

CENTRAL BROWARD EAST-WEST TRANSIT STUDY

Soils, Floodplains, and Drainage Basins

Technical Memorandum



July 2012



JACOBS

CENTRAL BROWARD



TRANSIT STUDY

This page intentionally left blank.

Table of Contents

1.0 Soils	1
1.1 Western Segment Soils	2
1.2 Central Griffin Road Segment Soils	4
1.3 Central SR 7/Broward Boulevard Segment Soils	7
1.4 Eastern Segment Soils	10
2.0 Floodplains	13
2.1 Western Segment Floodplains	14
2.2 Central Griffin Road Segment Floodplains	14
2.3 Central SR 7/Broward Boulevard Segment Floodplains	14
2.4 Eastern Segment Floodplains.....	14
3.0 Drainage Basins	19
3.1 Western Segment Drainage Basins	21
3.2 Central Griffin Road Segment Drainage Basins	21
3.3 Central SR 7/Broward Boulevard Segment Drainage Basins	21
3.4 Eastern Segment Drainage Basins	21

List of Exhibits

Exhibit 1: Western Segment Soils	2
Exhibit 2: Western Segment Soils Map	3
Exhibit 3: Central Griffin Road Segment Soils	4
Exhibit 4: Central Griffin Road Segment Soils Map	6
Exhibit 5: Central SR 7/Broward Boulevard Segment Soils	7
Exhibit 6: Central SR 7/Broward Boulevard Segment Soils Map	9
Exhibit 7: Eastern Segment Soils	10
Exhibit 8: Eastern Segment Soils Map	12
Exhibit 9: FEMA Flood Zone Descriptions.....	13
Exhibit 10: FEMA 100-year Flood Elevations for the Study Corridor.....	13
Exhibit 11: Western Segment Floodplains Map	15
Exhibit 12: Central Griffin Road Segment Floodplains Map	16
Exhibit 13: Central SR 7/Broward Boulevard Segment Floodplains Map	17
Exhibit 14: Eastern Segment Floodplains Map	18
Exhibit 15: Western Segment Drainage Basins Map.....	23
Exhibit 16: Central Griffin Road Segment Drainage Basins Map.....	24
Exhibit 17: Central SR 7/Broward Boulevard Segment Drainage Basins Map	25
Exhibit 18: Eastern Segment Drainage Basins Map	26

This page intentionally left blank.

1.0 Soils

The Information regarding area soils was obtained from the United States Department of Agriculture Natural Resources Conservation Service (USDA NRCS). The proposed alternatives span several soil associations, including Arents, Basinger, Dade, Dania, Duette, Hallandale, Immokalee, Lauderdale, Margate, Matlasha, Okeelanta, Paola, Pennsuco, Perrine, Plantation, Pomello, Pompano, and Sanibel. Among these soil associations, there are also a variety of soil types, which are derived by the composition of the soil (a mixture of sand, silt and clay). These types include:

- Fine Sand, a variation of soil, which is a nearly level, poorly drained, sandy soil that is rapidly permeable, and underlain by limestone bedrock.
- Gravelly Sand, Limestone Substratum, a variation of soil with larger particles (gravel) mixed in, also underlain by limestone bedrock.
- Muck, which is nearly level, very poorly draining organic soil.
- Silty Clay Loam, which is a nearly level, very poorly draining loamy (well-balanced of silt, sand and clay) soil, primarily found in coastal lowlands. It is made up of 27% to 40% of clay and less than 20% of sand.
- Silty Clay Loam, Tidal, which is similar to Silty Clay Loam, but found in Tidal Swamps.
- Silty Clay Loam, Variant, which consists of nearly level, very poorly drained soils in flatlands and swamps near the coast. These areas are under urban development.
- Udorthents, which are areas where native soil has been removed and filled with artificial soil material. They consist of unconsolidated geologic material removed in the excavation of ditches, canals, lakes, and ponds. Also considered in this category are 'shaped' Udorthents, which consist of a mixture of soil and geologic soil materials that have been shaped and contoured mainly for golf courses and major highways.
- Urban Land, which is where more than 85% of the surface is covered by shopping centers, parking lots, streets, sidewalk, airports, large building, houses or other structures and where natural soil cannot be observed.
- Urban Land Complex, which is a well-balanced mix of Urban Land and other types of soil associations.
- Urban Land Complex, Arents, which are areas of mangrove swamps that have been altered for urban development and waterways.
- Urban Land Complex, Arents, Organic Substratum, which are areas of Arents, Organic Substratum, usually in open areas such as lawns, parks, and vacant lots, mixed with Urban Land.
- Urban Land Complex, Limestone Substratum, which is similar to Urban Land Complex, but specifically has layers of limestone substratum.
- Urban Land Complex, Marl Substratum, which is a mix of Urban Land Complex and Marl (a lime-rich mud which contains variable amounts of clay and aragonite). This is typically made up of indurate marine deposits and lake sediments.

These soil types (and associations) are spread throughout the region; however, silty soils are found only in the eastern portions of the study area and Urban Land and Urban Land complexes are found only in the central and eastern portions of the study area. The location and proportion of the different soils are described below in greater detail within each alignment segment.

1.1 Western Segment Soils

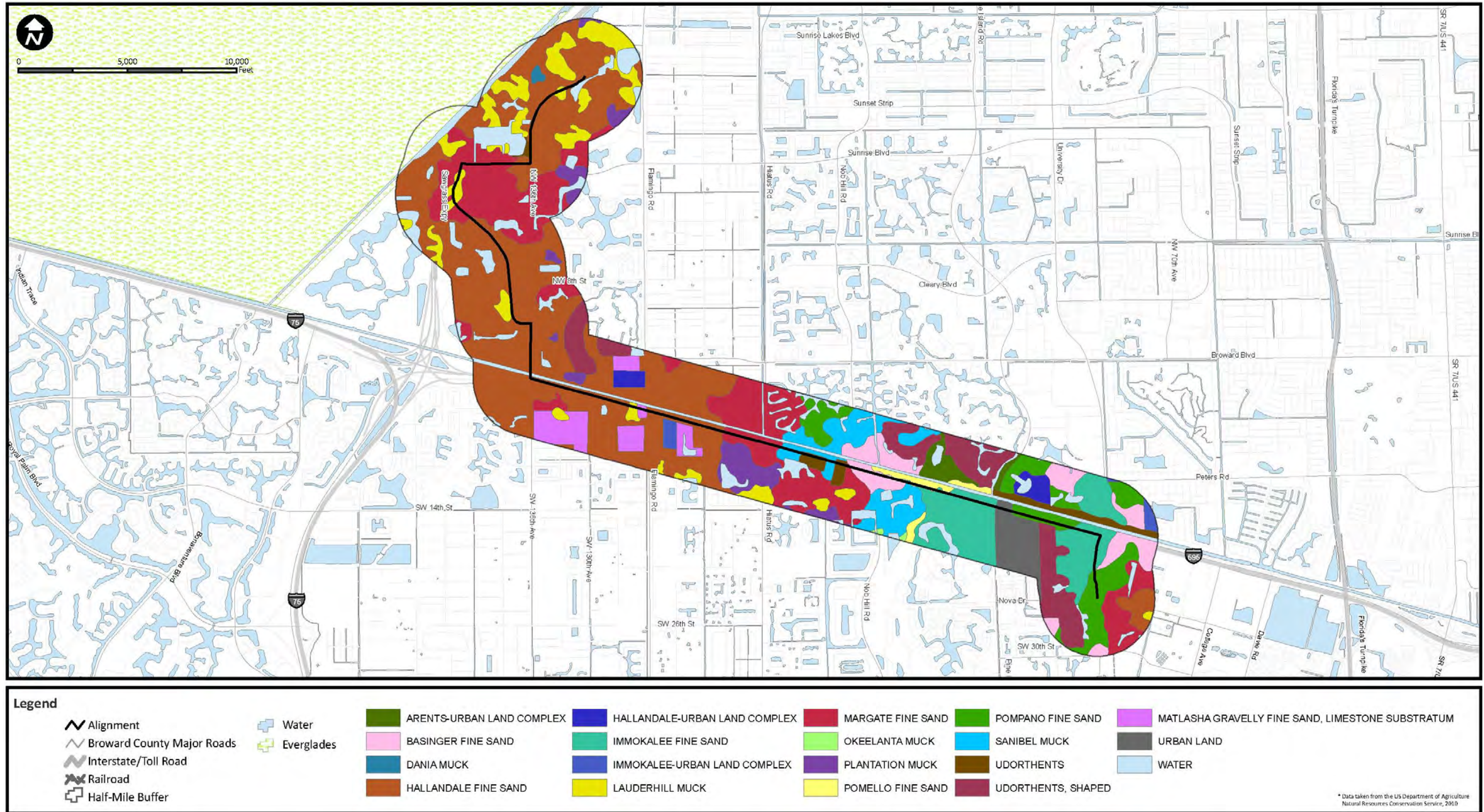
Soil types within the Western Segment include Muck, various types of Sand, and small amounts of Urban Land Complex in the eastern portion, which is much more varied than the western half that lies roughly west of Hiatus Road. The western portion of this segment is dominated mostly by Hallandale Fine Sand and Lauderhill Muck. Overall, the largest soil type within this segment Hallandale Fine Sand, covering 2,114 acres, followed by Margate Fine Sand, which covers 938 acres. Exhibit 1 lists the soils found within this segment, while Exhibit 2 shows their locations.

Exhibit 1: Western Segment Soils

Soil Type	Acreage	Location
ARENTS-URBAN LAND COMPLEX	60	Eastern portion
BASINGER FINE SAND	236	Eastern portion
DANIA MUCK	9	Western portion
HALLANDALE-URBAN LAND COMPLEX	60	Segmentwide
HALLANDALE FINE SAND	2,114	Western portion
IMMOKALEE-URBAN LAND COMPLEX	414	Eastern portion
IMMOKALEE FINE SAND	34	Segmentwide
LAUDERHILL MUCK	360	Segmentwide
MARGATE FINE SAND	938	Segmentwide
MATLASHA GRAVELLY FINE SAND, LIMESTONE SUBSTRATUM	165	Western portion
OKEELANTA MUCK	5	Eastern portion
PLANTATION MUCK	170	Segmentwide
POMELLO FINE SAND	46	Eastern portion
POMPANO FINE SAND	301	Eastern portion
SANIBEL MUCK	248	Eastern portion
UDORTHENTS	88	Eastern portion
UDORTHENTS, SHAPED	376	Segmentwide
URBAN LAND	131	Eastern portion
WATER	566	Segmentwide

Source: USDA Natural Resources Conservation Service, 2010.

Exhibit 2: Western Segment Soils Map



1.2 Central Griffin Road Segment Soils

Soil types within the Central Griffin Road Segment vary greatly. There are very few large, homogenous swaths of soil coverage. Fine Sand and Urban Land Complex are the most common soil types within this segment. The most dominant is Margate Fine Sand, covering 1,086 acres. The next two largest soil types are Urban Land and Basinger Fine Sand, covering 633 and 573 acres, respectively. Exhibit 3 lists the soils found within this segment, while Exhibit 4 shows their locations.

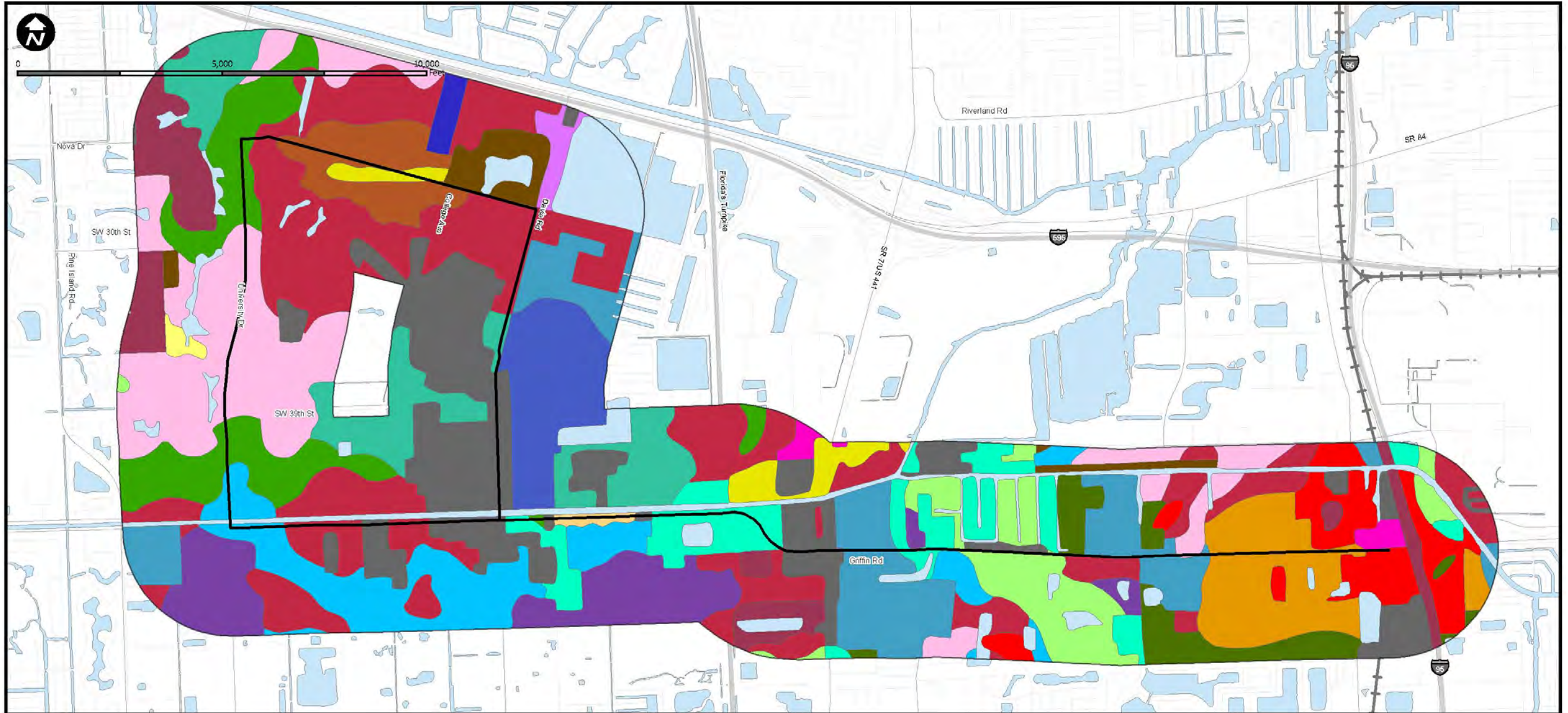
Exhibit 3: Central Griffin Road Segment Soils

Soil Type	Acreage	Location
ARENTS-URBAN LAND COMPLEX	139	Eastern portion
ARENTS, ORGANIC SUBSTRATUM-URBAN LAND COMPLEX	271	Segmentwide
BASINGER FINE SAND	573	Segmentwide
DADE-URBAN LAND COMPLEX	257	Eastern portion
DADE FINE SAND	207	Eastern portion
HALLANDALE-URBAN LAND COMPLEX	25	Western portion
HALLANDALE FINE SAND	151	Western portion
IMMOKALEE-URBAN LAND COMPLEX	209	Western portion
IMMOKALEE FINE SAND	316	Western portion
LAUDERHILL MUCK	76	Segmentwide
MARGATE FINE SAND	1,086	Segmentwide
MATLASHA GRAVELLY FINE SAND, LIMESTONE SUBSTRATUM	30	Western portion
MATLASHA, LIMESTONE SUBSTRATUM-URBAN LAND COMPLEX	417	Segmentwide
OKEELANTA MUCK	220	Segmentwide
PAOLA-URBAN LAND COMPLEX	12	Western portion
PLANTATION MUCK	279	Segmentwide
POMELLO FINE SAND	13	Western portion
POMPANO FINE SAND	314	Western portion
SANIBEL MUCK	324	Segmentwide
UDORTHENTS	90	Segmentwide
UDORTHENTS-URBAN LAND COMPLEX	30	Eastern portion
UDORTHENTS, SHAPED	235	Segmentwide
URBAN LAND	633	Segmentwide
WATER	381	Segmentwide

Source: USDA Natural Resources Conservation Service, 2010.

This page intentionally left blank.

Exhibit 4: Central Griffin Road Segment Soils Map



Legend	
Alignment	Water
Broward County Major Roads	
Interstate/Toll Road	
Railroad	
Half-Mile Buffer	
UDORTHENTS-URBAN LAND COMPLEX	BASINGER FINE SAND
PAOLA-URBAN LAND COMPLEX	HALLANDALE FINE SAND
DADE FINE SAND	HALLANDALE-URBAN LAND COMPLEX
DADE-URBAN LAND COMPLEX	IMMOKALEE FINE SAND
ARENTE-URBAN LAND COMPLEX	IMMOKALEE-URBAN LAND COMPLEX
LAUDERHILL MUCK	POMPAHO FINE SAND
MARGATE FINE SAND	SANIBEL MUCK
OKEELANTA MUCK	UDORTHENTS
PLANTATION MUCK	UDORTHENTS, SHAPED
POMELLO FINE SAND	URBAN LAND
ARENTE, ORGANIC SUBSTRATUM-URBAN LAND COMPLEX	MATLASHA, LIMESTONE SUBSTRATUM-URBAN LAND COMPLEX
MATLASHA GRAVELLY FINE SAND, LIMESTONE SUBSTRATUM	WATER

* Data taken from the US Department of Agriculture Natural Resources Conservation Service, 2010

1.3 Central SR 7/Broward Boulevard Segment Soils

Soil types within the Central SR 7/Broward Boulevard Segment differ between the northern and southern portions. The northern portion, which begins roughly at Riverland Road, is mostly made up of Urban Land Complex, while the southern portion is primarily Fine Sand. Overall, the most common soil type within this segment is Duette Urban Land Complex, covering 833 acres. The next most common is Margate Fine Sand, covering 621 Acres, followed by Urban Land, covering 610 acres, and Immokalee Limestone Substratum Urban Land Complex, covering 600 acres. Exhibit 5 lists the soils found within this segment, while Exhibit 6 shows their locations.

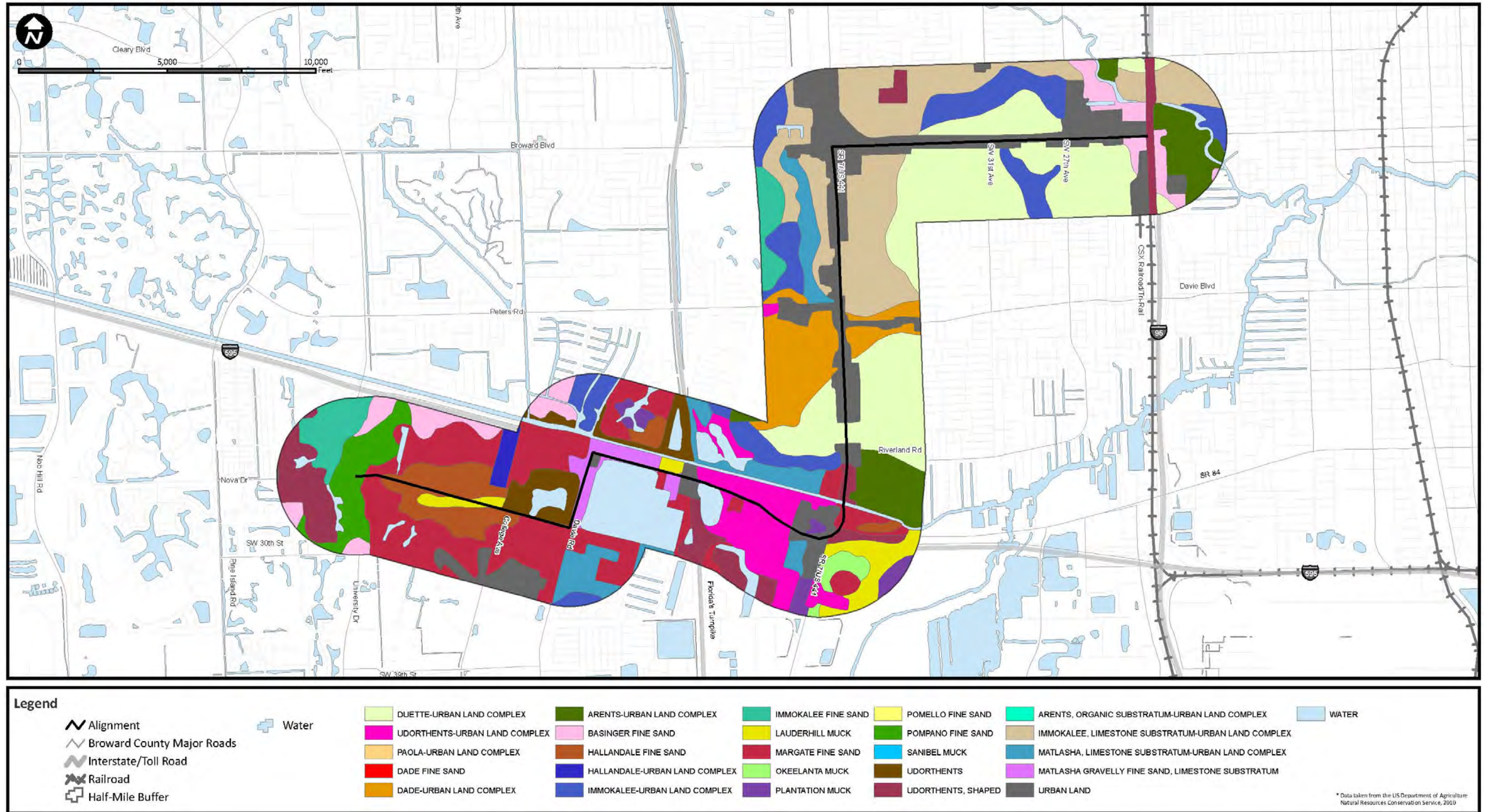
Exhibit 5: Central SR 7/Broward Boulevard Segment Soils

Soil Type	Acreeage	Location
ARENTS-URBAN LAND COMPLEX	217	Segmentwide
BASINGER FINE SAND	185	Segmentwide
DADE-URBAN LAND COMPLEX	226	Northern portion
DUETTE-URBAN LAND COMPLEX	833	Northern portion
HALLANDALE-URBAN LAND COMPLEX	25	Southern portion
HALLANDALE FINE SAND	178	Southern portion
IMMOKALEE-URBAN LAND COMPLEX	364	Segmentwide
IMMOKALEE FINE SAND	141	Segmentwide
IMMOKALEE, LIMESTONE SUBSTRATUM-URBAN LAND COMPLEX	600	Northern portion
LAUDERHILL MUCK	104	Southern portion
MARGATE FINE SAND	621	Southern portion
MATLASHA GRAVELLY FINE SAND, LIMESTONE SUBSTRATUM	67	Southern portion
MATLASHA, LIMESTONE SUBSTRATUM-URBAN LAND COMPLEX	202	Segmentwide
OKEELANTA MUCK	32	Southern portion
PLANTATION MUCK	51	Southern portion
POMPANO FINE SAND	125	Southern portion
UDORTHENTS	114	Southern portion
UDORTHENTS-URBAN LAND COMPLEX	231	Segmentwide
UDORTHENTS, SHAPED	246	Segmentwide
URBAN LAND	610	Segmentwide
WATER	355	Segmentwide

Source: USDA Natural Resources Conservation Service, 2010.

This page intentionally left blank.

Exhibit 6: Central SR 7/Broward Boulevard Segment Soils Map



1.4 Eastern Segment Soils

Soil types within the Eastern Segment also differ between the northern and southern portions, divided roughly near the SR 84 area, with much more Urban Land found throughout compared to the other segments. Other than Urban Land, the northern portion is mostly made up of Urban Land Complex, reflecting the presence of the City of Fort Lauderdale. Other than Urban Land, the southern portion mostly consists of Clay Loam and Fine Sand. Overall, the most common soil type within this segment is by far Urban Land, covering 1,662 acres. The next most common soils are Dade Urban Land Complex and Immokalee Limestone Substratum Urban Land Complex, covering 794 acres and 660 acres, respectively. Exhibit 7 lists the soils found within this segment, while Exhibit 8 shows their locations.

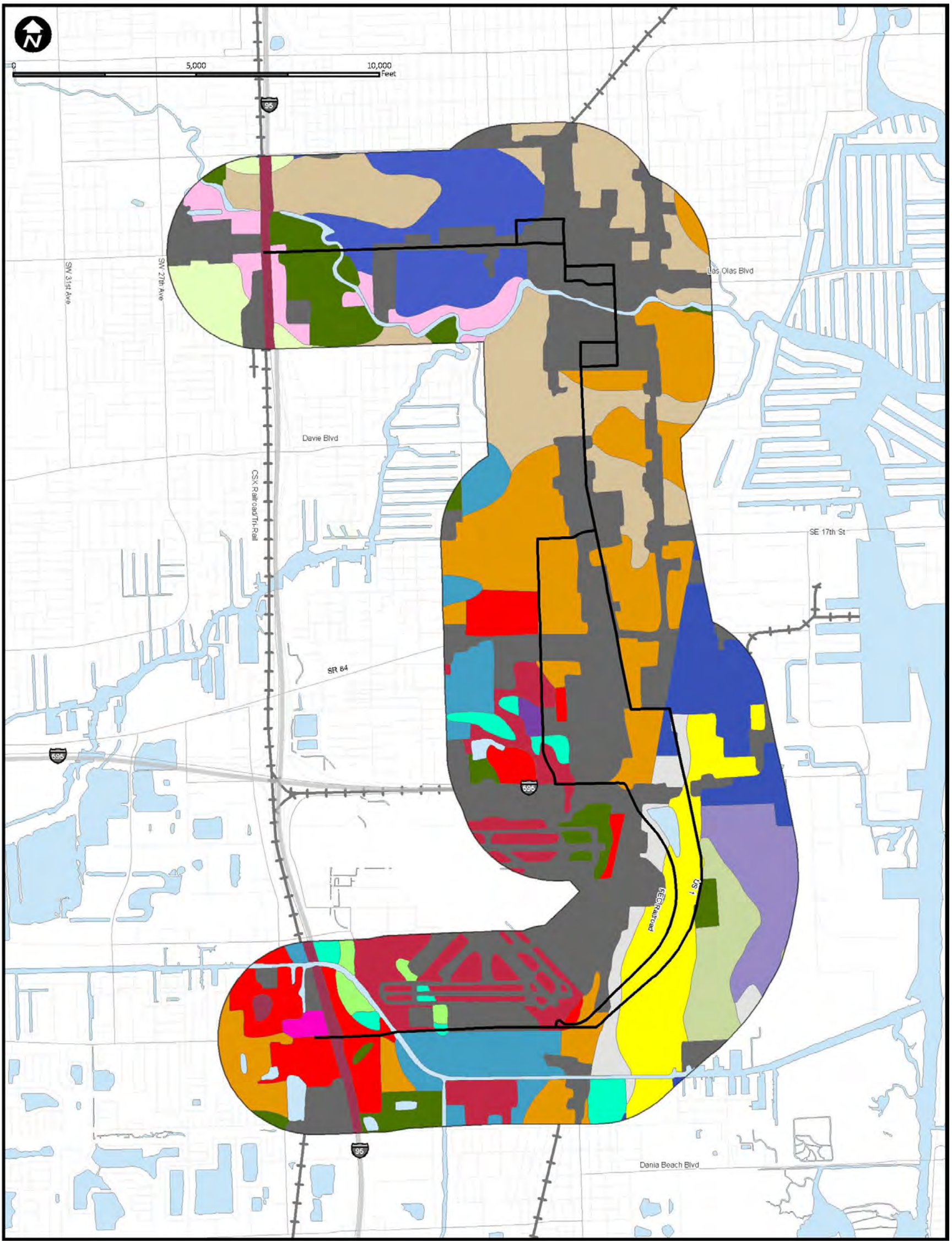
Exhibit 7: Eastern Segment Soils

Soil Type	Acreage	Location
ARENTS-URBAN LAND COMPLEX	262	Segmentwide
ARENTS, ORGANIC SUBSTRATUM-URBAN LAND COMPLEX	80	Southern portion
BASINGER FINE SAND	124	Northern portion
DADE-URBAN LAND COMPLEX	794	Segmentwide
DADE FINE SAND	270	Southern portion
DUETTE-URBAN LAND COMPLEX	99	Northern portion
IMMOKALEE-URBAN LAND COMPLEX	328	Northern portion
IMMOKALEE, LIMESTONE SUBSTRATUM-URBAN LAND COMPLEX	660	Northern portion
MARGATE FINE SAND	318	Southern portion
MATLASHA, LIMESTONE SUBSTRATUM-URBAN LAND COMPLEX	264	Segmentwide
OKEELANTA MUCK	32	Southern portion
PENNSUCO SILTY CLAY LOAM	316	Southern portion
PENNSUCO SILTY CLAY LOAM, TIDAL	179	Southern portion
PERRINE SILTY CLAY LOAM	135	Southern portion
PERRINE VARIANT SILT LOAM, FREQUENTLY FLOODED	106	Southern portion
PLANTATION MUCK	12	Southern portion
UDORTHENTS-URBAN LAND COMPLEX	16	Southern portion
UDORTHENTS, MARLY SUBSTRATUM-URBAN LAND COMPLEX	223	Southern portion
UDORTHENTS, SHAPED	74	Segmentwide
URBAN LAND	1,662	Segmentwide
WATER	138	Segmentwide

Source: USDA Natural Resources Conservation Service, 2010.

This page intentionally left blank.

Exhibit 8: Eastern Segment Soils Map



Legend			

* Data taken from the US Department of Agriculture Natural Resources Conservation Service, 2010

2.0 Floodplains

South Florida is a region with flat topography and sandy soils that become saturated after heavy rains. Flooding in this part of the country usually results from slow infiltration and runoff. Flat topography combined with heavy land use and intense rainfall events have resulted in periodic flooding throughout the region.

The Federal Emergency Management Agency (FEMA) has created floodplain maps for thousands of cities, counties, and villages to identify flood-prone properties, and to define areas where management of floodplain development is necessary. The current 100-year and 500-year floodplains were obtained from FEMA through the Florida Geographic Data Library (FGDL). After reviewing the Digital Flood Insurance Rate Maps (DFIRMs) supplied by FEMA, it was determined that the Central Broward Transit Corridor goes through flood zones AH, AE, X and X500. Exhibit 9 contains descriptions of these flood zones.

FEMA is currently in the process of updating flood zone boundaries and base flood elevations (BFE) for Broward County Florida. The appeals and review process took place during the first half of 2012, but the new boundaries and elevation data have not yet been finalized or adopted by FEMA. Because of this, the existing floodplain data from 1996 was chosen for this analysis.

Exhibit 9: FEMA Flood Zone Descriptions

Zone	Description
Zone AE	An area inundated by 100-year flooding, for which base flood elevations have been determined.
Zone AH	An area inundated by 100-year flooding (usually an area of ponding), for which base flood elevations have been determined; flood depths range from 1 to 3 feet.
Zone X	An area that is determined to be outside the 100- and 500-year floodplains.
Zone X500	An area inundated by 500-year flooding; an area inundated by 100-year flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile; or an area protected by levees from 100-year flooding.

Source: FEMA, 1996.

The 100-year flood elevations were obtained from Broward County for the CBT Corridor and are shown in Exhibit 10 below.

Exhibit 10: FEMA 100-year Flood Elevations for the Study Corridor

General Area	100 year Flood Elevation (ft)
West of Florida's Turnpike	9.0
East of Florida's Turnpike	7.5

Source: Broward County Department of Planning and Environmental Protection Geographic Information Systems, March 2000,

2.1 Western Segment Floodplains

The vast majority of the Western Segment is comprised of FEMA Flood Zone AH. There are very narrow, linear segments of Zone AE running parallel to I-595 on both sides of the New River Canal. In addition, there are two small areas of Zones X and X500, deemed to be outside of the flood hazard area, located south of I-595 in the eastern portion of the alignment segment. Exhibit 11 shows the location of the flood zones within the Western Segment.

2.2 Central Griffin Road Segment Floodplains

With respect to floodplains, the Central Griffin Road Segment is divided in half at Florida's Turnpike. The portion of this segment on the west side of the Turnpike falls primarily into Zone AH, with a significant amount of land classified as Zone X near the northeast corner of the SFEC where Nova Drive meets Davie Road. The eastern portion of this segment mostly consists of land within Zone AE, with the exception of two large areas classified as Zones X and X500 along Griffin Road near I-95. Exhibit 12 shows the location of the flood zones within the Central Griffin Road Segment.

2.3 Central SR 7/Broward Boulevard Segment Floodplains

The Central SR 7/Broward Boulevard Segment is almost evenly made up of Zones AE, AH, and X. Zone AH is found on the western edges, along Nova Drive and northwest of the upper segment of SR 7. Zone AE is found in the area surrounding the I-595/SR 7 interchange, and also to the north and east of Broward Boulevard. Zone X is primarily found on both sides of the central part of SR 7, to the southeast of the SR 7/Broward Boulevard intersection, and near the northeast corner of the SFEC. Exhibit 13 shows the location of the flood zones within the Central SR 7/Broward Boulevard Segment.

2.4 Eastern Segment Floodplains

The Eastern Segment is mostly classified as Zone AE. This includes the most populous parts of the segment along Broward Boulevard, through the Central Business District, and south to Davie Boulevard. There is also a large, central area between Davie Boulevard and Griffin Road that is classified as either Zone X or X500. This area includes the Fort Lauderdale-Hollywood International Airport. Exhibit 14 shows the location of the flood zones within the Eastern Segment.

Exhibit 11: Western Segment Floodplains Map

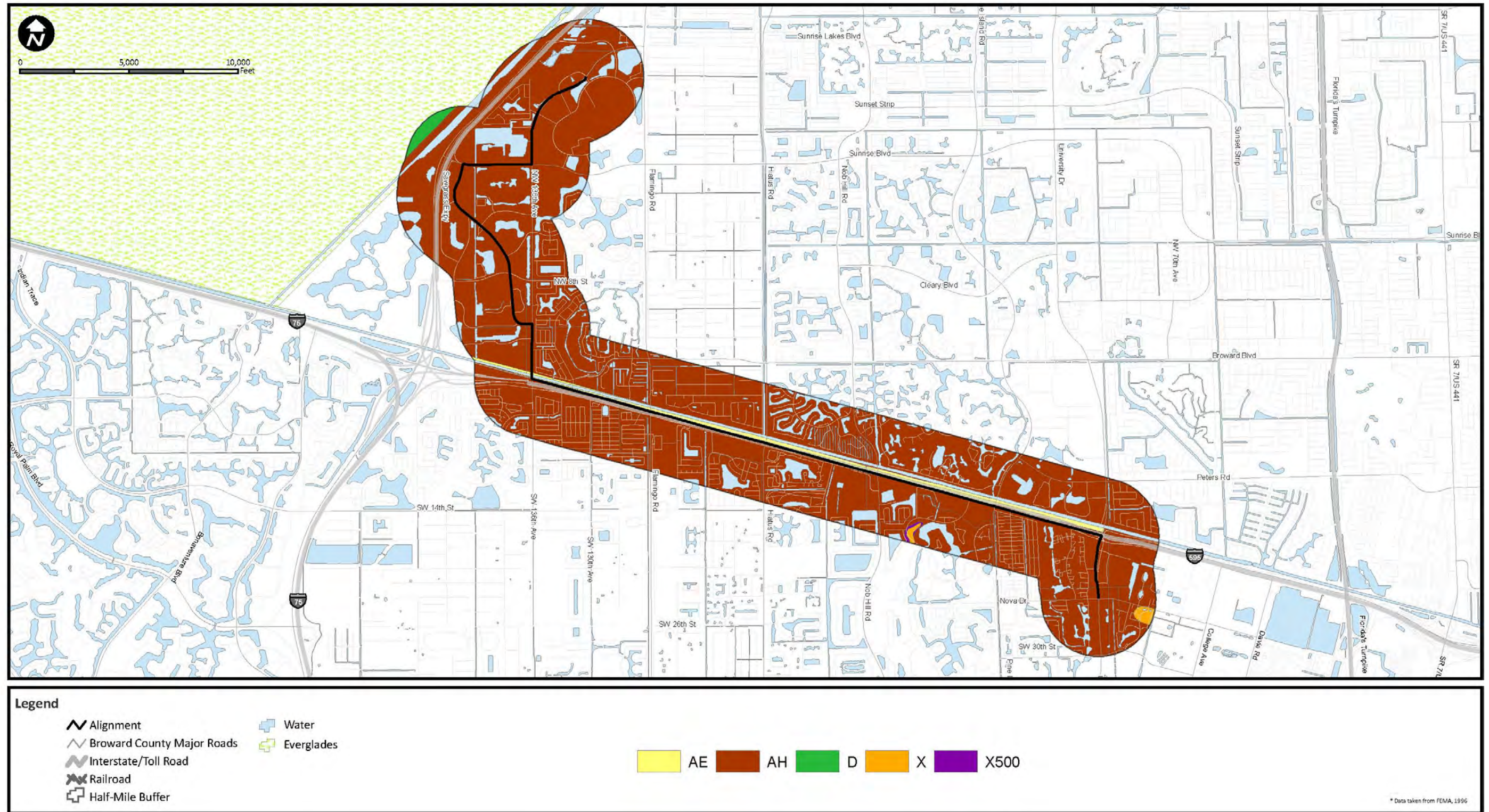


Exhibit 12: Central Griffin Road Segment Floodplains Map

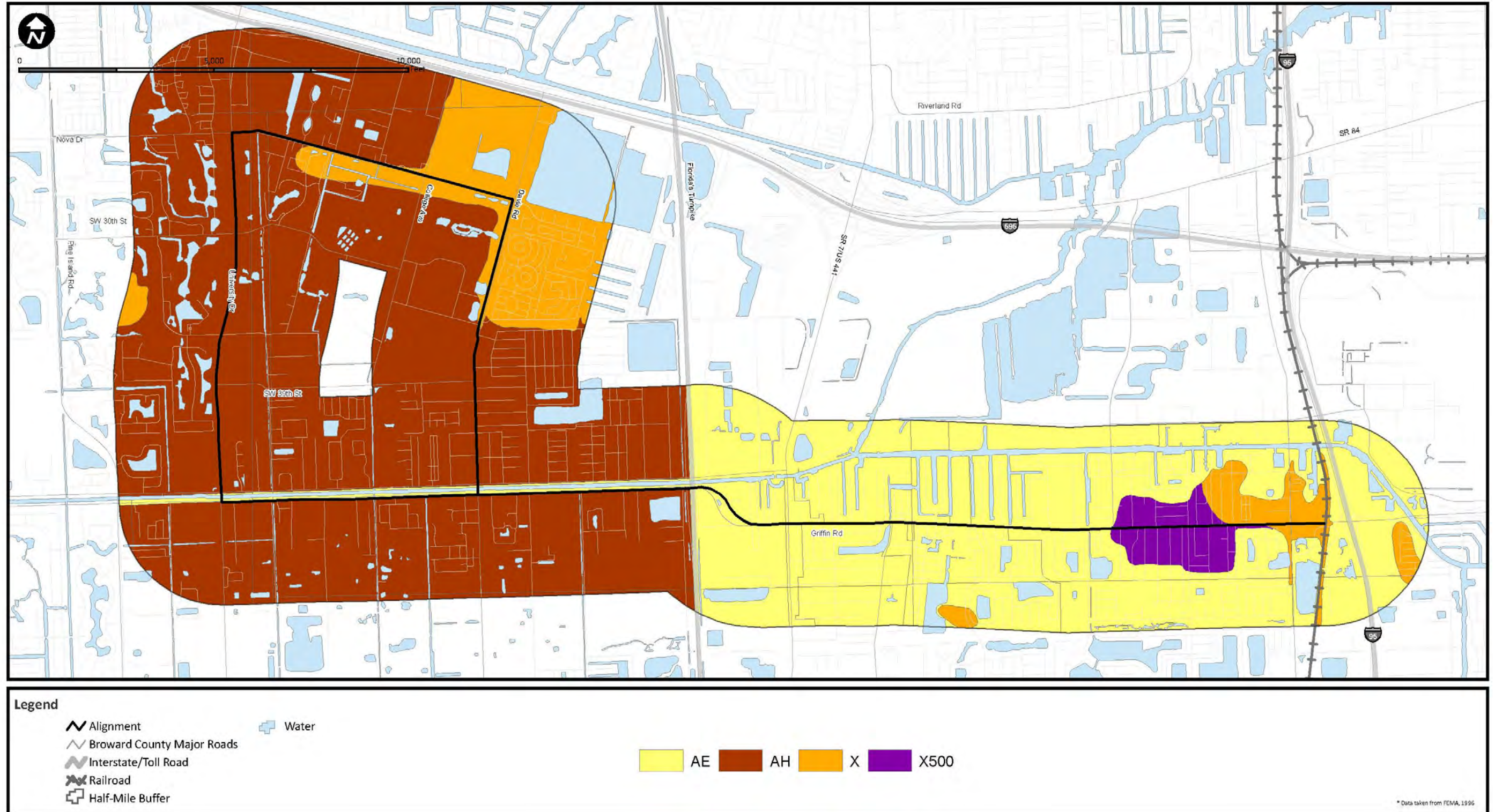
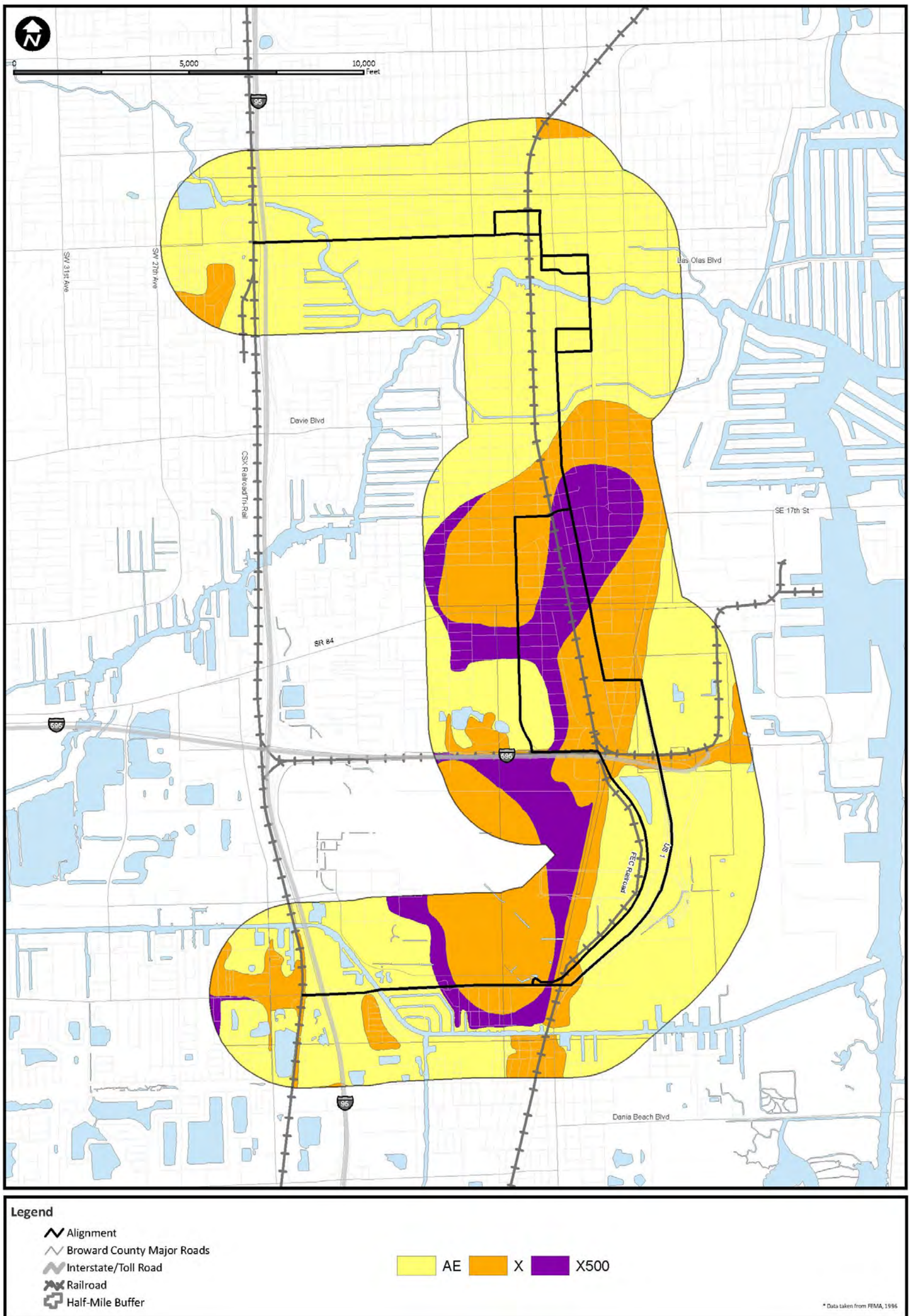


Exhibit 14: Eastern Segment Floodplains Map



3.0 Drainage Basins

The Central Broward Transit alternatives cross a total of eight Broward County drainage basins: C-10, C-11 East, C-11 West, C-12 East, C-12 West, North New River Canal East, North New River Canal West, and Coral Reef.

C- 10 Basin

The C-10 Basin is located in southeast Broward County, encompassing part of the cities of Dania Beach and Hollywood. It has a drainage area of just over 9,000 acres. Land within this basin drains into the C-10 and Hollywood Canals, which flow north into the Dania Cut-Off Canal and eventually into the Intracoastal Waterway.

Land uses within the C-10 Basin are primarily residential and commercial. Major east-west roadways crossing this basin include Stirling Road, Sheridan Street, and Hollywood Boulevard, while I-95 is the only major north-south roadway. Only a small, northeastern corner of this drainage basin falls within the study corridor.

C- 11 East & West Basins

The C-11 Basins are located in west central Broward County and together make up the largest basin area located entirely within the county. The C-11 West Basin has a drainage area of over 42,000 acres, while the C-11 East Basin drains almost 17,000 acres. Together, the basins include the Town of Davie, Cooper City, Weston, Southwest Ranches, the northern half of the City of Pembroke Pines, a western section of the City of Hollywood, a southern section of the City of Sunrise and unincorporated Broward County land as well. The majority of the runoff from C-11 West Basin is pumped westward into the Everglades Protection Area. The C-11 West basin is the only drainage basin in Broward County that regularly discharges into the Everglades. The C-11 East Basin drains areas east of Nob Hill Road. Water from the C-11 East is pumped eastward to eventually drain into the Intracoastal Waterway. Flow in the C-11 Canal is maintained mostly by groundwater inflow, which may occur directly or into the many drainage canals that discharge into the C-11 Canal. Structure S-13 regulates water level at the east end of the C-11 Canal by controlling discharges to tidewaters.

Land use within the C-11 Basins is mostly residential. There are several major east-west roadways that cross these basins, including Griffin Road, Stirling Road, and Sheridan Street. There are also several major north-south roadways, including I-75, Flamingo Road, University Drive, and Florida's Turnpike. Only the northwestern corner of the C-11 West Basin is within the study corridor, while a significant portion of the C-11 East Basin is located within the corridor.

C- 12 East & West Basins

The C-12 Basins are located in central Broward County, and together encompass western portions of the city of Fort Lauderdale, eastern portions of the cities of Lauderhill and Plantation, and several unincorporated portions of the County. The C-12 East Basin has a drainage area of just over 5,000 acres, while the C-12 West Basin covers an area just under 5,000 acres. The land within these two basins drains into the C-12 Canal, which in turn becomes the water source for the North Fork of the New River, an estuarine water body that flows through downtown Fort Lauderdale and into the Intracoastal Waterway.

The C-12 Basin is unique in Broward County, because it has no direct link to seepage water from the Water Conservation Areas (WCA).

Land use within both C-12 Basins is primarily residential. Urban stormwater runoff is a major pollution source. Transportation-related pollution via runoff is expected through much of the waterway due to the major roadways crossing the canal. Sunrise and Broward Boulevards are the major east-west roadways that cross the drainage areas, whereas SR 7, Florida's Turnpike, and I-95 cross the basins running north-south. The study corridor runs through the central part of both basins.

North New River Canal East & West Basins

The North New River Canal (NNRC) was the first canal constructed in Broward County to connect to Lake Okeechobee through a series of levees and water control structures. The North New River Canal East and West Basins are located in west central Broward County and encompass most of the City of Plantation, the southwestern portion of Sunrise, a western portion of the City of Fort Lauderdale, and a small portion of unincorporated Broward County. The NNRC West Basin covers almost 18,000 acres, while the much smaller East Basin covers just over 2,000 acres. The NNRC Basins receive flow from three WCAs. The WCA 2 constitutes the main western inflow via the S-143 and S-34. Additional water from WCA 2B and WCA 3A can also flow into the NNRC by S-141 and S-142, respectively through the S-34 depending on specific water elevations. Sometimes the NNRC water is discharged through G-123 and S-142 into WCA 3A if certain hydrological conditions are met.

Land uses within these two basins are mostly residential with significant amounts of office and commercial uses found in the NNRC West Basin. Major north-south roadways that cross these drainage areas include the Sawgrass Expressway, Flamingo Road, University Drive, Florida's Turnpike, and SR 7. Major east-west roadways include Broward Boulevard, Sunrise Boulevard, and I-595. The southern parts of both basins are within the study corridor.

Coral Reef Basin

The Coral Reef Basin is located in eastern Broward County, stretching from Delray Beach in the north to Hallandale Beach in the south. It drains an area covering nearly 60,000 acres directly into the Intracoastal Waterway. Relevant to the study area, it has freshwater originating from the C-10, C-11, C-12, C-13 and North New River Canals, which also drain into the Intracoastal Waterway. Here the outflow is mixed with tidal waters and discharges through Port Everglades Inlet to the Atlantic Ocean. The Coral Reef Basin encompasses the nearby cities of Fort Lauderdale, Hollywood, Dania Beach, a small eastern portion of the Town of Davie, and several unincorporated parts of Broward County.

The land use within the Coral Reef Basin differs greatly throughout the study area. There are very few areas that are without some development which includes residential neighborhoods, urban downtown Fort Lauderdale, and industrial activity. Major north-south roadways are I-95, Andrews Avenue, and US 1. Major east-west roadways are Griffin Road, I-595, SR 84, and Broward Boulevard. A large part of the eastern portion of this basin falls within the study corridor.

3.1 Western Segment Drainage Basins

The Western Segment lies partially within three major Broward County drainage Basins. Everything north of I-595 is a part of the North New River Canal Basin. Areas south of I-595 are a part of either the C-11 East or West Basins, with the boundary between two being Hiatus Road. Exhibit 15 shows the location of drainage basins within the Western Segment.

3.2 Central Griffin Road Segment Drainage Basins

The Central Griffin Road Segment also lies within three partial drainage basins. The portion west of SR 7 is a part of the C-11 East Basin. The portion to the east of SR 7 is mostly a part of the Coral Reef Basin with the exception of the small corner south of Griffin Road and east of the CSX Rail Corridor. This area is a part of the C-10 Basin. Exhibit 16 shows the location of drainage basins within the Central Griffin Road Segment.

3.3 Central SR 7/Broward Boulevard Segment Drainage Basins

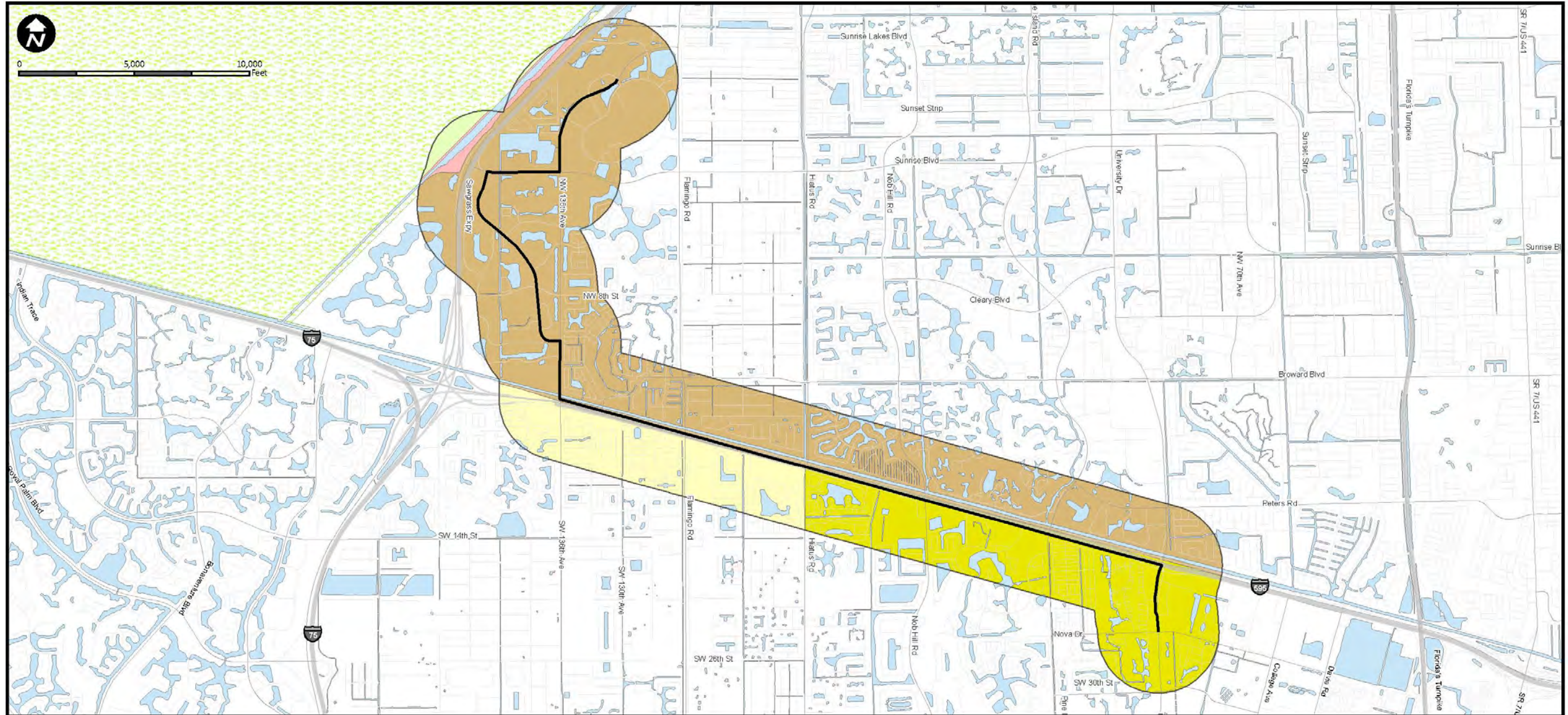
The Central SR 7/Broward Boulevard Segment lies within parts of five major drainage basins. The portion south of I-595 and west of SR 7 is a part of the C-11 East Basin, while the portion south of I-595 and east of SR 7 is a part of the Coral Reef Basin. The area north of I-595 extending to Davie Boulevard is a part of the North New River Canal East Basin. Further north, the area surrounding the intersection of SR 7 and Broward Boulevard is a part of the C-12 West Basin, and the far eastern portion of the segment along Broward Boulevard is a part of the C-12 East Basin. Exhibit 17 shows the location of drainage basins within the Central SR 7/Broward Boulevard Segment.

3.4 Eastern Segment Drainage Basins

The Eastern Segment lies within the boundaries of three drainage basins. A small section south of Griffin Road and in between the CSX and SFEC Rail Corridors is a part of the C-10 Basin. The northern portion along Broward Boulevard west of downtown Fort Lauderdale is a part of the C-12 East Basin. All other parts of this section fall within the Coral Reef Basin. Exhibit 18 shows the location of drainage basins within the Eastern Segment.

This page intentionally left blank.

Exhibit 15: Western Segment Drainage Basins Map



Legend			
Alignment	Water	C-11 EAST	NORTH NEW RIVER CANAL WEST
Broward County Major Roads	Everglades	C-11 WEST	CONSERVATION AREA 2B
Interstate/Toll Road		C-13 WEST	
Railroad			
Half-Mile Buffer			

* Data taken from the South Florida Water Management District, December 2011

Exhibit 16: Central Griffin Road Segment Drainage Basins Map

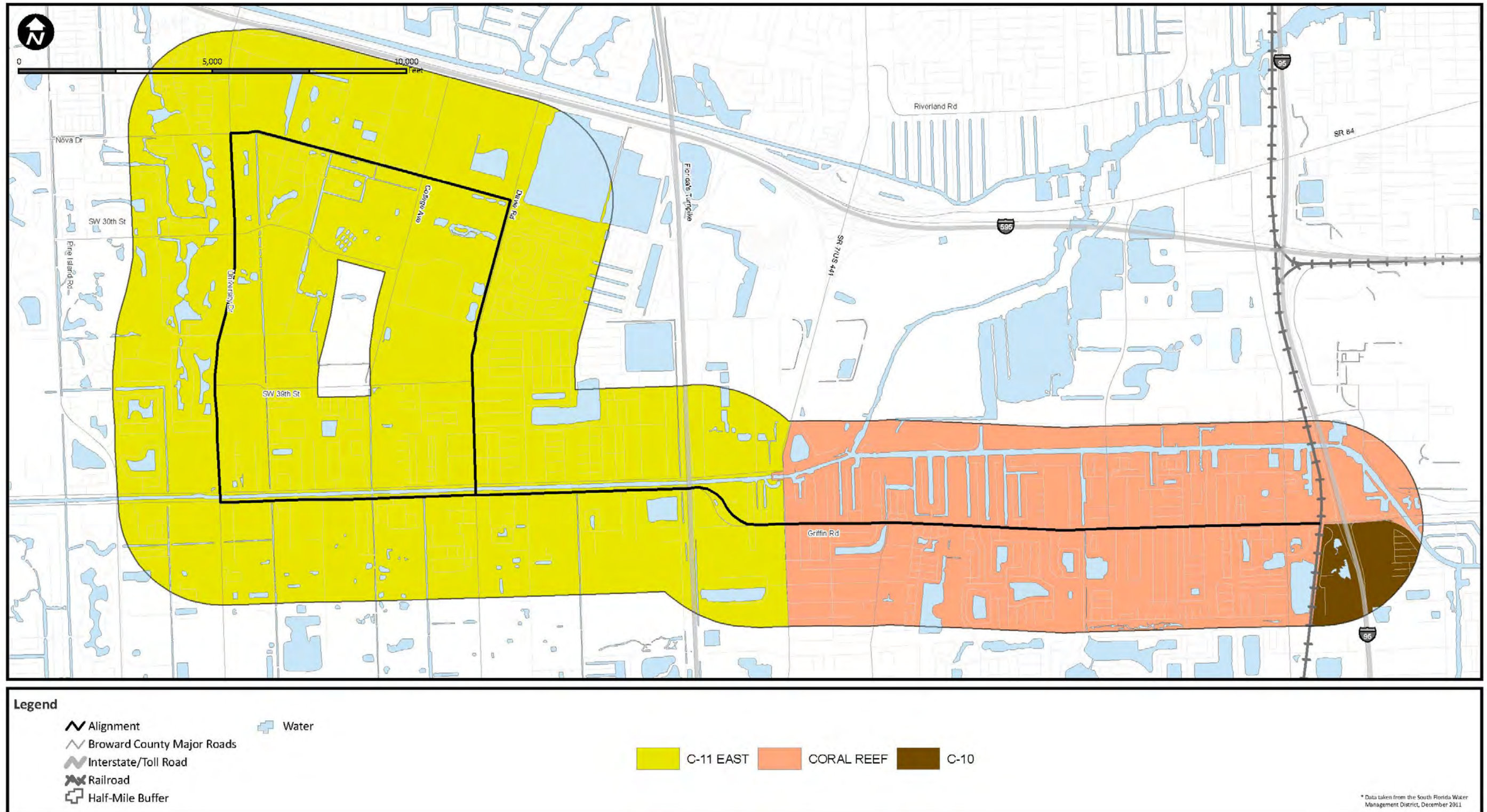


Exhibit 17: Central SR 7/Broward Boulevard Segment Drainage Basins Map

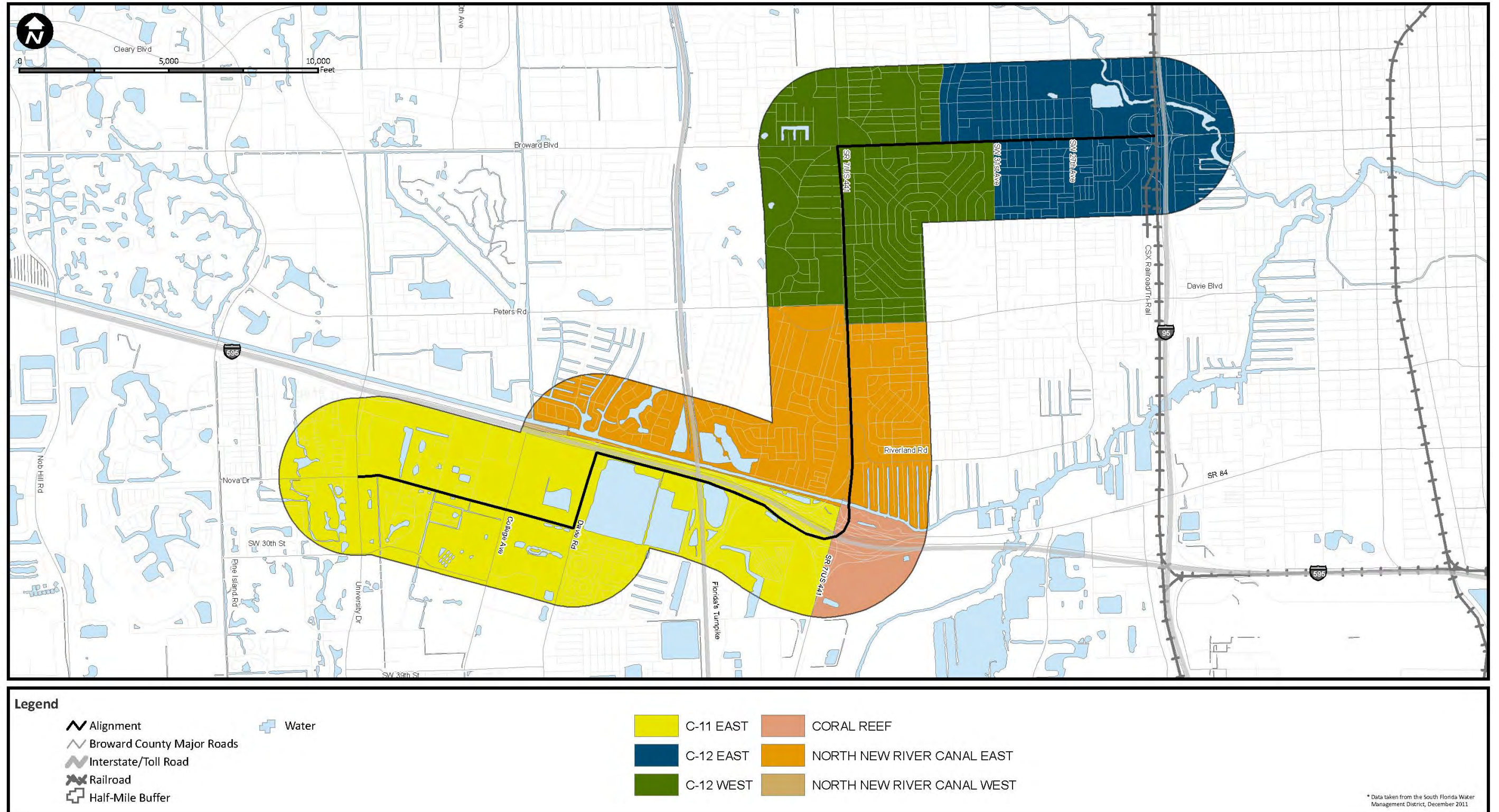


Exhibit 18: Eastern Segment Drainage Basins Map

