1 EXECUTIVE SUMMARY

EPA's "Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments" Final Rule (40 C.F.R. Part 257, Subpart D) subsection §257.81 requires the owner or operator of an existing or new CCR landfill or any lateral expansion of a CCR landfill to prepare a run-on and run-off control system plan to document how these control systems have been designed and constructed to meet the applicable requirements of this section of the rule. Each plan is to be supported by appropriate engineering calculations. The original plan was prepared October 17, 2016, and is being revised in accordance with §257.81(c)(4).

Ash Landfill No. 1 is located at the Florida Power & Light Company (FPL) Gulf Clean Energy Center (formerly Plant Crist) in Pensacola, Florida. The facility consists of a dry CCR storage cell and a sedimentation pond. The sedimentation pond is shared between Ash Landfill 1 and Ash Landfill 2.

The storm water flows have been calculated using the National Resources Conservations Service method (also known as the Soil Conservation Service (SCS) method) using 25-year, 24-hour storm events. Runoff curve number data was determined using Table 2-2A from the Urban Hydrology for Small Watersheds (TR-55).

Appendix B from the TR-55 was used to determine the rainfall distribution methodology. Precipitation values were determined from National Oceanic and Atmospheric Administration (NOAA) Atlas 14 Point Precipitation Frequency Estimates.

The NRCS provided information on the soil characteristics and hydrologic groups present at the site. The soil characteristics and hydrologic groups were determined based on the Escambia County Soil Survey. This information was placed into Interconnected Pond Routing (ICPR) Version 4.07.08 and used to generate appropriate precipitation curves, runoff curve numbers and storm basin runoff values.

Ash Landfill 1 is designed and constructed such that the active portion of the landfill is higher than the surrounding area, and is surrounded by perimeter ditches, which prevents run-on to the landfill. Run-on is diverted through the perimeter ditches to the sedimentation pond. Run-off from the landfill is directed to a collection area at the low end of the cell via interior ditches or sheet flow where it is then diverted to the sedimentation pond. The water level in the sedimentation pond is controlled by a dual pumping system. During a 25-year, 24-hour storm event, the discharge into the sedimentation pond results in a water level rise to approximately elevation 107.3ft. This is below the crest elevation of the sedimentation pond dike of elevation 108.8ft, leaving additional storage capacity available, if needed, for larger storm events.

The facility is operated subject to and in accordance with 40 C.F. R. §257.3-3 of EPA's regulations.

I hereby certify that this Run-On and Run-Off Control Plan meets the requirements of 40 C.F.R. §257.81

Christopher K. Nobles, P.E.
Hargrove & Associates, Inc. (Florida Certificate of Authorization No. 8496)
Florida License No. 63238

2 INTRODUCTION

Florida Power & Light Company (FPL) operates a Coal Combustion Residual (CCR) landfill at its Gulf Clean Energy Center (formerly Plant Crist) in Pensacola, Florida. The CCR landfill is regulated by the United States Environmental Protection Agency's (EPA) rule for Disposal of CCR in Landfills and Surface Impoundments (40 C.F.R. Part 257, Subpart D). The information provided in this document is to demonstrate the run-on and run-off controls of the subject CCR landfill.

3 SITE INFORMATION

3.1 Existing Conditions

FPL operates two ash landfills at its Gulf Clean Energy Center in Pensacola, Florida. The total area occupied by the landfills is roughly 78 acres and includes a fly ash landfill (Landfill 1 - 60 acres), bottom ash landfill (Landfill 2 - 18 acres), and associated stormwater sedimentation basin and conveyance system. A large portion of Landfill 1 has been capped and is used for plant support activities such as equipment storage and parking. Runoff from Landfill 1 is conveyed by culverts and perimeter ditches to the sedimentation basin. Stormwater from the sedimentation basin is then conveyed by an outfall structure to the sedimentation pond. Stormwater from the closed interim landfill and neighboring parking lot is collected in the sedimentation pond. The runoff from the parking lot is conveyed by large ditches to the sedimentation pond. The closed interim landfill, Landfill 1, Landfill 2, and parking lot combined add approximately 125.6 acres of runoff to the sedimentation pond. The stormwater collected in the sedimentation pond discharges through evaporation, percolation to groundwater and/or by pumping to the cooling tower canal as authorized under the facility's NPDES industrial wastewater permit.

3.2 Soil Conditions

The soils within the project limits are identified on the "Custom Soil Resource Report for Escambia County, Florida", dated August 10, 2021, and are provided in the table below:

Map Unit	Map Unit Name	Hydrologic Soil Group
16	Arents-Urban land complex	A
24	Poarch sandy loam, 0 to 2% slopes	C
25	Poarch sandy loam, 2 to 5% slopes	C
32	Troup sand, 0 to 5% slopes	A
54	Troup-Poarch complex, 8 to 12% slopes	A
55	Troup-Poarch complex, 2 to 5% slopes	A
99	Water	-

The predominant hydrologic soil group for the site is A. The soil survey report can be found in Appendix D.

4 METHODOLOGY

4.1 Hydrologic and Hydraulic (H&H) Analysis

The hydrologic and hydraulic (H&H) analysis was performed using Interconnected Pond Routing (ICPR) Version 4.07.08. The National Resources Conservation Service (NRCS) TR-55 methodology was used to calculate rainfall runoff in the model. Direct rainfall runoff response was developed using a unit hydrograph with a shape factor of 484.

4.2 Rainfall

The following rainfall event was used for the evaluation of the stormwater management facility:

25-year, 24-hour storm event	11.5 inches

The rainfall totals were obtained from the NOAA Atlas 14, Volume 9, Version 2 Precipitation Frequency Data Set. The type of rainfall distribution used in the model was the Soil Conservation Service (SCS) Type III Distribution.

4.3 Drainage Basin Delineation

The main drainage areas for the project were delineated based on LiDAR data obtained from Northwest Florida Water Management District. Information dataset is based on 2017 data. Additional survey data was collected at the existing sedimentation pond and basins by Jackson Land Surveying, LLC on April 13, 2021, and during the timeframe of July 26 to August 4, 2021, respectively

The drainage area was delineated into four (4) main areas:

Basin	Size Drainage Area (Acres)	Description
LF1	45.7	Active and Capped Landfill No. 1 (Fly Ash Landfill); Sedimentation Basin
ILS	47.2	Capped Landfill No. 1; Parking Lot; Southern Portion of Closed Interim Landfill; and Southern Portion of Sedimentation Pond
ILN	14.5	Northern Portion of Closed Interim Landfill; Northern Portion of Sedimentation Pond
LF2	18.2	Active Landfill No. 2 (Bottom Ash Landfill); Sedimentation Basin

The four main basins were further divided into subbasins for the H&H analysis. See Appendix A for the Drainage Basin Delineation Map (SK-11886-CV-001) for the four main basins. The subbasin delineation within the four main basins is not shown on the map.

4.4 Time of Concentration

The time of concentration (t_c) is the time it takes for runoff to travel from the hydraulically most distant part of the subbasin to the determined subbasin outlet or other point of reference. The t_c was calculated based on the slope of the ground, travel distance within the basin, and type of ground cover, using the NRCS TR-55 method, "Urban Hydrology for Small Watersheds". The tc for the subbasins ranged from 6 minutes to 47 minutes. The t_c for each subbasins can be found in Appendix B for each subbasin.

4.5 Weighted Curve Number (Equivalent Curve Number)

In order to calculate runoff, the existing subbasins must be assigned a weighted Curve Number (CN). The CNs are determined by overlaying land use and hydrologic soil group data within the subbasin. The land use areas were delineated based on aerial photography and design data. Each unique land use and hydrologic soil group combination is assigned a specific CN. The areas of each unique curve number are then summed and divided by the area of the subbasin to determine the percentage of contribution for each curve number. Each curve number in the basin is then multiplied by its respective percentage and the results summed. The resulting number is the "weighted CN" which is considered a representative composite for the subbasin. The "weighted CN" or "Equivalent CN" ranged between 30 to 79.1 for each basin. Subbasins associated only with the ponds have an "Equivalent CN" of 100. The "Equivalent CN" for each subbasin can be found in Appendix C for each subbasin.

5 H&H RESULTS

ICPR was used to model the existing conditions at the site. The main focus of the H&H model was to determine Run-on Control and Run-Off Control System based on a 25-year, 24-hour storm event.

5.1 Run-on Control System Plan

There is no stormwater run-on into the facility because the active portion of both Landfill 1 and Landfill 2 is higher than the surrounding area and therefore prevents any stormwater run-on onto the exposed ash.

5.2 Run-off Control System Plan

The runoff from the Landfill 1 and Landfill 2 ultimately is routed to the sedimentation pond. As necessary, the discharge from the sedimentation pond is routed to the cooling tower canal using a pumping system. The pumping system consists of the following pumps:

- Two (2) alternating 1,000 gallon per minute (gpm) pumps;
- One (1) 600 gpm pump.

The ultimate pumping capacity is 1,600 gpm (3.57 cfs) total. Only one (1) of the 1,000 gpm pumps can run at one time.

The results of routing the design storm event through the landfill are presented in the following table:

Sedimentation Pond

Normal Pool Elev. (ft)	Top of Embankment Elev. (ft)	Peak Water Surface Elev. (ft)	Freeboard* (ft)	Peak Inflow (cfs)	Peak Outflow(cfs)
96.5	108.8	107.3	1.5	167.9	3.57

*Freeboard is measured from the top of the embankment to the peak water surface elevation.

6 APPENDICES

Appendix A Drainage Basin Delineation Map

Appendix B ICPR Input Data

Appendix C ICPR Results

Appendix D Soil Survey

APPENDIX A

DRAINAGE BASIN DELINEATION MAP

NOTES:

1. TOPOGRAPHIC DATA FOR THE ENTIRE SITE WAS OBTAINED FROM THE NORTHWEST FLORIDA MANAGEMENT DISTRICT. DATASET BASED ON 2017 INFORMATION.
2. TOPOGRAPHIC DATA FOR THE FLY ASH, BOTTOM ASH, AND SEDIMENTATION POND WAS OBTAINED BY JACKSON LAND SURVEYING, LLC (NOT SHOWN).
3. TOPOGRAPHIC DATA HAS BEEN ADJUSTED BASED ON PLANT CORRECTION FACTOR OF 72.79 FT FROM FLORIDA STATE PLANE COORDINATES TO PLANT DATUM.
4. DRAINAGE BASIN DELINEATION BASED ON TOPOGRAPHIC DATA.

DRAINAGE BASIN DELINEATION:

- BASIN LF1
- BASIN ILS
- BASIN ILN
- BASIN LF2

NO.	DATE	REVISIONS	BY	CK.	APPR.	REFERENCE DRAWINGS
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–
A	9/24/21	ISSUED FOR INFORMATION	CKN	AMC	CKN	

NEXTera ENERGY

DRAWN BY CKN	DATE 9/1/21
CHECKED BY AMC	DATE 9/1/21
APPROVED BY CKN	DATE 8/25/21
COST/SCHEDULE/ AREA	–
SCALE	1"=200'

hargrove engineers+constructors
Hargrove and Associates Inc.
20 S Royal St. Mobile, AL 36602
251.476.0605 - hargrove-epc.com

DRAWING TITLE

NEXTERA ENERGY
GULF CLEAN ENERGY CENTER
FLORIDA POWER & LIGHT
DRAINAGE BASIN DELINEATION MAP

P.O. NO.	
APPROVED BY –	DATE –
APPROVED BY –	DATE –
DRAWING NUMBER SK-11886-CV-001	REV. A

APPENDIX B

ICPR INPUT DATA

Simulation: 025Y24HR

Scenario: Scenario1
Run Date/Time: 8/27/2021 11:45:52 AM
Program Version: ICPR4 4.07.08

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	36.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: Plant Crist_1
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: Plant Crist

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain: Global

		Opt:	
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SCSIII-24
		Rainfall Amount:	11.50 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment: Sources:
1. NOAA Atlas 14 ,Volume 9, Version 2, 25-yr, 24-hr rainfall
2. Rainfall Distribution from TR-55, Figure B-2.

Manual Basin: ILN-1

Scenario:	Scenario1
Node:	ILN-1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	47.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH484
Peaking Factor:	484.0
Area:	12.2300 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
6.0400	Open Space (grass cover >75%)	A	
3.3100	Woods - Good	A	
1.1000	Open Space (grass cover 50 to 75%)	A	
1.7800	Gravel	A	

Comment:

Manual Basin: ILN-2

Scenario:	Scenario1
Node:	SED POND
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	6.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH484

Peaking Factor: 484.0
Area: 2.2200 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
2.2200	WATER	A	

Comment:

Manual Basin: ILS-1

Scenario: Scenario1
Node: ILS-1
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 2.4900 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
0.4600	Asphalt	A	
1.0600	Gravel	A	
0.6100	Woods - Good	A	
0.3600	Open Space (grass cover 50 to 75%)	A	

Comment:

Manual Basin: ILS-2

Scenario: Scenario1
Node: ILS-2
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 7.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 2.3600 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
2.0700	Gravel	A	
0.2900	Open Space (grass cover >75%)	A	

Comment:

Manual Basin: ILS-3

Scenario: Scenario1
Node: ILS-3
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 13.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 18.9200 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
1.7500	Asphalt	A	
9.5500	Gravel	A	
6.0500	Woods - Good	A	
1.5700	Open Space (grass cover 50 to 75%)	A	

Comment:

Manual Basin: ILS-4

Scenario: Scenario1
Node: ILS-4
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 14.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 10.9600 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
2.8600	Gravel	A	
1.2500	Woods - Fair	A	
3.0200	Woods - Good	A	
3.8300	Open Space (grass cover >75%)	A	

Comment:

Manual Basin: ILS-5

Scenario: Scenario1
Node: ILS-5
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number

Time of Concentration: 30.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 10.5900 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
3.7900	Woods - Good	A	
2.7400	Open Space (grass cover >75%)	A	
1.4000	Gravel	A	
2.6600	Open Space (grass cover 50 to 75%)	A	

Comment:

Manual Basin: ILS-6

Scenario: Scenario1
Node: SED POND
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 6.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 1.8500 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
1.8500	WATER	A	

Comment:

Manual Basin: L1-1

Scenario: Scenario1
Node: L1-1
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 6.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 6.4800 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
0.4800	Asphalt	A	

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
2.9400	Woods - Fair	A	
3.0600	Gravel	A	

Comment:

Manual Basin: L1-2

Scenario: Scenario1
Node: L1-2
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 18.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 4.5700 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
3.7100	Gravel	A	
0.8600	Woods - Fair	A	

Comment:

Manual Basin: L1-3

Scenario: Scenario1
Node: L1-3
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 35.6000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 8.9600 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
1.8900	Woods - Good	A	
0.1100	Gravel	A	
5.7400	Open Space (grass cover >75%)	A	
1.2200	Gravel	A	

Comment:

Manual Basin: L1-4

Scenario: Scenario1
Node: FA POND
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 6.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 9.8000 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
0.9200	Gravel	A	
2.1500	WATER	A	
0.1900	Woods - Fair	A	
6.5400	Open Space (grass cover >75%)	A	

Comment:

Manual Basin: L1-5

Scenario: Scenario1
Node: L1-5
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 6.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 15.0300 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
11.4900	Dirt	A	
3.5400	Open Space (grass cover 50 to 75%)	A	

Comment:

Manual Basin: L1-6

Scenario: Scenario1
Node: L1-6
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 6.0000 min
Max Allowable Q: 0.00 cfs

Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 0.8300 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
0.8300	Woods - Good	A	

Comment:

Manual Basin: L2-1

Scenario: Scenario1
Node: L2-1
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 6.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 13.9300 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
4.6300	Dirt	A	
0.8300	Dirt	C	
2.3200	Open Space (grass cover<50%)	C	
3.7800	Open Space (grass cover<50%)	A	
0.4600	Open Space (grass cover >75%)	A	
1.9100	Gravel	A	

Comment:

Manual Basin: L2-2

Scenario: Scenario1
Node: BA POND
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 6.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 4.2600 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
1.0900	Open Space (grass cover 50 to 75%)	A	
1.8200	WATER	A	
0.9200	Open Space (grass cover 50 to 75%)	C	
0.3100	Gravel	A	
0.1200	Gravel	A	

Comment:

Node: BA POND

Scenario: Scenario1
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 86.59 ft
Warning Stage: 107.79 ft

Stage [ft]	Area [ac]	Area [ft2]
86.59	0.0000	1
86.79	0.0011	48
87.79	0.0420	1830
88.79	0.1150	5009
89.79	0.1940	8451
90.79	0.3080	13416
91.79	0.5070	22085
91.99	0.5850	25483
92.79	0.6790	29577
93.79	0.7260	31625
94.79	0.7750	33759
95.79	0.8260	35981
96.79	0.8790	38289
97.79	0.9320	40598
98.79	0.9870	42994
99.79	1.0440	45477
100.79	1.1030	48047
101.79	1.1760	51227
102.79	1.2510	54494
103.79	1.3180	57412
104.79	1.3880	60461
105.79	1.4650	63815
106.79	1.5500	67518
107.79	1.6440	71613

Comment: Sedimentation Pond was surveyed by Jackson Land Surveying.

Survey was performed in State Plane Coordinates with NAVD 1988 datum. Elevation data was converted to Plant Datum using a

+72.29' conversion.

Node: FA POND

Scenario: Scenario1
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 101.79 ft
Warning Stage: 116.79 ft

Stage [ft]	Area [ac]	Area [ft2]
101.79	0.2696	11744
102.79	0.5562	24228
103.79	0.6609	28789
104.79	0.8184	35650
105.79	1.0247	44636
106.79	1.1792	51366
107.79	1.3184	57430
108.79	1.4113	61476
109.79	1.4996	65323
110.79	1.5824	68929
111.79	1.6643	72497
112.79	1.7442	75977
113.79	1.8280	79628
114.79	1.9347	84276
115.79	2.0393	88832
116.79	2.1807	94991
117.79	2.3293	101464

Comment: Sedimentation Pond was surveyed by Jackson Land Surveying.

Survey was performed in State Plane Coordinates with NAVD 1988 datum. Elevation data was converted to Plant Datum using a +72.29' conversion.

Node: OUTFALL

Scenario: Scenario1
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 0.00 ft
Warning Stage: 0.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	0.00
0	0	0	999.0000	0.00

Comment:

Node: SED POND

Scenario: Scenario1
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 96.30 ft
Warning Stage: 108.79 ft

Stage [ft]	Area [ac]	Area [ft2]
82.79	0.0027	118
83.79	0.0376	1638
84.79	0.1001	4360
85.79	0.1961	8542
86.79	0.3057	13316
87.79	0.4742	20656
88.79	0.6317	27517
89.79	0.7643	33293
90.79	0.8715	37963
91.79	1.0023	43660
92.79	1.1391	49619
93.79	1.3196	57482
94.79	1.5224	66316
95.79	1.7286	75298
96.79	2.0279	88335
97.79	2.3093	100593
98.79	2.5561	111344
99.79	2.9699	129369
100.79	3.0656	133538
101.79	3.1831	138656
102.79	3.3045	143944
103.79	3.4190	148932
104.79	3.5351	153989
105.79	3.6506	159020
106.79	3.7713	164278
107.79	3.8933	169592
108.79	4.0248	175320

Comment: Sedimentation Pond was surveyed by Jackson Land Surveying.

Survey was performed in State Plane Coordinates with NAVD 1988 datum. Elevation data was converted to Plant Datum using a +72.29' conversion.

Curve Number: Plant Crist_1 [Set]

Land Cover Zone	Soil Zone	Curve Number [dec]
Asphalt	A	98.0
Dirt	A	72.0
Dirt	C	87.0
Gravel	A	76.0
Open Space (grass cover 50 to 75%)	A	49.0
Open Space (grass cover 50 to 75%)	C	79.0
Open Space (grass cover >75%)	A	39.0
Open Space (grass cover<50%)	A	68.0
Open Space (grass cover<50%)	C	86.0
WATER	A	100.0
Woods - Fair	A	36.0
Woods - Good	A	30.0
Woods - Good	C	70.0
Woods - Poor	A	45.0

APPENDIX C

ICPR RESULTS

Manual Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
ILN-1	025Y24HR	20.68	12.6167	11.50	3.50	12.2300	42.7	0.00	0.00

Manual Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
ILN-2	025Y24HR	17.37	12.1667	11.50	11.50	2.2200	100.0	0.00	0.00

Manual Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
ILS-1	025Y24HR	12.79	12.2333	11.50	6.75	2.4900	64.1	18.47	18.47

Manual Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
ILS-2	025Y24HR	14.90	12.1833	11.50	7.76	2.3600	71.1	0.00	0.00

Manual Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
ILS-3	025Y24HR	89.10	12.2667	11.50	6.20	18.9200	60.3	9.25	9.25

Manual Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
ILS-4	025Y24HR	33.42	12.2833	11.50	3.93	10.9600	45.5	0.00	0.00

Manual Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
ILS-5	025Y24HR	23.16	12.4333	11.50	3.55	10.5900	43.0	0.00	0.00

Manual Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
ILS-6	025Y24HR	14.48	12.1667	11.50	11.50	1.8500	100.0	0.00	0.00

Manual Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
L1-1	025Y24HR	30.92	12.2000	11.50	5.94	6.4800	58.7	7.41	7.41

Manual Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
L1-2	025Y24HR	25.24	12.2833	11.50	7.31	4.5700	68.0	0.00	0.00

Manual Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
L1-3	025Y24HR	17.40	12.5000	11.50	3.45	8.9600	42.4	0.00	0.00

Manual Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
L1-4	025Y24HR	40.36	12.2000	11.50	5.31	9.8000	54.4	0.00	0.00

Manual Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
L1-5	025Y24HR	89.27	12.1833	11.50	7.07	15.0300	66.4	0.00	0.00

Manual Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
L1-6	025Y24HR	1.09	12.2667	11.50	1.55	0.8300	30.0	0.00	0.00

Manual Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
L2-1	025Y24HR	91.50	12.1833	11.50	8.06	13.9300	73.4	0.00	0.00

Manual Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
L2-2	025Y24HR	28.01	12.1833	11.50	8.82	4.2600	78.9	0.00	0.00

Node Max Conditions w/ Times [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
BA POND	025Y24 HR	107.79	103.40	0.0010	44.63	1.23	56275	24.2895	0.0864	12.2000	9.3090

Node Max Conditions w/ Times [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage	Max Total Inflow	Max Total Outflow	Max Surface Area	Time to Max Stage	Time to Min/Max Delta	Time to Max Total	Time to Max Total

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
FA POND	025Y24HR	116.79	111.77	0.0005	192.94	47.86	75094	12.8052	2.7690	12.2450	12.8052

Node Max Conditions w/ Times [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
OUTFALL	025Y24HR	0.00	0.00	0.0000	3.57	0.00	0	0.0000	0.0000	11.6810	0.0000

Node Max Conditions w/ Times [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
SED POND	025Y24HR	108.79	107.28	0.0002	167.90	3.57	167142	25.6851	12.5586	12.5052	11.6810

APPENDIX D

SOIL SURVEY

United States Department of Agriculture

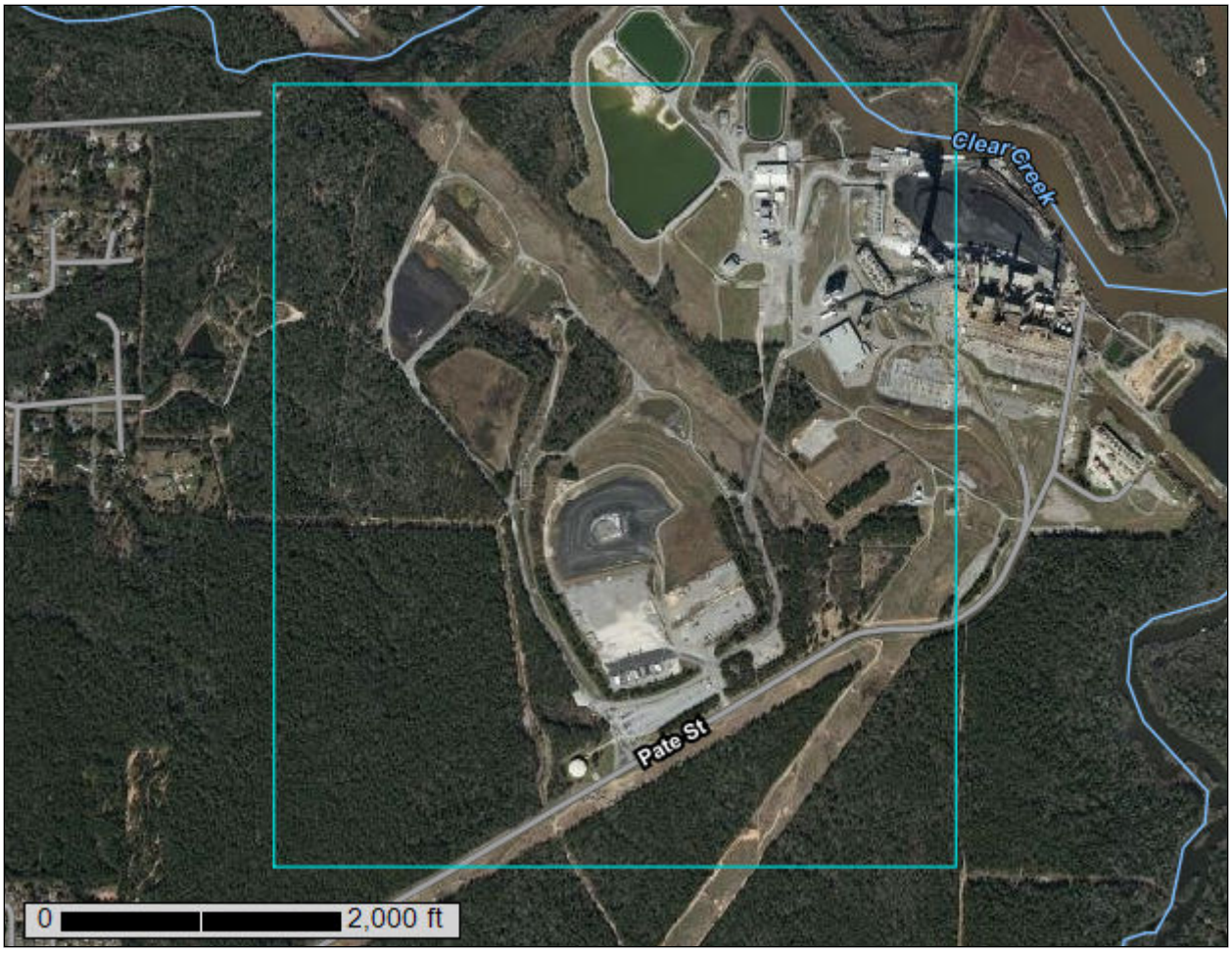
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Escambia County, Florida

Gulf Clean Energy Site



August 10, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (Gulf Clean Energy Site)

Map Scale: 1:11,500 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 150 300 600 900

Feet
0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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: Escambia County, Florida
Survey Area Data: Version 20, Jun 11, 2020

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

Date(s) aerial images were photographed: Feb 3, 2020—Feb 28, 2020

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.

Map Unit Legend (Gulf Clean Energy Site)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
16	Arents-Urban land complex	47.8	7.6%
24	Poarch sandy loam, 0 to 2 percent slopes	4.4	0.7%
25	Poarch sandy loam, 2 to 5 percent slopes	29.7	4.7%
32	Troup sand, 0 to 5 percent slopes	203.4	32.5%
33	Troup sand, 5 to 8 percent slopes	5.5	0.9%
38	Bonifay loamy sand, 0 to 5 percent slopes	6.4	1.0%
49	Dorovan muck and Fluvaquents, frequently flooded	23.5	3.8%
54	Troup-Poarch complex, 8 to 12 percent slopes	229.4	36.6%
55	Troup-Poarch complex, 2 to 5 percent slopes	39.9	6.4%
56	Troup-Poarch complex, 5 to 8 percent slopes	17.0	2.7%
99	Water	19.6	3.1%
Totals for Area of Interest		**626.5**	**100.0%**

Map Unit Descriptions (Gulf Clean Energy Site)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion

of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Escambia County, Florida

16—Arents-Urban land complex

Map Unit Setting

National map unit symbol: 1jv56
Elevation: 0 to 210 feet
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 276 to 306 days
Farmland classification: Not prime farmland

Map Unit Composition

Arents and similar soils: 60 percent
Urban land: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arents

Setting

Landform: Rises on marine terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Altered marine deposits

Typical profile

AC - 0 to 80 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 50.02 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: A
Forage suitability group: Forage suitability group not assigned (G133AA999FL)
Other vegetative classification: Forage suitability group not assigned (G133AA999FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Marine terraces

Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G133AA999FL)
Other vegetative classification: Forage suitability group not assigned (G133AA999FL)
Hydric soil rating: Unranked

24—Poarch sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1jv5f
Elevation: 30 to 280 feet
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 276 to 306 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Poarch and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Poarch

Setting

Landform: Rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: sandy loam
Bt - 5 to 31 inches: sandy loam
Btv - 31 to 80 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 30 to 60 inches
Frequency of flooding: None
Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Forage suitability group: Loamy and clayey soils on flats of hydric or mesic lowlands (G133AA331FL)
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G133AA331FL)
Hydric soil rating: No

Minor Components

Perdido

Percent of map unit: 3 percent
Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on rises and knolls of mesic uplands (G133AA321FL)
Hydric soil rating: No

Notcher

Percent of map unit: 3 percent
Landform: Rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on rises and knolls of mesic uplands (G133AA321FL)

Escambia

Percent of map unit: 2 percent
Landform: Rises on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G133AA331FL)
Hydric soil rating: No

Bonifay

Percent of map unit: 2 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G133AA121FL)
Hydric soil rating: No

25—Poarch sandy loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1jv5g
Elevation: 20 to 280 feet
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 276 to 306 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Poarch and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Poarch

Setting

Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: sandy loam
Bt - 5 to 31 inches: sandy loam
Btv - 31 to 80 inches: sandy loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 30 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Forage suitability group: Loamy and clayey soils on flats of hydric or mesic lowlands (G133AA331FL)

Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G133AA331FL)
Hydric soil rating: No

Minor Components

Notcher
Percent of map unit: 5 percent
Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on rises and knolls of mesic uplands (G133AA321FL)
Hydric soil rating: No

Bonifay
Percent of map unit: 5 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G133AA121FL)
Hydric soil rating: No

Perdido
Percent of map unit: 3 percent
Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on rises and knolls of mesic uplands (G133AA321FL)
Hydric soil rating: No

Bama
Percent of map unit: 2 percent
Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on knolls and ridges of mesic uplands (G133AA311FL)
Hydric soil rating: No

32—Troup sand, 0 to 5 percent slopes

Map Unit Setting
National map unit symbol: 2ttkc
Elevation: 100 to 430 feet

Mean annual precipitation: 59 to 69 inches
Mean annual air temperature: 55 to 70 degrees F
Frost-free period: 209 to 295 days
Farmland classification: Farmland of local importance

Map Unit Composition

Troup and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Troup

Setting

Landform: Knolls, ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 6 inches: sand
E - 6 to 46 inches: sand
Bt - 46 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: R133AY002FL - Longleaf Pine-Turkey Oak Hills
Forage suitability group: Sandy soils on ridges and dunes of xeric uplands (G133AA111FL)
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G133AA111FL)
Hydric soil rating: No

Minor Components

Blanton

Percent of map unit: 10 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope, interfluve

Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R133AY002FL - Longleaf Pine-Turkey Oak Hills
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G133AA121FL)
Hydric soil rating: No

Lakeland

Percent of map unit: 5 percent
Landform: Hills on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R133AY002FL)
Hydric soil rating: No

Foxworth

Percent of map unit: 5 percent
Landform: Ridges on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R133AY002FL - Longleaf Pine-Turkey Oak Hills
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G133AA121FL)
Hydric soil rating: No

33—Troup sand, 5 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2ttkr
Elevation: 100 to 400 feet
Mean annual precipitation: 40 to 69 inches
Mean annual air temperature: 55 to 70 degrees F
Frost-free period: 190 to 310 days
Farmland classification: Not prime farmland

Map Unit Composition

Troup and similar soils: 88 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Troup

Setting

Landform: Ridges, knolls, marine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope, interfluve

Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 4 inches: sand
E - 4 to 53 inches: loamy sand
Bt1 - 53 to 65 inches: sandy loam
Bt2 - 65 to 80 inches: sandy clay loam

Properties and qualities

Slope: 5 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: R133AY002FL - Longleaf Pine-Turkey Oak Hills
Forage suitability group: Sandy soils on ridges and dunes of xeric uplands (G133AA111FL)
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G133AA111FL)
Hydric soil rating: No

Minor Components

Bonifay

Percent of map unit: 4 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve, side slope, tread
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G133AA121FL)
Hydric soil rating: No

Lucy

Percent of map unit: 4 percent
Landform: Broad interstream divides
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Sandy over loamy soils on knolls and ridges of mesic uplands (G133AA211FL)
Hydric soil rating: No

Lakeland

Percent of map unit: 4 percent
Landform: Hills on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve, side slope, riser
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R133AY002FL)
Hydric soil rating: No

38—Bonifay loamy sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2tsyc
Elevation: 50 to 390 feet
Mean annual precipitation: 45 to 73 inches
Mean annual air temperature: 52 to 72 degrees F
Frost-free period: 246 to 306 days
Farmland classification: Farmland of local importance

Map Unit Composition

Bonifay and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bonifay

Setting

Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 3 inches: loamy sand
E - 3 to 54 inches: loamy sand
Btv - 54 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.58 in/hr)
Depth to water table: About 42 to 60 inches
Frequency of flooding: None
Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Forage suitability group: Sandy soils on rises, knolls, and ridges of mesic uplands (G133AA121FL)
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G133AA121FL)
Hydric soil rating: No

Minor Components

Albany

Percent of map unit: 4 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G133AA131FL)
Hydric soil rating: No

Blanton

Percent of map unit: 4 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve, base slope, tread
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G133AA121FL)
Hydric soil rating: No

Troup

Percent of map unit: 4 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G133AA111FL)
Hydric soil rating: No

Lakeland

Percent of map unit: 4 percent
Landform: Hills on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, riser
Down-slope shape: Convex
Across-slope shape: Linear

Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G133AA111FL)
Hydric soil rating: No

Fuquay

Percent of map unit: 4 percent
Landform: Ridges on marine terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve, riser
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy over loamy soils on rises, knolls, and ridges of mesic uplands (G133AA221FL)
Hydric soil rating: No

49—Dorovan muck and Fluvaquents, frequently flooded

Map Unit Setting

National map unit symbol: 1jv66
Elevation: 0 to 450 feet
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 276 to 306 days
Farmland classification: Not prime farmland

Map Unit Composition

Dorovan and similar soils: 45 percent
Fluvaquents and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dorovan

Setting

Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Organic material

Typical profile

Oa1 - 0 to 8 inches: muck
Oa2 - 8 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: About 0 to 6 inches
Frequency of flooding: FrequentNone
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Very high (about 13.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: B/D
Forage suitability group: Organic soils in depressions and on flood plains (G133AA645FL)
Other vegetative classification: Organic soils in depressions and on flood plains (G133AA645FL)
Hydric soil rating: Yes

Description of Fluvaquents

Setting

Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy fluvial sediments

Typical profile

A - 0 to 4 inches: fine sand
C - 4 to 25 inches: sandy loam
Cg - 25 to 40 inches: sandy clay loam
2Cg - 40 to 80 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.57 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: FrequentNone
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C/D
Forage suitability group: Forage suitability group not assigned (G133AA999FL)
Other vegetative classification: Forage suitability group not assigned (G133AA999FL)
Hydric soil rating: Yes

Minor Components

Mantachie

Percent of map unit: 5 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on stream terraces, flood plains, or in depressions (G133AA345FL)
Hydric soil rating: No

Bigbee

Percent of map unit: 5 percent
Landform: Stream terraces on marine terraces, flood plains on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on stream terraces or flood plains (G133AA114FL)
Hydric soil rating: No

Pelham

Percent of map unit: 5 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G133AA245FL)
Hydric soil rating: Yes

54—Troup-Poarch complex, 8 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2ttlw
Elevation: 120 to 280 feet
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 276 to 306 days
Farmland classification: Not prime farmland

Map Unit Composition

Troup and similar soils: 45 percent
Poarch and similar soils: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Troup

Setting

Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: sand
E - 5 to 58 inches: sand
Bt1 - 58 to 68 inches: sandy loam
Bt2 - 68 to 80 inches: sandy clay loam

Properties and qualities

Slope: 8 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Forage suitability group: Sandy soils on strongly sloping to steep side slopes of xeric uplands (G133AA113FL)
Other vegetative classification: Sandy soils on strongly sloping to steep side slopes of xeric uplands (G133AA113FL)
Hydric soil rating: No

Description of Poarch

Setting

Landform: Ridges on marine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: sandy loam
Bt - 5 to 31 inches: sandy loam
Btv - 31 to 80 inches: sandy loam

Properties and qualities

Slope: 8 to 12 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 30 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Forage suitability group: Loamy and clayey soils on rises, knolls, and ridges of mesic uplands (G133AA322FL)
Other vegetative classification: Loamy and clayey soils on rises, knolls, and ridges of mesic uplands (G133AA322FL)
Hydric soil rating: No

Minor Components

Lakeland

Percent of map unit: 7 percent
Landform: Hills on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve, side slope, riser
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R133AY002FL)
Hydric soil rating: No

Bonifay

Percent of map unit: 7 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, tread
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G133AA121FL)
Hydric soil rating: No

Maubila

Percent of map unit: 6 percent
Landform: Ridges on marine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on rises, knolls, and ridges of mesic uplands (G133AA322FL)
Hydric soil rating: No

55—Troup-Poarch complex, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1jv6c
Elevation: 20 to 350 feet
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 276 to 306 days
Farmland classification: Not prime farmland

Map Unit Composition

Troup and similar soils: 45 percent
Poarch and similar soils: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Troup

Setting

Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: sand
E - 5 to 58 inches: sand
Bt1 - 58 to 68 inches: sandy loam
Bt2 - 68 to 80 inches: sandy clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A

Forage suitability group: Sandy soils on ridges and dunes of xeric uplands (G133AA111FL)
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G133AA111FL)
Hydric soil rating: No

Description of Poarch

Setting
Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile
A - 0 to 5 inches: sandy loam
Bt - 5 to 31 inches: sandy loam
Btv - 31 to 80 inches: sandy loam

Properties and qualities
Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 30 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Moderate (about 8.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Forage suitability group: Loamy and clayey soils on flats of hydric or mesic lowlands (G133AA331FL)
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G133AA331FL)
Hydric soil rating: No

Minor Components

Lakeland
Percent of map unit: 5 percent
Landform: Hills on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G133AA111FL)
Hydric soil rating: No

Notcher

Percent of map unit: 5 percent
Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on rises and knolls of mesic uplands (G133AA321FL)
Hydric soil rating: No

Bonifay

Percent of map unit: 5 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G133AA121FL)
Hydric soil rating: No

Albany

Percent of map unit: 3 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G133AA131FL)
Hydric soil rating: No

Escambia

Percent of map unit: 2 percent
Landform: Rises on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G133AA331FL)
Hydric soil rating: No

56—Troup-Poarch complex, 5 to 8 percent slopes

Map Unit Setting

National map unit symbol: 1jv6d
Elevation: 0 to 300 feet
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 276 to 306 days
Farmland classification: Not prime farmland

Map Unit Composition

Troup and similar soils: 45 percent
Poarch and similar soils: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Troup

Setting

Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: sand
E - 5 to 58 inches: sand
Bt1 - 58 to 68 inches: sandy loam
Bt2 - 68 to 80 inches: sandy clay loam

Properties and qualities

Slope: 5 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Forage suitability group: Sandy soils on ridges and dunes of xeric uplands (G133AA111FL)
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G133AA111FL)
Hydric soil rating: No

Description of Poarch

Setting

Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: sandy loam

Bt - 5 to 31 inches: sandy loam
Btv - 31 to 80 inches: sandy loam

Properties and qualities

Slope: 5 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 30 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Forage suitability group: Loamy and clayey soils on rises, knolls, and ridges of mesic uplands (G133AA322FL)
Other vegetative classification: Loamy and clayey soils on rises, knolls, and ridges of mesic uplands (G133AA322FL)
Hydric soil rating: No

Minor Components

Lakeland

Percent of map unit: 5 percent
Landform: Hills on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G133AA111FL)
Hydric soil rating: No

Notcher

Percent of map unit: 5 percent
Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on rises, knolls, and ridges of mesic uplands (G133AA322FL)
Hydric soil rating: No

Bonifay

Percent of map unit: 5 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G133AA121FL)

Hydric soil rating: No

Maubila

Percent of map unit: 3 percent
Landform: Marine terraces, ridges
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on rises, knolls, and ridges of mesic uplands (G133AA322FL)
Hydric soil rating: No

Iuka

Percent of map unit: 2 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on stream terraces and flood plains (G133AA334FL)
Hydric soil rating: No

99—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G133AA999FL)
Other vegetative classification: Forage suitability group not assigned (G133AA999FL)
Hydric soil rating: Unranked

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (Gulf Clean Energy Site)

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.

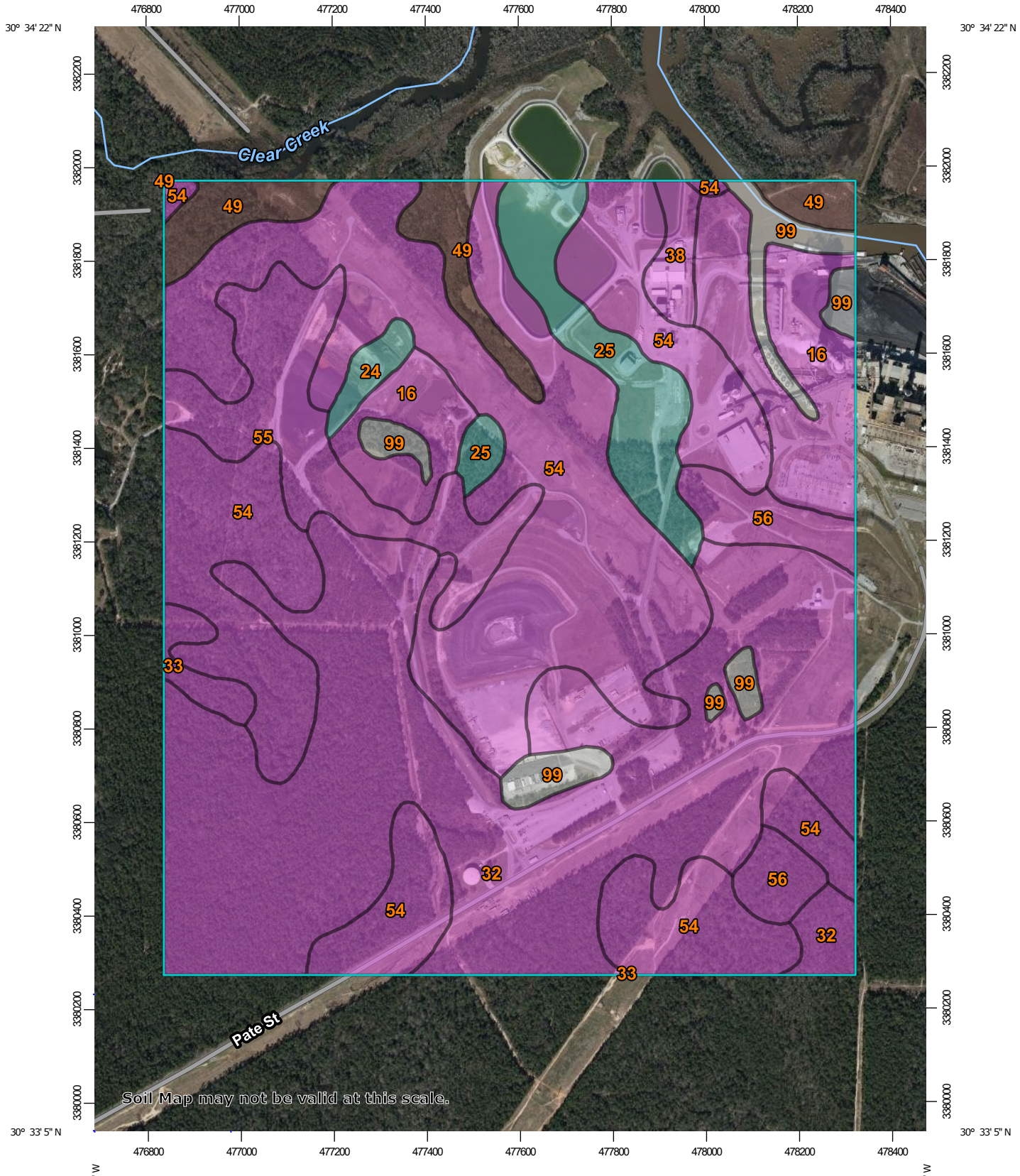
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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.

Custom Soil Resource Report
Map—Hydrologic Soil Group (Gulf Clean Energy Site)



Map Scale: 1:11,500 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N 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 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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: Escambia County, Florida
Survey Area Data: Version 20, Jun 11, 2020

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

Date(s) aerial images were photographed: Feb 3, 2020—Feb 28, 2020

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.

Table—Hydrologic Soil Group (Gulf Clean Energy Site)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
16	Arents-Urban land complex	A	47.8	7.6%
24	Poarch sandy loam, 0 to 2 percent slopes	C	4.4	0.7%
25	Poarch sandy loam, 2 to 5 percent slopes	C	29.7	4.7%
32	Troup sand, 0 to 5 percent slopes	A	203.4	32.5%
33	Troup sand, 5 to 8 percent slopes	A	5.5	0.9%
38	Bonifay loamy sand, 0 to 5 percent slopes	A	6.4	1.0%
49	Dorovan muck and Fluvaquents, frequently flooded	B/D	23.5	3.8%
54	Troup-Poarch complex, 8 to 12 percent slopes	A	229.4	36.6%
55	Troup-Poarch complex, 2 to 5 percent slopes	A	39.9	6.4%
56	Troup-Poarch complex, 5 to 8 percent slopes	A	17.0	2.7%
99	Water		19.6	3.1%
Totals for Area of Interest			**626.5**	**100.0%**

Rating Options—Hydrologic Soil Group (Gulf Clean Energy Site)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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