

**DETAILED STUDY ALTERNATIVES CARRIED
FORWARD
&
BRIDGING DECISIONS AND ALIGNMENT REVIEW**

Proposed Improvements to Wilson Road (SR 1540) from US 276 to
SR 1504 (Old US 64/Old Hendersonville Highway)

Transylvania County

STIP Project R-5763

North Carolina Department of Transportation
Division 14



MERGER CONCURRENCE POINT NUMBERS 2 AND 2A

February 13, 2019

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1. INTRODUCTION

The North Carolina Department of Transportation (NCDOT) proposes to improve SR 1540 (Wilson Road) from US 276 to SR 1504 (Old US 64/Old Hendersonville Highway), approximately 3.7 miles, as shown on **Figure 1**. This state-funded project is included in the State Transportation Improvement Program (STIP) as project number R-5763. The project proposes to upgrade Wilson Road moving it out of the 50-year floodplain associated with the French Broad River and improve the safety of Wilson Road. The anticipated environmental document for this project is a combined State Environmental Analysis/Finding of No Significant Impacts (SEA/FONSI).

Because of the potential impacts to human and natural resources, STIP Project R-5763 will follow the Section 404/NEPA Merger Process. An Individual Permit is expected, although final discretion lies with the US Army Corps of Engineers (USACE).

1.1 Concurrence Point 1: Purpose and Need and Study Area Defined

On January 24, 2019, the Merger Team expressed their agreement with the project's purpose and need and study area. Formal concurrence is anticipated once US Fish and Wildlife Service (USFWS) and US Environmental Protection Agency (USEPA) have had a chance to review the information presented, as they were absent from the January meeting.

Project Need:

Currently, Wilson Road is flooded during 10-year and 50-year flood events making the road impassable to residents, those traveling to or from businesses, and to the City of Brevard's wastewater treatment plant (WWTP). In addition, Wilson Road exceeds the statewide and critical crash rates for similar roadways in non-fatal injury and wet crashes.

Project Purpose:

The purpose of this project is to bring the roadway out of the 2 percent annual chance (50-year) flood zone of the French Broad River and address facility deficiencies throughout the corridor, bringing the road up to minimum design standards.

Project Study Area

The project study area boundaries are shown on **Figure 1**. The study area for this project encompasses approximately 200 feet on either side of the existing Wilson Road centerline. It extends approximately 250 additional feet to the east of the centerline as it approaches Old US 64/Old Hendersonville Highway to include the Ecusta Road intersection. Where the French Broad River is closer to the road than the 200-foot boundary, the study area stops at the French Broad River. The resultant study area encompasses approximately 173 acres, including sufficient area to pursue alignment shifts and apply avoidance and minimization measures during design development.

2. CONCURRENCE POINT 2: DETAILED STUDY ALTERNATIVES CARRIED FORWARD

The identification, consideration, and analysis of alternatives are key to the SEPA process, the 404 permitting process, and NCDOT's goal of objective decision-making. Consideration of alternatives leads to a solution that satisfies the transportation need and avoids and minimizes adverse impacts to environmental and community resources. This identification and consideration includes a No-Build

Alternative and an analysis of a reasonable range of Build Alternatives, including improving existing roadways and new location alternatives.

2.1 Alternatives Considered but Eliminated

A Feasibility Study, finalized in January 2017, analyzed three possible concepts for the subject project. The first concept would make minor upgrades and improvements using NCDOT's Resurfacing, Restoration, and Rehabilitation (3R) guidelines. Under this concept the roadway would remain in the 50-year floodplain and not meet the purpose and need of the project.

The third concept proposed to upgrade Wilson Road to Principal Arterial (US Route) design standards. This concept would put Wilson Road on new location over the mountain. This concept had high impacts to the human and natural environment, most notably the relocation of 53 residences. In addition, this concept met with extremely high opposition from the public and local officials during the public meeting held in September 2016. Furthermore, the cost of this concept was estimated at \$102.6M, more than three times the other concepts.

The second concept was to improve Wilson Road to current design standards and move it out of the 50-year floodplain. This concept was moved forward as Build Alternative 1.

2.2 No-Build Alternative

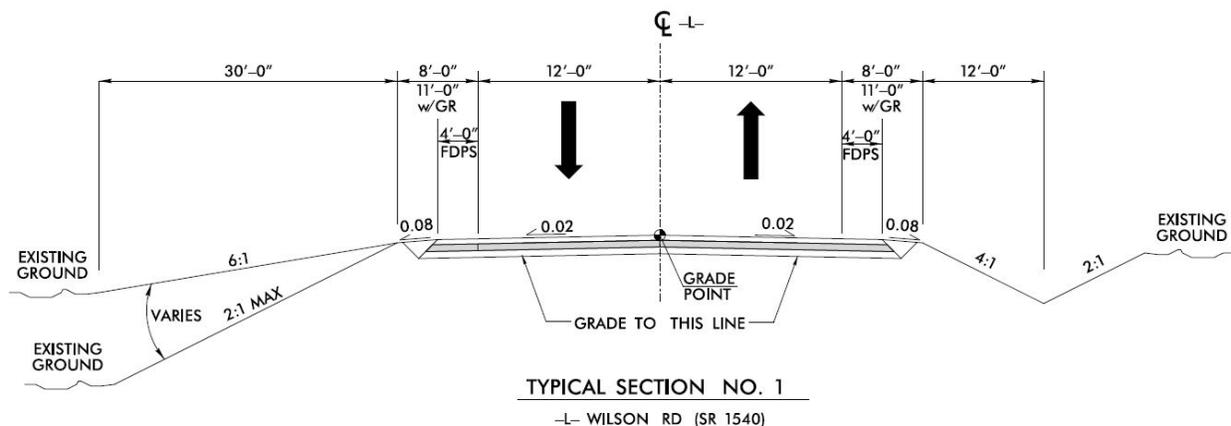
The No-Build Alternative is the baseline comparative alternative for the design year (2040). The No-Build Alternative would not provide any improvements to the roadway except what is generally needed to maintain the road.

2.3 Potential Build Alternatives

The two Build Alternatives listed below would bring the roadway up to minimum design standards and bring the road out of the 2 percent annual chance (50-year) floodplain of the French Broad River.

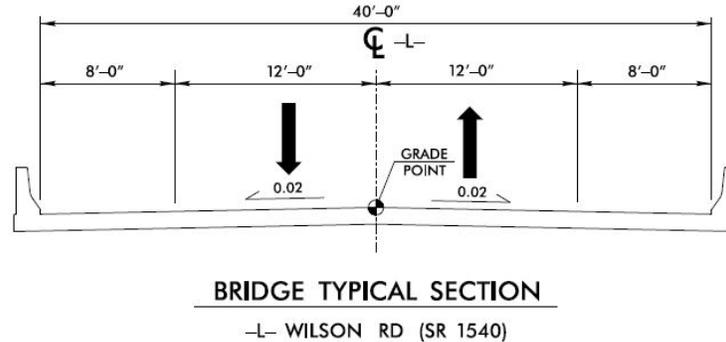
The proposed typical section for both alternatives includes two 12-foot travel lanes and 8-foot shoulders on each side (4 feet of each shoulder would be paved, with 4 feet of grass shoulder beyond the pavement) as depicted in **Exhibit 1**.

Exhibit 1. Proposed Roadway Typical Section



Build Alternative 1 would replace the bridge over the French Broad River on new location and Build Alternative 2 would replace the bridge in place. The proposed typical section of the bridge would maintain the two 12-foot lanes with 8-foot shoulders as shown in **Exhibit 2**.

Exhibit 2. Proposed Bridge Typical Section



The two Build Alternatives have the same alignment for the majority of the road length. The proposed alignment is shown on **Figure 1**.

Build Alternative 1 would realign Wilson Road to intersect with Ecusta Road, creating a four-way intersection. Beginning approximately 0.4 mile south of the northern terminus, this realignment would shift the road and the bridge, approximately 260 feet east of the existing road and bridge. The existing bridge and remaining pavement would be removed and the remnant portion of Wilson Road north of the river would be terminated at the French Broad River, allowing for access to businesses, homes, and the river access area.

Build Alternative 2 would maintain Wilson Road on its existing alignment, beginning approximately 0.4 mile south of the northern terminus. The current bridge over the French Broad River would be replaced in place with a longer bridge. Due to the length of the travel time (>10 minutes), an offsite detour is unacceptable under *NCDOT Guidelines for Evaluation of Offsite Detours for Bridge Replacement Projects* (April 2004) and a temporary bridge would need to be provided for an on-site detour during construction.

2.4 Analysis of Build Alternatives

The **No-Build Alternative** does not meet the purpose and need because it would neither raise the road out of the 50-year floodplain, nor would it address the facility deficiencies. Although the No-Build Alternative does not meet the project's purpose and need, it will be retained for analysis to provide a basis for comparing adverse impacts and benefits of the detailed study alternative.

Build Alternative 1

Under Build Alternative 1, the roadway would be raised out of the 50-year floodplain and horizontal and vertical deficiencies in the roadway would be corrected to meet current minimum design standards. The bridge over Williamson Creek would be replaced on new location.

Wilson Road would be realigned, beginning approximately 0.4 mile south of the northern terminus, near the Brevard Wastewater Treatment Plant, on new location to connect with Ecusta Road. A replacement bridge would be built on new alignment over the French Broad River. It is expected that to meet the purpose of moving Wilson Road out of the 50-year floodplain the bridge will exceed 1,000 feet in length. The bridge bents will not be placed in the French Broad River; however, a causeway will likely be used for a crane to set the girders of the bridge. The potential impacts of the causeway and bridge will be evaluated in the Biological Assessment. It is expected that the bridge will take approximately two years to construct. Once the new bridge and roadway are constructed, traffic from Wilson Road will be

shifted and the old road and bridge will be removed. Wilson Road will be terminated before the river but allow access to homes, businesses, and the NC Wildlife Resource Commission boat access.

Table 1 provides the total impacts to jurisdictional resources, based on conceptual design cut/fill limits (slope stake limits plus 40 feet). These impacts to the project are from the southern terminus at US 276 to approximately 0.4 mile south of the northern terminus, where the Build Alternatives diverge.

Table 1. Potential Impacts to Jurisdictional Resources for Build Alternative 1

Resource	Potential Impact*
Jurisdictional Streams	3,322 ft
Jurisdictional Wetlands	0.5 ac
Jurisdictional Surface Waters (Ponds)	0.15 ac
Jurisdictional Surface Waters (Tributaries)	973 ft

*Impacts determined based on conceptual design slope stakes plus an additional 40 feet.

Build Alternative 1 would move Wilson Road out of the 50-year floodplain of the French Broad River. However, it would remain in the 100-year and 500-year floodplains.

Table 2. Potential Floodplain Impacts for Build Alternative 1

FEMA Floodplain	Impact (ac)
100-year Floodplain	39.7
500-year Floodplain	7.4

*Impacts determined based on conceptual design slope stakes plus an additional 40 feet.

Field surveys of federally-listed threatened and endangered species determined that the Appalachian elktoe is present in the French Broad River. NCDOT will prepare a Biological Assessment of the species in consultation with the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act.

The NC Historic Preservation Office (NC HPO) has accepted NCDOT’s recommendation that the Albert and Mary Jenkins House, Glen Cannon Country Club, and the Pisgah Forest US Post Office are eligible for listing on the National Register of Historic Places (NRHP). Build Alternative 1 would impact the Jenkins House property.

NCDOT’s Archaeology Group reviewed the project and determined that there are no NRHP-listed or eligible archaeological sites present or affected by this project. However, the Archaeology Group did determine that the Wetzel Family Cemetery is located just north of the Glen Cannon golf course, adjacent to Wilson Road. The conceptual design does not impact this cemetery.

Realigning Wilson Road with Ecusta Road to create a four-way intersection would remove the short distance between the roads and improve safety by reducing left-turning conflicts. **Table 5** provides the total number of crashes at the Wilson Road and Old Hendersonville Highway/Old US 64 intersection and at the Old Hendersonville Highway/Old US 64 and Ecusta Road intersection. Crash types at the Wilson Road and Old Hendersonville Highway/Old US 64 intersection were primarily angle crashes (8) and rear-end crashes (4). There were no fatal or severe injury crashes at this intersection. No crashes involving pedestrians and one (1) crash involving a bicyclist were also recorded. At the Old Hendersonville Highway/Old US 64 and Ecusta Road intersection the crash types were primarily angle crashes (4) and rear-end crashes (4). There were no fatal or severe injury crashes at this intersection. No crashes involving pedestrians or bicyclists were observed.

Table 3. Intersection Crash Summary (5/1/2013 to 4/30/2018)

	Number of Crashes	Crashes per 100 Million Vehicles Entered
SR 1504 (Old Hendersonville Hwy) at SR 1540 (Wilson Rd)	14	64.97
SR 1504 (Old Hendersonville Hwy) at SR 1512 (Ecusta Rd)	10	42.13

Improving the safety of these two intersections is also desired by Transylvania County. However, the realignment of Wilson Road would impact the mobile home community located on Old Hendersonville Highway/Old US 64 across from Ecusta Road and one residence located at 3564 Wilson Road.

Build Alternative 2

Under Build Alternative 2, the roadway would be raised out of the 50-year floodplain and horizontal and vertical deficiencies in the roadway would be corrected to meet current minimum design standards. The bridge over Williamson Creek would be replaced on new location.

Under this alternative, Wilson Road would remain on existing alignment, beginning approximately 0.4 mile south of the northern terminus, near the Brevard Waste Water Treatment Plant. The road would be raised to move it out of the 50-year floodplain. The existing bridge over the French Broad River would be need to be replaced with a bridge exceeding 1,000 feet in length. A temporary bridge would need to be constructed to detour traffic during the 2-year construction period. Replacing the bridge and improving the road on existing alignment and constructing a temporary bridge would have potential impacts to jurisdictional resources and the 100-year and 500-year floodplain as shown in **Tables 4 and 5**.

The slope stake limits plus 40 feet from Build Alternative 1 were averaged to give an approximate comparison of what a new bridge on current alignment may look like. The average width is 155 feet. To account for potential jurisdictional impacts from the temporary bridge, the impacts from Build Alternative 1 were used.

Table 4. Potential Impacts to Jurisdictional Resources for Build Alternative 2

Resource	Potential Impact
Jurisdictional Streams	3,500 ft*
Jurisdictional Wetlands	0.5 ac*
Jurisdictional Surface Waters (Ponds)	0.15 ac
Jurisdictional Surface Waters (Tributaries)	1,763 ft

*Includes impacts from on-site detour bridge

Build Alternative 2 would move Wilson Road out of the 50-year floodplain of the French Broad River. However, it would remain in the 100-year and 500-year floodplains.

Table 5. Potential Floodplain Impacts for Both Build Alternative 2

FEMA Floodplain	Impact* (ac)
100-year Floodplain	32.1
500-year Floodplain	8.0

*Does not include impacts from on-site detour bridge

The off-site detour route required for someone beginning at 3226 Wilson Road (Brevard Wastewater Treatment Plant) to the Pisgah Forest US Post Office would be approximately 12 minutes. Bridge construction is expected to take approximately 2 years. This delay is considered unacceptable under *NCDOT Guidelines for Evaluation of Offsite Detours for Bridge Replacement Projects* (April 2004). This additional time would also affect EMS response times and response time to the Brevard Wastewater Treatment Plant should there be an emergency during construction. Consequently, a temporary bridge would need to be constructed adjacent to the proposed replacement bridge. Although not quantified, the impacts to natural resources, including to the Appalachian elktoe, resulting from building both the replacement bridge on current location and the temporary detour bridge could be expected to double.

Using the conceptual typical section width plus 40 feet, replacing the bridge in place and bringing the road up to current minimum design criteria would also potentially impact five mobile homes, two single family homes, and two businesses along Wilson Road and two businesses on the corners of Wilson Road and Old Hendersonville Highway/Old US 64.

Build Alternative 2 would impact the Jenkins House property and may also have impacts to the Pisgah Forest US Post Office. The conceptual design does not impact the Wetzel Family cemetery.

2.5 Recommended Alternatives for Detailed Study

NCDOT recommends Build Alternative 1 for further study and dropping Build Alternative 2 due to the increased impacts, cost, and constructability issues. The impacts of both Build Alternatives are the same for the majority of the project. The alignments for each alternative diverge approximately 0.4 mile south of the northern terminus of the project. **Table 6** summarizes the potential impacts of Build Alternative 1 and Build Alternative 2 for the 0.4 mile.

Table 6. Summary of Potential Impacts by Proposed Build Alternative

Resources	Build Alternative 1 (New Alignment)	Build Alternative 2 (Replace in Place)
	Potential Impacts	
Jurisdictional Streams	3,322 ft	3,500 ft ¹
Jurisdictional Wetlands	0.5 ac	0.5 ac ¹
Jurisdictional Surface Waters (Ponds)	0.15 ac	0.15 ac
Jurisdictional Surface Waters (Tributary)	973 ft	1,763 ft
100-year Floodplain	39.7	32.1 ²
500-year Floodplain	7.4	8.0 ²
Residential Relocations	8 (7 mobile homes)	9 (6 mobile/modular homes)
Business Relocations	0	4

¹ Includes impacts from temporary on-site detour bridge

² Does not include impacts from temporary on-site detour bridge

3. CONCURRENCE POINT 2A BRIDGING DECISIONS

There are two major structures on Wilson Road, the bridge over Williamson Creek and the bridge over the French Broad River. **Table 9** provides summary information on the streams and the major structures.

Both bridges are expected to be replaced on new location to meet the project's purpose and need. In the area of Williamson Creek, Wilson Road will be shifted to the west on new location, away from the Glen Cannon Country Club to improve roadway deficiencies. Consequently, the bridge over Williamson Creek will be replaced on new alignment. The existing bridge over Williamson Creek would be used as an on-site detour until the new bridge is constructed and opened to traffic. The bridge over Williamson Creek would be approximately 300 feet long. NCDOT is conducting 2D hydraulic modeling of the French Broad River and contributing streams and tributaries to assist in determining the length of the bridge.

As stated in CP2, Build Alternative 1 will also shift the alignment of the bridge over the French Broad River. To bring the road and bridge out of the 50-year floodplain and not constrain conveyance of the river, the bridge is expected to be over 1,000 feet long. Bridge length will be determined following the 2D modeling effort.

Table 9. Existing and Proposed Major Drainage Structures

SITE #	ROUTE	STREAM INFORMATION						EXISTING STRUCTURE	Build Alternative 1	
		STREAM NAME	NCDWR STREAM INDEX NUMBER	PERENNIAL/ INTERMITTENT	STREAM LENGTH (ft)	STREAM CLASS	DRAINAGE AREA (sq mi) [acres]	Number, Size, Structure Type	Recommended Structure (Additional Length)	Potential Stream Impact ³
1	SR 1540 (Wilson Road)	Williamson Creek	6-32	PERENNIAL	495 ft	C, Tr, HQW	5.5 sq mi (3520 ac)	3-Span (1@25'-4"; 1@24'-11"; 1@25'-4"); 76' length; steel plank floor on I-beams	Replace on new location (approx. 300')	179 ft
2	SR 1540 (Wilson Road)	French Broad River	6-(27)	PERENNIAL	7,884 ft	B	156 sq mi (99,840 ac)	3-Span (1@60'-6.3125"; 1@60'; 1@60'-6.3125"); 181' length; reinforced concrete floor/ precast deck panels/ prestressed	Replace on new location (approx. >1,000')	279 ft

4. PROJECT SCHEDULE

Table 9 provides the tentative milestone schedule for this project (subject to change). The funding schedule is consistent with the 2018-2027 STIP.

Milestone	Schedule*
Concurrence Point 2/2A	February 2019
Biological Assessment	February 2019
Concurrence Point 3/4A	April 2019
Biological Opinion	June 2019
State EA/FONSI	July 2019
Begin ROW Acquisition ¹	FY 2019
Begin Construction ¹	FY 2021
*tentative, subject to change;	
¹ This schedule is expected to change to FY 2023/FY 2027	

5. AVOIDANCE AND MINIMIZATION TRACKING

Avoidance and Minimization (A&M) measures to reduce impacts to the natural and human environment regularly occur throughout the planning and design stages of a project. The following are questions provided by NCDOT Environmental Analysis Unit (EAU) – Environmental Coordination and Permitting (ECAP) to consider and record A&M measures throughout the life of the project and at particular concurrence points in the Merger process.

These measures (where applicable) shall be discussed with the merger team at each merger point for concurrence on projects. In addition, discussion on these measures could generate additional avoidance and minimization to be included for the project. No signatures are required for these measures.

Features noted in the A&M measures are shown on **Figure 1**.

Project Feasibility, Internal and External Scoping, CP1	
404 & 401 A&M	
Did NCDOT choose a certain alignment for the project based on avoiding streams, buffers and wetlands?	The study area does not extend into the French Broad River as NCDOT has determined that the roadway alignment will be shifted away from the river where necessary to improve horizontal and vertical alignment.
Are there any red flags concerning protected streams, conservation easements, or mitigation property?	The French Broad River provides habitat for the Appalachian elktoe, a federally protected species (endangered), which has been found in the stretch of the river adjacent to Wilson Road. NCDOT is conducting a Biological Assessment (BA) to evaluate the potential effects of this project on the elktoe.

<p>Does the study area suit the purpose and need and has it been minimized, reducing impacts to streams and wetlands, and keeping with the purpose of the project?</p>	<p>The study area has been minimized to avoid impacts to the French Broad River where it is adjacent to the roadway. The study area is sized to accommodate an improvement of Wilson Road on existing alignment where possible and realignment where necessary to bring the horizontal and vertical alignment up to current design standards.</p>
<p>Is it feasible to expand existing transportation facilities, reducing impacts to all resources rather than new location?</p>	<p>The 2016 Feasibility Study evaluated a new location concept and found it to have substantial additional impacts to the human and natural environment when compared to the proposed upgrade of the existing alignment.</p>

Project Feasibility, Internal and External Scoping, CP1	
Non-404/401 A&M	
<p>Where/Why did NCDOT decide to focus on a certain alignment for the project?</p>	<p>The Feasibility Study analyzed three concepts: Concept 1 – Minor upgrades and improvements using 3R guidelines Concept 2 – Upgrade the road to Major Collector design standards Concept 3 – Upgrade the road to Principal Arterial design standards</p> <p>The Feasibility Study determined that: Concept 1 did not meet proposed purpose and need of project. Concept 2 meets purpose and need and has fewer impacts and is less costly than Option 3. Concept 3 required the road to be realigned on new location, resulting in higher residential relocations and a higher cost.</p> <p>Therefore, NCDOT recommended Concept 2 be carried forward, which includes adjustments to the horizontal and vertical alignment while retaining current alignment to the extent feasible.</p>
<p>Are there any red flags due to utilities, rail, or human environment resources?</p>	<p>Mobile home community at northern terminus of project.</p>
<p>Are there any Red flags due to known threatened and endangered (T&E) species locations?</p>	<p>Appalachian elktoe (E) found in the French Broad River</p>
<p>Are there parks, recreational areas, refuges, or historic properties that qualify for Section 4(f) or Section 106 consideration?</p>	<p>Three resources were recommended as eligible for listing on the National Register of Historic Places.</p>

Are FEMA Hazard Mitigation Grant Program (HMGP) properties, aka, FEMA Buy-out properties, avoided?	No known FEMA buy-out parcels are located within the study area.
Are there any red flags associated with encroachment into 100-year floodplain including potential longitudinal encroachment into the FEMA regulated floodplain?	Majority of the project is within the 100-year floodplain currently and will remain in the 100-year floodplain in the future.

CP2	
404 & 401 A&M	Non-404 A&M
During this Functional Design stage, were alternatives considered that avoided or minimized impacts to streams, buffers and wetlands?	Build Alternative 1 and Build Alternative 2 shifted the alignment of the majority of the road away from the French Broad River. Build Alternative 1 replaces the bridge over the French Broad River on new alignment, avoiding the need for an additional temporary bridge, which would have additional impacts.
Corridor re-alignment to avoid or minimize impacts	
Were water body classifications considered in determining alternatives to carry forward?	The French Broad River was avoided to minimize impacts to the Appalachian elktoe.
Are there any impaired waterbodies that would benefit from enhancement and inclusion in the ROW?	No.

CP2	
Non-404 A&M	
Were alternatives considered that upgraded facilities to avoid or minimize impacts to the human environment?	Build Alternative 1 aligns Wilson Road with Ecusta Road, which will improve safety at these two intersections.
Avoid or minimize natural and human fragmentation	The Build Alternatives improve Wilson Road in its existing location instead of rerouting the road on new alignment.
Is longitudinal encroachment into any regulated floodplain avoided?	Wilson Road is already in the FEMA 100-year floodplain and will remain that way.
Was consideration given to potential impacts to structures in the floodplain?	Hydraulic 2D modeling is underway to study the potential of the proposed design to impact structures in or near the floodplain.
Are there any identified areas of geoenvironmental concern?	1 UST is located at the northern end of the project at the One Stop gas station at the corner of Ecusta Road and Old US 64/Old Hendersonville Highway.

CP2A	
404 & 401 A&M	
Is bridging decided vs culvert? – Document the advantages for spanning structures – include spanning of streams, wetlands and buffers	The existing bridges will be replaced with bridges.
Estimate preliminary structure sizes and document when additional avoidance and minimization measures have been recommended – including bottomless culverts (where bedrock is found) and utilizing box culverts with sills instead of pipe culverts	The bridge over Williamson Creek will be approximately 300 feet. The bridge over the French Broad River will be greater than 1,000 feet.
Are we maintaining perpendicular crossing to achieve minimum impact?	The Williamson Creek bridge will be at an angle to account for the curve of the roadway.
Bridge spanning jurisdictional resources or buffers	Yes.
Are we removing an old causeway?	All causeways that are used will be removed.
Maintain existing drainage patterns – avoiding impacts to both natural and human environment	Hydraulic 2D modeling is underway.
Have we shown anywhere that we can lessen direct discharge vs non discharge of stormwater to streams? Has an analysis been done for this?	Hydraulic 2D modeling is underway.

CP2A	
Non-404 A&M	
Design alternatives to achieve minimum impact to the human environment	Build Alternative 1 impacts the fewest residences and businesses.
Develop adequate hydraulic structure to maintain integrity of the floodplain	Hydraulic 2D modeling is underway.
On-site or off-site detours	On-site detours will be used under Build Alternative 1.
Have Wildlife crossings been considered?	No.

Section 404/NEPA Merger Project Team Meeting Agreement
Concurrence Point No. 2
Detailed Study Alternatives Carried Forward

Project Name/Description: SR 1540 (Wilson Road) between US 276 and SR 1504 (Old US 64/Old Hendersonville Highway). **STIP Project: R-5763**

_____ **No Build Alternative** – Carried forward for the purpose of a baseline, does not meet purpose and need.

The two Build Alternatives listed below would bring the roadway up to minimum design standards and bring the road out of the 2 percent annual chance (50-year) floodplain of the French Broad River.

_____ **Build Alternative 1** – Realign Wilson Road to intersect with Ecusta Road, creating a four-way intersection. Beginning approximately 0.4 mile south of the northern terminus, this realignment would shift the road, and the bridge, approximately 260 feet east of the existing road and bridge. The existing bridge and remaining pavement would be removed and the remnant portion of Wilson Road north of the river would be terminated at the French Broad River, allowing for access to businesses, homes, and the river access area.

_____ **Build Alternative 2** – Wilson Road would remain on its existing alignment, beginning approximately 0.4 mile south of the northern terminus. The current bridge over the French Broad River would be replaced in place.

The Merger Team has concurred on this date of February 13, 2019, on the above Detailed Study Alternatives Carried Forward for STIP Project R-5763.

USACE	NCHPO
USEPA	Land of Sky RPO
USFWS	Eastern Band of Cherokee Indians
NCDWR	Cherokee Nation
NCWRC	United Keetowah Band
NCDOT	Land of Sky RPO

Section 404/NEPA Merger Project Team Meeting Agreement
Concurrence Point No. 2A
Bridging Decisions and Alignment Review

Project Name/Description: SR 1540 (Wilson Road) between US 276 and SR 1504 (Old US 64/Old Hendersonville Highway). **STIP Project: R-5763**

Replace the existing bridge over Williamson Creek with an approximately 300-foot long bridge. Length will be determined following the 2D Hydraulic modeling of the French Broad River and its floodplain.

Replace the existing bridge over the French Broad River with a bridge that is greater than 1,000 feet in length. Length will be determined following the 2D Hydraulic modeling of the French Broad River and its floodplain.

The Merger Team has concurred on this date of February 13, 2019, on the above Bridging Decisions and Alignment Review for STIP Project R-5763.

USACE	NCHPO
USEPA	Land of Sky RPO
USFWS	Eastern Band of Cherokee Indians
NCDWR	Cherokee Nation
NCWRC	United Keetowah Band
NCDOT	Land of Sky RPO

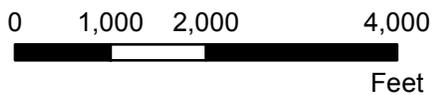
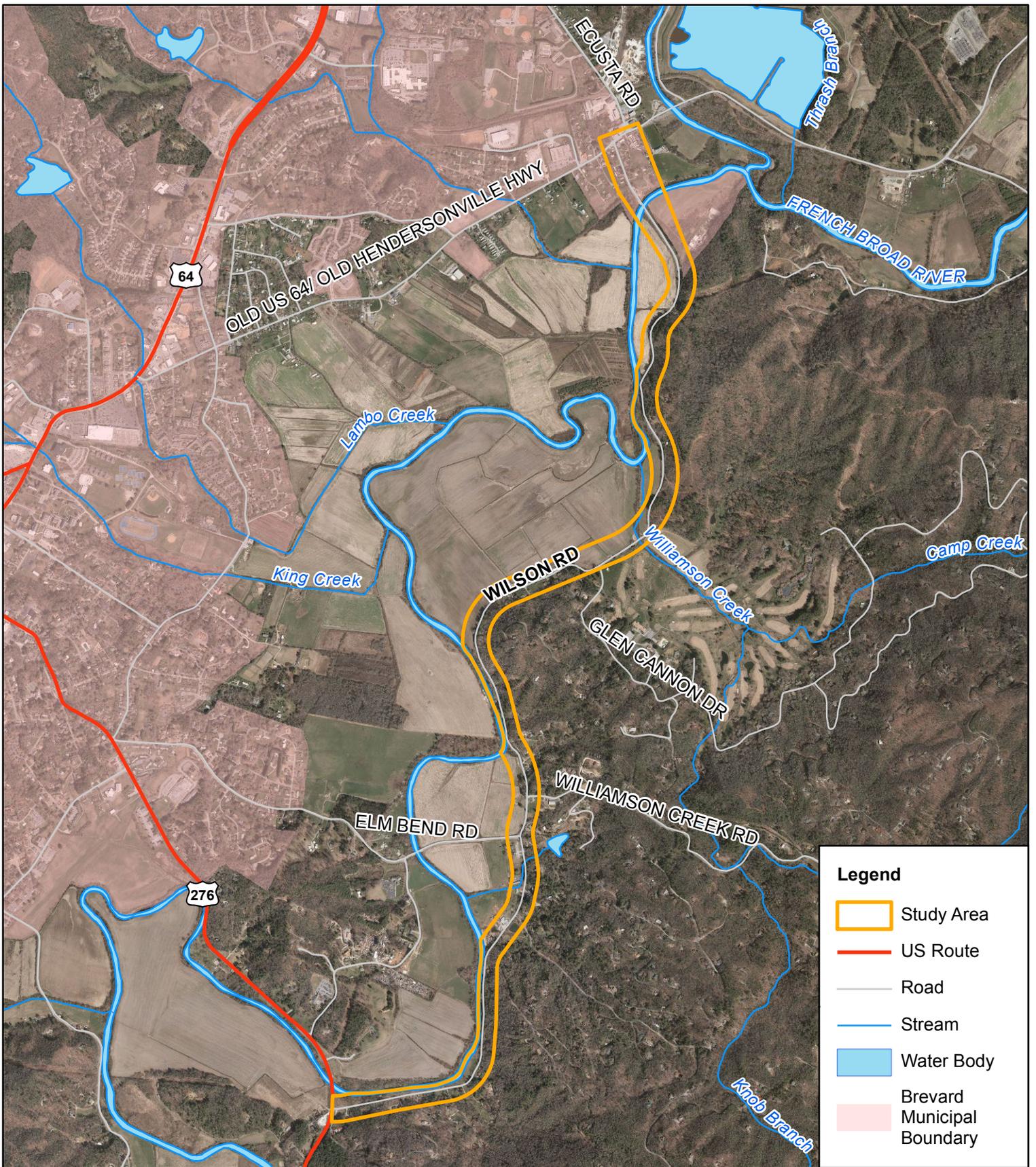
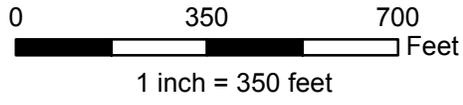
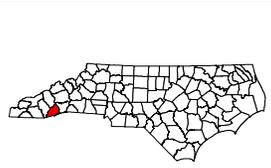
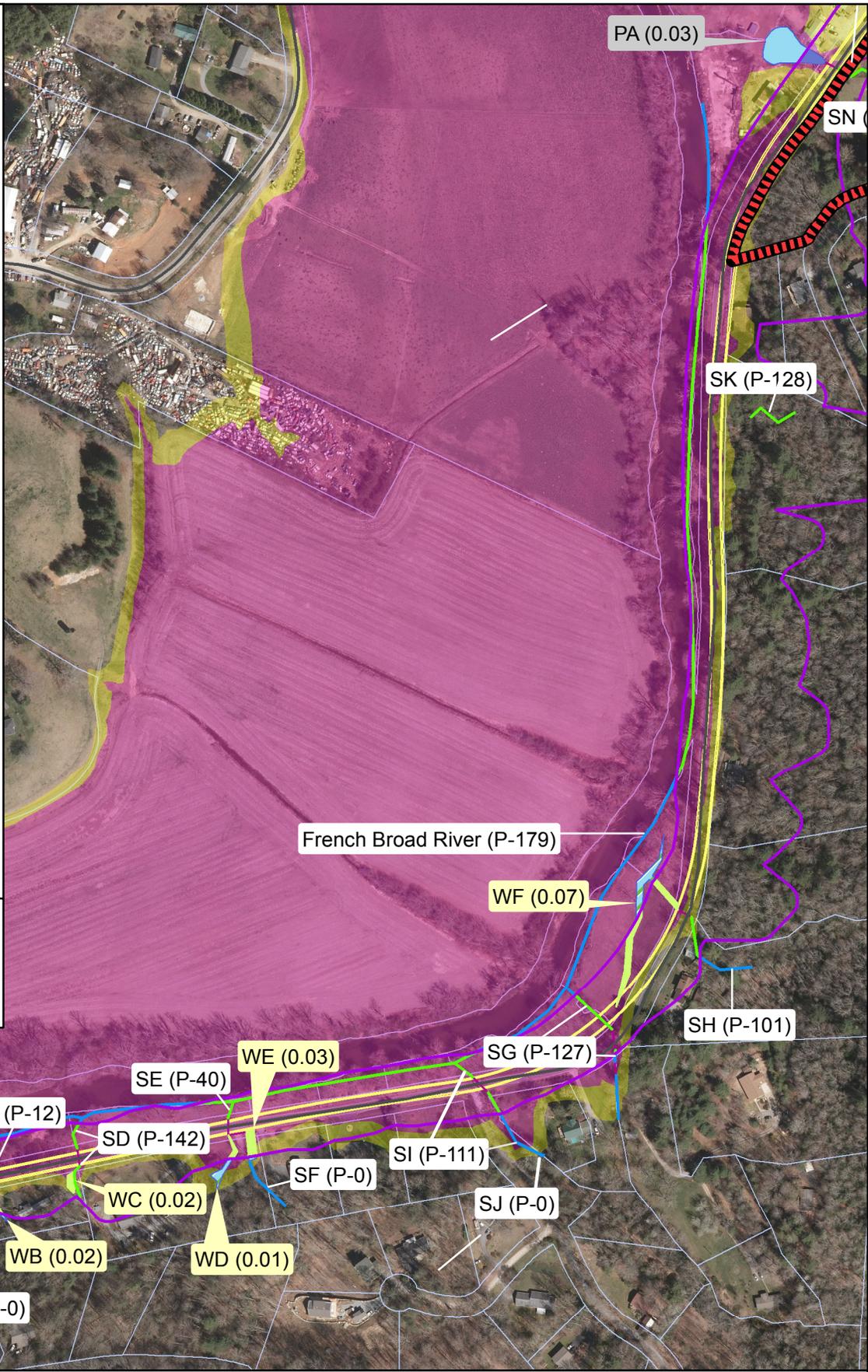


Figure 1
Study Area
STIP Project No. R-5763
 Upgrades to Wilson Road (SR 1540)
 from US 264 to Old US 64/
 Old Hendersonville Highway (SR 1504)
 Brevard, Transylvania County



Stream ID (P or I - feet of impact)
 P = perennial, I = intermittent
 Wetland ID (acre of impact)
 Pond ID (acre of impact)
 Tributary ID (feet of impact)



**Potential Impacts
 Both Build Alternatives**

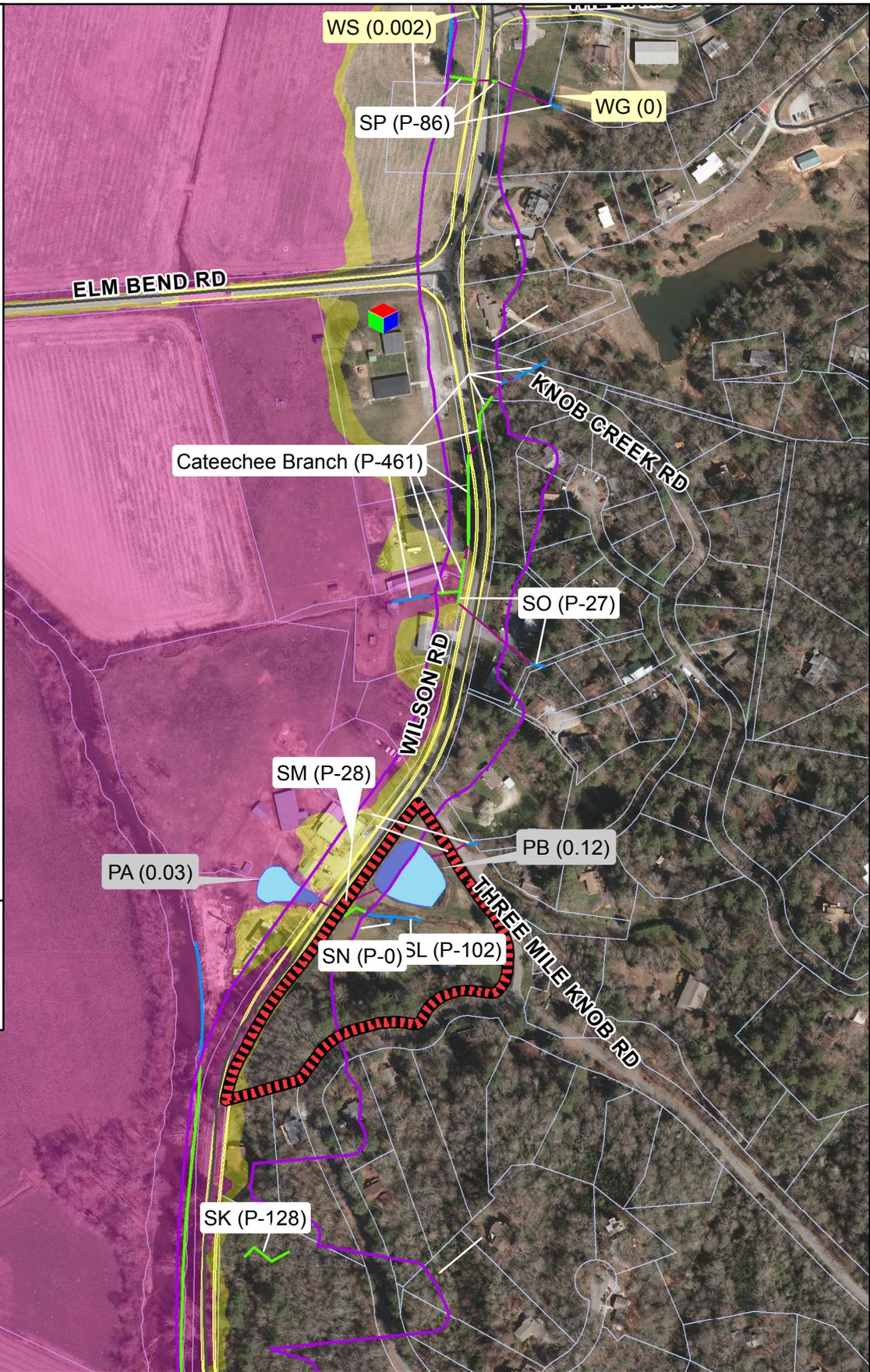
STIP Project No R-5763
 Improvements to Wilson Road from US 276
 to Old US 64/ Old Hendersonville Highway
 Brevard, Transylvania County

FIGURE
2A

Legend

- Daycare
- UST - Low Risk
- NPDES WWTP**
- Major
- Minor
- US Highway
- Road
- Both Build Alternatives (SS+40ft)
- Delineated Stream
- Stream Impact (SS+40ft)
- Delineated Wetland
- Wetland Impact (SS+40ft)
- Delineated Pond
- Pond Impact (SS+40ft)
- Proposed Functional Design
- NRHP Eligible Sites
- FEMA Flood Zone**
- 100-year Floodplain
- 500-year Floodplain
- Parcel Boundary

Stream ID (P or I - feet of impact)
P = perennial, I = intermittent
Wetland ID (acre of impact)
Pond ID (acre of impact)
Tributary ID (feet of impact)



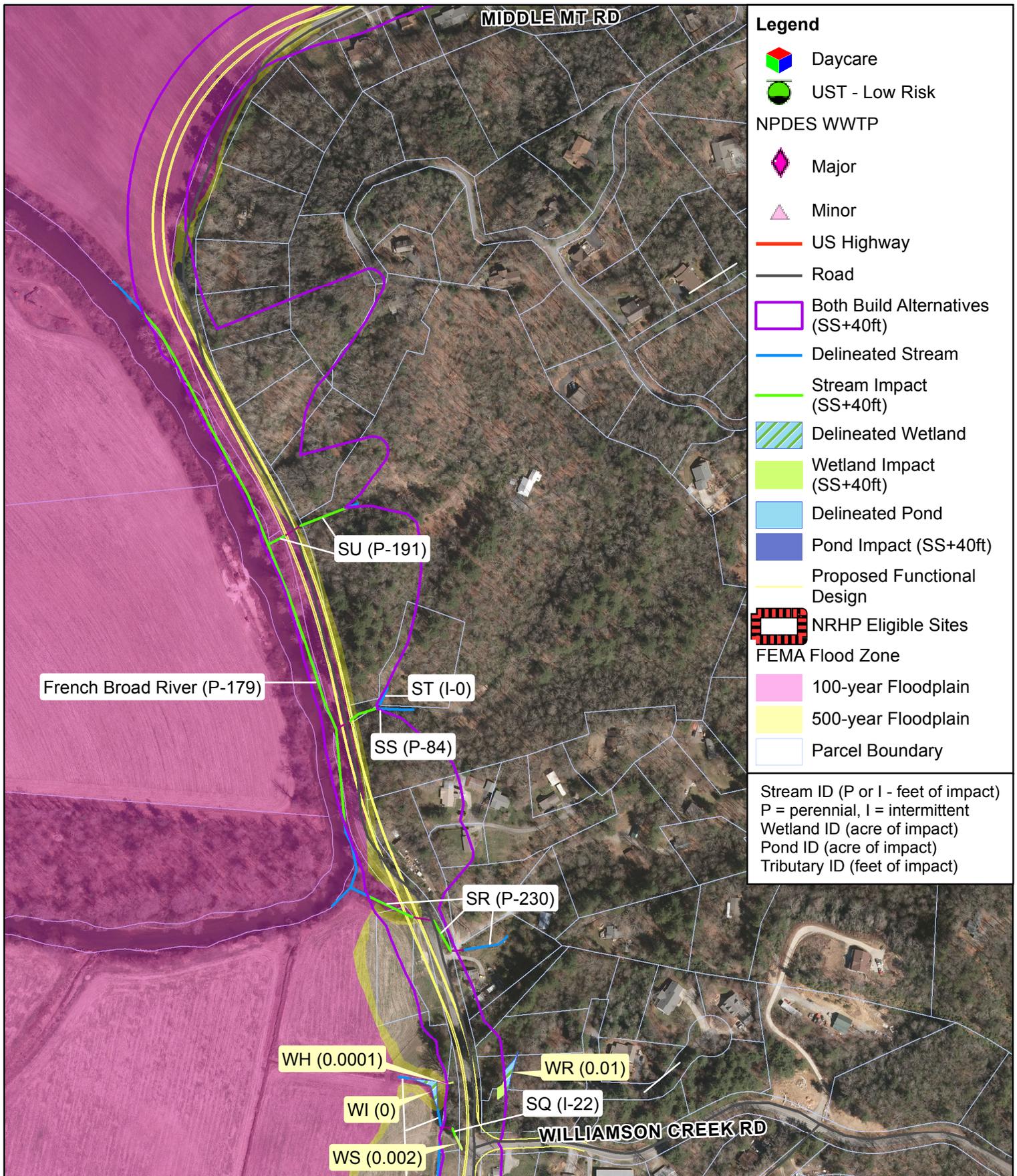


0 350 700
Feet
1 inch = 350 feet



Potential Impacts
Both Build Alternatives
STIP Project No R-5763
Improvements to Wilson Road from US 276
to Old US 64/ Old Hendersonville Highway
Brevard, Transylvania County

FIGURE
2B



Potential Impacts
Both Build Alternatives
 STIP Project No R-5763
 Improvements to Wilson Road from US 276
 to Old US 64/ Old Hendersonville Highway
 Brevard, Transylvania County

FIGURE 2C

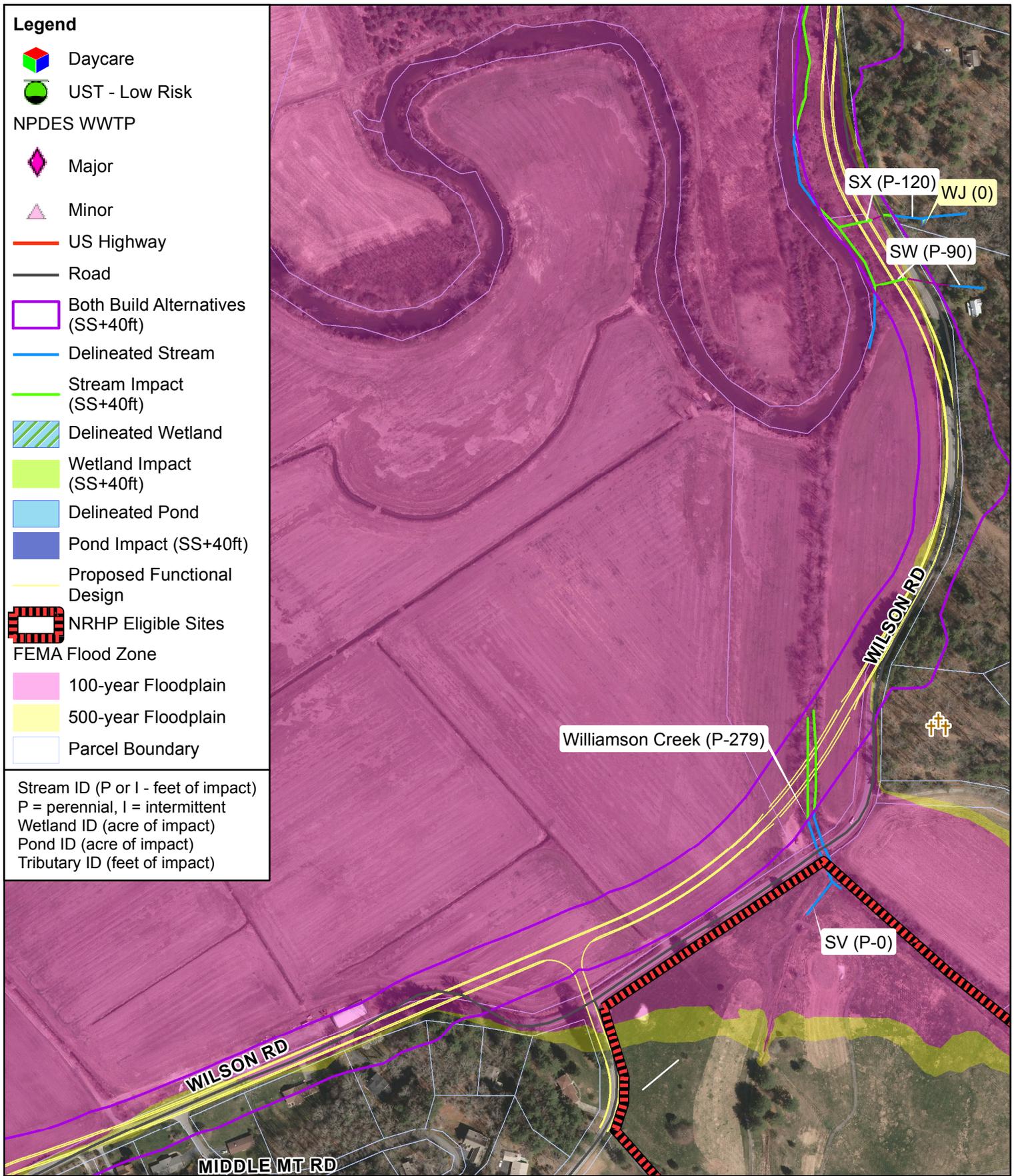
0 350 700 Feet
 1 inch = 350 feet

N

Legend

-  Daycare
-  UST - Low Risk
- NPDES WWTP**
-  Major
-  Minor
-  US Highway
-  Road
-  Both Build Alternatives (SS+40ft)
-  Delineated Stream
-  Stream Impact (SS+40ft)
-  Delineated Wetland
-  Wetland Impact (SS+40ft)
-  Delineated Pond
-  Pond Impact (SS+40ft)
-  Proposed Functional Design
-  NRHP Eligible Sites
- FEMA Flood Zone**
-  100-year Floodplain
-  500-year Floodplain
-  Parcel Boundary

Stream ID (P or I - feet of impact)
P = perennial, I = intermittent
Wetland ID (acre of impact)
Pond ID (acre of impact)
Tributary ID (feet of impact)



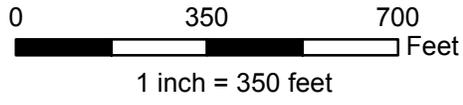
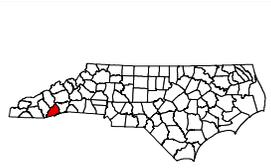
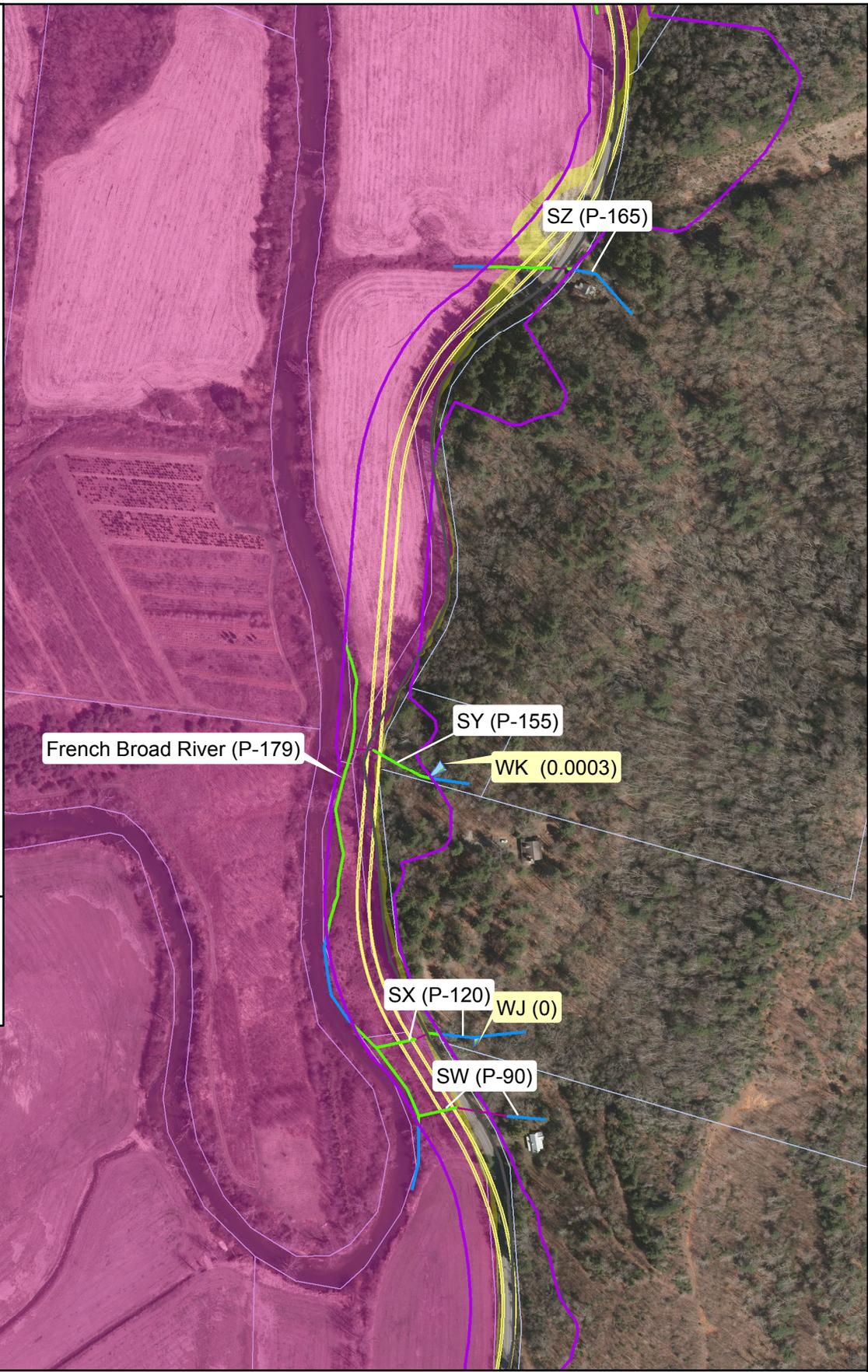
Potential Impacts
Both Build Alternatives

STIP Project No R-5763
Improvements to Wilson Road from US 276
to Old US 64/ Old Hendersonville Highway
Brevard, Transylvania County

FIGURE 2D

- Legend**
-  Daycare
 -  UST - Low Risk
 - NPDES WWTP**
 -  Major
 -  Minor
 -  US Highway
 -  Road
 -  Both Build Alternatives (SS+40ft)
 -  Delineated Stream
 -  Stream Impact (SS+40ft)
 -  Delineated Wetland
 -  Wetland Impact (SS+40ft)
 -  Delineated Pond
 -  Pond Impact (SS+40ft)
 -  Proposed Functional Design
 -  NRHP Eligible Sites
 - FEMA Flood Zone**
 -  100-year Floodplain
 -  500-year Floodplain
 -  Parcel Boundary

Stream ID (P or I - feet of impact)
P = perennial, I = intermittent
Wetland ID (acre of impact)
Pond ID (acre of impact)
Tributary ID (feet of impact)



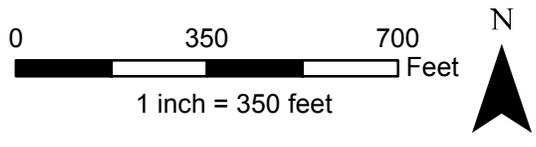
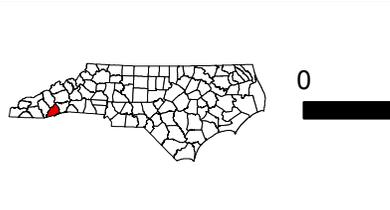
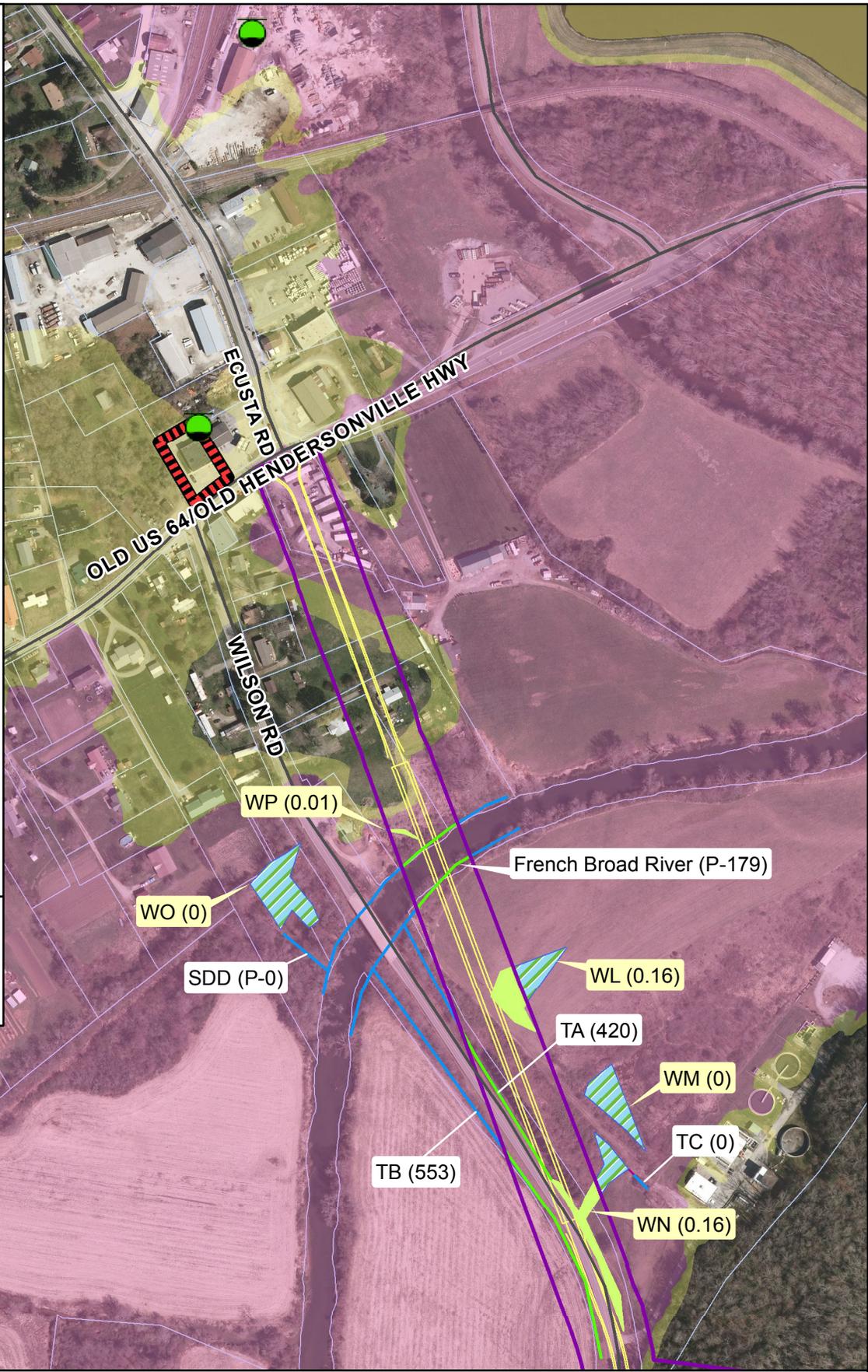
**Potential Impacts
Both Build Alternatives**

STIP Project No R-5763
Improvements to Wilson Road from US 276
to Old US 64/ Old Hendersonville Highway
Brevard, Transylvania County

FIGURE
2E

- Legend**
-  Daycare
 -  UST - Low Risk
 - NPDES WWTP**
 -  Major
 -  Minor
 -  US Highway
 -  Road
 -  Build Alternative 1 (SS+40ft)
 -  Delineated Stream
 -  Stream Impact (SS+40ft)
 -  Delineated Wetland
 -  Wetland Impact (SS+40ft)
 -  Delineated Pond
 -  Pond Impact (SS+40ft)
 -  Proposed Functional Design
 -  NRHP Eligible Sites
 - FEMA Flood Zone**
 -  100-year Floodplain
 -  500-year Floodplain
 -  Parcel Boundary

Stream ID (P or I - feet of impact)
 P = perennial, I = intermittent
 Wetland ID (acre of impact)
 Pond ID (acre of impact)
 Tributary ID (feet of impact)



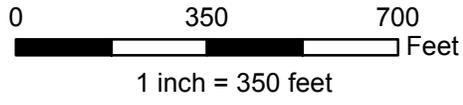
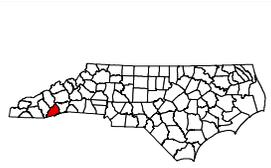
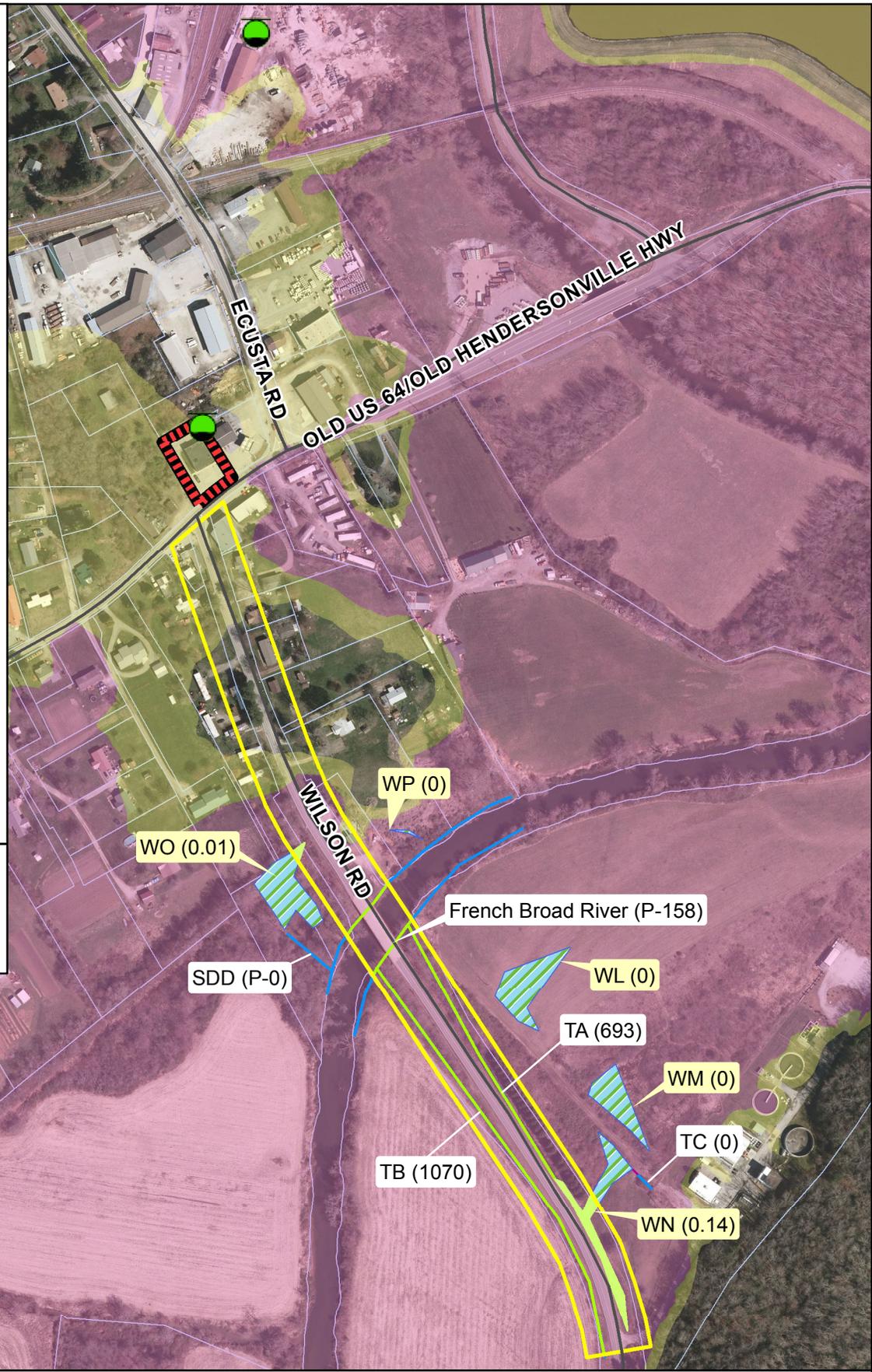
Potential Impacts
Build Alternative 1: New Alignment
 STIP Project No R-5763
 Improvements to Wilson Road from US 276
 to Old US 64/ Old Hendersonville Highway
 Brevard, Transylvania County

FIGURE 2F

Legend

-  Daycare
-  UST - Low Risk
- NPDES WWTP**
-  Major
-  Minor
-  US Highway
-  Road
-  Build Alternative 2 (155 ft Corridor)
-  Delineated Stream
-  Stream Impact (155 ft Corridor)
-  Delineated Wetland
-  Wetland Impact (155 ft Corridor)
-  Delineated Pond
-  Pond Impact (SS+40ft)
-  NRHP Eligible Sites
- FEMA Flood Zone**
-  100-year Floodplain
-  500-year Floodplain
-  Parcel Boundary

Stream ID (P or I - feet of impact)
 P = perennial, I = intermittent
 Wetland ID (acre of impact)
 Pond ID (acre of impact)
 Tributary ID (feet of impact)



Potential Impacts
Build Alternative 2: Replace in Place

STIP Project No R-5763
 Improvements to Wilson Road from US 276
 to Old US 64/ Old Hendersonville Highway
 Brevard, Transylvania County

FIGURE
2G

Appendix A: Jurisdictional Resources Streams

Table 2 lists jurisdictional streams within the project study area. No impacts are anticipated where Wilson Road runs parallel to the French Broad River. Impacts included in Table 1 are based on functional design slope stake limits plus a 40-foot buffer. French Broad River impacts are only included at the proposed river crossing.

Table 1. Characteristics of Jurisdictional Streams and Potential Impacts

Map ID	Length (ft.)	Classification	Compensatory Mitigation Required	River Basin Buffer	Build Alternative 1 Impacts (ft)	Build Alternative 2 Impacts (ft)
Catechee Branch	661	Perennial	Yes	Not Required		
French Broad River	7,884	Perennial	Yes	Not Required	179	357
Williamson Creek	495	Perennial	Yes	Not Required	279	279
SA-I	238	Intermittent	Undetermined	Not Required	78	78
SA-P	210	Perennial	Yes	Not Required	196	196
SB	195	Perennial	Yes	Not Required	62	62
SC	20	Perennial	Yes	Not Required	0	0
SD-I	79	Intermittent	Undetermined	Not Required	65	65
SD-P	77	Perennial	Yes	Not Required	77	77
SE-I	143	Intermittent	Undetermined	Not Required	64	64
SE-P	40	Perennial	Yes	Not Required	40	40
SF	140	Perennial	Yes	Not Required	0	0
SG	285	Perennial	Yes	Not Required	126	126
SH	231	Perennial	Yes	Not Required	101	101
SI	263	Perennial	Yes	Not Required	111	111
SJ	5	Perennial	Yes	Not Required	0	0
SK	128	Perennial	Yes	Not Required	128	128
SL	234	Perennial	Yes	Not Required	102	102
SM	81	Perennial	Yes	Not Required	28	28
SN	19	Perennial	Yes	Not Required	0	0
SO	65	Perennial	Yes	Not Required	27	27
SP	363	Perennial	Yes	Not Required	86	86
SQ	65	Intermittent	Undetermined	Not Required	65	65
SR	414	Perennial	Yes	Not Required	230	230
SS	186	Perennial	Yes	Not Required	84	84
ST	54	Intermittent	Undetermined	Not Required	0	0
SU	224	Perennial	Yes	Not Required	191	191
SV	114	Perennial	Yes	Not Required	0	0
SW	183	Perennial	Yes	Not Required	90	90
SX	323	Perennial	Yes	Not Required	120	120
SY	244	Perennial	Yes	Not Required	155	155
SZ	426	Perennial	Yes	Not Required	165	165

Table 1. Characteristics of Jurisdictional Streams and Potential Impacts

Map ID	Length (ft.)	Classification	Compensatory Mitigation Required	River Basin Buffer	Build Alternative 1 Impacts (ft)	Build Alternative 2 Impacts (ft)
SDD	138	Perennial	Yes	Not Required	0	0
SEE	12	Perennial	Yes	Not Required	12	12
Total	14,239			Total	3,322	3,500

Note: There are no streams SAA-SCC.

¹Impacts based on functional design slope stake limits plus 40 feet

Wetlands

Table 2 lists potential jurisdictional wetlands and their characteristics within the project study area as well as potential impacts based on functional design slope stake limits plus 40 feet.

Table 2. Characteristics of Potential Jurisdictional Wetlands and Potential Impacts

Map ID	NCWAM Classification	NCWAM Rating	Hydrologic Classification	Area (ac.)	Build Alternative 1 Impact (ac.)	Build Alternative 2 Impact (ac.)
	Headwater	High		0.04	0.04	0.04
		High		0.02	0.02	0.02
WC	Headwater Forest	High	Riparian	0.02	0.02	0.02
WD	Headwater Forest	High	Riparian	0.01	0	0
WE	Headwater Forest	Low	Riparian	0.03	0.03	0.03
WF	Floodplain Pool	High	Riparian	0.13	0.08	0.08
WG	Headwater Forest	Low	Riparian	0.002	0	0
WH	Seep	High	Non-riparian	0.0001	<0.01	<0.01
WI	Headwater Forest	Low	Riparian	0.03	0	0
WJ	Headwater Forest	High	Riparian	0.004	0	0
WK	Seep	Medium	Non-riparian	0.02	<0.01	<0.01
WL	Floodplain Pool	Low	Riparian	0.31	0.16	0
WM	Bottomland Hardwood Forest	Low	Riparian	0.22	0	0
WN	Bottomland Hardwood Forest	Low	Riparian	0.27	0.16	0.3
WO	Bottomland Hardwood Forest	Low	Riparian	0.34	0	0
WP	Floodplain Pool	Low	Riparian	0.01	0.01	0.01
			Total	1.46	0.5	0.5

¹Impacts based on functional design slope stake limits plus 40 feet

Surface Waters

Five surface waters (i.e., ponds and tributaries) were identified in the study area and are listed in Table 4 along with potential impacts from the project.

Table 3. Surface waters in the study area and potential impacts

Surface Water	Jurisdictional	Map ID of Connection	Area (ac)/ Length (ft)	Build Alternative 1 Impact	Build Alternative 2 Impact
TA	Yes	French Broad River	693 ft	420 ft	693 ft

Table 3. Surface waters in the study area and potential impacts

Surface Water	Jurisdictional	Map ID of Connection	Area (ac)/ Length (ft)	Build Alternative 1 Impact	Build Alternative 2 Impact
TB	Yes	French Broad River	1,079 ft	553 ft	1,070 ft
TC	Yes	WN/French Broad River	48 ft	0	0
PA	Yes	SL/SM	0.18 ac	0.03 ac	0.03 ac
PB	Yes	SL/SM	0.40 ac	0.12 ac	0.12 ac