BRIDGING DECISIONS AND ALIGNMENT REVIEW

US 321/US 421 Improvements
from US 321/ US 421 junction north of Vilas, to SR 1107 (NC 105 Bypass) west of Boone

Watauga County

STIP Project R-2615

North Carolina Department of Transportation

Division 11

MERGER CONCURRENCE POINT NUMBER 2A

May 20, 2026, 1:00 p.m.

Prepared By
WGI
5640 Dillard Drive, Suite2300
Cary, NC 27518
919-852-0468

1. Introduction

Lead federal agency: Federal Highway Administration
Primary points of contact for the subject project are:

Agency	Name
Federal Highway Administration (FHWA)	Seth Wilcher
U.S. Army Corps of Engineers (USACE)	Lori Beckwith
North Carolina Department of Water Resources (NCDWR)	Faith Harden
North Carolina Department of Transportation	Wes Cartner
WGI	Martha Register

The purpose of this Merger Team meeting is to discuss and achieve concurrence on the proposed major hydraulic crossings on the project and the proposed alignment.

1.1 Project Description

The project proposes to improve US 321/US 421 from its junction near Vilas to SR 1107 (105 Bypass) just west of Boone, in Watauga County (Figure 1). The roadway is classified as other principal arterial according to the NCDOT functional classification system. The proposed improvements would widen approximately 3.5 miles of US 321/US 421, to include four travel lanes, the addition of a median, and five-foot paved shoulders to accommodate bicycles.

1.2 Project History and Merger Plan

The project was in the 2018-2027 NCDOT STIP, and most recently, can be found in the 2026 – 2035 STIP (July 2025, 2026-2035 STIP). Project planning was initiated by NCDOT in May 2018. Start of Study coordination, internal NCDOT information requests, landowner notifications, community studies site visit and interviews, natural resources investigations, preliminary hydraulics analysis, traffic capacity analysis, and a combined merger meeting for CP 1 and 2 were completed prior to the project being put on hold on September 4, 2019. The project was restarted two years later in October 2021. A public workshop was held on October 13, 2022, after which time the project was unofficially placed on hold.

Project work was restarted in July 2025. Start of Study coordination was reinitiated. A community studies site visit, natural resources investigations, traffic forecast and capacity analysis, and a utility review have been completed. An informal update meeting was held with the Merger Team in January 2026 (Meeting Summary).

Right-of-way (ROW) acquisition construction are not yet scheduled. The current STIP cost estimate is presented in Table 1. The proposed project schedule is included in Table 2 and is based on the Merger Plan (Merger Plan; October 2025). The schedule and cost estimates are draft and subject to change.

Table 1. 2024 R-2615 Cost Estimate

Phase	**Cost Estimate**
Right of Way	$75,000,000
Utilities	$2,900,000
Construction	$78,300,000
Total*	**$156,200,000**
Note: cost estimates are subject to change.	

Table 2. STIP R-2615 Project Schedule*

Milestone	**Format**	**Anticipated Date**
CP 1 and 2 (Purpose and Need/Study Area and Alternatives	In-person	May 16, 2019
Public Workshop/Local Officials Meeting	In-person	October 13, 2022
Merger Update Meeting	In-person/Virtual	January 14, 2026
CP 2a (Bridging)	In-person/Virtual	May 20, 2026
Public Workshop/Local Officials Meeting	In-person	December 2026
CP 3 (LEDPA)	Virtual	January 2027
Categorical Exclusion	Electronic Distribution	July 2027
Begin ROW Acquisition		TBD
Begin Construction		TBD

*Tentative, subject to change.

1.3 Past Merger Meetings Summary

CP1: The Merger Meeting for CP1 was held on May 16, 2019. During the meeting, the Purpose and Need for the project was created and the Project Study Area was defined. The signed Concurrence Point 1 form is available on Sharepoint (CP 1 form).

As discussed in the January 2026 update meeting, the study area has been expanded since the CP 1 meeting to include areas for potential cut and fill slopes in mountainous terrain, to accommodate road intersection improvements on connecting secondary roads, and to better model the floodplain of Brushy Fork Creek at the western project terminus. The updated study area is shown in Figure 1.

CP2: The Merger Meeting for CP2 was also held on May 16, 2019. The purpose of the meeting was to discuss alternatives for project development and determine which should be carried forward for detailed study. As a result of this meeting the Merger Team concurred that the following alternative:

Preliminary Best-Fit, would be carried forward for detailed study. The signed Concurrence Point 2 form is available on Sharepoint (CP 2 form).

An informal update meeting was held with the Merger Team in January 2026. The purpose of the update was to provide a project overview, note the current project status and discuss steps forward, particularly in regard to the Merger Process. The update PowerPoint presentation is available on Sharepoint (Update Presentation). The USACE in their meeting comments noted that additional details should be presented to the Merger Team about the preliminary best-fit alignment. As part of the CP 2 concurrence it was stated "…for the purposes of this meeting a preliminary best-fit alignment was developed to facilitate discussions of the concept. In coordination with resource/permitting agencies, the preliminary best-fit alignment will be adjusted as designs progress in advance of selecting the LEDPA/Preferred Alternative (Concurrence Point 3)." As part of this CP 2a meeting packet additional information regarding preliminary widening alternatives is included.

Community Resources

A field site visit was completed in September 2025 to update the 2019 Environmental Features mapping to better reflect changes in the study area and add new development. Figures 2A and 2B illustrate community resources such as businesses, churches, historic sites and potential hazardous sites identified in the project study area.

Water Resources

Due to changes in the project study area, the R-2615 Natural Resources Technical Report was updated and reissued in January 2026 (NRTR 2026) Jurisdictional streams and wetlands are located in the study area and are shown in the NRTR figures (4A to 4I). Water resources in the study area are part of the Watauga River basin (U.S. Geological Survey [USGS] Hydrologic Unit 06010103).

Forty-three (43) streams were identified within the study area and included three named streams: Brushy Fork Creek, George Branch and Linville Creek. The remainder are unnamed tributaries (UTs) to two of these streams; there are no unnamed tributaries to Linville Creek in the project study area. These streams are considered jurisdictional surface waters under Section 404 of the Clean Water Act. All jurisdictional streams have been designated as cold water streams for the purposes of mitigation. Stream and surface water information are found in **Appendix A** and locations are shown in **Figures 4 to 9 (Appendix B).**

There are no designated High-Quality Waters (HQW) or water supply watersheds (WS-I or WS-II) within the study area or within 1.0 mile downstream of the study area. There are no Outstanding Resource Waters (ORW) within the study area or within 1.0 mile downstream of the study area. No streams within the study area or within 1.0 mile of the study area are identified in the North Carolina 2022 Final 303(d) list of impaired waters. The North Carolina Wildlife Resources Commission stated in a correspondence dated August 21, 2025, that a trout moratorium may be required but will be determined at a later date.

Seventy-four jurisdictional wetlands, totaling 3.43 acres, were identified within the study area. Wetland information is found in **Appendix A** and locations are shown in **Figures 4 to 9 (Appendix B)**.

2. Analysis of Alternatives

As previously noted, the Merger Team concurred that the preliminary Best-Fit Alternative will be carried forward for detailed study during the Merger Meeting held on May 16, 2019.

NCDOT and its subconsultant group reviewed an East Side Widening and a West Side Widening Alternatives during a meeting on April 1, 2019 (Meeting Minutes 04012019) to develop a preliminary Best-Fit Alignment. The group attempted to avoid and minimize impacts to the natural and human environment by shifting the alignments along the corridor to create the preliminary alignment.

East (Left) Side Widening Alternative

The east side widening alternative (visually to the north) proposed to widen US 321/US 421 from its junction near Vilas to SR 1107 (105 Bypass) (Figures 4A through 9A). This alternative will have the majority of its widening, and thus impacts, to properties on the east side of the facility with limited opportunities to avoid resources.

West (Right) Side Widening Alternative

The west side widening alternative (visually to the south) proposed to widen US 321/US 421 from its junction near Vilas to SR 1107 (105 Bypass) (Figures 4B through 9B). This alternative will have the majority of its widening, and thus impacts, to properties on the west side of the facility with limited opportunities to avoid resources.

Best Fit Widening Alternative

Utilizing known environmental and community features, a preliminary best-fit alignment was generated (4C through 9C). This preliminary best fit alternative proposes to widen US 321/ US 421 with a hybrid shifting alignment from its junction near Vilas to SR 1107 (105 Bypass). This alignment incorporates shifting the widening from one side of the highway to the other, as needed, to provide the opportunity to avoid impacts to community and jurisdictional resources.

During the April 1, 2019 meeting, the preliminary Best-Fit Alignment was generated as follows in an attempt avoid and/or minimize impacts to resources:

- From the he US 321/US 421 junction to approximately station 45-50, widen to the east, due to the location of Willowdale Baptist Church (Figures 4A to C);
- From roughly station 50, it is recommended that the widening transitions through the curve to the west side to minimize stream impacts (Figures 4A to C, and 5A to C).
- Widening to the west will continue through the businesses at Robin Lane. Business(es) located at Robin Lane on the west side of US 321/421 will be impacted. However, widening to the east would impact a mini-storage facility on the opposite side of US 421 (Figures 5A to C).
- The stream is located just off the east shoulder of US 321/421 from roughly station 75 to station 90. It was recommended that the widening stay to the west and to hold the shoulder, to the extent possible, in order to avoid the stream (Figures 5A to C).
    - The widening will transition to a reduced in the median from 30-feet to 23-feet (*this typical section has been further reduced in an effort to minimize impacts in Vilas, see typical sections presented below*) at approximately station 95 through the village of Vilas

to approximately station 120. The alignment has not been determined for the section through Vilas (between the proposed U-turn bulbs at Lonnie Henson Road to the west and the Dollar General store to the east).

  - Curb and gutter will be utilized in this section to minimize impacts to residences and businesses.

- Widening will transition to the east at roughly station 130. It was recommended to hold the shoulder on the west side around station 130 to avoid the stream (Figures 6A to C).
- In order to avoid the churches located at roughly stations 160 and 170, it was recommended to widen to the east through station 160 and transition to the west around station 175 (Figures 6A to C, 7A to C and 8A to C).
- At the southern project terminus widening should be transitioned to symmetrical (Figures 9A to C).
- It was recommended to shift SR 1107 intersection to the east in order to realign it with Old Bristol Road to create better sight distance with the crest of the road and reduce the skew.
- The median will be reduced going into the intersection with SR 1107 to transition to match existing at the eastern project terminus.

Since this 2019 meeting, the following avoidance and minimization adjustments to the alignment have been recommended:

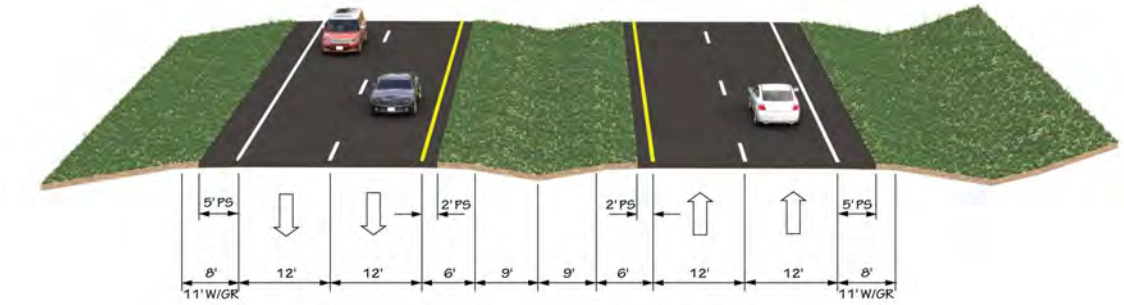
- The alignment should be adjusted away from the eligible historic property boundary (Grady L. and Ardath R. Green House) near the eastern intersection with Linville Creek Road. Additional coordination is needed to minimize impacts to Bushy Fork Creek which parallel US 321/US 421 on the opposite side of the highway from the historic property.

- The left and symmetrical widening alternatives are recommended for elimination from consideration within the limits of the Vilas community. These two alternatives at this location have been modeled to create an unacceptable rise to the detailed flood elevations in this location.

Proposed Typical Sections

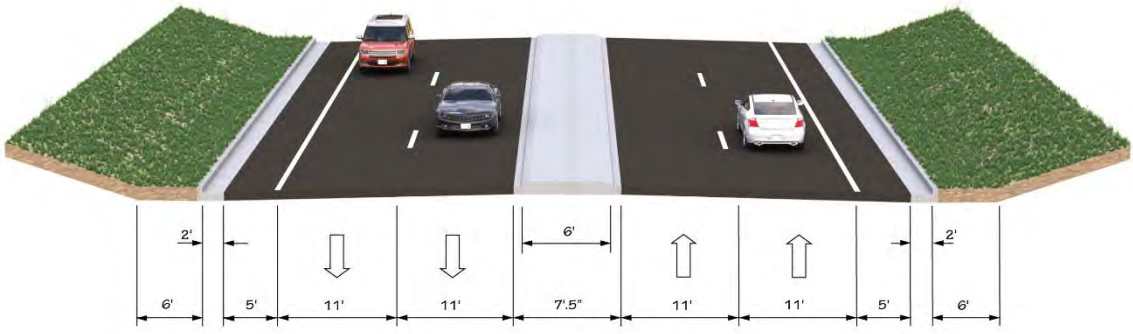
Two proposed typical sections are proposed for this project. Both typical sections are consistent with the NCDOT Roadway Design Manual for this type of facility and design speeds.

For the majority of the widening of this section of US 321/US 421, the project proposes four 12-foot travel lanes, a 30-foot depressed grass median, and 5-foot paved shoulders to accommodate bicycles.



TYPICAL SECTION
-L- US 321 / US 421

For the approximately 0.5 mile area in the community of Vilas, the project proposed a curb and gutter section with four 11-foot travel lanes, a 6-foot concrete median and a 5-foot paved shoulder to accommodate bicycles. This typical section has been proposed to aid in minimizing impacts to the residences and businesses lining both sides of the highway at this location. This typical section is proposed for the area between the proposed U-turn bulbs at Lonnie Henson Road to the west and the Dollar General store to the east.



TYPICAL SECTION
-L- US 321 / US 421

A summary of estimated impacts by build alternative for streams, wetlands and other resources are shown in **Table 5**.

Table 5: Potential Impacts to Resources by Build Alternative[1]

Resource	Left Widening	Right Widening	Best Fit Widening[2]
Streams (ft)	7,726.28 ft	7,302.42 ft	6,809.53
Wetlands (ac)	0.53 ac	0.79 ac	0.56 ac
EMS Facilities	0	0	1
Churches	3	3	1
Cemeteries	0	0	0
Potential Historic Architecture Sites	1	1	1
Residential Properties	62	66	79
Multi-family Bldgs.	3	1	2
Businesses	28	27	30
Post Office	1	1	1

1-Impacts measured based on slope stake limits plus an additional 40 feet.
2-The Best Fit Alternative defaulted to symmetrical widening for the village of Vilas and impact quantities include preliminary design for Y-lines.

Appendix A includes data tables that provides potential impacts to individual jurisdictional resources by alternative. **Appendix A** also had detailed information on the jurisdictional resources from the NRTR (NRTR 2026). Impact summary tables are included in **Appendix B** enumerating the estimated impact for each alternative by map segment (**Figures 4 to 9**).

3. Major Hydraulic Crossings

Fifteen hydraulic crossings were identified in the project study area (**Site map, Appendix C**). Major hydraulic crossings are those with a contributing drainage area requiring conveyance greater than a 72-inch pipe. A total of seven potential major hydraulic crossings were identified for the proposed project based on the 2019 Hydraulic Planning Report Hydraulic Planning Report). Of the seven major hydraulic structures identified, four of them are outside of the design footprint and will not be impacted by project implementation (Sites 3, 6, 8 and 9). (Site 8 received major damage from Hurricane Helene in fall 2024. This bridge on Circle Drive West is being reconstructed by Division 11 as a separate project as part of hurricane reconstruction efforts).

The three remaining major hydraulic crossings are described in **Table 6** and additional information including the site map and photographs are included in **Appendix C**.

Site #1 – George Branch at US 321

Site 1 is the US 321 crossing of George Branch approximately 450 feet northwest of the US 321/421 interchange. This stream crossing has a drainage area of 0.34 square miles. The current land use is

primarily rural commercial. The existing structure is a 1@6'x5' reinforced concrete box culvert (RCBC) with wingwalls, buried 1.0' and skewed 60 degrees to the roadway. The structure is in fair condition, with some crumbling of the concrete at the outlet. The centerline of the roadway is approximately 11-12 feet above the creek bed, and the normal depth of flow is approximately 0.3 feet with ordinary high water approximately 2.0 feet deep. George Branch comes in from the northeast before converging with an unnamed tributary from the northwest directly upstream of the culvert. The upstream floodplain contains an automotive shop and ice-skating rink, both approximately 100 feet away from the channel. The downstream floodplain contains a vacant commercial business and a recently-constructed EMS station. There is moderate erosion behind and adjacent to the wingwall on the upstream side. The upstream and downstream banks are vegetated and stable. Information from area residents suggests the 100-year storm does not overtop the road.

Site 2 – Brushy Fork at US 321/421 – FEMA Detailed Study

Site 2 is the US 321 crossing of Brushy Fork located approximately 0.1 mile south of the US 421/US 321 junction. This stream has a drainage area of 5.05 square miles. The current land use is rural and primarily wooded. The existing structure is a 3@8'x9' RCBC with a concrete headwall skewed 110 degrees to the roadway. The main channel of Brushy Fork is confined to the two right barrels, with the left barrel reserved for high flow conditions. The structure is fair condition with minor cracks and spalling of the concrete. The centerline of the road is approximately 20 feet above the creek bed, and the normal depth of flow is 0.8 feet with ordinary high water at about 1.5 feet deep. The channel is approximately 11 feet wide with a distance of 13 feet from top of bank to top of bank. Downstream banks are vegetated and stable while there is moderate erosion and undercutting of the upstream right bank. There is an abandoned single-family home in the downstream left floodplain approximately 40 feet away from the channel. There is a church in the downstream right floodplain about 150 feet away from the channel. Both of these structures are located within the FEMA 100-yr flood hazard zone. The upstream floodplain is vegetated with a warehouse on the left (left to right looking downstream). Preliminary calculations suggest the 100-yr storm does not overtop the road.

Site 7 – Brushy Fork at US 321/421

Site 7 is the US 321/421 crossing of Brushy Fork located approximately 500 feet southeast of the westernmost intersection with Circle Drive W. This stream crossing has a drainage area of 1.71 square miles. The current land use is primarily rural and wooded with residential development in the vicinity of the culvert. The existing structure is a 2@10'x5' RCBC skewed 45 degrees to the roadway. The structure is considered structurally deficient, with moderate cracks and spalling of the concrete. The centerline of the roadway is approximately 9 feet above the streambed at the inlet. The normal depth of flow is 0.6 feet, with ordinary high water at approximately 1.0 foot deep. A ditch comes into the channel downstream of the culvert from the right. The outlet of the culvert is perched approximately 4 feet above the streambed, with a scour hole that measures 1.5 feet deep by 20 feet wide by 10 feet long at the outlet. The channel parallels the roadway both upstream and downstream of the culvert. The upstream and downstream banks in the immediate vicinity of the culvert show minor undercutting, and there is some minor erosion behind the downstream right wingwall. There is heavy erosion and undercutting of both banks approximately 150 feet downstream of the culvert. This crossing is not included in the FEMA regulated portion of Brushy Fork which begins just downstream. There are no structures in the FEMA 100-year flood hazard zone downstream of the structure. Information from area

residents indicate the 100-year storm does not overtop the road, though the stream floods out of its banks regularly into residential yards approximately 400 feet upstream of the structure.

Table 6. Major Hydraulic Structures[1] Recommendations, Cost Estimate, and Potential Impacts by Alternative

SITE NO[3]	ROUTE	STREAM NAME[4]	NRTR MAP ID	NCDWR STREAM INDEX NUMBER	STREAM/ WETLAND SIZE (ft / ac)	STREAM CLASS	DRAINAGE AREA	EXISTING STRUCTURE	East (Left) Alignment			Preliminary Best Fit			West (Right) Alignment		
								Number, Size, Structure Type	Recommended Structure	Cost Estimate[5]	Potential Stream/ Wetland Impact[2]	Recommended Structure	Cost Estimate[5]	Potential Stream/ Wetland Impact[2]	Recommended Structure	Cost Estimate[5]	Potential Stream/ Wetland Impact[2]
1	US 321	George Branch	George Branch	8-15-10-2	1,513 / 0.01	C	0.34 sq. mi.	1@6'x5' RCBC (buried 1 ft.)	1 @ 6' x 7' RCBC (buried 1 ft.) (130'OAL)	$140,400	149 ft / 0.02 ac.	1@6'x7' RCBC (buried 1') 110' OAL	$118,800	129 ft / 0.02 ac	1@6'x7' RCBC (buried 1') 155' OAL	$167,400	164 ft / 0.02 ac
2	US 321/US 421	Brushy Fork Creek	Brushy Fork	8-15-10	7,820 / 126.1	C	5.05 sq mi	3@8'x9' RCBC	3@8'x13' RCBC (buried 1') 210' OAL	$1,134,000	206 ft / 0.0 ac	3@8'x13' RCBC (buried 1') 200' OAL	$1,080,000	196 ft / 0.0 ac	3@8'x13' RCBC (buried 1') 200' OAL	$1,080,000	209 ft / 0.0 ac
7	US 321/US 421	Brushy Fork Creek	Brushy Fork	8-15-10	3,072	C	1.71 sq mi	2 @ 10' x 5' RCBC	2 @ 12' x 6' (buried 1 ft.) 185' OAL	$481,000	485 ft / 0.0 ac (6)	2@12'x6' RCBC (buried 1') 175' OAL	$455,000	475 ft / 0.0 ac (6)	2@12'x6' RCBC (buried 1') 175' OAL	$455,000	475 ft /0.0 ac (6)

NOTES:

(1) Major Hydraulic Structures - conveyance greater than 72-inch pipe or have an opening equal to or greater than 30 square feet.
(2) Impacts based on slope stake limits plus 40 feet.
(3) Site numbering based on approved Hydraulic Planning Report.
(4) All streams listed above are perennial.
(5) Cost estimates are preliminary and for comparison purposes only. Subject to change.
(6) Includes +/- 300' of stream relocation.

4. Avoidance and Minimization

Efforts to avoid and minimize impacts, to date (May 6, 2026), include:

- From the US 321/US 421 junction to approximately station 45-50, widen to the east, due to the location of Willowdale Baptist Church;
- From roughly station 50, it is recommended that the widening transitions through the curve to the west side to minimize stream impacts (Figures 4A to C, and 5A to C).
- Widening to the west will continue through the businesses at Robin Lane. Business(es) located at Robin Lane on the west side of US 321/421 will be impacted. However, widening to the east would impact a mini-storage facility on the opposite side of US 421 (Figures 5A to C).
- The stream is located just off the east shoulder of US 321/421 from roughly station 75 to station 90. It was recommended that the widening stay to the west and to hold the shoulder, to the extent possible, in order to avoid the stream (Figures 5A to C).
    - The widening will transition to a reduced in the median from 30-feet to 23-feet (*this typical section has been further reduced in an effort to minimize impacts in Vilas, see typical sections presented below*) at approximately station 95 through the village of Vilas to approximately station 120. The alignment has not been determined for the section through Vilas.
    - Curb and gutter will be utilized in this section to minimize impacts to residences and businesses.
- Widening will transition to the east at roughly station 130. It was recommended to hold the shoulder on the west side around station 130 to avoid the stream (Figures 6A to C).
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Since this 2019 meeting, the following avoidance and minimization adjustments to the alignment have been recommended:

- The alignment should be adjusted away from the eligible historic property boundary (Grady L. and Ardath R. Green House) near the eastern intersection with Linville Creek Road. Additional coordination is needed to minimize impacts to Bushy Fork Creek which parallel US 321/US 421 on the opposite side of the highway from the historic property.

- The left and symmetrical widening alternatives are recommended for elimination from consideration within the limits of the Vilas community. These two alternatives at this location have been modeled to create an unacceptable rise to the detailed flood elevations in this location.

Merger Plan Review/Next Steps

Based on the Merger Plan for the project, NCDOT proposes the next Merger Meeting will be CP 3 (LEDPA). Prior to the next Merger Meeting, NCDOT will complete the impacts analyses and update costs. It is anticipated that the CP 3 meeting will be held in roughly one year; Merger Team members will be notified of any changes that require a revision of this timetable.

Section 404/NEPA Merger Project Team Meeting Agreement

Concurrence Point No. 2A

Project Purpose and Need and Study Area Defined

Project Name/Description: US 321/US 421 Widening from the US 321 and US 421 junction west of Vilas to NC 105 Bypass (SR 1107) in Boone, Watauga County. **STIP Project: R-2615**

The Merger Team has concurred on this date of May 20, 2026, on the major hydraulics structures as shown in **Table 6** of the CP2A Merger Packet for STIP Project R-2615.

USACE _____ NCDCM _____

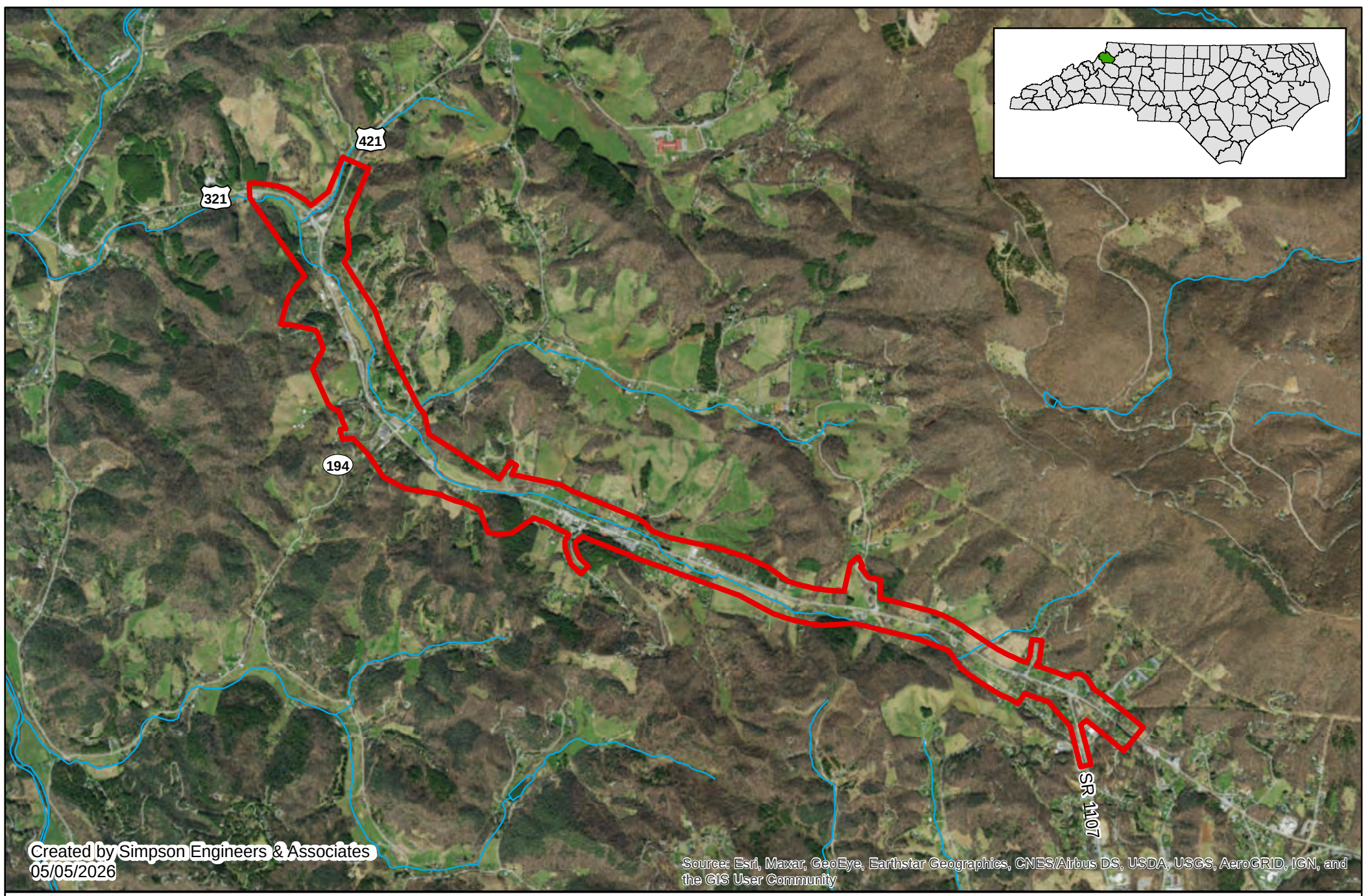
USEPA _____ FHWA _____

USFWS _____ NCDOT _____

NCDWR _____ NOAA Fisheries _____

NCWRC _____ CMPO _____

Figures 1 and 2



NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 11

PROJECT STUDY AREA MAP

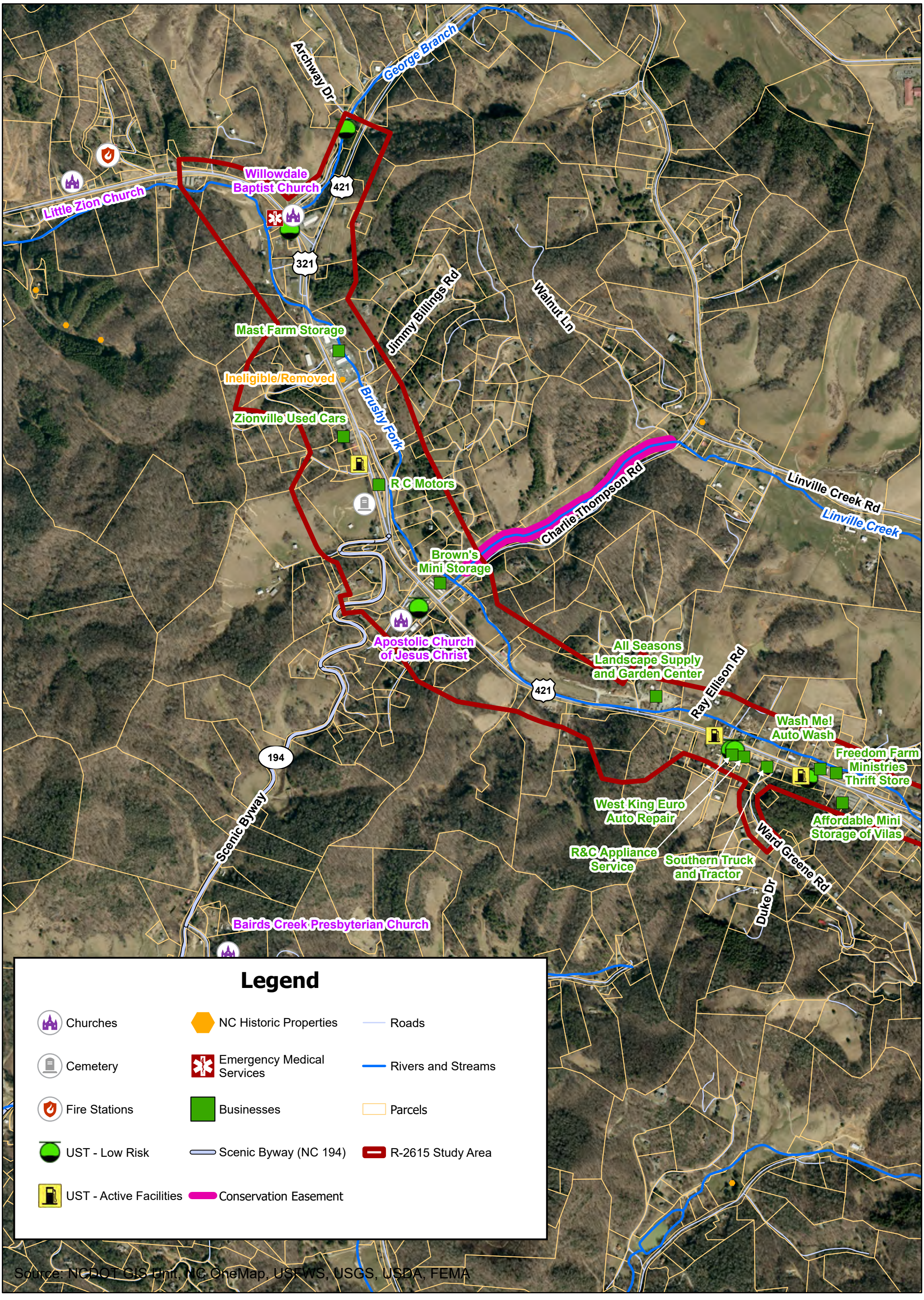
R-2615

Widen US 321/US 421
Junction near Vilas to SR 1107 (105 Bypass)

County: Watauga
Division: 11 WBS:
38819.1.2

N

0 0.25 0.5 1 Miles



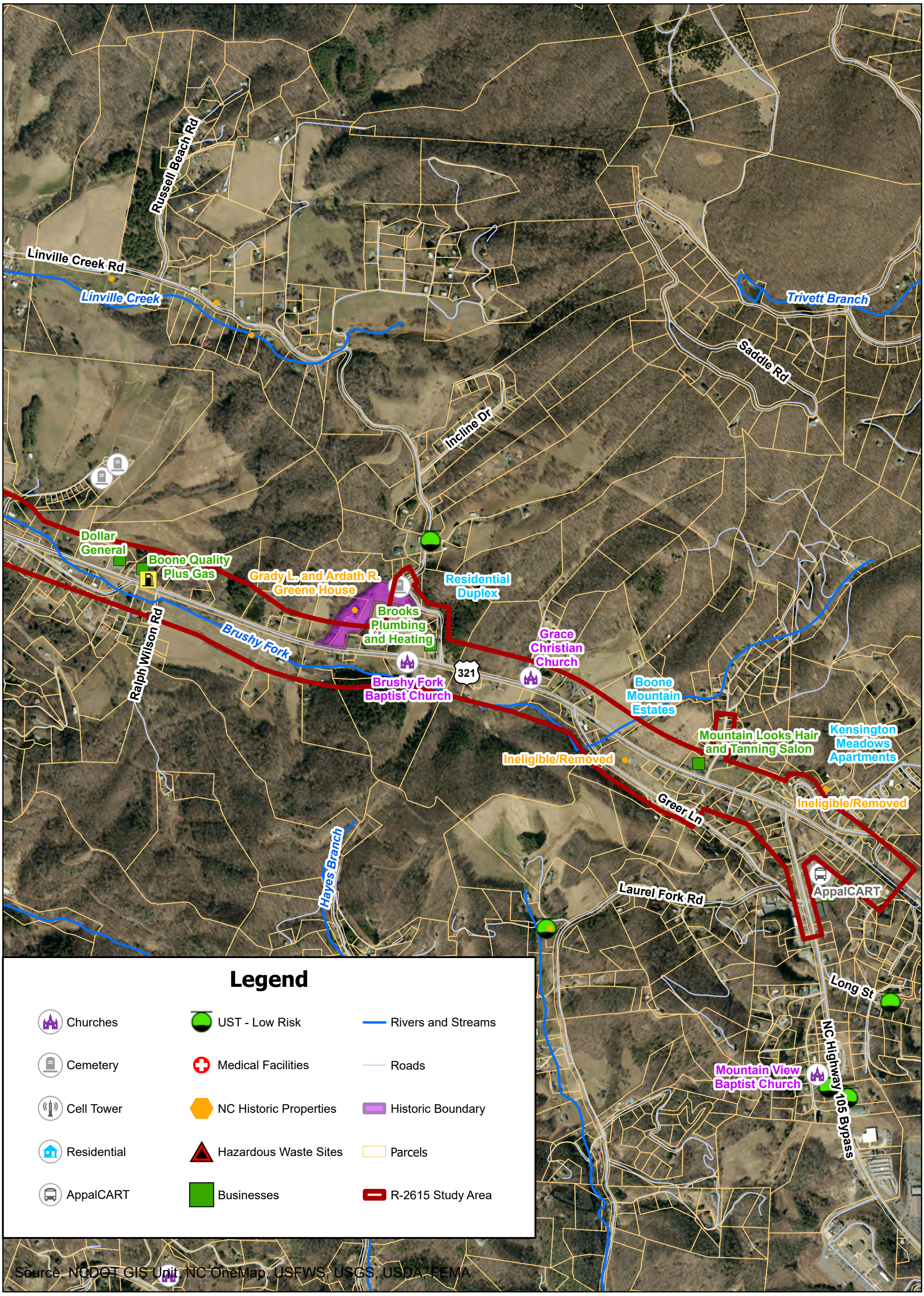
Environmental Features
Widen US 321/421
Junction near Vilas to SR 1107

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

N

0 0.2 0.4 Miles

Figure 2A



Environmental Features
Widen US 321/421
Junction near Vilas to SR 1107

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

N

0 0.2 0.4 Miles

WGI

Figure 2B

Appendix A

Jurisdictional Resources

Characteristics of Jurisdictional Streams in the Study Area

Stream Name	NRTR Map ID	NCDWR Index Number	Best Usage Classification	NCSAM Rating	Classification
Brushy Fork	Brushy Fork	8-15-10	C	NA	Perennial
George Branch	George Branch	8-15-10-2	C	NA	Perennial
Linville Creek	Linville Creek	8-15-10-1	C	NA	Perennial
UT to Brushy Fork	SA	8-15-10	C	NA	Perennial
UT to Brushy Fork	SB	8-15-10	C	NA	Perennial
UT to George Branch	SC	8-15-10-2	C	NA	Perennial
UT to Brushy Fork	SD	8-15-10	C	Low	Intermittent
UT to George Branch	SE	8-15-10-2	C	NA	Perennial
UT to Brushy Fork	SF	8-15-10	C	NA	Perennial
UT to Brushy Fork	SG	8-15-10	C	NA	Perennial
UT to Brushy Fork	SH	8-15-10	C	Low	Intermittent
UT to Brushy Fork	SI	8-15-10	C	Medium	Intermittent
UT to Brushy Fork	SI	8-15-10	C	NA	Perennial
UT to Brushy Fork	SJ	8-15-10	C	Low	Intermittent
UT to Brushy Fork	SK	8-15-10	C	Medium	Intermittent
UT to Brushy Fork	SL	8-15-10	C	NA	Perennial
UT to Brushy Fork	SM	8-15-10	C	Medium	Intermittent
UT to Brushy Fork	SN	8-15-10	C	NA	Perennial
UT to Brushy Fork	SO	8-15-10	C	Low	Intermittent
UT to Brushy Fork	SP	8-15-10	C	Low	Intermittent
UT to Brushy Fork	SQ	8-15-10	C	NA	Perennial
UT to Brushy Fork	SR	8-15-10	C	NA	Perennial
UT to Brushy Fork	SS	8-15-10	C	High	Intermittent
UT to Brushy Fork	ST	8-15-10	C	NA	Perennial
UT to Brushy Fork	SU	8-15-10	C	Medium	Intermittent
UT to Brushy Fork	SV	8-15-10	C	NA	Perennial
UT to Brushy Fork	SW	8-15-10	C	NA	Perennial
UT to Brushy Fork	SX	8-15-10	C	Medium	Intermittent
UT to Brushy Fork	SY	8-15-10	C	Low	Intermittent
UT to Brushy Fork	SY	8-15-10	C	NA	Perennial
UT to Brushy Fork	SZ	8-15-10	C	NA	Perennial
UT to Brushy Fork	SAA	8-15-10	C	NA	Perennial
UT to Brushy Fork	SAB	8-15-10	C	High	Intermittent
UT to Brushy Fork	SAC	8-15-10	C	NA	Perennial
UT to Brushy Fork	SAC	8-15-10	C	Medium	Intermittent
UT to Brushy Fork	SAD	8-15-10	C	NA	Perennial
UT to Brushy Fork	SAE	8-15-10	C	Medium	Intermittent
UT to Brushy Fork	SAF	8-15-10	C	NA	Perennial
UT to Brushy Fork	SAG	8-15-10	C	NA	Perennial
UT to Brushy Fork	SAH	8-15-10	C	NA	Perennial
UT to Brushy Fork	SAI	8-15-10	C	NA	Perennial

UT to Brushy Fork	SAJ	8-15-10	C	NA	Perennial
UT to Brushy Fork	SAK	8-15-10	C	High	Intermittent
UT to Brushy Fork	SAK	8-15-10	C	NA	Perennial
UT to Brushy Fork	SAL	8-15-10	C	High	Intermittent
UT to Brushy Fork	SAM	8-15-10	C	Low	Intermittent

*Perennial streams did not have NCSAM evaluations completed. These streams can be evaluated during permitting if impacted.

Characteristics of Wetlands in the Study Area

Map ID*	NRTR Figure Number	NCWAM Classification	Forested	NCWAM Rating	Hydrologic Classification	Area (ac.) in Study Area
WA	4B	Non-Tidal Freshwater Marsh	No	Medium	Riparian	0.20
WB	4B	Non-Tidal Freshwater Marsh	No	Medium	Riparian	0.01
WC	4B	Headwater Forest	Yes	High	Riparian	0.01
WD	4B	Headwater Forest	Yes	Medium	Riparian	0.01
WE	4C	Non-Tidal Freshwater Marsh	No	Medium	Riparian	0.01
WF	4C	Headwater Forest	No	Medium	Riparian	0.01
WG	4C	Headwater Forest	No	Medium	Riparian	0.04
WH	4C	Headwater Forest	No	Low	Riparian	0.06
WI	4C	Non-Tidal Freshwater Marsh	No	Medium	Riparian	0.03
WJ	4C	Non-Tidal Freshwater Marsh	No	Medium	Riparian	0.01
WK	4C	Headwater Forest	No	Low	Riparian	0.19
WL	4C	Headwater Forest	No	High	Riparian	0.01
WM	4D	Headwater Forest	No	Medium	Riparian	0.13
WN	4D	Headwater Forest	No	High	Riparian	0.01
WO	4D	Headwater Forest	No	Medium	Riparian	0.05
WP	4D	Non-Tidal Freshwater Marsh	No	Medium	Riparian	0.02
WQ	4D	Non-Tidal Freshwater Marsh	No	Low	Riparian	0.04
WR	4D	Bottomland Hardwood Forest	Yes	High	Riparian	0.02
WS	4D	Non-Tidal Freshwater Marsh	No	Low	Riparian	0.03
WT	4D	Non-Tidal Freshwater Marsh	No	Low	Riparian	0.06
WW	4E	Headwater Forest	No	High	Riparian	0.01
WX	4E	Headwater Forest	No	High	Riparian	0.01

Map ID*	NRTR Figure Number	NCWAM Classification	Forested	NCWAM Rating	Hydrologic Classification	Area (ac.) in Study Area
WZ	4E	Non-Tidal Freshwater Marsh	No	Low	Riparian	<0.01
WAA	4E	Non-Tidal Freshwater Marsh	No	Low	Riparian	0.05
WAB	4E	Headwater Forest	Yes	High	Riparian	0.04
WAD	4E	Headwater Forest	Yes	High	Riparian	0.02
WAE	4F	Non-Tidal Freshwater Marsh	No	Medium	Riparian	0.01
WAF	4F	Headwater Forest	No	Medium	Riparian	0.01
WAG	4F	Headwater Forest	Yes	High	Riparian	0.15
WAH	4F	Headwater Forest	No	Low	Riparian	0.03
WAI	4F	Headwater Forest	No	Medium	Riparian	0.01
WAJ	4F	Bottomland Hardwood Forest	Yes	High	Riparian	0.07
WAK	4F	Headwater Forest	No	Medium	Riparian	0.01
WAL	4F	Non-Tidal Freshwater Marsh	Yes	High	Riparian	0.09
WAN	4G	Headwater Forest	No	Medium	Riparian	0.11
WAO	4G	Headwater Forest	No	Medium	Riparian	0.05
WAP	4G	Headwater Forest	Yes	High	Riparian	0.01
WAQ	4G	Headwater Forest	Yes	High	Riparian	0.03
WAT	4H	Headwater Forest	No	Low	Riparian	0.06
WAU	4H	Headwater Forest	No	Medium	Riparian	0.09
WAV	4H	Headwater Forest	No	Medium	Riparian	0.02
WAX	4H	Headwater Forest	No	Medium	Riparian	0.01
WAY	4H	Headwater Forest	No	Medium	Riparian	0.06
WAZ	4H	Headwater Forest	No	Low	Riparian	0.02
WBA	4H	Headwater Forest	No	High	Riparian	0.01
WBB	4I	Headwater Forest	No	Medium	Riparian	0.03
WBC	4H	Headwater Forest	No	Low	Riparian	0.04
WBE	4E	Headwater Forest	No	Medium	Riparian	0.01
WBF	4E	Headwater Forest	Yes	Medium	Riparian	0.07
WBG	4D	Headwater Forest	Yes	Medium	Riparian	<0.01
WBH	4C	Headwater Forest	No	High	Riparian	<0.01
WBI	4F	Headwater Forest	No	Low	Riparian	0.01
WBJ	4G	Headwater Forest	No	Low	Riparian	0.03
WBK	4F	Seep	No	Low	Non-riparian	0.05
WBL	4E	Headwater Forest	No	Low	Riparian	0.01
WBM	4D	Headwater Forest	No	Low	Riparian	0.03
WBN	4C	Headwater Forest	No	Medium	Riparian	0.10
WBO	4C	Seep	No	Medium	Non-riparian	0.01
WBP	4D	Headwater Forest	No	Low	Riparian	0.02

Map ID*	NRTR Figure Number	NCWAM Classification	Forested	NCWAM Rating	Hydrologic Classification	Area (ac.) in Study Area
WBQ	4B	Non-Tidal Freshwater Marsh	Yes	Medium	Riparian	0.03
WBR	4C	Bottomland Hardwood Forest	Yes	High	Riparian	<0.01
WBS	4C	Headwater Forest	No	Medium	Riparian	0.06
WBT	4C	Headwater Forest	No	Low	Riparian	0.02
WBU	4C	Headwater Forest	No	High	Riparian	0.02
WBV	4C	Headwater Forest	No	Low	Riparian	0.07
WBW	4C	Non-Tidal Freshwater Marsh	No	Medium	Riparian	0.01
WBX	4C	Seep	Yes	High	Non-riparian	0.07
WBY	4D	Headwater Forest	Yes	Low	Riparian	0.04
WBZ	4D	Headwater Forest	Yes	Medium	Riparian	0.02
WCA	4E	Headwater Forest	No	High	Riparian	0.57
WCB	4H	Headwater Forest	No	Medium	Riparian	0.01
WCC	4H	Headwater Forest	No	High	Riparian	0.04
WCD	4H	Seep	No	Low	Non-riparian	0.07
WCE**	4F	Non-Tidal Freshwater Marsh	No	NA	Riparian	0.06

Jurisdictional resources impact quantities for the Left Alignment Alternative by Figure

Figure 4A			
Streams		Wetlands	
Name	Length (Ft)	Name	Area (Ac)
Stream D	52.83	Wetland E	0.0019
Brushy Fork Creek	196.44	Wetland H	0.01
Stream F	94.39	Wetland K	0.03
Figure 5A			
Streams		Wetlands	
Name	Length (Ft)	Name	Area (Ac)
Brushy Fork Creek	930.58	Wetland P	0.01
Brushy Fork Creek	1656.93	Wetland O	0.05
Stream I	77.24	Wetland N	0.01
Brushy Fork Creek	463.81	Wetland M	0.02
Stream K	28.09	Wetland S	0.02
Stream J	313.52	Wetland T	0.06
		Wetland Z	0.00076
		Wetland AA	0.0032
Figure 6A			
Streams		Wetlands	
Name	Length (Ft)	Name	Area (Ac)
Brushy Fork Creek	808.47	Wetland AA	0.04
Stream R	24.84	Wetland AG	0.01
Figure 7A			
Streams		Wetlands	
Name	Length (Ft)	Name	Area (Ac)
Stream R	131.98	Wetland AH	0.03
Brushy Fork Creek	1434.35	Wetland BK	0.06
Stream T	298.78	Wetland AJ	0.06
Stream V	161.74	Wetland AK	0.01
		Wetland AL	0.09
		Wetland AI	0.00077
		Wetland AQ	0.00052
Figure 8A			
Streams		Wetlands	
Name	Length (Ft)	Name	Area (Ac)
Stream W	158.6		
Stream X	105.4		
Stream Y	288.92		

Figure 9A			
Streams		**Wetlands**	
Name	**Length (Ft)**	**Name**	**Area (Ac)**
Stream Z	259.41	Wetland AZ	0.01
Stream AA	208.34		
Stream AB	4.97		
Stream AC	26.65		

Jurisdictional resources impact quantities for the Right Alignment Alternative by Figure

Figure 4B			
Streams		**Wetlands**	
Name	**Length (Ft)**	**Name**	**Area (Ac)**
Stream D	58.68	Wetland K	0.1
Brushy Fork Creek	209.46		
Stream F	51.81		
Figure 5B			
Streams		**Wetlands**	
Name	**Length (Ft)**	**Name**	**Area (Ac)**
Brushy Fork Creek	2125.58	Wetland O	0.05
Stream I	30.46	Wetland P	0.0059
Stream L	7.19	Wetland M	0.04
Stream K	28.09	Wetland N	0.01
Stream J	313.52	Wetland T	0.01
		Wetland AA	0.003
Figure 6B			
Streams		**Wetlands**	
Name	**Length (Ft)**	**Name**	**Area (Ac)**
Stream N	43.59	Wetland AA	0.04
Stream R	22.29		
Brushy Fork Creek	160.59		
Figure 7B			
Streams		**Wetlands**	
Name	**Length (Ft)**	**Name**	**Area (Ac)**
Brushy Fork Creek	2470.37	Wetland AH	0.03
Stream R	63.78	Wetland BK	0.06
Stream T	297.44	Wetland AJ	0.06
Stream V	109.8	Wetland AK	0.01
		Wetland AL	0.09
		Wetland AN	0.11
		Wetland AO	0.15
Figure 8B			
Streams		**Wetlands**	
Name	**Length (Ft)**	**Name**	**Area (Ac)**
Stream W	162.61		
Stream X	152.49		
Stream Y	367.78		

Figure 9B			
Streams		**Wetlands**	
Name	**Length (Ft)**	**Name**	**Area (Ac)**
Stream Z	253.2	Wetland AZ	0.02
Stream AB	4.97		
Stream AA	250.1		
Stream AC	118.62		

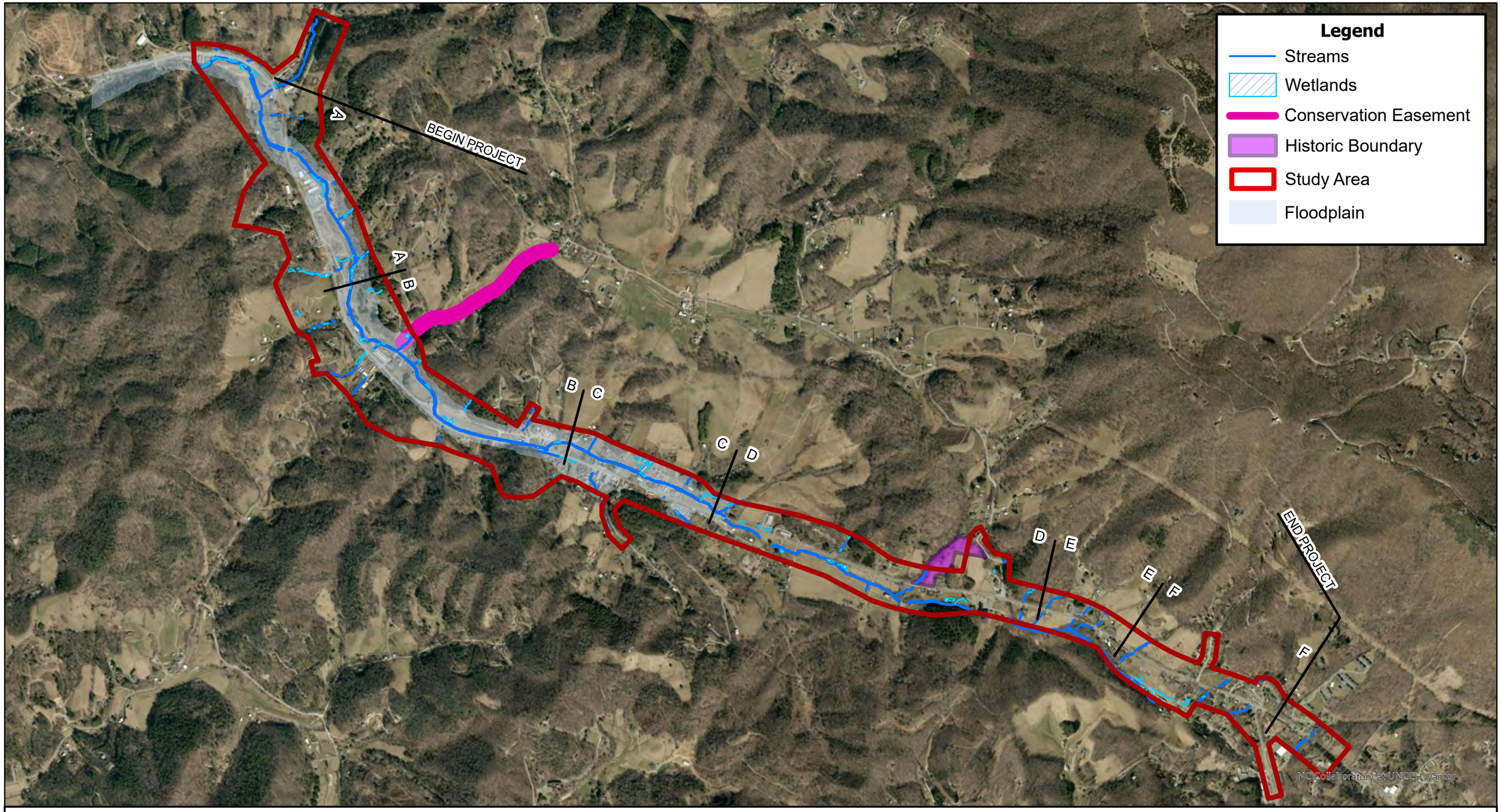
Jurisdictional resources impact quantities for the Best Fit Alignment Alternative by Figure

Figure 4A			
Streams		**Wetlands**	
Name	**Length (Ft)**	**Name**	**Area (Ac)**
George Branch	128.96	Wetland A	0.004
Stream D	51.88	Wetland C	0.016
Brushy Fork Creek	283.68	Wetland E	0.0019
Stream F	118.96	Wetland H	0.03
		Wetland K	0.08
Figure 5C			
Streams		**Wetlands**	
Name	**Length (Ft)**	**Name**	**Area (Ac)**
Brushy Fork Creek	2140.05	Wetland L	0.02
Stream L	7.19	Wetland BH	0.001
Stream K	3.52	Wetland O	0.05
Stream J	313.52	Wetland M	0.04
Stream G	296.99	Wetland N	0.01
Stream I	15.67	Wetland Z	0.00076
		Wetland AA	0.003
Figure 6C			
Streams		**Wetlands**	
Name	**Length (Ft)**	**Name**	**Area (Ac)**
Stream N	92.38	Wetland AA	0.04
Stream Q	3.89		
Brushy Fork Creek	248.15		
Figure 7C			
Streams		**Wetlands**	
Name	**Length (Ft)**	**Name**	**Area (Ac)**
Brushy Fork Creek	1354.12	Wetland AH	0.03
Stream R	100.57	Wetland BK	0.06
Stream T	280.38	Wetland AI	0.001
Stream V	117.09	Wetland AJ	0.06
Stream S	33.64	Wetland AK	0.01
		Wetland AL	0.09
		Wetland AN	0.01

Figure 8C			
Streams		**Wetlands**	
Name	**Length (Ft)**	**Name**	**Area (Ac)**
Stream W	164.23		
Stream X	138.37		
Stream Y	346.76		
Brushy Fork Creek	12.28		
Figure 9C			
Streams		**Wetlands**	
Name	**Length (Ft)**	**Name**	**Area (Ac)**
Stream Z	303.94		0.004
Stream AA	209.78		
Stream AC	38.56		
Stream AB	4.97		

Appendix B

Figures 4 to 9 and Estimated Impact Quantities by Map Segment by Build Alternatives



NORTH CAROLINA DEPRTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 11

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

R-2615
Widen US 321/US 421
Junction near Vilas to SR 1107 (105 Bypass)
Overall Map - Potential Alternatives - Segment Breaks

N

0 950 1,900 3,800 Feet

WGI

3

Legend

- Streams
- Wetlands
- Slope Stakes
- Impact Area - Left Alignment
- Study Area
- Floodplain

421

321

George Branch

BEGIN PROJECT

Brushy Fork

Jimmy Billings Rd

Vilas Overlook

Abby Ln

A

MATCH LINE

B

NC Collaboratory at UNCCH, Vantor

NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION DIVISION
OF HIGHWAYS DIVISION 11

R-2615
Widen US 321/US 421
Junction near Vilas
to SR 1107 (105 Bypass)
Left Alignment

N

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May 2026

0 250 500 Feet

WGI

4A

Legend

- Streams
- Wetlands
- Slope Stakes
- Impact Area - Right Alignment
- Study Area
- Floodplain

421

George Branch

321

BEGIN PROJECT

Brushy Fork

Jimmy Billings Rd

Vilas Overlook

Abby Ln

A

MATCH LINE

B

NC Collaboratory at UNCCH, Vantor

NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION DIVISION
OF HIGHWAYS DIVISION 11

R-2615
Widen US 321/US 421
Junction near Vilas
to SR 1107 (105 Bypass)
Right Alignment

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

0 250 500 Feet

4B

Legend

- Streams
- Wetlands
- Slope Stakes
- Impact Area - Best Fit Alignment
- Study Area
- Floodplain

BEGIN PROJECT

421

321

George Branch

Brushy Fork

Jimmy Billings Rd

Vilas Overlook

Abby Ln

A

MATCH LINE

B

NC Collaboratory at UNCCH, Microsoft, Vantor

NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION DIVISION
OF HIGHWAYS DIVISION 11

R-2615
Widen US 321/US 421
Junction near Vilas
to SR 1107 (105 Bypass)
Best Fit Alignment

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

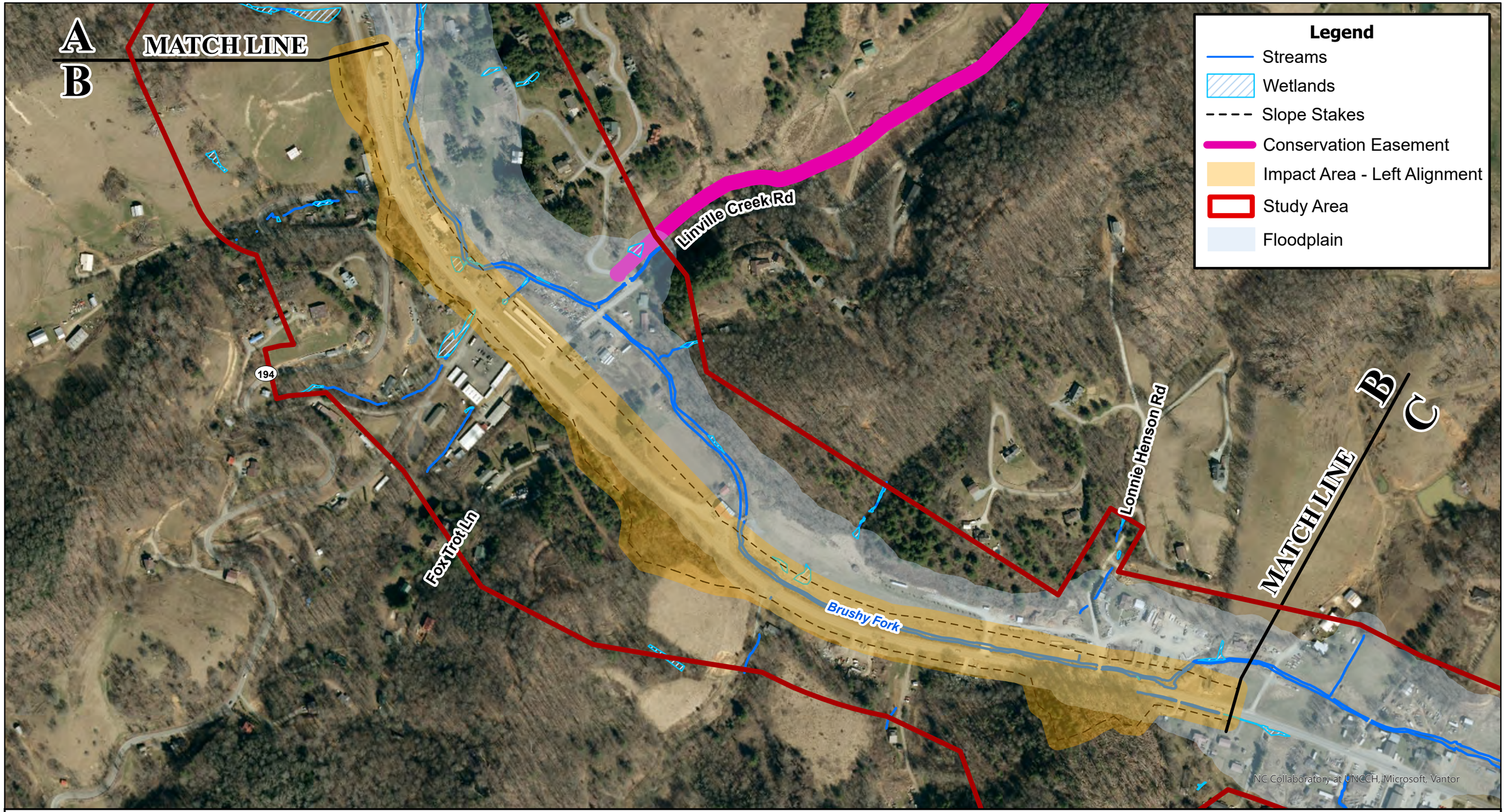
0 250 500 Feet

4C

Potential Impacts to Resources by Build Alternative – Map 4[1]

Resource	Left Widening	Right Widening	Best Fit Widening[2]
Streams (ft)	343.66	319.95	583.48
Wetlands (ac)	0.042	0.01	0.132
EMS Facilities	0	0	1
Churches	1	1	0
Cemeteries	0	0	0
Potential Historic Architecture Sites	0	0	0
Residential Properties	5	3	6
Multi-family Bldgs.	0	0	0
Businesses	4	3	4
Post Office	1	1	1

1-Impacts measured based on slope stake limits plus an additional 40 feet.
2-The Best Fit Alternative defaulted to symmetrical widening for the village of Vilas and impact quantities includes preliminary design for Y-lines.



NORTH CAROLINA DEPRTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 11

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

R-2615
Widen US 321/US 421
Junction near Vilas to SR 1107 (105 Bypass)
Left Alignment

N

0 250 500 1,000
Feet

WGI

5A

A
B
MATCH LINE
Linville Creek Rd
194
Fox Trot Ln
Brushy Fork
Lonnie Henson Rd
B
C
MATCH LINE
NC Collaboratory at UNCCH, Microsoft, Vantor

Legend
- Streams
- Wetlands
- Slope Stakes
- Conservation Easement
- Impact Area - Right Alignment
- Study Area
- Floodplain

NORTH CAROLINA DEPRTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 11

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

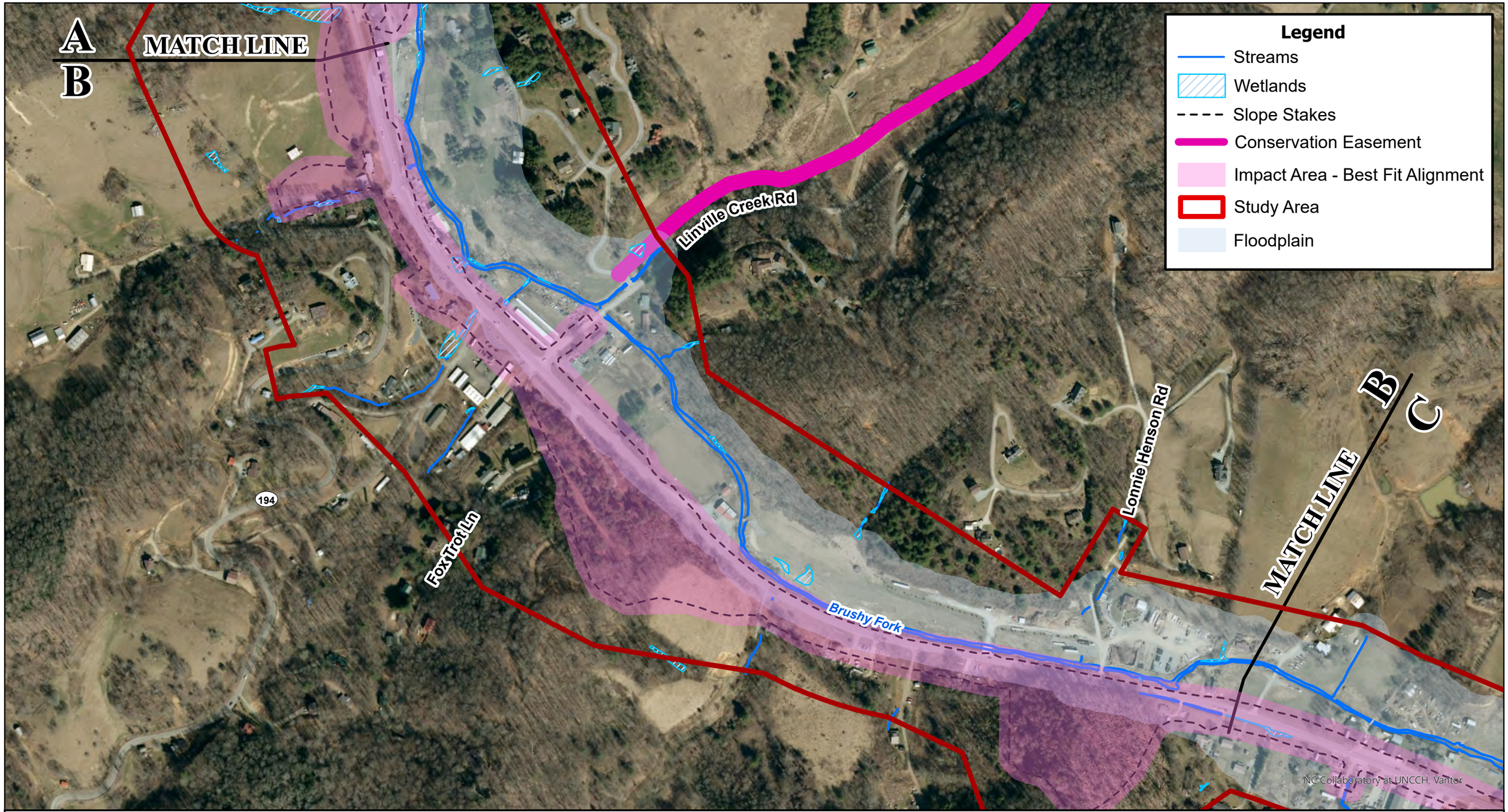
R-2615
Widen US 321/US 421
Junction near Vilas to SR 1107 (105 Bypass)
Right Alignment

N

0 250 500 1,000 Feet

WGI

5B



NORTH CAROLINA DEPRTMENT
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DIVISION OF HIGHWAYS
DIVISION 11

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

R-2615
Widen US 321/US 421
Junction near Vilas to SR 1107 (105 Bypass)
Best Fit Alignment

N

0 250 500 1,000
Feet

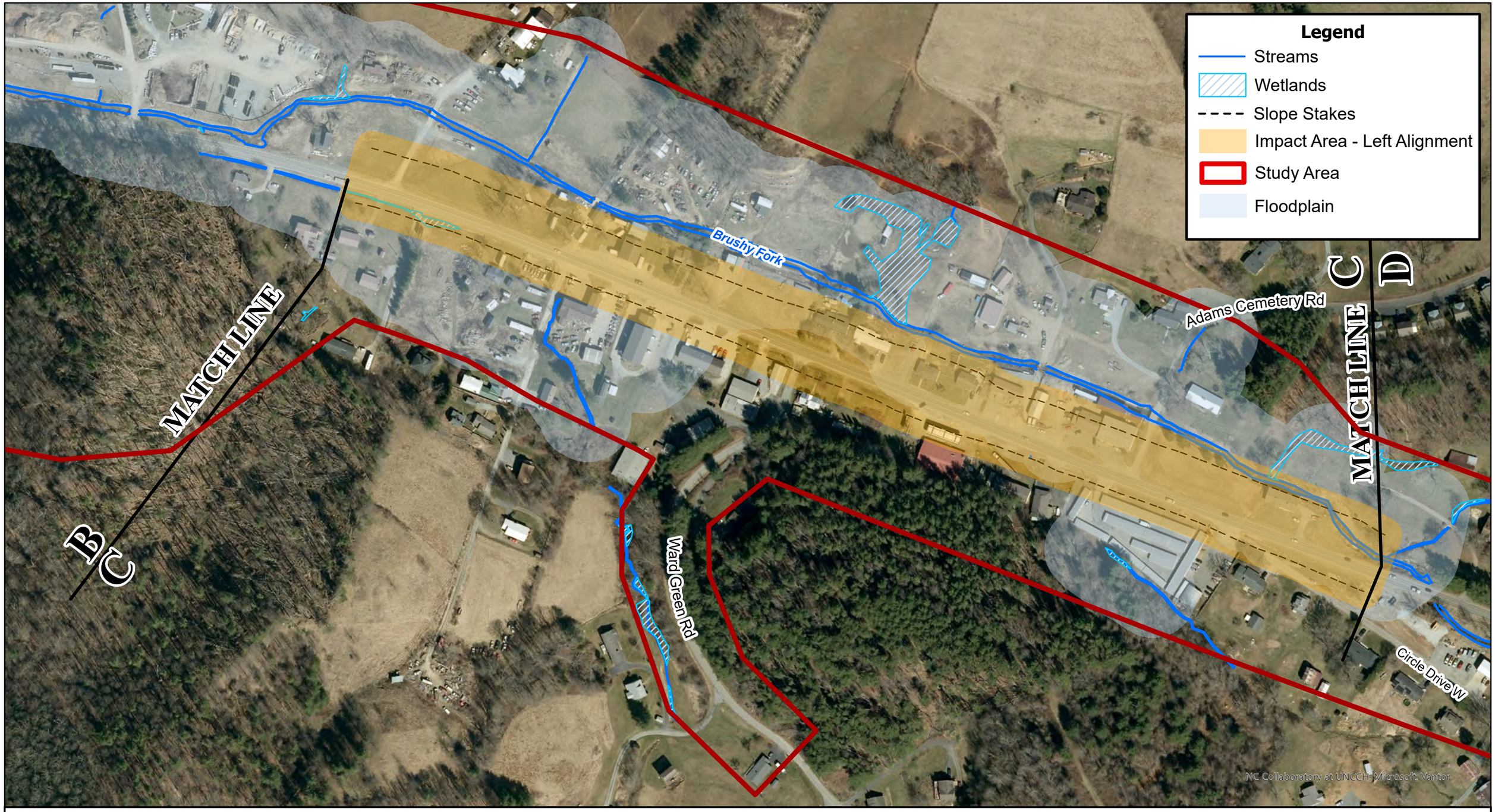
WGI

5C

Potential Impacts to Resources by Build Alternative – Map 5[1]

Resource	Left Widening	Right Widening	Best Fit Widening[2]
Streams (ft)	3,470.18	2,504.84	2,776.92
Wetlands (ac)	0.174	0.119	0.125
EMS Facilities	0	0	0
Churches	0	0	0
Cemeteries	0	0	0
Potential Historic Architecture Sites	0	0	0
Residential Properties	8	12	12
Multi-family Bldgs.	0	0	0
Businesses	6	6	6

1-Impacts measured based on slope stake limits plus an additional 40 feet.
2-The Best Fit Alternative defaulted to symmetrical widening for the village of Vilas and impact quantities includes preliminary design for Y-lines.



NORTH CAROLINA DEPRTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 11

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

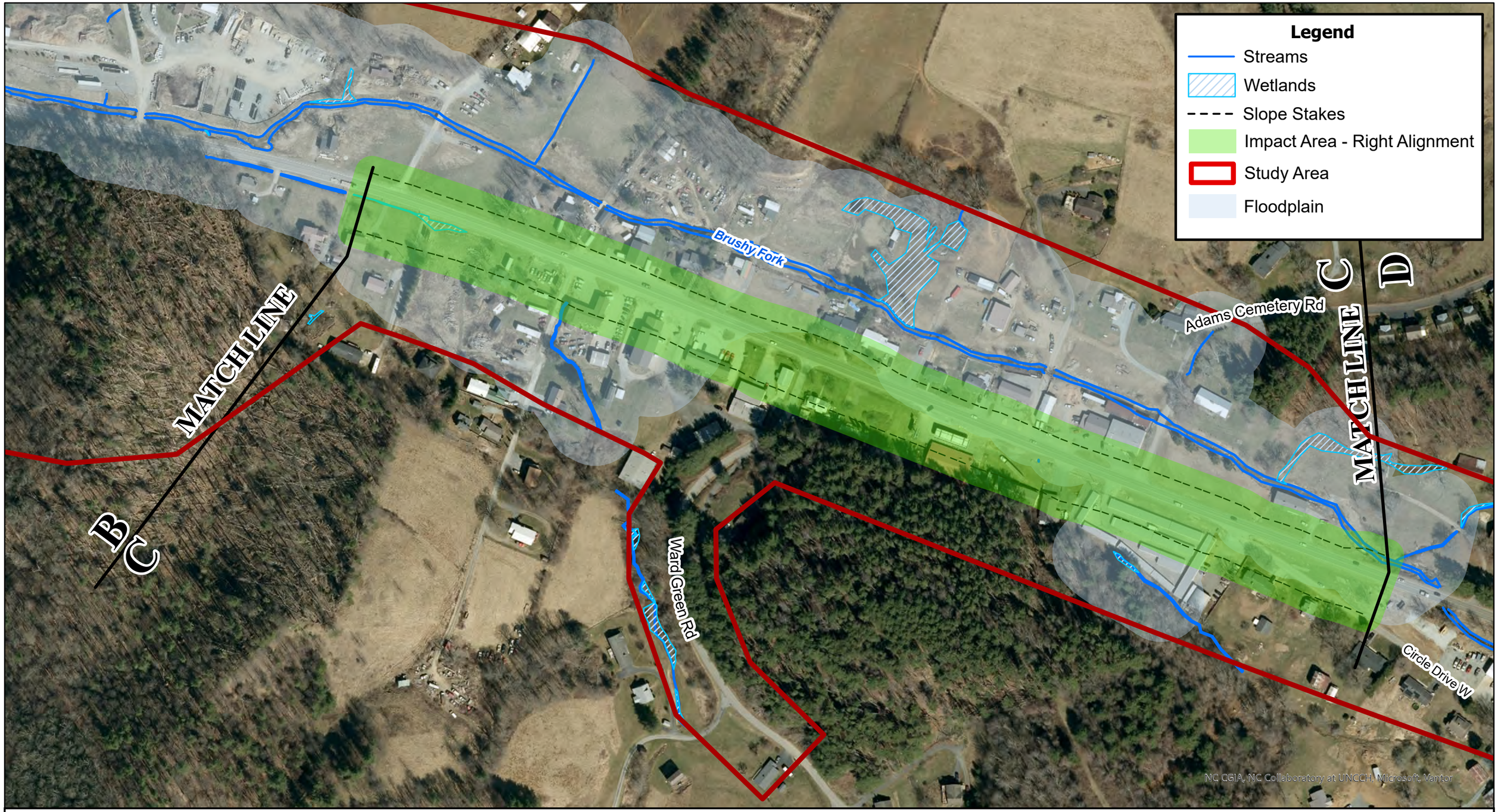
R-2615
Widen US 321/US 421
Junction near Vilas to SR 1107 (105 Bypass)
Left Alignment

N

0 125 250 500 Feet

WGI

6A



NORTH CAROLINA DEPRTMENT
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DIVISION OF HIGHWAYS
DIVISION 11

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

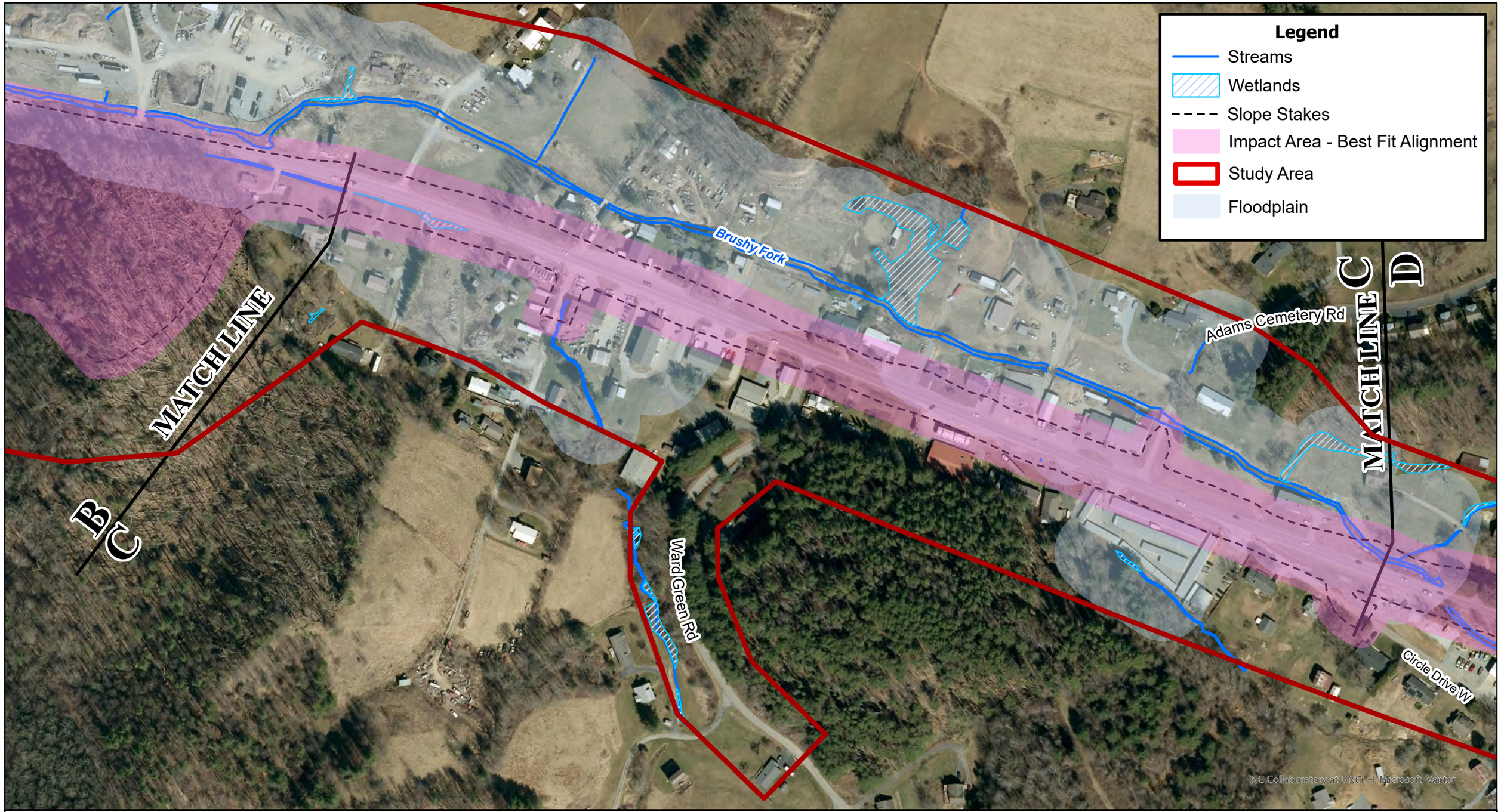
R-2615
Widen US 321/US 421
Junction near Vilas to SR 1107 (105 Bypass)
Right Alignment

N

0 125 250 500
Feet

WGI

6B



NORTH CAROLINA DEPRTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 11

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

R-2615
Widen US 321/US 421
Junction near Vilas to SR 1107 (105 Bypass)
Best Fit Alignment

N

0 125 250 500
Feet

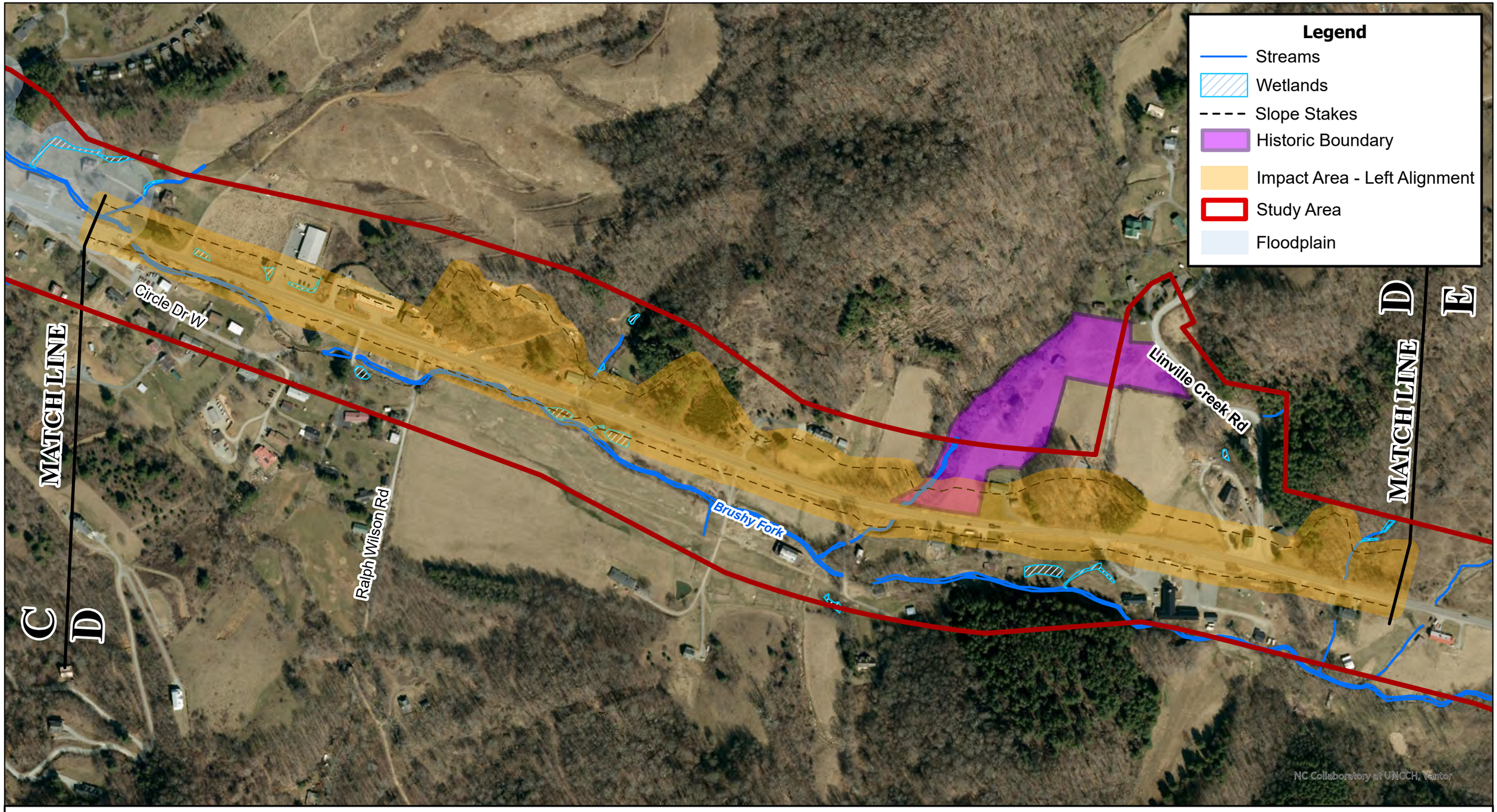
WGI

6C

Potential Impacts to Resources by Build Alternative – Map 6[1]

Resource	Left Widening	Right Widening	Best Fit Widening[2]
Streams (ft)	833.31	226.47	344.42
Wetlands (ac)	0.05	0.04	0.04
EMS Facilities	0	0	0
Churches	0	0	0
Cemeteries	0	0	0
Potential Historic Architecture Sites	0	0	0
Residential Properties	12	15	12
Multi-family Bldgs.	1	1	1
Businesses	8	9	9

1-Impacts measured based on slope stake limits plus an additional 40 feet.
2-The Best Fit Alternative defaulted to symmetrical widening for the village of Vilas and impact quantities includes preliminary design for Y-lines.



NORTH CAROLINA DEPRTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 11

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

R-2615
Widen US 321/US 421
Junction near Vilas to SR 1107 (105 Bypass
Left Alignment

N

0 250 500 1,000
Feet

WGI

7A

NORTH CAROLINA DEPRTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 11

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

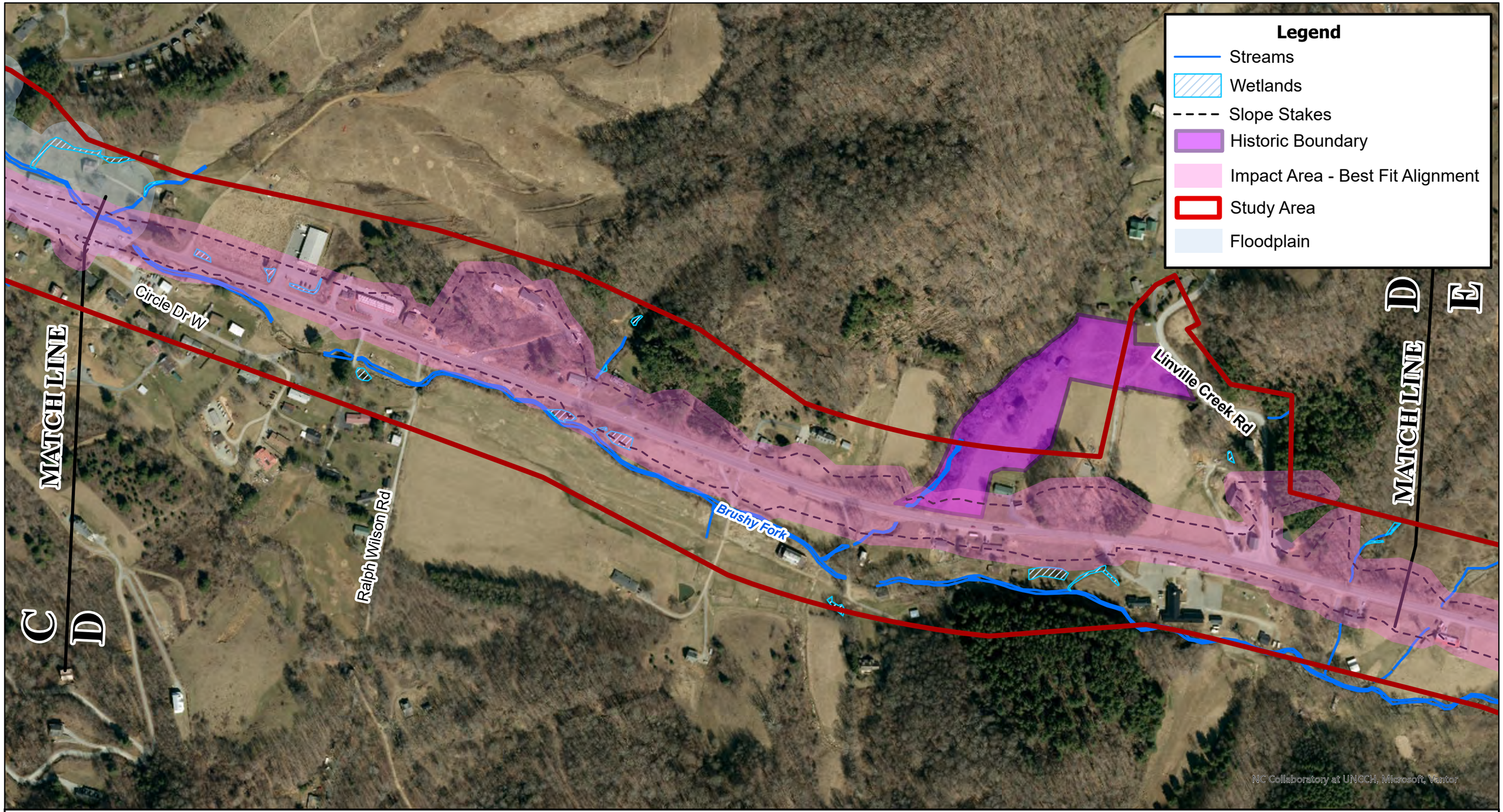
R-2615
Widen US 321/US 421
Junction near Vilas to SR 1107 (105 Bypass
Right Alignment

N

0 250 500 1,000
Feet

WGI

7B



NORTH CAROLINA DEPRTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 11

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

R-2615
Widen US 321/US 421
Junction near Vilas to SR 1107 (105 Bypass
Best Fit Alignment

N

0 250 500 1,000 Feet

WGI

7C

Potential Impacts to Resources by Build Alternative – Map 7[1]

Resource	Left Widening	Right Widening	Best Fit Widening[2]
Streams (ft)	2,026.85	2,961.39	1,885.82
Wetlands (ac)	0.251	0.51	0.261
EMS Facilities	0	0	0
Churches	0	0	0
Cemeteries	0	0	0
Potential Historic Architecture Sites	1	1	1
Residential Properties	8	11	8
Multi-family Bldgs.	1	0	1
Businesses	3	3	4

1-Impacts measured based on slope stake limits plus an additional 40 feet.
2-The Best Fit Alternative defaulted to symmetrical widening for the village of Vilas and impact quantities includes preliminary design for Y-lines.

NORTH CAROLINA DEPRTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 11

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

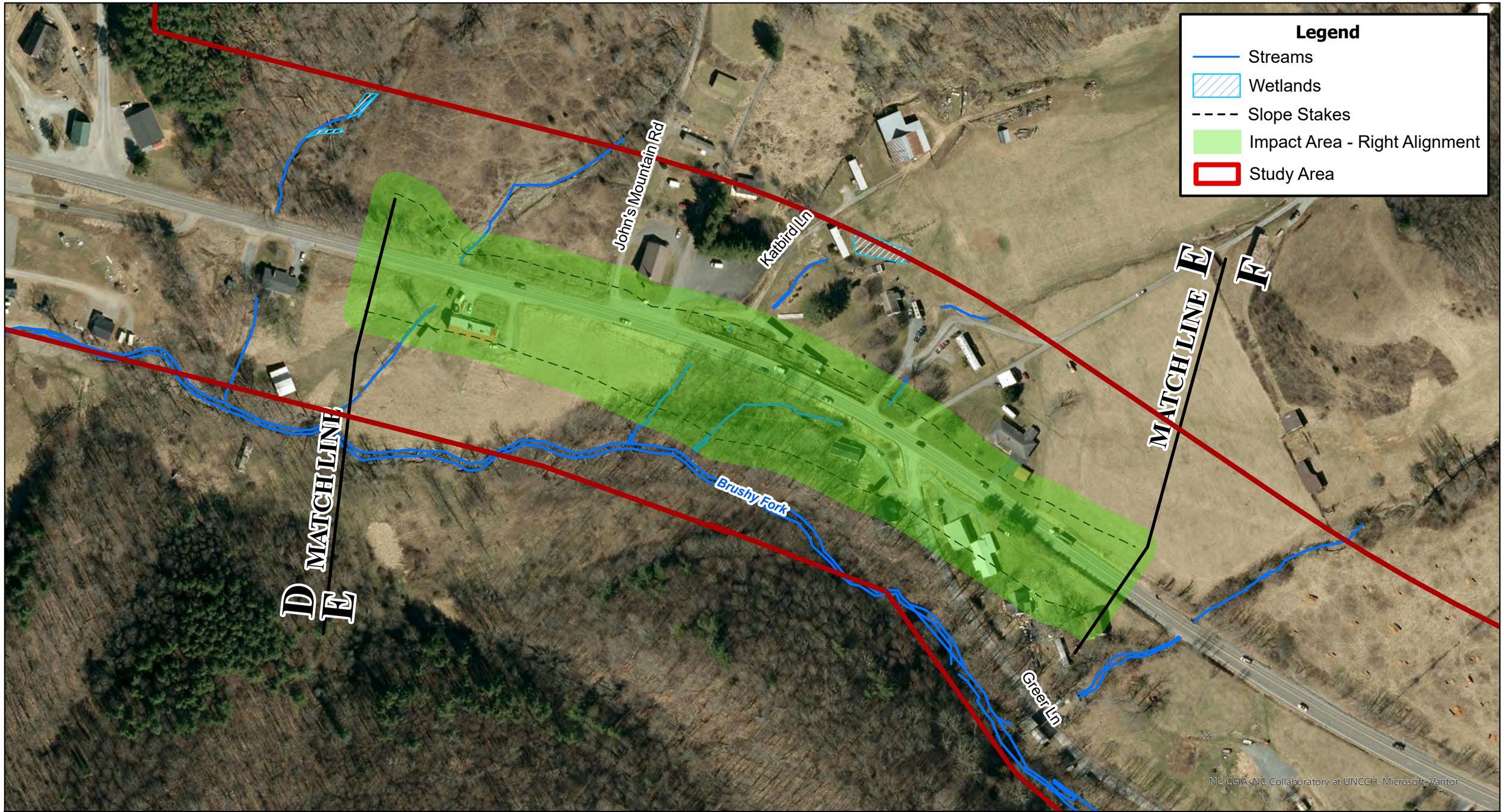
R-2615
Widen US 321/US 421
Junction near Vilas to SR 1107 (105 Bypass)
Left Alignment

N

0 250 500 Feet

WGI

8A



NORTH CAROLINA DEPRTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 11

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

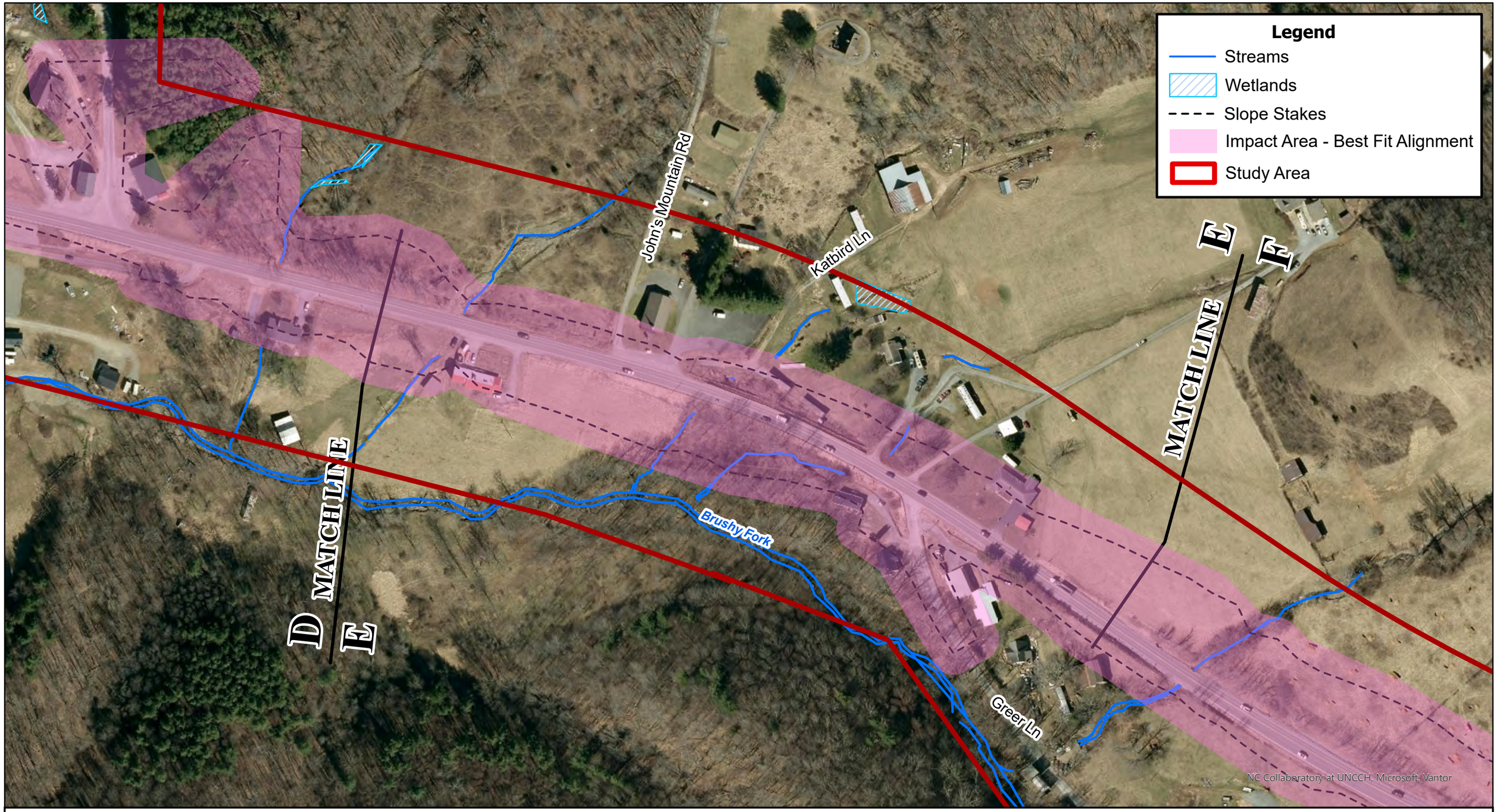
R-2615
Widen US 321/US 421
Junction near Vilas to SR 1107 (105 Bypass)
Right Alignment

N

0 250 500 Feet

WGI

8B



NORTH CAROLINA DEPRTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 11

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

R-2615
Widen US 321/US 421
Junction near Vilas to SR 1107 (105 Bypass)
Best Fit Alignment

N

0 250 500 Feet

WGI

8C

Potential Impacts to Resources by Build Alternative – Map 8[1]

Resource	Left Widening	Right Widening	Best Fit Widening[2]
Streams (ft)	552.92	682.88	661.64
Wetlands (ac)	0	0	0
EMS Facilities	0	0	0
Churches	1	1	1
Cemeteries	0	0	0
Potential Historic Architecture Sites	0	0	0
Residential Properties	6	7	8
Multi-family Bldgs.	0	0	0
Businesses	4	5	4

1-Impacts measured based on slope stake limits plus an additional 40 feet.
2-The Best Fit Alternative defaulted to symmetrical widening for the village of Vilas and impact quantities includes preliminary design for Y-lines.

NORTH CAROLINA DEPRTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 11

County: Watauga
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Date: May, 2026

R-2615
Widen US 321/US 421
Junction near Vilas to SR 1107 (105 Bypass)
Left Alignment

N

0 250 500 1,000 Feet

WGI

9A

NORTH CAROLINA DEPRTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 11

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

R-2615
Widen US 321/US 421
Junction near Vilas to SR 1107 (105 Bypass)
Right Alignment

N

0 250 500 1,000 Feet

9B

NORTH CAROLINA DEPRTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 11

County: Watauga
Division: 11
WBS: 38819.1.2
Date: May, 2026

R-2615
Widen US 321/US 421
Junction near Vilas to SR 1107 (105 Bypass)
Best Fit Alignment

N

0 250 500 1,000 Feet

WGI

9C

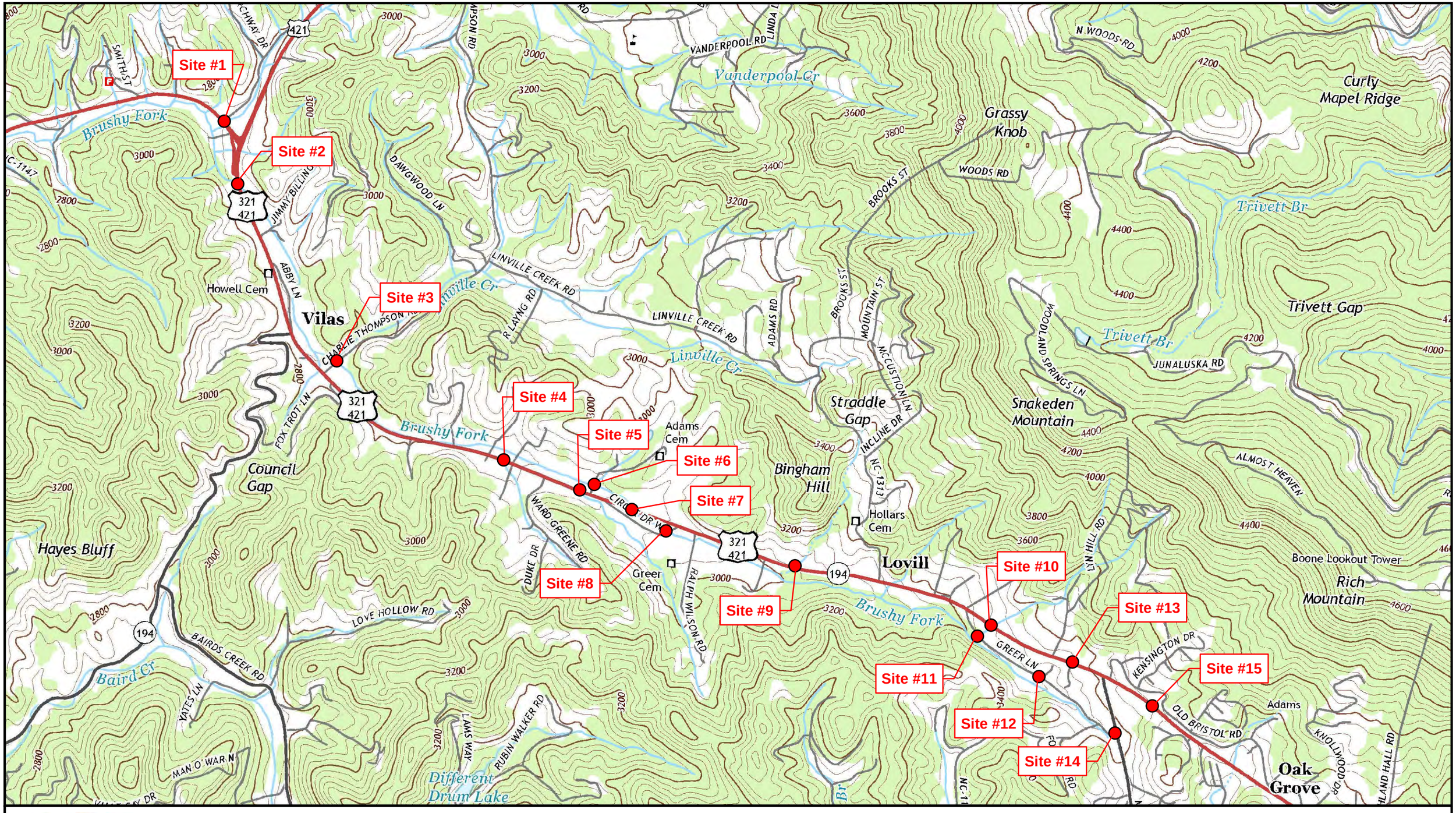
Potential Impacts to Resources by Build Alternative – Map 9[1]

Resource	Left Widening	Right Widening	Best Fit Widening[2]
Streams (ft)	499.37	626.89	557.25
Wetlands (ac)	0.01	0.02	0.004
EMS Facilities	0	0	0
Churches	0	0	0
Cemeteries	0	0	0
Potential Historic Architecture Sites	0	0	0
Residential Properties	22	18	33
Multi-family Bldgs.	1	0	0
Businesses	3	4	3

1-Impacts measured based on slope stake limits plus an additional 40 feet.
2-The Best Fit Alternative defaulted to symmetrical widening for the village of Vilas and impact quantities includes preliminary design for Y-lines.

Appendix C

Site map and photos from the Hydraulic Planning Report



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 11

DRAINAGE AREA OVERVIEW
US 321/421 WIDENING
WATAUGA COUNTY, NC

2013 USGS Quadrangles
Boone, Sherwood, & Valle Cruis

County:	Watauga
Division:	11
TIP:	R-2615
Date:	March 2019

N

1,500 750 0 1,500
1" = 1,500'

Figure 1

Site 1 – Georges Branch at US 321; downstream face.

Site 2 – Brushy Fork Creek at US 321 / US 421; upstream face. Note sediment filled barrel at left.

Site 7 – Brushy Fork Creek at US 321 /US 421; upstream face.