

Appendix N

N.1 Bridge Replacement Scoping Trip Risk Assessment Form

N.2 SCDOT Floodplain Checklist and Maps



Appendix N.1

Bridge Replacement Scoping Trip Risk Assessment Form

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 assessment 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 piers

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.)

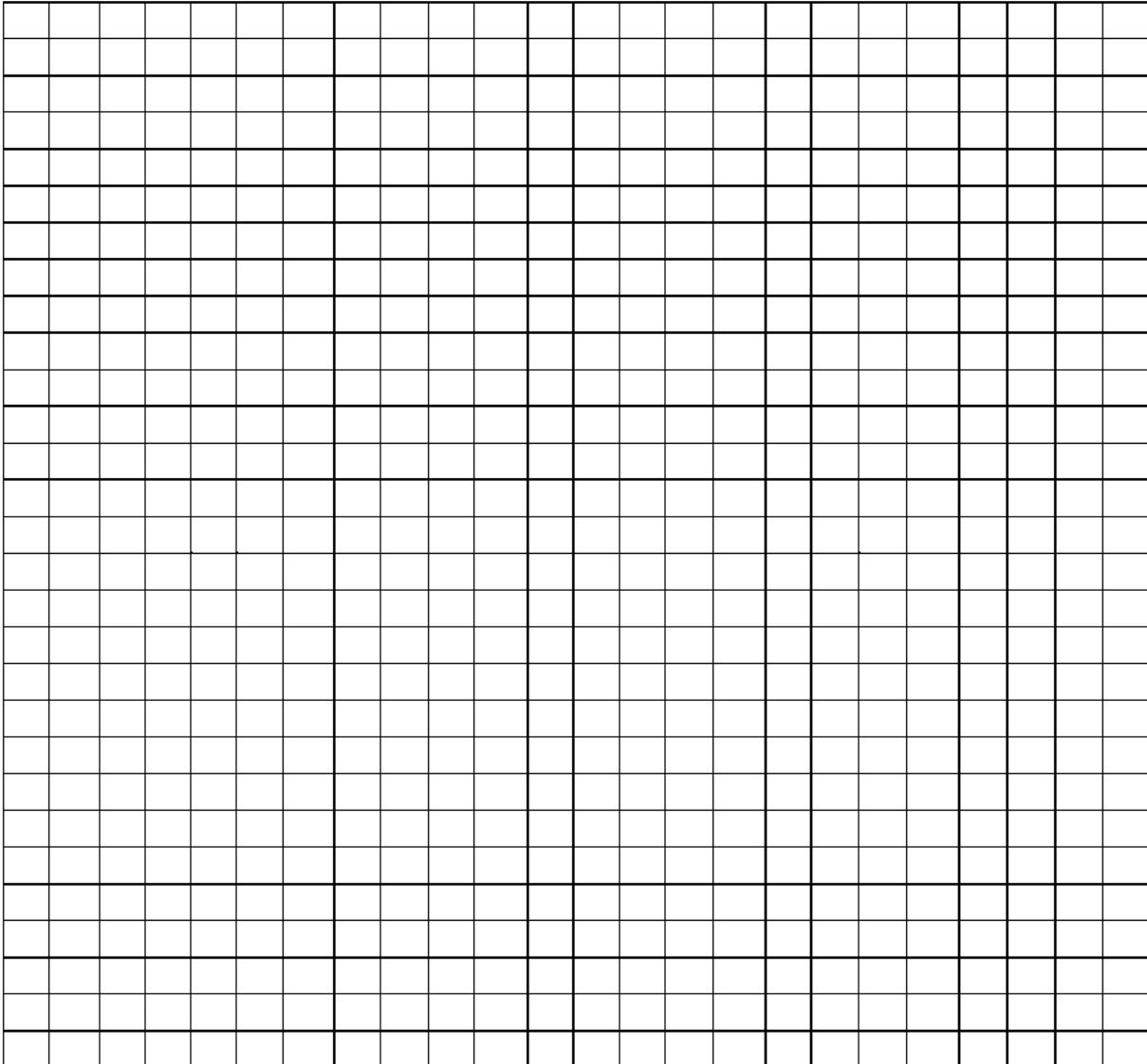
A. Proposed Bridge Recommendation:

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 15:14:29 -04'00'

Title: **Discipline leader -Structures**

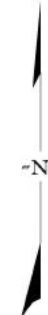
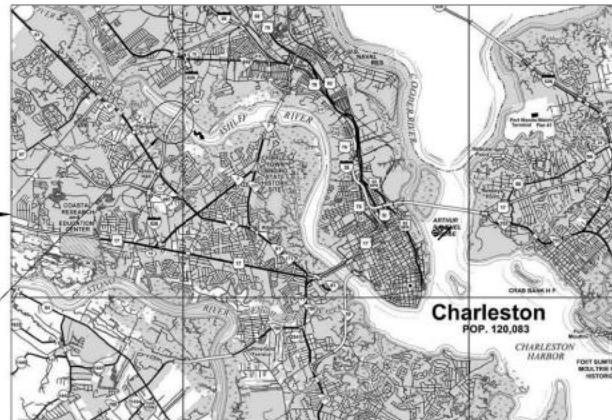
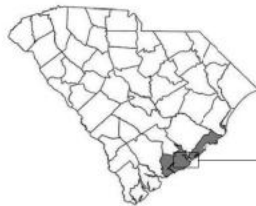


INDEX OF SHEETS

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

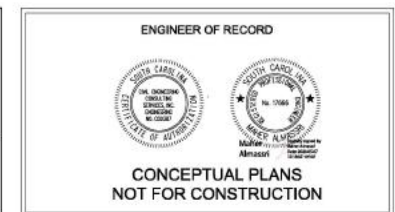
Approximate Location of Bridge is
Latitude 32°50'07" N
Longitude 80°01'28" W

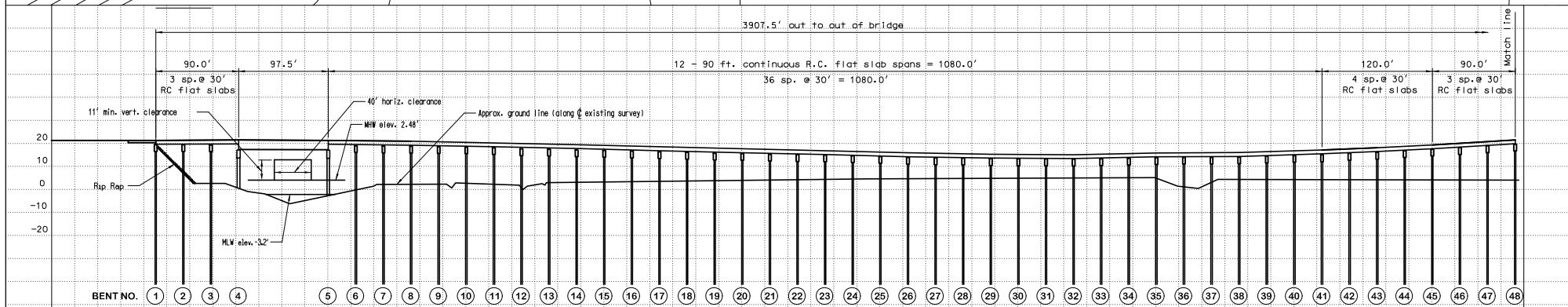
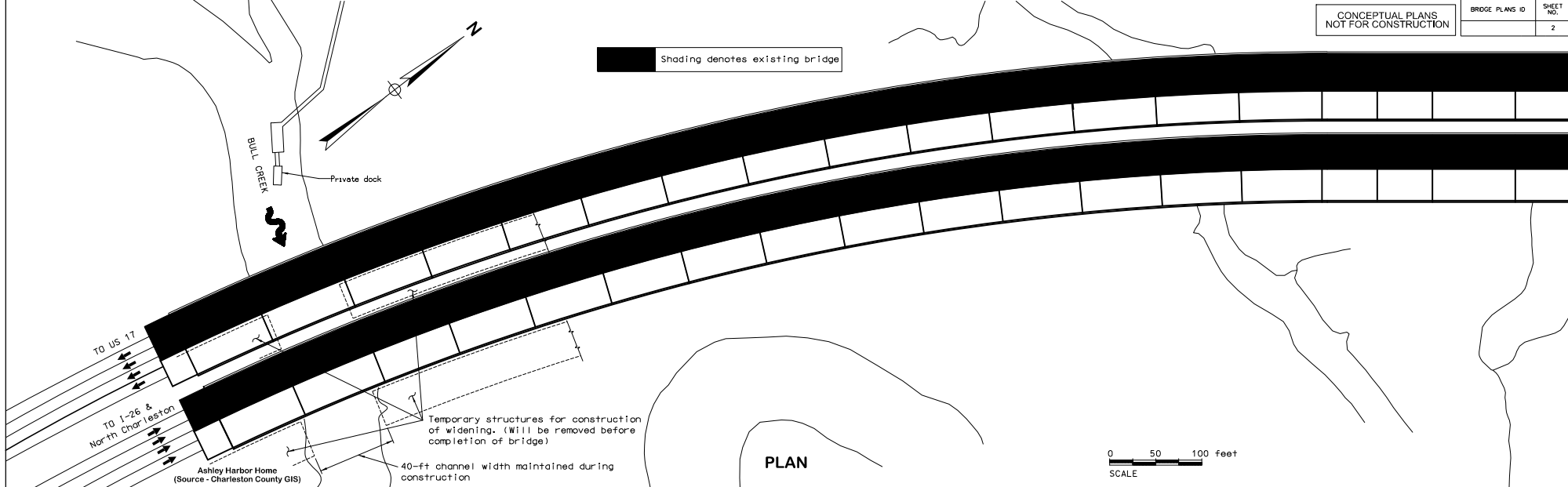


0 1 2 3 4 miles

LAYOUT

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

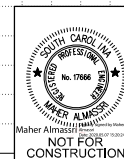




CONCEPTUAL SUBSTRUCTURE:
 Bents 1-3 & 6-48 - Driven Prestressed piles
 Bents 4 & 5 - Round Concrete Columns

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.



REVISIONS	REV.			
	REV.			
	REV.			
	REVIEWED			
	QUAN.			
	DR.	MSA	DPM	03-20
	DES.			
		By	Check	DATE

C E CIVIL ENGINEERING
C S CONSULTING SERVICES, INC.

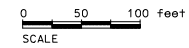
SOUTH CAROLINA
 DEPARTMENT OF TRANSPORTATION

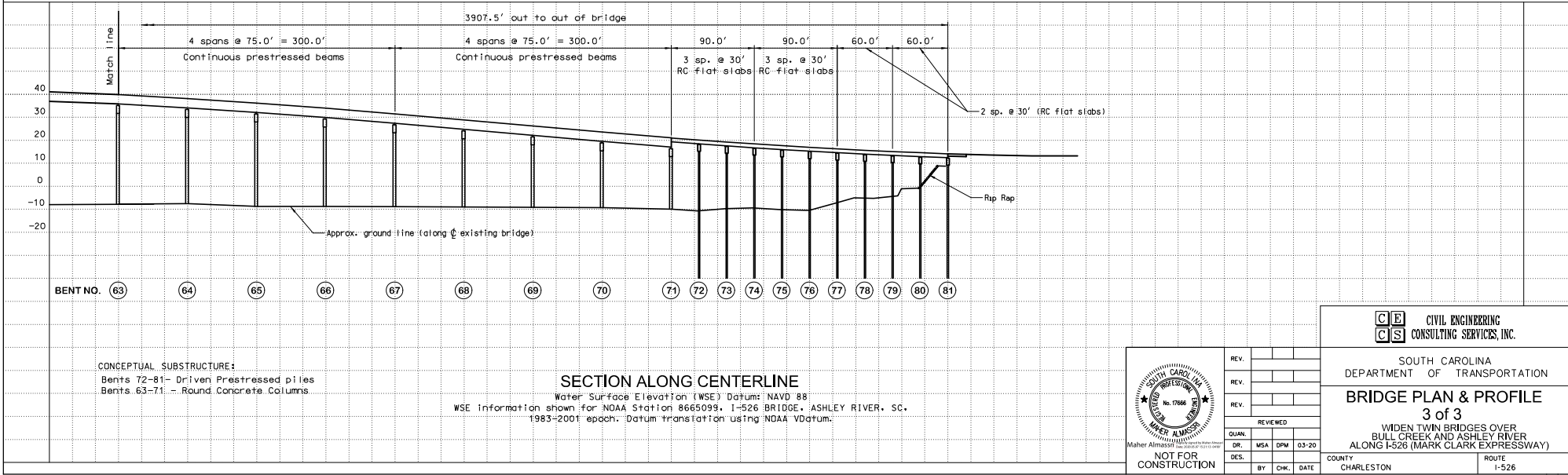
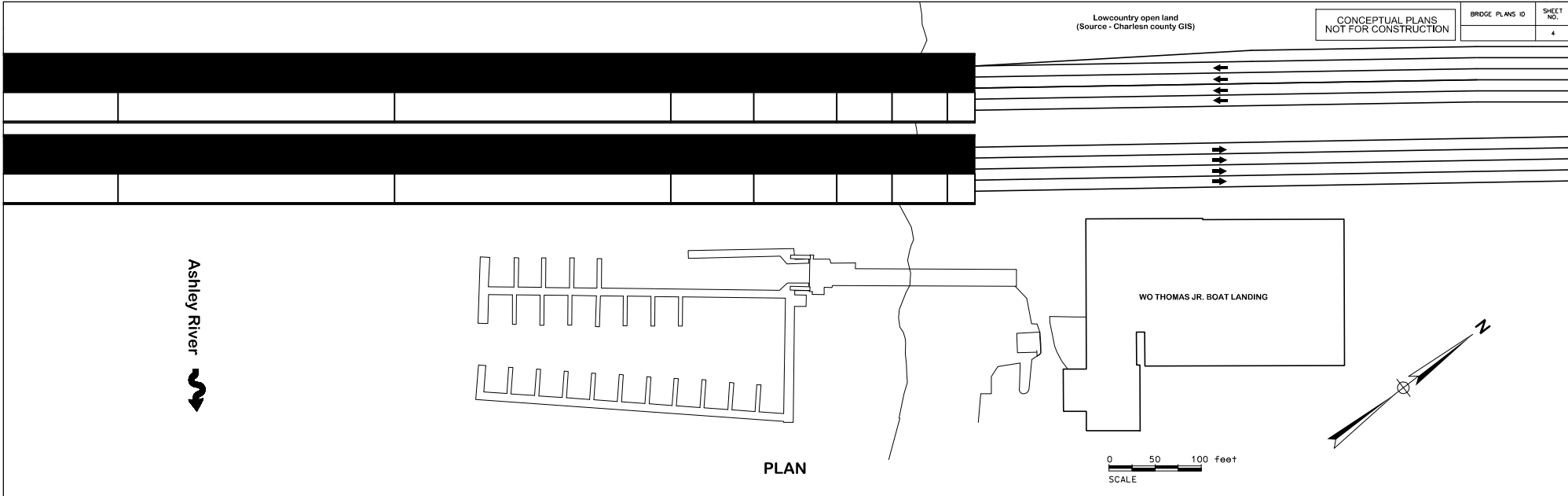
BRIDGE PLAN & PROFILE

1 of 3
 WIDEN TWIN BRIDGES OVER
 BULL CREEK AND ASHLEY RIVER
 ALONG I-526 (MARK CLARK EXPRESSWAY)

COUNTY CHARLESTON	ROUTE I-526
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Ashley River







Appendix N.2

SCDOT Floodplain Checklist and Maps

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.

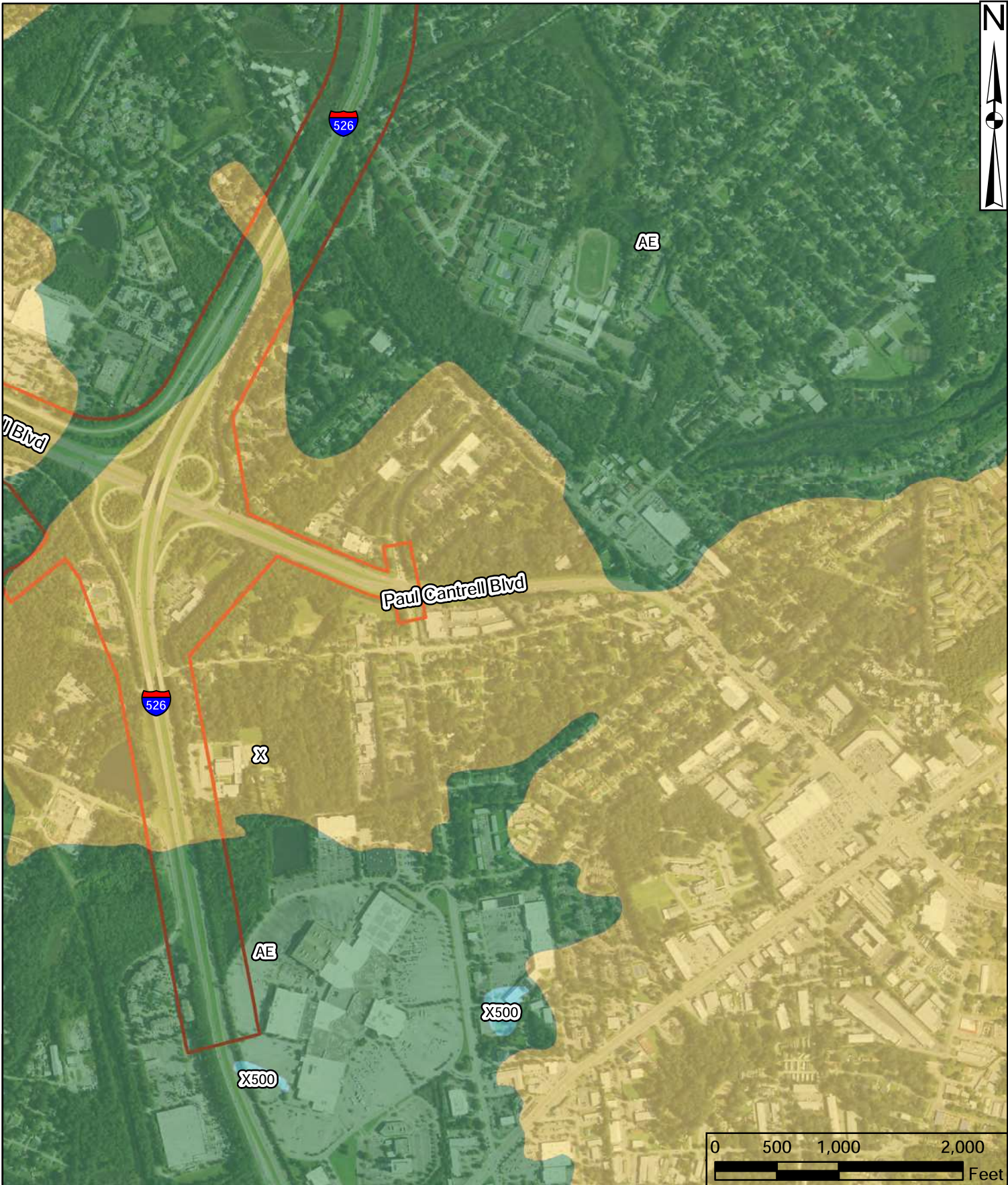


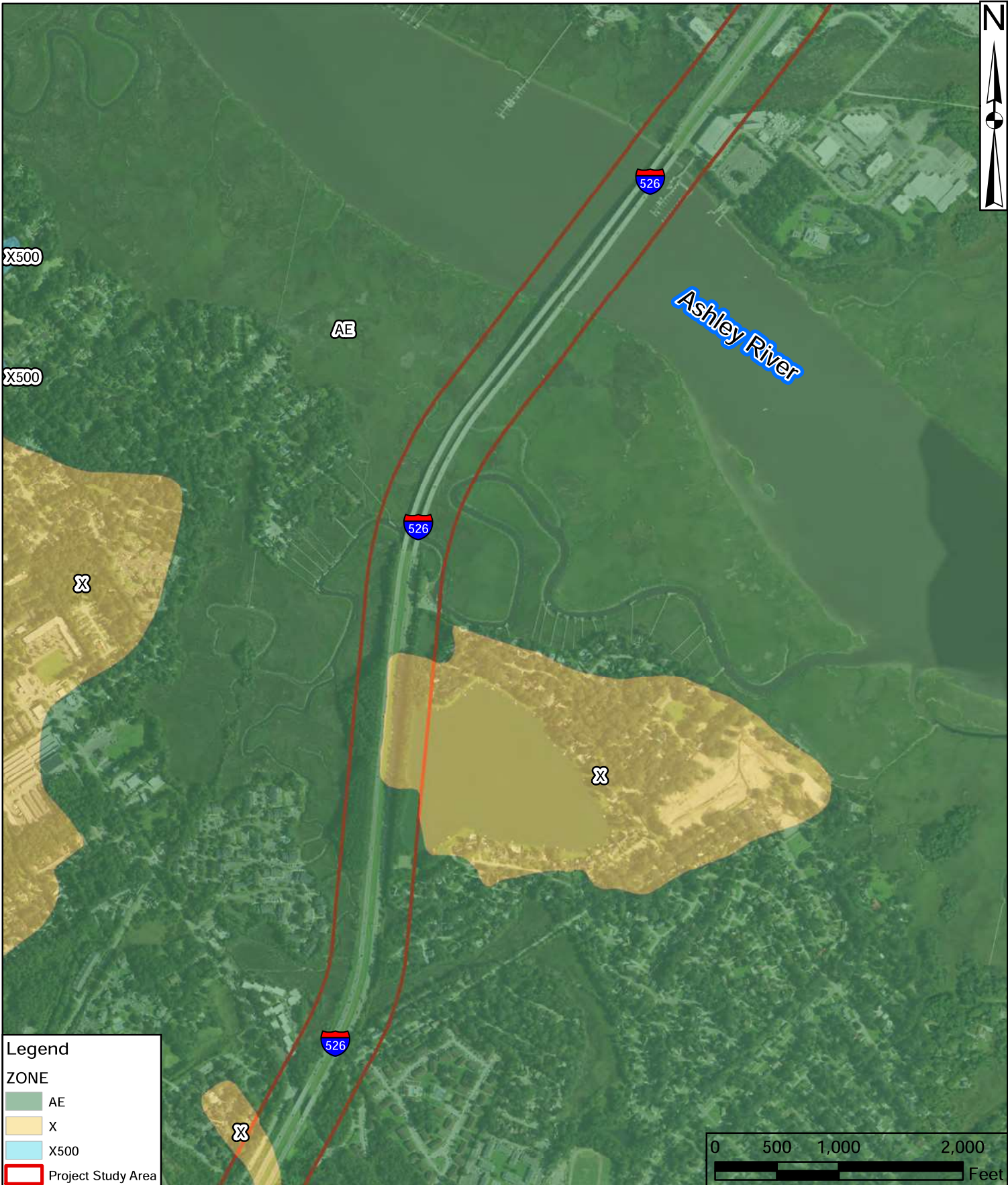
Hydraulic Engineer

08/12/2020

Date



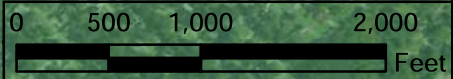


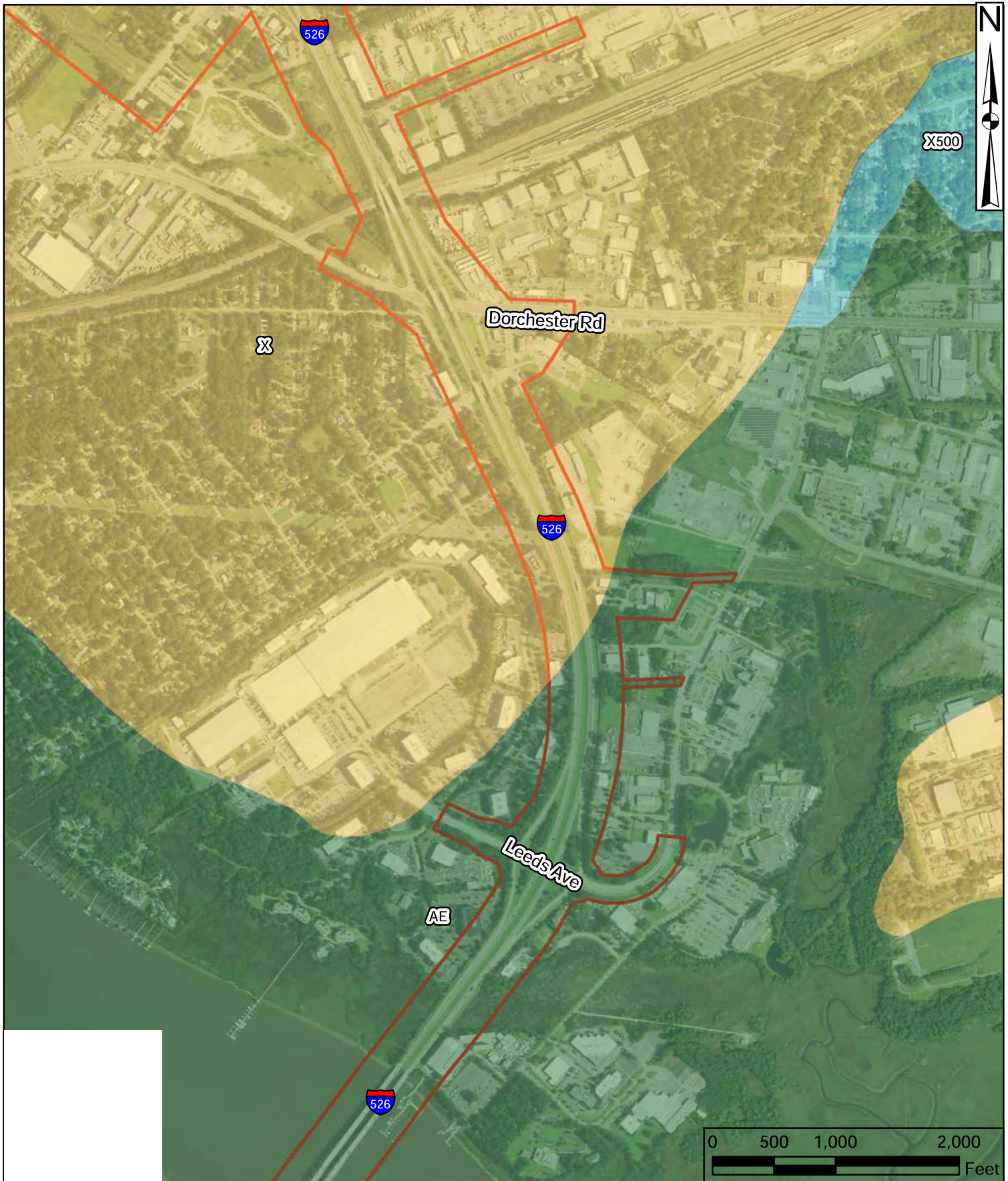


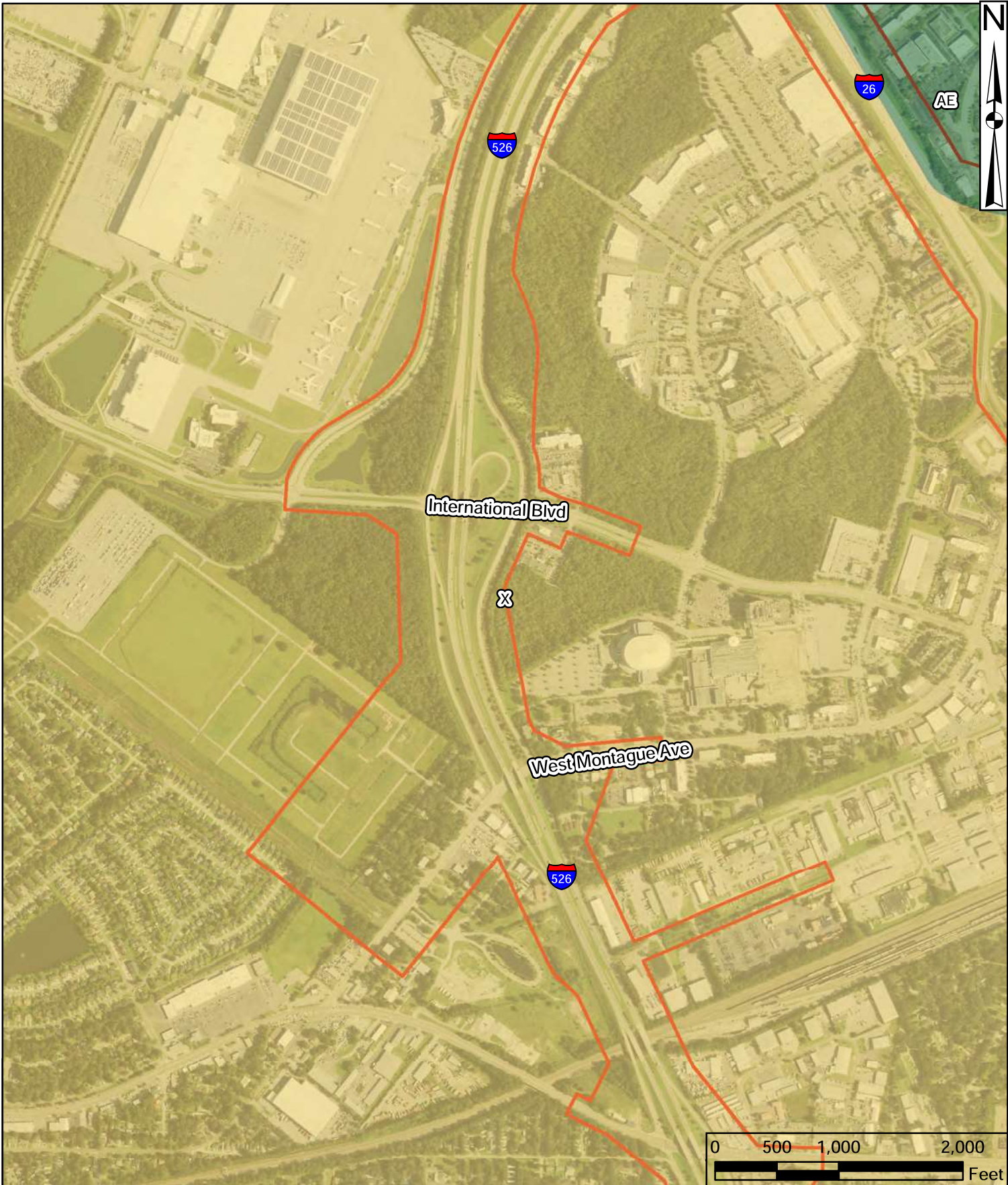
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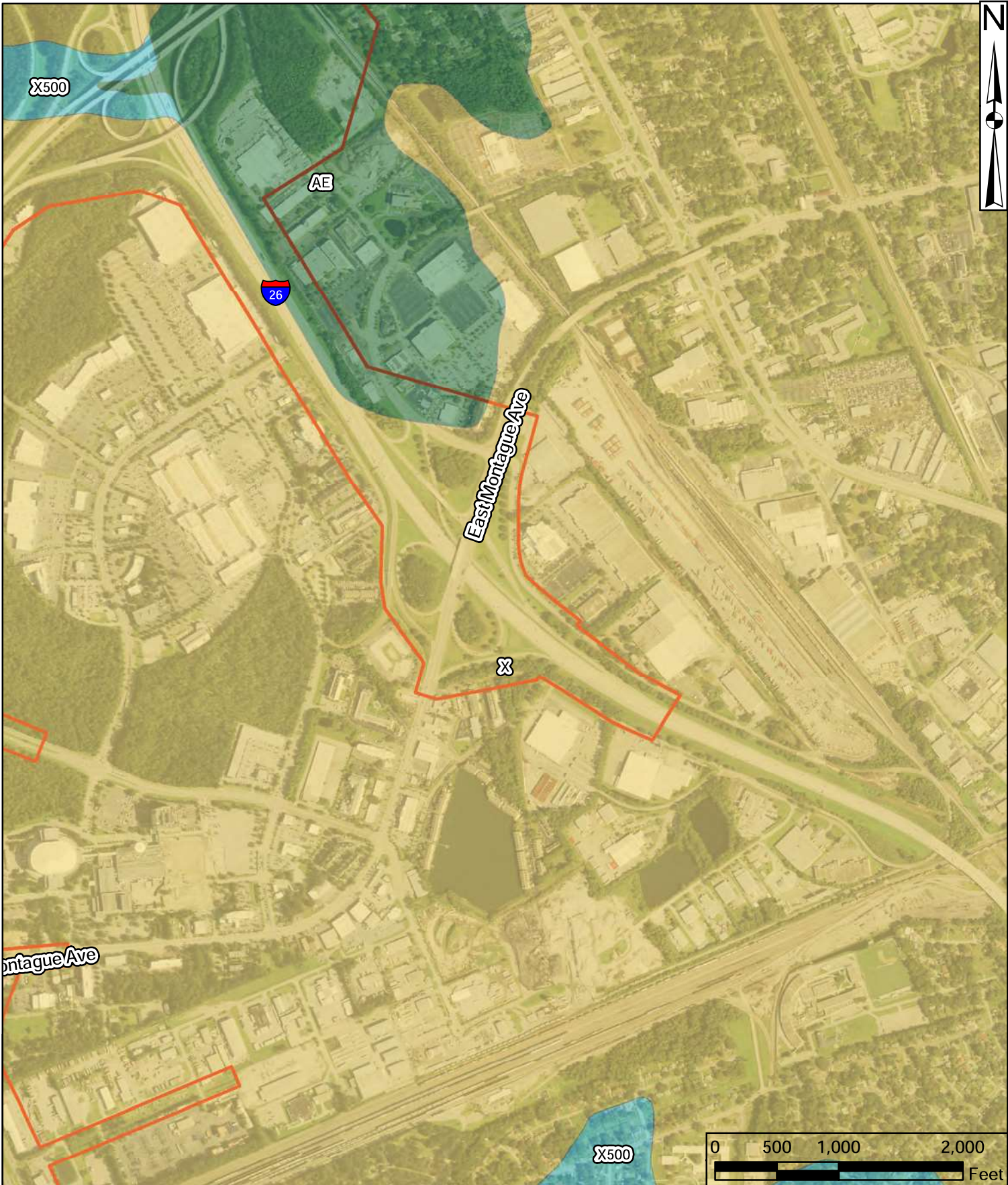
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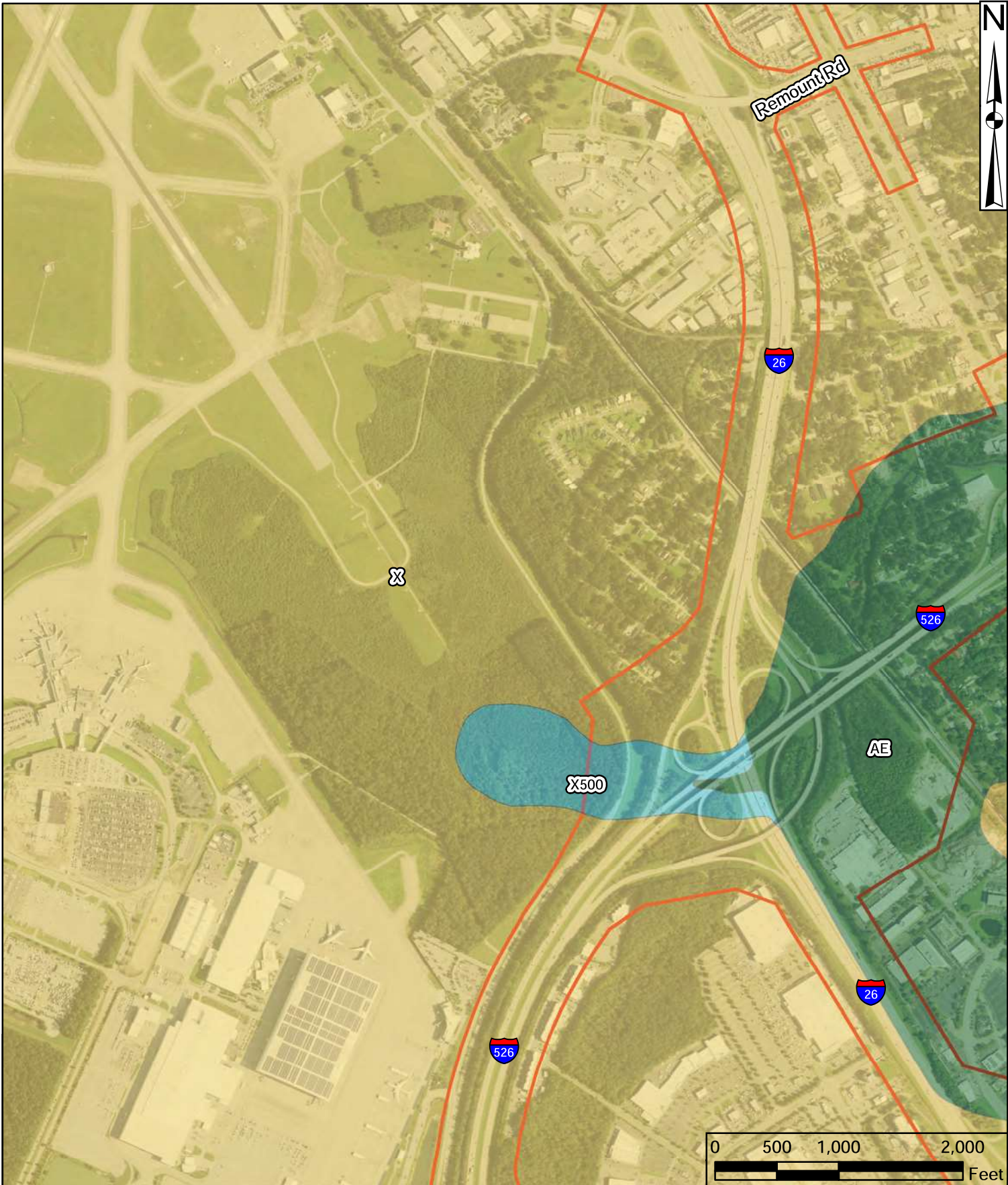
- AE
- X
- X500
- Project Study Area

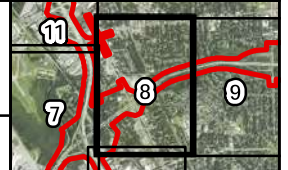
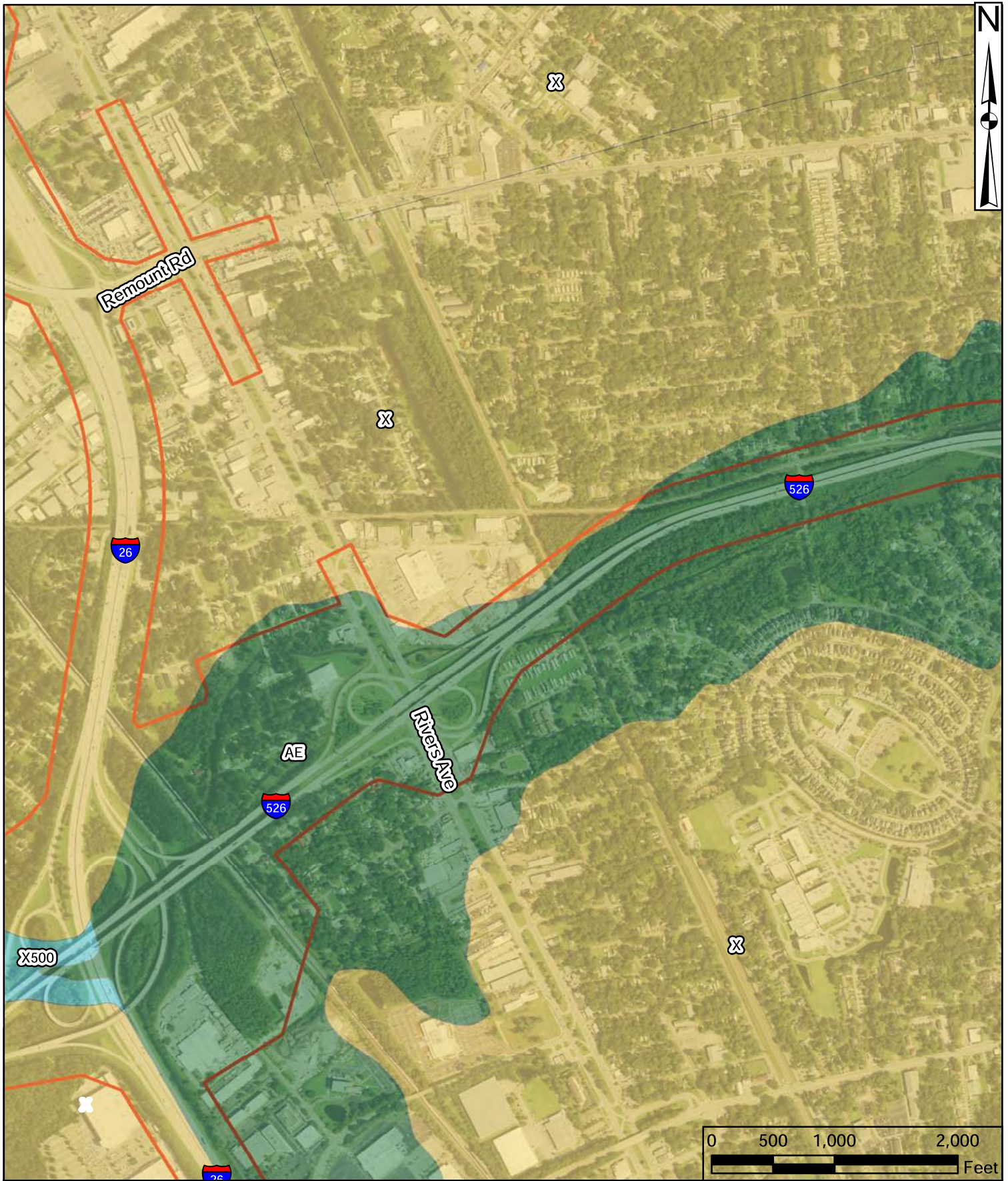


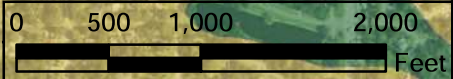
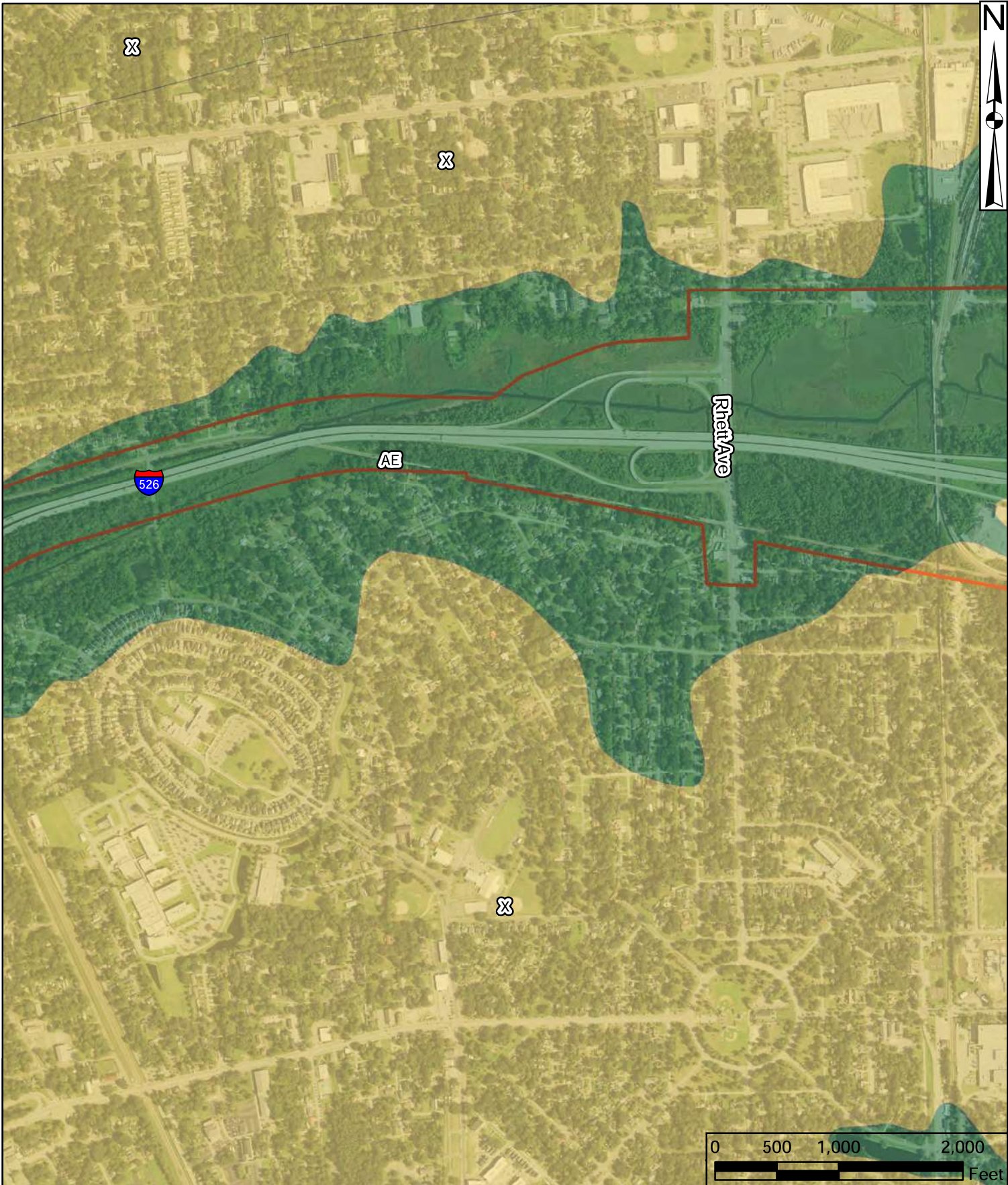




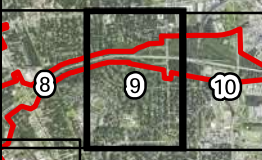










 	Source: FEMA Floodplain Q3flood 2019	I-526 Lowcountry Corridor West Charleston County SCDOT P032102 February 2020		
	Drawn By: RHH QA/QC: KLM	FEMA Floodzones	Figure 4.19 Sheet 9 of 11	

