

Appendix N

Bridge Replacement Scoping Trip Risk Assessment Form

SCDOT Floodplain Checklist and Maps



BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

COUNTY: Charleston

DATE: 06/22/2020

ROAD #: I-526

STREAM CROSSING: Ashley River and Bulls Creek

Purpose & Need for the Project:

Increase capacity at the I-26/I-526 interchange and along the I-526 mainline, thereby relieving traffic congestion and improving operations at the I-26/I-526 interchange and along the I-526 mainline from Paul Cantrell Boulevard to Virginia Avenue.

I. FEMA Acknowledgement

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

Panel Number: 45019C0484J Effective Date: 11/17/2004 (See Attached)

II. FEMA Floodmap Investigation

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

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

III. No Rise/CLOMR Preliminary Determination

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

Justification: Widening of existing bridge

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

Justification:

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

IV. Preliminary Bridge Assessment

A. Locate Existing Plans

a. Bridge Plans Yes File No. 10.804 Sheet No. X (See Attached)
 No

b. Road Plans Yes File No. Sheet No. (See Attached)
 No

B. Historical Highwater Data

a. USGS Gage Yes Gage No. 021720869 Results: 15.58 gage
 No reading 9/11/2007

b. SCDOT/USGS Documented Highwater Elevations
 Yes Results:
 No

c. Existing Plans Yes See Above
 No

V. Field Review

A. Existing Bridge

Length: 3907.5 ft. Width: 75.291 ft. Max. span Length: 120 ft.

Alignment: Tangent Curved

Bridge Skewed: Yes No Angle:

End Abutment Type: pile bent

Riprap on End Fills: Yes No Condition: little minor damage

Superstructure Type: mix of concrete flat slabs and steel girders

Substructure Type: prestressed pile bents - concrete

Utilities Present: Yes No

Describe: traffic fiber in median conduit, service conduit on east side

Debris Accumulation on Bridge: Percent Blocked Horizontally: 0 %
Percent Blocked Vertically: 0 %

Hydraulic Problems: Yes No

Describe:

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

V. Field Review (cont.)

B. Hydraulic Features

a. Scour Present: Yes No Location: _____

b. Distance from F.G. to Normal Water Elevation: _____ N/A ft.

c. Distance from Low Steel to Normal Water Elev.: _____ N/A ft.

d. Distance from F.G. to High Water Elevation: _____ 39.1 ft.

e. Distance from Low Steel to High Water Elev.: _____ 35 ft.

f. Channel Banks Stable: Yes No
Describe: minor amount of drift

g. Soil Type: silty sand & clay resting on cooper marl

h. Exposed Rock: Yes No Location: _____

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

C. Existing Roadway Geometry

a. Can the existing roadway be closed for an On-Alignment Bridge Replacement
 Yes No

Describe:

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

If "No", will the proposed bridge be:

- Staged Constructed
- Replaced on New Alignment

BRIDGE REPLACEMENT SCOPING TRIP RISK ASSESSMENT FORM

VI. Field Review (cont.)

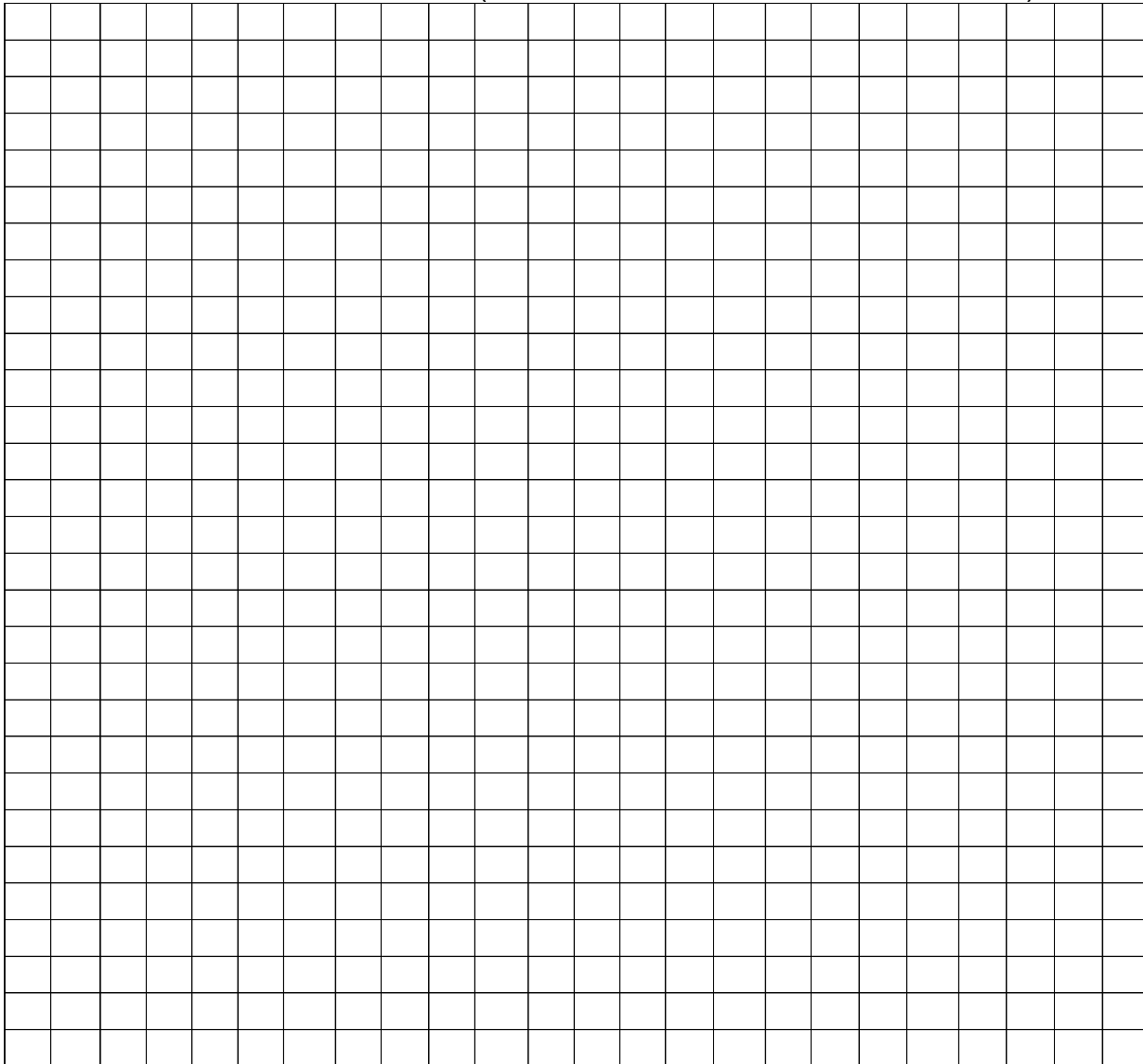
A. Proposed Bridge Recommendation:

Length: 3907.5 ft. Width: 75.291 ft. Elevation: varies ft.

Span Arrangement: same as existing

Notes: _____

BRIDGE SITE DIAGRAM: (Show North Arrow and Direction of Flow) *see attached plans*



Performed By: Maher Almassri Digitally signed by Maher Almassri
Date: 2020.08.11 16:14:29 -04'00'

Title: Discipline leader -Structures



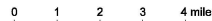
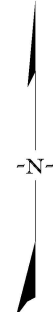
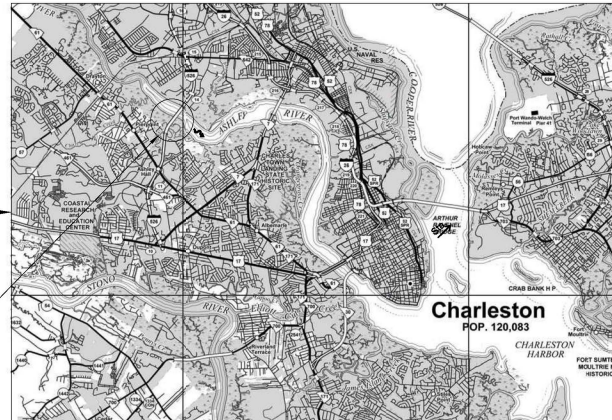
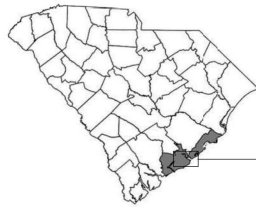
South Carolina Department of Transportation

INDEX OF SHEETS

1. Title Sheet
2. Bridge Plan & Profile 1
3. Bridge Plan & Profile 2
4. Bridge Plan & Profile 3
5. Bridge Staging

**CONCEPTUAL PLANS
 UTILIZED TO OBTAIN
 COAST GUARD BRIDGE PERMIT
 WIDEN TWIN BRIDGES OVER
 BULL CREEK AND ASHLEY RIVER
 ALONG I-526 (MARK CLARK EXPRESSWAY)
 IN CHARLESTON, CHARLESTON COUNTY, SOUTH CAROLINA**

Approximate Location of Bridge Is	
Latitude	32°-50'-07" N
Longitude	80°-01'-28" W



LAYOUT

WIDEN 3907.5' TWIN BRIDGES ALONG I-526 (MARK CLARK EXPY) OVER BULL CREEK & ASHLEY RIVER (GENERAL WILLIAM C. WESTMORELAND BRIDGE)

REVIEWED	MSA	DPM	04-20
DR.	BY	CHK	DATE

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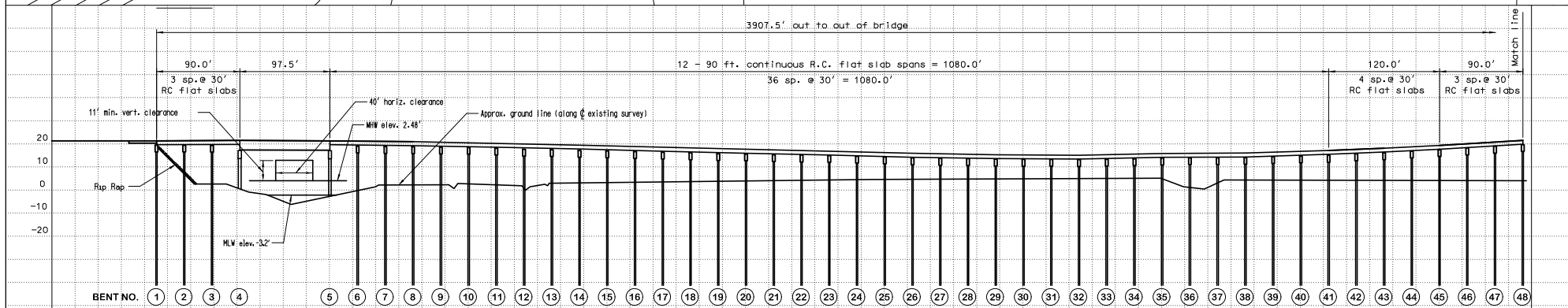
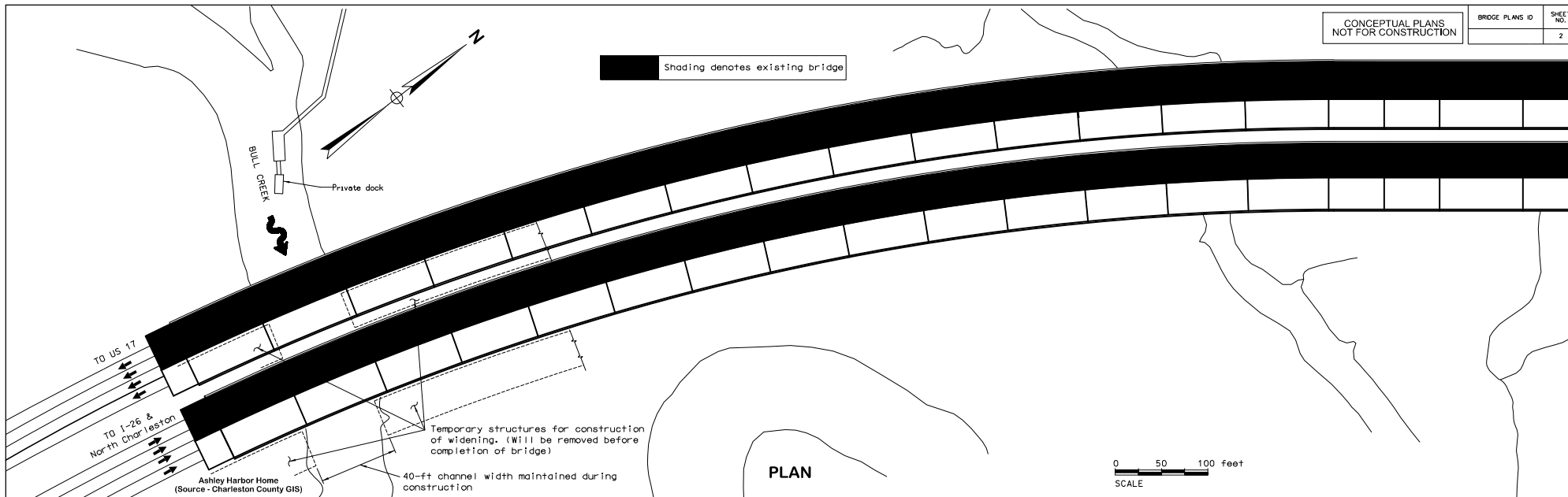
CONSULTING ENGINEERING FIRM

C E	CIVIL ENGINEERING CONSULTING SERVICES, INC.
C S	

2000 PARK STREET
SUITE 201
COLUMBIA, S.C. 29201

ENGINEER OF RECORD

**CONCEPTUAL PLANS
 NOT FOR CONSTRUCTION**



CONCEPTUAL SUBSTRUCTURE:
 Bents 1-3 & 6-48 - Driven Prestressed piles
 Bents 4 & 5 - Round Concrete Columns

SECTION ALONG CENTERLINE

Water Surface Elevation (WSE) Datum: NAVD 88
 WSE information shown for NOAA Station 8665099, I-526 BRIDGE, ASHLEY RIVER, SC.
 1983-2001 epoch. Datum translation using NOAA VDatum.



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BY:	CHK:
DATE:	

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SOUTH CAROLINA
 DEPARTMENT OF TRANSPORTATION

BRIDGE PLAN & PROFILE
 1 of 3

WIDEN TWIN BRIDGES OVER
 BULL CREEK AND ASHLEY RIVER
 ALONG I-526 (MARK CLARK EXPRESSWAY)

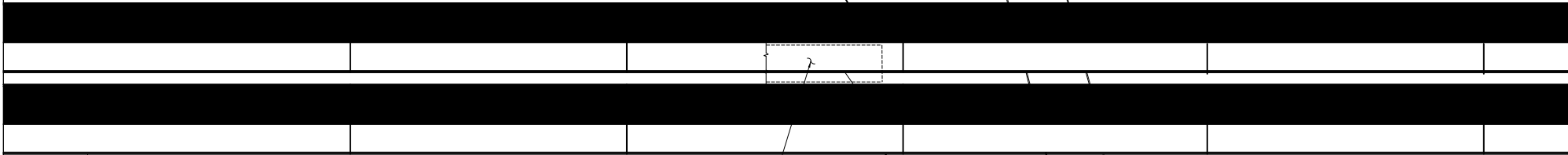
COUNTY: CHARLESTON ROUTE: I-526

NOT FOR CONSTRUCTION

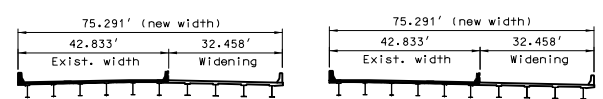
Shading denotes existing bridge

Holland Charles G.
(Source - Charleston County GIS)

CONCEPTUAL PLANS NOT FOR CONSTRUCTION	BRIDGE PLANS ID	SHEET NO.
		3



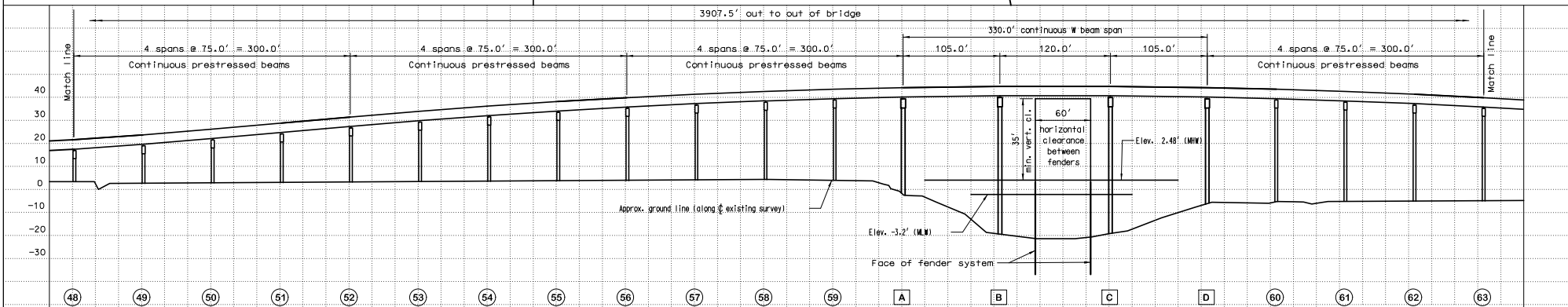
NOTES:
Low chord elevation is to be determined by the designer. A 35' minimum vertical clearance will be maintained.
Crane barges will be moored in river behind the fenders during fender construction.



Widening schematic

Maintain 2 lanes of traffic in each direction during construction

PLAN



SECTION ALONG CENTERLINE

CONCEPTUAL SUBSTRUCTURE:
Bents 48-63, A, B, C, and D - Round Concrete Columns

Water Surface Elevation (WSE) Datum: NAVD 88
WSE information shown for NOAA Station 8665099, I-526 BRIDGE, ASHLEY RIVER, SC,
1983=2001 epoch. Datum translation using NOAA VDatum.



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DES.		
BY:	CHK:	DATE:

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SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION

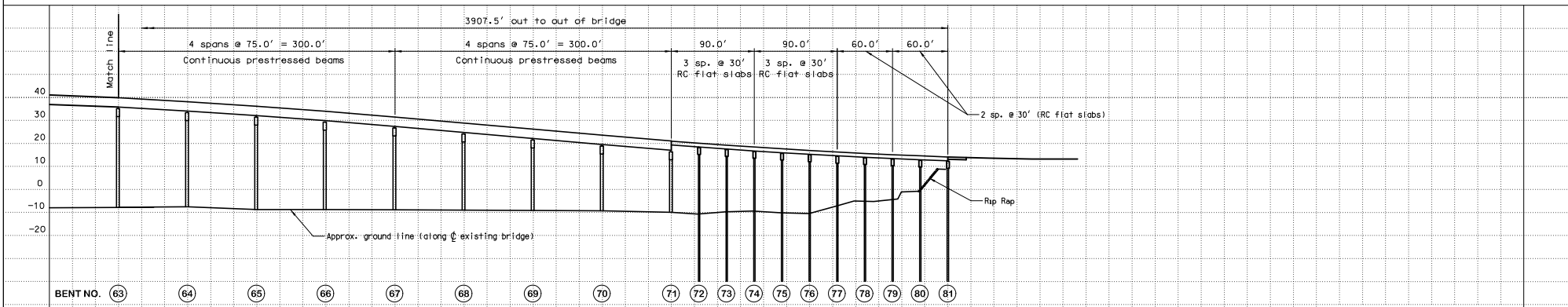
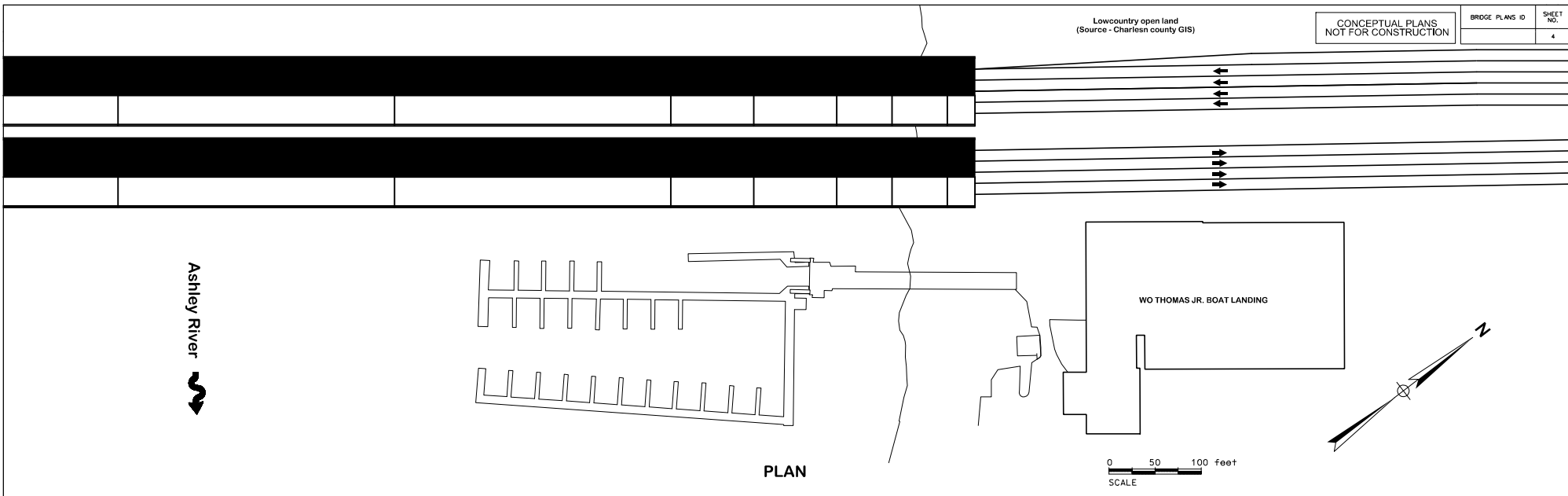
BRIDGE PLAN & PROFILE
2 of 3

WIDEN TWIN BRIDGES OVER
BULL CREEK AND ASHLEY RIVER
ALONG I-526 (MARK CLARK EXPRESSWAY)

COUNTY: CHARLESTON

ROUTE: I-526

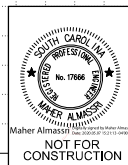
NOT FOR CONSTRUCTION



CONCEPTUAL SUBSTRUCTURE:
Bents 72-81- Driven Prestressed piles
Bents 63-71 - Round Concrete Columns

SECTION ALONG CENTERLINE

Water Surface Elevation (WSE) Datum: NAVD 88
WSE information shown for NOAA Station 8665099, I-526 BRIDGE, ASHLEY RIVER, SC.
1983-2001 epoch. Datum transition using NOAA VDatum.



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BY	CHK.
DATE	

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BRIDGE PLAN & PROFILE
3 of 3

WIDEN TWIN BRIDGES OVER
BULL CREEK AND ASHLEY RIVER
ALONG I-526 (MARK CLARK EXPRESSWAY)

COUNTY CHARLESTON ROUTE I-526

NOT FOR CONSTRUCTION

**South Carolina Department of Transportation
Location and Hydraulic Design of Encroachments on Floodplains Checklist**

23 CFR 650, this regulation shall apply to all encroachments and to all actions which affect base floodplains, except for repairs made with emergency funds. Note: These studies shall be summarized in the environmental review documents prepared pursuant to 23 CFR 771.

I. PROJECT DESCRIPTION

The proposed project consists of 3.5 miles of work on I-26 and 9.2 miles of work on I-526 for a total of 12.7 miles. The boundaries of the study area, shown in Figure 1.2, generally follows the section of I-526 from Paul Cantrell Boulevard to Virginia Avenue including the I-26/I-526 interchange. The I-526 LCC WEST project also proposes upgrades/changes to five interchanges along I-526; the I-526 at Paul Cantrell Boulevard interchange; the I-26/I-526 system-to-system interchange; the I-526 at Rivers Avenue; the I-526 at N Rhett Avenue and the I-526 at Virginia Avenue interchange.

A. Narrative Describing Purpose and Need for Project

- a. Relevant Project History:
- b. General Project Description and Nature of Work (attach Location and Project Map):
- c. Major Issues and Concerns:

The I-526 Lowcountry Corridor (LCC) West project is an ongoing effort by the SCDOT to address traffic demands on the I-526 corridor. The purpose of the project is to increase capacity at the I-26/I-526 interchange and along the I-526 mainline, thereby relieving traffic congestion and improving operations at the I-26/I-526 interchange and along the I-526 mainline from Paul Cantrell Boulevard to Virginia Avenue (see map: Figure 1).

Major issues include impacts to environmental justice communities, Waters of the U.S., and costs.

B. Are there any floodplain(s) regulated by FEMA located in the project area?

Yes No

C. Will the placing of fill occur within a 100-year floodplain?

Yes No

D. Will the existing profile grade be raised within the floodplain?

Yes. US 52 will have the roadway profile raised. Other areas in the floodplain will be elevated bridges. The profile increase would result in localized fill within the 100-year floodplain of the riverine systems, although this will be occurring on existing floodplain fill (i.e., existing roadway). It is anticipated that the fill will not have minor water surface elevations impacts.

For systems that have culverts crossings, culvert extension would be constructed at the grade of the existing crossing. It is anticipated that the fill will have minimal water surface elevations impacts.

E. If applicable, please discuss the practicability of alternatives to any longitudinal encroachments.

Not applicable.

F. Please include a discussion of the following: commensurate with the significance of the risk or environmental impact for all alternatives containing encroachments and those actions which would support base floodplain development:

a. What are the risks associated with implementation of the action?

The bridge crossings include ramps within floodplains, but these ramps would be supported on piles with only minor fill needed, and therefore, should only result in minimal base floodplain elevation changes. The impacted areas are generally located in undeveloped areas with major floodplain geometry/water surface elevations influenced by adjacent bridges.

The crossings with culverts would likely require culvert extensions that will be constructed within the floodplain. The culvert extensions would be designed to accommodate a 50-year storm event and checked for a 100-year storm event. Additional fill would be required for construction of the culvert extension.

- b. What are the impacts on the natural and beneficial floodplain values?

Minor floodplain fill is generally the only impact to the floodplain value. This will result in minor losses in flood storage, vegetation, and wetland ecosystems. Most impacts are inclusive of elevated roadways which limit impact footprints.

No significant water quality and biological impacts are anticipated as these will be mitigated prior to discharge to the natural floodplain.

- c. What measures were used to minimize floodplain impacts associated with the action?

Elevated roadways were used to minimize floodplain impacts. Potential impacts include the construction of bridges and associated ramps, and culvert extensions. Minor fill will be required to accommodate the ramps and culvert extensions.

- d. Were any measures used to restore and preserve the natural and beneficial floodplain values impacted by the action?

Preservation of the natural and beneficial floodplain values will be achieved using elevated roadways rather than a completely filled roadway corridor. Only minor fill will be needed to accommodate ramp construction. No measures were used to restore natural and beneficial floodplain values.

- G. Please discuss the practicability of alternatives to any significant encroachments or any support of incompatible floodplain development.

Numerous alternatives were developed and evaluated using specific criteria established through public involvement activities and engineering design. These alternatives were further reduced to the final reasonable alternatives based on public involvement activities and reduced environmental impacts. The range of Reasonable Alternatives includes a mainline alternative from Paul Cantrell Blvd to International Blvd, 4 alternatives at the I-26/I-526 interchange, and 5 alternatives at the North Rhett Ave and Virginia Ave intersections. All alternatives would result in floodplain impacts.

The proposed roadway improvements will generally be elevated roadways within the floodplain without any ramps/access points within the natural floodplain. As a result, the project will not support incompatible floodplain development.

- H. Were local, state, and federal water resources and floodplain management agencies consulted to determine if the proposed highway action is consistent with existing watershed and floodplain management programs and to obtain current information on development and proposed actions in the affected? Please include agency documentation.

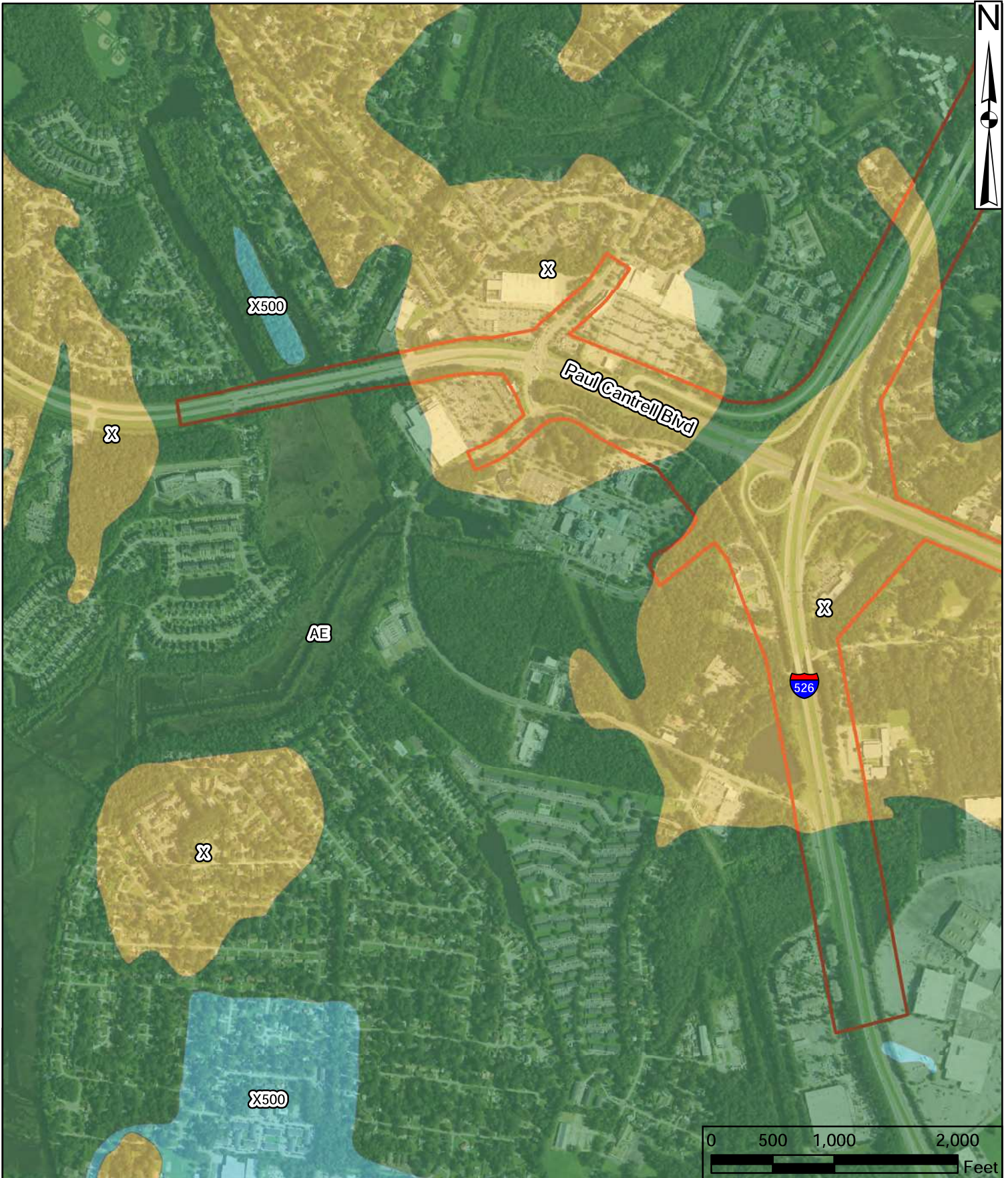
To date, there has been limited coordination with local, state, or federal agencies regarding the proposed project and its impacts on the watershed and floodplain. At the appropriate stage of project development (i.e. final design), a complete hydraulic study performed to SCDOT guidelines for Hydraulic Design Studies would be conducted to determine the effects of the project more precisely on the base floodplains. If after the completion of the studies it is determined that a conditional letter of map revision (CLOMR) is needed, appropriate coordination with FEMA would take place.

Ryan C. Phillips

08/12/2020

Hydraulic Engineer

Date



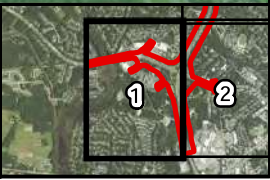
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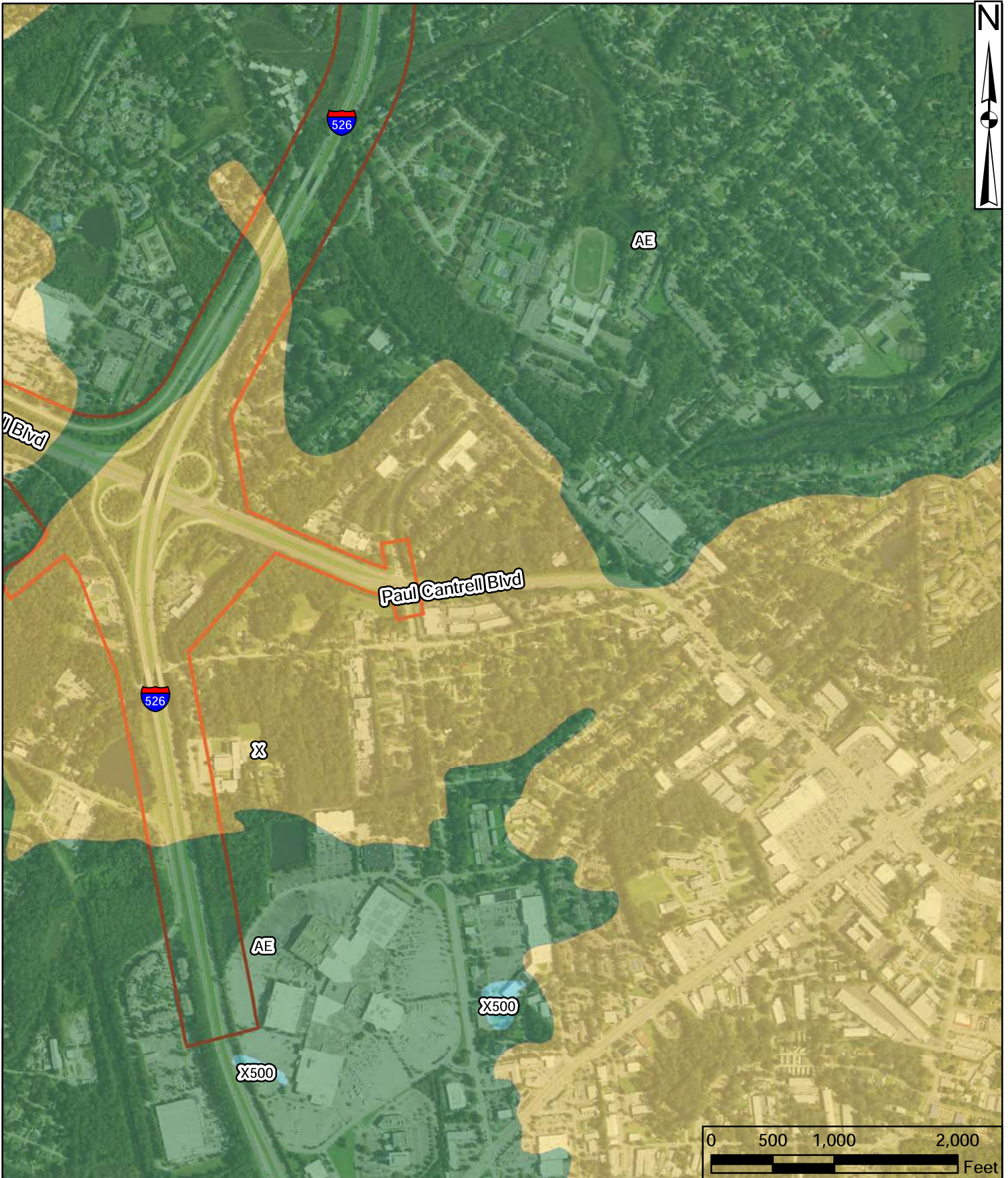
Drawn By: RHH
QA/QC: KLM

I-526 Lowcountry Corridor West
Charleston County
SCDOT P032102
February 2020

FEMA Floodzones

Figure 4.19
Sheet 1 of 11





Source:
FEMA Floodplain Q3flood
2019

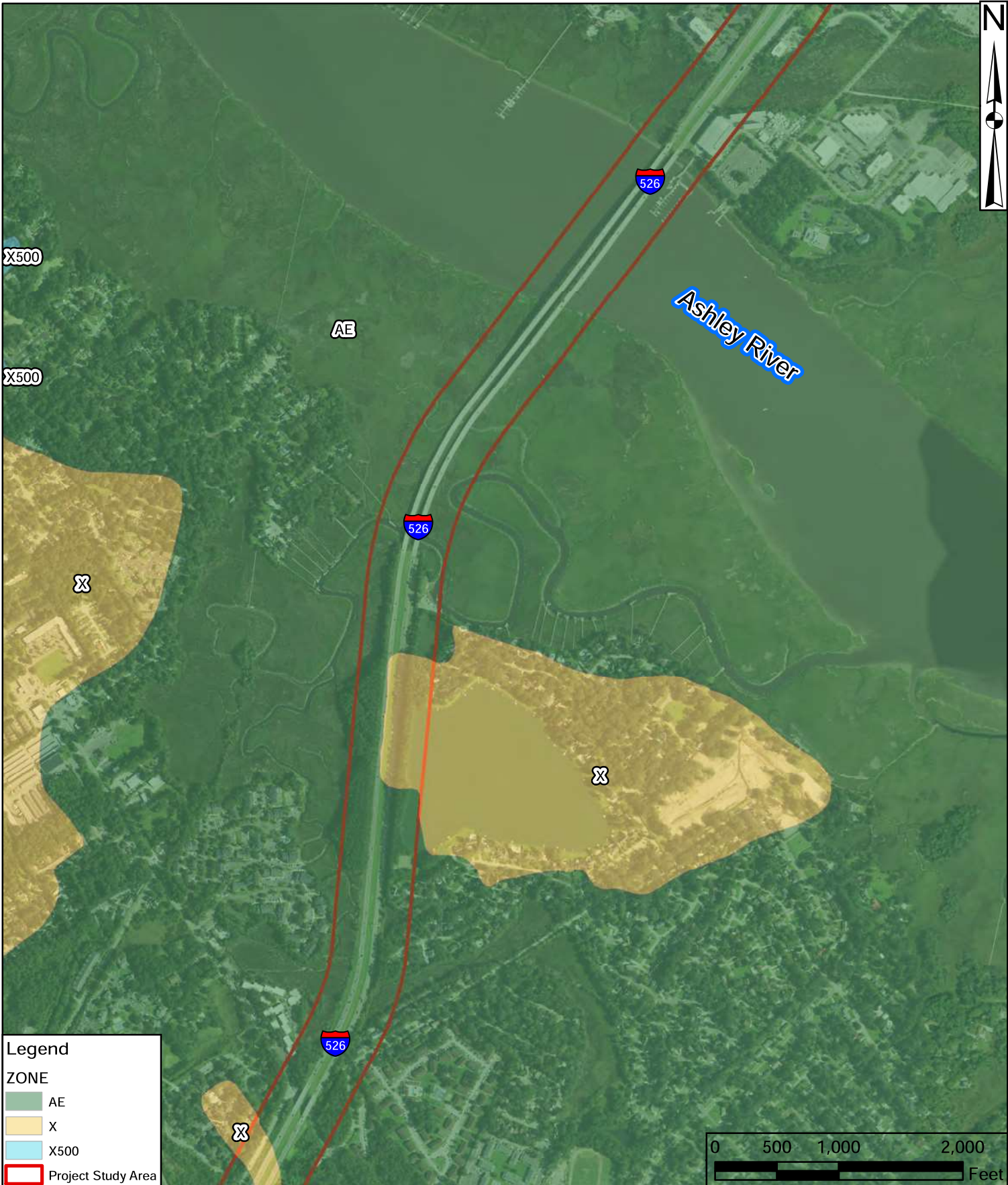
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Charleston County
SCDOT P032102
February 2020

FEMA Floodzones

Figure 4.19
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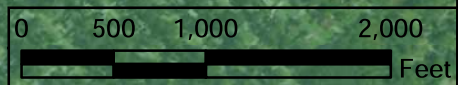




Legend

ZONE

- AE
- X
- X500
- Project Study Area





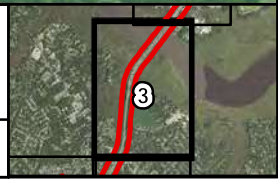
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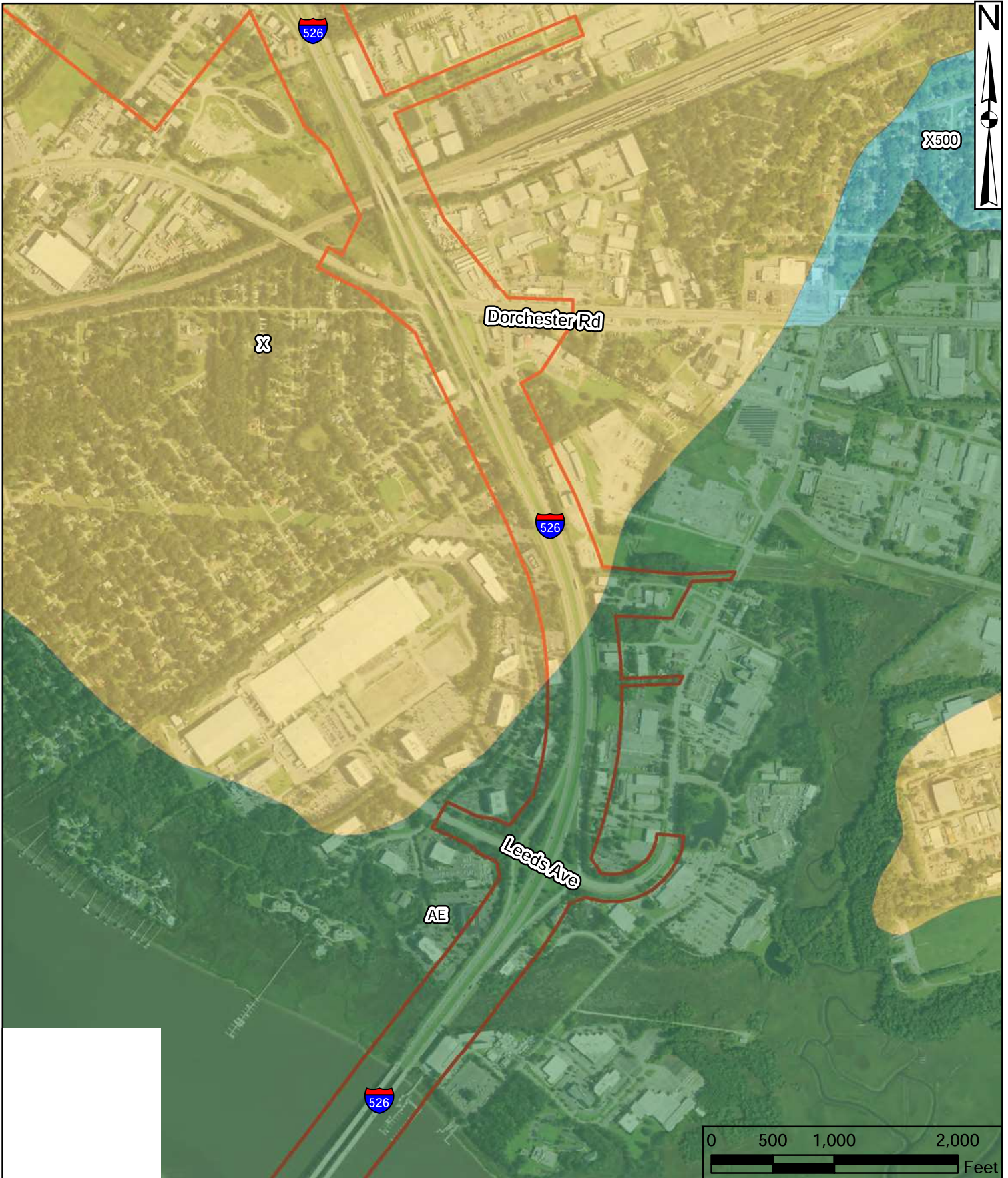
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Charleston County
SCDOT P032102
February 2020

FEMA Floodzones

Figure 4.19
Sheet 3 of 11







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FEMA Floodplain Q3flood
2019

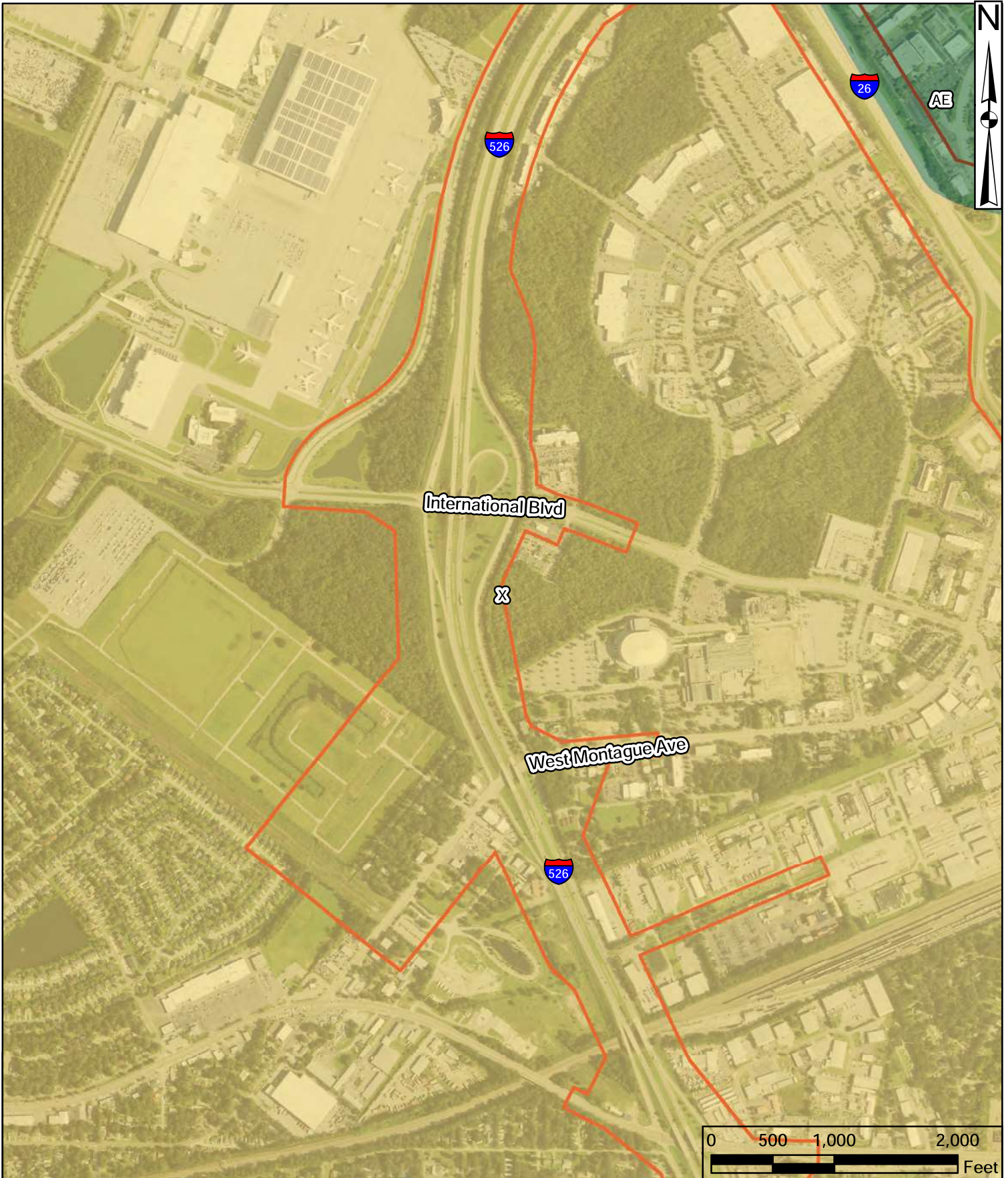
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Charleston County
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FEMA Floodzones

Figure 4.19
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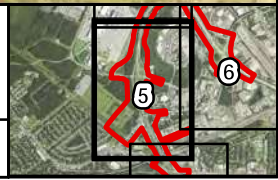
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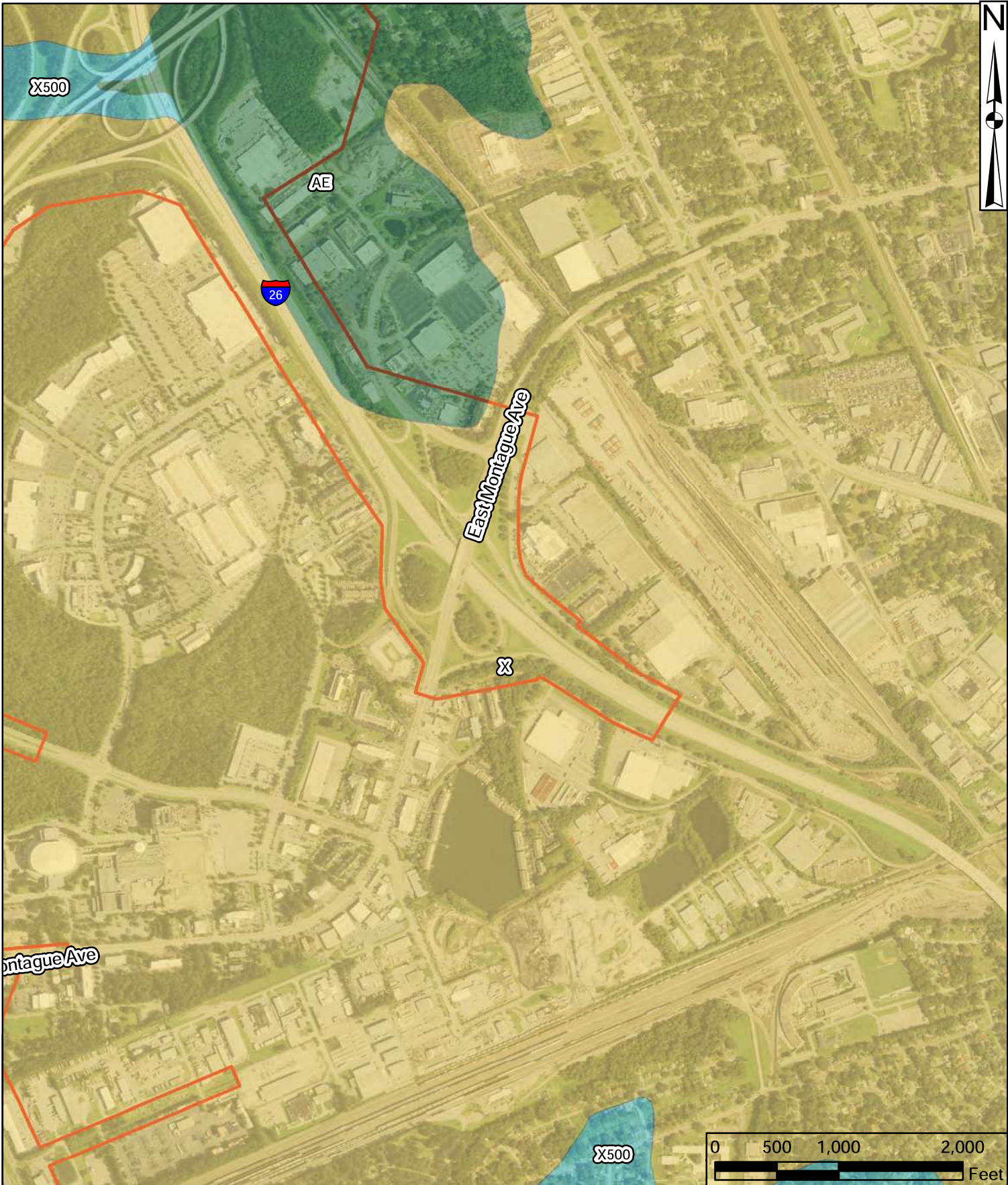
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Charleston County
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February 2020

FEMA Floodzones

Figure 4.19
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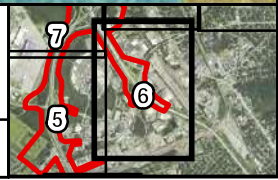
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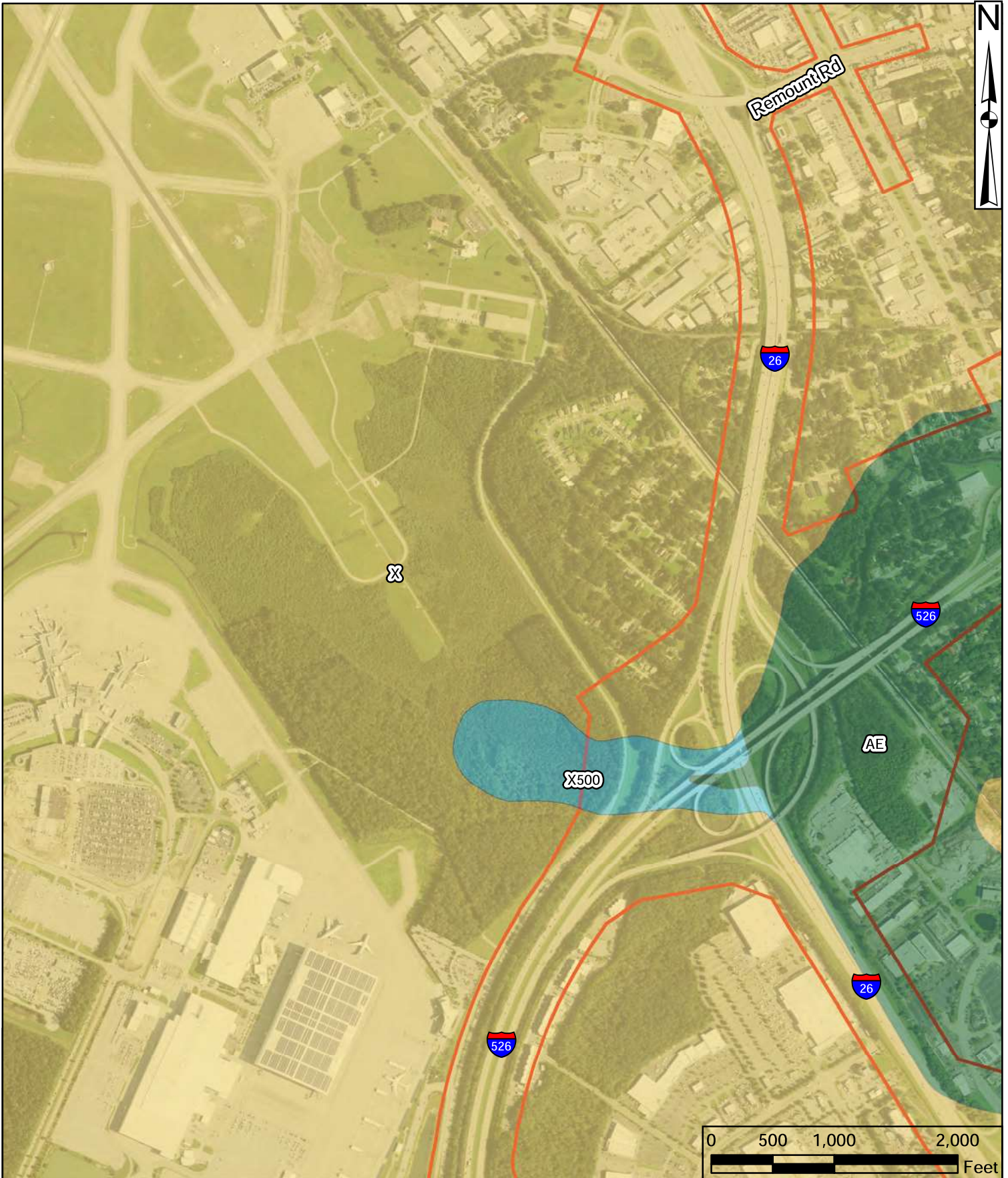
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I-526 Lowcountry Corridor West
 Charleston County
 SCDOT P032102
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 FEMA Floodzones

Figure 4.19
 Sheet 6 of 11







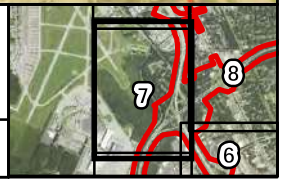
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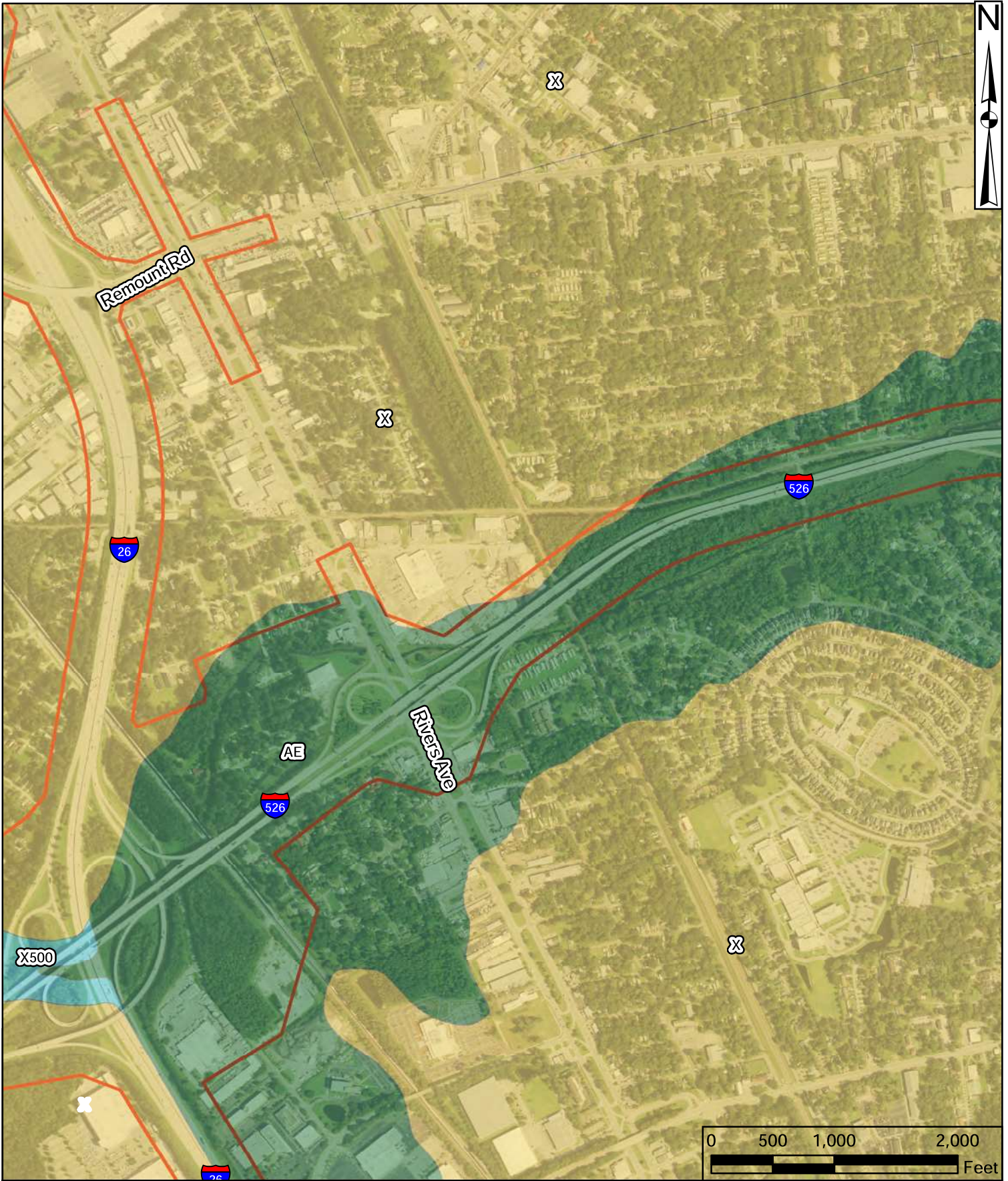
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I-526 Lowcountry Corridor West
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FEMA Floodzones

Figure 4.19
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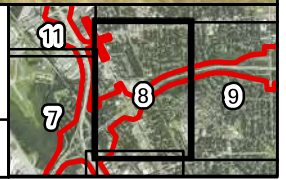
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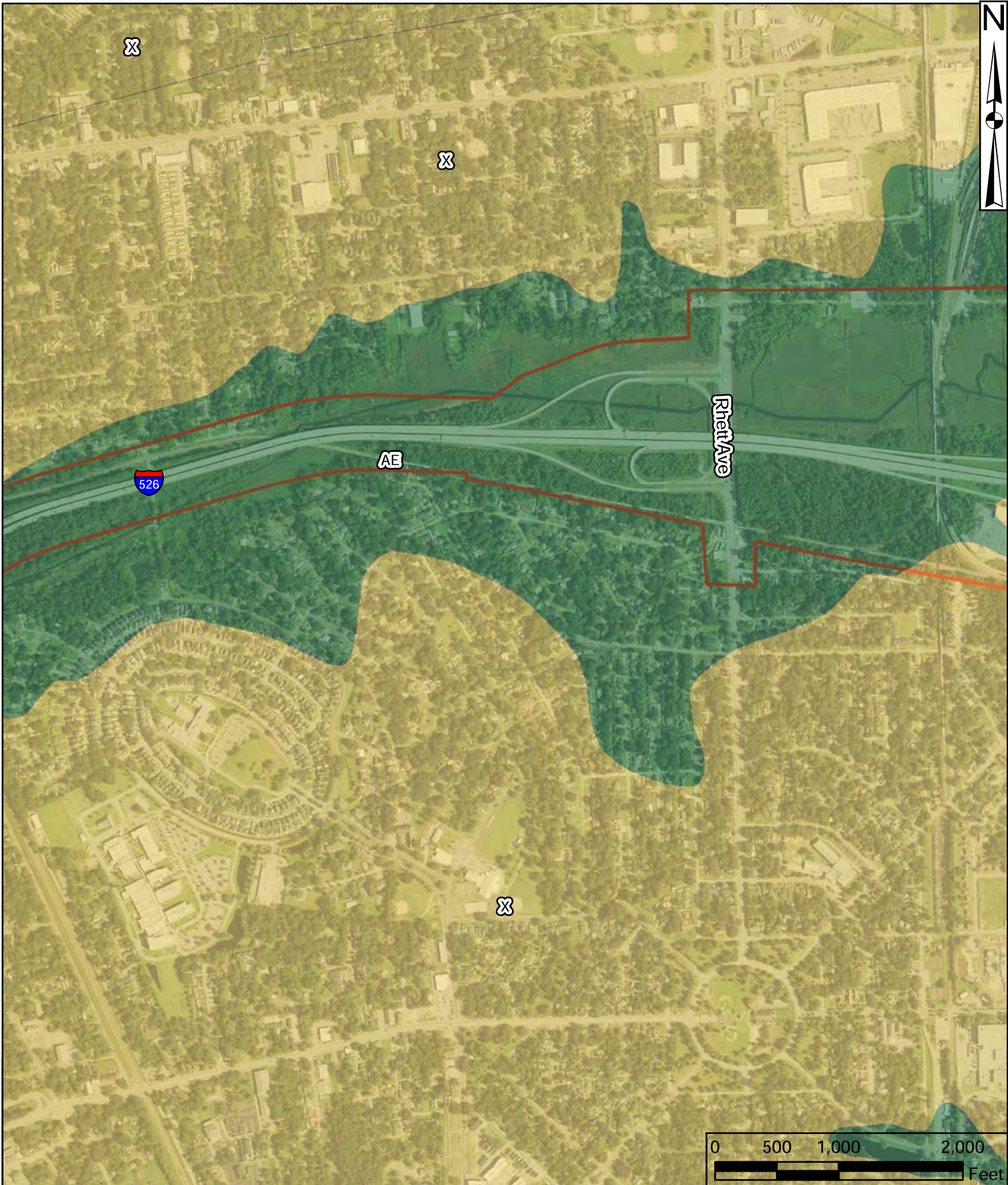
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I-526 Lowcountry Corridor West
Charleston County
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February 2020

FEMA Floodzones

Figure 4.19
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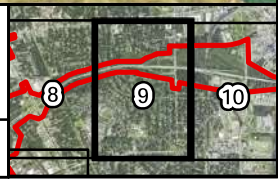
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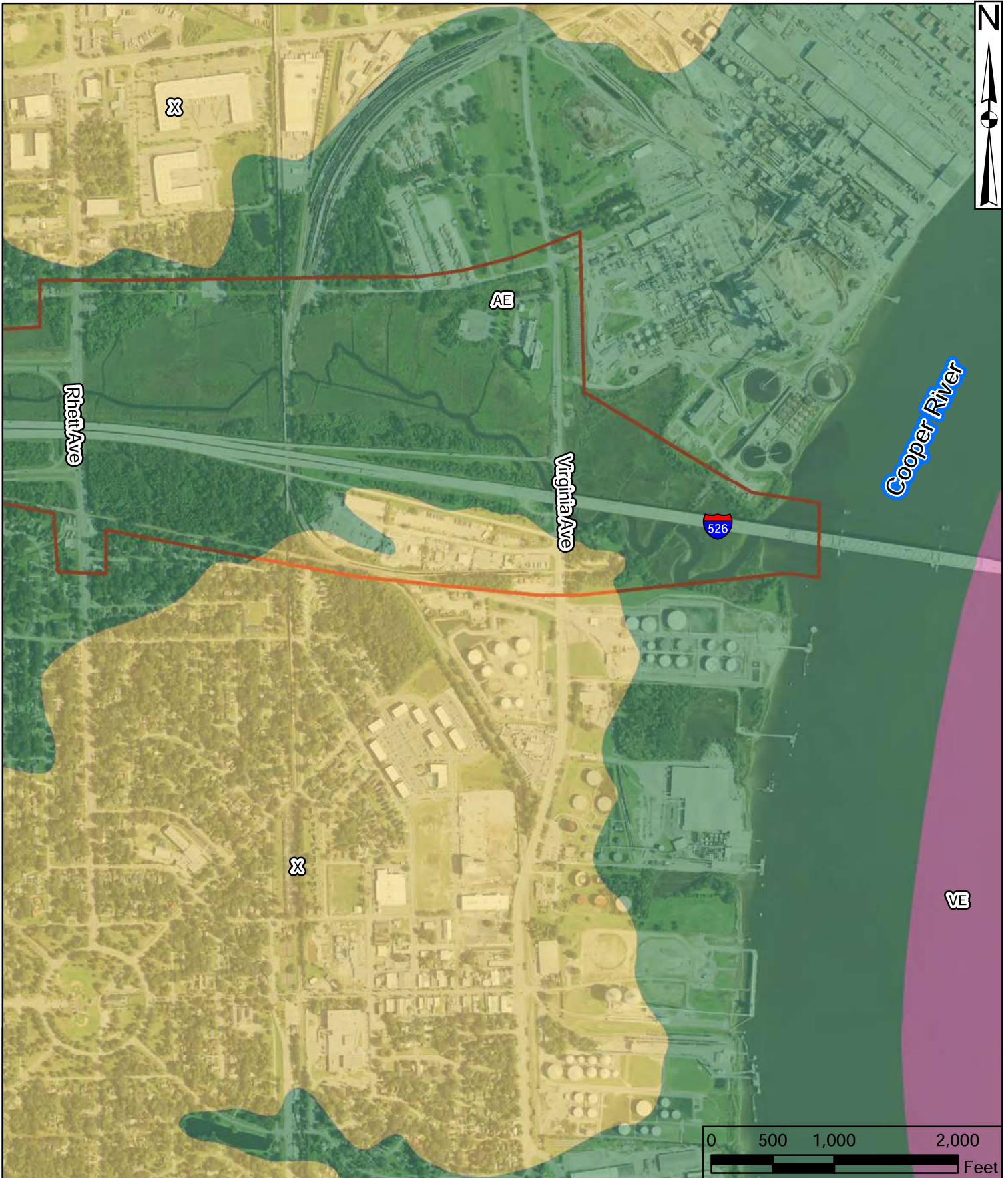
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I-526 Lowcountry Corridor West
Charleston County
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FEMA Floodzones

Figure 4.19
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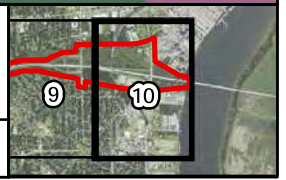
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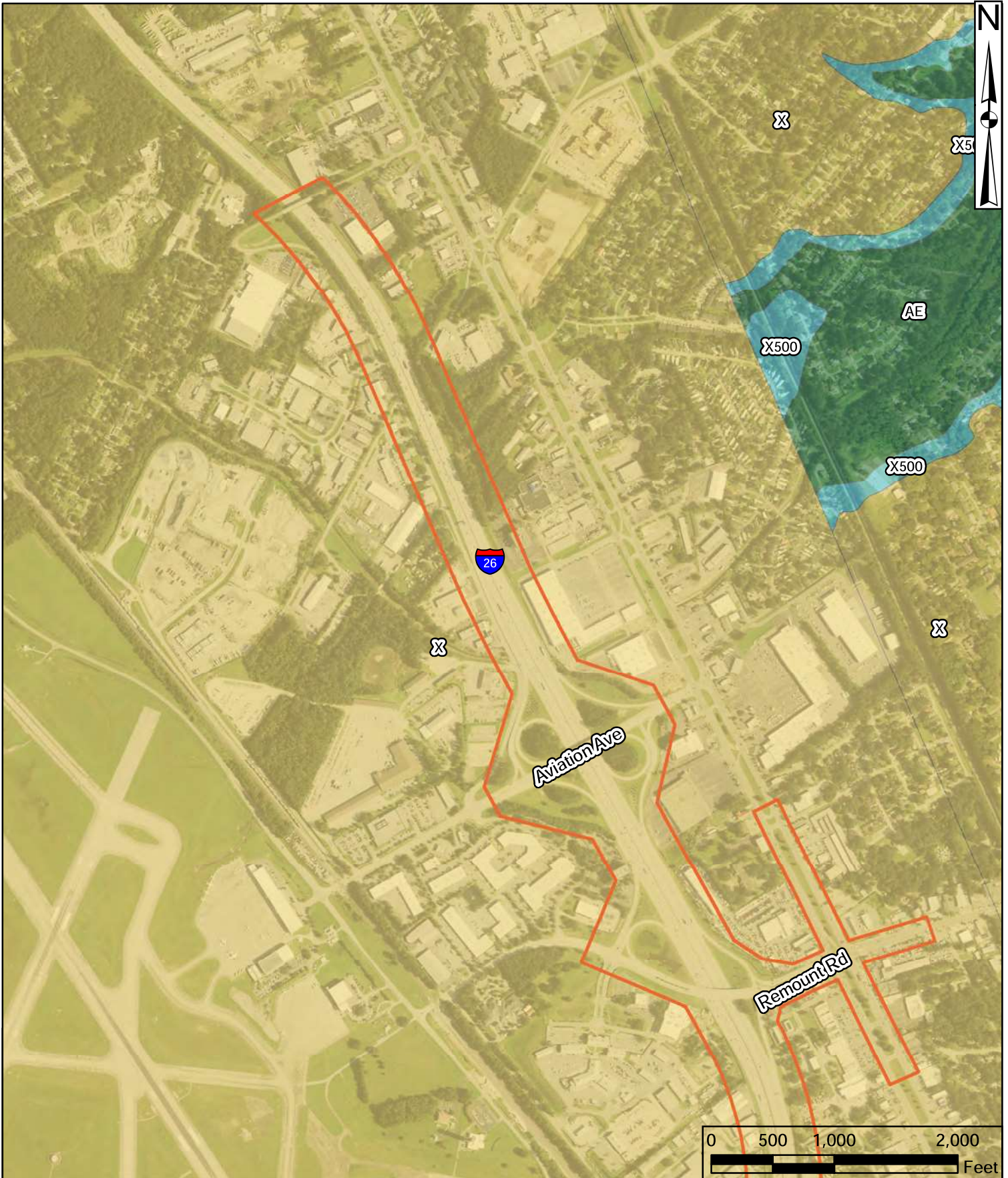
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I-526 Lowcountry Corridor West
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February 2020

FEMA Floodzones

Figure 4.19
Sheet 10 of 11







Source:
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2019

Drawn By: RHH
QA/QC: KLM

I-526 Lowcountry Corridor West
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FEMA Floodzones

Figure 4.19
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