Section 404/NEPA Merger Project Team
Purpose and Need and Study Area
for NC 210 Improvements

NC 210 from US 17 to south of SR 1518 (Old Folkstone Road)
Onslow County

STIP Project U-5949

North Carolina Department of Transportation

ADDENDUM
Merger Concurrence Point 1

April 26, 2019

1. Introduction

Project Description

The North Carolina Department of Transportation (NCDOT) proposes to widen NC 210 from US 17 to south of SR 1518 (Old Folkstone Road) in Onslow County, North Carolina. The project is approximately 5.8 miles long and is identified in the State Transportation Improvement Program (STIP) as Project No. U-5949, WBS No. 46896.1.1. The project location is shown in attached **Figures 1 and 2** in Appendix A.

Merger Screening

In coordination with the US Army Corps of Engineers (USACE), it was determined NCDOT should follow the Section 404/NEPA Merger Process for this project. This decision was made at the Merger Screening meeting held on March 22, 2018.

Purpose of this Addendum

The purpose of this Merger Team addendum document is to provide additional materials related to the purpose and need for the project (Concurrence Point No. 1 [CP 1]).

2. Project Status, Background, Schedule, and Cost

The project is included in the current 2018-2027 STIP as project U-5949 and will be managed by NCDOT Division 3. Right-of-way acquisition and construction are scheduled to begin in Fiscal Years 2022 and 2025, respectively.

This project, or portions of this project, are included in the following metropolitan or local plans:

(1) Jacksonville Urban Area Metropolitan Planning Organization (JUMPO)'s 2040 Long Range Transportation Plan (LRTP) (April 2015; amended in March 2018), which recommends widening between the project termini from the existing two lanes to a four-lane facility with bicycle and pedestrian improvements. The LRTP also noted that NC 210 is a designated evacuation route.

(2) Topsail Area Comprehensive Transportation Plan (November 2009) includes a portion of the NC 210 project corridor. The highway map shows NC 210 and NC 172 as "Boulevards that Need Improvement." The Bicycle Map shows NC 210 as an "On Road" facility that Needs Improvement.

(3) The Onslow County – Sneads Ferry Community Plan highlights the area between NC 172 and Old Folkstone Road as the preferred location for commercial growth in the area.

The project will include the following improvements:

(1) Widening of NC 210 from US 17 to south of Old Folkstone Road
(2) Intersection improvements; intersections within the project corridor include:
    a. NC 210 at US 17 (signalized)
    b. NC 210 at Dixon High School Entrance (unsignalized)
    c. NC 210 at SR 1646 (Dixon Rd) (unsignalized)
    d. NC 210 at Rifle Range Road (US Marine Corps [USMC] Base Camp Lejeune/Marine Corps Special Operations Command [MARSOC] Main Entrance) (signalized)
    e. NC 210 at USMC/MARSOC Base Secondary Entrance/Manchester Lane (unsignalized)
    f. NC 210 at SR 1671 (Betty Dixon Road) (signalized)
    g. NC 210 at Beaufort Drive (unsignalized)
    h. NC 210 at Village Drive/Quarters Landing Circle (future signal)
    i. NC 210 at NC 172 (signalized)
    j. NC 210 at Dixon Middle School Entrance/Ridge Field Avenue (signalized)
    k. NC 210 at Pebble Shore Drive (unsignalized)
    l. NC 210 at Old Folkstone Road (signalized)
    m. US 17 at Dixon High School Entrance (future signal)

Feasibility Study

NCDOT prepared a Feasibility Study for the widening of NC 210 from US 17 to NC 172 and widening of NC 172 from NC 210 to the USMC/MARSOC gate in January 2013 (FS-1003C). Project U-5949 addresses only the improvements to NC 210. The Feasibility Study recommended the typical section on NC 210 to be a four-lane median-divided shoulder section using a 23-foot raised grass median and eight-foot shoulders on 150 feet of right of way.

Public Involvement

The JUMPO 2040 LRTP process included three workshops designed to gather community input. Local businesses and members of the public were presented with the recommendation to widen NC 210 at these meetings.

Other TIP Projects in the Area

(1) W-5203L – Widening of Old Folkstone Road
(2) W-5203T – Intersection Improvements at US 17 and NC 172 and US 17 and Old Folkstone Road
(3) W-5602 – NC 172 from the Camp Lejeune gate to NC 210; convert two lane roadway to three lane roadway with a two way left turn lane

Project Schedule

The tentative project schedule is show below. Dates are preliminary and subject to change.

• Data Collection (including Traffic)	Began June 2017
• Initial Project assessments	Began August 2017
• Design Public Hearing Map	2019
• Combined State EA/FONSI	2019
• Right of Way Plans	FY 2022
• Let to Construction	FY 2025

Cost

• Right of Way	$4,312,000
• Construction	$41,486,000
• Utilities	$1,000,000
• **Total**:	$46,798,000

3. Merger Concurrence Point 1 – PURPOSE AND NEED AND PROPOSED STUDY AREA

Environmental Resources

Environmental resources in the project area are listed below in **Table 1** and shown in attached **Figure 3** (Appendix A). Additional feature-specific data for streams and wetlands can be found in Appendix A. These features have been delineated as part of the Natural Resources Technical Report (NRTR; in progress). In addition to the streams and wetlands identified as part of this project, a previously-completed verification for the USMC (delineation referred to as Stones Bay and verified in May 2013) also overlaps with the project area. This delineation, where it overlaps the project study area, will be considered in the project design and alternative analysis. Appendix A also provides feature-specific details for the Stones Bay delineation where it overlaps the project. Species-specific information related to federally protected species can be also be found in Appendix A.

The study area is part of the Cape Fear River basin (U.S. Geological Survey [USGS] Hydrologic Unit 03030007) and the New River basin (USGS Hydrologic Unit 03020302). While a small portion of the study area occurs within the Cape Fear basin, all water resources occurring within the study area are part of the New River basin. Alligator Bay, which is within 1.0 mile of the project study area, has been designated as an Outstanding Resource Water (ORW). Additionally, Stones Creek, which crosses the study area, and both Everett Creek and Mill Creek are designated High Quality Waters (HQW). There are no water supply watersheds (WS-I or WS-II) within 1.0 mile downstream of the study area. The North Carolina 2016 Final 303(d) list of impaired waters does not identify any waters within 1.0 mile downstream of the study area as impaired; however, Stones Creek, Everett Creek, Mill Creek, and Alligator Bay are all listed as "Shellfish Growing Area – Prohibited (fecal, SH, SA)."

The project is located in an unincorporated area of the county, approximately 10 miles south of the City of Jacksonville and two miles from Sneads Ferry. Adjacent to the project are USMC Base Camp Lejeune/MARSOC and Stones Creek Game Land (SCGL). In addition, three Onslow County public schools are located along the project corridor: Dixon High School is located at the northern terminus; Dixon Elementary is located in the middle of the project, and the newly-relocated Dixon Middle School is located in the southern portion. The project corridor serves as an important route for local residents and USMC Base Camp Lejeune/MARSOC personnel, as well as for vacation travelers headed to Topsail Island, which is located less than three miles from the southern project terminus.

Table 1. Environmental Resources within the study area

Cultural Resources	
Archaeology	Survey Required, December 18, 2017
Historical Architecture	Intensive-level survey of one property (Dixon High School) currently underway

Table 1. Environmental Resources within the study area (Continued)

Human Environment Resources	
Community Resources	1 Cemetery – Dixon Cemetery
	2 Churches – Sneads Ferry Presbyterian Church and Born Again Baptist Church
	3 Public Schools – Dixon Elementary School, Dixon Middle School, and Dixon High School
	1 Private School – North Shore Academy
	Sneads Ferry Quality Childcare
	Onslow County Environmental Education Center and Walking Trails
	Sneads Ferry Branch Library
	USMC Base Camp LeJeune/MARSOC
	NC 210 Rescue Squad (EMS)
	Electrical Substation east of NC 210, south of Rifle Range Road
Public Parks	Stones Creek Game Land (SCGL)
	Everett Creek Preserve (NC Coastal Land Trust)
Greenways	North Carolina Mountains to Sea Trail (along NC 210 from southern terminus to SCGL and within SCGL)
	East Coast Greenway – NC 210 identified as part of coastal route
High % Special Populations	None
Natural Environment Resources	
Streams Delineated as Part of This Project /Number of Crossings	11 streams and 3 tributaries (2,303 lin. ft. streams, 189 lin. ft. tributaries); Streams include Stones Creek and 4 UTs, 2 UTs of Everett Creek, and 4 UTs of Mill Creek/3 stream crossings (1 bridge)
Streams Delineated as Part of the Stones Bay Verification Within Project Area/Number of Crossings	1 Stream (230 lin. Ft.); UT of Stones Creek/0 stream crossings
Wetlands Delineated as Part of This Project	43 wetlands, totaling 18.00 acres delineated

Table 1. Environmental Resources within the study area (Continued)

Wetlands Delineated as Part of the Stones Bay Verification Within Project Area	7 wetland features, totaling 2.97 acres
Water Supply Watershed Critical Areas	No
Stream Mitigation Sites	None
Riparian Buffer Rules Apply	No
List of Threatened and Endangered Species and Biological Conclusions	American alligator (T[S/A]) – Not Required
	Bald Eagle (BGPA) – No Impact
	Green sea turtle (T) – No Effect
	Hawksbill (=carey) sea turtle (E) – No Effect
	Kemp's (=Atlantic) ridley sea turtle (E) – No Effect
	Leatherback sea turtle (E) – No Effect
	Loggerhead sea turtle (T) – No Effect
	Northern long-eared bat (T) – MALAA (per NCDOT Programmatic Biological Opinion)
	Piping plover (T) – No Effect
	Red-cockaded woodpecker (E) – MANLAA
	Red knot (T) – No Effect
	West Indian manatee (E) – No Effect
	Cooley's meadowrue (E) – No Effect
	Golden sedge (E) – No Effect
	Pondberry (E) – MANLAA
	Rough-leaved loosestrife (E) – MANLAA
	Seabeach amaranth (E) – No Effect

Note: BGPA – Bald and Golden Eagle Protection Act; MALAA – May Affect, Likely to Adversely Affect; MANLAA – May Affect, Not Likely to Adversely Affect E – Endangered; T – Threatened; T(S/A) – Threatened due to Similarity in Appearance

Existing Roadway Conditions and Classifications

NC 210 within the project corridor currently exists as a two-lane undivided facility. The posted speed limit along NC 210 varies between 35 and 55 miles per hour (mph) (55 mph from US 17 south to the southern boundary of Camp LeJeune; 45 mph from the southern boundary of Camp LeJeune to south to Old Folkstone Road; 35 mph from Old Folkstone Road south to the southern project terminus). The current facility configuration does not provide control of access.

Existing NC 210 is classified as a Minor Arterial in the NCDOT Functional Classification System, as is NC 172, which crosses NC 210 about halfway through the project area. US 17 at the northern terminus is classified as a Principal Arterial, while Old Folkstone Road is classified as a Major Collector near the southern terminus.

Purpose and Need of Project

NCDOT Division of Highways – Division 3 is currently managing the project development, environmental, and engineering studies for the proposed improvements to NC 210 in Onslow County (U-5949). The project is included in the approved 2018-2027 STIP and is scheduled for right-of-way in fiscal year 2022 and construction in 2025. The project will include analysis of widening and associated improvements to this 5.8-mile segment of NC 210 between US 17 and a point south of Old Folkstone Road.

The attached figures provide details regarding the proposed project footprint and the potential environmental resources present. The attached figures are located in Appendix A and are as follows:

Figures (Appendix A)

(1) **Figure 1**: Project Location
(2) **Figure 2**: Project Study Area
(3) **Figure 3**: Environmental Features Map

Additionally, information regarding existing and future traffic conditions has been summarized from the 2018 Traffic Analysis Report for U-5949 completed for NCDOT Division 3 by Accelerate Engineering, PLLC (7/24/2018).

The **need** for this study can be summarized as follows:

- *Traffic congestion exists along the existing facility and is expected to worsen in the future.*

  Based on the NCDOT 2018 Traffic Analysis Report for U-5949, average vehicle per day (vpd) totals ranged between 9,000 (south of the NC 210/Old Folkstone Road intersection) and 17,400 (along NC 210 west of its intersection with NC 172) within the project area. These volumes are forecasted to increase to between approximately 13,800 and 31,800 along NC 210, respectively, in 2040 without construction of the project (see schematic on page 9).

  Specifically, near the US 17/NC 210 intersection, the 2018 AADT ranges between 16,400 and 22,200 vpd on US 17 and is 10,800 vpd on NC 210. These volumes are projected to increase to 33,000 and 42,400 vpd along US 17 and to 18,000 on NC 210 in 2040 without construction of U-5949.

For a typical two-lane street (including those with exclusive left-turn lanes) with a 45-mph speed limit, the approximate daily volumes for general planning use are 15,900 vpd for LOS D and 18,300 vpd for LOS E (HCM 6th Edition, Chapter 16, Urban Street Facilities – Applications). Most sections of NC 210 north of Old Folkstone Road are forecasted to have AADT above these volume thresholds in 2040.

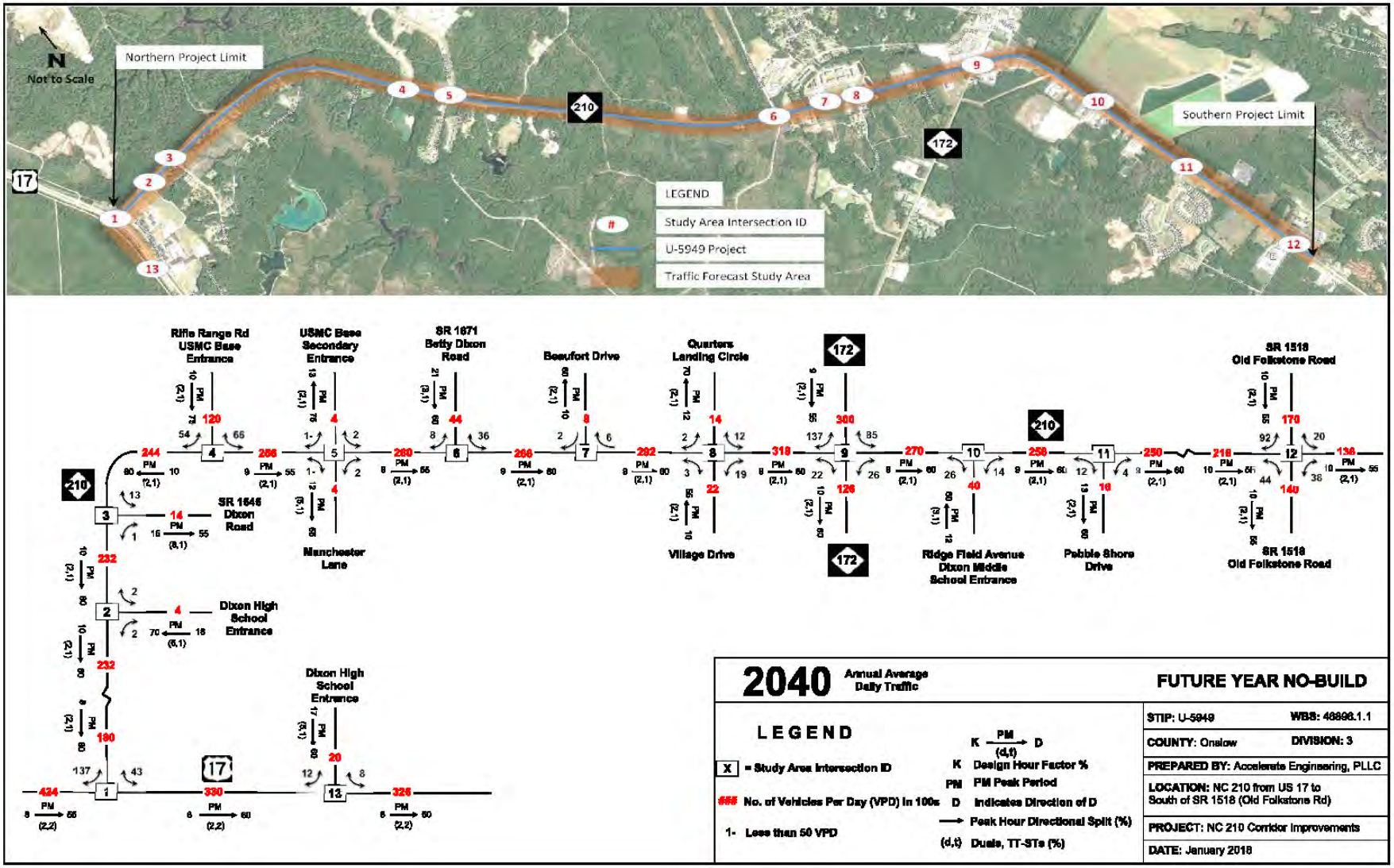
Along the NC 210 project corridor, there are three schools and a major military base which collectively intensify the traffic congestion during peak hours. Most intersections are estimated to experience peak hour travel demands equivalent to at least 9% of the daily volumes.

Methodology

The Intersection Level of Service (LOS) Analysis Method (versus Arterial LOS) was used to evaluate the NC 210 project corridor based on current federal and state guidelines, as well as current industry practices. On arterials where the traffic signals are spaced less than two miles apart, the arterials are considered "urban streets" having "interrupted" traffic flow in the current Highway Capacity Manual (6th Edition, Chapter 3, Model Characteristics – Motorized Vehicle Mode).

The use of intersection analysis for urban arterials is supported by the 2018 AASHTO "Green Book" (2018 AASHTO A Policy on Geometric Design of Highway and Streets 7th Edition, Section 2.4.6.3 Arterial Streets and Highways in Urban Areas). The Green Book states that, for Arterial Streets and Highways in Urban Areas, the traffic capacity "is generally dominated by the capacity of its individual signalized intersections." Therefore, the levels of service of intersections in the NC 210 project corridor were used to evaluate the need for capacity improvements.

2040 No-Build Peak Hour Traffic Volumes



Results

As shown in Table 2, the 2017 No-Build capacity analysis shows that all the signalized study intersections currently operate at an overall acceptable LOS of LOS D or better. Approaches at each of the signalized intersections within the project corridor currently operate at a LOS D or better in both peak hours for the existing conditions. However, the 2017 No-Build queue analysis (Table 3) shows that the signalized intersections of NC 210/NC 172 and NC 210/Old Folkstone Road have turn-lane storage deficiencies during at least one peak hour.

All the unsignalized study intersection movements operate at a LOS D or better in both the 2017 No-Build AM and PM peak hours, except for the side-street movements at the NC 210 and Quarters Landing Circle/Village Drive intersection. During both AM and PM peak hours, the eastbound Village Drive approach and the westbound Quarters Landing Circle approach operate at a LOS E and F, respectively. The westbound left-turn queue exceeds the existing 50 feet of storage in both AM and PM peak hours. The 2017 Base Year peak-hour delays indicate that the roadway currently experiences congestion issues. Two traffic signals experience queues that spillback beyond available storage resulting in potential delay and safety concerns. Also, two unsignalized intersections result in side-street movements operating at undesirable levels of service, LOS E and LOS F.

As shown in Table 4, the 2040 No-Build capacity analysis shows that 3 signalized intersections are anticipated to operate at LOS F in the AM peak hour, while 2 are anticipated to operate at LOS F in the PM peak hour. The analysis shows that the intersections of NC 210/NC 172 and NC 210/Old Folkstone Road are expected to operate at an overall LOS F in both peak hours in 2040 without improvements to NC 210. Additionally, all unsignalized intersections except for the intersection of NC 210 and Pebble Shore Drive are anticipated to have movements operate at a LOS F in at least one peak hour in 2040 without construction of U-5949. In total, 10 of 13 studied intersections will experience failing movements in at least one peak hour in 2040 without construction of U-5949. Furthermore, 9 of the 13 intersections have movements that will experience maximum queue lengths that exceed the available storage in either the AM or PM peak of the 2040 No-Build conditions (Table 5).

Based on the 2017 No-Build analysis, two signalized intersections are anticipated to have side-street movements that operate at LOS E in the AM peak and LOS F in the PM peak. Also, two signalized intersections have storage deficiencies. These operations are expected to considerably degrade in 2040 without construction of U-5949 resulting in multiple signalized intersections operating at LOS F and numerous signalized and unsignalized movements operating at LOS F. LOS F operations indicate that the projected volumes exceed the capacity of a facility or a movement often resulting in breakdown and unstable conditions.

Additionally, NC 210 is an important artery for the area. It is classified as a minor arterial and connects to US 17 (a principal arterial) and North Topsail Beach, serves as a commuter corridor for the area USMC facilities, and provides access to three public schools. All of these area-specific stressors are expected to continue to grow, in turn contributing to the increasing traffic volumes in the area.

Table 2. Level of Service Analysis – 2017 No-Build

Intersection	Approach		No Build (2017)			
			AM		PM	
			Delay (sec)	LOS	Delay (sec)	LOS
US 17 @ NC 210	signalized	Intersection Average	**14.2**	**B**	**13.1**	**B**
		WB - NC 210	12.9	B	12.0	B
		NB - US 17	18.3	B	19.4	B
		SB - US 17	10.8	B	10.2	B
NC 210 @ Dixon High School Entrance	unsignalized	WB - NC 210	0.3	A	0.1	A
		NB - Dixon High School Entrance	25.1	D	26.0	D
NC 210 @ Dixon Rd	unsignalized	WB - NC 210	0.7	A	0.6	A
		NB - Dixon Rd	26.6	D	23.3	C
NC 210 @ Rifle Rd / USMC Base Entrance	signalized	Intersection Average	**14.5**	**B**	**17.1**	**B**
		WB - Rifle Range Rd/USMC Entr.	17.4	B	17.6	B
		NB - NC 210	17.9	B	23.4	C
		SB - NC 210	11.1	B	10.3	B
NC 210 @ USMC Base Secondary Entrance / Manchester Ln	unsignalized	EB - Manchester Ln	24.3	C	33.7	D
		WB - USMC Secondary Entr.	28.6	D	24.3	C
		NB - NC 210	0.0	A	0.1	A
NC 210 @ Betty Dixon Rd	signalized	Intersection Average	**14.5**	**B**	**12.7**	**B**
		WB - Betty Dixon Rd	21.3	C	19.7	B
		NB - NC 210	9.0	A	8.0	A
		SB - NC 210	19.4	B	13.5	B
NC 210 @ Beaufort Dr	unsignalized	WB - Beaufort Dr	17.4	C	12.7	B
NC 210 @ Quarters Landing Circle / Village Dr	unsignalized	EB - Village Dr	46.9	E	45.3	E
		WB - Quarters Landing Cir	190.3	F	110.7	F
		NB - NC 210	0.5	A	0.6	A
		SB - NC 210	0.1	A	0.2	A
NC 210 @ NC 172	signalized	Intersection Average	**41.8**	**D**	**39.3**	**D**
		EB - NC 172	48.7	D	49.3	D
		WB - NC 172	30.9	C	31.0	C
		NB - NC 210	47.7	D	40.6	D
		SB - NC 210	42.2	D	43.1	D
NC 210 @ Ridge Field Ave / Dixon Middle School Entrance	signalized	Intersection Average	**12.0**	**B**	**12.4**	**B**
		EB - Ridge Field Ave / Dixon Middle School Entrance	19.5	B	25.4	C
		NB - NC 210	8.5	A	4.2	A
		SB - NC 210	14.6	B	15.2	B
NC 210 @ Pebble Shore Dr	unsignalized	NB - NC 210	0.2	A	0.3	A
NC 210 @ Old Folkstone Rd	signalized	Intersection Average	**15.0**	**B**	**14.3**	**B**
		EB - Old Folkstone Rd	17.2	B	16.3	B
		WB - Old Folkstone Rd	13.8	B	16.1	B
		NB - NC 210	13.8	B	11.8	B
		SB - NC 210	15.4	B	13.7	B
US 17 @ Dixon High School Entrance	unsignalized	WB - Dixon High School Entr.	28.2	D	20.0	C
		SB - US 17	1.6	A	0.5	A

Unacceptable Delay/LOS

Table 3. Queue Analysis – 2017 No-Build

Intersection	Turn Lane		Storage Length (ft)	No Build (2017)			
				AM		PM	
				95th% Queue (ft)	Max Queue (ft)	95th% Queue (ft)	Max Queue (ft)
US 17 @ NC 210	signalized	WBL	300	69	109	101	146
		WBR	400	68	97	67	110
		NBR	300	94	42	57	--
		NBU	300	8	30	8	32
		SBL	400	121	184	89	163
NC 210 @ Dixon High School Entrance	unsignalized	WBL	275	2	38	--	29
		NB	--	8	38	10	58
NC 210 @ Dixon Rd	unsignalized	WBTL	--	4	208	4	156
		NB	--	26	86	18	78
NC 210 @ Rifle Rd / USMC Base Entrance	signalized	WBL	--	35	76	82	131
		WBR	375	33	81	102	145
		NBR	300	59	92	23	146
		SBL	500	116	132	47	57
NC 210 @ USMC Base Secondary Entrance / Manchester Ln	unsignalized	EB	--	6	57	8	40
		WBR	275	10	21	4	21
		NBL	175	--	14	--	23
		SBL	200	--	17	--	15
NC 210 @ Betty Dixon Rd	signalized	WBL	--	72	130	134	162
		WBR	175	49	83	69	105
		NBR	275	--	65	--	56
		SBL	175	38	122	32	160
NC 210 @ Beaufort Dr	unsignalized	WBR	--	6	20	2	5
NC 210 @ Quarters Landing Circle / Village Dr	unsignalized	EB	--	38	94	46	100
		WBL	50	94	103	42	69
		WBTR	--	8	68	4	38
		NBL	--	4	--	2	--
		NBR	175	--	--	--	4
		SBL	150	--	25	2	29
NC 210 @ NC 172	signalized	EBL	400 (TWLT)	83	174	52	59
		WBL	200 (TWLT)	#150	183	#240	211
		WBR	450	356	247	274	190
		NBL	300 (TWLT)	100	400	#115	150
		NBR	150	234	250	165	249
		SBL	400	#210	200	214	599
NC 210 @ Ridge Field Ave / Dixon Middle School Entrance	signalized	EBL	--	49	88	85	88
		EBR	425	21	52	58	75
		NBL	350	20	73	10	58
		SBR	350	17	61	15	54
NC 210 @ Pebble Shore Dr	unsignalized	EB	--	26	67	16	66
		NBL	225	--	33	2	31
		SBR	150	--	--	--	--
NC 210 @ Old Folkstone Rd	signalized	EBLT	--	159	276	118	191
		EBL	250 (TWLT)	--	--	--	--
		EBR	150	69	206	72	149
		WBTL	--	84	158	122	260
		WBL	250 (TWLT)	--	--	--	--
		WBR	50	94	143	103	150
		NBL	150	64	125	69	152
		SBL	100	108	187	82	155
US 17 @ Dixon High School Entrance	unsignalized	WBL	--	38	67	22	74
		WBR	125	10	46	4	54
		NBR	275	--	6	--	2
		NBU	275	--	19	--	27
		SBL	275	8	54	2	62

Queue length greater than storage length

#: volume exceeds capacity

Table 4. Level of Service Analysis – 2040 No-Build

Intersection	Approach		No Build (2040)			
			AM		PM	
			Delay (sec)	LOS	Delay (sec)	LOS
US 17 @ NC 210	signalized	Intersection Average	**25.1**	**C**	**21.1**	**C**
		WB - NC 210	29.4	C	21.6	C
		NB - US 17	29.4	C	28.5	C
		SB - US 17	18.9	B	16.6	B
NC 210 @ Dixon High School Entrance	unsignalized	WB - NC 210	0.6	A	0.1	A
		NB - Dixon High School Entrance	**	F	**	F
NC 210 @ Dixon Rd	unsignalized	WB - NC 210	1.2	A	0.8	A
		NB - Dixon Rd	**	F	25.1	D
NC 210 @ Rifle Rd / USMC Base Entrance	signalized	Intersection Average	**29.5**	**C**	**34.4**	**C**
		WB - Rifle Range Rd/USMC Entr.	29.4	C	41.3	D
		NB - NC 210	34.6	C	45.9	D
		SB - NC 210	25.1	C	15.9	B
NC 210 @ USMC Base Secondary Entrance / Manchester Ln	unsignalized	EB - Manchester Ln	**	F	**	F
		WB - USMC Secondary Entr.	**	F	**	F
		NB - NC 210	0.1	A	0.2	A
NC 210 @ Betty Dixon Rd	signalized	Intersection Average	**105.8**	**F**	**53.4**	**D**
		WB - Betty Dixon Rd	175.2	F	84.9	F
		NB - NC 210	104.5	F	33.6	C
		SB - NC 210	69.8	E	55.7	E
NC 210 @ Beaufort Dr	unsignalized	WB - Beaufort Dr	64.3	F	22.3	C
NC 210 @ Quarters Landing Circle / Village Dr	unsignalized	EB - Village Dr	**	F	**	F
		WB - Quarters Landing Cir	**	F	**	F
		NB - NC 210	0.7	A	1.2	A
		SB - NC 210	0.1	A	0.2	A
NC 210 @ NC 172	signalized	Intersection Average	**174.5**	**F**	**160.6**	**F**
		EB - NC 172	261.5	F	245.0	F
		WB - NC 172	135.5	F	123.7	F
		NB - NC 210	185.9	F	103.7	F
		SB - NC 210	143.8	F	199.9	F
NC 210 @ Ridge Field Ave / Dixon Middle School Entrance	signalized	Intersection Average	**46.4**	**D**	**44.4**	**D**
		EB - Ridge Field Ave / Dixon Middle School Entrance	80.5	F	103.3	F
		NB - NC 210	53.9	D	14.6	B
		SB - NC 210	25.3	C	51.8	D
NC 210 @ Pebble Shore Dr	unsignalized	NB - NC 210	0.2	A	0.5	A
NC 210 @ Old Folkstone Rd	signalized	Intersection Average	**93.9**	**F**	**83.1**	**F**
		EB - Old Folkstone Rd	98.7	F	79.5	E
		WB - Old Folkstone Rd	91.9	F	68.0	E
		NB - NC 210	104.7	F	96.9	F
		SB - NC 210	83.2	F	89.7	F
US 17 @ Dixon High School Entrance	unsignalized	WB - Dixon High School Entr.	**	F	**	F
		SB - US 17	3.7	A	0.6	A

Unacceptable Delay/LOS
** Delay exceeds 300 seconds

Table 5. Queue Analysis – 2040 No-Build

Intersection	Turn Lane		Storage Length (ft)	No Build (2040)			
				AM		PM	
				95th% Queue (ft)	Max Queue (ft)	95th% Queue (ft)	Max Queue (ft)
US 17 @ NC 210	signalized	WBL	300	#163	147	217	193
		WBR	400	171	146	200	150
		NBR	300	141	400*	87	31
		NBU	300	7	73	8	32
		SBL	400	#281	280	198	203
NC 210 @ Dixon High School Entrance	unsignalized	WBL	275	6	61	2	32
		NB	--	92	107	126	195
NC 210 @ Dixon Rd	unsignalized	WBTL	--	14	1656	12	1332
		NB	--	254	1000	32	842
NC 210 @ Rifle Rd / USMC Base Entrance	signalized	WBL	--	72	119	#231	315
		WBR	375	64	91	240	246
		NBR	300	123	500	46	500
		SBL	500	#272	189	90	172
NC 210 @ USMC Base Secondary Entrance / Manchester Ln	unsignalized	EB	--	78	88	76	107
		WBR	275	2	21	2	25
		NBL	175	--	24	--	72
		SBL	200	--	24	--	75
NC 210 @ Betty Dixon Rd	signalized	WBL	--	336	757	#575	1985
		WBR	175	243	274	250	275
		NBR	275	164	375	50	375
		SBL	175	311	275	#288	275
NC 210 @ Beaufort Dr	unsignalized	WBR	--	42	56	10	39
NC 210 @ Quarters Landing Circle / Village Dr	unsignalized	EB	--	--	1100	--	1099
		WBL	50	26	150	54	148
		WBTR	--	--	1007	--	998
		NBL	--	14	--	18	--
		NBR	175	--	165	--	275
		SBL	150	2	227	4	249
NC 210 @ NC 172	signalized	EBL	400 (TWLT)	#314	500	#228	500
		WBL	200 (TWLT)	#709	300	#1031	300
		WBR	450	#1129	550	698	550
		NBL	300 (TWLT)	#300	400	#383	400
		NBR	150	657	250	459	250
		SBL	400	#589	600	#608	600
NC 210 @ Ridge Field Ave / Dixon Middle School Entrance	signalized	EBL	--	141	245	#345	733
		EBR	425	62	114	210	422
		NBL	350	140	450	#175	416
		SBR	350	39	117	22	409
NC 210 @ Pebble Shore Dr	unsignalized	EB	--	308	986	198	147
		NBL	225	2	324	6	131
		SBR	150	--	--	--	--
NC 210 @ Old Folkstone Rd	signalized	EBLT	--	#596	--	#360	--
		EBL	250 (TWLT)	#533	350	#360	349
		EBR	150	225	250	203	250
		WBTL	--	#516	--	#549	--
		WBL	250 (TWLT)	#220	350	#209	350
		WBR	50	592	150	434	150
		NBL	150	#358	250	#350	250
		SBL	100	#848	200	#670	200
US 17 @ Dixon High School Entrance	unsignalized	WBL	--	316	968	162	981
		WBR	125	58	225	18	225
		NBR	275	--	19	--	10
		NBU	275	--	27	2	25
		SBL	275	56	242	10	98

Queue length greater than storage length

#: volume exceeds capacity

The **purpose** for the proposed action is as follows:

- *Alleviate motorized vehicle congestion along NC 210 between US 17 and south of Old Folkstone Road (SR 1518).*

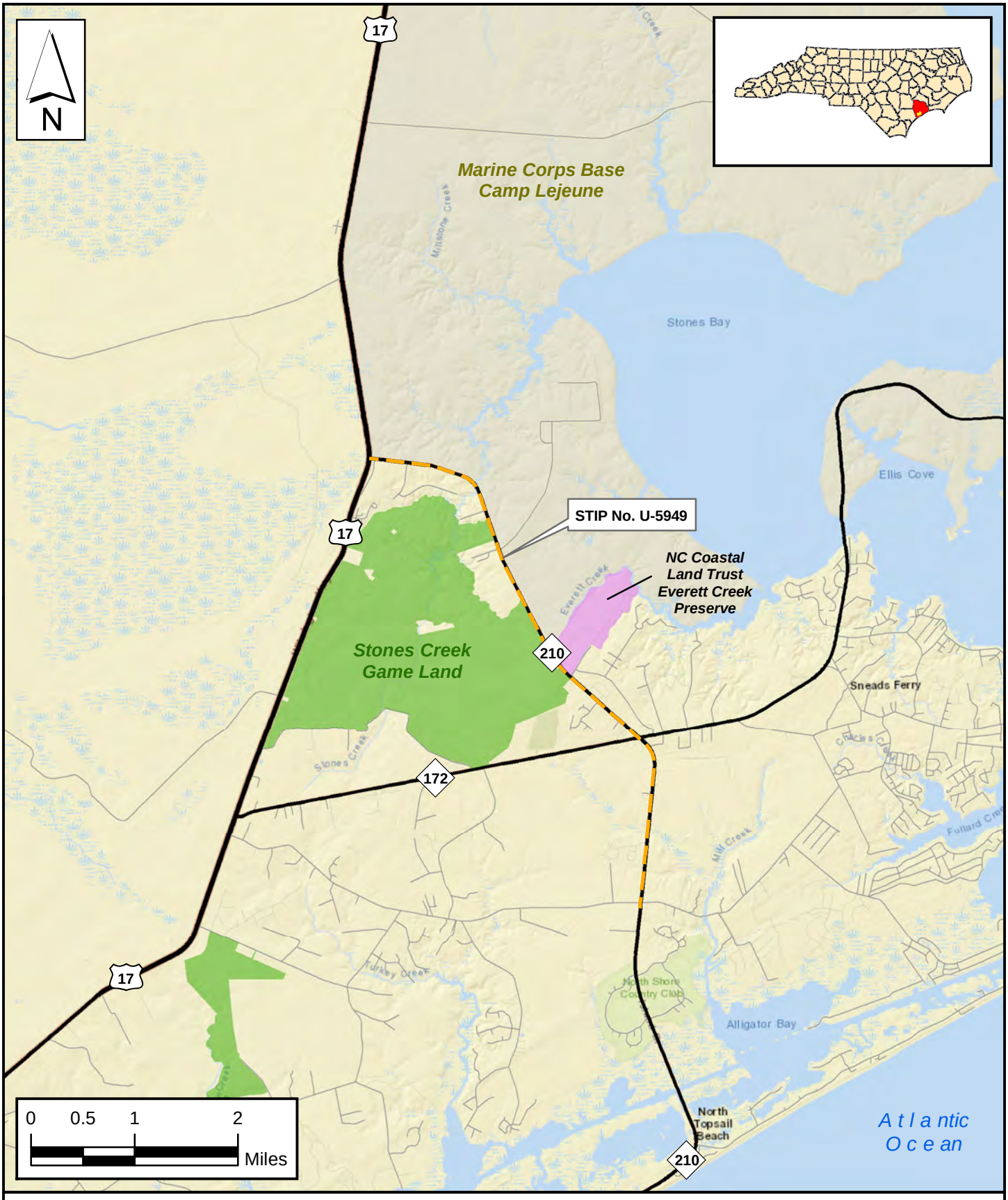
  The measure of performance for evaluating this improvement will be level of service (LOS). The project is intended to achieve an overall **LOS D or better** within the project area during peak hour operations. Where feasible, the goal of the project will also be to bring signalized and unsignalized movements to LOS D or better.

Proposed Project Study Area

The proposed study area developed to address the purpose and need of U-5949 is shown in attached **Figures 1 and 2** (Appendix A). The study area ranges between 300 – 500 feet wide and begins at the US 17/NC 210 intersection and extends approximately 5.8 miles south along NC 210 to a point approximately 3,300 linear feet south of SR 1518 (Old Folkstone Road). The study area also extends ~1,500 linear feet north and 1,900 linear feet south along US 17; 1,500 linear feet west and 1,700 linear feet east along NC 172; and ~1,200 linear feet west and 2,300 linear feet east along Old Folkstone Road.

The Concurrence Point 1 concurrence form, which includes the proposed purpose and need and project study area, is attached to this package in Appendix A.

Appendix A
Concurrence Point 1 Supporting Documentation



NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS

Project Location

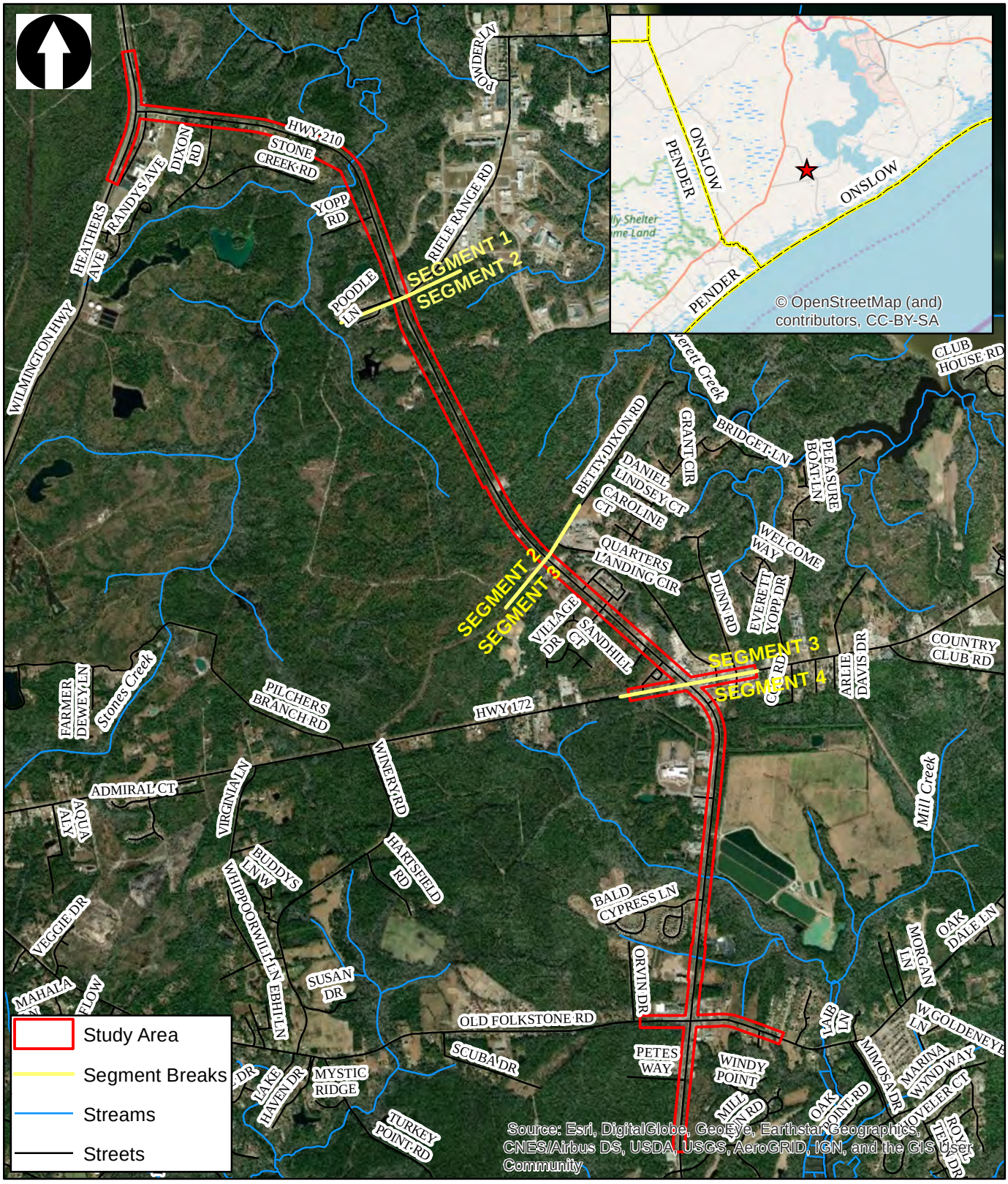
**WIDEN NC 210 FROM
US 17 TO SOUTH OF
SR 1518 (OLD FOLKSTONE RD)**

ONSLOW COUNTY
NORTH CAROLINA

County:	ONSLOW
Div: 3	STIP# U-5949
WBS:	46896.1.1
Date:	NOVEMBER 2017

Figure

1



THREE OAKS ENGINEERING

Prepared For: STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

Project Study Area

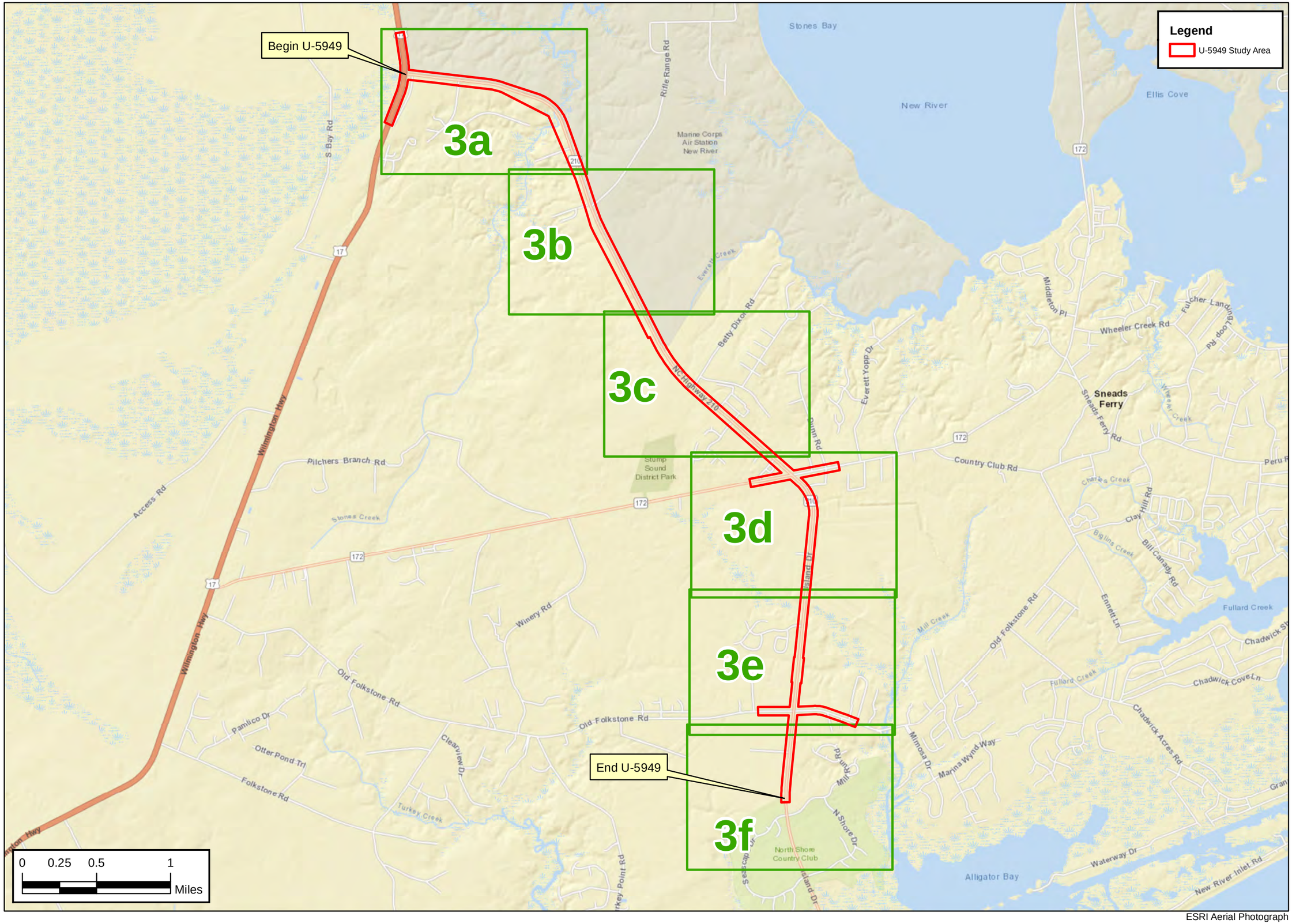
Widen NC 210 from
US 17 to south of
SR 1518 (Old Folkstone Rd)

Onslow County, North Carolina

Date:	June 2018
Scale:	0 1,000 2,000 Feet
Job No.:	17-006
Drawn By:	CMR
Checked By:	NH

Figure

2



ESRI Aerial Photograph

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
HIGHWAY DIVISION 3

ENVIRONMENTAL FEATURES MAP
WIDEN NC 210 FROM US 17 TO SOUTH OF SR 1518 (OLD FOLKSTONE RD)

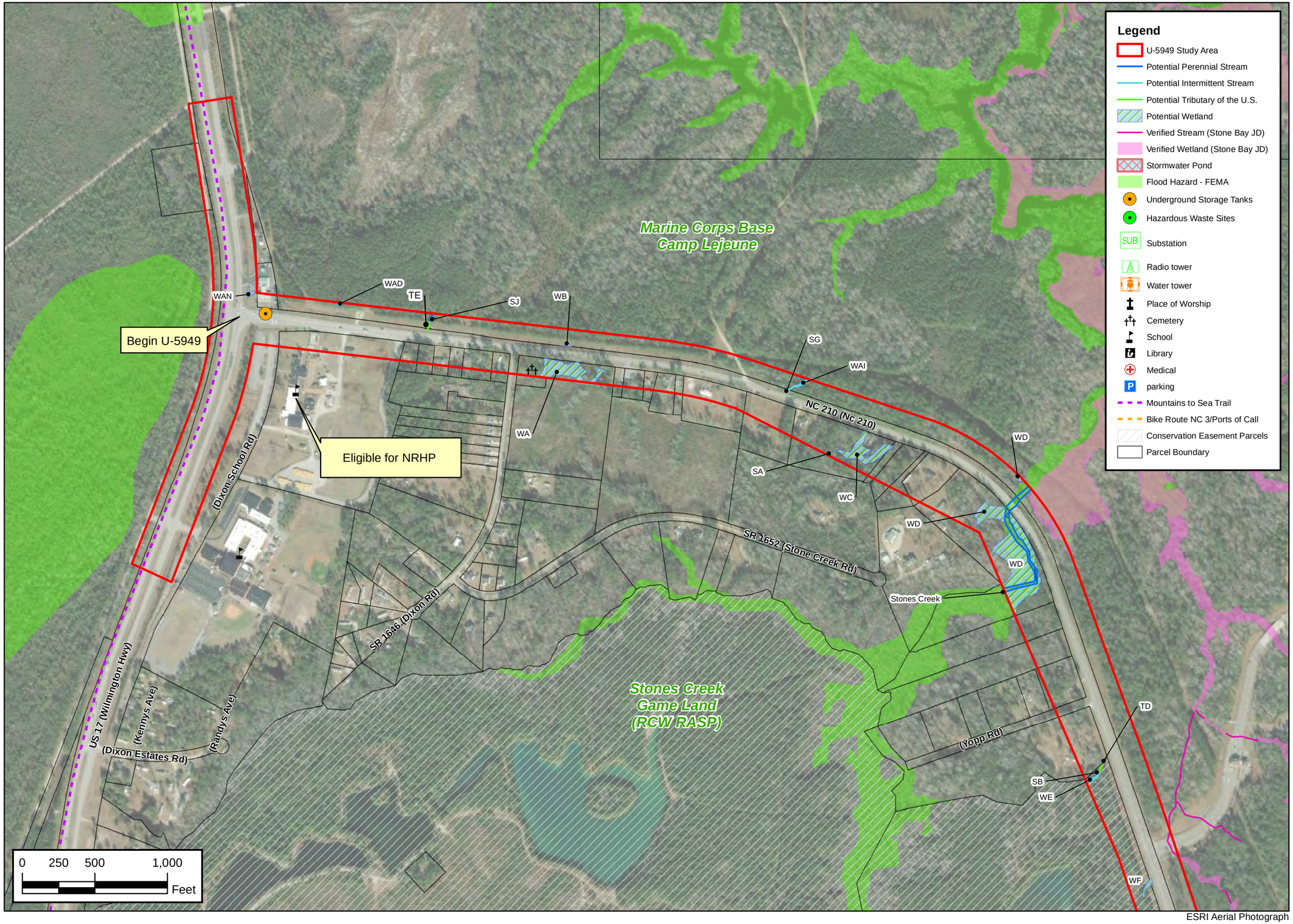
ONSLOW COUNTY
STIP PROJECT U-5949

N

By: C ROWELLS	
County: ONSLOW	
Div: 3	STIP# U-5949
Date: JUNE 2018	

Figure

3



ESRI Aerial Photograph

NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
HIGHWAY DIVISION 3

ENVIRONMENTAL FEATURES MAP
WIDEN NC 210 FROM US 17 TO SOUTH
OF SR 1518 (OLD FOLKSTONE RD)
ONSLOW COUNTY
STIP PROJECT U-5949

By:
C ROWELLS

County:
ONSLOW

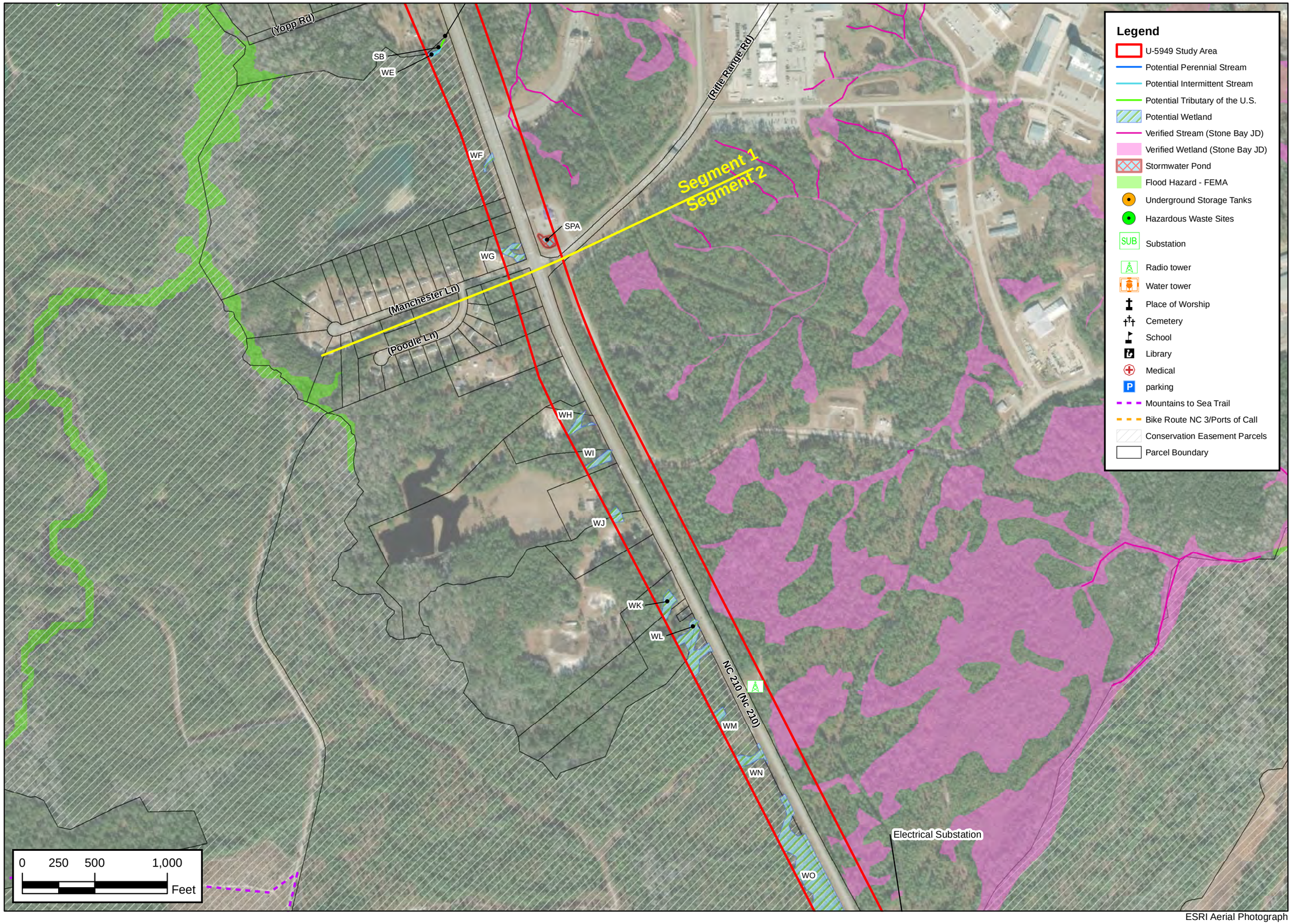
Div:
3

STIP#
U-5949

Date:
APRIL 2019

Figure

3a



ESRI Aerial Photograph

NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
HIGHWAY DIVISION 3

ENVIRONMENTAL FEATURES MAP
WIDEN NC 210 FROM US 17 TO SOUTH OF SR 1518 (OLD FOLKSTONE RD)

ONSLOW COUNTY
STIP PROJECT U-5949

N

By:
C ROWELLS

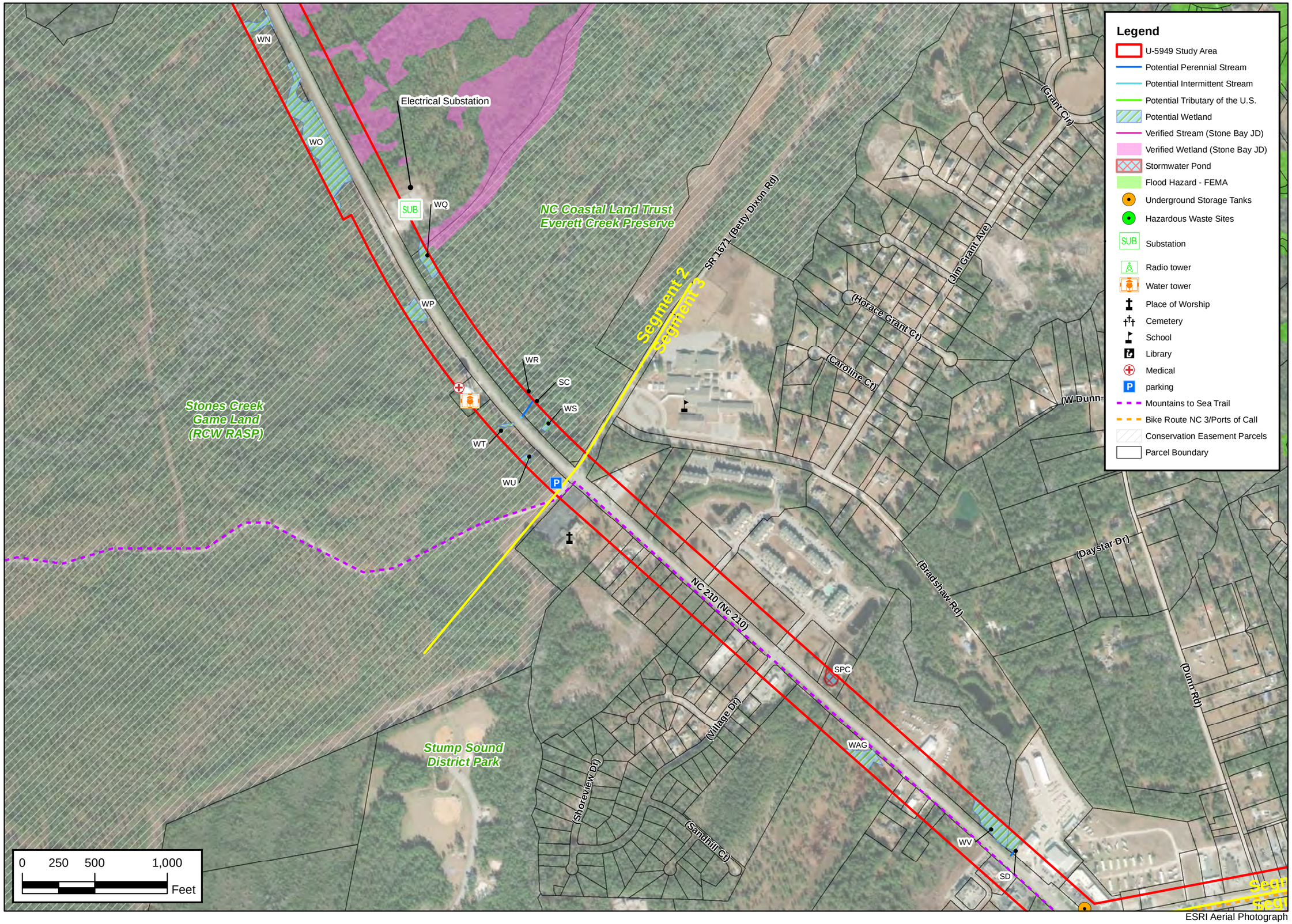
County:
ONSLOW

Div:	STIP#
3	U-5949

Date:
APRIL 2019

Figure

3b



ESRI Aerial Photograph

NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
HIGHWAY DIVISION 3

ENVIRONMENTAL FEATURES MAP
WIDEN NC 210 FROM US 17 TO SOUTH
OF SR 1518 (OLD FOLKSTONE RD)
ONSLOW COUNTY
STIP PROJECT U-5949

N

By:
C ROWELLS

County:
ONSLOW

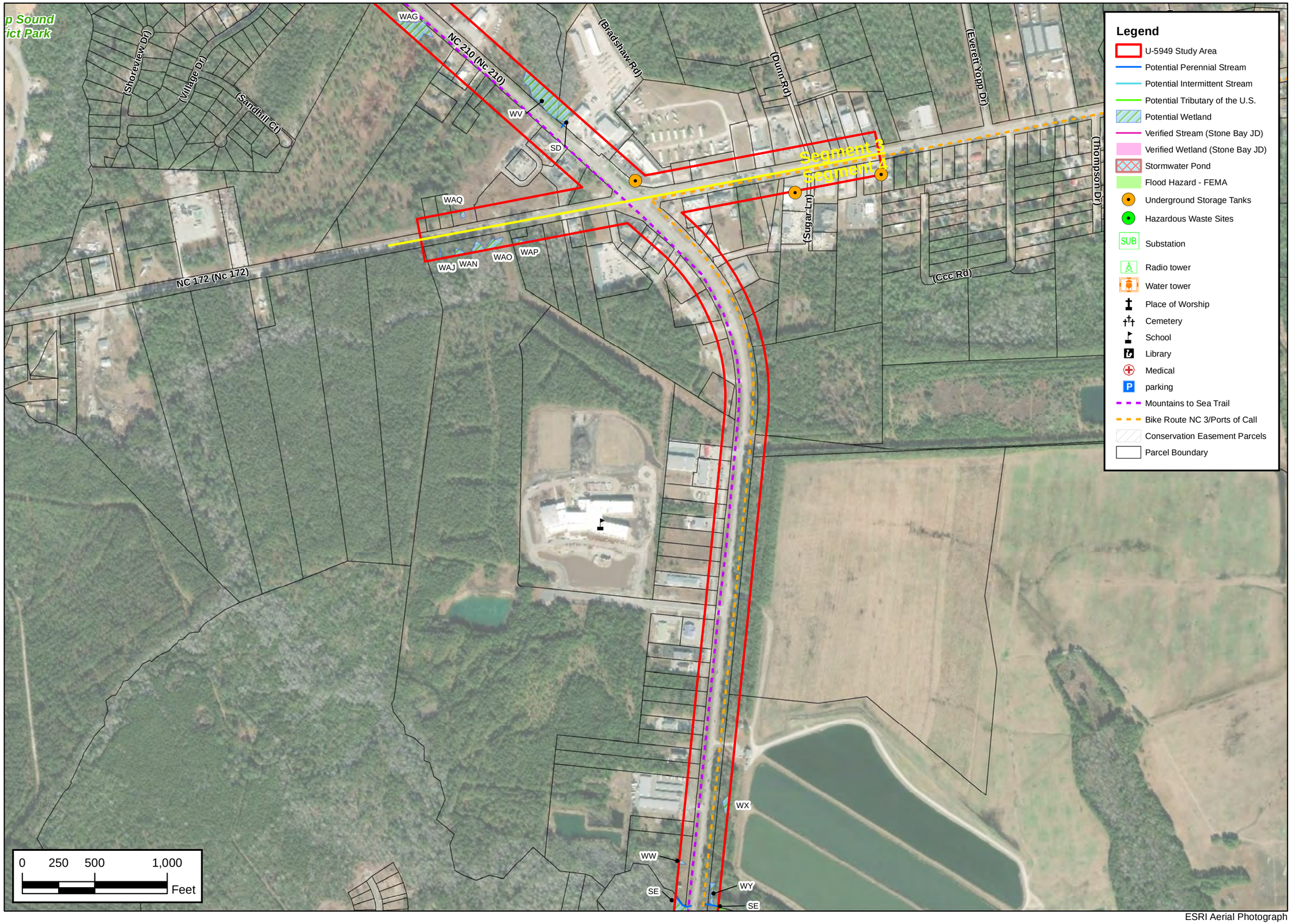
Div:
3

STIP#
U-5949

Date:
APRIL 2019

Figure

3c



ESRI Aerial Photograph

NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
HIGHWAY DIVISION 3

ENVIRONMENTAL FEATURES MAP
WIDEN NC 210 FROM US 17 TO SOUTH OF SR 1518 (OLD FOLKSTONE RD)

ONSLOW COUNTY
STIP PROJECT U-5949

N

By:
C ROWELLS

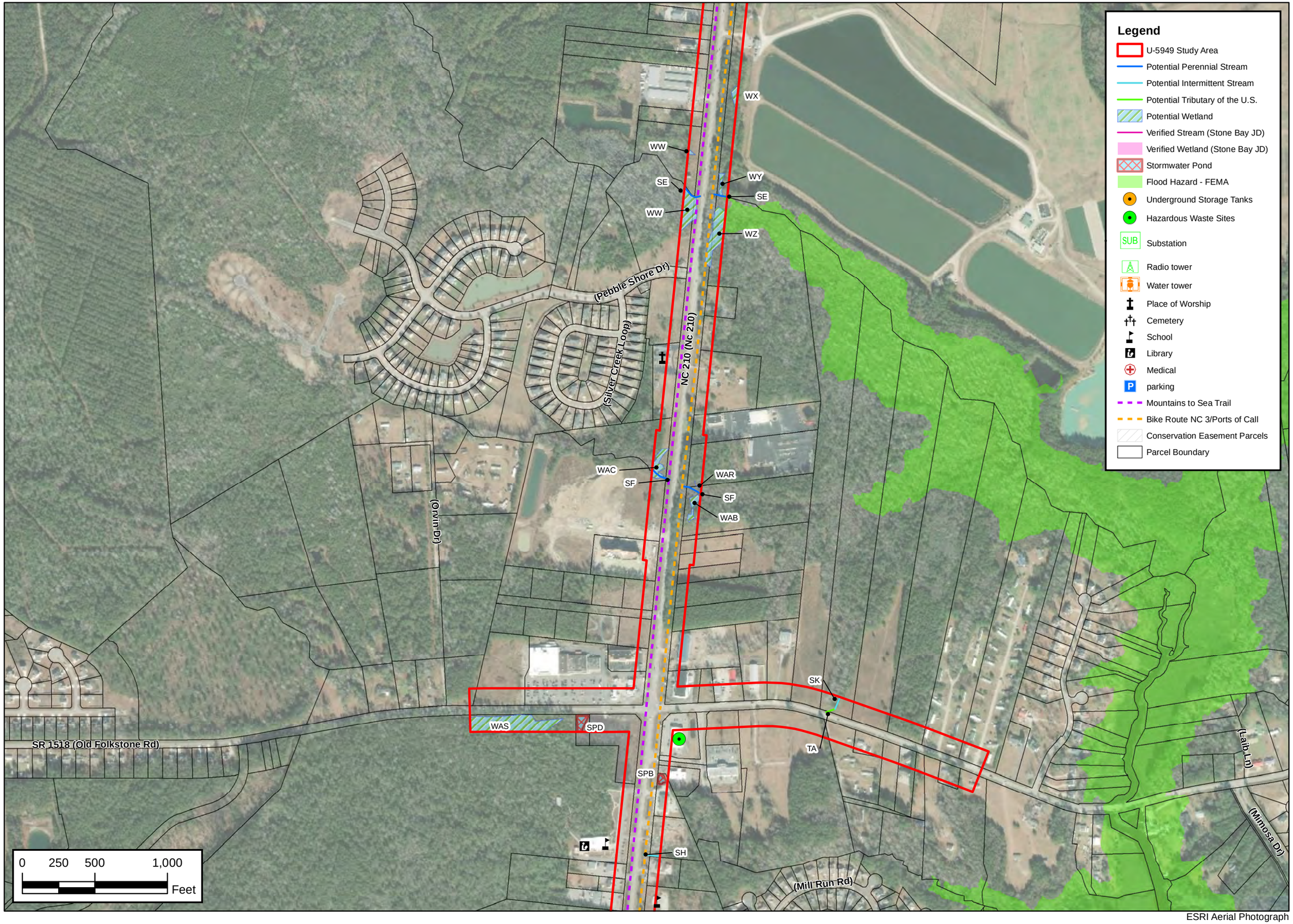
County:
ONSLOW

Div:	STIP#
3	U-5949

Date:
APRIL 2019

Figure

3d



ESRI Aerial Photograph

NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
HIGHWAY DIVISION 3

ENVIRONMENTAL FEATURES MAP
WIDEN NC 210 FROM US 17 TO SOUTH OF SR 1518 (OLD FOLKSTONE RD)

ONSLOW COUNTY
STIP PROJECT U-5949

N

By:
C ROWELLS

County:
ONSLOW

Div:
3

STIP#
U-5949

Date:
APRIL 2019

Figure

3e

ESRI Aerial Photograph

NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
HIGHWAY DIVISION 3

ENVIRONMENTAL FEATURES MAP
WIDEN NC 210 FROM US 17 TO SOUTH OF SR 1518 (OLD FOLKSTONE RD)

ONSLOW COUNTY
STIP PROJECT U-5949

N

By:
C ROWELLS

County:
ONSLOW

Div:
3

STIP#
U-5949

Date:
APRIL 2019

Figure

3f

Table 1. Streams in the study area

Stream Name	Map ID	NCDWR Index Number	Best Usage Classification
Stones Creek	Stones Creek	19-30-3	SA; HQW
UT to Stones Creek	SA	19-30-3	SA; HQW
UT to Stones Creek	SB	19-30-3	SA; HQW
UT to Everett Creek	SC	19-32	SA; HQW
UT to Everett Creek	SD	19-32	SA; HQW
UT to Mill Creek	SE	19-39-3-1	SA; HQW
UT to Mill Creek	SF	19-39-3-1	SA; HQW
UT to Stones Creek	SG	19-30-3	SA; HQW
UT to Mill Creek	SH	19-39-3-1	SA; HQW
UT to Stones Creek	SJ	19-30-3	SA; HQW
UT to Mill Creek	SK	19-39-3-1	SA; HQW

Table 2. Characteristics of potential jurisdictional streams in the study area

Map ID	Length (ft.)	Classification	Compensatory Mitigation Required	River Basin Buffer
Stones Creek	1,013	Perennial	Yes	Not Subject
SA	31	Intermittent	Undetermined	Not Subject
SB	76	Intermittent	Undetermined	Not Subject
SC	13	Intermittent	Undetermined	Not Subject
SC	139	Perennial	Yes	Not Subject
SD	57	Perennial	Yes	Not Subject
SE	232	Perennial	Yes	Not Subject
SF	289	Perennial	Yes	Not Subject
SG	189	Intermittent	Undetermined	Not Subject
SH	114	Intermittent	Undetermined	Not Subject
SJ	62	Perennial	Yes	Not Subject
SK	88	Intermittent	Undetermined	Not Subject
Total	**2,303**			

Table 3. Characteristics of potential jurisdictional wetlands in the study area

Map ID*	NCWAM Classification	NCWAM Rating	Hydrologic Classification	Area (ac.) in Study Area
WA	Headwater Forest	Medium	Riparian	0.79
WB	Headwater Forest	Low	Riparian	0.03
WC	Headwater Forest	High	Riparian	0.66
WD	Riverine Swamp Forest	High	Riparian	1.38
WE	Headwater Forest	High	Riparian	0.05
WF	Headwater Forest	High	Riparian	0.07
WG	Headwater Forest	High	Riparian	0.23
WH	Headwater Forest	High	Riparian	0.18
WI	Headwater Forest	High	Riparian	0.22
WJ	Headwater Forest	High	Riparian	0.17
WK	Headwater Forest	High	Riparian	0.26
WL	Headwater Forest	High	Riparian	0.80
WM	Seep	High	Non-riparian	0.12
WN	Headwater Forest	High	Riparian	0.29
WO	Headwater Forest	High	Riparian	3.00
WP	Headwater Forest (Forested)	High	Riparian	0.16
WP	Headwater Forest (Unforested)	Low	Riparian	0.23
WQ	Headwater Forest	High	Riparian	0.35
WR	Bottomland Hardwood Forest	Medium	Riparian	0.01
WS	Bottomland Hardwood Forest	Medium	Riparian	0.10
WT	Headwater Forest	Low	Riparian	0.04
WU	Headwater Forest	High	Riparian	0.07
WV	Bottomland Hardwood Forest	High	Riparian	0.99
WW	Headwater Forest (Forested)	High	Riparian	0.29
WW	Headwater Forest (Unforested)	Low	Riparian	0.21
WX	Basin Wetland	Medium	Non-riparian	0.10
WY	Headwater Forest	High	Riparian	0.07
WZ	Bottomland Hardwood Forest	High	Riparian	0.63
WAB	Bottomland Hardwood Forest	Medium	Riparian	0.14
WAC	Bottomland Hardwood Forest	Low	Riparian	0.26
WAD	Bottomland Hardwood Forest	Low	Riparian	0.01
WAE	Bottomland Hardwood Forest	Low	Riparian	0.77
WAF	Headwater Forest	High	Riparian	0.12
WAG	Pine Flat	Medium	Non-riparian	0.44
WAI	Headwater Forest	High	Riparian	0.05
WAJ	Headwater Forest	High	Riparian	0.01
WAK	Pine Flat	Low	Non-riparian	0.67

Table 3. Characteristics of potential jurisdictional wetlands in the study area (Continued)

Map ID*	NCWAM Classification	NCWAM Rating	Hydrologic Classification	Area (ac.) in Study Area
WAL	Pine Flat	Medium	Non-riparian	0.06
WAM	Pine Flat	Low	Non-riparian	2.18
WAN	Pine Flat	Medium	Non-riparian	0.09
WAO	Headwater Forest	High	Riparian	0.23
WAP	Headwater Forest	High	Riparian	0.06
WAQ	Basin Wetland	Low	Non-riparian	0.03
WAR	Headwater Forest	High	Riparian	<0.01
WAS	Pine Flat	Medium	Non-riparian	1.38
			Total	**18.00**

*Wetland WAA doesn't exist.

Table 4. Surface waters in the study area

Surface Water*	Jurisdictional	Map ID of Connection	Length (lf)
TA	Yes	SK/Mill Creek	67
TD	Yes	SB/Stones Creek	55
TE	Yes	SJ/Stones Creek	67

* TB and TC do not exist.

Table 5. Stones Bay streams in the study area

Stream Name*	Map ID	NCDWR Index Number	Best Usage Classification
UT to Stones Creek	Stones Bay Stream 1	19-30-3	SA; HQW

*Feature IDs were not provided with the Stones Bay delineation.

Table 6. Stones Bay wetlands in the study area

Map ID*	Hydrologic Classification	Area (ac.) in Study Area
Stones Bay Wetland 1	Riparian	0.66
Stones Bay Wetland 2	Riparian	<0.01
Stones Bay Wetland 3	Riparian	0.38
Stones Bay Wetland 4	Riparian	1.05
Stones Bay Wetland 5	Riparian	0.11
Stones Bay Wetland 6	Riparian	0.75
Stones Bay Wetland 7	Riparian	0.02
	Total	**2.97**

*Feature IDs were not provided with the Stones Bay delineation. The IDs above were assigned by NCDOT. The IDs start at the northernmost wetland and proceed south.

Table 7. ESA federally protected species listed for Onslow County

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
Alligator mississippiensis	American alligator	T (S/A)	Yes	Not Required
Chelonia mydas	Green sea turtle	T	No	No Effect
*Eretmochelys imbricate**	Hawksbill (=carey) sea turtle	E	No	No Effect
Lepidochelys kempii	Kemp's (=Atlantic) ridley sea turtle	E	No	No Effect
Dermochelys coriacea	Leatherback sea turtle	E	No	No Effect
Caretta caretta	Loggerhead sea turtle	T	No	No Effect
Charadrius melodus	Piping plover	T	No	No Effect
Picoides borealis	Red-cockaded woodpecker	E	Yes	No Effect
Calidris canutus rufa	Red knot	T	No	No Effect
Trichechus manatus	West Indian manatee	E	No	No Effect
Thalictrum cooleyi	Cooley's meadowrue	E	Yes	No Effect
Carex lutea	Golden sedge	E	Yes	No Effect
Lindera melissifolia	Pondberry	E	Yes	No Effect
Lysimachia asperulaefolia	Rough-leaved loosestrife	E	Yes	No Effect
Amaranthus pumilus	Seabeach amaranth	T	No	No Effect

Note: E – Endangered; T – Threatened; T(S/A) – Threatened due to Similarity in Appearance

[ADD DATE]

Section 404/NEPA Merger Team Meeting Agreement

Concurrence Point No. 1: Project Purpose & Need and Proposed Study Area

Project Name/Description: Widen NC 210 from two lanes to a four-lane median-divided facility from US 17 to south of SR 1518 (Old Folkstone Road) in Onslow County, North Carolina., WBS No. 46896.1.1, **State Transportation Improvement Program (STIP) Project No. U-5949**.

Purpose and Need of Proposed Project

The needs to be addressed by this project can be summarized as follows:

- *Traffic congestion exists along the existing facility and is expected to worsen in the future.*

The purpose of the proposed project is to alleviate motorized vehicle congestion along NC 210 between US 17 and south of Old Folkstone Road (SR 1518), with the goal of achieving an overall level of service (LOS) D or better within the project area during peak hour operations. Where feasible, the goal of the project will also be to bring signalized and unsignalized movements to LOS D or better.

Project Study Area

The proposed project study area was developed to address the above-stated purpose and need for U-5949. The project study area boundaries are fully depicted on Figures 1 and 2 of the Merger packet dated August 16, 2018.

The Project Team members have concurred, on this date of [ADD DATE], on the project purpose and need as stated above and the project study area fully depicted in Figures 1 and 2 of the Merger packet dated August 16, 2018.

US Army Corps of Engineers _____
Brad Shaver DATE

US Fish & Wildlife Service _____
Gary Jordan DATE

NC Division of Water Resources _____
Joanne Steenhuis DATE

NC Wildlife Resources Commission _____
Travis Wilson DATE

US Environmental Protection Agency _____
Chris Militscher DATE

[ADD DATE]

NC Department of Transportation

Krista Kimmel DATE

NC State Historic Preservation Office

Renee Gledhill-Earley DATE

NC Division of Coastal Management

Stephen Lane DATE