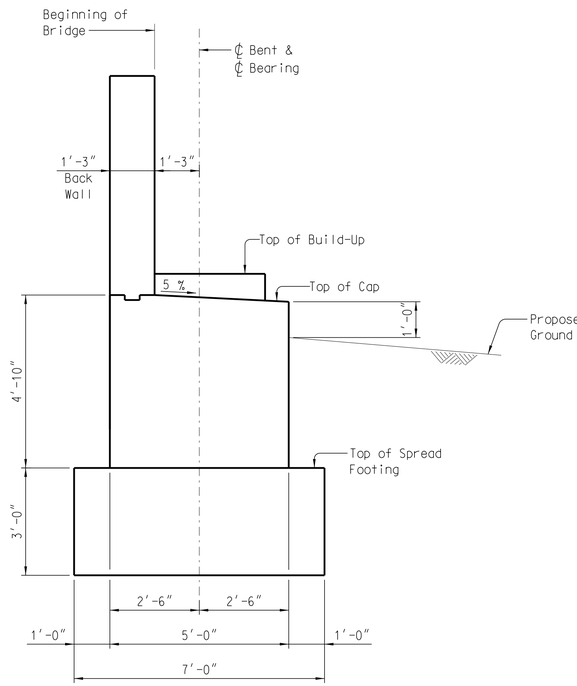
BRIDGE PLANS ID	SHEET NO.
0035179-B01	6



PLAN

ELEVATION



Note: Foundation dependent on Bridge Geotechnical Report

REV.				
REV.				
REV.				
REVIEWED				
QUAN.				
DR.	KLS	RUR	3-15	
DES.				
	BY	CHK.	DATE	

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

END BENT 1

COUNTY	ROUTE
EDGEFIELD / McCORMICK	S-68 / S-227

Printed: Thursday, October 29, 2015 10:06:46 AM

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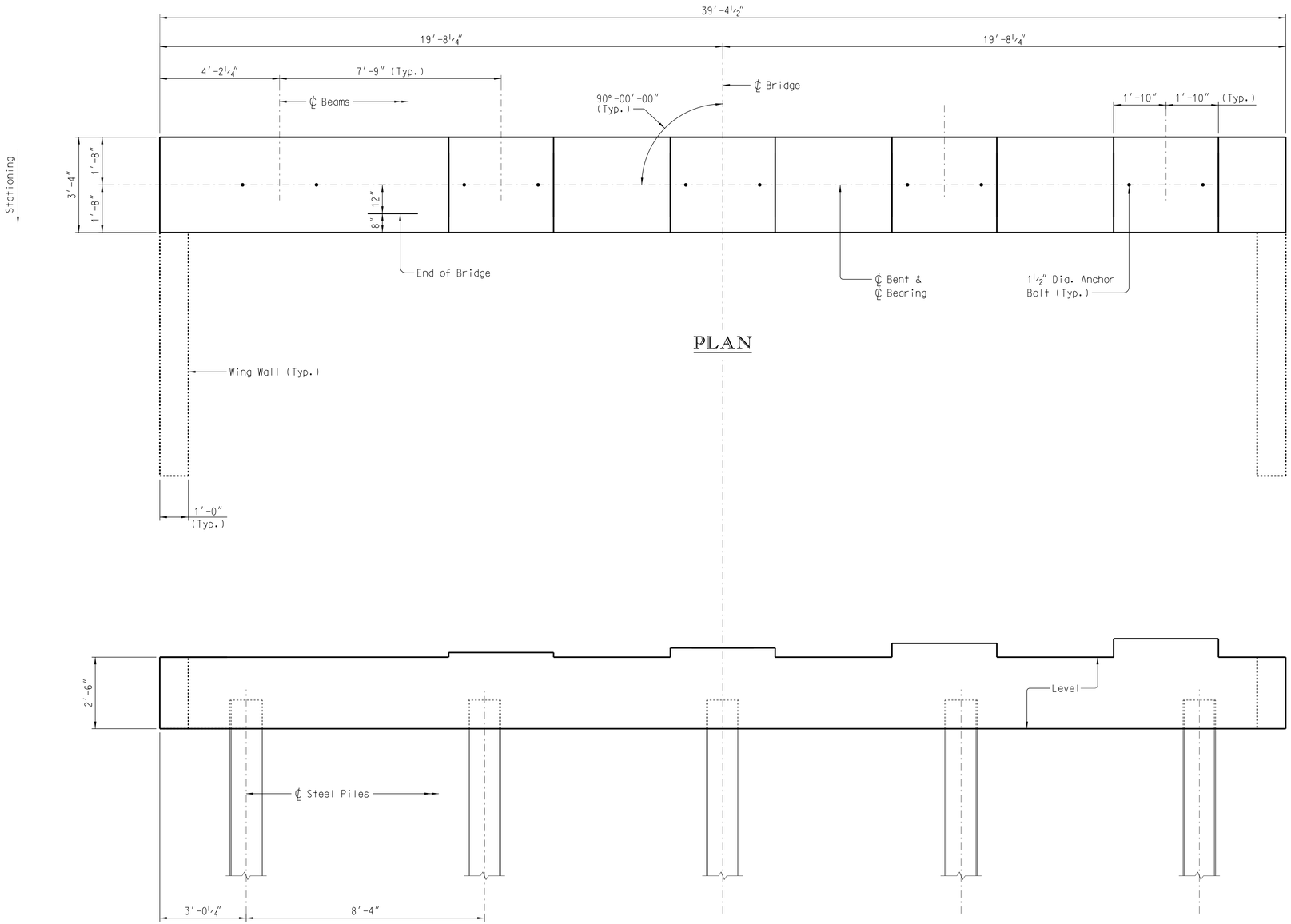
BRIDGE PLANS ID	SHEET NO.
0035179-B01	7



PLAN

ELEVATION

(Looking Opposite Direction of Stationing)

PILE NO. ➡ 5 4 3 2 1

Piles are numbered from right to left looking in the opposite direction of stationing.

Note: Foundation dependent on Bridge Geotechnical Report

REV.				
REV.				
REV.				
REVIEWED				
QUAN.				
DR.	KLS	RUR	3-15	
DES.				
	BY	CHK.	DATE	

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

END BENT 3

COUNTY	ROUTE
EDGEFIELD / McCORMICK	S-68 / S-227

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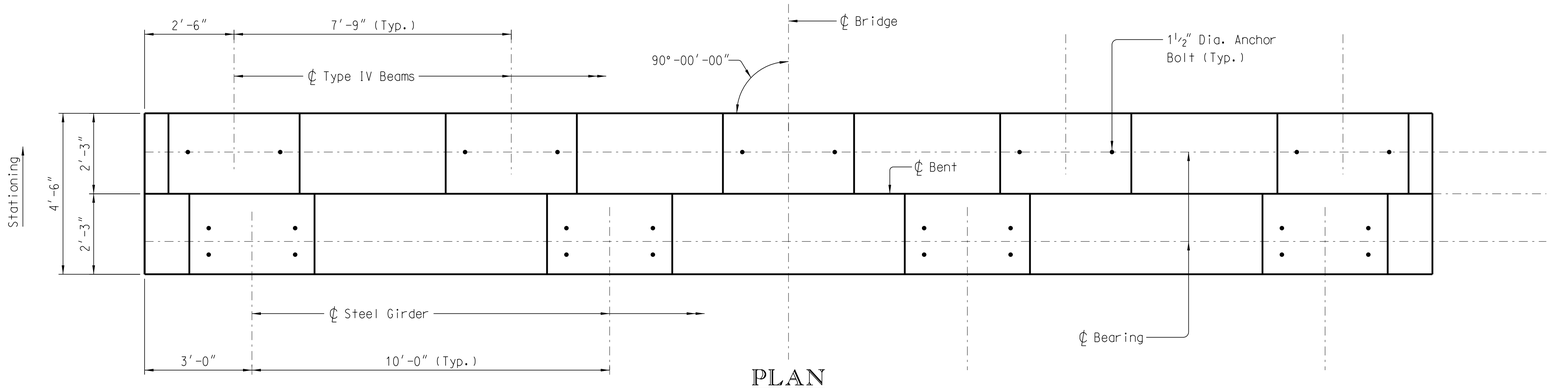
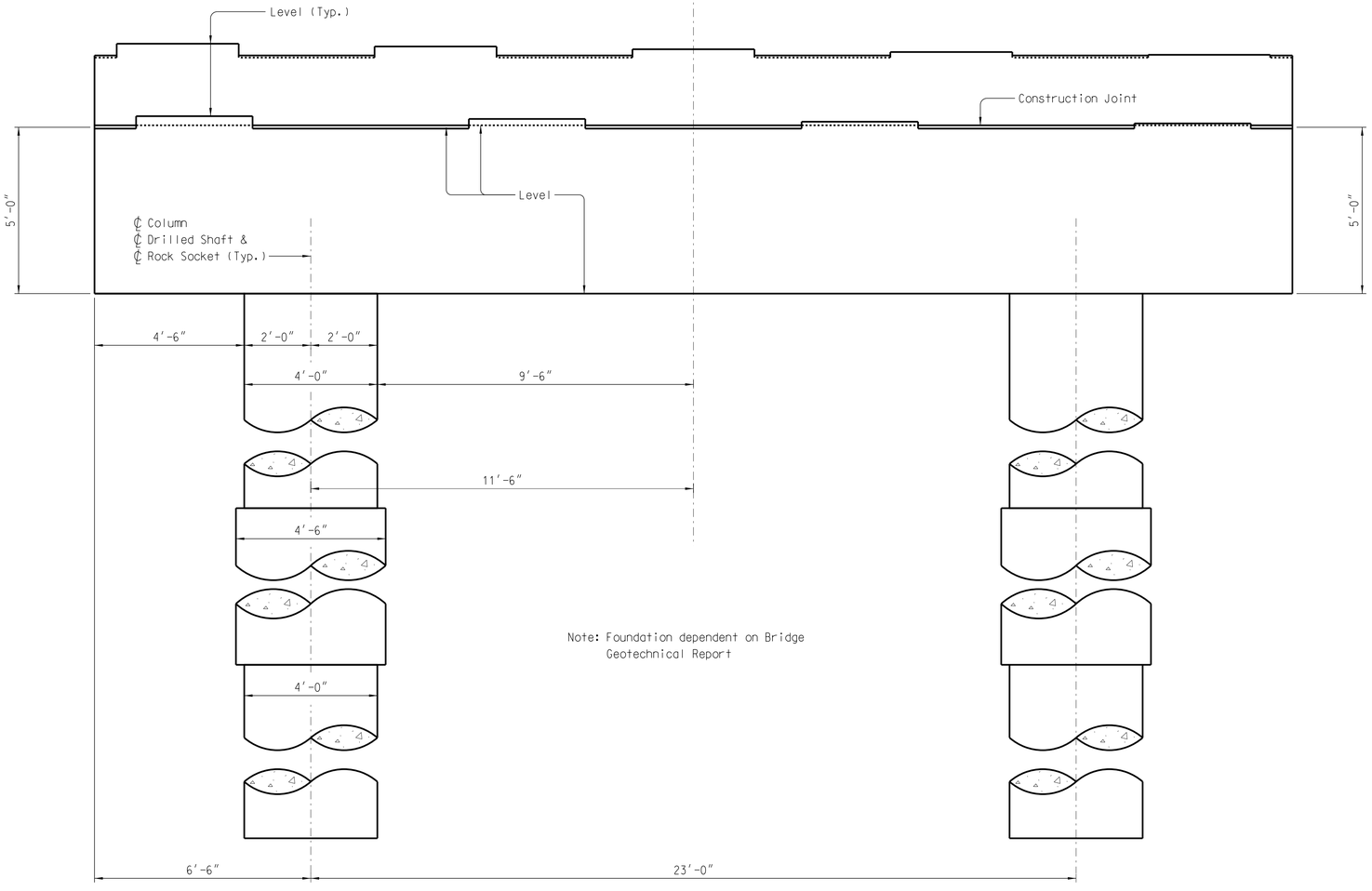
BRIDGE PLANS ID	SHEET NO.
0035179-B01	8



PLAN



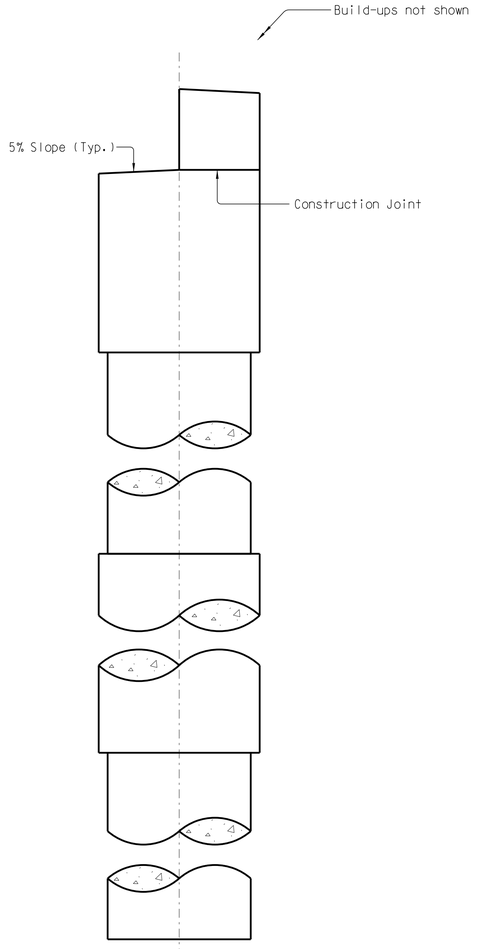
Note: Foundation dependent on Bridge Geotechnical Report

SHAFT NO. ➡ 1 2

Drilled Shafts are numbered from left to right looking in direction of stationing.

ELEVATION

(Looking in Direction of Stationing)



END ELEVATION

REV.				
REV.				
REV.				
REVIEWED				
QUAN.				
DR.	KLS	RUR	2-15	
DES.				
	BY	CHK.	DATE	

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERIOR BENT 2

COUNTY	ROUTE
EDGEFIELD / McCORMICK	S-68 / S-227

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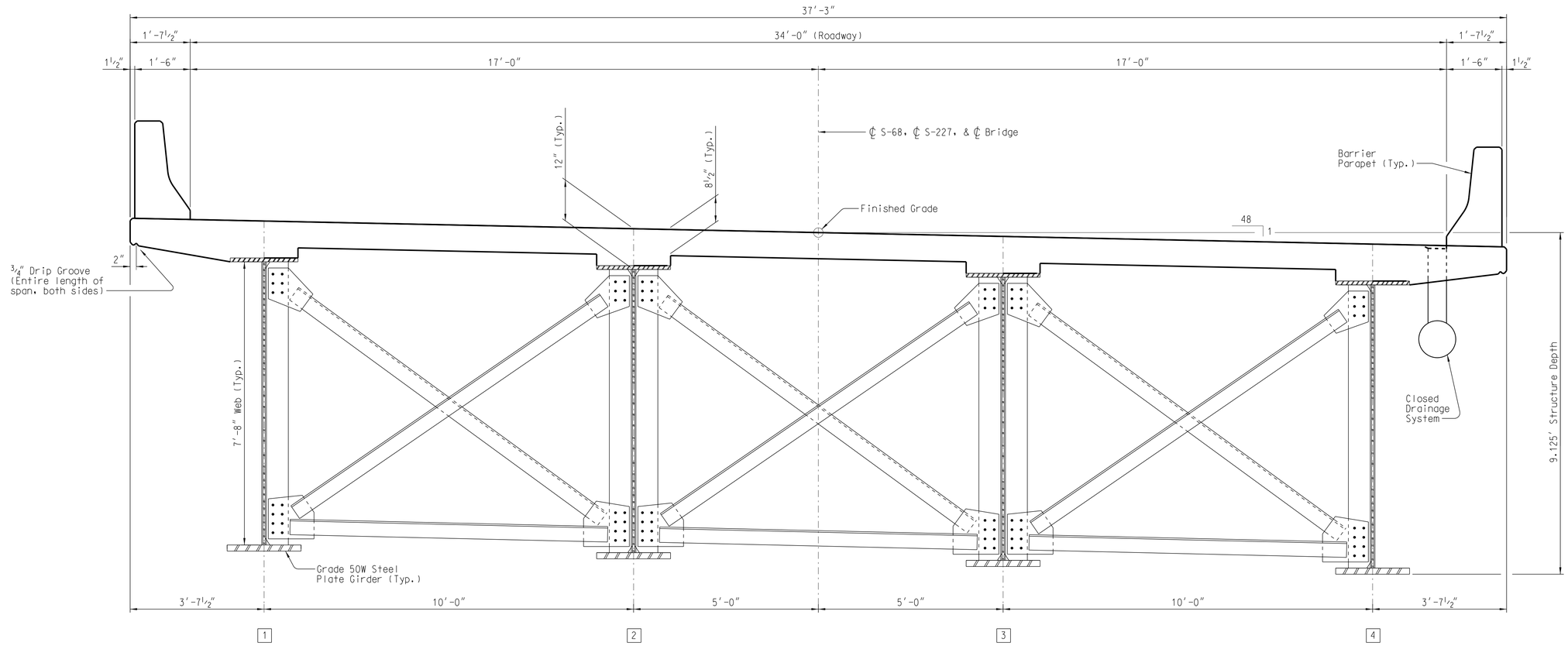
BRIDGE PLANS ID	SHEET NO.
0035179-B01	9



SECTION THRU SUPERSTRUCTURE - SPAN 1

Looking in Direction of Stationing

REV.			
REV.			
REV.			
REVIEWED			
QUAN.			
DR.	KLS	RUR	3-15
DES.			
	BY	CHK.	DATE

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SUPERSTRUCTURE DETAIL (SPAN 1)

COUNTY	ROUTE
EDGEFIELD / McCORMICK	S-68 / S-227

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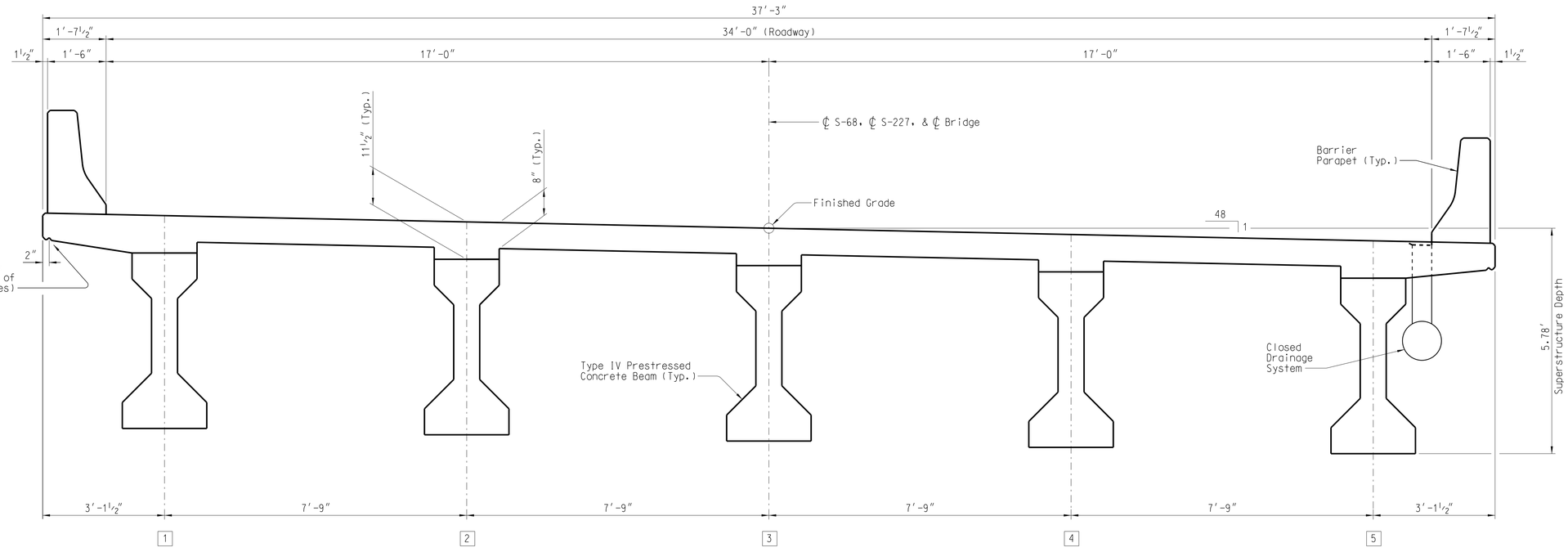
b35179sx.dgn

BRIDGE PLANS ID	SHEET NO.
0035179-B01	10



SECTION THRU SUPERSTRUCTURE - SPAN 2

Looking in Direction of Stationing

REV.			
REV.			
REV.			
REVIEWED			
QUAN.			
DR.	KLS	RUR	3-15
DES.			
	BY	CHK.	DATE

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SUPERSTRUCTURE DETAIL (SPAN 2)

COUNTY	ROUTE
EDGEFIELD / McCORMICK	S-68 / S-227

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APPENDIX B

Select Photos from Mussel Survey

Eastern Elliptio (bottom), Creeper (2nd from bottom), Carolina Spike (3rd from bottom), Eastern Creekshell (all others)

Brook Floater (top)Eastern Creekshell (bottom)

Turkey Creek below Key Road

APPENDIX E

AGENCY COORDINATION

DEPARTMENT OF THE ARMY
CHARLESTON DISTRICT, CORPS OF ENGINEERS
69A HAGOOD AVENUE
CHARLESTON, SOUTH CAROLINA 29403-5107

REPLY TO
ATTENTION OF

April 16, 2015

Regulatory Division

RECEIVED
APR 23 2015
Environmental Management
SCDOT

Mr. Sean Connolly
South Carolina Department of Transportation
P.O. Box 191
Columbia, South Carolina 29202-0191

Dear Mr. Connolly:

This is in response to your letter of March 27, 2015, requesting a Preliminary Jurisdictional Determination (Preliminary) for a 30 acre project area, located where S-68/ S-227 (Key Road) crosses Turkey Creek in Edgefield and McCormick Counties, South Carolina. The project area is depicted on the enclosed three drawings (Figures 6, 7, and 8) entitled "S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK" and dated February 19, 2015. A preliminary jurisdictional determination is used to indicate that this office has identified wetlands or other waters on the property and believes these waters may be jurisdictional waters of the United States. Since the Preliminary does not verify the actual jurisdictional status of wetlands and/or waters of the United States on the property, it relies on the presumption of jurisdiction for the purpose of expediting the request for a Preliminary.

Based on a review of aerial photography, topographic maps, National Wetland Inventory maps and soil survey information, it has been concluded that the boundaries shown on the referenced drawings are a reasonable approximation of the location and boundaries of the waters found on this site. The area in question contains approximately 308 linear feet/ 0.549 acre of federally defined freshwater wetlands or other waters. You are cautioned that this delineation is approximate, subject to change, and should be used for planning purposes only. This office should be contacted prior to performing any work in or around these wetlands or other waters. In order for a definitive determination to be provided, these areas should be located and marked on-site, sketched or surveyed, platted on a map, and should be accompanied by a request for an Approved Jurisdictional Determination. Upon receipt of such a request, this office can then issue an approved determination as to jurisdiction (rather than the presumption of jurisdiction). You should also be aware that the areas identified as wetlands or other waters may be subject to restrictions or requirements of other state or local government entities.

Please note that since this jurisdictional determination is a Preliminary, it is subject to change and therefore is not an appealable action under the Corps of Engineers administrative appeal procedures defined at 33 CFR 331. If a permit application is forthcoming as a result of this Preliminary, a copy of this letter, as well as the attached sketch or plat should be submitted as part of the application. Otherwise, a delay could occur in confirming that a preliminary jurisdictional determination was performed for the permit project area.

This preliminary jurisdictional determination is a non-binding action and as such has no expiration until it is superseded by an Approved Jurisdictional Determination. If you intend to

request an Approved Jurisdictional Determination in the future, you are advised not to commence work in these wetlands and/or waters prior to receiving the Approved Jurisdictional Determination.

In future correspondence concerning this matter, please refer to SAC 2015-00468-DJJ. You may still need state or local assent. Prior to performing any work, you should contact the South Carolina Department of Health and Environmental Control. A copy of this letter is being forwarded to them for their information.

Enclosed are two copies of the Preliminary Jurisdictional Determination Form signed by our office. Please sign both copies, retain one copy for your records and return one signed copy to this office in the enclosed self-addressed envelope.

If you have any questions concerning this matter, please contact Elizabeth Williams at 843-329-8044 or toll free at 1-866-329-8187.

Sincerely,

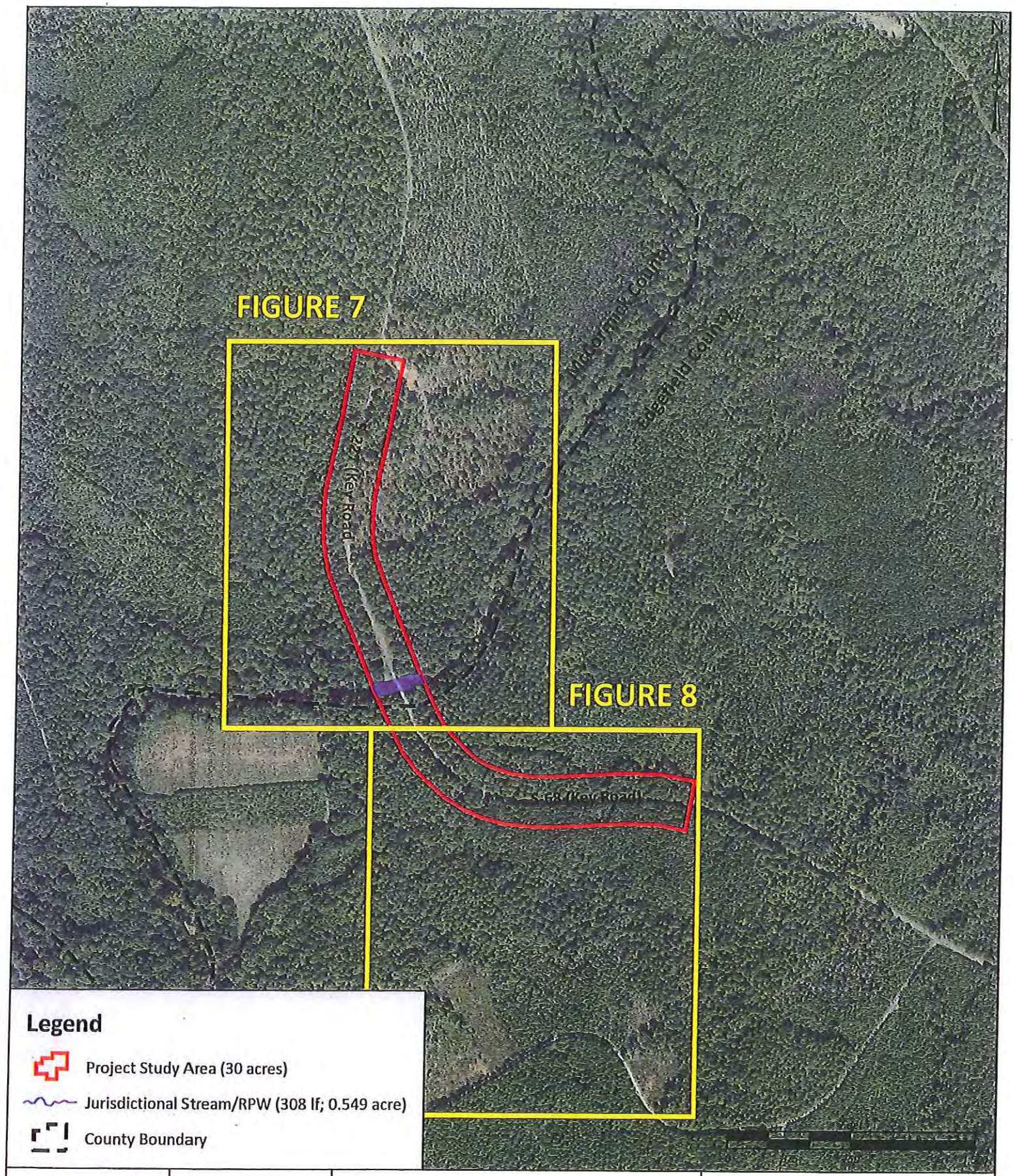
Travis G. Hughes
Chief, Special Projects Branch

Enclosures

Preliminary Jurisdictional Determination Form

Copy Furnished:

Mr. Matt DeWitt
Mead and Hunt
307 West Main Street
Lexington, South Carolina 29072



Mead & Hunt
307 W. Main Street
Lexington, SC 29072
Tel. 803.996.2900
www.meadhunt.com

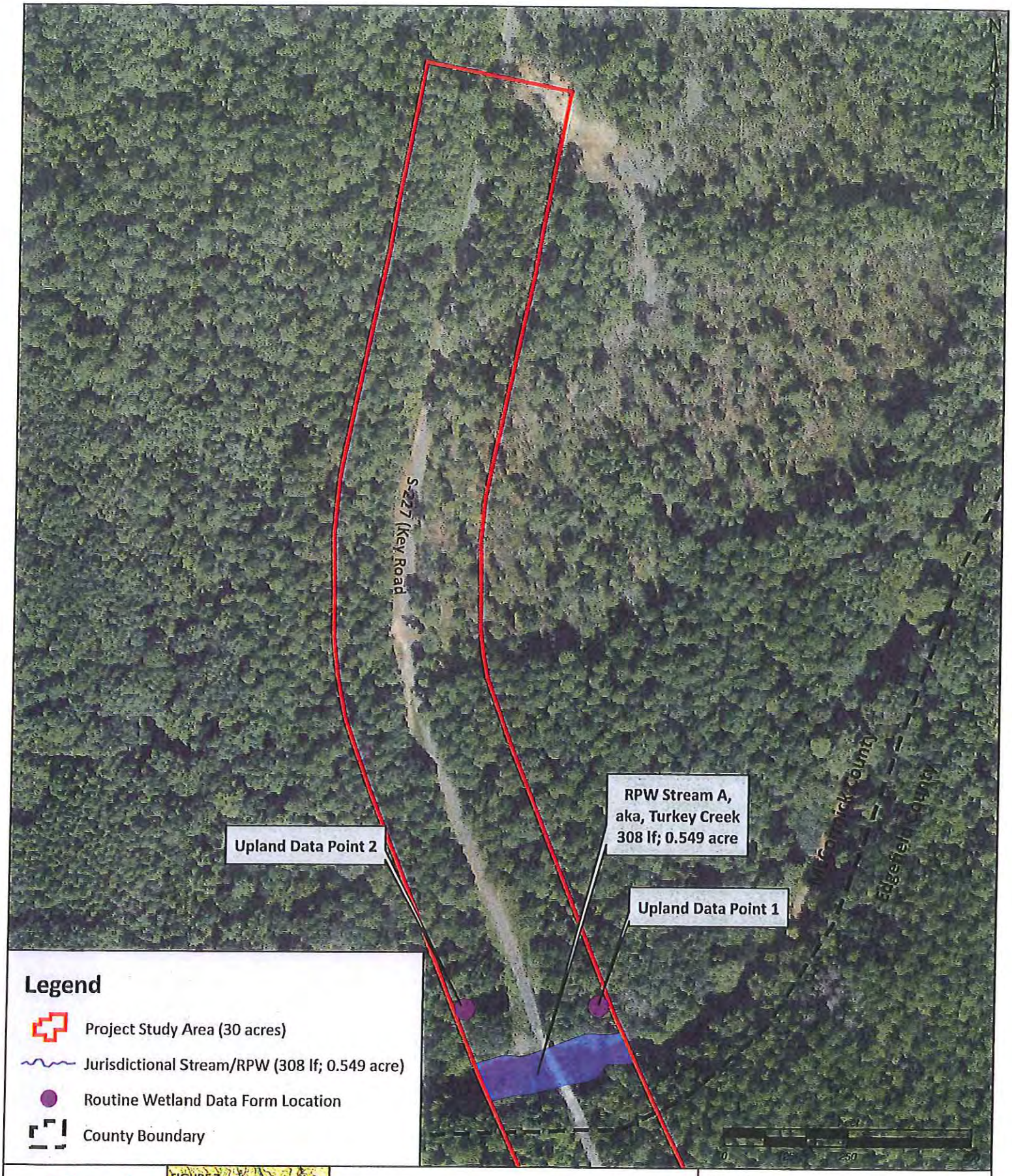
S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

APPLICATION BY: SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

JURISDICTIONAL WATERS OF THE U.S. INDEX

M&H PROJ: R3286900-140626.01 SCDOT PIN: 35179 USACE SAC: NOT YET ASSIGNED	SOURCE: NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) AERIAL PHOTOGRAPHY (MCCORMICK COUNTY (2013))	DRAWN BY: MTD	QAQC BY: JBS
		DATE: 02/19/2015	FIGURE 6



Mead & Hunt
Mead & Hunt
307 W. Main Street
Lexington, SC 29072
Tel. 803.996.2900
www.meadhunt.com

FIGURE 7

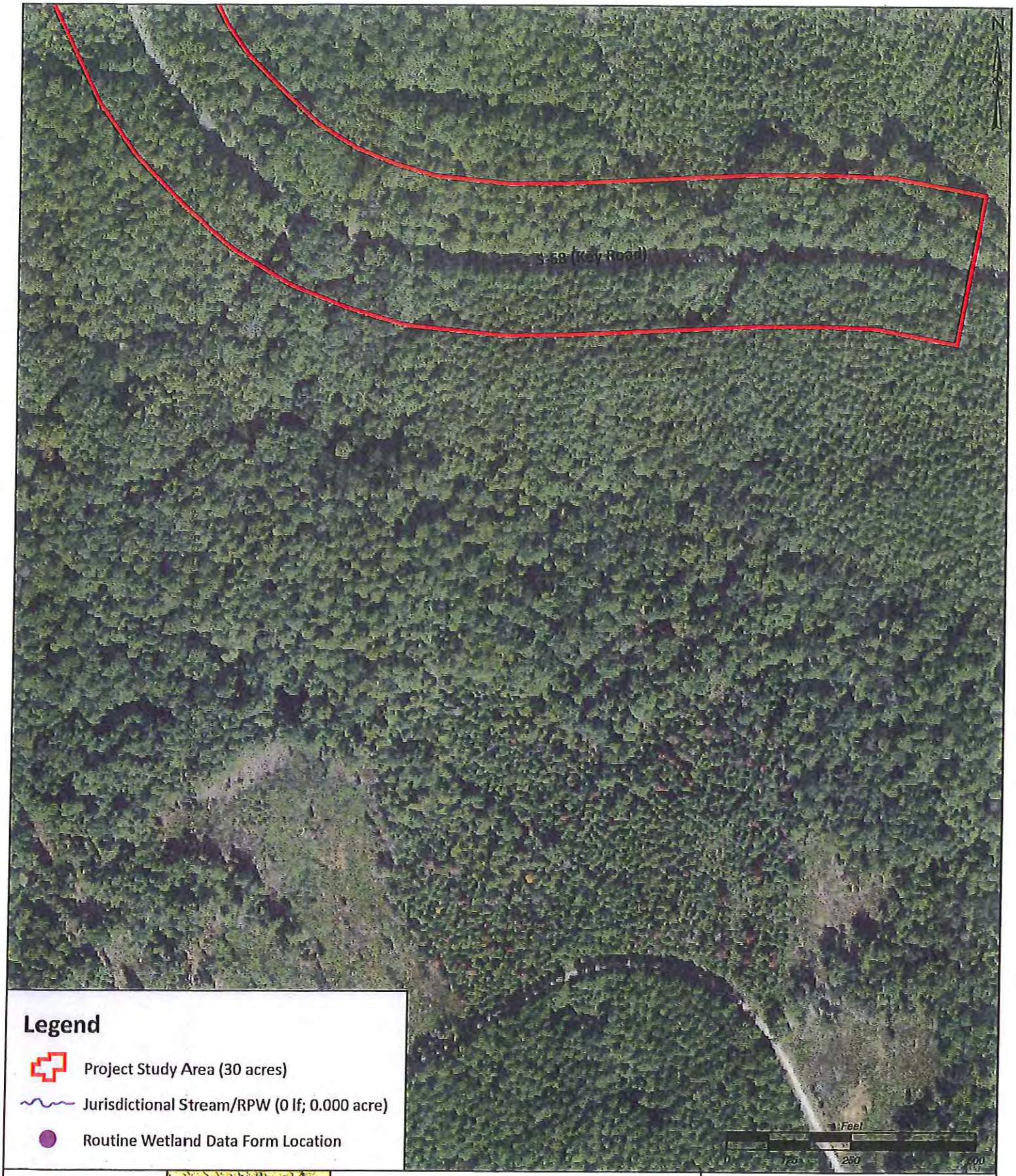
S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT
OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

APPLICATION BY: SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

JURISDICTIONAL WATERS OF THE U.S. MAP

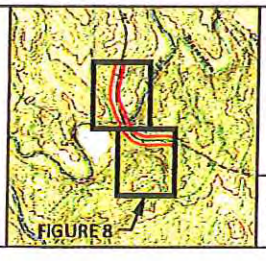
M&H PROJ: R3286900-140626.01 SCDOT PIN: 35179 USACE SAC: NOT YET ASSIGNED	SOURCE: NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) AERIAL PHOTOGRAPHY (MCCORMICK COUNTY (2013))
DRAWN BY: MTD	QAQC BY: JBS
DATE: 02/19/2015	FIGURE 7



Legend

- Project Study Area (30 acres)
- Jurisdictional Stream/RPW (0 lf; 0.000 acre)
- Routine Wetland Data Form Location

Mead & Hunt
Mead & Hunt
307 W. Main Street
Lexington, SC 29072
Tel. 803.996.2900
www.meadhunt.com



S-68/S-227 (KEY ROAD) BRIDGE REPLACEMENT
OVER TURKEY CREEK

EDGEFIELD AND McCORMICK COUNTIES, SOUTH CAROLINA

APPLICATION BY: SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

JURISDICTIONAL WATERS OF THE U.S. MAP

M&H PROJ: R3286900-140626.01 SCDOT PIN: 35179 USACE SAC: NOT YET ASSIGNED	SOURCE: NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) AERIAL PHOTOGRAPHY (MCCORMICK COUNTY (2013))	DRAWN BY: MTD	QAQC BY: JBS
		DATE: 02/19/2015	FIGURE 8

ATTACHMENT

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD): April 16, 2015

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD: SC DOT PO Box 191, Columbia SC 29202

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: SAC 2015-00468 S-68 / S-227 (Key Road) Bridge Replacement Project Over Turkey Creek

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION: S-68 / S-227 (Key Road) Bridge Over Turkey Creek. Turkey Creek acts as the county line between McCormick and Edgefield Counties and therefore the project falls in both Counties.

(USE THE ATTACHED TABLE TO DOCUMENT MULTIPLE WATERBODIES AT DIFFERENT SITES)

State: SC County/parish/borough: McCormick and Edgefield City: Rural setting, approx 4 miles west of Parksville.

Center coordinates of site (lat/long in degree decimal format):

Lat. 33.794781°N, Long. -82.144490°W. Universal Transverse Mercator:

Name of nearest waterbody: Turkey Creek

Identify (estimate) amount of waters in the review area:

Non-wetland waters: 308 linear feet: 80 width (ft) and/or 0.549 acres.

Cowardin Class: Stream Flow:

Wetlands: acres. Cowardin Class:

Name of any water bodies on the site that have been identified as Section 10 waters:

Tidal:

Non-Tidal:

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date: 4-16-15 ☐ Field Determination. Date(s):

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which

does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
- ☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps: .
- ☐ Corps navigable waters' study: .
- ☐ U.S. Geological Survey Hydrologic Atlas: .
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☐ U.S. Geological Survey map(s). Cite scale & quad name: .
- ☒ USDA Natural Resources Conservation Service Soil Survey. Citation: McCormick and Edgefield Counties.
- ☒ National wetlands inventory map(s). Cite name: McCormick and Edgefield Counties.
- ☐ State/Local wetland inventory map(s): .
- ☐ FEMA/FIRM maps: .
- ☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- ☒ Photographs: ☒ Aerial (Name & Date):'99, 2006 SCDNR aerial infrared.

or ☒ Other (Name & Date):Site photographs provided by Matt DeWitt.

☐ Previous determination(s). File no. and date of response letter: .

☐ Other information (please specify): .

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and date of
Regulatory Project Manager
(REQUIRED)

4/24/15

Signature and date of
person requesting preliminary JD
(REQUIRED, unless obtaining the signature is impracticable)

Site number	Latitude	Longitude	Cowardin Class	Estimated amount of aquatic resource in review area	Class of aquatic resource
RPW A	33.794747	-82.144536	R	308LF/ 0.549AC	non-section 10 – non-wetland

D H E C
PROMOTE PROTECT PROSPER

Catherine E. Heigel, Director
Promoting and protecting the health of the public and the environment

January 28, 2016

Mr. Danny Johnson
SCDOT
PO Box 191
Columbia, SC 29202

Bridge Replacement General Permit Authorization
South Carolina Department of Transportation (SCDOT) SC GP-95-002 (Revised)
General Permit for Construction in Navigable Waters (General Permit)
Authorization Number: SC GP 95-002 16-001
Construction Project: Bridge replacement over Turkey Creek on S-68/S-277 (Key Road)
Construction must be completed by: January 1, 2020
Counties: Edgefield and McCormick

Dear Mr. Johnson:

The South Carolina Department of Health and Environmental Control (DHEC) has reviewed information regarding the proposed bridge replacement over Turkey Creek on S-68/S-227 (Key Road) in Edgefield and McCormick Counties. The project involves the replacement of the existing 2-lane bridge, which is approximately 304 feet in length and 20 feet in width, with a new 2-lane bridge that will be 320 feet in length and 37.25 feet in width. The existing bridge consists of a 150-foot steel thru-truss main span and ten 15-foot concrete approach spans, and the proposed bridge will consist of a 215-foot main span and one 105-foot span. Horizontal clearance will be maintained, and will completely span Turkey Creek. The vertical clearance will be reduced from the existing 39.75' to 38'.

It is the determination of this office that the proposed project complies with conditions of the above-referenced current General Permit issued by SCDHEC effective May 29, 2015. Therefore, you may consider this letter as the necessary authorization to undertake the proposed activity in strict accordance with the plans and specifications provided and subject to all conditions of the General Permit. Construction would have had to be completed by January 28, 2019. However, there is currently a Permit Extension Joint Resolution that was passed by the Legislature in July 2013. Therefore, the amended date of completion for this authorization is **January 1, 2020.**

Should you have questions, please contact me at (803) 898-4333 or at roweam@dhec.sc.gov. When corresponding about this authorization, please refer to the certificate number: SC GP 95-002 16-001.

Sincerely,

Alicia M. Rowe

Alicia M. Rowe
Project Manager
Water Quality Certification and Wetlands Section

cc: Upstate EQC Greenwood
Midlands EQC Aiken
Sean Connolly, SCDOT

D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

Permit for Construction in Navigable Waters

in Accordance with R. 19-450 et. seq., 1976 S.C. Code of Laws

PERMITTEE: **South Carolina Department of Transportation (SCDOT)**
PERMIT NUMBER: **SC GP 95-002 (Revised)**
DESCRIPTION OF WORK: To perform work in or affecting the navigable waters of South Carolina, pursuant to regulations and procedures established under Regulation 19-450 *Permits for Construction in Navigable Waters*, et seq., Code of Laws of South Carolina, 1976, as amended (R.19-450). The following construction activities will be covered by the General Permit reissuance: replacement, rehabilitation, refurbishment and/or retrofitting of material and design to bridge structures and box culverts in such a manner as to restore or maintain usefulness, increase safety or extend the life of the structure or its purpose; the placement of riprap, guardrails or pipes and box culverts and repaving, widening of approachway shoulders, minor roadway widening, paving and repaving (all of which must impact less than one half (0.5) acre of navigable waters per project), cleaning and repairing of outfall and roadway ditches that connect to State Navigable Waters. Proposed modifications involve authorization of utility line and scientific monitoring equipment relocation necessitated by bridge replacement construction.

DATE PERMIT ISSUED: May 29, 2015
CONSTRUCTION MUST BE COMPLETED BY: May 29, 2020

We have reviewed plans for this project and determined that there is a reasonable assurance that the proposed project will be conducted in a manner consistent with the permitting requirements of R. 19-450 et. seq., 1976 S.C. Code of Laws. The SC Department of Health and Environmental Control has also determined that this work is consistent with the Coastal Zone Management Program (48-39-10 et. seq.).

Please reference the attached copy of the general permit for applicable conditions.

The SC Department of Health and Environmental Control reserves the right to impose additional conditions on this Permit to respond to unforeseen, specific problems that might arise and to take any enforcement action necessary to ensure compliance with State standards.

All activities authorized by this permit remain subject to the requirements of all applicable laws, regulations and ordinances of federal, state, and local governments. The permittee may not conduct or maintain any activities authorized by this permit unless such activities also comply with all other applicable laws, regulations and ordinances of federal, state and local governments.

This permit shall not be deemed to be in derogation of any property rights or interests of persons or entities other than the permittee with respect to (a) property upon which the permitted activity is situated, or (b) property affected by the permitted activity. This permit confers upon the permittee no greater rights than the permittee possessed before issuance of the permit with respect to property rights or interests of third persons or entities.

Heather Preston

5/29/15

Heather Preston, Director
Division of Water Quality

Date

General Permit No: SC GP – 95- 002 (Revised)
Name of Applicant: South Carolina Department of Transportation (SCDOT)
Effective Date: May 29, 2015
Expiration Date: May 29, 2015

South Carolina Department of Health and Environmental Control General Permit

A General Permit to perform work in or affecting the navigable waters of South Carolina, pursuant to regulations and procedures established under R. 19-450, et seq., Code of Laws of South Carolina, 1976 as amended, is hereby issued by the South Carolina Department of Health and Environmental Control (SCHDEC) to:

South Carolina Department of Transportation involving Navigable Waters of South Carolina and

to authorize the following construction activities: Replacement, rehabilitation, refurbishment and/or retrofitting of material and design to bridge structures and box culverts in such a manner as to restore or maintain its usefulness, increase safety or extend the life of the structure or its purpose. Bridge replacement is defined as any project that involves the construction of a new bridge on the same location as an existing bridge or the total removal of the superstructure or more of an existing bridge. Bridge rehabilitation, refurbishment or retrofitting is anything less in scope than replacement. Bridge replacement on new location is not authorized by this General Permit. Bridge replacement on new location is defined as any bridge that extends more than 150 feet perpendicular to an existing bridge structure, centerline to centerline.

Concomitant to bridge replacement or rehabilitation as above defined, additional activities authorized include the placement of riprap, guardrails, pipes and box culverts, and repaving. Also, included is widening of approachway shoulders, minor roadway widening, paving and repaving; all of which must impact less than 0.50 acre of navigable waters per project. Cleaning and repairing of outfall and roadway ditches that connect to State navigable waters are also included. This is defined as the restoration of ditches to original elevations by the removal of accumulated debris and sediment.

Additionally, utility lines attached to existing bridges to be replaced may be relocated provided the relocation is with the right-of-way of the affected highway. Utility line replacement may be aerial, subaqueous, or attachment to the new bridge structure. Scientific monitoring equipment may be temporarily moved to adjacent areas until such time as the new bridge has been completed at which time the equipment must be relocated to the new bridge structure.

I. General Conditions

A. Activities authorized by this General Permit shall be as above described and conforming to the standards and conditions contained herein. Other construction of any kind with the navigable waters of South Carolina is not authorized by this document.

B. All activities identified and authorized herein shall be consistent with the terms and conditions of this permit. Any variance or activity not specifically identified and authorized herein shall constitute a violation of the terms and conditions of this permit; which may result in the modification, suspension, or revocation of this permit, and in the institution of such legal proceedings as the SCDHEC may consider appropriate.

C. The SCDOT must make every reasonable effort to execute the work authorized herein in a manner so as to minimize any adverse impact of the work on fish, wildlife, and the natural environmental values or historic or prehistoric values.

D. The SCDOT must execute the work authorized herein in a manner so as to minimize any degradation of water quality.

E. The SCDOT shall permit State law enforcement personnel, representatives of the SCDHEC, or other authorized State permit inspectors to make periodic inspections at any time deemed necessary in order to assure that the activity being performed under authority of this permit is in accordance with the terms and conditions prescribed herein.

F. The SCDOT shall maintain structures authorized herein in good condition.

G. This General Permit does not convey any property rights, either in real estate or material, or any exclusive privileges; and it does not authorize any injury to property or invasion of rights or any infringement of Federal, State, or local laws or regulations nor does it obviate the requirements to comply with any applicable standards required by ordinance for the construction of structures authorized herein.

H. This General Permit may be either modified, suspended, or revoked in whole or in part if the SCDHEC determines that such action would serve the public interest, and such modification, suspension or revocation shall not be an act entitling the permittee to compensation for any claimed loss as a consequence of such regulatory action, under any circumstances, this permit being issued solely as an accommodation to the permittee, and being revocable as conditions may warrant.

I. No attempt shall be made by the SCDOT to prevent reasonable use by the public of all navigable waters adjacent to the activity authorized by this permit.

J. If and when the SCDOT desires to abandon an authorized structure; the SCDOT may be required to remove the structure.

K. There shall be no unreasonable interference with navigation by the existence or use of structures authorized herein.

L. The SCDOT, upon receipt of a notice from the SCDHEC of failure to comply with the terms, conditions, or standards of this General Permit shall, within sixty (60) days (unless circumstances require more expeditious action to protect public health, safety, or environment) and in such manner as the agency may direct, effect compliance with terms, conditions, and standards or remove the structure from the navigable waters of South Carolina.

M. This General Permit relates to jurisdictional navigable waters of South Carolina excluding the critical areas of the coastal zone.

N. This General Permit is not applicable to projects requiring fill material placed in tidal waters.

O. This General Permit does not apply to bridge replacement projects that require an individual permit from the United States Coast Guard.

P. The Permittee must notify the South Carolina Department of Archives and History (Historic Preservation Division, Columbia, South Carolina) if any archaeological materials are encountered during the course of the work. Archaeological materials consists of any items, fifty years or older, which were made or used by man. These items include, but are not limited to stone projectile points, (arrowheads), ceramic shards, bricks, worked wood, bone and stone, metal and glass objects, and human skeleton remains. These materials may be present on the ground surface and/or under the surface of the ground.

Q. If underwater archaeological or paleontological remains are found during the course of work, the applicant must notify the South Carolina Institute of Archaeology and Anthropology (in accordance with the South Carolina Underwater Antiquities Act of 1991 (Article 5, Chapter 7, Title 54, Code of Laws of South Carolina, 1976). Archaeological remains consist of any material made or altered by man, which remain from past historic or prehistoric times (i.e., implements or tools, human burials, historic docks, structures, or non-recent vessel remains. Paleontological remains consist of prehistoric animal remains, original or fossilized, such as teeth, tusks bone, or entire skeletons.

II. Special Conditions: The following conditions set forth minimum criteria and do not preclude the establishment of more stringent criteria by appropriate authority or agreement.

A. Once the project is initiated, it must be carried to completion in an expeditious manner in order to minimize the period of disturbance to the environment.

B. Riprap must consist of clean stone or masonry material free of all potential sources of pollution.

C. Riprap must be place against the existing erosional scarp and landward of any wetland vegetation to prevent the loss of wetlands.

D. Pipes and box culverts must be placed at the same elevation as the flood plain or streambed to prevent erosion, to provide adequate passage of the indigenous aquatic community and to provide unimpeded flow of floodwaters.

E. Prior to the work beginning, a silt fence, silt barrier, or other suitable sediment control device must be placed between the construction area and the affected wetland or waterway. This device must be kept in a functioning capacity until the area is stabilized.

F. Construction activities must avoid encroachment into any wetland areas to the greatest extend practicable. Any unavoidable impacts to wetlands must be appropriately restored or mitigated consistent with agency guidelines.

G. Construction activities in navigable waters, including the removal of an existing bridge, must be minimal during the months of March, April, May, and June because of potential impacts to spawning fish.

H. SCDOT is advised that development activities in a 100-year floodplain, as designated in the Federal Emergency Management Agency (FEMA) Flood Insurance Study Data, are subject to floodplain management regulations of the National Flood Insurance Program [(NFIP) (44CFR)]. The NFIP further prohibits any development within a designated floodway, including placement of fill that results in any increase in based flood elevations. SCDOT must also comply with the FEMA – U.S. Federal Highway Administration Agreement on Floodplains Management.

I. All necessary measures must be taken to prevent oil, tar, trash, debris and other pollutants from entering the adjacent waters or wetlands.

J. Upon completion of construction activities, all disturbed areas, which are not paved must be restored to their original contours and must be permanently stabilized with a vegetative cover. This may include sprigging, trees, shrubs vines or ground cover.

K. Access to the project sites must be attained from highland, from the portion of the bridge already completed ("end on end construction") or from temporary work trestles, floating barges or mats instead of barge canals or causeways.

L. Scupper drains must not be placed directly over the waterbody, if practicable. Additionally, drains must be placed at an appropriate distance apart as design criteria allow.

M. Stormwater control measures, both during construction and post-construction, are required for bridges constructed over 303(d), TMDL, ORW, and other sensitive waters in accordance with the applicable SCDOT MS4 Permit.

N. All bridges and aerial utility line relocation associated with bridge replacement must meet SCDHEC navigation clearance requirements.

O. At the same time the SCDOT submits its permit application to the SCDHEC, SCDOT shall also submit a coy of the application to the S.C. Department of Natural Resources (SCDNR). SCDNR shall have ten (10) days from receipt of the application to notify SCDHEC of any relevant special or unique natural resource features or values (such as the presence of endangered species) and any measures needed to avoid impacts to such special features or values or to recommend that the project be elevated to individual permit status.

P. Any deviation from the specifications or other terms or conditions of the General Permit would constitute a violation of regulations and could result in removal of the structures or work and restoration of the waterway to its former condition and/or imposition of penalties by law.

III. Required Authorization

For authorization of the activities described in this General Permit, SCDOT must first complete and submit to SCDHEC a permit application for the work proposed.

IV. Penalties for Violation

Any deviation from the specifications of the terms or conditions of the General Permit would constitute a regulatory violation and could result in removal of the structures or work and restoration of the waterway to its former condition and/or imposition of penalties as provided by law.

V. Revocation of General Permit

This General Permit may be withdrawn or removed by issuance of a public notice at any time the SCDHEC determines that the singular or cumulative effects of the activities authorized herein have an adverse effect on the public interest. Following such revocation any future activities in areas covered by this General Permit will be processed as individual permits.

VI. Duration of the General Permit

This General Permit shall become effective on the date signed by the SCDHEC. This permit will cover activities started within five (5) years and completed within six (6) years after the date of issuance unless this permit is revoked in the interim. A revocation of the General Permit will not affect the work authorized by the effective General Permit.

By Authority of the South Carolina Department of Health and Environmental Control

Heather Preston — 5/29/15

Signature — Date

Director, Water Quality Division

Title

United States Department of the Interior

FISH AND WILDLIFE SERVICE
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407

April 20, 2016

Ms. Nicole Riddle
South Carolina Department of Transportation
P.O. Box 191
Columbia, SC 29202-0191

Re: S-68/S-227 (Key Road) Bridge Replacement over Turkey Creek
Edgefield and McCormick Counties, South Carolina
FWS Log No. 2016-I-0367

Dear Ms. Riddle:

The U.S. Fish and Wildlife Service (Service) has reviewed the information in your March 31, 2016, letter as well as the attached Biological Assessment (BA), regarding the proposed Federal Highway Administration (FHWA)/South Carolina Department of Transportation (SCDOT) replacement of the Key Road bridge over Turkey Creek within the Long Cane Ranger District of Sumter National Forest. The current bridge was built in 1925 and is considered structurally deficient and functionally obsolete.

The federally endangered Carolina heelsplitter (*Lasmigona decorata*) and its designated critical habitat are known to occur within the project area. A freshwater mussel survey was conducted by Three Oaks Engineering, Inc., in December of 2015; the associated report documented one individual Carolina heelsplitter was found approximately 70 feet upstream of the bridge. Therefore, bridge replacement activities have the potential to affect both critical habitat and individual heelsplitter located within and downstream of the project area. However, based on information provided in the BA, no bridge supports will be located within the stream channel, and there will be no temporary disturbance to the stream bottom from in-stream construction causeways, work pads, or construction within the stream. Additionally, SCDOT has committed to take extra precautions during construction and demolition (page 8 of the BA) in order to prevent the degradation of downstream habitat from sedimentation.

Based upon the information provided, including the additional environmental commitments agreed to by FHWA and SCDOT to protect the Carolina heelsplitter and its critical habitat in Turkey Creek, the Service concurs with the determination that the proposed project may affect, but is not likely to adversely affect, the Carolina heelsplitter or its designated critical habitat. Please note that obligations under the Endangered Species Act must be reconsidered if: (1) new information reveals impacts of this identified action may affect any listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a

manner, which was not considered in this assessment; or (3) a new species is listed or critical habitat is designated that may be affected by the identified action.

For informational purposes only, the Service has included a list of species that have been petitioned for listing under the Endangered Species Act as well as Candidate Species. These species are collectively referred to as "At-Risk Species" (ARS). We have included a list of the ARS that may occur in Edgefield and McCormick Counties, South Carolina. Although there are no Federal protections afforded to ARS, please consider including them in your survey efforts. Incorporating proactive measures to avoid or minimize harm to ARS may improve their status and assist with precluding the need to list these species. Additional information on ARS can be found at:

http://www.fws.gov/southeast/candidateconservation

If you need further assistance, please contact Ms. Morgan Wolf at (843) 727-4707 ext. 219, and reference FWS Log No. 2016-I-0367.

Sincerely,

Thomas D. McCoy

Thomas D. McCoy
Field Supervisor

TDM/MKW

South Carolina List of At-Risk, Candidate, Endangered, and Threatened Species - McCormick County

CATEGORY	COMMON NAME/STATUS	SCIENTIFIC NAME	SURVEY WINDOW/ TIME PERIOD	COMMENTS
Amphibian	None Found			
Bird	American wood stork (T)	*Mycteria americana*	February 15-September 1	Nesting season
	Bald eagle (BGEPA)	*Haliaeetus leucocephalus*	October 1-May 15	Nesting season
	Red-cockaded woodpecker (E)	*Picoides borealis*	April 1-July 31	Nesting season
Crustacean	None Found			
Fish	American eel (ARS)	*Anguilla rostrata*	March 1-May 30; October 1-December 15	Temperature dependent: normally (17-20°C); can be found between 13-25°C
	Blueback herring (ARS)	*Alosa aestivalis*	Mid-January-mid May	Peak: March-April
	Robust redhorse (ARS)	*Moxostoma robustum*	Late April-early May	Temperature dependent: 16-24°C
Insect	Septima's clubtail (ARS)	*Gomphus septima*	Year round	Active: May-August
Mammal	Tri-colored bat (ARS*)	*Perimyotis subflavus*	Year round	Found in mines and caves in the winter
Mollusk	Brook floater (ARS)	Alasmidonta varicosa	March 1-September 30	
	Carolina heelsplitter (E, CH)	*Lasmigona decorata*	March 1-September 30	Optimal survey window
Plant	Georgia aster (ARS*)	*Symphyotrichum georgianum*	Early October-mid November	
	Miccosukee gooseberry (T)	*Ribes echinellum*	June-September	Year round
Reptile	None Found			

*	Contact National Marine Fisheries Service (NMFS) for more information on this species
**	The U.S. Fish and Wildlife Service (FWS) and NMFS share jurisdiction of this species
ARS	Species that the FWS has been petitioned to list and for which a positive 90-day finding has been issued (listing may be warranted); information is provided only for conservation actions as no Federal protections currently exist.
ARS*	Species that are either former Candidate Species or are emerging conservation priority species
BGEPA	Federally protected under the Bald and Golden Eagle Protection Act
C	FWS or NMFS has on file sufficient information on biological vulnerability and threat(s) to support proposals to list these species
CH	Critical Habitat
E	Federally Endangered
P or P - CH	Proposed for listing or critical habitat in the Federal Register
S/A	Federally protected due to similarity of appearance to a listed species
T	Federally Threatened

These lists should be used only as a guideline, not as the final authority. The lists include known occurrences and areas where the species has a high possibility of occurring. Records are updated as deemed necessary and may differ from earlier lists.

For a list of State endangered, threatened, and species of concern, please visit https://www.dnr.sc.gov/species/index.html.

2/10/2015

South Carolina List of At-Risk, Candidate, Endangered, and Threatened Species - Edgefield County

CATEGORY	COMMON NAME/STATUS	SCIENTIFIC NAME	SURVEY WINDOW/ TIME PERIOD	COMMENTS
Amphibian	None Found			
Bird	Bald eagle (BGEPA)	*Haliaeetus leucocephalus*	October 1-May 15	Nesting season
	Red-cockaded woodpecker (E)	*Picoides borealis*	April 1-July 31	Nesting season
Crustacean	None Found			
Fish	American eel (ARS)	*Anguilla rostrata*	March 1-May 30; October 1-December 15	Temperature dependent: normally (17-20°C); can be found between 13-25°C
	Blueback herring (ARS)	*Alosa aestivalis*	Mid-January-mid May	Peak: March-April
	Robust redhorse (ARS)	*Moxostoma robustum*	Late April-early May	Temperature dependent: 16-24°C
Insect	None Found			
Mammal	Tri-colored bat (ARS*)	*Perimyotis subflavus*	Year round	Found in mines and caves in the winter
Mollusk	Brook floater (ARS)	*Alasmidonta varicosa*	March 1-September 30	
	Carolina heelsplitter (E, CH)	*Lasmigona decorata*	March 1-September 30	Optimal survey window
Plant	Carolina-birds-in-a-nest (ARS)	*Macbridea caroliniana*	July-November	
	Georgia aster (ARS*)	*Symphyotrichum georgianum*	Early October-mid November	
	Miccosukee gooseberry (T)	*Ribes echinellum*	June-September	Year round
	Ocmulgee skullcap (ARS)	*Scutellaria ocmulgee*	Late June-early October	
	Relict trillium (E)	*Trillium reliquum*	Mid March-April	
Reptile	None Found			

*	Contact National Marine Fisheries Service (NMFS) for more information on this species
**	The U.S. Fish and Wildlife Service (FWS) and NMFS share jurisdiction of this species
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2/10/2015

APPENDIX F

QUALIFICATIONS OF MEAD & HUNT PERSONNEL

The following Mead & Hunt employees were responsible for the preparation of this document:

Matthew DeWitt, PWS; Environmental Scientist
B.S. Environmental and Natural Resources
Matt DeWitt is a professional wetland scientist (PWS) with 12 years of experience throughout the southeastern United States working in environmental studies, with an emphasis on matters related to the Clean Water Act (CWA). He holds a bachelor's degree in environmental and natural resources, with minors in natural resource management and forestry. He specializes in CWA permitting and regulatory agency coordination. Matt has also participated in the preparation of numerous environmental documents pursuant to the National Environmental Policy Act (NEPA), including natural resources technical memorandums, protected species biological assessments, Environmental Assessments (EAs), and Environmental Impact Statements (EISs). Matt also performs natural resources studies, including wetland delineations, threatened and endangered species surveys, water quality sampling, environmental compliance studies, and mitigation site identification, design and monitoring.

Perry Rossa, PWS, PH; Environmental Scientist
B.S. Environmental and Natural Resources; M.S. Water Resources Management
Perry Rossa is a professional hydrologist (PH) and professional wetland scientist (PWS) with more than 20 years of experience in the execution of National Environmental Policy Act (NEPA) compliance documents and state and federal wetland permitting throughout the Upper Midwest. This includes wetland mitigation and the evaluation, design, restoration and management of many of the wetland and upland native plant communities. As project leader for wetland permitting and mitigation design teams, he has been responsible for the coordination of staff in biological and engineering studies, the establishment of restoration objectives and performance standards, the production of plans and specifications to achieve those standards and construction supervision. Perry provided technical quality control and quality assurance (QA/QC) measures for this document.