Prepared for:

South Carolina Department of Transportation

STORMWATER MANAGEMENT DESIGN REPORT

FOR

I-26 WIDENING PROJECT MM85 – MM101

LEXINGTON, RICHLAND, AND NEWBERRY COUNTIES, SOUTH CAROLINA
DECEMBER 2017

PREPARED BY:

Michael Baker INTERNATIONAL

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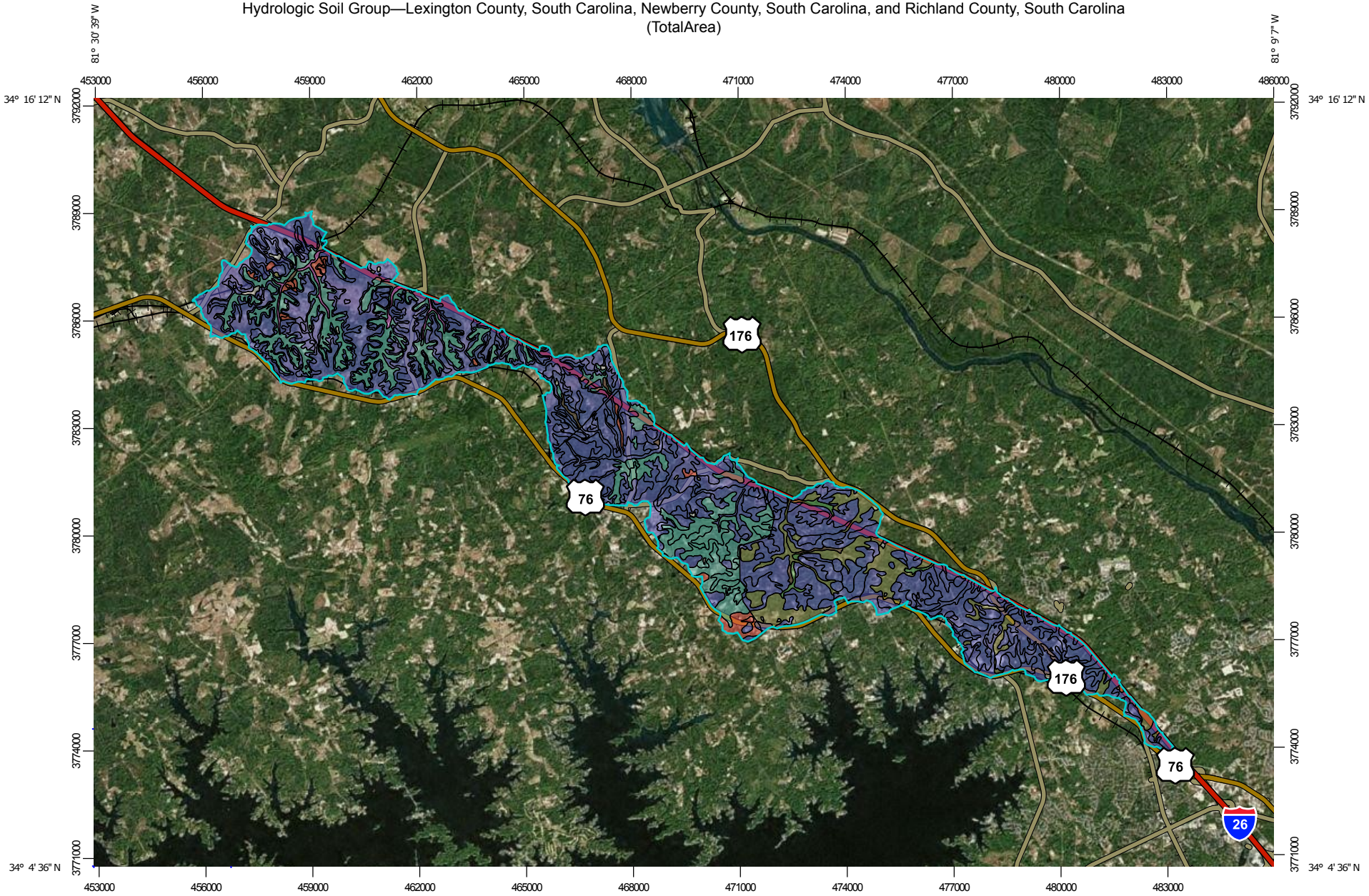
I-26 WIDENING PROJECT MM85 – MM101
Stormwater Management Design Report

1. Introduction

The South Carolina Department of Transportation (SCDOT) proposes to widen I-26 from four lanes to six lanes from approximately 1.6 miles west of the Exit 85 interchange to approximately 0.4 miles west of the Exit 101 interchange. The scope of this project includes adding an additional travel lane in each direction along I-26, replacing of overpass bridges, and improving various interchanges and exit ramps. The purpose of this project is to improve the efficiency of I-26 to accommodate traffic volumes and improve safety. The proposed widening will occur in the existing median in order to minimize potential right-of-way impacts.

2. Soils Information



Map Scale: 1:151,000 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 2000 4000 8000 12000

Feet
0 5000 10000 20000 30000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lexington County, South Carolina
Survey Area Data: Version 16, Oct 5, 2017

Soil Survey Area: Newberry County, South Carolina
Survey Area Data: Version 16, Oct 5, 2017

Soil Survey Area: Richland County, South Carolina
Survey Area Data: Version 19, Oct 5, 2017

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AmB	Alamance very fine sandy loam, 2 to 6 percent slopes	B	6.8	0.0%
CeB	Cecil fine sandy loam, 2 to 6 percent slopes	B	108.5	0.6%
CeC	Cecil fine sandy loam, 6 to 10 percent slopes	B	41.1	0.2%
Ch	Chenneby silty clay loam	B/D	4.8	0.0%
EnB	Enon silt loam, 2 to 6 percent slopes	D	132.0	0.7%
GeB	Georgeville very fine sandy loam, 2 to 6 percent slopes	B	1,156.4	6.5%
GeC	Georgeville very fine sandy loam, 6 to 10 percent slopes	B	709.5	4.0%
GeD	Georgeville very fine sandy loam, 10 to 15 percent slopes	B	260.5	1.5%
HrB	Herndon silt loam, 2 to 6 percent slopes	B	321.8	1.8%
LnB	Lignum silt loam, 2 to 6 percent slopes	D	12.5	0.1%
MeC	Mecklenburg silt loam, 6 to 10 percent slopes	D	30.4	0.2%
NaB	Nason silt loam, 2 to 6 percent slopes	C	563.9	3.2%
NaD	Nason silt loam, 6 to 15 percent slopes	C	556.3	3.1%
TaE	Tatum silt loam, 15 to 25 percent slopes	C	331.9	1.9%
To	Toccoa fine sandy loam	B	146.0	0.8%
W	Water		14.8	0.1%
Subtotals for Soil Survey Area			**4,397.4**	**24.9%**
Totals for Area of Interest			**17,663.8**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CaB	Callison silt loam, 2 to 6 percent slopes	C	8.9	0.1%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CfB2	Cecil sandy clay loam, 2 to 6 percent slopes, moderately eroded	B	2,736.8	15.5%
CfC2	Cecil sandy clay loam, 6 to 10 percent slopes, moderately eroded	B	1,685.4	9.5%
CnA	Chenneby silt loam, 0 to 2 percent slopes, frequently flooded	B/D	38.6	0.2%
GaB2	Georgeville silty clay loam, 2 to 6 percent slopes, moderately eroded	B	332.6	1.9%
GaC2	Georgeville silty clay loam, 6 to 10 percent slopes, moderately eroded	B	212.2	1.2%
GnD2	Gundy silt loam, 10 to 15 percent slopes, moderately eroded	B	29.0	0.2%
GnE2	Gundy silt loam, 15 to 25 percent slopes, moderately eroded	B	44.7	0.3%
HaB	Hard Labor sandy loam, 2 to 6 percent slopes	C	42.6	0.2%
HeB	Helena sandy loam, 2 to 6 percent slopes	C/D	4.3	0.0%
PaD2	Pacolet sandy clay loam, 10 to 15 percent slopes, moderately eroded	B	204.0	1.2%
PaE2	Pacolet sandy clay loam, 15 to 25 percent slopes, moderately eroded	C	1,453.4	8.2%
PaF2	Pacolet sandy clay loam, 25 to 50 percent slopes, moderately eroded	B	45.4	0.3%
RnD2	Rion sandy loam, 10 to 15 percent slopes, moderately eroded	B	38.0	0.2%
RnE2	Rion sandy loam, 15 to 25 percent slopes, moderately eroded	B	40.3	0.2%
ToA	Toccoa sandy loam, 0 to 3 percent slopes, frequently flooded	A	126.7	0.7%
W	Water		70.0	0.4%
WnB	Winnsboro sandy loam, 2 to 6 percent slopes	C	11.3	0.1%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
WoA	Worsham loam, 0 to 2 percent slopes	D	5.2	0.0%
WwD2	Wynott-Wilkes complex, 10 to 15 percent slopes, moderately eroded	D	14.2	0.1%
WwE2	Wynott-Wilkes complex, 15 to 25 percent slopes, moderately eroded	D	34.7	0.2%
WyB2	Wynott-Winnsboro complex, 2 to 6 percent slopes, moderately eroded	D	24.3	0.1%
WyC2	Wynott-Winnsboro complex, 6 to 10 percent slopes, moderately eroded	D	30.4	0.2%
Subtotals for Soil Survey Area			**7,233.0**	**40.9%**
Totals for Area of Interest			**17,663.8**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AtA	Altavista silt loam, 0 to 2 percent slopes	A/D	94.6	0.5%
Ce	Chewacla loam, 0 to 2 percent slopes, frequently flooded	B/D	31.5	0.2%
CH	Chewacla soils	B/D	11.9	0.1%
Co	Congaree loam	C/D	83.9	0.5%
GeB	Georgeville silt loam, 2 to 6 percent slopes	B	859.8	4.9%
GeC	Georgeville silt loam, 6 to 10 percent slopes	B	347.4	2.0%
HeB	Herndon silt loam, 2 to 6 percent slopes	B	33.7	0.2%
KrB	Kirksey loam, 2 to 6 percent slopes	C/D	34.2	0.2%
NaB	Nason silt loam, 2 to 6 percent slopes	B	999.6	5.7%
NaC	Nason silt loam, 6 to 10 percent slopes	B	1,944.8	11.0%
NaE	Nason complex, 10 to 30 percent slopes	B	508.6	2.9%
OaB	Orange loam, 0 to 4 percent slopes	C/D	1,062.5	6.0%
W	Water		21.1	0.1%
Subtotals for Soil Survey Area			**6,033.5**	**34.2%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Totals for Area of Interest			**17,663.8**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

3. Hydraulic Analysis

Field investigations were performed to inventory the location and condition of the existing crossline drainage structures within the project limits. The hydraulic field inspections looked for structures potentially in the floodplain, signs of highwater marks or flooding debris, erosion or visible scour, and whether the pipes needed to be cleaned before video inspection.

A hydrological study of the crossline watersheds was performed using existing topographic maps, information gathered from the field investigations and available information from federal, state and local agencies.

Hydraulic analyses for pre- and post-developed conditions were performed on the cross drainage and median drainage structures based on the appropriate route designation. The cross drainage structures were checked for overtopping using the 100-yr storm event.

The proposed project crosses or encroaches on five Zone A FEMA floodplains, and four Zone AE FEMA floodplains. Zone A floodplains are determined by approximate methods and no base flood elevations (BFEs) or floodways are established. Zone AE floodplains have published base flood elevations (BFEs) and may have floodways established. See FEMA Flood Maps in Section 4.

Attached are culvert summary tables that show the performance of the existing crosslines with existing and proposed flow rates. HW/D was only calculated for open-ended culverts.

Table 1: Existing Pipes With Existing Flow Rates (See Appendices for Calculations)

Culvert Data							Hydrology Data			50-Year Storm			100-Year Storm		
Site ID	Station	Size (US/DS)	Type	Length	FL IN	FL OUT	DA	Hydrologic Method	Tc	Q (cfs)	HW Elevation (ft)	HW/D	Q (cfs)	HW Elevation (ft)	HW/D
61	606+75	48	RCP	386	315.42	304.64	26.81	RATIONAL	26.72	56	318.61	0.80	63	318.84	0.85
62	612+00	15	RCP	118	335.21	331.66	1.28	RATIONAL	5.00	7	337.25	-	8	337.42	-
63	621+00	24	RCP	272	348.38	341.64	0.88	RATIONAL	5.00	4	349.39	-	5	349.48	-
1A	624+80	15	RCP	85	342.42	342.33	0.68	RATIONAL	5.00	4	343.79	-	4	343.96	1.23
1	627+36	4x6	RCBC	258	328.30	323.71	47.16	RATIONAL	35.56	82	331.87	0.59	93	332.18	0.65
2A	630+59	24/60	RCP	438	336.67	323.45	82.87	RATIONAL	24.27	143	338.38	0.86	161	338.52	0.92
2	630+59	54/60	RCP	704	337.08	323.45		RATIONAL	45.24	143	342.16	1.13	161	343.67	1.46
3A/4A	641+02	24	RCP	440	358.45	348.62	7.34	RATIONAL	39.04	20	360.31	0.93	22	360.57	1.06
5A	647+67	18/24	RCP	201	375.42	367.34	7.82	RATIONAL	5.00	19	378.80	-	21	378.80	2.26
6A	647+67	15/24	RCP	564	380.83	367.34		RATIONAL	29.84	19	382.57	-	21	382.82	1.59
7A	658+13	36/42	RCP	273	378.54	370.15	20.48	RATIONAL	36.13	46	381.47	0.98	52	381.73	1.06
8A	667+02	18/42	RCP	460	390.11	371.08	24.81	RATIONAL	5.00	37	391.02	-	41	391.09	0.65
9A	667+02	42	RCP	321	379.66	371.08		RATIONAL	35.94	37	382.10	0.70	41	382.28	0.75
10A	677+57	24	RCP	353	395.63	384.58	13.50	RATIONAL	41.14	24	397.73	-	27	397.93	1.15
11A	689+22	18	RCP	479	390.31	382.48	4.94	RATIONAL	29.40	10	391.46	-	12	391.55	0.83
12A	692+89	18	RCP	198	385.15	382.65	4.01	RATIONAL	27.35	7	385.93	0.52	8	385.99	0.56
3	699+91	4x6	RCBC	168	357.35	355.29	93.31	RATIONAL	32.74	142	362.63	0.88	160	363.12	0.96
4	703+80	4x6	RCBC	214	347.50	344.53	139.35	SCS	88.00	205	354.48	1.16	255	355.93	1.41
13A	706+13	15	RCP	65	376.54	374.67	0.86	RATIONAL	5.00	5	378.12	-	6	378.35	1.45
14A	721+73	15	RCP	65	376.02	374.94	1.88	RATIONAL	5.00	10	379.81	-	12	380.64	3.69
5	724+19	4x6	RCBC	212	346.96	344.63	104.90	SCS	89.00	135	352.06	0.85	171	353.03	1.01
15A	741+89	42	RCP	244	351.59	344.95	29.90	RATIONAL	40.28	44	354.01	0.69	49	354.18	0.74
16A	745+22	30	RCP	240	357.91	351.42	8.46	RATIONAL	26.86	12	359.55	0.66	14	359.67	0.70
17A	748+10	18/24	RCP	386	368.46	360.06	7.70	RATIONAL	39.40	13	369.84	0.92	15	369.95	0.99
18A	754+08	24/36	RCP	363	372.63	367.22	15.52	RATIONAL	40.96	26	374.74	1.06	29	374.94	1.16
19A	766+23	18/24	RCP	299	375.83	368.31	10.51	RATIONAL	41.40	15	377.83	-	17	378.10	1.51
20A	770+96	36	RCP	238	361.29	355.17	9.86	RATIONAL	40.18	13	362.70	0.47	15	362.79	0.50
21A	775+22	30	RCP	251	354.84	345.70	10.18	RATIONAL	40.20	27	357.32	0.99	30	357.54	1.08
22A	778+75	15	RCP	92	361.53	359.50	0.66	RATIONAL	5.00	4	362.70	-	4	362.81	1.02
23A	784+82	24	RCP	219	353.65	350.84	5.43	RATIONAL	24.96	16	354.48	0.42	18	354.53	0.44
24A	788+59	18	RCP	262	349.21	341.68	2.85	RATIONAL	26.51	6	349.79	-	7	349.83	0.41
25A	793+41	18	RCP	154	330.32	327.02	1.85	RATIONAL	5.00	9	331.37	-	10	331.46	0.76
6	798+71	10x8	RCBC	176	310.83	309.62	491.78	SCS	127.00	449	316.97	0.77	573	318.14	0.91
26A	799+02	15	RCP	76	320.90	317.81	1.81	RATIONAL	5.00	10	324.39	-	11	325.24	3.47
27A	803+22	15/18	RCP	147	324.00	320.02	2.58	RATIONAL	38.51	5	324.92	-	5	324.94	0.75
7	806+36	10x10	RCBC	176	309.40	308.43	804.74	REGRESSION	-	755	318.16	0.88	886	319.26	0.99
28A	809+64	18	RCP	81	334.50	332.94	0.47	RATIONAL	5.00	3	335.35	-	3	335.42	0.61
29A	812+19	18	RCP	149	343.70	340.51	2.06	RATIONAL	5.00	12	344.69	-	13	344.92	0.81
30A	820+38	24	RCP	208	354.69	349.28	8.81	RATIONAL	39.46	17	356.71	1.01	20	356.90	1.10
31A	828+52	18	RCP	456	365.22	351.53	4.45	RATIONAL	19.42	15	366.28	-	17	366.37	0.77
32A/33A	841+04	18	RCP	545	361.35	350.90	7.86	RATIONAL	28.74	20	363.88	-	22	365.46	2.74

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Culvert Data							Hydrology Data			50-Year Storm			100-Year Storm		
Site ID	Station	Size (US/DS)	Type	Length	FL IN	FL OUT	DA	Hydrologic Method	Tc	Q (cfs)	HW Elevation (ft)	HW/D	Q (cfs)	HW Elevation (ft)	HW/D
8	852+31	8x8	RCBC	130	341.27	339.57	352.84	SCS	102.00	362	347.42	0.77	464	348.62	0.92
34A	858+28	18	RCP	653	365.58	355.19	5.81	RATIONAL	28.80	14	366.63	-	15	366.70	0.75
35A	866+81	24	RCP	195	372.04	370.15	12.15	RATIONAL	41.58	14	374.02	0.99	16	374.06	1.01
36A	879+72	18	RCP	681	374.63	357.56	4.79	RATIONAL	32.41	10	375.99	-	11	376.11	0.99
37A	886+19	24	RCP	228	359.83	357.27	59.75	RATIONAL	55.43	46	369.00	4.58	51	371.54	5.86
9	890+08	10x10	RCBC	142	353.03	352.30	575.74	SCS	135.00	757	361.81	0.88	916	363.14	1.01
38A	896+23	15	RCP	100	364.92	363.79	1.10	RATIONAL	5.00	6	366.96	-	7	367.30	1.90
39A	902+27	15	RCP	81	381.83	380.42	1.10	RATIONAL	5.00	6	383.85	-	7	384.17	1.87
40A	908+27	15	RCP	99	394.81	394.24	1.41	RATIONAL	5.00	8	397.40	-	9	397.92	2.49
41A	920+50	18	RCP	182	403.34	397.20	2.01	RATIONAL	5.00	9	404.47	-	10	404.56	0.81
42A	927+74	15	RCP	117	386.47	379.92	1.33	RATIONAL	5.00	7	389.19	-	8	389.64	2.54
43A	929+78	18	RCP	879	396.77	377.13	11.99	RATIONAL	37.28	13	397.81	-	15	397.88	0.74
44A	932+41	48	RCP	171	375.14	374.03	93.27	RATIONAL	66.51	98	379.82	1.17	380	380.73	1.40
45A	938+82	18	RCP	206	382.37	381.50	1.71	RATIONAL	5.00	10	384.66	-	12	385.25	1.92
46A	945+21	15/18	RCP	82	391.56	389.79	2.79	RATIONAL	37.68	7	393.73	-	8	394.08	2.02
48A/49A	950+12	15/18	RCP	864	396.82	387.50	8.27	RATIONAL	39.45	18	404.59	-	20	408.38	9.25
47A	953+66	15/18	RCP	315	408.31	401.60	5.94	RATIONAL	32.65	13	409.63	1.05	14	409.72	1.13
50A	959+36	24	RCP	220	410.12	408.15	1.08	RATIONAL	5.00	5	410.70	-	6	410.74	0.31
51A	967+18	15/18	RCP	173	399.58	396.38	3.42	RATIONAL	26.92	10	400.82	-	12	401.00	1.13
52A	972+20	15	RCP	76	382.87	376.72	0.92	RATIONAL	5.00	5	384.70	-	6	384.75	1.50
10	975+00	4x6	RCBC	180	363.01	359.41	139.01	SCS	80.00	278	372.15	1.52	335	374.40	1.90
53A	978+50	18	RCP	165	372.36	369.80	5.36	RATIONAL	38.09	8	373.97	-	9	374.05	1.13
54A (2)	987+40	18/24	RCP	400	368.71	361.44	7.75	RATIONAL	39.94	16	369.79	-	18	369.88	0.78
54A (1)	987+40	24	RCP	308	368.82	361.44	7.75	RATIONAL	39.94	16	369.70	0.44	18	369.76	0.47
55A	992+69	15	RCP	140	366.64	363.22	2.73	RATIONAL	23.31	9	368.42	-	10	368.52	1.50
56A	999+61	18	RCP	194	360.82	358.56	2.92	RATIONAL	5.00	14	361.82	-	16	362.28	0.97
57A	1003+06	15	RCP	152	353.51	346.62	1.23	RATIONAL	5.00	7	355.13	-	8	355.11	1.28
58A	1010+06	36	RCP	604	337.49	318.56	20.10	RATIONAL	34.20	35	339.90	0.80	39	340.02	0.84
59A	1019+60	18	RCP	210	312.06	301.43	13.88	RATIONAL	25.86	28	314.31	1.50	32	314.63	1.71
60A (1)	1023+00	15/18	RCP	540	309.20	296.84	13.47	RATIONAL	23.79	20	311.95	2.20	22	312.42	2.57
60A (2)	1023+00	18	RCP	235	305.25	296.84	13.47	RATIONAL	26.46	20	306.99	1.16	22	307.14	1.26
11	1029+62	8x8	RCBC	137	283.76	282.98	349.59	SCS	92.00	488	291.31	0.94	607	292.66	1.11
64	1033+00	15	RCP	77	288.32	287.16	1.39	RATIONAL	5.00	8	291.00	-	10	291.56	-
12	1035+78	(2) 12x12	RCBC	130	274.19	273.72	3596.45	REGRESSION	-	1878	284.72	0.88	2183	285.50	0.94
65	1037+00	15	RCP	97	287.59	281.34	1.16	RATIONAL	5.00	7	289.61	-	8	289.98	-
66	1043+00	18	RCP	178	303.68	299.74	1.14	RATIONAL	26.19	4	304.71	-	4	304.79	-
67	1046+50	30	RCP	232	313.96	305.66	8.13	RATIONAL	38.53	11	315.50	-	12	315.62	-
68	1050+80	18	RCP	365	334.79	325.22	1.04	RATIONAL	10.22	4	335.98	-	5	336.07	-
69	1058+00	18	RCP	189	333.17	318.05	2.35	RATIONAL	36.50	4	334.29	-	5	334.38	-
70	1066+00	36	RCP	336	298.64	292.47	27.70	RATIONAL	40.28	28	301.11	0.82	32	301.29	0.88
71	1069+20	18	RCP	321	299.77	297.88	3.24	RATIONAL	27.51	4	300.96	-	5	301.05	-

Table 1: Existing Pipes With Existing Flow Rates (See Appendices for Calculations)

Culvert Data							Hydrology Data			50-Year Storm			100-Year Storm		
Site ID	Station	Size (US/DS)	Type	Length	FL IN	FL OUT	DA	Hydrologic Method	Tc	Q (cfs)	HW Elevation (ft)	HW/D	Q (cfs)	HW Elevation (ft)	HW/D
13 (US)	1071+50	(2) 8x10	RCBC	110	288.87	288.61	1417.08	REGRESSION	-	1060	297.08	0.82	1240	298.03	0.92
13 (DS)	1071+50	(2) 10x10	RCBC	88	285.40	285.32	1551.44	REGRESSION	-	1120	293.23	0.78	1310	293.91	0.85
14	1080+80	6X6	RCBC	108	300.42	299.68	119.74	SCS	48.00	142	304.45	0.67	193	305.36	0.82
72	1082+00	24	RCP	144	310.16	302.71	4.75	RATIONAL	38.38	5	311.18	0.51	5	311.26	0.55
73	1085+50	18	RCP	234	320.58	318.01	3.09	RATIONAL	35.68	6	321.97	-	6	322.08	-
74	1090+00	18	RCP	227	329.92	320.33	1.06	RATIONAL	35.78	2	330.63	-	2	330.68	-
75	1091+50	24	RCP	276	328.83	321.70	4.33	RATIONAL	37.08	5	329.96	-	6	330.05	-
76	1094+50	42	RCP	260	332.53	327.63	32.20	RATIONAL	35.95	49	335.71	0.91	56	335.96	0.98
77	1099+50	15	RCP	128	352.70	341.78	1.06	RATIONAL	5.00	5	354.21	-	6	354.41	-
78/80	1104+50	18	RCP	447	384.65	370.41	3.66	RATIONAL	31.51	11	386.39	-	12	386.54	-
79	1106+50	18	RCP	306	387.38	373.22	1.89	RATIONAL	11.66	7	388.93	-	8	389.09	-
81	1111+45	18	RCP	200	393.63	388.66	0.35	RATIONAL	5.00	1	394.24	-	2	394.29	-
82	1112+50	15	RCP	80	388.20	386.25	0.26	RATIONAL	5.00	2	388.91	-	2	388.97	-
83/84/85/86	1114+20	18/36	RCP	554	387.07	376.32	16.91	RATIONAL	5.00	42	388.56	-	47	388.68	-
83/84/85/86	1118+00	15/36	RCP	86	377.28	371.02			5.00		378.81	-		378.94	-
83/84/85/86	1118+50	24/36	RCP	41	370.92	368.00			11.47		374.27	-		374.65	-
83/84/85/86	1119+50	30/36	RCP	554	377.96	353.72			32.64		380.59	0.88		380.81	0.95
87	1119+00	18	RCP	96	377.91	374.92	2.10	RATIONAL	20.50	8	379.67	-	9	379.87	-
88	1126+00	24	RCP	-	-	-	-	-	-	-	-	-	-	-	-
89	1127+00	24	RCP	175	362.87	360.44	3.89	RATIONAL	23.68	10	364.54	-	11	364.67	-
15	1132+58	7x7	RCBC	210	339.59	338.13	263.71	SCS	102.00	305	345.63	0.86	386	346.65	1.01
90	1138+00	18	RCP	255	367.68	359.95	3.94	RATIONAL	35.67	9	368.69	-	10	368.76	-
91	1144+00	18	RCP	417	380.50	376.00	3.36	RATIONAL	31.52	4	380.96	-	5	380.99	-
92/93	1152+00	15/18	RCP	603	379.00	366.21	5.73	RATIONAL	48.96	9	380.14	-	10	380.22	-
94	1155+00	18	RCP	169	370.90	354.84	3.79	RATIONAL	26.97	5	372.16	-	6	372.27	-
95	1157+00	18	RCP	174	366.16	363.72	2.20	RATIONAL	22.11	5	367.46	-	6	367.57	-
96	1162+00	15	RCP	109	353.53	351.56	1.51	RATIONAL	5.00	6	354.93	-	7	355.08	-
97	1165+00	15	RCP	109	343.11	340.88	0.42	RATIONAL	5.00	3	344.07	-	3	344.15	-
16	1168+26	(2) 10x12	RCBC	140	318.62	318.06	2600.25	REGRESSION	-	1530	328.09	0.79	1780	328.79	0.85
98	1175+00	24	RCP	186	333.62	326.55	5.64	RATIONAL	21.61	9	335.23	-	11	335.36	-
17	1176+80	6x6	RCBC	157	330.43	328.84	142.10	SCS	49.00	304	337.12	1.12	379	338.30	1.31
99	1180+00	15	RCP	109	337.98	335.61	0.71	RATIONAL	5.00	5	339.42	-	5	339.60	-
100	1185+00	18	RCP	194	351.66	348.04	10.42	RATIONAL	38.83	14	353.40	1.16	16	353.56	1.27
18	1190+17	4x4	RCBC	153	354.39	353.54	56.68	RATIONAL	49.12	58	357.31	0.73	66	357.55	0.79
101	1196+00	18	RCP	171	386.00	379.27	1.44	RATIONAL	5.00	8	387.88	-	10	388.14	-
102	1201+00	18	RCP	153	406.27	404.20	2.26	RATIONAL	5.00	11	407.46	-	13	407.56	-
103	1206+00	18	RCP	148	426.38	417.06	2.85	RATIONAL	30.48	7	428.05	-	8	428.24	-
104	1218+00	18	RCP	153	428.87	425.09	2.98	RATIONAL	23.51	8	430.70	-	9	430.93	-
105	1223+00	15	RCP	73	420.25	412.54	1.30	RATIONAL	5.00	8	422.70	-	9	423.21	-
19	1225+00	8x8	RCBC	156	407.70	406.27	416.12	SCS	83.00	676	417.14	1.18	833	418.79	1.39
106	1227+50	15	RCP	106	428.73	415.05	0.91	RATIONAL	5.00	5	430.28	-	6	430.51	-

Table 1: Existing Pipes With Existing Flow Rates (See Appendices for Calculations)

Culvert Data							Hydrology Data			50-Year Storm			100-Year Storm		
Site ID	Station	Size (US/DS)	Type	Length	FL IN	FL OUT	DA	Hydrologic Method	Tc	Q (cfs)	HW Elevation (ft)	HW/D	Q (cfs)	HW Elevation (ft)	HW/D
107	1229+00	24	RCP	-	-	-	-	-	-	-	-	-	-	-	-
108	1230+10	18	RCP	182	447.62	428.65	1.81	RATIONAL	30.71	2	448.38	0.51	3	448.45	0.55
109	1233+00	18	RCP	157	456.76	450.54	2.53	RATIONAL	27.13	6	458.21	-	7	458.34	-
110	1238+00	18	RCP	197	469.06	449.19	3.08	RATIONAL	31.71	5	470.32	0.84	6	470.44	0.92
111	1240+00	24	RCP	223	467.30	453.83	15.73	RATIONAL	50.80	16	469.40	1.05	18	469.61	1.16
112	1242+50	18	RCP	163	475.00	474.00	1.88	RATIONAL	30.42	5	476.33	-	6	476.44	-
113	1248+00	18	RCP	89	476.41	475.30	1.20	RATIONAL	5.00	7	478.04	-	8	478.23	-
114	1250+50	42	RCP	212	474.21	463.05	29.78	RATIONAL	47.18	25	476.29	0.59	28	476.44	0.64
115	1254+00	15	RCP	88	480.61	470.23	1.28	RATIONAL	5.00	7	482.81	-	8	483.26	-
116	1260+50	18	RCP	155	508.95	498.09	3.83	RATIONAL	32.38	9	510.94	-	10	511.21	-
117	1268+50	30	RCP	282	530.10	518.93	20.27	RATIONAL	46.60	25	532.63	1.01	29	532.86	1.10
118/119	1276+00	15	RCP	184	560.36	550.22	1.15	RATIONAL	5.00	7	562.52	-	8	562.94	-
120	1292+00	18 & 24	RCP	435	567.27	555.00	12.25	RATIONAL	36.99	22	568.58	0.87	25	368.67	-132.40
121	1301+00	18	RCP	158	540.62	538.81	2.58	RATIONAL	5.00	16	542.57	-	19	543.27	-
122	1305+50	24	RCP	218	519.63	511.50	17.97	RATIONAL	50.03	20	522.26	1.32	23	522.61	1.49
123	1311+50	48	RCP	210	485.34	482.65	77.34	RATIONAL	48.31	84	489.51	1.04	95	489.90	1.14
124	1316+50	18	RCP	133	492.08	491.06	1.94	RATIONAL	38.01	4	493.28	-	5	493.38	-
125	1319+75	48	RCP	242	462.82	449.57	45.43	RATIONAL	43.02	46	465.62	0.70	52	465.83	0.75
126	1321+00	15	RCP	112	486.27	459.21	0.62	RATIONAL	5.00	4	487.45	-	5	487.60	-
127	1323+25	24	RCP	217	480.13	453.99	3.07	RATIONAL	25.47	4	480.98	0.43	4	481.04	0.46
128	1329+75	15	RCP	112	472.07	467.83	2.03	RATIONAL	5.00	12	474.60	-	13	475.11	-
129	1330+75	4x6	RCBC	260	434.46	428.39	108.39	SCS	59.00	168	440.30	0.97	215	441.39	1.16
130	1332+00	15	RCP	150	469.92	436.60	1.30	RATIONAL	5.00	8	472.41	-	9	472.97	-
131	1345+00	18	RCP	167	467.83	462.67	6.77	RATIONAL	31.04	13	469.22	-	15	469.33	-
132	1350+00	6x6	RCBC	216	429.00	422.87	286.58	SCS	85.00	322	435.91	1.15	415	437.42	1.40
133	1351+00	15	RCP	114	454.57	432.22	1.68	RATIONAL	5.00	11	457.06	-	12	457.09	-
134	1358+00	15 & 18	RCP	78	472.43	471.05	2.06	RATIONAL	5.00	11	474.07	-	13	474.28	-
135	1364+50	15	RCP	107	494.01	491.97	0.72	RATIONAL	5.00	5	495.39	-	5	495.55	-
136	1367+00	24x24x36	-	-	-	-	-	-	-	-	-	-	-	-	-
137	1368+00	36	RCP	252	483.10	468.95	22.11	RATIONAL	41.26	25	485.34	0.75	28	485.50	0.80
138	1370+00	15	RCP	83	501.36	492.77	0.37	RATIONAL	5.00	2	502.19	-	3	502.26	-
139	1376+00	18	RCP	210	501.74	498.55	1.65	RATIONAL	30.38	4	502.92	-	5	503.01	-
140	1381+00	30	RCP	390	498.30	487.20	23.27	RATIONAL	60.92	27	530.63	-	31	499.34	-
141	1381+00	30	RCP	67	488.53	487.20	26.54	RATIONAL	60.92	32	491.54	1.20	36	491.89	1.34
142	1395+00	18	RCP	171	484.40	479.99	8.15	RATIONAL	39.48	14	486.15	-	15	486.32	-
143	1400+00	30	RCP	230	462.48	457.25	18.93	RATIONAL	41.97	29	465.31	1.13	33	465.61	1.25
144/145	1404+50	15 & 18	RCP	460	452.50	439.16	10.97	RATIONAL	49.81	11	453.02	-	12	453.06	-
144/145	1406+50	18 & 24	RCP	246	448.43	439.16					450.10	1.11		450.24	1.21
146	1413+00	18	RCP	254	418.98	408.41	1.72	RATIONAL	5.00	12	420.60	-	13	420.77	-
147	1416+00	24	RCP	-	-	-	-	-	-	-	-	-	-	-	-
148	1418+50	9x9	RCBC	176	383.98	382.26	842.13	REGRESSION	-	780	393.52	1.06	915	394.66	1.19

Table 1: Existing Pipes With Existing Flow Rates (See Appendices for Calculations)

Culvert Data							Hydrology Data			50-Year Storm			100-Year Storm		
Site ID	Station	Size (US/DS)	Type	Length	FL IN	FL OUT	DA	Hydrologic Method	Tc	Q (cfs)	HW Elevation (ft)	HW/D	Q (cfs)	HW Elevation (ft)	HW/D
149	1421+00	36	RCP	205	413.79	410.00	36.05	RATIONAL	26.48	63	418.36	1.52	72	419.08	1.76
151/153/154	1422+00	18/24	RCP	139	415.03	410.73	8.59	RATIONAL	23.69	22	416.54	-	24	416.07	-
151/153/154	1422+00	15/24	RCP	363	425.23	410.73		RATIONAL			428.99	-		429.76	-
150/152	1422+50	18	RCP	474	426.79	407.30	1.37	RATIONAL	5.00	7	428.53	-	8	428.65	-
155	1433+00	18	RCP	294	433.68	424.28	1.30	RATIONAL	5.00	7	435.27	-	8	435.45	-
156	1433+00	18	RCP	196	433.46	428.63	0.83	RATIONAL	5.00	4	434.62	-	5	434.73	-
157	1434+50	15	RCP	100	429.17	424.66	0.44	RATIONAL	5.00	3	430.10	-	3	430.18	-
158	1437+50	36	RCP	265	400.46	393.50	30.94	RATIONAL	32.46	44	403.71	1.08	49	404.04	1.19
159	1440+00	15	RCP	127	410.08	397.68	1.13	RATIONAL	5.00	6	411.92	-	7	412.25	-
160	1447+00	(2) 8x8	RCBC	198	383.03	381.47	1299.45	REGRESSION	-	1010	390.75	0.97	1180	391.61	1.07
161	1451+00	15	RCP	103	398.38	392.51	0.63	RATIONAL	5.00	4	399.54	-	4	399.66	-
162	1456+00	24	RCP	53	401.78	399.80	45.36	RATIONAL	48.49	57	406.31	2.27	64	406.36	2.29
163	1456+00	15	RCP	107	403.54	395.83	0.65	RATIONAL	5.00	4	404.77	-	5	404.90	-
164	1461+25	15	RCP	102	408.69	402.42	0.70	RATIONAL	5.00	5	410.09	-	5	410.28	-
165	1466+50	18	RCP	255	421.31	412.82	19.45	RATIONAL	102.10	23	428.13	4.55	26	429.68	5.58
166/167/168	1469+50	36	RCP	249	428.62	422.62	33.68	RATIONAL	48.35	56	432.21	1.20	63	432.59	1.32
166/167/168	1469+50	15	RCP	302	431.00	422.62					433.30	-		433.66	-
166/167/168	1469+50	18	RCP	482	443.34	422.62					444.47	-		444.55	-
169/170	1476+50	18	RCP	211	455.41	448.29	4.57	RATIONAL	25.14	15	457.13	-	17	457.29	-
171/172	1483+50	18	RCP	291	474.95	472.02	2.00	RATIONAL	14.73	6	476.33	0.92	7	476.45	1.00
173	1490+00	18	RCP	218	469.68	465.76	2.08	RATIONAL	5.00	12	470.85	-	14	470.94	-
174	1495+00	18	RCP	228	450.18	446.46	2.86	RATIONAL	24.68	8	451.94	-	9	452.15	-
175	1500+00	18	RCP	217	429.33	425.78	3.54	RATIONAL	25.14	10	430.31	-	11	430.38	-
176/177	1502+50	18/24	RCP	247	414.93	407.25	5.95	RATIONAL	39.27	8	416.19	0.84	9	416.28	0.90
176/177	1502+50	18/24	RCP	295	411.00	407.25					412.07	-		412.16	-
178	1511+00	18	RCP	153	385.56	382.31	3.77	RATIONAL	26.97	12	387.16	-	13	387.31	-
179	1517+00	15	RCP	82	370.43	362.47	1.44	RATIONAL	5.00	10	373.24	-	11	373.27	-
180	1521+00	(2) 12x12	RCBC	195	352.33	351.99	3504.63	REGRESSION	-	1830	363.19	0.91	2130	363.74	0.95
181	1528+00	15	RCP	113	406.70	382.25	0.40	RATIONAL	5.00	3	407.56	-	3	407.64	-
182	1530+00	15	RCP	94	419.53	411.01	0.46	RATIONAL	5.00	3	420.54	-	4	420.63	-
183	1541+00	36	RCP	199	412.71	407.00	37.61	RATIONAL	47.74	35	415.52	0.94	40	415.75	1.01
184	1543+50	18	RCP	174	418.58	415.90	2.11	RATIONAL	36.79	2	419.26	0.45	2	419.31	0.49
185	1546+50	15	RCP	87	419.54	415.89	1.12	RATIONAL	5.00	7	421.63	-	8	422.02	-
186	1548+10	60	RCP	188	406.25	404.45	63.88	RATIONAL	37.01	65	409.43	0.64	73	409.67	0.68
187	1554+00	18	RCP	162	441.44	429.07	2.45	RATIONAL	15.39	8	443.06	1.08	9	443.24	1.20

Table 2: Existing Pipes With Proposed Flow Rates (See Appendices for Calculations)

Culvert Data							Hydrology Data			50-Year Storm			100-Year Storm					
Site ID	Station	Size (US/DS)	Type	Length	FL IN	FL OUT	DA	Hydrologic Method	Tc	Q (cfs)	HW Elevation (ft)	HW/D	Q (cfs)	HW Elevation (ft)	HW/D	Overtopping	Field Notes	50-Year Hydraulic Analysis Notes and Recommendations
61	606+75	48	RCP	386	315.42	304.64	26.81	RATIONAL	26.72	61	318.79	0.84	69	319.05	0.91	N	No visual issues or signs of erosion	Retain, meets design criteria
62	612+00	15	RCP	118	335.21	331.66	0.81	RATIONAL	5.00	8	337.42	-	9	337.45	-	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
63	621+00	24	RCP	272	348.38	341.64	0.88	RATIONAL	5.00	6	349.56	-	6	349.66	-	N	No visual issues or signs of erosion	Retain, meets design criteria
1A	624+80	15	RCP	85	342.42	342.33	0.41	RATIONAL	5.00	4	343.85	-	5	344.04	-	N	Remove debris at outlet, no sign of erosion downstream	Replace 15" pipe with 18" RCP
1	627+36	4x6	RCBC	258	328.30	323.71	47.18	RATIONAL	35.56	67	331.38	0.51	75	331.65	0.56	N	No visual issues or signs of erosion	Retain, meets design criteria
2A	630+59	24/60	RCP	438	336.67	323.45	82.60	RATIONAL	24.27	155	338.53	0.93	174	338.74	1.03	N	No signs of erosion. Golf cart shop located adjacent to downstream channel	Retain, meets design criteria
2	630+59	54/60	RCP	704	337.08	323.45		RATIONAL	45.24	155	342.44	1.19	174	343.04	1.32	N		Retain, meets design criteria
3A/4A	641+02	24	RCP	440	358.45	348.62	7.36	RATIONAL	39.04	22	360.42	0.99	25	360.70	1.13	N	Scour hole at outlet resulting in ponding water	Retain, meets design criteria. Rip-Rap at outlet needed
5A	647+67	18/24	RCP	201	375.42	367.34	7.56	RATIONAL	5.00	22	378.87	-	25	379.60	-	N	Scour hole downstream	Retain. Inlet is surcharged, but water still contained in ditch. Rip-Rap at outlet needed.
6A	647+67	15/24	RCP	564	380.83	367.34		RATIONAL	29.84	22	382.66	-	25	383.00	-	N		Replace 15" pipe with 18" RCP. Rip-Rap at outlet needed
7A	658+13	36/42	RCP	273	378.54	370.15	20.64	RATIONAL	36.13	36	381.58	1.01	57	381.86	1.11	N	30" pipe upstream coming from detention pond. Outfall channel has rip-rap and is stable	Retain, meets design criteria
8A	667+02	18/42	RCP	460	390.11	371.08	24.58	RATIONAL	5.00	40	391.15	-	45	391.38	-	N	Concrete pad for upstream inlet needs repair. No evidence of erosion at outfall	Retain, meets design criteria
9A	667+02	42	RCP	321	379.66	371.08		RATIONAL	35.94	40	382.19	0.72	45	382.43	0.79	N		Retain, meets design criteria
10A	677+57	24	RCP	353	395.63	384.58	13.47	RATIONAL	41.14	25	397.73	-	29	397.93	-	N	Sediment in outlet pipe	Retain. Outfall channel will need to be regraded to drain. Clean existing pipe
11A	689+22	18	RCP	479	390.31	382.48	4.88	RATIONAL	29.40	13	391.81	-	14	391.89	-	N	Concrete pad around drop inlet needs repair. Outfall channel needs to be cleaned	Retain, meets design criteria. Clean outfall channel
12A	692+89	18	RCP	198	385.15	382.65	3.90	RATIONAL	27.35	8	385.93	0.52	9	385.99	0.56	N	Pipe inlet covered with brush. Outfall channel needs to be cleaned	Retain, meets design criteria. Clean outfall channel
3	699+91	4x6	RCBC	168	357.35	355.29	92.58	RATIONAL	32.74	154	362.94	0.93	173	363.47	1.02	N	No signs of erosion	Retain, meets design criteria
4	703+80	4x6	RCBC	214	347.50	344.53	139.35	SCS	88.00	205	354.48	1.16	255	355.93	1.41	N	Approximately 1.5' of standing water in box. No signs of erosion	Retain, meets design criteria
13A	706+13	15	RCP	65	376.54	374.67	0.59	RATIONAL	5.00	6	378.23	-	7	378.48	-	N	Pipe outlets into concrete channel, no issues	Replace 15" pipe with 18" RCP
14A	721+73	15	RCP	65	376.02	374.94	1.13	RATIONAL	5.00	11	380.15	-	13	381.18	-	Y	Pipe outlets into concrete channel, no issues	Replace 15" pipe with 18" RCP. Inlet will be surcharged but would not overtop.
5	724+19	4x6	RCBC	212	346.96	344.63	104.90	SCS	89.00	135	352.06	0.85	171	353.03	1.01	N	Approximately 2' of scour downstream	Retain, meets design criteria. Rip-Rap at outlet needed
15A	741+89	42	RCP	244	351.59	344.95	26.73	RATIONAL	40.28	36	354.09	0.71	41	354.26	0.76	N	Small scour hole downstream resulting in ponding water	Retain, meets design criteria. Rip-Rap at outlet needed
16A	745+22	30	RCP	240	357.91	351.42	8.64	RATIONAL	26.86	13	359.61	0.68	15	359.73	0.73	N	Pipe outlets into concrete channel, no issues	Retain, meets design criteria
17A	748+10	18/24	RCP	386	368.46	360.06	7.64	RATIONAL	39.40	15	369.83	0.91	17	369.94	0.99	N	Upstream pipe inlet needs to be cleaned. Drop inlet upstream needs repair	Retain, meets design criteria
18A	754+08	24/36	RCP	363	372.63	367.22	15.53	RATIONAL	40.96	29	374.74	1.06	32	374.94	1.16	N	Sediment and standing water in outlet pipe	Retain, meets design criteria
19A	766+23	18/24	RCP	299	375.83	368.31	10.53	RATIONAL	41.40	17	377.83	-	19	378.10	1.51	N	Drop inlet needs repair	Retain, meets design criteria
20A	770+96	36	RCP	238	361.29	355.17	9.68	RATIONAL	40.18	14	362.76	0.49	16	362.87	0.53	N	0.5' standing water in downstream channel. No evidence of erosion	Retain, meets design criteria
21A	775+22	30	RCP	251	354.84	345.70	10.04	RATIONAL	40.20	28	357.38	1.02	31	357.61	1.11	N	24" CMP upstream from sub-division detention pond. Outfall channel needs to be regraded. Sediment in outlet pipe	Retain, meets design criteria
22A	778+75	15	RCP	92	361.53	359.50	0.39	RATIONAL	5.00	4	362.74	-	4	362.86	1.06	N	Clear leaves at outfall and regrade channel	Replace 15" pipe with 18" RCP. Grade outfall to drain
23A	784+82	24	RCP	219	353.65	350.84	5.50	RATIONAL	24.96	19	355.17	0.76	22	355.23	0.79	N	No visual issues or signs of erosion	Retain, meets design criteria
24A	788+59	18	RCP	262	349.21	341.68	2.70	RATIONAL	26.51	7	349.79	-	8	349.83	0.41	N	Pipe outlet couldn't be located	Retain, meets design criteria
25A	793+41	18	RCP	154	330.32	327.02	1.66	RATIONAL	5.00	10	331.64	-	12	331.76	0.96	N	No visual issues or signs of erosion	Retain, meets design criteria
6	798+71	10x8	RCBC	176	310.83	309.62	491.78	SCS	127.00	449	316.97	0.77	573	318.14	0.91	N	Channel banks show evidence of flow approximately 3.0' high	Retain, meets design criteria
26A	799+02	15	RCP	76	320.90	317.81	1.08	RATIONAL	5.00	11	324.66	-	12	325.60	3.76	Y	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
27A	803+22	15/18	RCP	147	324.00	320.02	2.15	SCS	38.51	5	324.92	-	6	325.14	0.91	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
7	806+36	10x10	RCBC	176	309.40	308.43	804.65	REGRESSION	-	755	318.16	0.88	886	319.26	0.99	N	Approximately 1.0' of standing water in box	Retain, meets design criteria
28A	809+64	18	RCP	81	334.50	332.94	0.28	RATIONAL	5.00	3	335.38	-	3	335.46	0.64	N	No visual issues or signs of erosion	Retain, meets design criteria
29A	812+19	18	RCP	149	343.70	340.51	1.60	RATIONAL	5.00	14	345.09	-	15	345.41	1.14	N	Pipe approximately 40% full of sediment	Retain, meets design criteria
30A	820+38	24	RCP	208	354.69	349.28	8.54	RATIONAL	39.46	19	356.90	1.10	22	357.13	1.22	N	No signs of erosion. Top of outlet pipe damaged	Retain, meets design criteria
31A	828+52	18	RCP	456	365.22	351.53	4.59	RATIONAL	19.42	17	366.37	-	20	366.46	0.83	N	Upstream drop inlet needs repair. Outlet pipe is 90% submerged. Scour hole downstream with ponded water	Retain, meets design criteria. Rip-Rap at outlet needed
32A/33A	841+04	18	RCP	545	361.35	350.90	7.52	RATIONAL	28.74	21	363.95	-	23	366.63	3.52	Y	Scour hole at outlet resulting in ponding water. Outlet pipe 75% submerged	Replace last 18" pipe with 24" RCP. Rip-Rap at outlet needed
8	852+31	8x8	RCBC	130	341.27	339.57	352.84	SCS	102.00	362	347.42	0.77	464	348.62	0.92	N	No visual issues or signs of erosion	Retain, meets design criteria
34A	858+28	18	RCP	653	365.58	355.19	5.68	RATIONAL	28.80	16	366.69	-	18	366.84	0.84	N	Slight sediment buildup in downstream channel	Retain. Grade outfall to drain
35A	866+81	24	RCP	195	372.04	370.15	11.87	RATIONAL	41.58	16	374.27	1.11	18	374.31	1.13	N	Brush blocking 50% of upstream pipe	Retain, meets design criteria
36A	879+72	18	RCP	681	374.63	357.56	4.81	RATIONAL	32.41	12	376.04	-	14	376.18	1.03	N	Outlet pipe in marsh area. 1.5' of standing water at outfall	Retain, meets design criteria
37A	886+19	24	RCP	228	359.83	357.27	59.76	RATIONAL	55.43	46	369.81	4.99	51	372.56	6.36	Y	Extreme erosion upstream around inlet pipe and channel. Shares an outfall with 36A	Pipe undersized. HW/D criteria violated. Replace 24" pipe with 36" RCP
9	890+08	10x10	RCBC	142	353.03	352.30	575.74	SCS	135.00	757	361.81	0.88	916	363.14	1.01	N	Heavy vegetation present upstream and downstream. No evidence of erosion	Retain, meets design criteria
38A	896+23	15	RCP	100	364.92	363.79	0.66	RATIONAL	5.00	6	366.89	-	7	367.21	1.83	N	Pipe joint broken. Outfall channel needs to be regraded	Replace 15" pipe with 18" RCP
39A	902+27	15	RCP	81	381.83	380.42	0.66	RATIONAL	5.00	6	383.82	-	7	384.15	1.85	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
40A	908+27	15	RCP	99	394.81	394.24	0.84	RATIONAL	5.00	8	397.43	-	9	397.97	2.52	N	Sediment buildup in outfall channel	Replace 15" pipe with 18" RCP. Grade to drain
41A	920+50	18	RCP	182	403.34	397.20	1.85	RATIONAL	5.00	11	404.98	-	12	405.10	1.17	N	No visual issues or signs of erosion	Retain, meets design criteria
42A	927+74	15	RCP	117	386.47	379.92	0.80	RATIONAL	5.00	8	389.13	-	9	389.61	2.51	N	Pipe outlets between 2 trees. No visual damage to pipe	Replace 15" pipe with 18" RCP
43A	929+78	18	RCP	879	396.77	377.13	12.18	RATIONAL	37.28	15	397.89	-	17	398.04	0.85	N	Standing water in downstream channel. Top of outlet pipe damaged. No visual signs of erosion	Retain, meets design criteria
44A	932+41	48	RCP	171	375.14	374.03	93.28	RATIONAL	66.51	101	379.92	1.20	113	380.44	1.33	N	Scour hole upstream with brush blocking pipe inlet. Approximately 1.0' standing water in outfall channel	Retain, meets design criteria. Fill scour hole upstream
45A	938+82	18	RCP	206	382.37	381.50	1.36	RATIONAL	5.00	10	384.50	-	11	385.07	1.80	N	Pipe 75% submerged in small scour hole	Retain. Rip-Rap at outlet needed
46A	945+21	15/18	RCP	82	391.56	389.79	2.73	RATIONAL	37.68	8	393.26	-	9	393.48	1.53	N	Pipe outlet couldn't be located	Replace 15" pipe with 18" RCP
48A/49A	950+12	15/18	RCP	864	396.82	387.50	8.47	RATIONAL	39.45	20	405.19	-	23	409.14	9.86	Y	Pipe outlet couldn't be located	Pipe system is undersized and shows overtopping. Replace 15" and 18" pipe with 24" RCP
47A	953+66	15/18	RCP	315	408.31	401.60	5.94	RATIONAL	32.65	15	409.63	1.06	17	409.92	1.29	Y	Heavy erosion in upstream channel. Downstream drop inlet with standing water. Ponded water at outfall.	Replace 15" pipe with 18" RCP. Replace last 18" pipe with 24" RCP. Add Rip-Rap upstream of pipe inlet to stabilize channel
50A	959+36	24	RCP	220	410.12	408.15	1.14	RATIONAL	5.00	6	410.80	-	7	410.85	0.37	N	No visual issues or signs of erosion	Retain, meets design criteria
51A	967+18	15/18	RCP	173	399.58	396.38	3.36	RATIONAL	26.92	13	401.19	-	15	401.75	1.74	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
52A	972+20	15	RCP	76	382.87	376.72	0.55	RATIONAL	5.00	5	384.78	-	6	385.00	1.71	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
10	975+00	4x6	RCBC	180	363.01	359.41	139.01	SCS	80.00	278	372.15	1.52	335	374.40	1.90	N	Approximately 1.0' of water in box	Does not meet HW/D criteria. No risk of of overtopping for 100 year event. Retain existing RCBC, add 24" RCP as a relief culvert to meet HW/D criteria. Add Rip-Rap at outlet

Table 2: Existing Pipes With Proposed Flow Rates (See Appendices for Calculations)

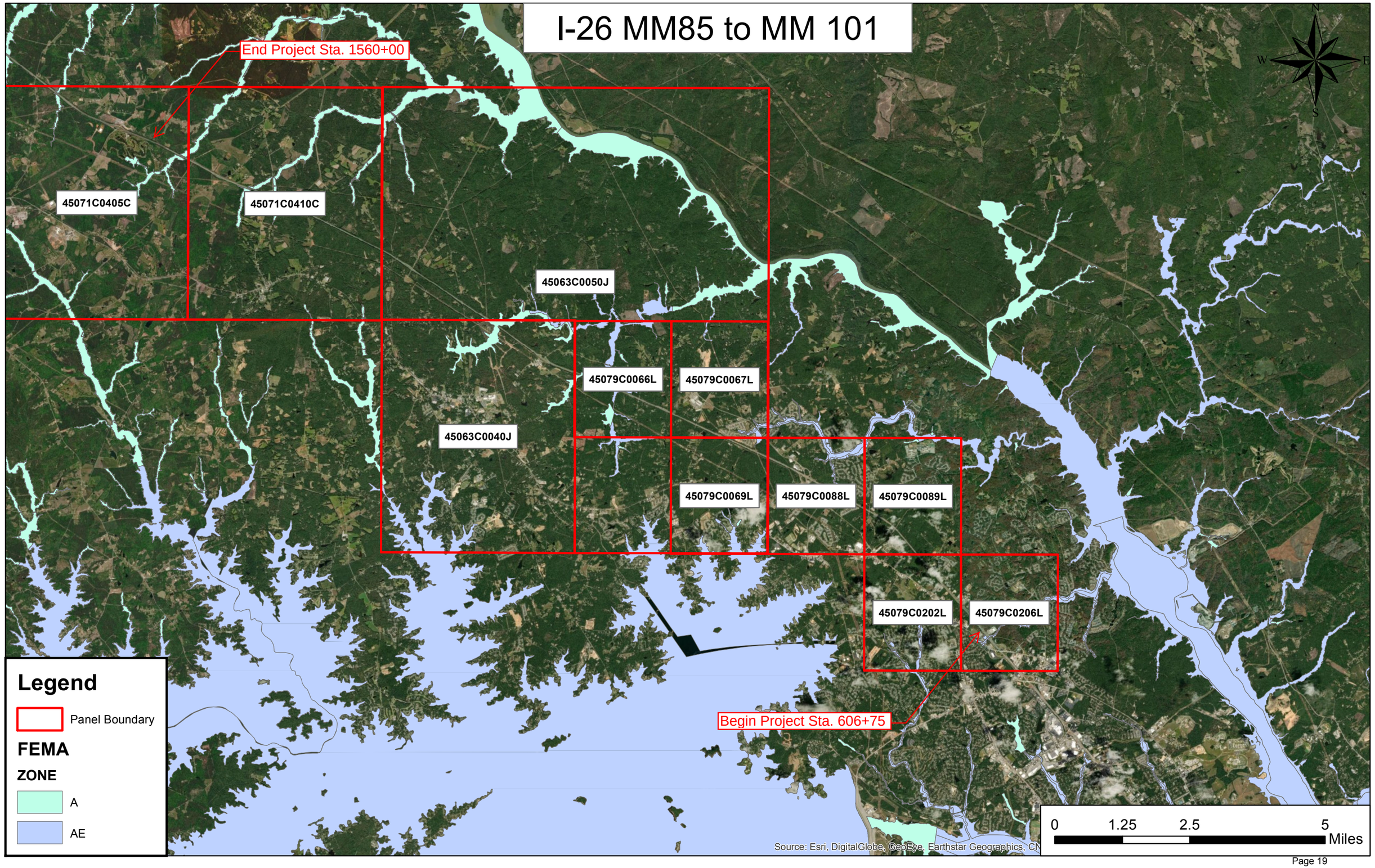
Culvert Data							Hydrology Data			50-Year Storm			100-Year Storm					
Site ID	Station	Size (US/DS)	Type	Length	FL IN	FL OUT	DA	Hydrologic Method	Tc	Q (cfs)	HW Elevation (ft)	HW/D	Q (cfs)	HW Elevation (ft)	HW/D	Overtopping	Field Notes	50-Year Hydraulic Analysis Notes and Recommendations
53A	978+50	18	RCP	165	372.36	369.80	5.04	RATIONAL	38.09	9	374.26	-	10	374.35	1.33	N	Approximately 1.0' of water in scour hole at outlet	Retain, meets design criteria. Rip-Rap at outlet needed
54A (1)	987+40	18/24	RCP	400	368.71	361.44	7.71	RATIONAL	39.94	20	369.63	-	22	369.75	0.69	N	Channel banks at outlet pipe downstream show signs of erosion	Retain, meets design criteria. Rip-Rap at outlet needed
54A (2)	987+40	24	RCP	308	368.82	361.44	7.71	RATIONAL	39.94	20	369.70	0.44	22	369.83	0.50	N		
55A	992+69	15	RCP	140	366.64	363.22	2.65	RATIONAL	23.31	12	368.52	-	13	368.78	1.71	N	50% sediment buildup in outlet pipe. Outfall channel needs to be regraded	Replace 15" pipe with 18" RCP. Grade outfall to drain
56A	999+61	18	RCP	194	360.82	358.56	2.85	RATIONAL	5.00	18	362.77	-	21	363.55	1.82	N	No visual issues or signs of erosion	Retain, meets design criteria
57A	1003+06	15	RCP	152	353.51	346.62	1.10	RATIONAL	5.00	8	355.18	-	10	355.30	1.43	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
58A	1010+06	36	RCP	604	337.49	318.56	20.27	RATIONAL	34.20	36	339.90	0.80	41	340.04	0.85	N	50% sediment buildup in outlet pipe. Outfall channel needs to be regraded	Retain, meets design criteria. Clean and grade outfall channel to drain
59A	1019+60	18	RCP	210	312.06	301.43	13.84	RATIONAL	25.86	33	314.31	1.50	37	315.15	2.06	Y	Severe erosion in downstream channel	Replace 18" pipe with 24" RCP
60A (1)	1023+00	15/18	RCP	540	309.20	296.84	13.40	RATIONAL	23.79	21	311.95	2.20	24	312.51	2.65	Y	Signs of erosion in outfall channel	Replace 15" pipe with 18" RCP
60A (2)	1023+00	18	RCP	235	305.25	296.84	13.40	RATIONAL	26.46	21	307.03	1.19	24	307.26	1.34	Y		Replace 18" pipe with 24" RCP
11	1029+62	8x8	RCBC	137	283.76	282.98	349.59	SCS	92.00	488	291.31	0.94	607	292.66	1.11	N	No visual issues or signs of erosion	Retain, meets design criteria
64	1033+00	15	RCP	77	288.32	287.16	0.74	RATIONAL	5.00	7	290.50	-	8	290.91	-	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
12	1035+78	(2) 12x12	RCBC	130	274.19	273.72	3596.45	REGRESSION	-	1878	284.72	0.88	2183	285.50	0.94	N	No visual issues or signs of erosion	Retain, meets design criteria
65	1037+00	15	RCP	97	287.59	281.34	0.64	RATIONAL	5.00	6	289.40	-	7	289.71	-	N	Last section of pipe is crushed.	Replace 15" pipe with 18" RCP
66	1043+00	18	RCP	178	303.68	299.74	1.05	RATIONAL	26.19	4	304.81	-	5	304.89	-	N	Visible scour in downstream channel. Pipe approximately 40% full of sediment	Retain, meets design criteria. Rip-Rap at outlet needed
67	1046+50	30	RCP	232	313.96	305.66	7.92	RATIONAL	38.53	11	315.54	-	13	315.66	-	N	Pipe approximately 20% full of sediment.	Retain, meets design criteria
68	1050+80	18	RCP	365	334.79	325.22	1.04	RATIONAL	10.22	7	336.35	-	8	336.50	-	N	No visual issues or signs of erosion	Retain, meets design criteria
69	1058+00	18	RCP	189	333.17	318.05	2.27	RATIONAL	36.50	5	334.47	-	6	334.58	-	N	Outfall channel severely eroded	Retain, meets design criteria. Rip-Rap at outlet needed
70	1066+00	36	RCP	336	298.64	292.47	27.70	RATIONAL	40.28	30	301.18	0.85	34	301.37	0.91	N	Pipe approximately 20% full of sediment	Retain, meets design criteria
71	1069+20	18	RCP	321	299.77	297.88	3.34	RATIONAL	27.51	5	301.06	-	6	301.16	-	N	No visual issues or signs of erosion	Retain, meets design criteria
13 (US)	1071+50	(2) 8x10	RCBC	110	288.87	288.61	1417.08	REGRESSION	-	1060	297.08	0.82	1240	298.03	0.92	N	No visual issues or signs of erosion	Retain, meets design criteria
13 (DS)	1071+50	(2) 10x10	RCBC	88	285.40	285.32	1551.44	REGRESSION	-	1120	293.23	0.78	1310	293.91	0.85	N	No visual issues or signs of erosion	Retain, meets design criteria
14	1080+80	6X6	RCBC	108	300.42	299.68	119.74	SCS	48.00	142	304.45	0.67	193	305.36	0.82	N	No visual issues or signs of erosion	Retain, meets design criteria
72	1082+00	24	RCP	144	310.16	302.71	4.84	RATIONAL	38.38	5	311.24	0.54	6	311.32	0.58	N	No visual issues or signs of erosion	Retain, meets design criteria
73	1085+50	18	RCP	234	320.58	318.01	2.96	RATIONAL	35.68	7	322.24	-	8	322.41	-	N	No visual issues or signs of erosion	Retain, meets design criteria
74	1090+00	18	RCP	227	329.92	320.33	1.02	RATIONAL	35.78	3	330.74	-	3	330.80	-	N	No visual issues or signs of erosion	Retain, meets design criteria
75	1091+50	24	RCP	276	328.83	321.70	8.63	RATIONAL	37.08	12	330.76	-	14	330.93	-	N	Upstream inlet eroded	Retain, meets design criteria. Repair upstream inlet
76	1094+50	42	RCP	260	332.53	327.63	32.20	RATIONAL	35.95	58	336.05	1.01	65	336.36	1.09	N	Erosion both upstream and downstream. Upstream erosion may have occurred due to tree blocking pipe inlet	Retain, meets design criteria. Stabilize upstream and downstream channels. Rip-Rap needed at outfall
77	1099+50	15	RCP	128	352.70	341.78	0.73	RATIONAL	5.00	7	354.53	-	8	354.55	-	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
78/80	1104+50	18	RCP	447	384.65	370.41	3.65	RATIONAL	31.51	14	386.55	-	15	386.07	-	N	Sediment build-up in upstream inlet.	Pipe and inlet surcharged. Flow contained within ditch. Upsize to 24" to meet hydraulic criteria
79	1106+50	18	RCP	306	387.38	373.22	1.89	RATIONAL	11.66	7	388.93	-	8	389.09	-	N	No visual issues or signs of erosion	Retain, meets design criteria
81	1111+45	18	RCP	200	393.63	388.66	0.35	RATIONAL	5.00	1	394.24	-	2	394.29	-	N	No visual issues or signs of erosion	Retain, meets design criteria
82	1112+50	15	RCP	80	388.20	386.25	0.26	RATIONAL	5.00	3	389.12	-	3	389.20	-	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
83/84/85/86	1114+20	18/36	RCP	554	387.07	376.32	18.46	RATIONAL	5.00	43	388.56	-	49	388.68	-	N	No visual issues or signs of erosion	Retain, meets design criteria
83/84/85/86	1118+00	15/36	RCP	86	377.28	371.02			5.00		378.73	-		378.84	-	N		
83/84/85/86	1118+50	24/36	RCP	41	370.92	368.00			11.47		374.42	-		374.84	-	N		
83/84/85/86	1119+50	30/36	RCP	554	377.96	353.72			32.64		380.59	1.05		380.81	1.14	N		
87	1119+00	18	RCP	96	377.91	374.92	2.26	RATIONAL	20.50	9	379.89	-	10	380.01	-	N	No visual issues or signs of erosion	Retain, meets design criteria
88	1126+00	24	RCP	-	-	-	-	-	-	-	-	-	-	-	-	-	Pipe not located	Pipe not modeled due to incomplete survey. Obtain additional survey to model pipe
89	1127+00	24	RCP	175	362.87	360.44	3.89	RATIONAL	23.68	12	364.76	-	13	364.93	-	N	Pipe approximately 30% full of sediment	Retain, meets design criteria
15	1132+58	7x7	RCBC	210	339.59	338.13	263.71	SCS	102.00	305	345.63	0.86	386	346.65	1.01	N	Approximately 2' of stagnant water in box. Beaver dam located downstream	Retain, meets design criteria. Due to stagnant water, downstream channel may need work in order to drain
90	1138+00	18	RCP	255	367.68	359.95	3.87	RATIONAL	35.67	10	368.83	-	12	368.91	-	N	Downstream channel banks show signs of erosion	Retain, meets design criteria. Rip-Rap at outlet needed
91	1144+00	18	RCP	417	380.50	376.00	3.42	RATIONAL	31.52	5	380.96	-	6	380.99	-	N	Pipe disjointed between frontage road and inlet	Retain, meets design criteria
92/93	1152+00	15/18	RCP	603	379.00	366.21	5.49	RATIONAL	48.96	9	380.14	-	10	380.22	-	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
94	1155+00	18	RCP	169	370.90	354.84	3.87	RATIONAL	26.97	6	372.24	-	6	372.36	-	N	Last joint of pipe separated.	Retain, meets design criteria
95	1157+00	18	RCP	174	366.16	363.72	1.94	RATIONAL	22.11	5	367.44	-	6	367.55	-	N	Pipe approximately 60% full of sediment	Retain, meets design criteria. Grade outfall ditch to drain
96	1162+00	15	RCP	109	353.53	351.56	1.51	RATIONAL	5.00	9	355.75	-	11	356.15	-	N	Pipe approximately 50% full of sediment	Replace 15" pipe with 18" RCP
97	1165+00	15	RCP	109	343.11	340.88	0.42	RATIONAL	5.00	4	344.37	-	5	344.51	-	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
16	1168+26	(2) 10x12	RCBC	140	318.62	318.06	2600.25	REGRESSION	-	1530	328.09	0.79	1780	328.79	0.85	N	West side culvert has a few feet of sediment build-up	Retain, meets design criteria. Clean west side culvert
98	1175+00	24	RCP	186	333.62	326.55	4.95	RATIONAL	21.61	9	335.14	-	10	335.26	-	N	No visual issues or signs of erosion	Retain, meets design criteria
17	1176+80	6x6	RCBC	157	330.43	328.84	142.10	SCS	49.00	304	337.12	1.12	379	338.30	1.31	N	No visual issues or signs of erosion	Retain, meets design criteria
99	1180+00	15	RCP	109	337.98	335.61	0.71	RATIONAL	5.00	7	340.04	-	8	340.41	-	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
100	1185+00	18	RCP	194	351.66	348.04	10.09	RATIONAL	38.83	14	353.40	1.16	16	353.56	1.27	N	Pipe outlet covered by brush	Retain, meets design criteria. Clean outfall channel of brush
18	1190+17	4x4	RCBC	153	354.39	353.54	56.68	RATIONAL	49.12	61	357.41	0.76	69	357.65	0.81	N	No visual issues or signs of erosion	Retain, meets design criteria
101	1196+00	18	RCP	171	386.00	379.27	1.44	RATIONAL	5.00	10	388.35	-	12	388.75	-	N	No visual issues or signs of erosion	Retain, meets design criteria
102	1201+00	18	RCP	153	406.27	404.20	2.26	RATIONAL	5.00	14	407.69	-	16	407.82	-	N	No visual issues or signs of erosion	Retain, meets design criteria
103	1206+00	18	RCP	148	426.38	417.06	2.68	RATIONAL	30.48	8	428.15	-	9	428.36	-	N	Last joint of pipe separated.	Retain, meets design criteria
104	1218+00	18	RCP	153	428.87	425.09	2.81	RATIONAL	23.51	9	430.86	-	10	431.12	-	N	Pipe outlets approximately 1.5' above outfall ditch	Retain, meets design criteria. Rip-Rap at outlet needed
105	1223+00	15	RCP	73	420.25	412.54	0.80	RATIONAL	5.00	8	422.59	-	9	423.07	-	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
19	1225+00	8x8	RCBC	156	407.70	406.27	416.12	SCS	83.00	676	417.14	1.18	833	418.79	1.39	N	No visual issues or signs of erosion	Retain, meets design criteria
106	1227+50	15	RCP	106	428.73	415.05	0.61	RATIONAL	5.00	6	430.40	-	7	430.67	-	N	Scour hole at outfall	Replace 15" pipe with 18" RCP. Rip-rap needed at outlet
107	1229+00	24	RCP	-	-	-	-	-	-	-	-	-	-	-	-	-	Could not locate 24" RCP	Retain, meets design criteria
108	1230+10	18	RCP	182	447.62	428.65	1.88	RATIONAL	30.71	3	448.46	0.56	3	448.53	0.61	N	Downstream channel eroded	Retain, meets design criteria. Rip-Rap at outlet needed
109	1233+00	18	RCP	157	456.76	450.54	2.41	RATIONAL	27.13	7	458.42	-	8	458.61	-	N	Deep, well-defined outfall channel. Erosion evident in downstream channel	Retain, meets design criteria. Rip-Rap at outlet needed
110	1238+00	18	RCP	197	469.06	449.19	2.96	RATIONAL	31.71	6	470.53	0.98	7	470.68	1.08	N	Scour hole at outfall	Retain, meets design criteria. Rip-Rap at outlet needed
111	1240+00	24	RCP	223	467.30	453.83	15.79	RATIONAL	50.80	17	469.60	1.15	20	469.85	1.28	N	No visual issues or signs of erosion	Retain, meets design criteria
112	1242+50	18	RCP	163	475.00	474.00	1.74	RATIONAL	30.42	7	476.56	-	7	476.72	-	N	Pipe outlet not found, appears to be buried	Retain, meets design criteria
113	1248+00	18	RCP	89	476.41	475.30	0.86	RATIONAL	5.00	8	478.29	-	9	478.55	-	N	Major scour hole. Pipe outlets 6'-10' above bottom of ditch	Retain, meets design criteria. Rip-Rap at outlet needed
114	1250+50	42	RCP	212	474.21	463.05	30.10	RATIONAL	47.18	26	476.35	0.61	30	476.51	0.66	N	Scour hole at outfall	Retain, meets design criteria. Rip-Rap at outlet needed
115	1254+00	15	RCP	88	480.61	470.23	0.91	RATIONAL	5.00	9	483.37	-	10	484.01	-	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
116	1260+50	18	RCP	155	508.95	498.09	3.62	RATIONAL	32.38	11	511.50	-	13	511.95	-	N	Rip-rap at outfall but channel banks are eroded	Retain, meets design criteria. Rip-Rap at outlet needed
117	1268+50	30	RCP	282	530.10	518.93	20.27	RATIONAL	46.60	28	532.82	1.09	32	533.10	1.20	N	Pipe approximately 60% full of sediment	Retain, meets design criteria
118/119	1276+00	15	RCP	184	560.36	550.22	1.07	RATIONAL	5.00	8	563.00	-	10	563.04	-	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
120	1292+00	18 & 24	RCP	435	567.27	555.00	12.16	RATIONAL	36.99	25	568.58	0.87	28	568.67	0.93	N	No visual issues or signs of erosion	Pipe surcharged. Flow contained within structure.

Table 2: Existing Pipes With Proposed Flow Rates (See Appendices for Calculations)

Culvert Data							Hydrology Data			50-Year Storm			100-Year Storm					
Site ID	Station	Size (US/DS)	Type	Length	FL IN	FL OUT	DA	Hydrologic Method	Tc	Q (cfs)	HW Elevation (ft)	HW/D	Q (cfs)	HW Elevation (ft)	HW/D	Overtopping	Field Notes	50-Year Hydraulic Analysis Notes and Recommendations
121	1301+00	18	RCP	158	540.62	538.81	2.57	RATIONAL	5.00	20	543.91	-	23	545.00	-	N	Outlet pipe needs cleaning	Pipe and inlet surcharged. Flow contained within ditch.
122	1305+50	24	RCP	218	519.63	511.50	17.97	RATIONAL	50.03	23	522.61	1.49	26	523.06	1.71	N	Pipe approximately 20% full of sediment	Does not meet HW/D criteria. No risk for overtopping. Replace 24" pipe with 30" RCP to meet HW/D criteria
123	1311+50	48	RCP	210	485.34	482.65	77.34	RATIONAL	48.31	91	489.74	1.10	102	490.19	1.21	N	No visual issues or signs of erosion	Retain, meets design criteria
124	1316+50	18	RCP	133	492.08	491.06	1.80	RATIONAL	38.01	5	493.33	-	5	493.43	-	N	Scour hole at outfall	Retain, meets design criteria. Rip-Rap at outlet needed
125	1319+75	48	RCP	242	462.82	449.57	45.56	RATIONAL	43.02	47	465.64	0.70	53	465.85	0.76	N	No visual issues or signs of erosion	Retain, meets design criteria
126	1321+00	15	RCP	112	486.27	459.21	0.37	RATIONAL	5.00	4	487.29	-	4	487.40	-	N	Scour hole at outfall	Replace 15" pipe with 18" RCP. Rip-rap needed at outlet
127	1323+25	24	RCP	217	480.13	453.99	3.13	RATIONAL	25.47	4	481.02	0.44	5	481.08	0.47	N	Scour hole at outfall	Retain, meets design criteria. Rip-Rap at outlet needed
128	1329+75	15	RCP	112	472.07	467.83	1.80	RATIONAL	5.00	13	474.32	-	15	474.89	-	N	Scour hole at outfall	Replace 15" pipe with 18" RCP. Rip-rap needed at outlet
129	1330+75	4x6	RCBC	260	434.46	428.39	108.39	SCS	59.00	168	440.30	0.97	215	441.39	1.16	N	No visual issues or signs of erosion	Retain, meets design criteria
130	1332+00	15	RCP	150	469.92	436.60	0.76	RATIONAL	5.00	7	472.01	-	8	472.45	-	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
131	1345+00	18	RCP	167	467.83	462.67	6.77	RATIONAL	31.04	14	469.38	-	16	469.50	-	N	No visual issues or signs of erosion	Retain, meets design criteria
132	1350+00	6x6	RCBC	216	429.00	422.87	286.58	SCS	85.00	322	435.91	1.15	415	437.42	1.40	N	No visual issues or signs of erosion	Retain, meets design criteria
133	1351+00	15	RCP	114	454.57	432.22	0.97	RATIONAL	5.00	9	457.04	-	11	457.07	-	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
134	1358+00	15 & 18	RCP	78	472.43	471.05	1.89	RATIONAL	5.00	13	473.96	-	14	474.14	-	N	Pipe approximately 10% full of sediment	Replace 15" pipe with 18" RCP
135	1364+50	15	RCP	107	494.01	491.97	0.42	RATIONAL	5.00	4	495.27	-	5	495.41	-	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
136	1367+00	24x24x36	-	-	-	-		-	-	-	-	-	-	-	-	-	Could not locate spring box	-
137	1368+00	36	RCP	252	483.10	468.95	22.11	RATIONAL	41.26	27	485.43	0.78	30	485.61	0.84	N	Pipe approximately 30% full of sediment	Retain, meets design criteria
138	1370+00	15	RCP	83	501.36	492.77	0.22	RATIONAL	5.00	2	502.14	-	2	502.22	-	N	Pipe approximately 10% full of sediment	Replace 15" pipe with 18" RCP
139	1376+00	18	RCP	210	501.74	498.55	1.65	RATIONAL	30.38	5	503.05	-	6	503.16	-	N	No visual issues or signs of erosion	Retain, meets design criteria
140	1381+00	30	RCP	390	498.30	487.20	22.74	RATIONAL	60.92	28	499.36	-	31	499.44	-	N	Scour hole at outfall	Retain, meets design criteria. Rip-Rap at outlet needed
141	1381+00	30	RCP	67	488.53	487.20	26.54	RATIONAL	60.92	33	491.70	1.27	38	492.09	1.42	N	No visual issues or signs of erosion	Does not meet HW/D criteria. No risk for overtopping. Add additional 18" RCP to meet HW/D criteria
142	1395+00	18	RCP	171	484.40	479.99	8.15	RATIONAL	39.48	16	486.33	-	18	486.56	-	N	No visual issues or signs of erosion	Retain, meets design criteria
143	1400+00	30	RCP	230	462.48	457.25	18.79	RATIONAL	41.97	31	465.48	1.20	36	465.83	1.34	N	Pipe approximately 20% full of sediment	Retain, meets design criteria
144/145	1404+50	15 & 18	RCP	460	452.50	439.16	10.69	RATIONAL	49.81	12	453.02	-	14	453.06	-	N	Pipe approximately 50% full of sediment	Replace 15" pipe with 18" RCP
144/145	1406+50	18 & 24	RCP	246	448.43	439.16					450.10	1.11		450.24	1.21	N	Pipe approximately 50% full of sediment	Retain, meets design criteria
146	1413+00	18	RCP	254	418.98	408.41	1.73	RATIONAL	5.00	15	420.78	-	17	421.00	-	N	No visual issues or signs of erosion	Retain, meets design criteria
147	1416+00	24	RCP	-	-	-	-	-	-	-	-	-	-	-	-	-	Could not locate 24" RCP	-
148	1418+50	9x9	RCBC	176	383.98	382.26	842.13	REGRESSION	-	780	393.52	1.06	915	394.66	1.19	N	30" RCP pipe sections both upstream and downstream of box	Pipe size in Enclosure 1 shows 8x8 RCBC, survey received shows 9x9 RCBC. HW/D criteria is met when modeled as 9x9 RCBC. Verify box size
149	1421+00	36	RCP	205	413.79	410.00	36.05	RATIONAL	26.48	63	418.36	1.52	72	419.08	1.76	N	Pipe transitions from 36" RCP to RCBC somewhere under frontage road. Box culvert outlet completely filled with sediment and water. Approximately 2" of clearance from top of box to top of water	Does not meet HW/D criteria. No risk for overtopping. Replace 36" RCP with RCBC. Locate buried junction box and verify pipes aren't collapsed. Clean existing RCBC that is full of sediment.
151/153/154	1422+00	18/24	RCP	139	415.03	410.73	8.37	RATIONAL	23.69	23	416.45	-	26	430.56	-	N	No visual issues or signs of erosion	Retain, meets design criteria
151/153/154	1422+00	15/24	RCP	363	425.23	410.73		RATIONAL			429.59	-		416.57	-	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
150/152	1422+50	18	RCP	474	426.79	407.30	1.51	RATIONAL	5.00	8	428.76	-	9	428.92	-	N	No visual issues or signs of erosion	Retain, meets design criteria
155	1433+00	18	RCP	294	433.68	424.28	1.33	RATIONAL	5.00	7	435.33	-	8	435.53	-	N	Scour hole at outfall	Retain, meets design criteria. Rip-Rap at outlet needed
156	1433+00	18	RCP	196	433.46	428.63	0.88	RATIONAL	5.00	5	434.71	-	5	434.82	-	N	No visual issues or signs of erosion	Retain, meets design criteria
157	1434+50	15	RCP	100	429.17	424.66	0.25	RATIONAL	5.00	2	430.06	-	3	430.14	-	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
158	1437+50	36	RCP	265	400.46	393.50	31.16	RATIONAL	32.46	46	403.83	1.12	52	404.19	1.24	N	Scour hole at outfall	Retain, meets design criteria. Rip-Rap at outlet needed
159	1440+00	15	RCP	127	410.08	397.68	1.26	RATIONAL	5.00	8	412.38	-	9	412.85	-	N	Scour hole at outfall. Channel banks eroded as well	Replace 15" pipe with 18" RCP. Rip-rap needed at outlet
160	1447+00	(2) 8x8	RCBC	198	383.03	381.47	1299.45	REGRESSION	-	1010	390.75	0.97	1180	391.61	1.07	N	Looking upstream, box on the right has approximately 2' of sediment	Retain, meets design criteria
161	1451+00	15	RCP	103	398.38	392.51	0.36	RATIONAL	5.00	3	399.49	-	4	399.60	-	N	Pipe outlets approximately 1.5' above outfall ditch	Replace 15" pipe with 18" RCP
162	1456+00	24	RCP	53	401.78	399.80	45.36	RATIONAL	48.49	57	404.28	1.25	64	406.36	2.29	Y	Major erosion upstream. Downstream scour hole and stagnant water in ditch	Does not meet HW/D criteria. Headwater build-up shows overtopping. Add 3 additional 24" barrels to meet HW/D criteria. Verify hydrology.
163	1456+00	15	RCP	107	403.54	395.83	0.38	RATIONAL	5.00	4	404.69	-	4	404.80	-	N	Pipe outlets approximately 2' above outfall ditch	Replace 15" pipe with 18" RCP
164	1461+25	15	RCP	102	408.69	402.42	0.48	RATIONAL	5.00	5	410.06	-	5	410.23	-	N	Stagnant water in outlet pipe	Replace 15" pipe with 18" RCP
165	1466+50	18	RCP	255	421.31	412.82	19.68	RATIONAL	102.10	24	428.13	4.55	27	429.68	5.58	Y	Pipe outlets approximately 2' above outfall ditch	Wet ponds upstream of 18" crossline were not modeled as storage areas due to no outlet structure information. Using conservative methods to calculate flow rates, the crossline pipe shows severe overtopping. Obtain additional survey of upstream ponds and perform an in depth hydrologic model to more accurately reflect the flow rates this pipe receives
166/167/168	1469+50	36	RCP	249	428.62	422.62	33.68	RATIONAL	48.35	57	432.21	1.20	64	432.59	1.32	Y	Inlet furthest downstream holding water. Outlet pipe 60% full of water	Wet ponds upstream of 36" RCP were not modeled as a storage area. Pipe does not meet HW/D criteria based on the very conservative Q calculations. Replace 15" pipe with 18" pipe
166/167/168	1469+50	15	RCP	302	431.00	422.62					433.57	-		434.01	-	N		
166/167/168	1469+50	18	RCP	482	443.34	422.62					444.47	-		444.55	-	N		
169/170	1476+50	18	RCP	211	455.41	448.29	4.57	RATIONAL	25.14	18	457.34	-	20	457.56	-	N	Channel banks eroded downstream	Retain, meets design criteria. Rip-Rap at outlet needed
171/172	1483+50	18	RCP	291	474.95	472.02	2.08	RATIONAL	14.73	7	476.42	0.98	8	476.56	1.07	N	Pipe approximately 50% full of sediment	Retain, meets design criteria. Grade outfall ditch to drain
173	1490+00	18	RCP	218	469.68	465.76	2.09	RATIONAL	5.00	15	471.11	-	17	471.22	-	N	Pipe approximately 50% full of sediment	Retain, meets design criteria. Grade outfall ditch to drain
174	1495+00	18	RCP	228	450.18	446.46	3.50	RATIONAL	24.68	10	452.49	-	12	452.86	-	N	Pipe approximately 95% full of sediment	Retain, meets design criteria. Grade outfall ditch to drain
175	1500+00	18	RCP	217	429.33	425.78	3.53	RATIONAL	25.14	11	430.48	-	13	430.56	-	N	Pipe approximately 75% full of sediment	Retain, meets design criteria. Grade outfall ditch to drain
176/177	1502+50	18/24	RCP	247	414.93	407.25	5.92	RATIONAL	39.27	9	416.27	0.89	10	416.37	0.96	N	Pipe approximately 20% full of sediment	Retain, meets design criteria. Grade outfall ditch to drain
176/177	1502+50	18/24	RCP	295	411.00	407.25					412.05	-		412.13	-	N		
178	1511+00	18	RCP	153	385.56	382.31	3.77	RATIONAL	26.97	14	387.45	-	15	387.67	-	N	No visual issues or signs of erosion	Retain, meets design criteria
179	1517+00	15	RCP	82	370.43	362.47	0.86	RATIONAL	5.00	8	373.01	-	9	373.24	-	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
180	1521+00	(2) 12x12	RCBC	195	352.33	351.99	3504.63	REGRESSION	-	1830	363.19	0.91	2130	363.74	0.95	N	Looking upstream, box on the right has approximately 3' of sediment	Retain, meets design criteria
181	1528+00	15	RCP	113	406.70	382.25	0.24	RATIONAL	5.00	2	407.45	-	3	407.53	-	N	No visual issues or signs of erosion	Replace 15" pipe with 18" RCP
182	1530+00	15	RCP	94	419.53	411.01	0.28	RATIONAL	5.00	3	420.45	-	3	420.54	-	N	Scour hole at outfall	Replace 15" pipe with 18" RCP. Rip-rap needed at outlet
183	1541+00	36	RCP	199	412.71	407.00	37.61	RATIONAL	47.74	36	415.55	0.95	41	415.79	1.03	N	No visual issues or signs of erosion	Retain, meets design criteria
184	1543+50	18	RCP	174	418.58	415.90	2.11	RATIONAL	36.79	2	419.26	0.45	2	419.31	0.49	N	Pipe approximately 75% full of sediment	Retain, meets design criteria
185	1546+50	15	RCP	87	419.54	415.89	0.85	RATIONAL	5.00	8	422.11	-	9	422.56	-	N	Replace last section of pipe due to joint separation. Scour hole at outfall	Replace 15" pipe with 18" RCP. Rip-rap needed at outlet
186	1548+10	60	RCP	188	406.25	404.45	63.12	RATIONAL	37.01	68	409.52	0.65	76	409.76	0.70	N	No visual issues or signs of erosion	Retain, meets design criteria
187	1554+00	18	RCP	162	441.44	429.07	2.29	RATIONAL	15.39	8	443.15	1.14	10	443.36	1.28	N	No visual issues or signs of erosion	Retain, meets design criteria

4. Project Maps

I-26 MM85 to MM 101



NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0 North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was State Plane South Carolina FIPS 3900. The **horizontal datum** was NAD83 HARN, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov/

Base map information shown on this FIRM was provided in digital format by Newberry County, South Carolina.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Information eXchange** at 1-877-FEMA MAP (1-877-336-2627) for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Information eXchange may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

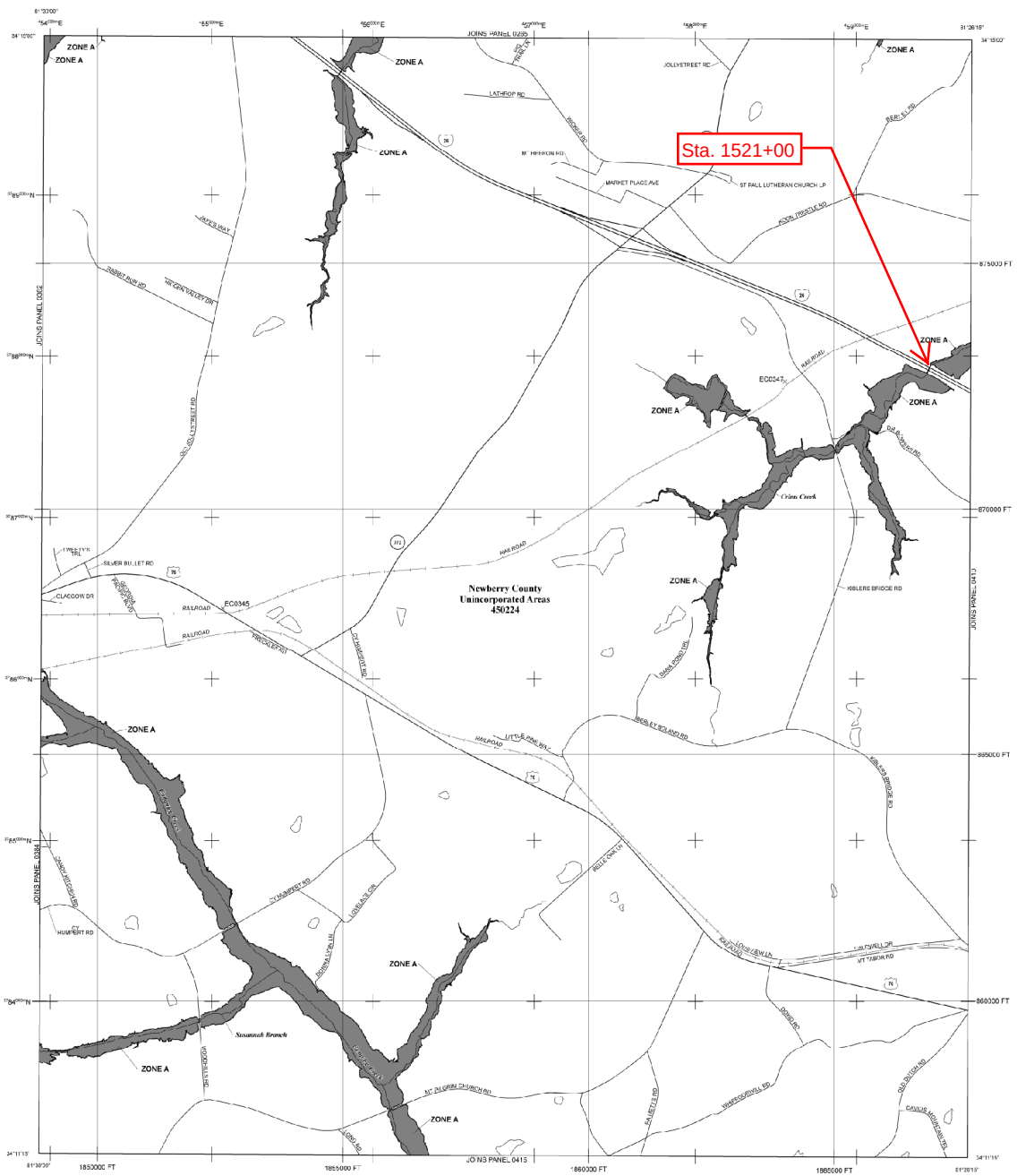
If you **have questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.

The **"profile base lines"** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the "profile base line", in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

DNR

This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of South Carolina and the Federal Emergency Management Agency (FEMA). The State of South Carolina has implemented a long term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map floodplain areas at the local level. As a part of this effort, the state of South Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

http://www.dnr.state.sc.us/



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A — No Base Flood Elevations determined.
- ZONE AE — Base Flood Elevations determined.
- ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99 — Areas to be protected from 1% annual chance flood event by a federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) HARN, Western Hemisphere
- 4775000 mE — 1000-meter Universal Transverse Mercator grid ticks, zone 17
- 600000 FT — 5000-foot grid values: South Carolina State Plane coordinate system (FIPSZONE = 3900), Lambert projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
SEPTEMBER 16, 2011

EFFECTIVE DATE(S) OF REVISION(S): TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0405C

FIRM

FLOOD INSURANCE RATE MAP
NEWBERRY COUNTY, SOUTH CAROLINA
AND INCORPORATED AREAS

PANEL 405 OF 485

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
NEWBERRY COUNTY	450224	0405	C

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
45071C0405C

EFFECTIVE DATE
SEPTEMBER 16, 2011

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0 North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was State Plane South Carolina FIPS 3900. The **horizontal datum** was NAD83 HARN, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov/

Base map information shown on this FIRM was provided in digital format by Newberry County, South Carolina.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Information eXchange** at 1-877-FEMA MAP (1-877-336-2627) for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Information eXchange may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

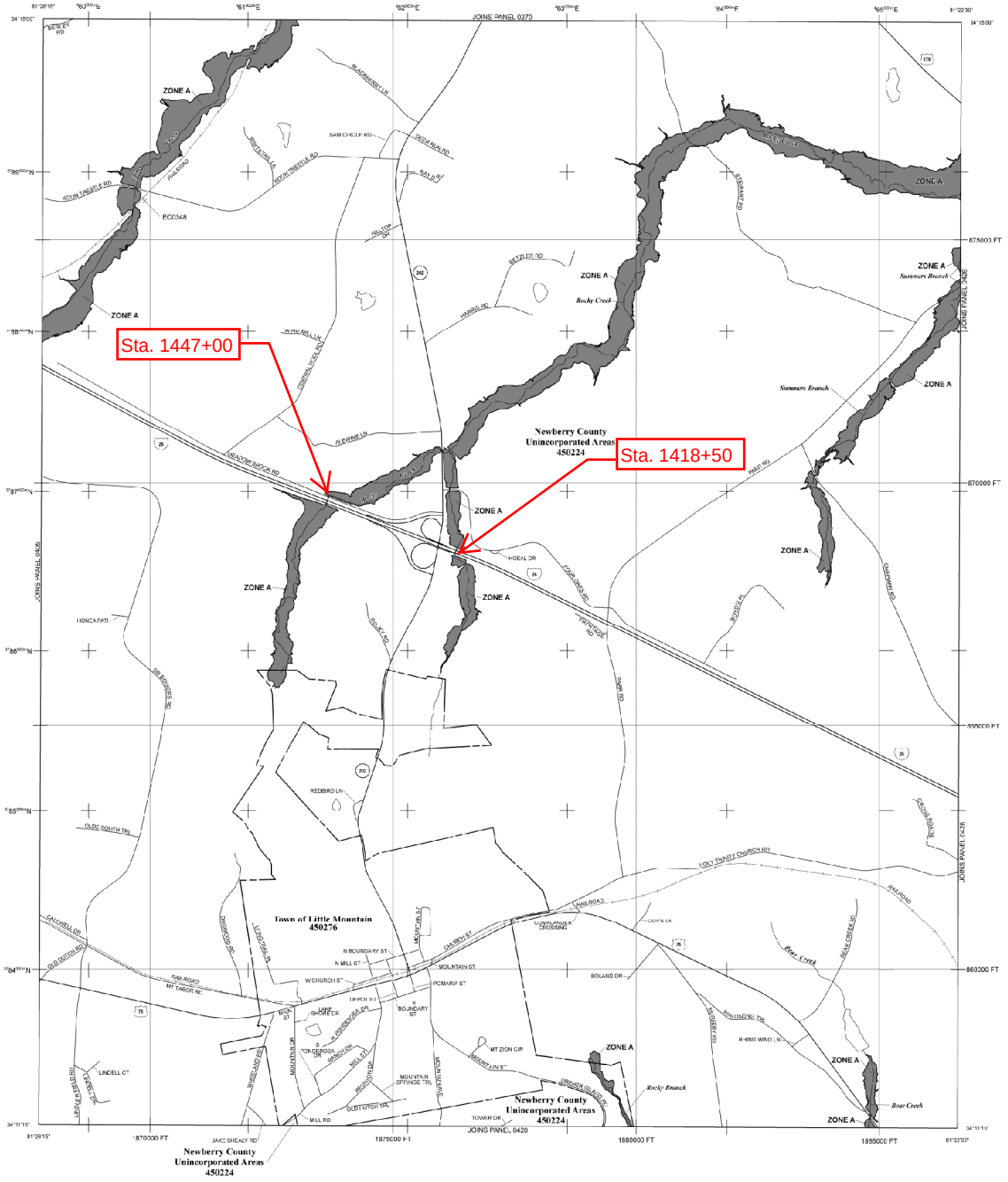
If you **have questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.

The **"profile base lines"** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the "profile base line", in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

DNR

This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of South Carolina and the Federal Emergency Management Agency (FEMA). The State of South Carolina has implemented a long term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map floodplain areas at the local level. As a part of this effort, the state of South Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

http://www.dnr.state.sc.us/



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A — No Base Flood Elevations determined.

ZONE AE — Base Flood Elevations determined.

ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 — Areas to be protected from 1% annual chance flood event by a federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
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- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) HARN, Western Hemisphere
- 4775000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 17
- 600000mE — 5000-foot grid values: South Carolina State Plane coordinate system (FIPSZONE = 3900), Lambert projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
SEPTEMBER 16, 2011

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0410C

FIRM

FLOOD INSURANCE RATE MAP
NEWBERRY COUNTY, SOUTH CAROLINA
AND INCORPORATED AREAS

PANEL 410 OF 485

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LITTLE MOUNTAIN, TOWN OF	450276	0410	C
NEWBERRY COUNTY	450224	0410	C

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
45071C0410C

EFFECTIVE DATE
SEPTEMBER 16, 2011

Federal Emergency Management Agency

Sta. 1168+26

NOTES TO USERS

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To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

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The **projection** used in the preparation of this map was Lambert Conformal Conic State Plane South Carolina FIPS 3900. The **horizontal datum** was NAD83 HARN, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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DNR

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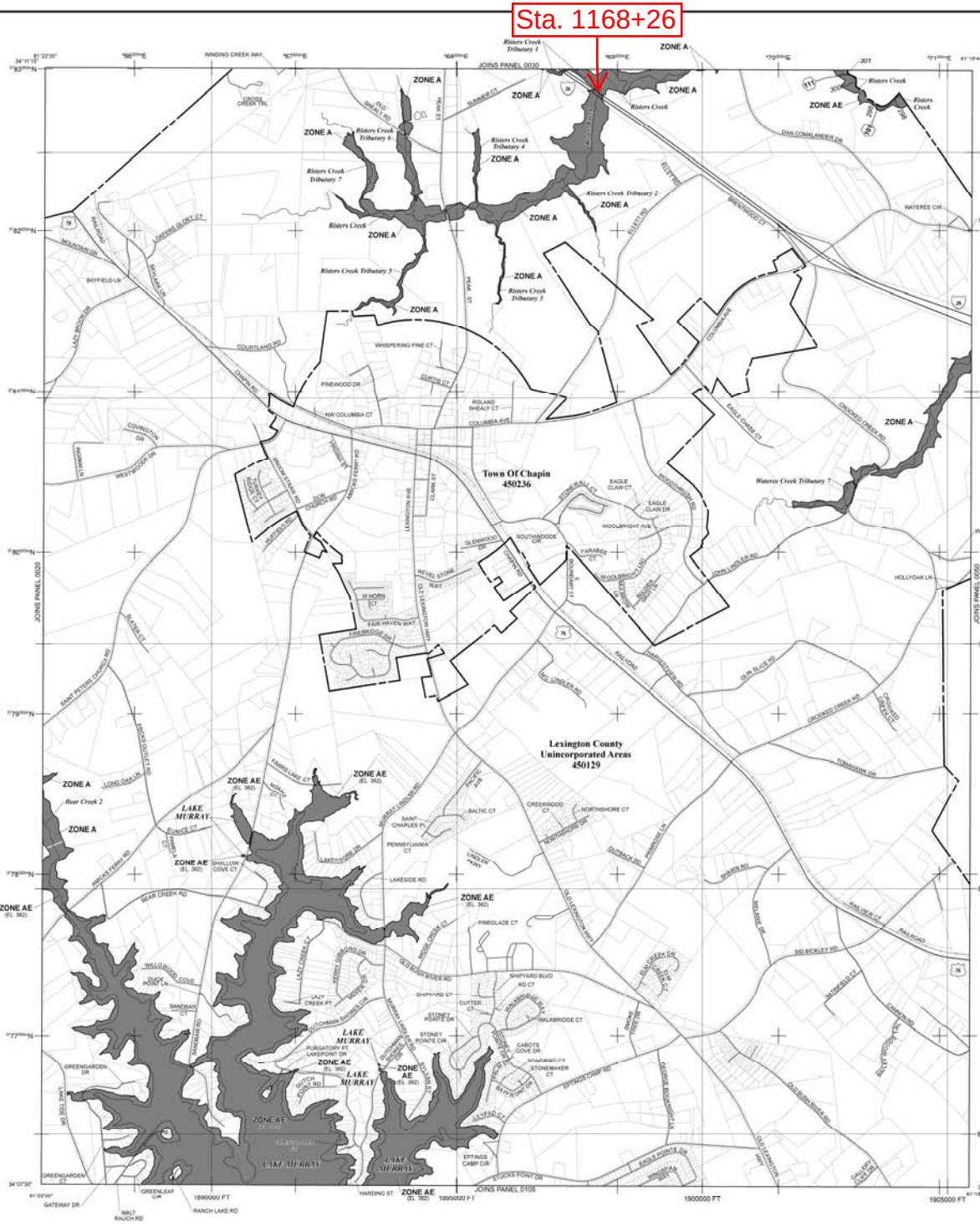
http://www.dnr.state.sc.us/



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
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COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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- Floodplain boundary
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- 513 (EL 987) — Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
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- 1000-meter Universal Transverse Mercator grid ticks, zone 17
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- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
July 17, 1995

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 9, 2000 - to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to change zone designations, to add roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

July 5, 2018 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to change Special Flood Hazard Areas, to change zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, to reflect updated topographic information, to change floodway, and to advance suffix.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0040J

FIRM
FLOOD INSURANCE RATE MAP
LEXINGTON COUNTY, SOUTH CAROLINA
AND INCORPORATED AREAS

PANEL 40 OF 555
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CHAPIN, TOWN OF	450236	0040	J
LEXINGTON COUNTY	450129	0040	J

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
45063C0040J

MAP REVISED
JULY 5, 2018

Federal Emergency Management Agency

NOTES TO USERS

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The **projection** used in the preparation of this map was Lambert Conformal Conic State Plane South Carolina FIPS 3900. The **horizontal datum** was NAD83 HARN, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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DNR

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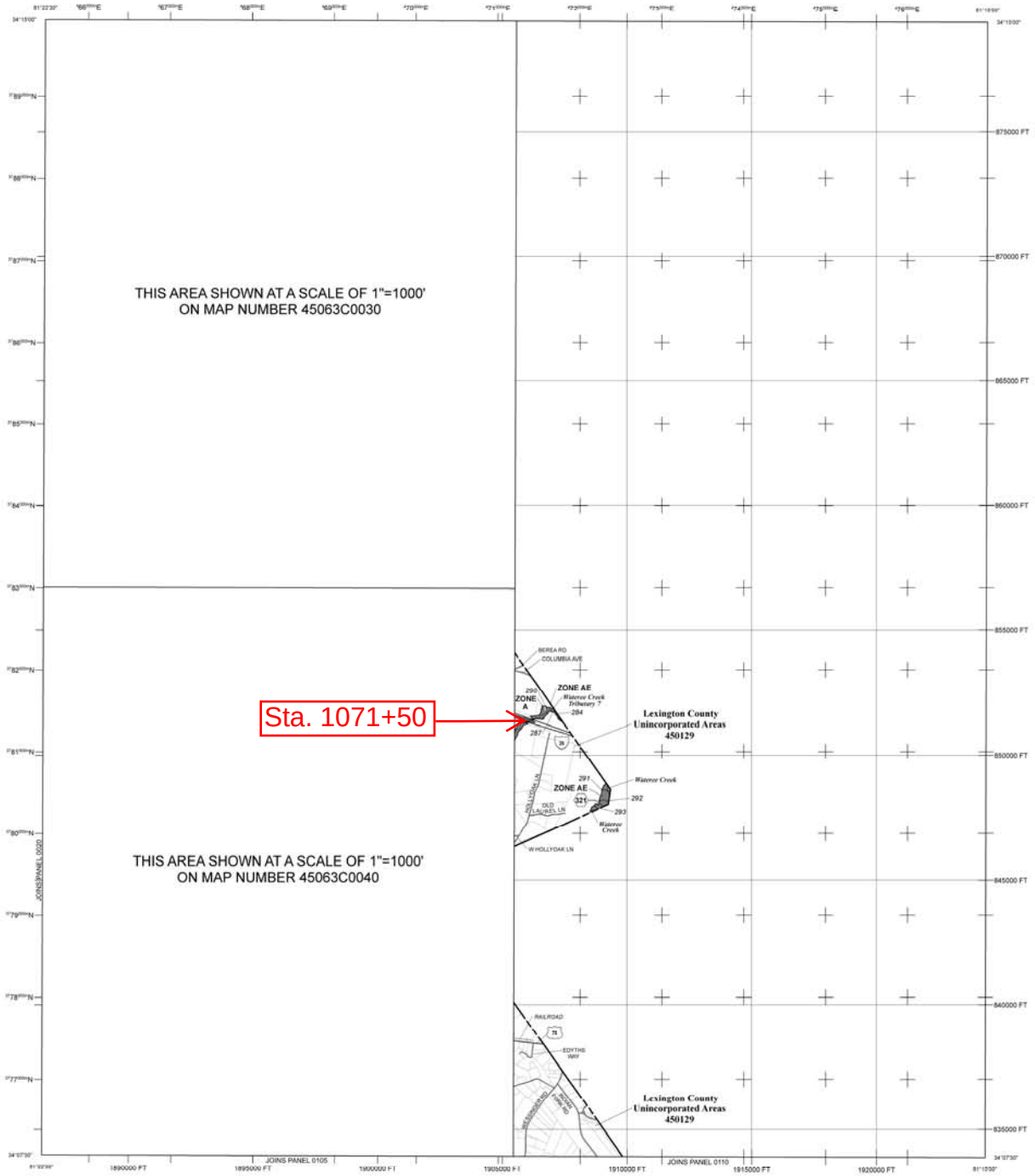
http://www.dnr.state.sc.us/



LEGEND

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ZONE A99 — Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities

513 (EL 987) — Base Flood Elevation line and value; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

A — A — Cross section line

23 — 23 — Transect line

87°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) HARN, Western Hemisphere

1000-meter Universal Transverse Mercator grid ticks, zone 17

6000000 FT — 5000-foot grid values: South Carolina State Plane coordinate system (FIPSZONE = 3900), Lambert projection

DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)

M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
July 17, 1995

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 9, 2000 - to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Area designations, to add roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

July 5, 2018 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to change Special Flood Hazard Areas, to change zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, to reflect updated topographic information, to change floodway, and to advance suffix.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'

1,000 0 1,000 2,000 3,000 4,000 FEET
300 0 600 1,200 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0050J

FIRM

FLOOD INSURANCE RATE MAP
LEXINGTON COUNTY, SOUTH CAROLINA
AND INCORPORATED AREAS

PANEL 50 OF 555

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LEXINGTON COUNTY	450129	0050	J

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
45063C0050J

MAP REVISED
JULY 5, 2018

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for insurance and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Lambert Conformal Conic State Plane South Carolina FIPS 3900. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Richland County, South Carolina.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a listing of Communities Participating in the National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

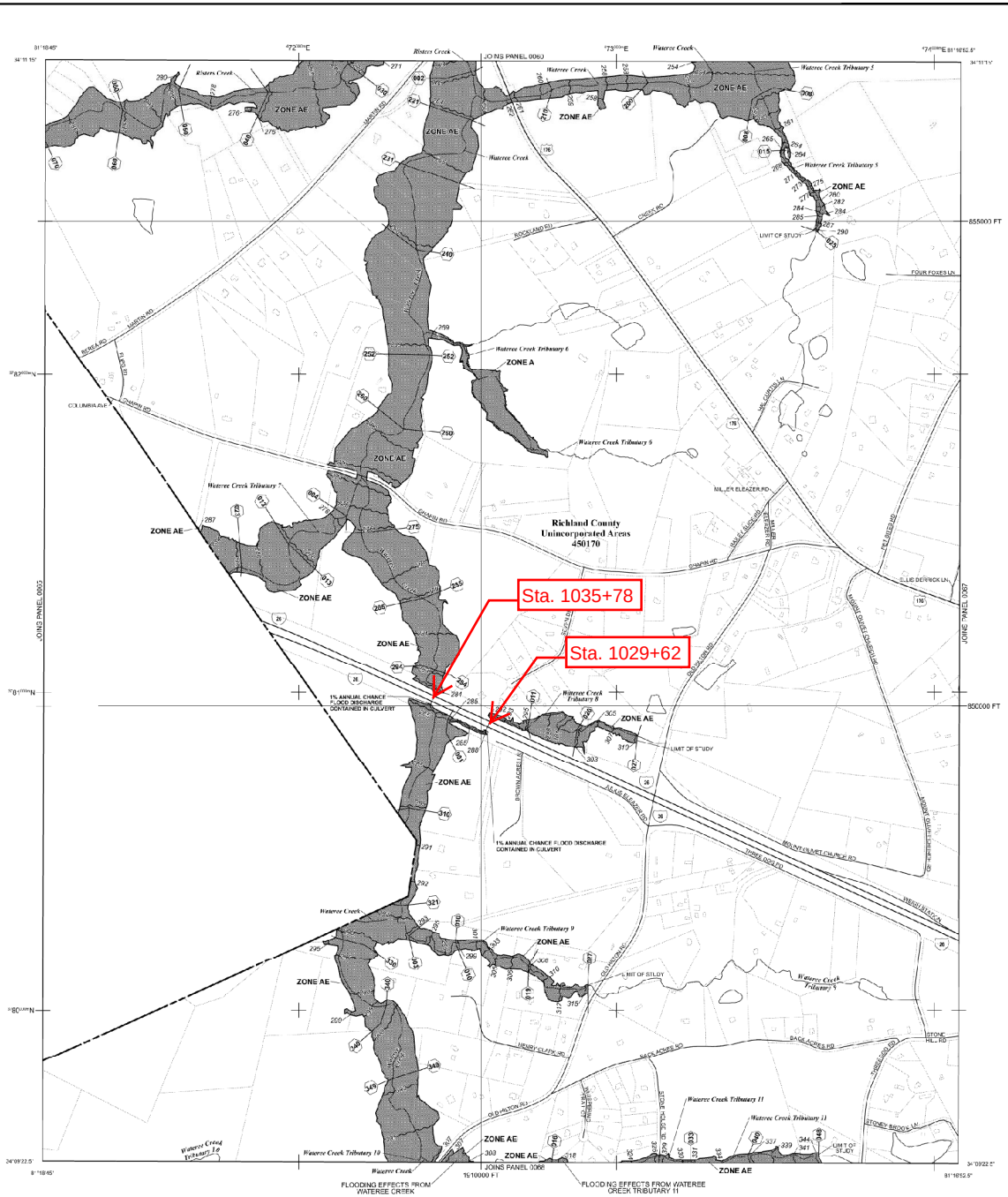
For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the **FEMA Mapping Information eXchange** at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service website at http://www.msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

The **profile base lines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the profile base line, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

DNR

This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of South Carolina and the Federal Emergency Management Agency (FEMA). The State of South Carolina has implemented a long term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map floodplain areas at the local level. As a part of this effort, the state of South Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

http://www.dnr.state.sc.us/



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

- ZONE A — No Base Flood Elevations determined.
- ZONE AE — Base Flood Elevations determined.
- ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99 — Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — Cross section line
- 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western hemisphere
- 4275000mE — 1000-meter Universal Transverse Mercator grid ticks, zone 17
- 6000000 FT — 5000-foot grid values: South Carolina State Plane coordinate system (FIPSZONE = 3900), Lambert projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
January 19, 1994

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 20, 2013
December 21, 2017

December 21, 2017 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to update map format, to add roads and road names, to reflect updated topographic information, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0066L

FIRM

FLOOD INSURANCE RATE MAP
RICHLAND COUNTY, SOUTH CAROLINA
AND INCORPORATED AREAS

PANEL 66 OF 650

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
RICHLAND COUNTY	450170	0066	L

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
45079C0066L

MAP REVISED
DECEMBER 21, 2017

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for insurance and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Lambert Conformal Conic State Plane South Carolina FIPS 3900. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

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1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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Base map information shown on this FIRM was provided in digital format by Richland County, South Carolina.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a listing of communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

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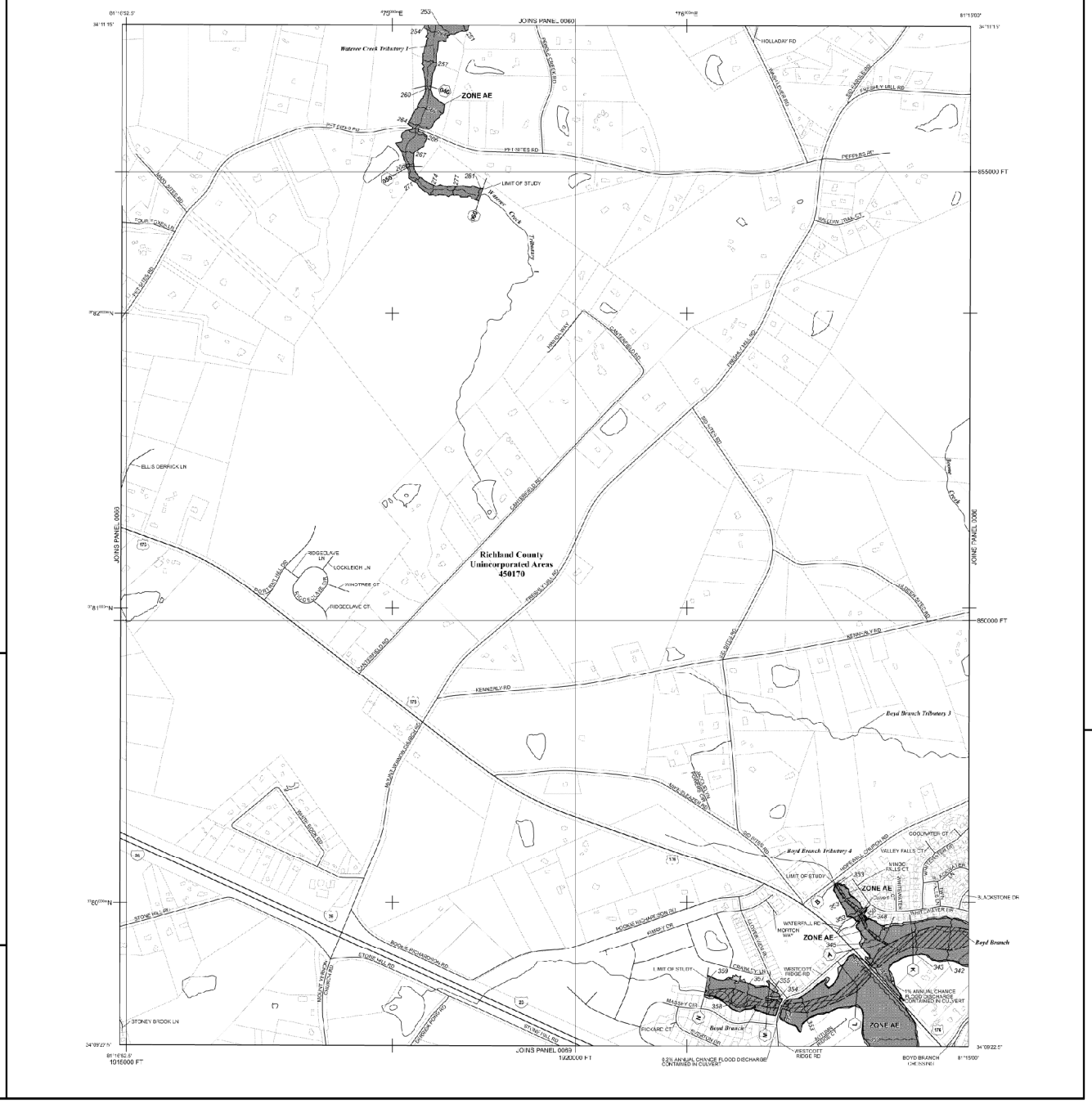
The **profile base lines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the profile base line, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

DNR

This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of South Carolina and the Federal Emergency Management Agency (FEMA). The State of South Carolina has implemented a long term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map floodplain areas at the local level. As a part of this effort, the state of South Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

http://www.dnr.state.sc.us/



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

- ZONE A — No Base Flood Elevations determined.
- ZONE AE — Base Flood Elevations determined.
- ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99 — Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
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- ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- (A) — (A) — Cross section line
- (23) — (23) — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4775000 mE — 1000-meter Universal Transverse Mercator grid ticks, zone 17
- 6600000 FT — 5000-foot grid values: South Carolina State Plane coordinate system (FIPSZONE 3900), Lambert Conformal Conic projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
January 19, 1984

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 28, 2013
September 29, 2010

December 21, 2017 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to update map format, to add roads and road names, to reflect updated topographic information, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

200 0 200 400 600 1,000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0067L

FIRM

FLOOD INSURANCE RATE MAP

RICHLAND COUNTY, SOUTH CAROLINA AND INCORPORATED AREAS

PANEL 67 OF 650

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
RICHLAND COUNTY	450170	0067	L

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
45079C0067L

MAP REVISED
DECEMBER 21, 2017

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

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Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0° North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Lambert Conformal Conic State Plane South Carolina FIPS 3900. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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Silver Spring, Maryland 20910-3282
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Base map information shown on this FIRM was provided in digital format by Richland County, South Carolina.

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For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the **FEMA Mapping Information eXchange** at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service website at http://www.msc.fema.gov/. Available products may include previously issued Letters of Map Change, a Flood Insurance Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

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DNR

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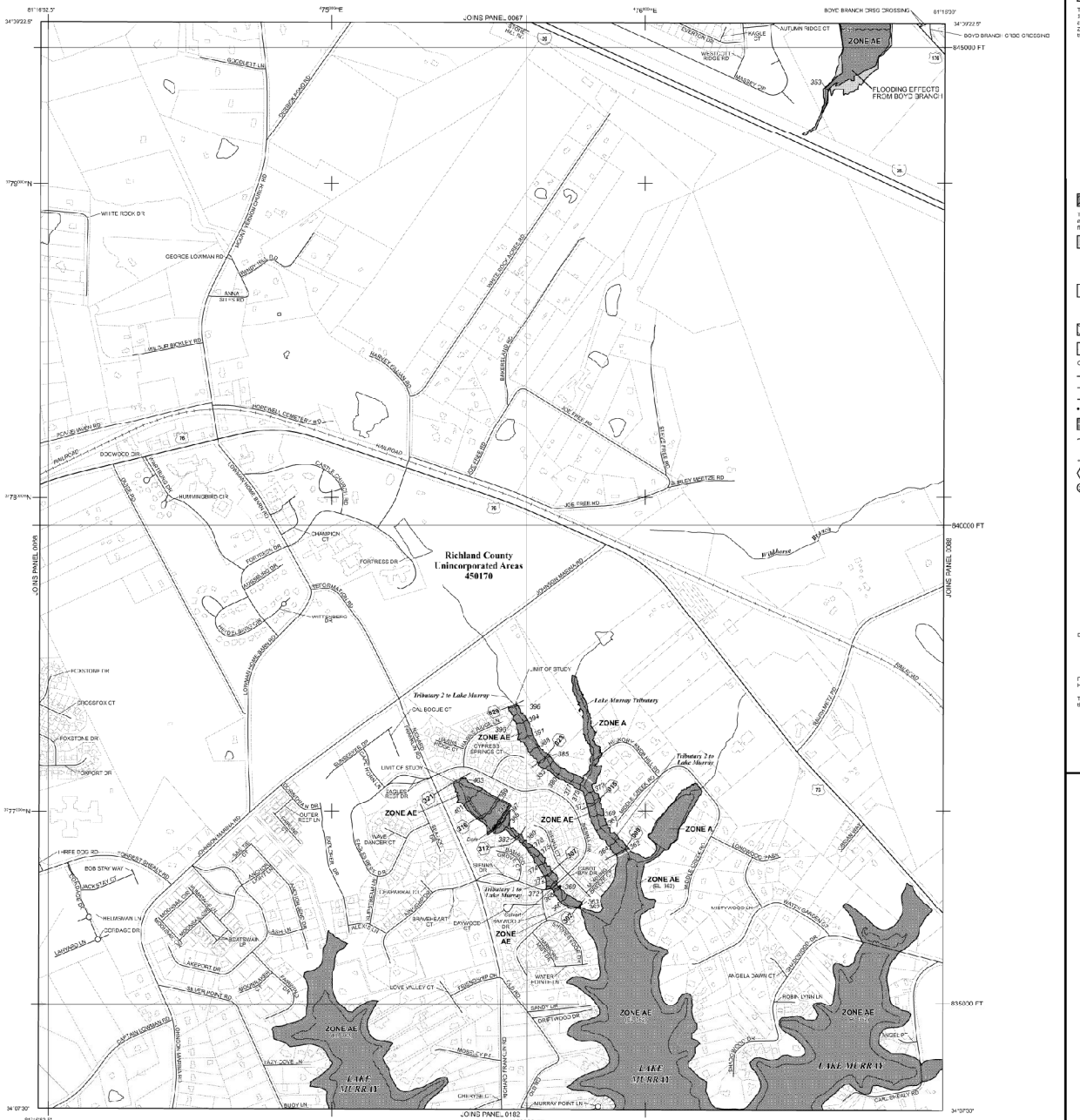
http://www.dnr.state.sc.us/



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** — No Base Flood Elevations determined.
- **ZONE AH** — Base Flood Elevations determined.
- **ZONE AH** — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** — Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** — Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 1000-meter Universal Transverse Mercator grid ticks, zone 17
- 6000000 FT — 5000-foot grid values: South Carolina State Plane coordinate system (FIPSZONE = 3900), Lambert projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
January 16, 1991

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 16, 2000
September 29, 2010

December 21, 2017 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to update map format, to add roads and road names, to reflect updated topographic information, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

200 0 200 500 750 1,000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0069L

FIRM

FLOOD INSURANCE RATE MAP

RICHLAND COUNTY, SOUTH CAROLINA AND INCORPORATED AREAS

PANEL 69 OF 650

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
RICHLAND COUNTY	450170	0069	L

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
45079C0069L

MAP REVISED
DECEMBER 21, 2017

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for insurance and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Lambert Conformal Conic State Plane South Carolina FIPS 3900. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Richland County, South Carolina.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a listing of communities inside and outside the SFHA.

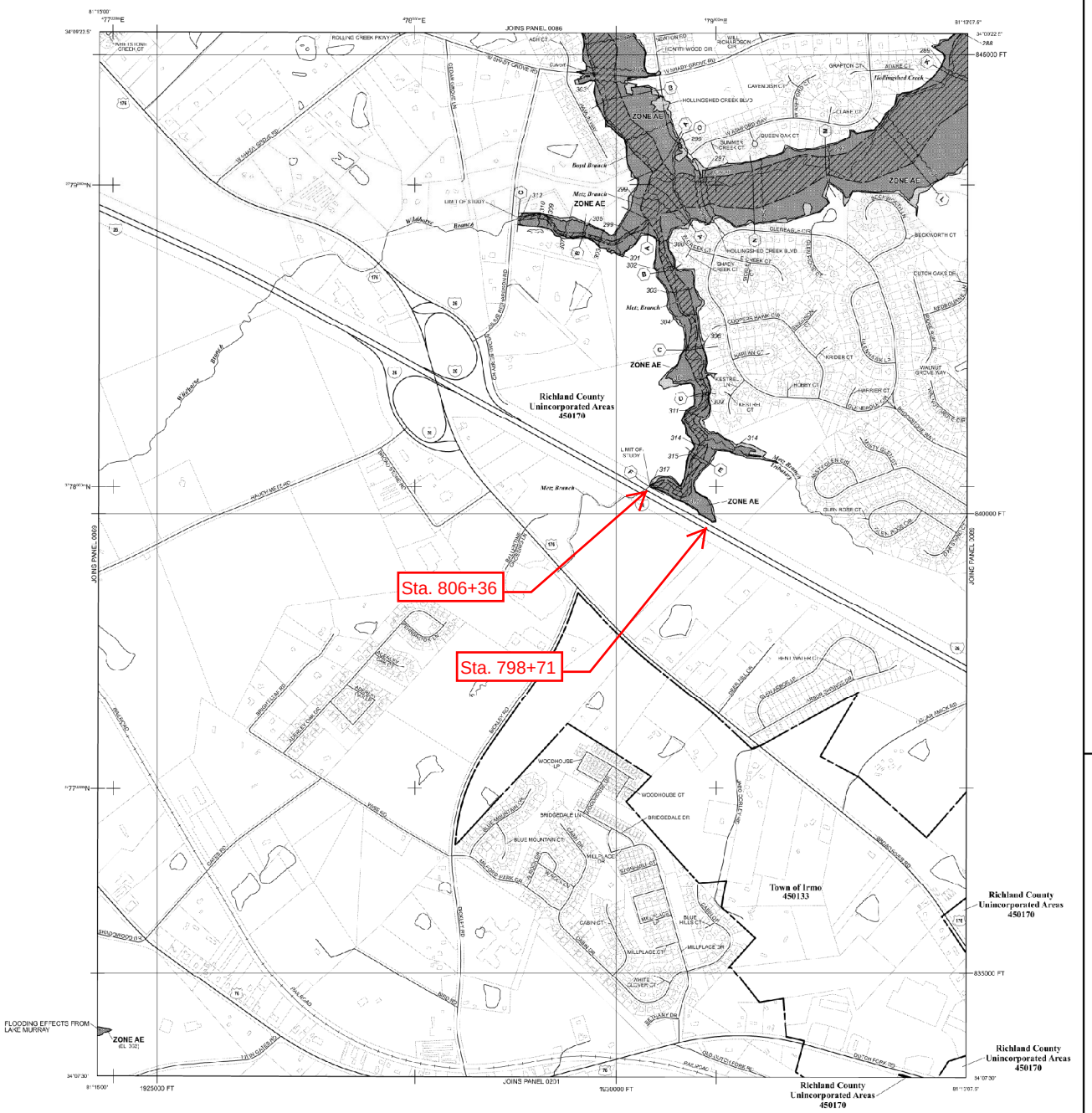
For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the **FEMA Mapping Information eXchange** at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service website at http://www.msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

The **profile base lines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the profile base line, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

DNR

This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of South Carolina and the Federal Emergency Management Agency (FEMA). The State of South Carolina has implemented a long term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map floodplain areas at the local level. As a part of this effort, the state of South Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

http://www.dnr.state.sc.us/



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

- **ZONE A** — No Base Flood Elevations determined.
- **ZONE AE** — Base Flood Elevations determined.
- **ZONE AH** — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
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- **ZONE A99** — Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** — Areas determined to be outside the 0.2% annual chance floodplain.
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COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL. 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 6000000 FT — 1000-meter Universal Transverse Mercator grid ticks, zone 17
- 1650000 FT — 5000-foot grid values: South Carolina State Plane coordinate system (FIPSZONE = 3900), Lambert projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
January 19, 1984

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 28, 1992
September 29, 2010

December 21, 2017 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Hazard Areas, to change Special Flood Hazard Areas, to update map format, to add roads and road names, to reflect updated topographic information, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

200 0 200 400 600 1,000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0088L

FIRM

FLOOD INSURANCE RATE MAP

RICHLAND COUNTY, SOUTH CAROLINA AND INCORPORATED AREAS

PANEL 88 OF 650

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
IRMO, TOWN OF	450133	0088	L
RICHLAND COUNTY	450170	0088	L

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
45079C0088L

MAP REVISED
DECEMBER 21, 2017

Federal Emergency Management Agency

NOTES TO USERS

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The **projection** used in the preparation of this map was Lambert Conformal Conic State Plane South Carolina FIPS 3900. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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DNR

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http://www.dnr.state.sc.us/

LEGEND

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ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

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COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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	Floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
~~ 513 ~~~	Base Flood Elevation line and value; elevation in feet*
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* Referenced to the North American Vertical Datum of 1988

(A)———(A)	Cross section line
(23)- - - -(23)	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4275000mE	1000-meter Universal Transverse Mercator grid ticks, zone 17
6000000 FT	5000-foot grid values: South Carolina State Plane coordinate system (FIPSZONE = 3900), Lambert projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
January 19, 1994

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 20, 2002
September 29, 2010

December 21, 2017 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to update map format, to add roads and road names, to reflect updated topographic information, and to incorporate previously issued Letters of Map Revision.

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MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0089L

FIRM
FLOOD INSURANCE RATE MAP
RICHLAND COUNTY, SOUTH CAROLINA
AND INCORPORATED AREAS

PANEL 89 OF 650

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
IRMO, TOWN OF	450133	0089	L
RICHLAND COUNTY	450170	0089	L

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
45079C0089L

MAP REVISED
DECEMBER 21, 2017

Federal Emergency Management Agency

NOTES TO USERS

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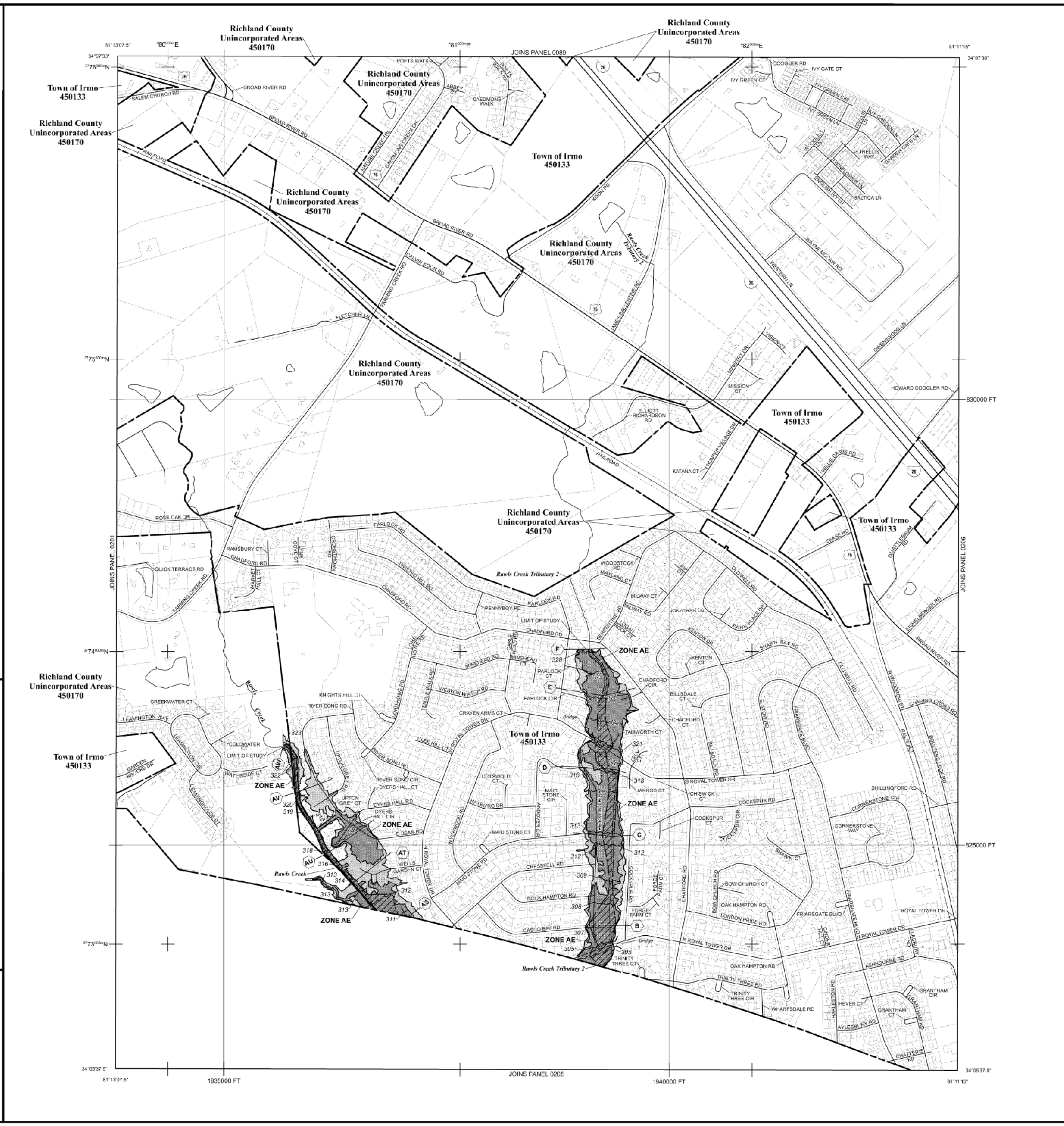
DNR

This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of South Carolina and the Federal Emergency Management Agency (FEMA). The State of South Carolina has implemented a long term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map floodplain areas at the local level. As a part of this effort, the state of South Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

http://www.dnr.state.sc.us/



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	Floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 - - - 23	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4275000mE	1000-meter Universal Transverse Mercator grid ticks, zone 17
6000000 FT	5000-foot grid values: South Carolina State Plane coordinate system (FIPSZONE = 3900), Lambert projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
January 19, 1994

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 20, 2002
September 29, 2010

December 21, 2017 to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to update map format, to add roads and road names, to reflect updated topographic information, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

NFIP

PANEL 0202L

FIRM

FLOOD INSURANCE RATE MAP

RICHLAND COUNTY, SOUTH CAROLINA

AND INCORPORATED AREAS

PANEL 202 OF 650

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
IRMO, TOWN OF	450133	0202	L
RICHLAND COUNTY	450170	0202	L

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 45079C0202L

MAP REVISED DECEMBER 21, 2017

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Lambert Conformal Conic State Plane South Carolina FIPS 3900. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/

Base map information shown on this FIRM was provided in digital format by Richland County, South Carolina.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

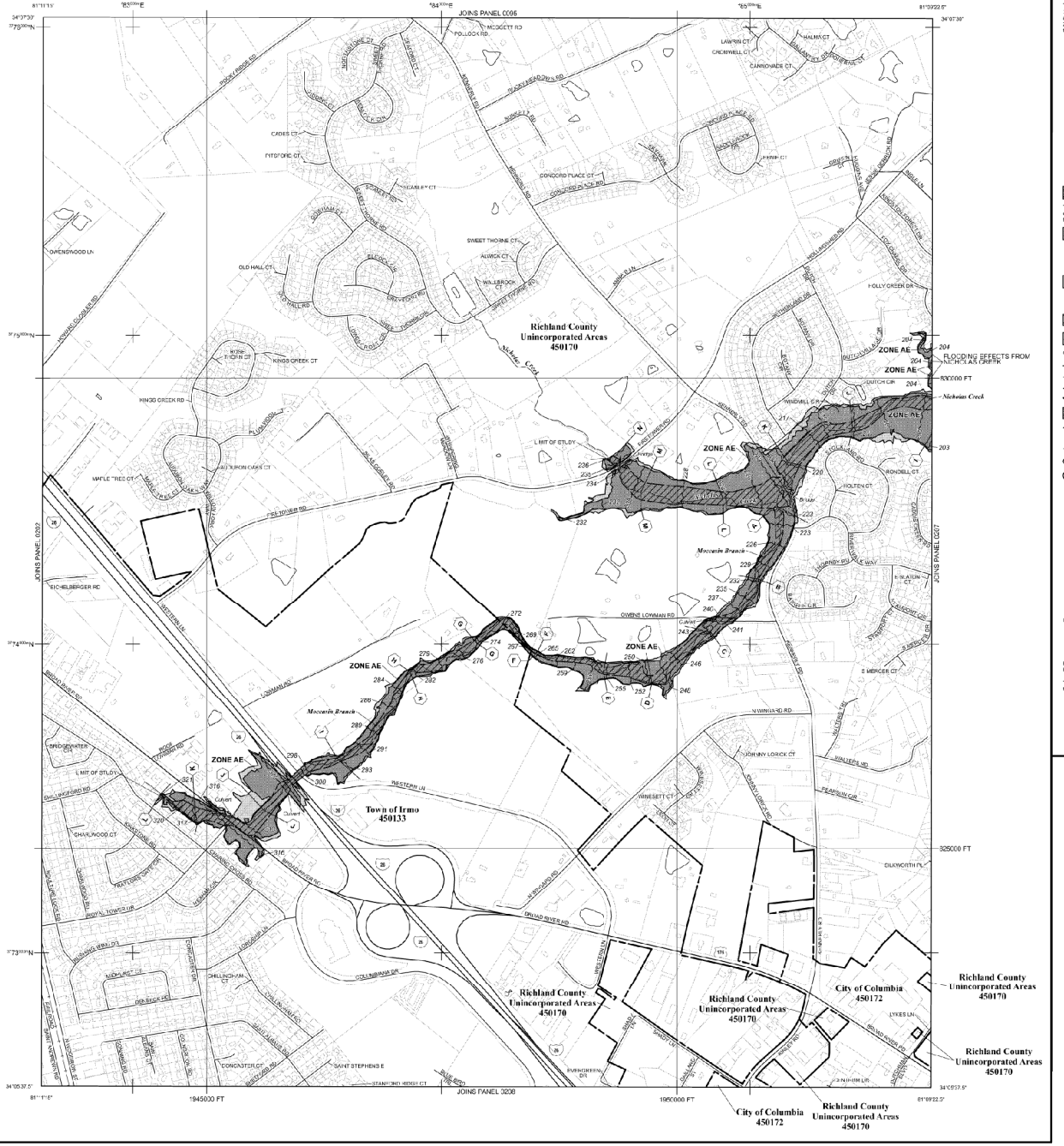
For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the **FEMA Mapping Information eXchange** at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service website at http://www.msc.fema.gov/. Available products may include previously issued Letters of Map Change, a Flood Insurance Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

The **profile base lines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the profile base line, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

DNR

This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of South Carolina and the Federal Emergency Management Agency (FEMA). The State of South Carolina has implemented a long term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map floodplain areas at the local level. As a part of this effort, the state of South Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

http://www.dnr.state.sc.us/



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

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- **ZONE A** — No Base Flood Elevations determined.
- **ZONE AE** — Base Flood Elevations determined.
- **ZONE AH** — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** — Area to be protected from 1% annual chance flood event by a federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** — Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Area Zones with different Base Flood Elevations, flood depths, or flood velocities
- 513 — Base Flood Elevation line and value; elevation in feet*
- EL 987 — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4°75'000"E — 1000-meter Universal Transverse Mercator grid ticks, zone 17
- 6000000 FT — 5000-foot grid values: South Carolina State Plane coordinate system (FIPSZONE = 3900), Lambert projection
- DX610 — Bench mark (see explanation in Notes to Users section of this FIRM panel)

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
January 16, 1986

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 16, 2007
September 29, 2010

December 21, 2017 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to update map format, to add roads and road names, to reflect updated topographic information, and to incorporate previously issued Letters of Map Revision.

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MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0206L

FIRM

FLOOD INSURANCE RATE MAP

RICHLAND COUNTY, SOUTH CAROLINA AND INCORPORATED AREAS

PANEL 206 OF 650

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLK JABER CITY OF	450172	0206	L
IRMO, TOWN OF	450155	0206	L
RICHLAND COUNTY	450170	0206	L

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
45079C0206L

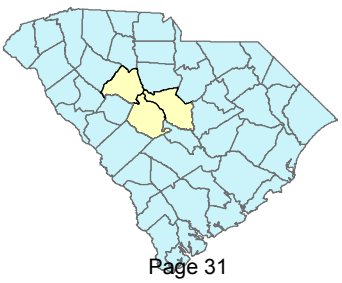
MAP REVISED
DECEMBER 21, 2017

Federal Emergency Management Agency

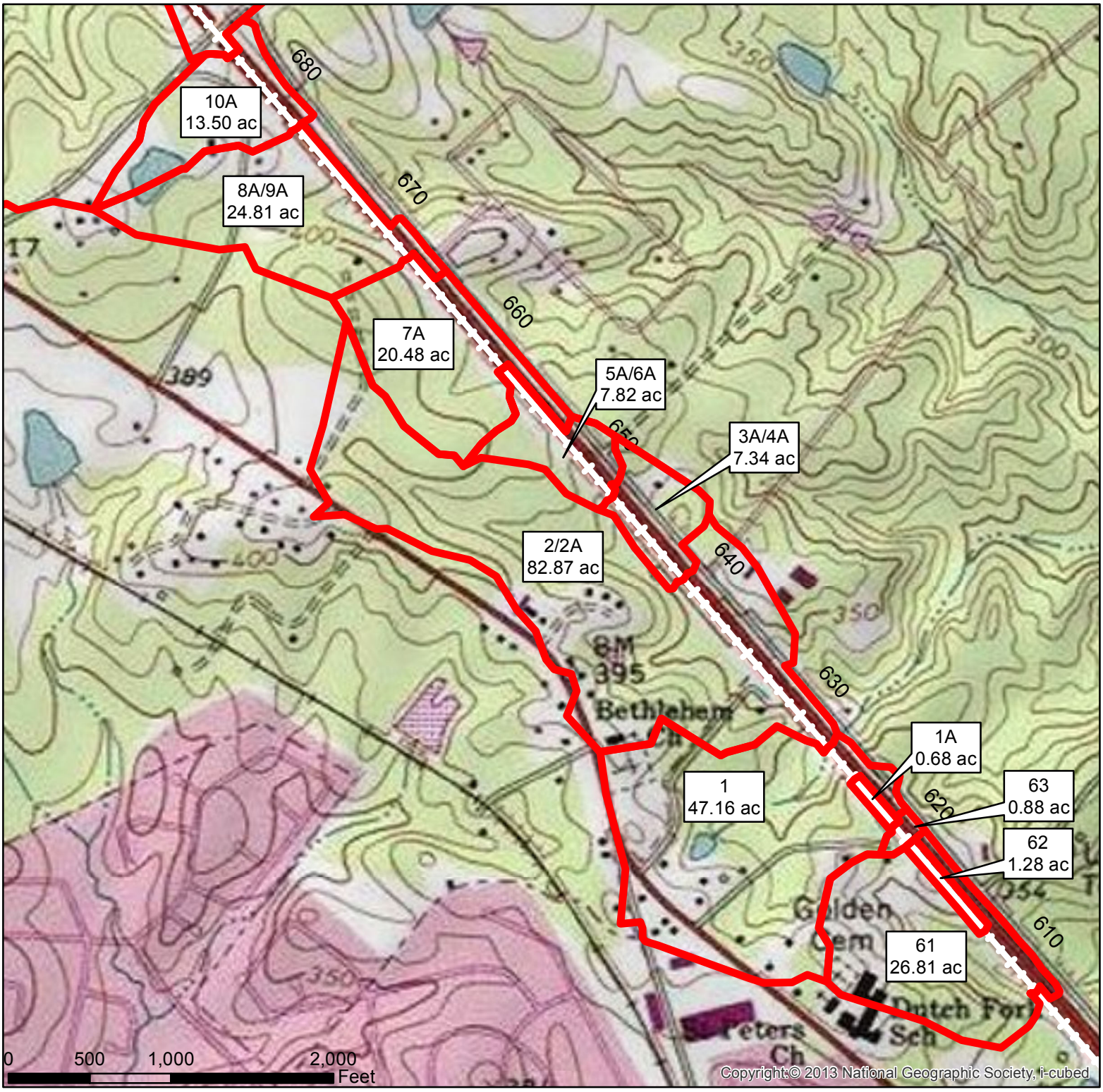
Legend

Project Location

I-26 MM 85 TO MM 101 TOPOGRAPHIC MAP



0 3 6 12 Miles



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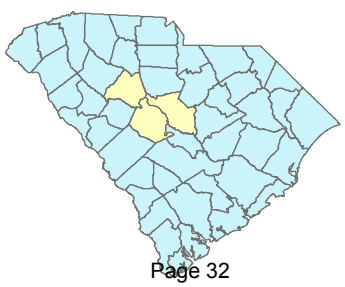
I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 606+75 - STA. 685+00
DRAINAGE AREA MAP
FIGURE 1



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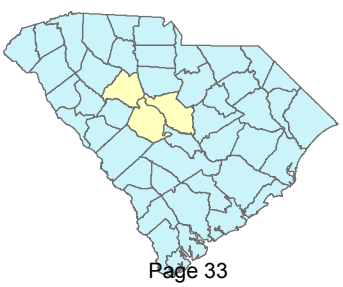
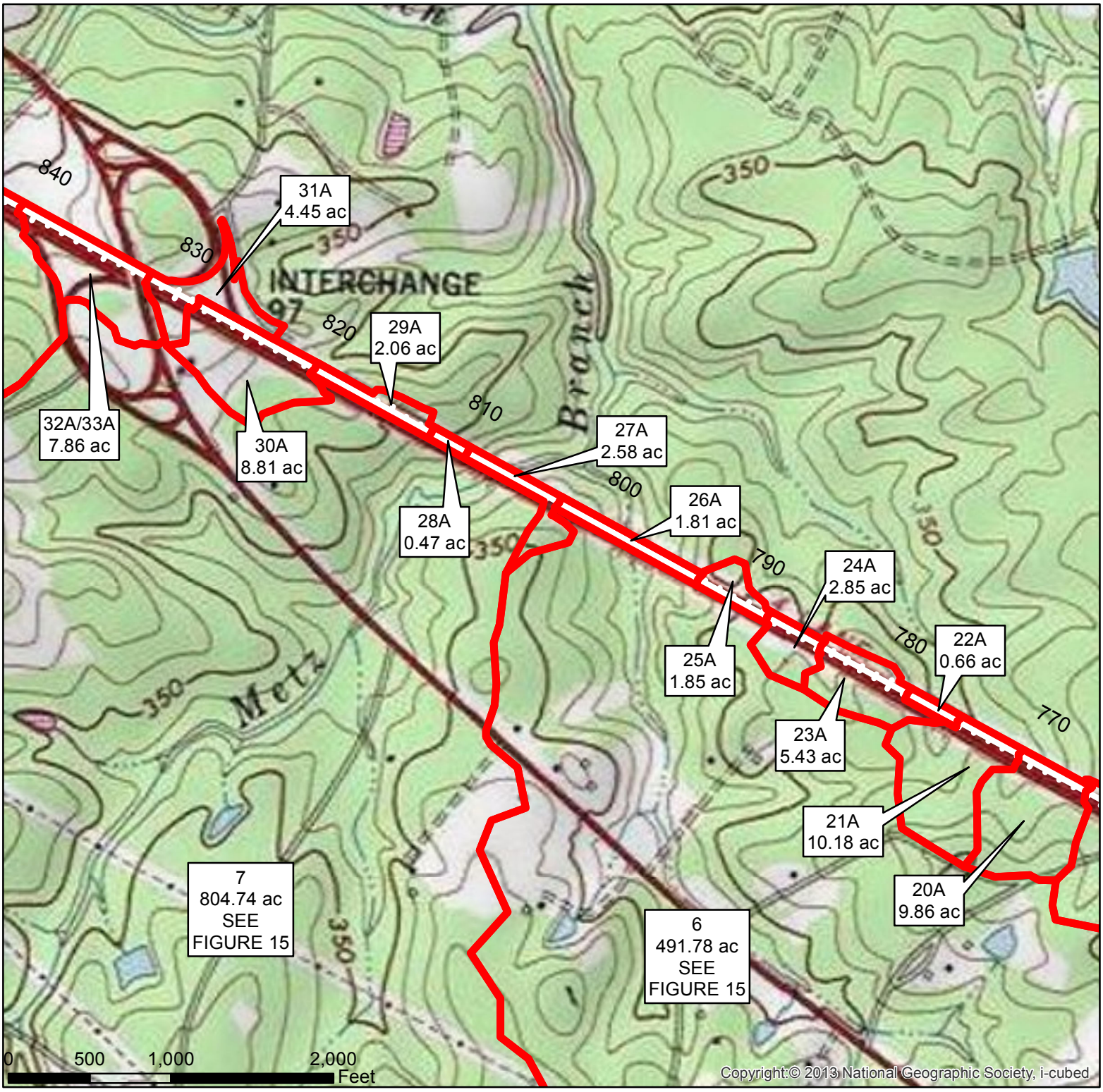
I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 685+00 - STA. 765+00
DRAINAGE AREA MAP
FIGURE 2





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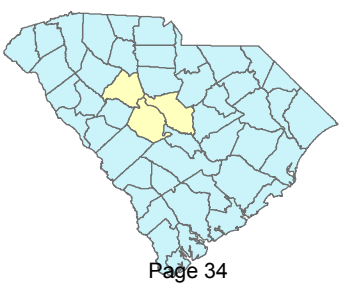
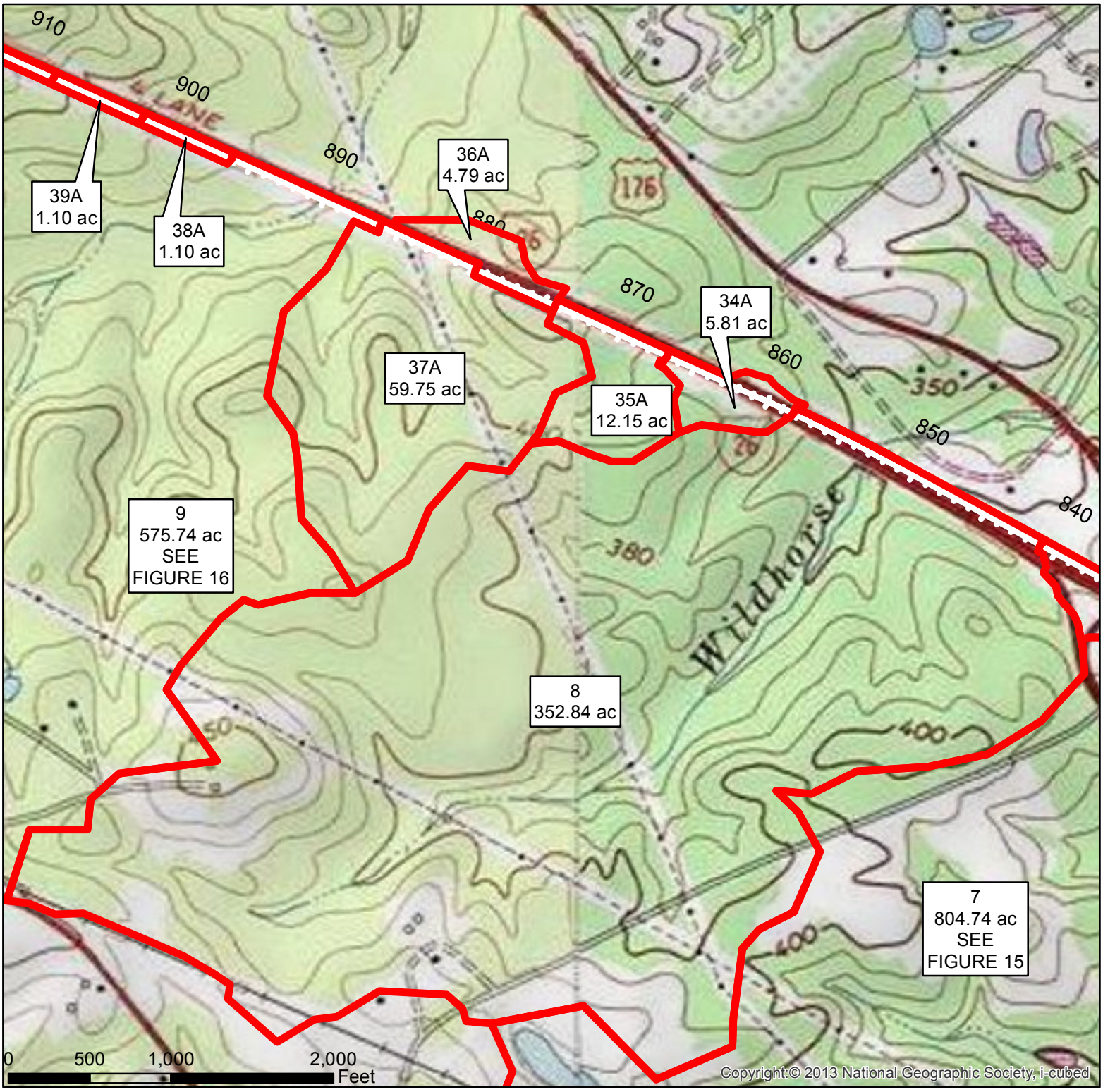
I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 765+00 - STA. 840+00
DRAINAGE AREA MAP
FIGURE 3





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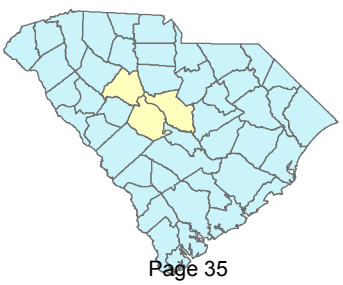
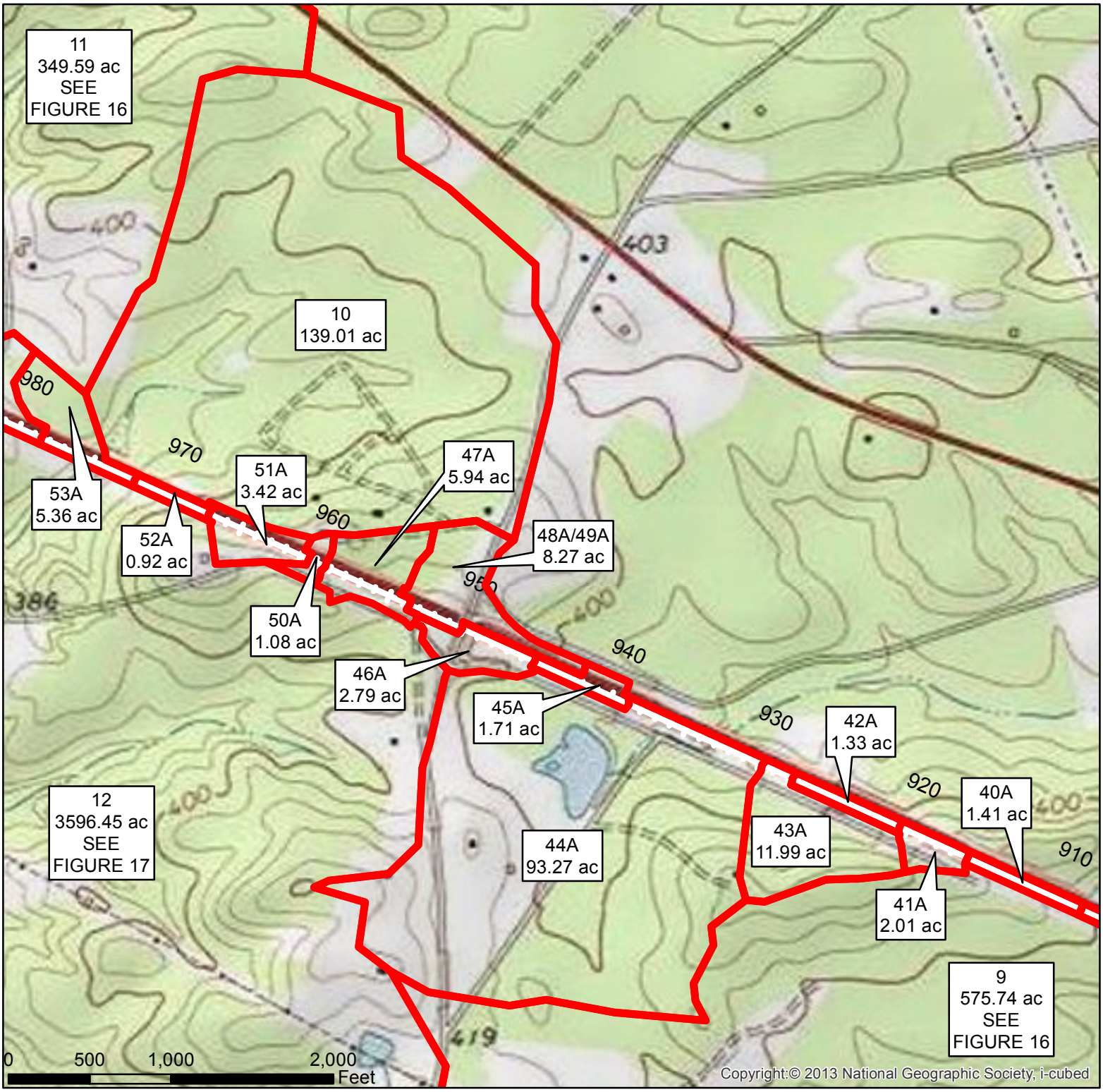
I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 840+00 - STA. 910+00
DRAINAGE AREA MAP
FIGURE 4





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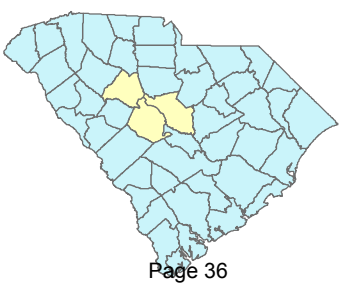
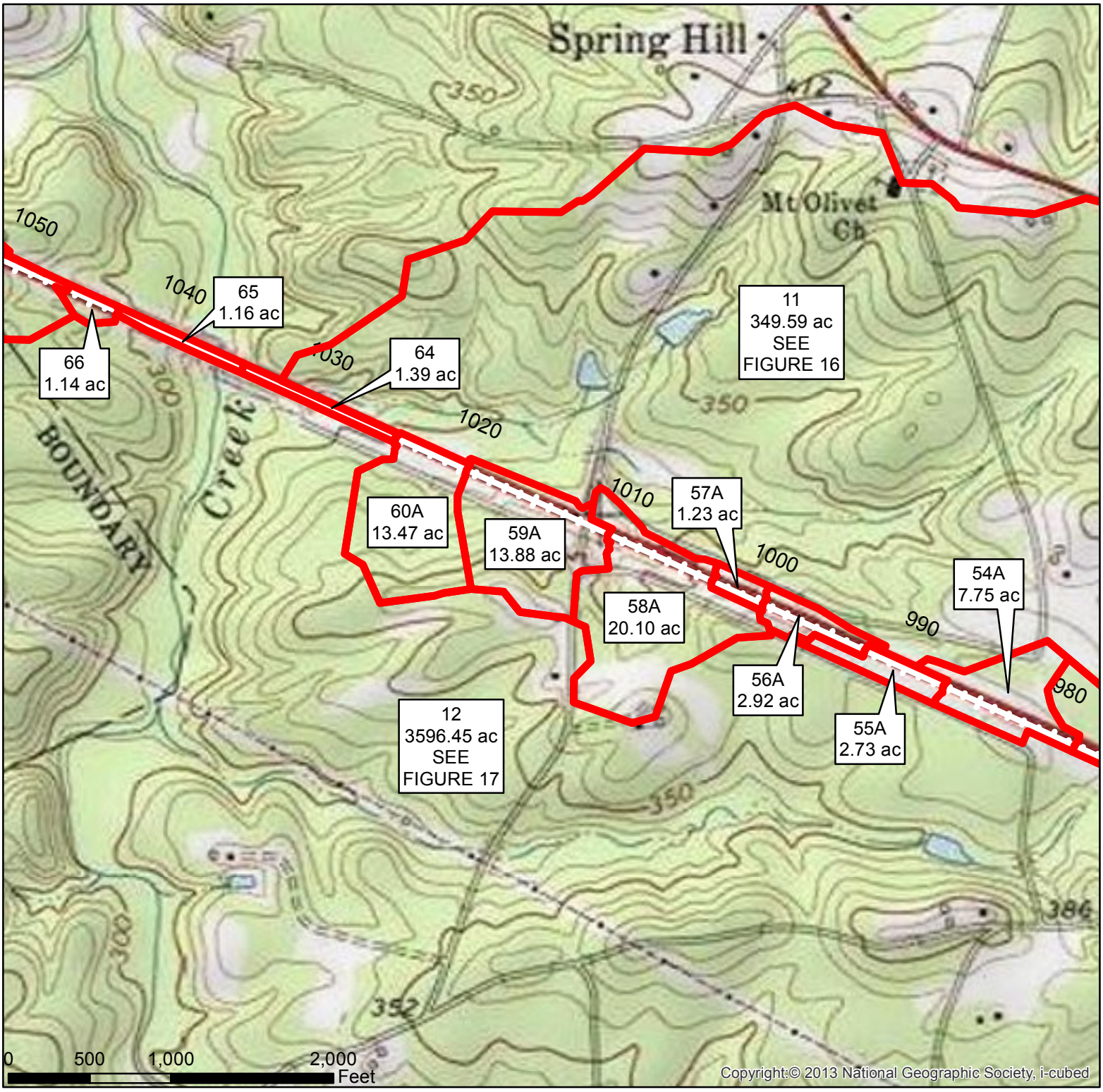
I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 910+00 - STA. 980+00
DRAINAGE AREA MAP
FIGURE 5





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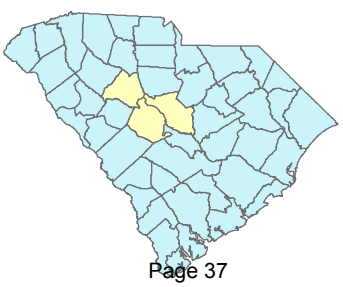
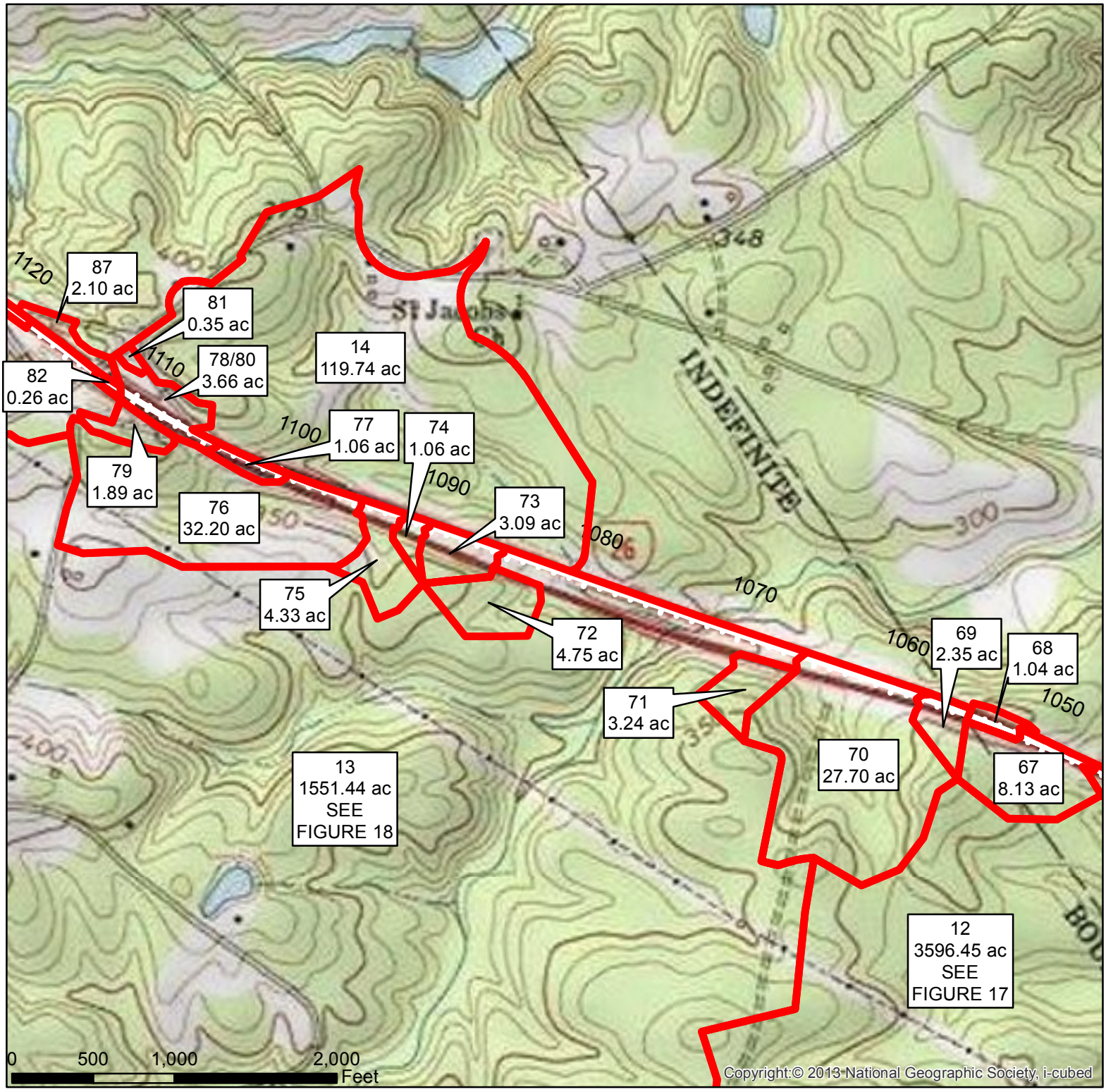
I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 980+00 - STA. 1050+00
DRAINAGE AREA MAP
FIGURE 6





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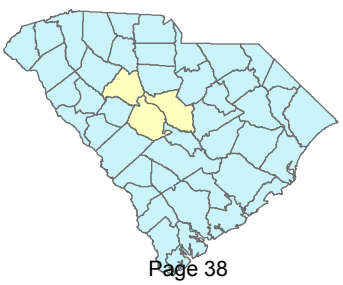
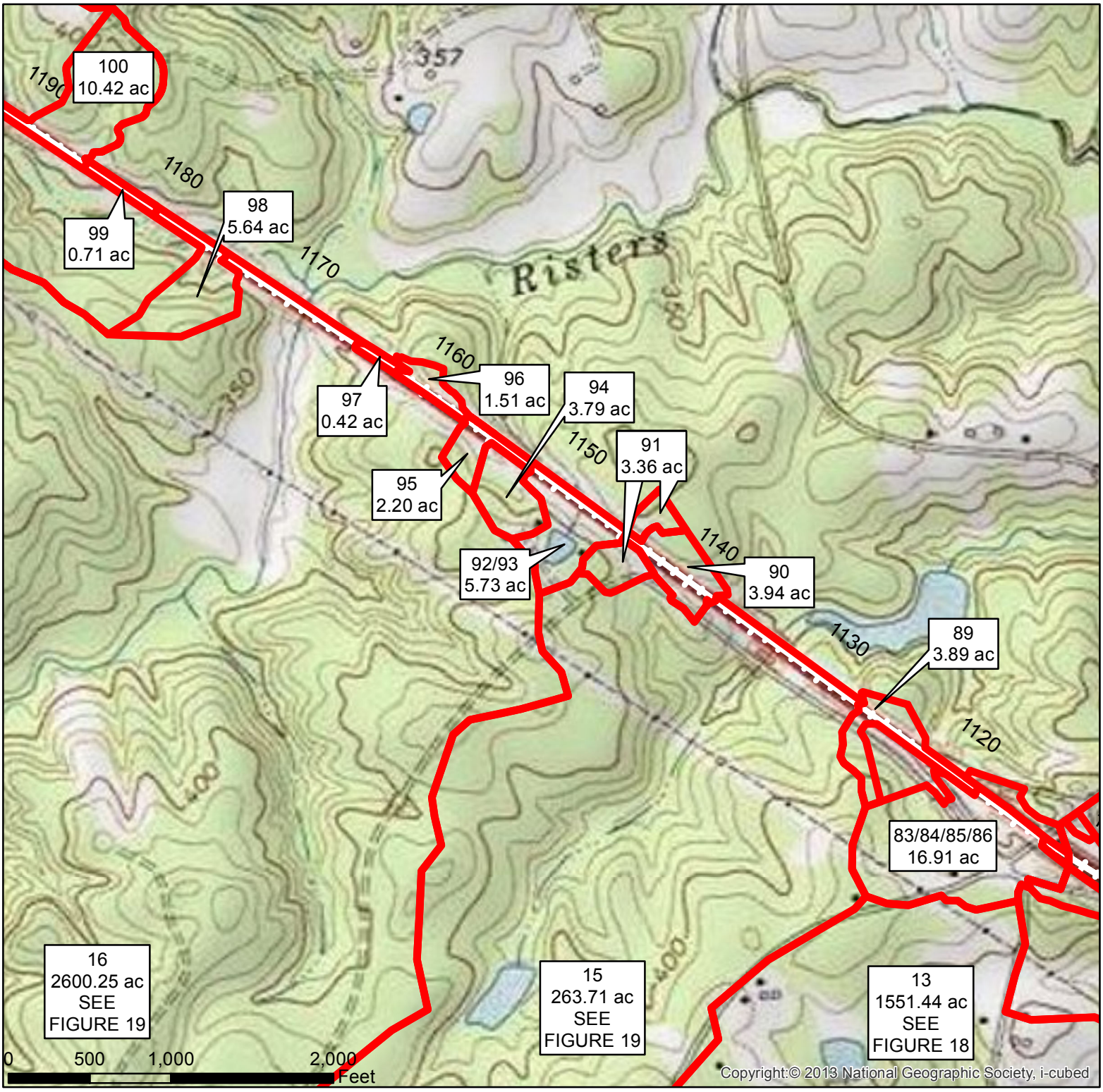
I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 1050+00 - STA. 1120+00
DRAINAGE AREA MAP
FIGURE 7





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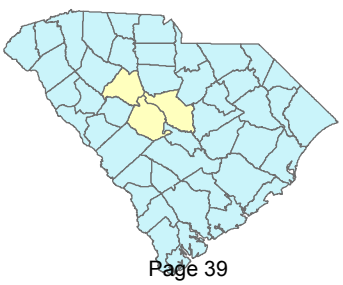
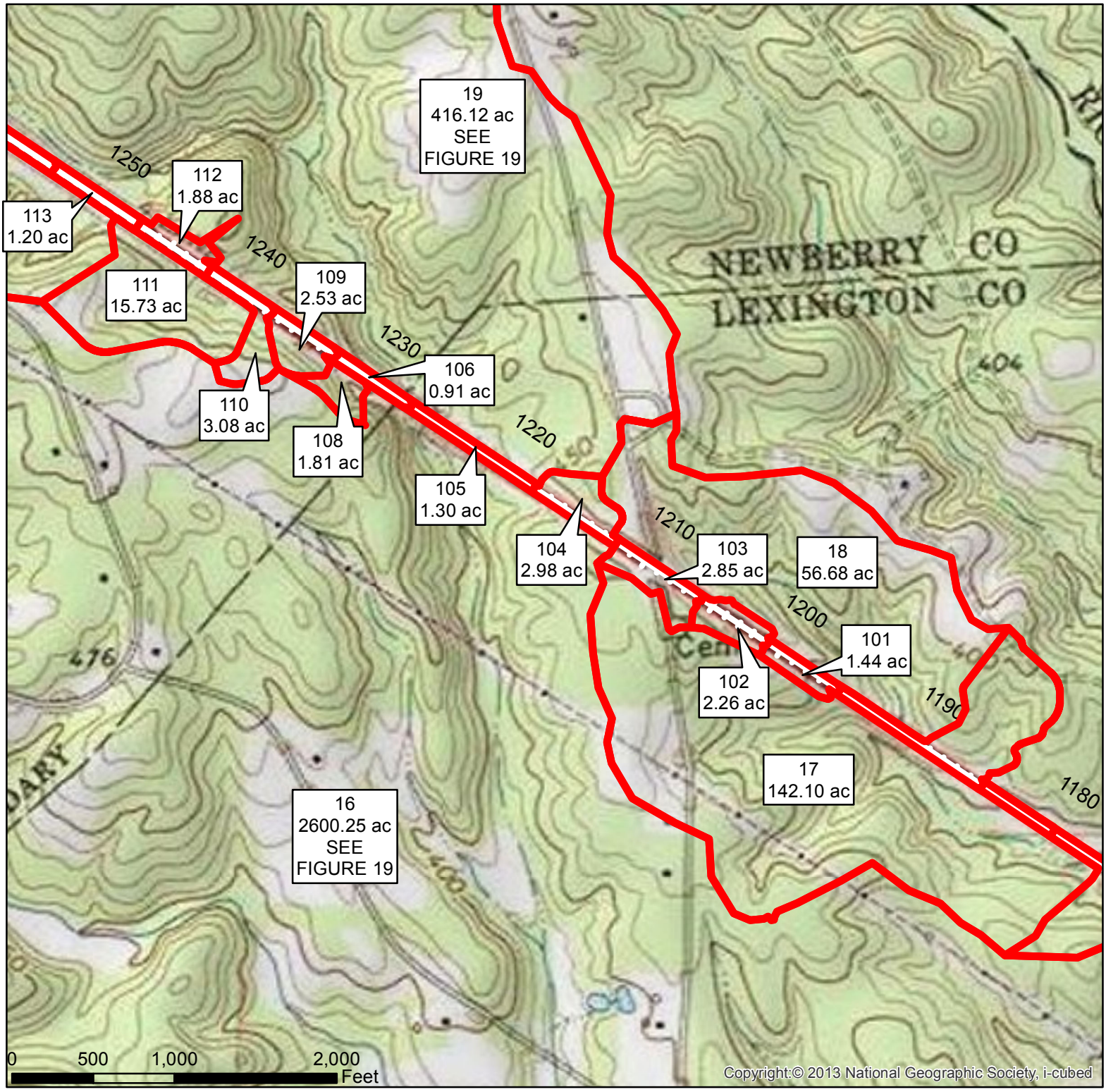
I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 1120+00 - STA. 1190+00
DRAINAGE AREA MAP
FIGURE 8





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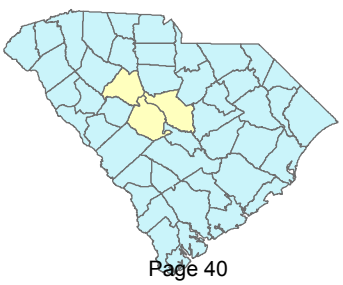
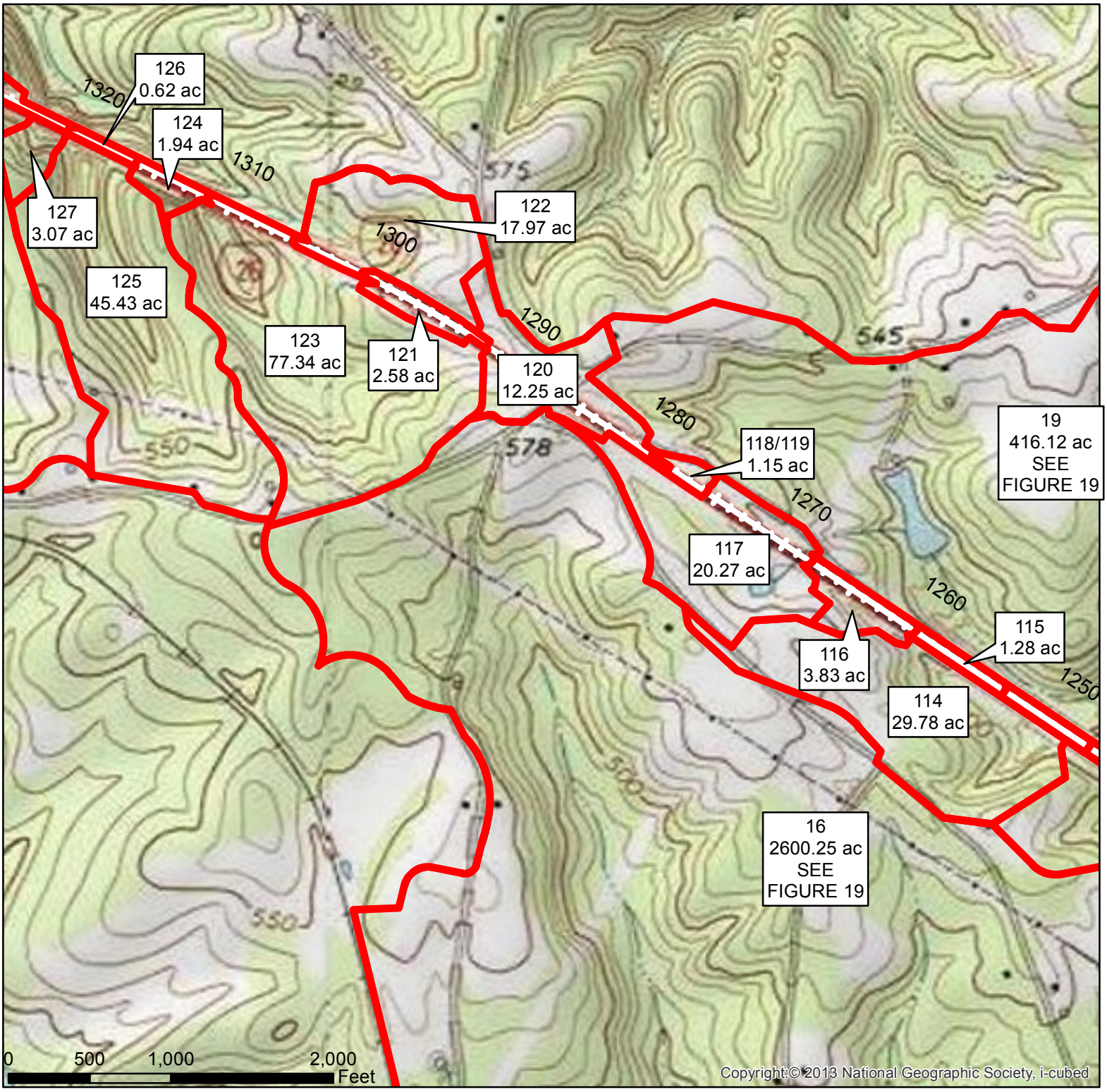
I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 1190+00 - STA. 1250+00
DRAINAGE AREA MAP
FIGURE 9





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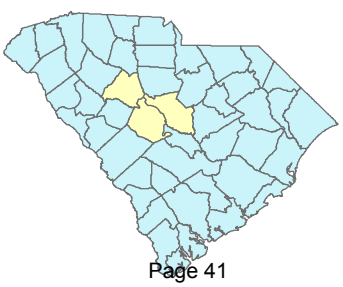
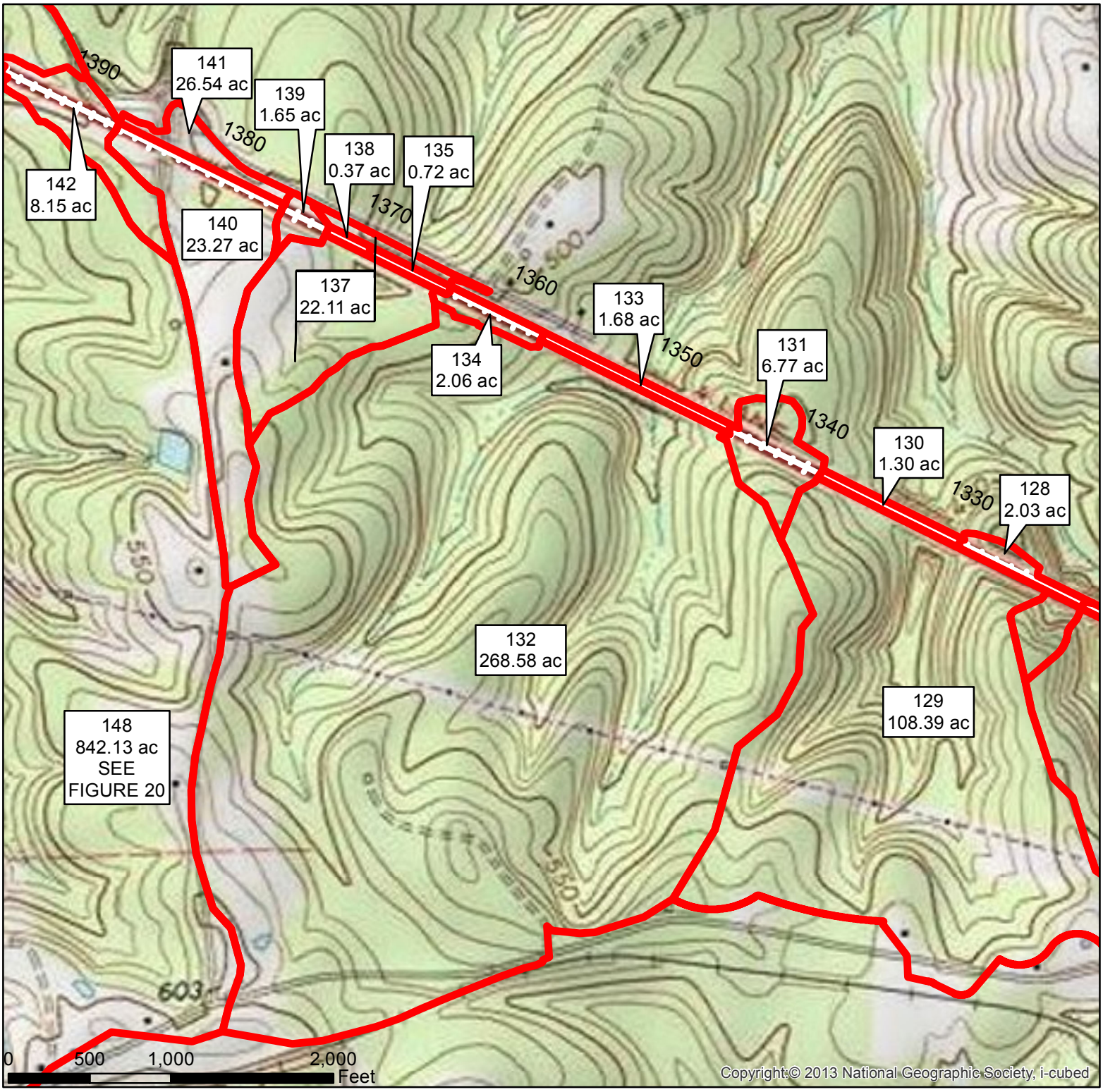
I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 1250+00 - STA. 1320+00
DRAINAGE AREA MAP
FIGURE 10





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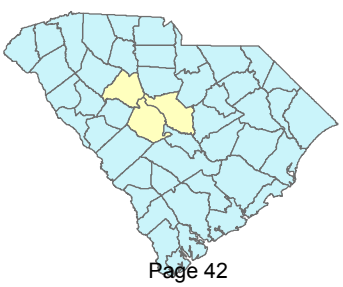
I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 1320+00 - STA. 1390+00
DRAINAGE AREA MAP
FIGURE 11



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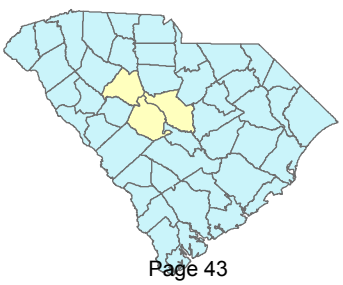
I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 1390+00 - STA. 1460+00
DRAINAGE AREA MAP
FIGURE 12



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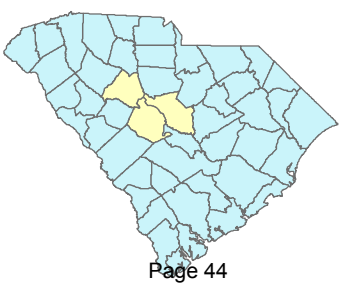
I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 1460+00 - STA. 1520+00
DRAINAGE AREA MAP
FIGURE 13

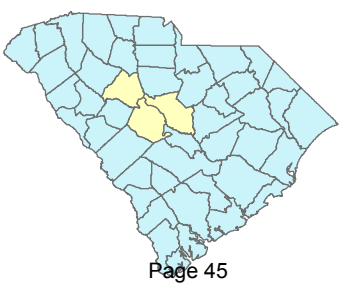


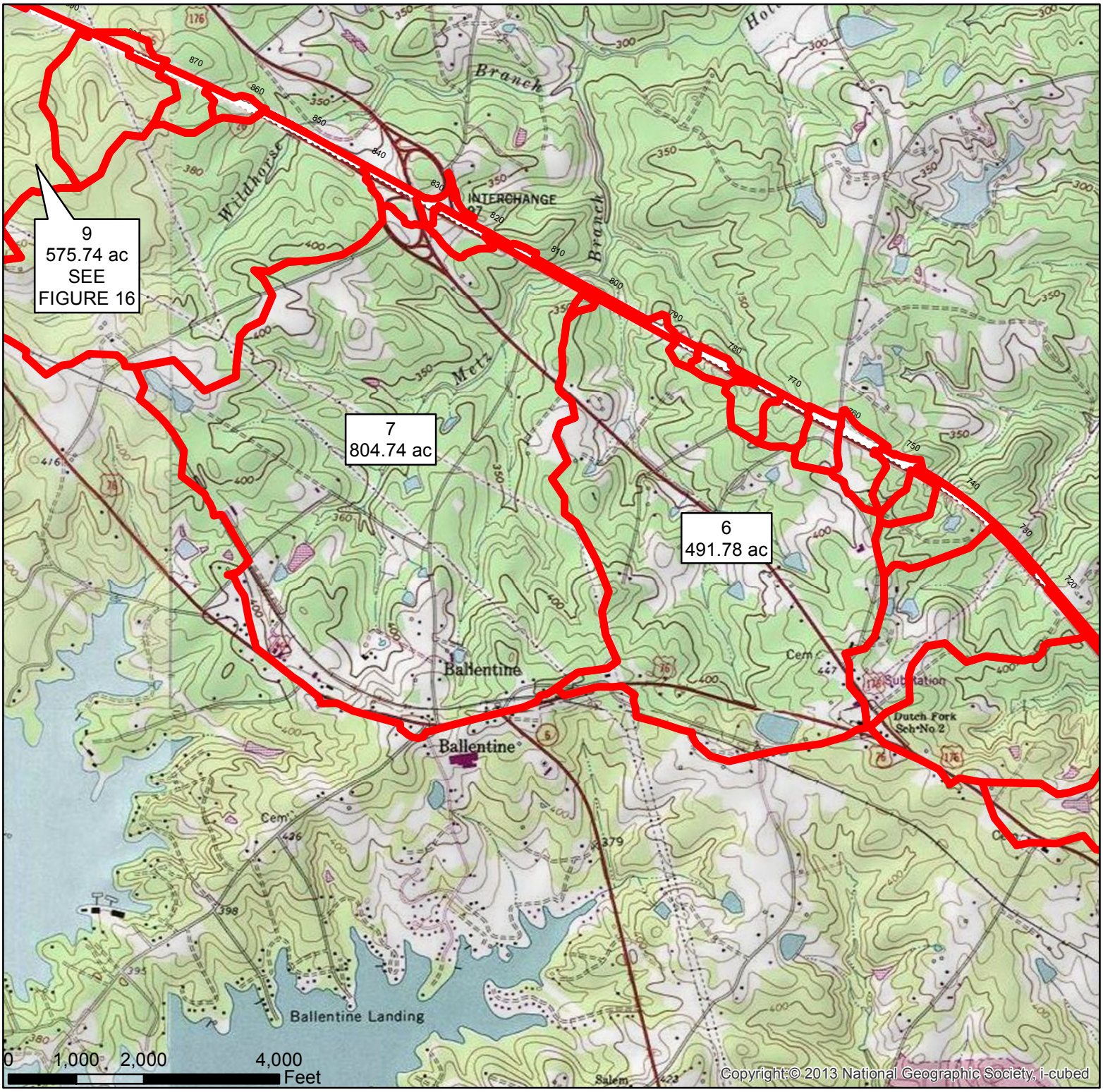
N

W E

S

I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 1520+00 - STA. 1525+00
DRAINAGE AREA MAP
FIGURE 14



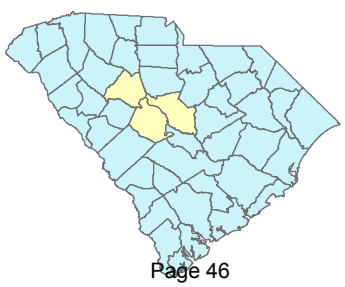


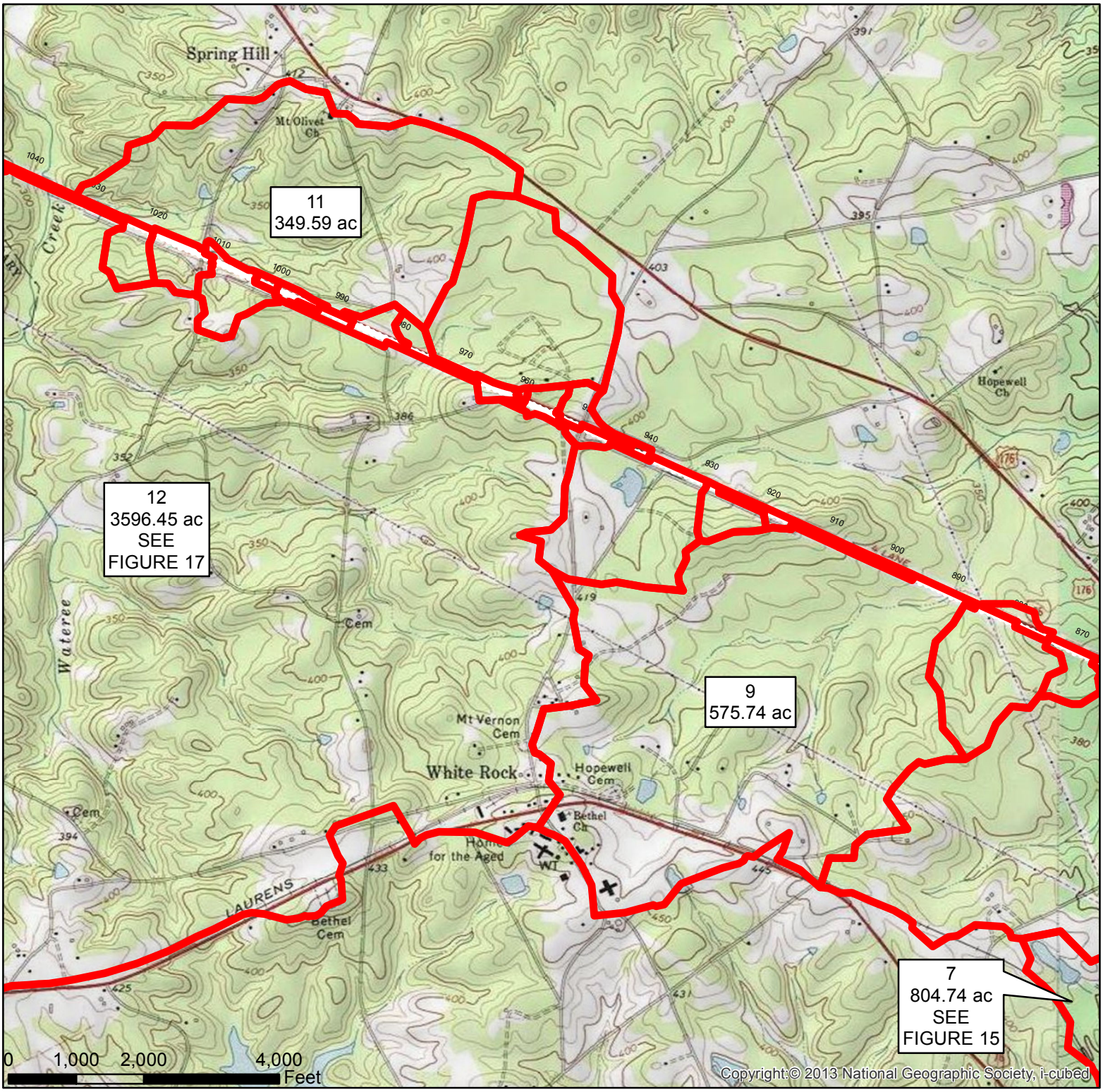
N

W E

S

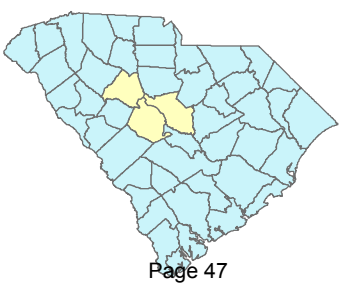
I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 730+00 - STA. 850+00
DRAINAGE AREA MAP
FIGURE 15

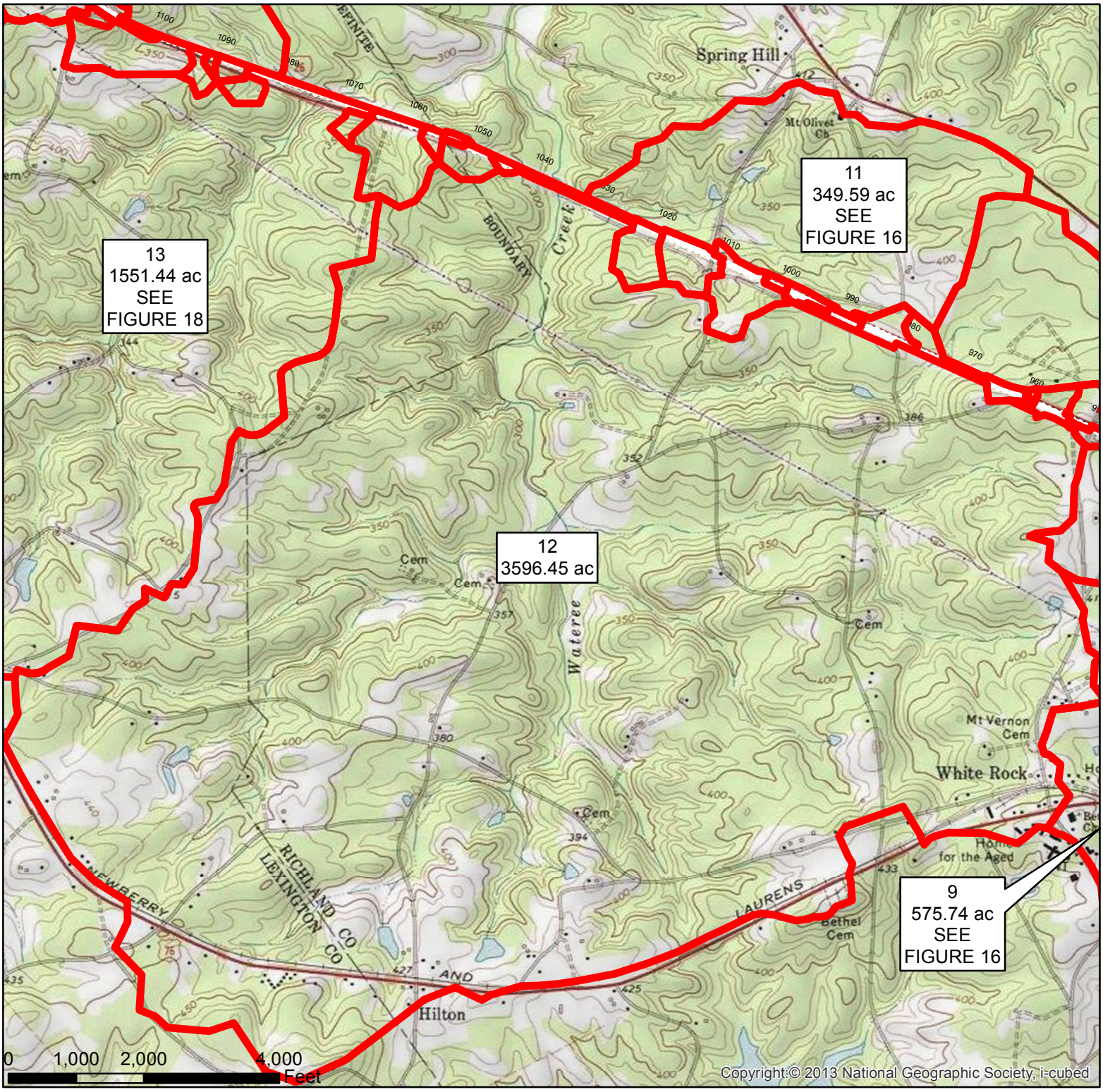




N
W E
S

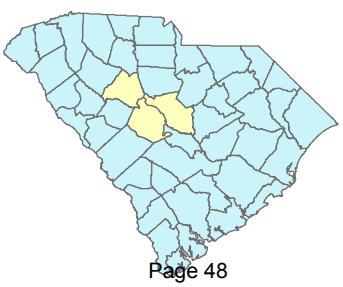
I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 880+00 - STA. 1030+00
DRAINAGE AREA MAP
FIGURE 16

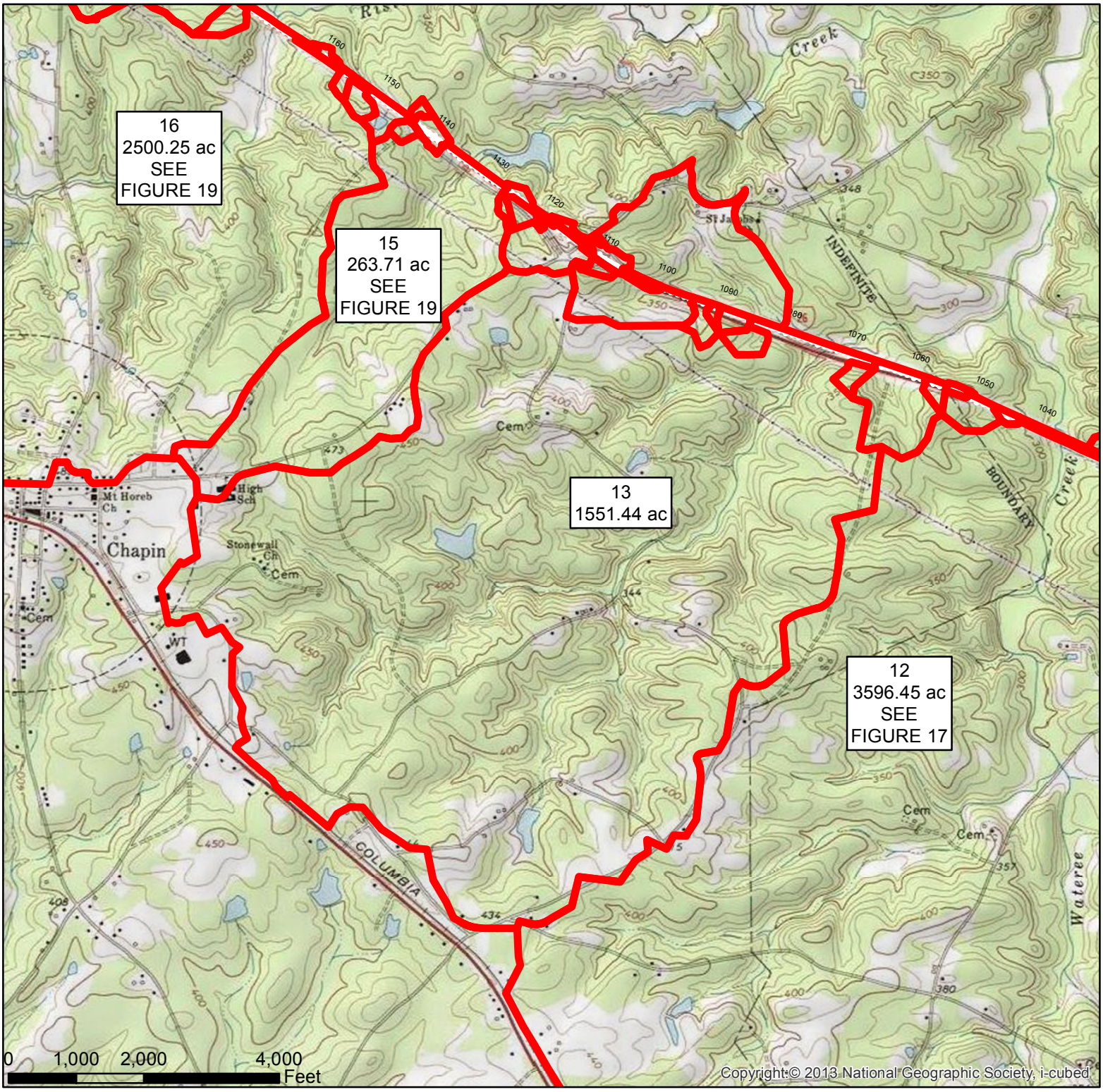




N
W E
S

I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 930+00 - STA. 1070+00
DRAINAGE AREA MAP
FIGURE 17



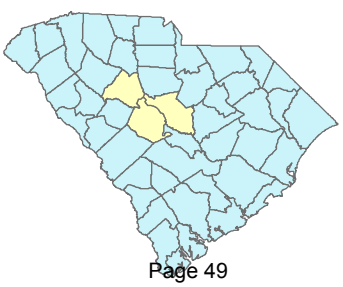


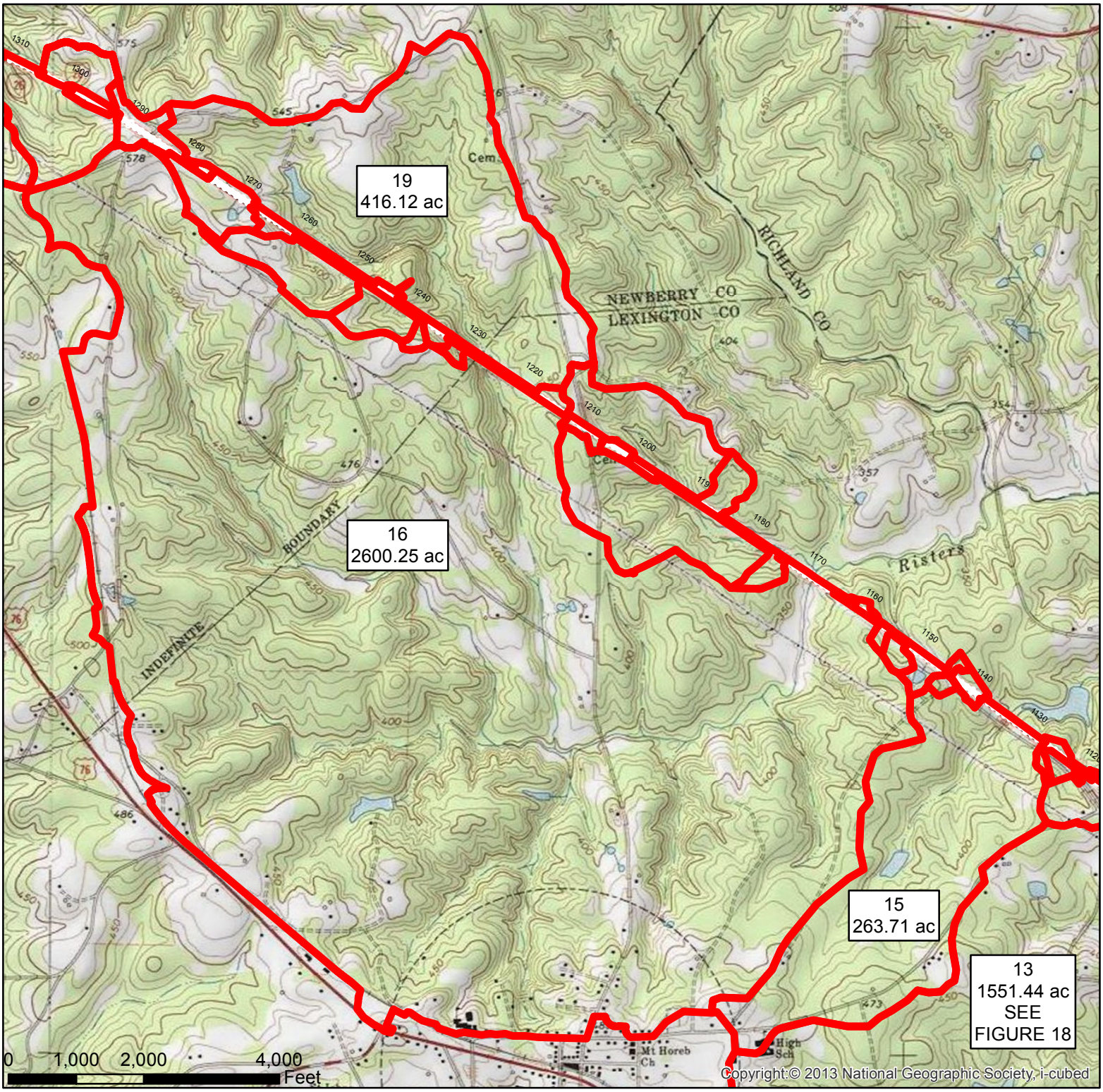
N

W E

S

I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 1050+00 - STA. 1130+00
DRAINAGE AREA MAP
FIGURE 18



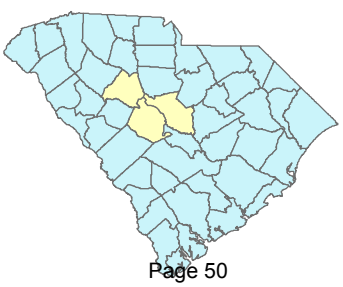


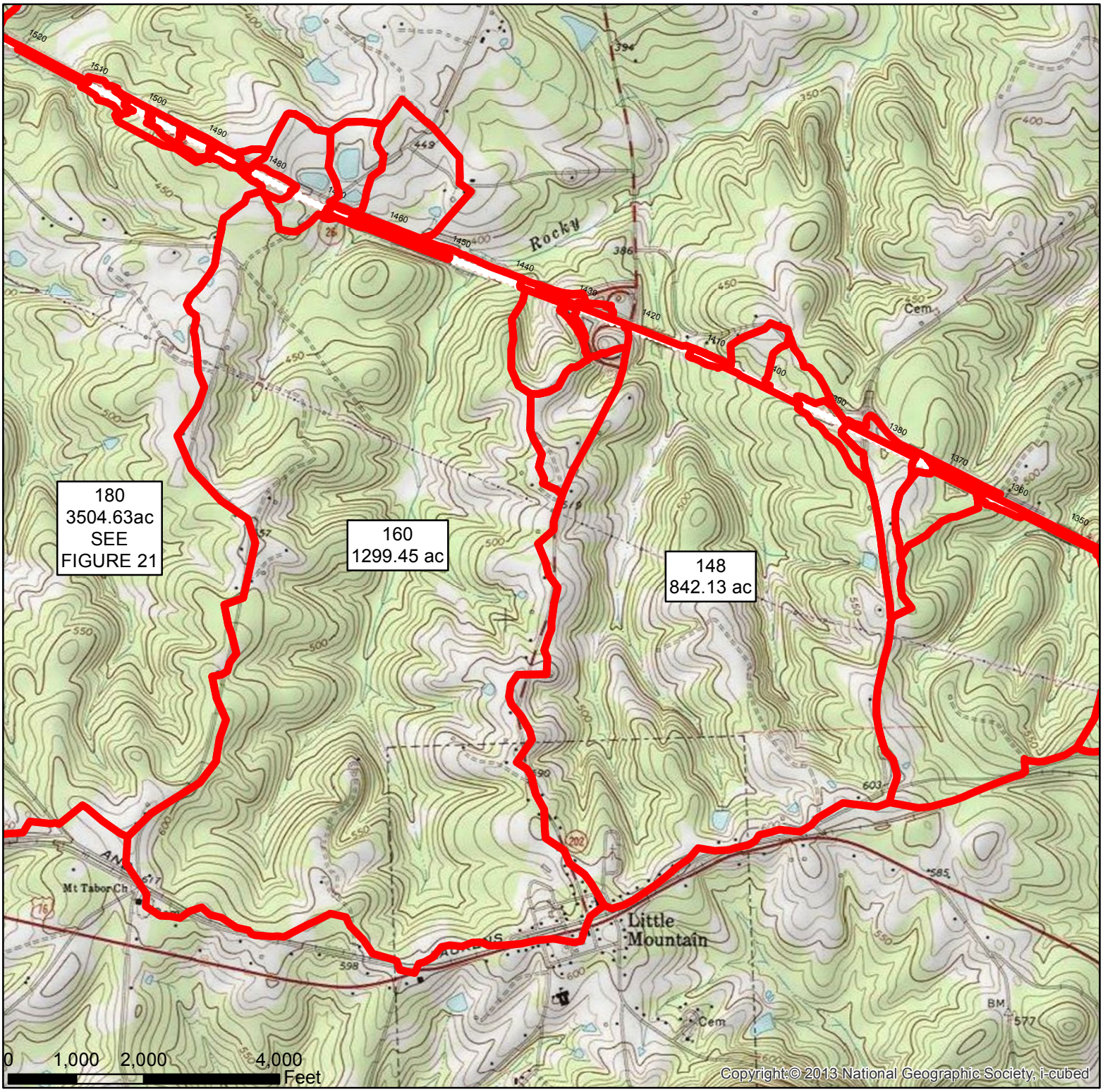
N

W E

S

I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 1120+00 - STA. 1300+00
DRAINAGE AREA MAP
FIGURE 19



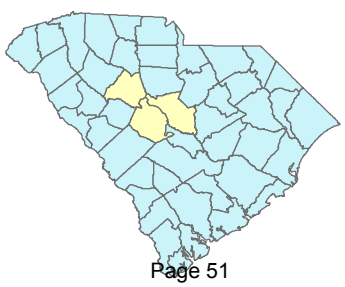


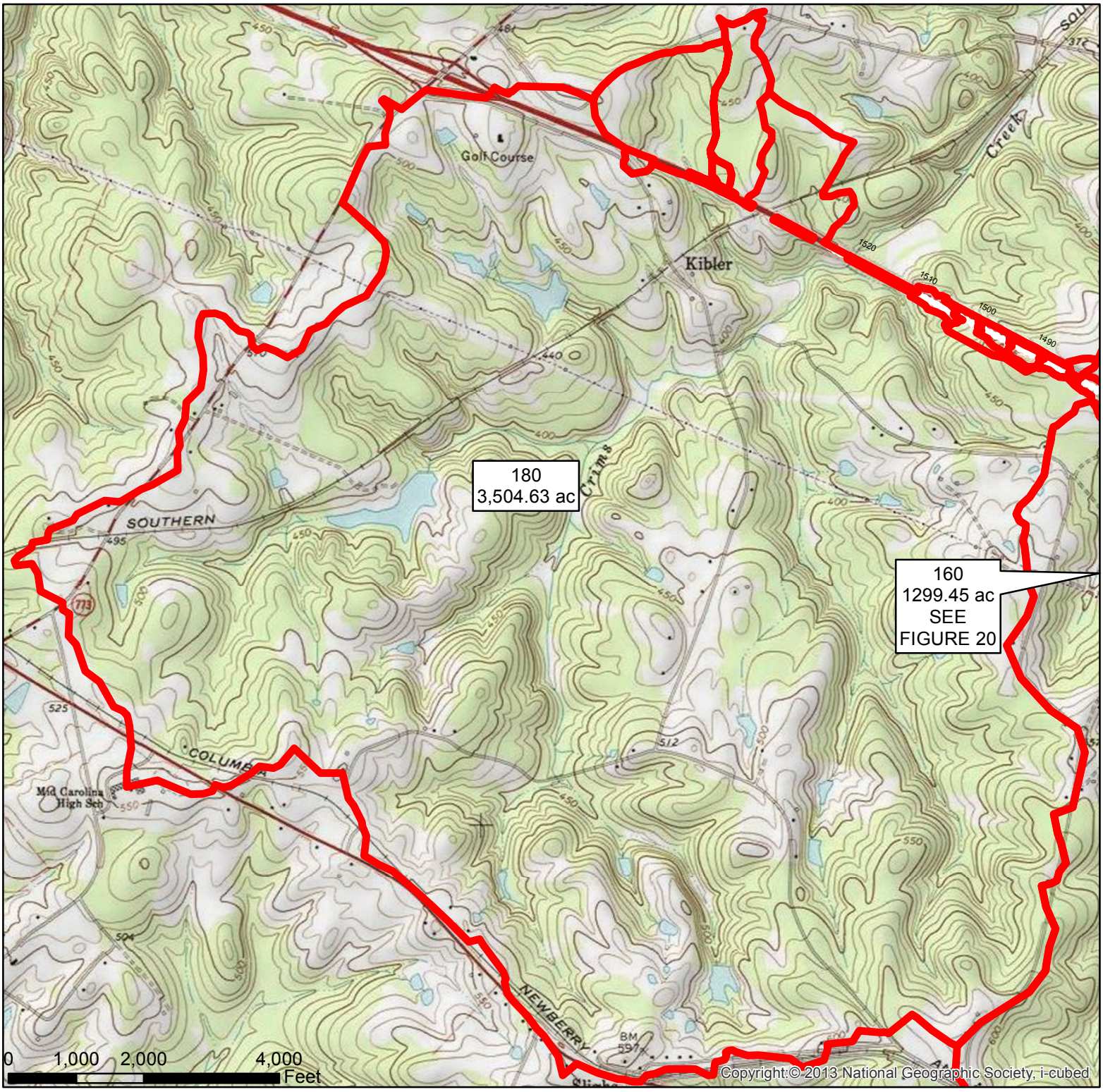
N

W E

S

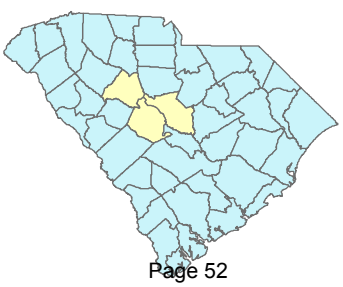
I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 1360+00 - STA. 1480+00
DRAINAGE AREA MAP
FIGURE 20





N
W E
S

I-26 WIDENING PROJECT
MM 85 - MM 101
STA. 1480+00 - STA. 1525+00
DRAINAGE AREA MAP
FIGURE 21



Site ID 61, Sta. 606+75

U/S

U/S

D/S

D/S

Site ID 62, Sta. 612+00

D/S

D/S

Site ID 63, Sta. 621+00

U/S

D/S

D/S

Site ID 1A, Sta. 624+80

D/S

D/S

Site ID 1, Sta. 627+36

U/S

U/S

D/S

D/S

Site ID 2A/2, Sta. 630+59

U/S

U/S

D/S

D/S

Site ID 3A/4A, Sta. 641+02

U/S

U/S

D/S

D/S

Site ID 5A/6A, Sta. 647+67

D/S

D/S

Site ID 7A, Sta. 658+13

D/S

D/S

Site ID 8A/9A, Sta. 667+02

U/S

U/S

D/S

D/S

Site ID 10A, Sta. 677+57

D/S

D/S

Site ID 11A, Sta. 689+22

D/S

U/S

Site ID 12A, Sta. 692+89

U/S

D/S

D/S

Site ID 3, Sta. 699+91

U/S

U/S

D/S

D/S

Site ID 4, Sta. 703+80

U/S

U/S

D/S

D/S

Site ID 13A, Sta. 706+13

D/S

Site ID 14A, Sta. 721+73

D/S

D/S

U/S

U/S

D/S

D/S

Site ID 15A, Sta. 741+89

U/S

U/S

D/S

D/S

Site ID 16A, Sta. 745+22

U/S

U/S

D/S

D/S

Site ID 17A, Sta. 748+10

U/S

U/S

D/S

D/S

Site ID 18A, Sta. 754+08

U/S

D/S

D/S

Site ID 19A, Sta. 766+23

D/S

D/S

Site ID 20A, Sta. 770+96

U/S

D/S

D/S

Site ID 21A, Sta. 775+22

U/S

D/S

D/S

Site ID 22A, Sta. 778+75

D/S

Site ID 23A, Sta. 784+82

U/S

D/S

D/S

Site ID 24A, Sta. 788+59

U/S

Site ID 25A, Sta. 793+41

D/S

D/S

Site ID 6, Sta. 798+71

U/S

U/S

D/S

D/S

Site ID 26A, Sta. 799+02

D/S

Site ID 27A, Sta. 803+22

D/S

D/S

Site ID 7, Sta. 806+36

U/S

U/S

D/S

D/S

Site ID 28A, Sta. 809-64

D/S

Site ID 29A, Sta. 812+19

D/S

Site ID 30A, Sta. 820+38

U/S

D/S

D/S

Site ID 31A, Sta. 828+52

D/S

Site ID 32A/33A, Sta. 841+04

U/S

U/S

D/S

Site ID 8, Sta. 852+31

U/S

U/S

D/S

D/S

Site ID 34A, Sta. 858+28

D/S

D/S

Site ID 35A, Sta. 866+81

U/S

D/S

Site ID 36A, Sta. 879+72

D/S

D/S

Site ID 37A, Sta. 886+19

U/S

U/S

D/S

Site ID 9, Sta. 890+08

U/S

U/S

D/S

D/S

Site ID 38A, Sta. 896+23

D/S

Site ID 39A, Sta. 902+27

D/S

Site ID 40A, Sta. 908+27

D/S

Site ID 41A, Sta. 920+50

U/S

U/S

D/S

D/S

D/S

Site ID 43A, Sta. 929+78

D/S

D/S

Site ID 44A, Sta. 932+41

U/S

U/S

D/S

D/S

Site ID 45A, Sta. 938+82

D/S

D/S

Site ID 46A, Sta. 945+21

U/S

Site ID 48A/49A, Sta. 950+12

U/S

U/S

U/S

D/S

D/S

Site ID 50A, Sta. 959+36

D/S

D/S

Site ID 51A, Sta. 967+18

D/S

D/S

Site ID 52A, Sta. 972+20

D/S

Site ID 10, Sta. 975+00

U/S

U/S

D/S

D/S

Site ID 53A, Sta. 978+50

D/S

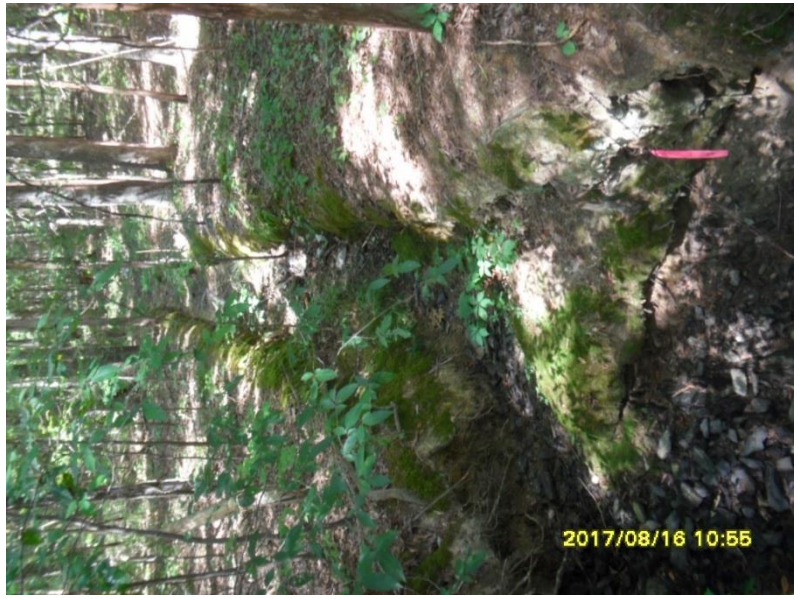
D/S

Site ID 54A (1)/(2), Sta. 987+40

U/S

U/S

D/S



D/S

Site ID 55A, Sta. 992+69

D/S

Site ID 56A, Sta. 999+61

D/S

Site ID 57A, Sta. 1003+06

D/S

Site ID 58A, Sta. 1010+06

D/S

D/S

Site ID 59A, Sta. 1019+60

U/S

U/S

D/S

D/S

Site ID 60A (1)/(2), Sta. 1023+00

U/S (60A-2)

U/S (60A-1)

D/S

Site ID 11, Sta. 1029+62

U/S

U/S

D/S

D/S

Site ID 64, Sta. 1033+00

D/S

D/S

D/S

D/S

Site ID 12, Sta. 1035+78

U/S

D/S

Site ID 65, Sta. 1037+00

D/S

D/S

D/S

Site ID 66, Sta. 1043+00

D/S

U/S

D/S

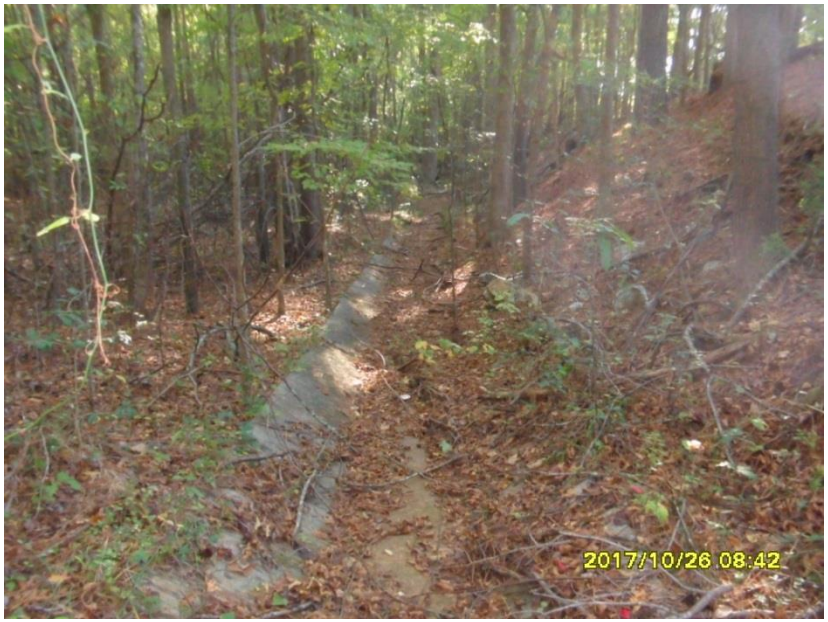
D/S

Site ID 67, Sta. 1046+50

D/S

U/S

D/S



D/S

Site ID 68, Sta. 1050+80

D/S

D/S

D/S

D/S

Site ID 69, Sta. 1058+00

U/S

D/S

D/S

Site ID 70, Sta. 1066+00

U/S

U/S

D/S

D/S

Site ID 71, Sta. 1069+20

U/S

U/S

D/S

U/S

Site ID 13, Sta. 1071+50

U/S

U/S

D/S

D/S

Site ID 14, Sta. 1080+80

U/S

U/S

U/S

U/S

Site ID 72, Sta. 1082+00

U/S

D/S

D/S

Site ID 73, Sta. 1085+50

U/S

D/S

D/S

Site ID 74, Sta. 1090+00

U/S

D/S

D/S

Site ID 75, Sta. 1091+50

D/S

D/S

Site ID 76, Sta. 1094+50

U/S

U/S

D/S

D/S

Site ID 77, Sta. 1099+50

D/S

D/S

Site ID 78/80, Sta. 1104+50

U/S

U/S

D/S

D/S

Site ID 79, Sta. 1106+50

D/S

U/S

D/S

D/S

Site ID 81, Sta. 1111+45

U/S

D/S

D/S

Site ID 82, Sta. 1112+50

D/S

D/S

D/S

Site ID 83/84/85/86, Sta. 1114+20

U/S

Site ID 83/84/85/86, Sta. 1118+00

U/S

U/S

Site ID 83/84/85/86, Sta. 1118+50

U/S

U/S

Site ID 83/84/85/86, Sta. 1119+50

U/S

D/S

D/S

Site ID 87, Sta. 1119+00

U/S

D/S

D/S

Site ID 89, Sta. 1127+00

D/S

U/S

D/S

D/S

Site ID 15, Sta. 1132+58

U/S

U/S

D/S

D/S

Site ID 90, Sta. 1138+00

U/S

D/S

D/S

Site ID 91, Sta. 1144+00

U/S

U/S

D/S

D/S

Site ID 92/93, Sta. 1152+00

U/S

U/S

D/S

U/S

Site ID 94, Sta. 1155+00

U/S

D/S

D/S

Site ID 95, Sta. 1157+00

D/S

U/S

Site ID 96, Sta. 1162+00

D/S

D/S

Site ID 97, Sta. 1165+00

D/S

Site ID 16, Sta. 1168+26

U/S

U/S

D/S

D/S

Site ID 98, Sta. 1175+00

U/S

D/S

D/S

Site ID 17, Sta. 1176+80

D/S

U/S

D/S

D/S

Site ID 99, Sta. 1180+00

D/S

D/S

Site ID 100, Sta. 1185+00

U/S

U/S

D/S

Site ID 18, Sta. 1190+17

U/S

D/S

D/S

D/S

D/S

Site ID 102, Sta. 1201+00

U/S

D/S

D/S

Site ID 103, Sta. 1206+00

U/S

U/S

D/S

D/S

Site ID 104, Sta. 1218+00

U/S

D/S

D/S

Site ID 105, Sta. 1223+00

D/S

Site ID 19, Sta. 1225+00

U/S

U/S

D/S

D/S

Site ID 106, Sta. 1227+50

D/S

D/S

U/S

U/S

D/S

Site ID 109, Sta. 1233+00

U/S

D/S

D/S

Site ID 110, Sta. 1238+00

U/S

D/S

Site ID 111, Sta. 1240+00

U/S

D/S

Site ID 112, Sta. 1242+50

U/S

D/S

Site ID 113, Sta. 1248+00

D/S

D/S

Site ID 114, Sta. 1250+50

U/S

D/S

U/S

D/S

Site ID 115, Sta. 1254+00

D/S

Site ID 116, Sta. 1260+50

U/S

D/S

Site ID 117, Sta. 1268+50

D/S

U/S

D/S

D/S

Site ID 118/119, Sta. 1276+00

D/S

D/S

Site ID 120, Sta. 1292+00

D/S

U/S

D/S

D/S

Site ID 121, Sta. 1301+00

U/S

D/S

Site ID 122, Sta. 1305+50

U/S

D/S

D/S

U/S

U/S

D/S

D/S

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U/S

D/S

D/S

Site ID 125, Sta. 1319+75

U/S

U/S

D/S

U/S

Site ID 126, Sta. 1321+00

D/S

U/S

U/S

D/S

D/S

D/S

D/S

D/S

Site ID 129, Sta. 1330+75

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D/S

U/S

Site ID 130, Sta. 1332+00

D/S

D/S

D/S

D/S

D/S

Site ID 132, Sta. 1350+00

U/S

U/S

D/S

Site ID 133, Sta. 1351+00

D/S

D/S

D/S

D/S

D/S

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D/S

Site ID 137, Sta. 1368+00

U/S

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D/S

U/S

Site ID 138, Sta. 1370+00

D/S

D/S

Site ID 139, Sta. 1376+00

D/S

U/S

D/S

D/S

Site ID 140, Sta. 1381+00

U/S

U/S

D/S

U/S

Site ID 141, Sta. 1381+00

U/S

D/S

Site ID 142, Sta. 1395+00

U/S

D/S

D/S

Site ID 143, Sta. 1400+00

U/S

U/S

D/S

D/S

Site ID 144/145, Sta. 1404+50

U/S

U/S

U/S

Site ID 144/145, Sta. 1406+50

U/S

D/S

D/S

Michael Baker INTERNATIONAL

Site ID 146, Sta. 1413+00

U/S

U/S

D/S

D/S

U/S

U/S

D/S

D/S

Site ID 149, Sta. 1421+00

U/S

U/S

D/S

D/S

Site ID 151/153/154, Sta. 1422+00

U/S

U/S

D/S

D/S

Site ID 150/152, Sta. 1422+50

U/S

U/S

D/S

D/S

Site ID 155, Sta. 1433+00

U/S

U/S

U/S

U/S

Site ID 156, Sta. 1433+00

U/S

U/S

D/S

D/S

Michael Baker INTERNATIONAL

Site ID 157, Sta. 1434+50

U/S

Site ID 158, Sta. 1437+50

U/S

U/S

D/S

D/S

D/S

D/S

D/S

Site ID 160, Sta. 1447+00

D/S

D/S

D/S

D/S

Site ID 161, Sta. 1451+00

D/S

D/S

Site ID 162, Sta. 1456+00

U/S

U/S

D/S

D/S

Site ID 163, Sta. 1456+00

D/S

D/S

Site ID 164, Sta. 1461+25

D/S

D/S

Site ID 165, Sta. 1466+50

U/S

U/S

D/S

D/S

Site ID 166/167/168, Sta. 1469+50

U/S

U/S

D/S

D/S

Site ID 169/170, Sta. 1476+50

U/S

U/S

D/S

D/S

Site ID 171/172, Sta. 1483+50

U/S

D/S

Site ID 173, Sta. 1490+00

U/S

D/S

D/S

Site ID 174, Sta. 1495+00

D/S

U/S

D/S

D/S

Site ID 175, Sta. 1500+00

D/S

U/S

D/S

D/S

Site ID 176/177, Sta. 1502+50

U/S

U/S

D/S

D/S

Site ID 178, Sta. 1511+00

D/S

U/S

D/S

D/S

D/S

D/S

D/S

D/S

Site ID 180, Sta. 1521+00

U/S

U/S

D/S

D/S

Site ID 181, Sta. 1528+00

D/S

D/S

Site ID 182, Sta. 1530+00

U/S

U/S

Site ID 183, Sta. 1541+00

U/S

U/S

D/S

D/S

Site ID 184, Sta. 1543+50

U/S

D/S

D/S

Site ID 185, Sta. 1546+50

D/S

D/S

D/S

D/S

Site ID 186, Sta. 1548+10

U/S

U/S

D/S

D/S

Site ID 187, Sta. 1554+00

U/S

U/S

D/S

D/S