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Exhibit EE.
Crosspoint North Site
Wetlands Delineation Memo

LOUISIANA ECONOMIC DEVELOPMENT CERTIFIED SITE

GREATER NEW ORLEANS INC
REGIONAL ECONOMIC DEVELOPMENT

J.V. Burkes & Associates, Inc.
1805 Shortcut Highway
Slidell, Louisiana 70458

985.649.0075 office
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www.jvburkes.com

July 17, 2020

Crosspoint North Site Wetlands Delineation Memo

Mr. Gary Silbert
GNO, Inc.
1100 Poydras Street, Suite 3475
New Orleans, LA 70163

RE: Wetland delineation of two parcels identified as Crosspoint North and Crosspoint South containing approximtely 14 acres and 19 acres respectively, located at the NW corner of Interstate 12 at Pumpkin Center Road, Tangipahoa Parish, LA

Dear Mr. Silbert,

At your request, J.V. Burkes & Associates, Inc. provided wetland delineation services for the two parcels identified above. Upon reaching the site to perform the delineation, we observed that most of the southern parcel and a small portion of the northern parcel appeared to have been recently cleared, disked and graded within a few weeks of our arrival. We confirmed this with the landowner. These actions complicate what should have been a relatively simple delineation and created a problem delineation where all three criteria used to identify wetlands - vegetation, hydrology and soils were affected. We had to treat the site as significantly disturbed and not in its normal state. We are currently identifying each site as potentially nonwet, however, should this be submitted to the Corps, additional work may be requested to confirm or refute the delineation call.

Call me or email me barbara@jvburkes.com with any questions you may have regarding the work performed. Please let me in know if you and the landowner would like these reports submitted to the Corps for the official Approved Jurisdictional Determination.

Respectfully,

Barbara Zelenka
Vice President
J.V. Burkes & Associates, Inc.

Wetland Delineation Study

Approximately 14 Acre Site

Known as Cross Point North

Located in Section 31 – T6S – R7E,

Tangipahoa Parish, LA

30 ° 29’ 05.55” N
90 ° 32’ 40.66” W

for

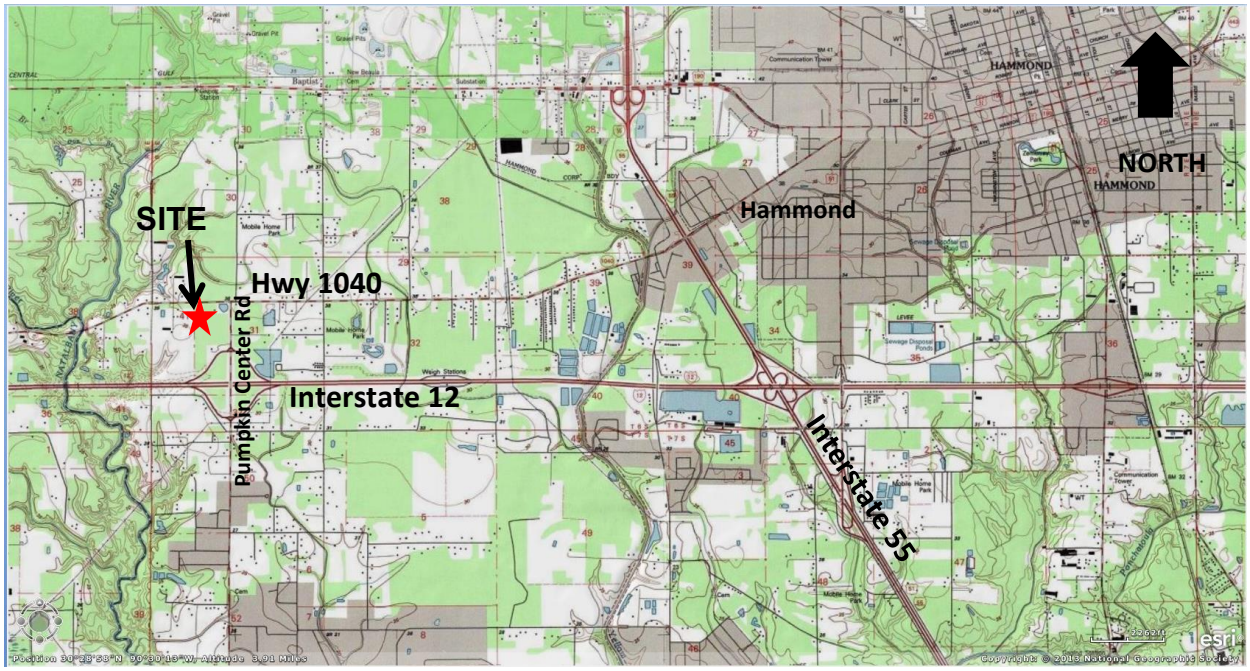
GNO, Inc.

Prepared by

J.V. Burkes & Associates
Engineering ◆ Surveying ◆ Planning ◆ Environmental
1805 Shortcut Highway
Slidell, LA 70458
Phone: (985) 649-0075
Fax: (985) 649-0154
www.jvburkes.com

Vicinity Map

Scale = 1:36,112



Approximately 14 Acre Site

Known as Cross Point North

Located in Section 31 – T6S – R7E,

Tangipahoa Parish, LA

30 ° 29’ 05.55” N
90 ° 32’ 40.66” W

Wetland Delineation Study on Approximately 14 Acre Site Known as Cross Point North Located in Sec. 31 – T6S – R7E, Tangipahoa Parish, LA

Overview

The approximately 14 acre site is located on the north side of Destination Drive and south of Old Baton Rouge Hwy. The site consists of several existing residential homes with large landscaped yards, vehicle/equipment storage areas, vegetated woods, and approximately 4 acres of cleared/disked land. According to the landowner, the area that was recently disked has been consistently maintained for many years. This area was devoid of vegetation. Several man-made swales divided the property.

Data Collection

The site was inspected on Tuesday, June 30, 2020, approximately 2 days following a heavy rainfall event. Four soil sample data forms were completed to document typical site conditions. Photographs were taken North, East, South, and West for the each data form. Other pertinent data points were collected with a GPS.

Vegetation

The vegetation on the site varied. In areas around the residential structures, there were ornamental plants and mowed grass. SS1 represented the cleared approximately 4 acre portion of the site. No vegetation was observed. SS2 represented the area around one of the residences adjacent to the woods. Vegetation was facultative and included loblolly pine (*Pinus taeda*), sweetgum (*Liquidambar styraciflua*), water oak (*Quercus nigra*), and Chinese tallow (*Sapium sebiferum*).

SS3 was taken in the wooded portion of the property. FAC and UPL overstory vegetation included loblolly pine, water oak, chinkapin oak (*Quercus muehlenbergii*) and sweetgum. Saplings were persimmon (*Diospyro virginiana*) and red maple (*Acer rubrum*).

SS4 was taken in a narrow strip of land adjacent to the lawn on Old Baton Rouge Hwy. This area had not been mowed recently and was near an abandoned driveway. Only herbaceous plants were observed: *Cyperus echinatus, Rhychospora inexpansa*, and *Panicum* sp.

Hydrology

The site was visited approximately 2 days after the most recent rain event. According to the US Army Corps of Engineers Antecedent Precipitation Tool with data from the NOAA, this area has experienced a **wetter than normal** season. All of the soils sampled had no hydrology. SS 3 was very slightly moist at 16". A linear strip of land, south of SS4, appeared to hold water as there were pockets of surface saturation. An investigation of this area did not reveal that the water flowed out.

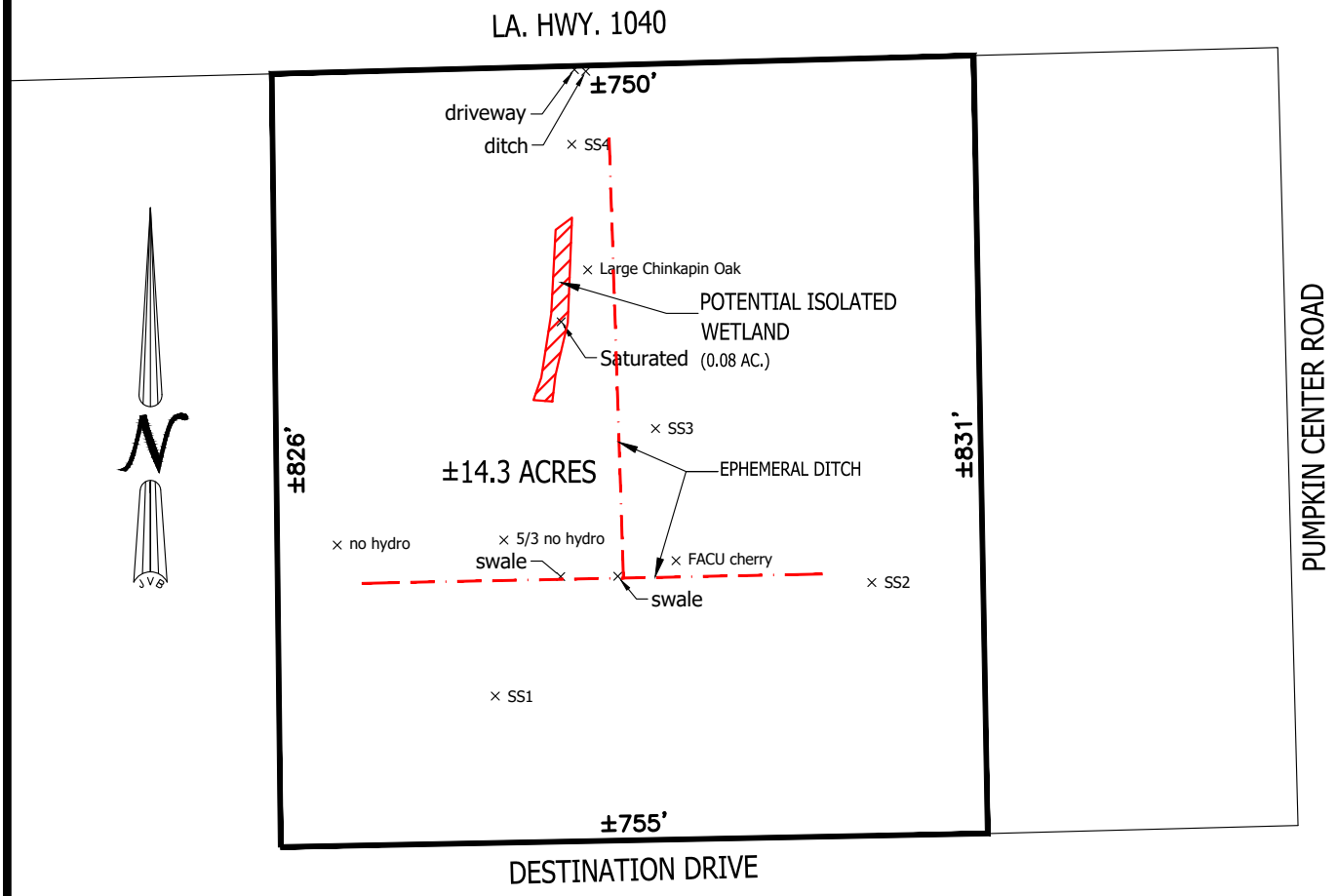
Soil

The NRCS web soil survey shows this area mapped as Abita (Ab) silt loam and Brimstone-Guyton soils (Bg). The soils appear to be consistent with the mapped type. The profile for SS1 was slightly mixed up due to the disking.

Summary/Opinion

This 14 acre site consists of several existing residential homes with large landscaped yards, vehicle/equipment storage areas, vegetated woods, and approximately 4 acres of cleared/disked land. According to the landowner, the area that was recently disked has been consistently maintained for many years. Overall, this site lacks hydrology with the exception of a small strip of land that is located between a residential lawn, cleared area, abandoned driveway, and equipment storage area. This low spot, potentially an isolated wetland, does not appear to be connected to any nearby swale. The swales located on the property had patches of remaining rainwater, but they were not draining offsite.

Please see proposed wetland map attached.



TOTAL AREA= ±14.3 ACRES

POTENTIAL ISOLATED WETLAND = 0.08 ACRES

NON-WETLANDS= ±14.22 ACRES

GRAPHIC SCALE

200 0 100 200

(IN FEET)

1 INCH = 200 FEET

DATE: 07.08.2020

SCALE: 1" = 200'

J.V. Burkes & Associates, Inc.

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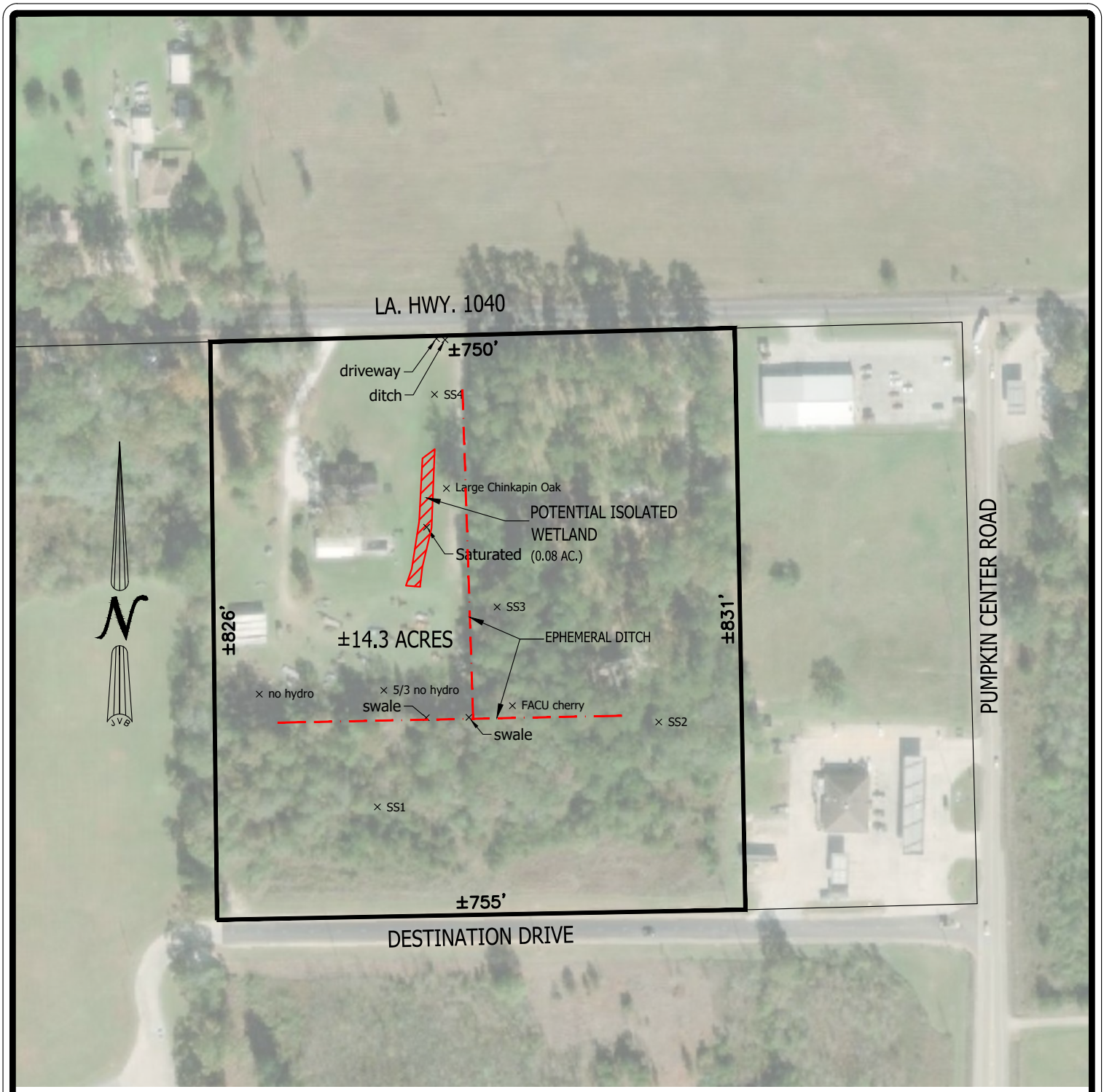
WETLANDS DELINEATION MAP ON ±14.3 ACRES IN SECT. 31, T6S, R7E, TANGIPAHOA PARISH, LOUISIANA FOR CSRS, INC.

PATHFILE: F:\Backup-Civil 3D Projects 05.31.2020\Civil 3D Projects\CROSS POINT WETLANDS\Cross Point-North.dwg



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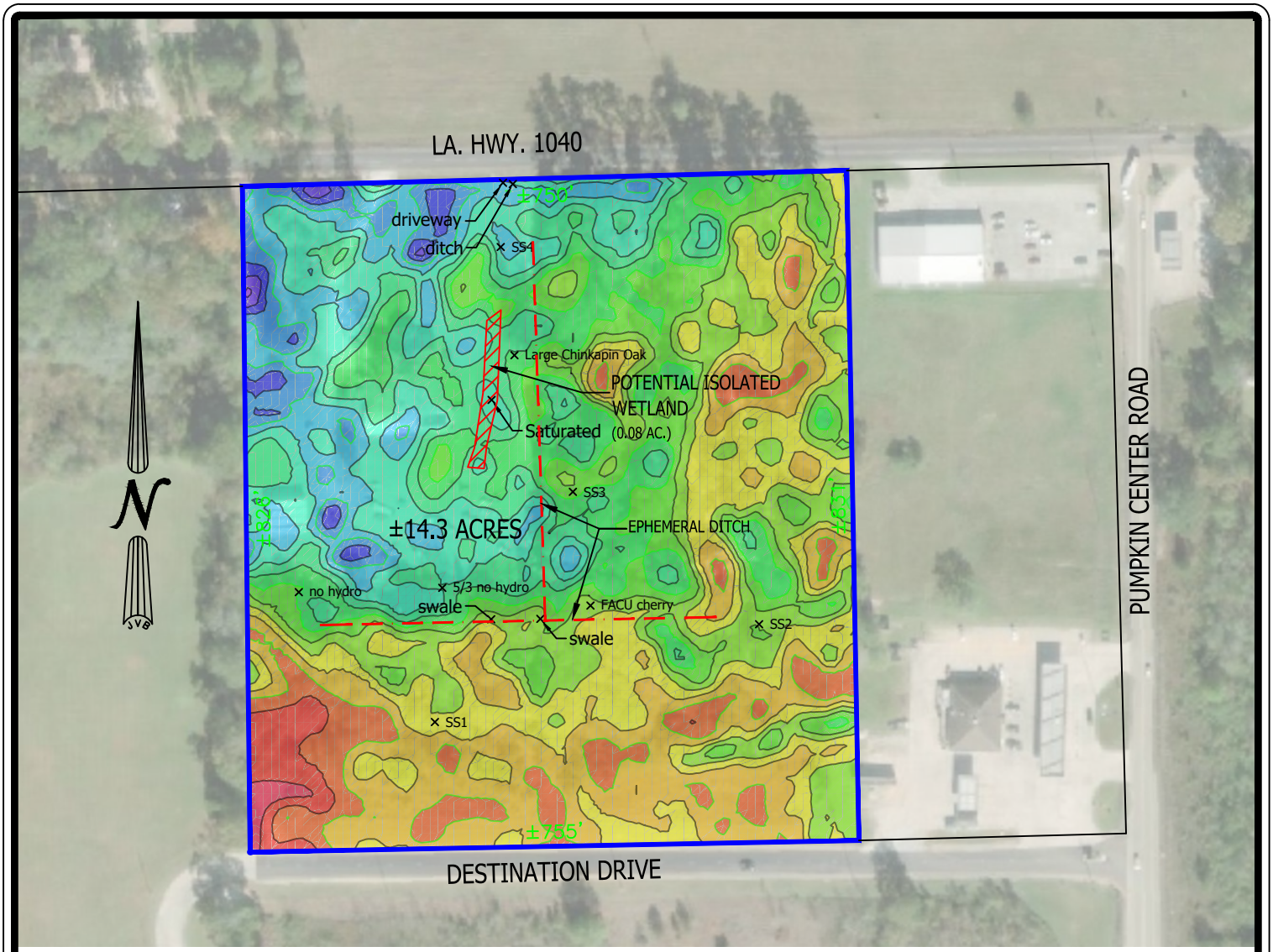

TOTAL AREA= ±14.3 ACRES

POTENTIAL ISOLATED WETLAND = 0.08 ACRES

NON-WETLANDS= ±14.22 ACRES

GRAPHIC SCALE

200 0 100 200

(IN FEET)

1 INCH = 200 FEET

Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	31.00	31.25	66.09	
2	31.25	31.50	1171.95	
3	31.50	31.75	6277.84	
4	31.75	32.00	18047.86	
5	32.00	32.25	41608.25	
6	32.25	32.50	66299.11	
7	32.50	32.75	58476.12	
8	32.75	33.00	66636.34	
9	33.00	33.25	62602.96	
10	33.25	33.50	73656.52	
11	33.50	33.75	90311.49	
12	33.75	34.00	86182.42	
13	34.00	34.25	38708.91	
14	34.25	34.50	10965.97	
15	34.50	34.75	2567.10	

DATE: 07.08.2020

SCALE: 1" = 200'

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WETLANDS DELINEATION MAP ON ±14.3 ACRES IN SECT. 31, T6S, R7E, TANGIPAHOA PARISH, LOUISIANA FOR CSRS, INC.

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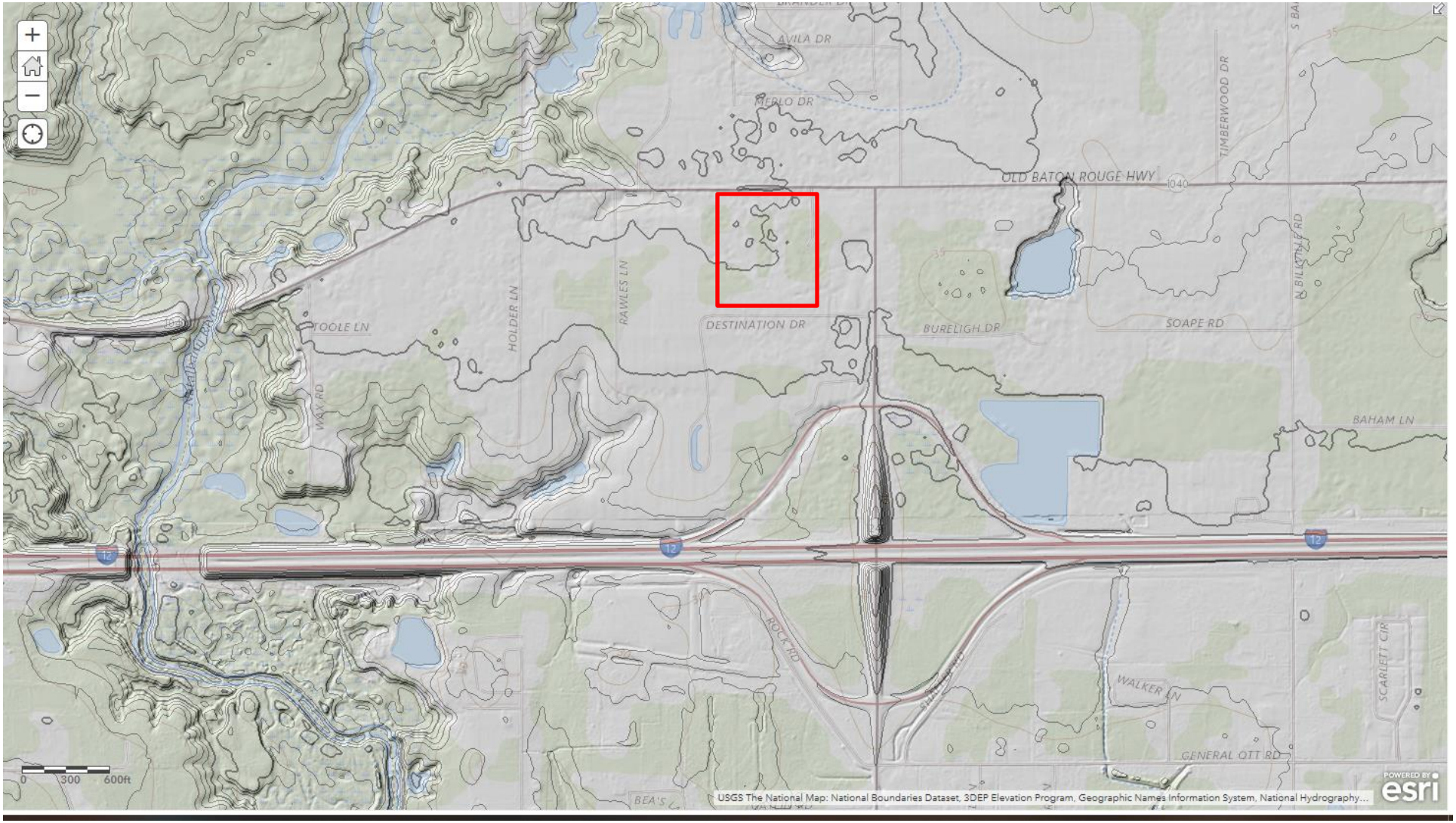
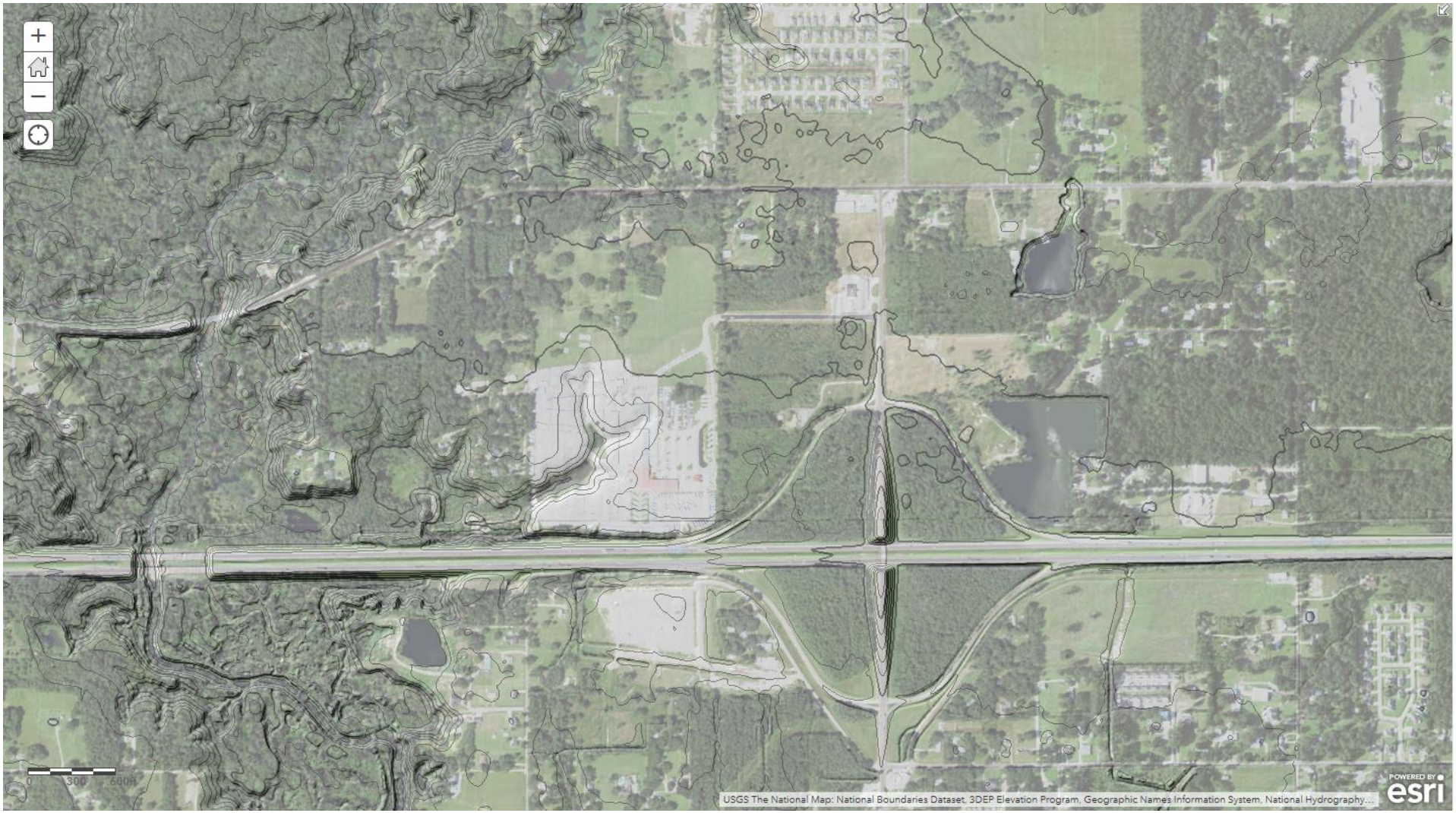


USGS map with overlays



USGS - Hillshade, contours and aerial background

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cross Point North +/-14 acres City/County: Tangipahoa Parish Sampling Date: 6-30-20

Applicant/Owner: GNO Inc State: LA Sampling Point: 1

Investigator(s): J.V. Burkes & Associates, Inc Section, Township, Range: Section 31-T6S-R7E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR O Lat: 30º 29' 03.0726" N Long: 90 º 32 ' 26.358 " W Datum: _____

Soil Map Unit Name: _____ NWI classification: no data

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation x, Soil x, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No x

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No x	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No x	
Wetland Hydrology Present?	Yes _____	No x	

Remarks:

Wetter than normal season. Vegetation removed

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- _____ Surface Water (A1)
- _____ High Water Table (A2)
- _____ Saturation (A3)
- _____ Water Marks (B1)
- _____ Sediment Deposits (B2)
- _____ Drift Deposits (B3)
- _____ Algal Mat or Crust (B4)
- _____ Iron Deposits (B5)
- _____ Inundation Visible on Aerial Imagery (B7)
- _____ Water-Stained Leaves (B9)
- _____ Aquatic Fauna (B13)
- _____ Marl Deposits (B15) (**LRR U**)
- _____ Hydrogen Sulfide Odor (C1)
- _____ Oxidized Rhizospheres on Living Roots (C3)
- _____ Presence of Reduced Iron (C4)
- _____ Recent Iron Reduction in Tilled Soils (C6)
- _____ Thin Muck Surface (C7)
- _____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- _____ Surface Soil Cracks (B6)
- _____ Sparsely Vegetated Concave Surface (B8)
- _____ Drainage Patterns (B10)
- _____ Moss Trim Lines (B16)
- _____ Dry-Season Water Table (C2)
- _____ Crayfish Burrows (C8)
- _____ Saturation Visible on Aerial Imagery (C9)
- _____ Geomorphic Position (D2)
- _____ Shallow Aquitard (D3)
- _____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No x	Depth (inches): _____
Water Table Present?	Yes _____	No x	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No x	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Slightly moist soils.

VEGETATION – Use scientific names of plants. Sampling Point: 1

Tree Stratum (Plot sizes: 30-ft. radius)	Absolute % Cover	Dominant Species	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
Total Cover:			
50% of total cover: ____ 20% of total cover: ____			
Sapling Stratum (30-ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
Total Cover:			
50% of total cover: ____ 20% of total cover: ____			
Shrub Stratum (30-ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
Total Cover:			
50% of total cover: ____ 20% of total cover: ____			
Herb Stratum (30 -ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover:			
50% of total cover: ____ 20% of total cover: ____			
Woody Vine Stratum (-ft. radius)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
50% of total cover: ____ 20% of total cover: ____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

____ 1. Rapid Test for Hydrophytic Vegetation

____ 2. Dominance Test is >50%

____ 3. Prevalence Test is ≤3.0[1]

____ 4. Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (If observed, list morphological adaptations below).

No vegetation

SOIL Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2"	10yr 6/3	100						silt loam
2-16"	10yr 5/3	100						silt loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) (**LRR P, T, U**)
- ____ 5m Mucky Mineral (A7) (**LRR P, T, U**)
- ____ Muck Presence (A8) (**LRR U**)
- ____ 1 cm Muck (A9) (**LRR P, T**)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coastal Prairie Redox (A16) (**MLRA 150A**)
- ____ Sandy Mucky Mineral (S1) (**RLRR O, S**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) (**LRR P, S, T, U**)
- ____ Polyvalue Below Surface (S8) (**LRR S, T, U**)
- ____ Thin Dark Surface (S9) (**LRR S, T, U**)
- ____ Loamy Mucky Mineral (F1) (**LRR O**)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) (**LRR U**)
- ____ Depleted Ochric (F11) (**MLRA 151**)
- ____ Iron-Manganese Masses (F12) (**LRR O, P, T**)
- ____ Umbric Surface (F13) (**LRR P, T, U**)
- ____ Delta Ochric (F17) (**MLRA, 151**)
- ____ Reduced Vertic (F18) (**MLRA 150A, 150B**)
- ____ Piedmont Floodplain Soils (F19) (**MLRA 149A**)
- ____ Anomalous Bright Loamy Soils (F20) (**MLRA 149A, 153C, 153D**)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR O**)
- ____ 2 cm Muck (A10) (**LRR S**)
- ____ Reduced Vertic (F18) (**outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) (**LRR P, S, T**)
- ____ Anomalous Bright Loamy Soils (F20) (**MLRA 153B**)
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12) (**LRR T, U)**
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless distributed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks:

SS 1


North


East


South


West

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cross Point North +/-14 acres City/County: Tangipahoa Parish Sampling Date: 6-30-20

Applicant/Owner: GNO, Inc. State: LA Sampling Point: 2

Investigator(s): J.V. Burkes & Associates, Inc Section, Township, Range: 31-T6S-R7E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR O Lat: 00º 00' 000000" N Long: 00 º 00 ' 000000 " W Datum:

Soil Map Unit Name: Abita (Aa) silt loam NWI classification: no data

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No x	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No x	
Wetland Hydrology Present?	Yes ____	No x	

Remarks:

Wetter than normal season

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) (**LRR U**)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No x	Depth (inches): ____
Water Table Present?	Yes ____	No x	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No x	Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: 2

Tree Stratum (Plot sizes: 30-ft. radius)	Absolute % Cover	Dominant Species	Indicator Status
1. Pinus taeda	30	y	FAC
2. Quercus nigra	10	y	FAC
3.			
4.			
5.			
6.			
Total Cover: 40			
50% of total cover: 20 20% of total cover: 8			
Sapling Stratum (30-ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
Total Cover:			
50% of total cover: 20% of total cover:			
Shrub Stratum (30-ft. radius)			
1. Quercus nigra	30	y	FAC
2. Liquidambar styraciflua	30	y	FAC
3. Sapium sebiferum	30	y	FAC
4.			
5.			
6.			
7.			
Total Cover: 90			
50% of total cover: 45 20% of total cover: 18			
Herb Stratum (30 -ft. radius)			
1. Panicum virgatum	40	y	FAC
2. Eupatorium capillifolium	20	y	FAC
3. Conoclinium coelestinum	10	n	FAC
4. Rubus alumnus	10	n	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover: 80			
50% of total cover: 40 20% of total cover: 16			
Woody Vine Stratum (-ft. radius)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
50% of total cover: 20% of total cover:			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species 210	x 3 = 630
FACU species	x 4 =
UPL species	x 5 =
Column Totals: 210 (A)	630 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

- ____ 1. Rapid Test for Hydrophytic Vegetation
- X 2. Dominance Test is >50%
- X 3. Prevalence Test is ≤3.0[1]
- ____ 4. Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (If observed, list morphological adaptations below).

SOIL Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4"	10yr 4/2	100			C	M		fine silt loam
4-16"	10yr 5/3	70	10YR 5/8	20	C	M		fine silt loam
			10YR 6/2	10	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) (**LRR P, T, U**)
- ____ 5m Mucky Mineral (A7) (**LRR P, T, U**)
- ____ Muck Presence (A8) (**LRR U**)
- ____ 1 cm Muck (A9) (**LRR P, T**)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coastal Prairie Redox (A16) (**MLRA 150A**)
- ____ Sandy Mucky Mineral (S1) (**RLRR O, S**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) (**LRR P, S, T, U**)
- ____ Polyvalue Below Surface (S8) (**LRR S, T, U**)
- ____ Thin Dark Surface (S9) (**LRR S, T, U**)
- ____ Loamy Mucky Mineral (F1) (**LRR O**)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) (**LRR U**)
- ____ Depleted Ochric (F11) (**MLRA 151**)
- ____ Iron-Manganese Masses (F12) (**LRR O, P, T**)
- ____ Umbric Surface (F13) (**LRR P, T, U**)
- ____ Delta Ochric (F17) (**MLRA, 151**)
- ____ Reduced Vertic (F18) (**MLRA 150A, 150B**)
- ____ Piedmont Floodplain Soils (F19) (**MLRA 149A**)
- ____ Anomalous Bright Loamy Soils (F20) (**MLRA 149A, 153C, 153D**)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR O**)
- ____ 2 cm Muck (A10) (**LRR S**)
- ____ Reduced Vertic (F18) (**outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) (**LRR P, S, T**)
- ____ Anomalous Bright Loamy Soils (F20) (**MLRA 153B**)
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12) (**LRR T, U)**
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless distributed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

SS 2


North


East


South


West

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cross Point North +/-14 acres City/County: Tangipahoa Parish Sampling Date: 6-30-20

Applicant/Owner: GNO, Inc. State: LA Sampling Point: 3

Investigator(s): J.V. Burkes & Associates, Inc Section, Township, Range: 31-T6S-R7E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR O Lat: 30 29' 5.8878" N Long: 90 º 32 ' 40.2576 " W Datum: _____

Soil Map Unit Name: Abita (Aa) silt loam NWI classification: no data

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No x	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No x	
Wetland Hydrology Present?	Yes _____	No x	

Remarks:

Wetter than normal season

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- _____ Surface Water (A1)
- _____ High Water Table (A2)
- _____ Saturation (A3)
- _____ Water Marks (B1)
- _____ Sediment Deposits (B2)
- _____ Drift Deposits (B3)
- _____ Algal Mat or Crust (B4)
- _____ Iron Deposits (B5)
- _____ Inundation Visible on Aerial Imagery (B7)
- _____ Water-Stained Leaves (B9)
- _____ Aquatic Fauna (B13)
- _____ Marl Deposits (B15) (**LRR U**)
- _____ Hydrogen Sulfide Odor (C1)
- _____ Oxidized Rhizospheres on Living Roots (C3)
- _____ Presence of Reduced Iron (C4)
- _____ Recent Iron Reduction in Tilled Soils (C6)
- _____ Thin Muck Surface (C7)
- _____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- _____ Surface Soil Cracks (B6)
- _____ Sparsely Vegetated Concave Surface (B8)
- _____ Drainage Patterns (B10)
- _____ Moss Trim Lines (B16)
- _____ Dry-Season Water Table (C2)
- _____ Crayfish Burrows (C8)
- _____ Saturation Visible on Aerial Imagery (C9)
- _____ Geomorphic Position (D2)
- _____ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No x	Depth (inches): _____
Water Table Present?	Yes _____	No x	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No x	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: 3

Tree Stratum (Plot sizes: 30-ft. radius)	Absolute % Cover	Dominant Species	Indicator Status
1. Pinus taeda	30	y	FAC
2. Quercus nigra	30	y	FAC
3. Liquidambar styraciflua	30	y	FAC
4.			
5.			
6.			
Total Cover:	90		
50% of total cover: 45	20% of total cover: 18		
Sapling Stratum (30-ft. radius)			
1. Diospyro virginiana	20	y	FAC
2. Quercus muehlenbergii	20	y	UPL
3.			
4.			
5.			
6.			
Total Cover:	40		
50% of total cover: 20	20% of total cover: 8		
Shrub Stratum (30-ft. radius)			
1. Acer rubrum	30	y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
Total Cover:	30		
50% of total cover: 15	20% of total cover: 6		
Herb Stratum (30 -ft. radius)			
1. Chasmanthium laxum	10	y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover:	10		
50% of total cover: 5	20% of total cover: 2		
Woody Vine Stratum (30-ft. radius)			
1. Smilax bona nox	30	y	FAC
2. Vitus rotundifolia	30	y	FAC
3.			
4.			
5.			
Total Cover:	60		
50% of total cover: 30	20% of total cover: 12		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: .89 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	10	x 2 =	20
FAC species	200	x 3 =	600
FACU species		x 4 =	
UPL species	20	x 5 =	100
Column Totals:	230 (A)		720 (B)

Prevalence Index = B/A = 3.13

Hydrophytic Vegetation Indicators:

____ 1. Rapid Test for Hydrophytic Vegetation

_X_ 2. Dominance Test is >50%

____ 3. Prevalence Test is ≤3.0[1]

____ 4. Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (If observed, list morphological adaptations below).

SOIL Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4"	10yr 5/2	100						fine silt loam
4-16"	10yr 5/3	100						fine silt loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) (**LRR P, T, U**)
- ____ 5m Mucky Mineral (A7) (**LRR P, T, U**)
- ____ Muck Presence (A8) (**LRR U**)
- ____ 1 cm Muck (A9) (**LRR P, T**)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coastal Prairie Redox (A16) (**MLRA 150A**)
- ____ Sandy Mucky Mineral (S1) (**RLRR O, S**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) (**LRR P, S, T, U**)
- ____ Polyvalue Below Surface (S8) (**LRR S, T, U**)
- ____ Thin Dark Surface (S9) (**LRR S, T, U**)
- ____ Loamy Mucky Mineral (F1) (**LRR O**)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) (**LRR U**)
- ____ Depleted Ochric (F11) (**MLRA 151**)
- ____ Iron-Manganese Masses (F12) (**LRR O, P, T**)
- ____ Umbric Surface (F13) (**LRR P, T, U**)
- ____ Delta Ochric (F17) (**MLRA, 151**)
- ____ Reduced Vertic (F18) (**MLRA 150A, 150B**)
- ____ Piedmont Floodplain Soils (F19) (**MLRA 149A**)
- ____ Anomalous Bright Loamy Soils (F20) (**MLRA 149A, 153C, 153D**)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR O**)
- ____ 2 cm Muck (A10) (**LRR S**)
- ____ Reduced Vertic (F18) (**outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) (**LRR P, S, T**)
- ____ Anomalous Bright Loamy Soils (F20) (**MLRA 153B**)
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12) (**LRR T, U)**
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless distributed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks:

SS 3


North


East


South


West

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cross Point North +/-14 acres City/County: Tangipahoa Parish Sampling Date: 6-30-20

Applicant/Owner: GNO, Inc. State: LA Sampling Point: 4

Investigator(s): J.V. Burkes & Associates, Inc Section, Township, Range: 31-T6S-R7E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR O Lat: 30º 29' 08.9016" N Long: 90 º 32 ' 41.2542 " W Datum:

Soil Map Unit Name: Abita (Aa) silt loam NWI classification: no data

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes y	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes y	No ____	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

Wetter than normal season

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) (**LRR U**)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No x	Depth (inches): ____
Water Table Present?	Yes ____	No x	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No x	Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: 4

Tree Stratum (Plot sizes: 30-ft. radius)	Absolute % Cover	Dominant Species	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
Total Cover:			
50% of total cover: ____ 20% of total cover: ____			
Sapling Stratum (30-ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
Total Cover:			
50% of total cover: ____ 20% of total cover: ____			
Shrub Stratum (30-ft. radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
Total Cover:			
50% of total cover: ___ 20% of total cover: ____			
Herb Stratum (30 -ft. radius)			
1. Cyperus echinatus	40	y	FAC
2. Rhynchospora inexpansa	20	y	FACW
3. Panicum sp.	20	y	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover: 80			
50% of total cover: 40 20% of total cover: 16			
Woody Vine Stratum (-ft. radius)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
50% of total cover: ____ 20% of total cover: ____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species 20	x 2 = 40
FAC species 60	x 3 = 180
FACU species	x 4 =
UPL species	x 5 =
Column Totals: 80 (A)	220 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

____ 1. Rapid Test for Hydrophytic Vegetation

X 2. Dominance Test is >50%

X 3. Prevalence Test is ≤3.0[1]

____ 4. Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (If observed, list morphological adaptations below).

SOIL Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6"	10yr 4/2	100			C	M		fine silt loam
6-16"	10yr 5/2	80	10YR 4/6	20	C	M		fine silt loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) (**LRR P, T, U**)
- ____ 5m Mucky Mineral (A7) (**LRR P, T, U**)
- ____ Muck Presence (A8) (**LRR U**)
- ____ 1 cm Muck (A9) (**LRR P, T**)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coastal Prairie Redox (A16) (**MLRA 150A**)
- ____ Sandy Mucky Mineral (S1) (**RLRR O, S**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) (**LRR P, S, T, U**)
- ____ Polyvalue Below Surface (S8) (**LRR S, T, U**)
- ____ Thin Dark Surface (S9) (**LRR S, T, U**)
- ____ Loamy Mucky Mineral (F1) (**LRR O**)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) (**LRR U**)
- ____ Depleted Ochric (F11) (**MLRA 151**)
- ____ Iron-Manganese Masses (F12) (**LRR O, P, T**)
- ____ Umbric Surface (F13) (**LRR P, T, U**)
- ____ Delta Ochric (F17) (**MLRA, 151**)
- ____ Reduced Vertic (F18) (**MLRA 150A, 150B**)
- ____ Piedmont Floodplain Soils (F19) (**MLRA 149A**)
- ____ Anomalous Bright Loamy Soils (F20) (**MLRA 149A, 153C, 153D**)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR O**)
- ____ 2 cm Muck (A10) (**LRR S**)
- ____ Reduced Vertic (F18) (**outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) (**LRR P, S, T**)
- ____ Anomalous Bright Loamy Soils (F20) (**MLRA 153B**)
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12) (**LRR T, U)**
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless distributed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

SS 4


North

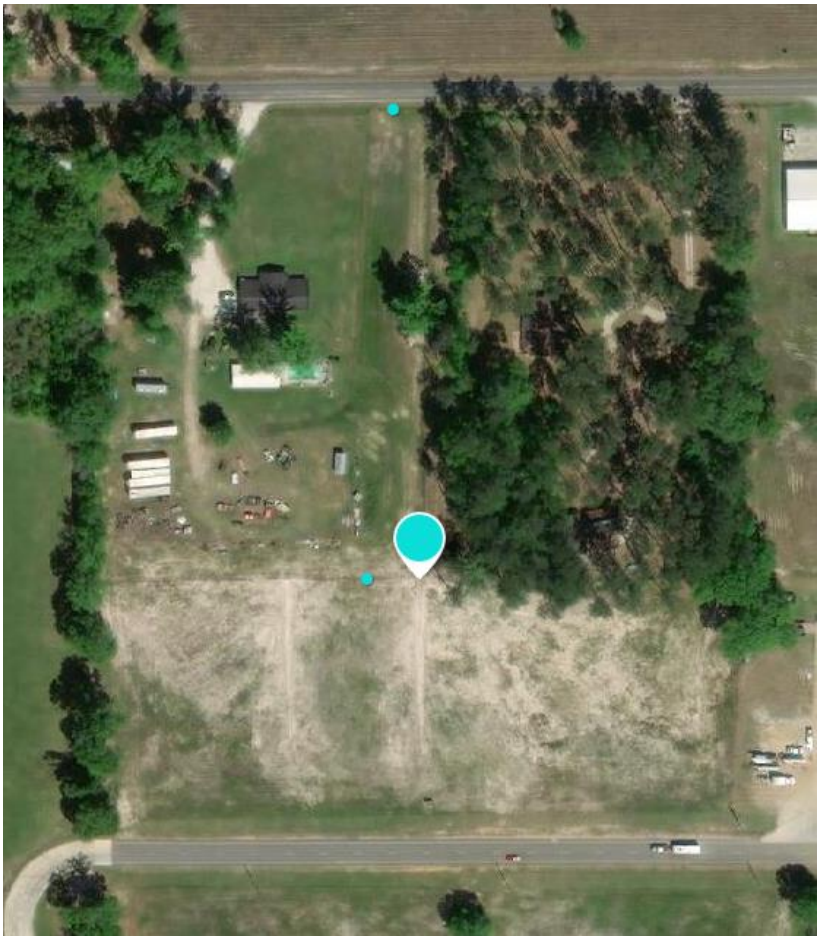

East


South


West

Waters photos – Heavy rains 2 days prior to visit

Corner of swales near field+/- 3' wide

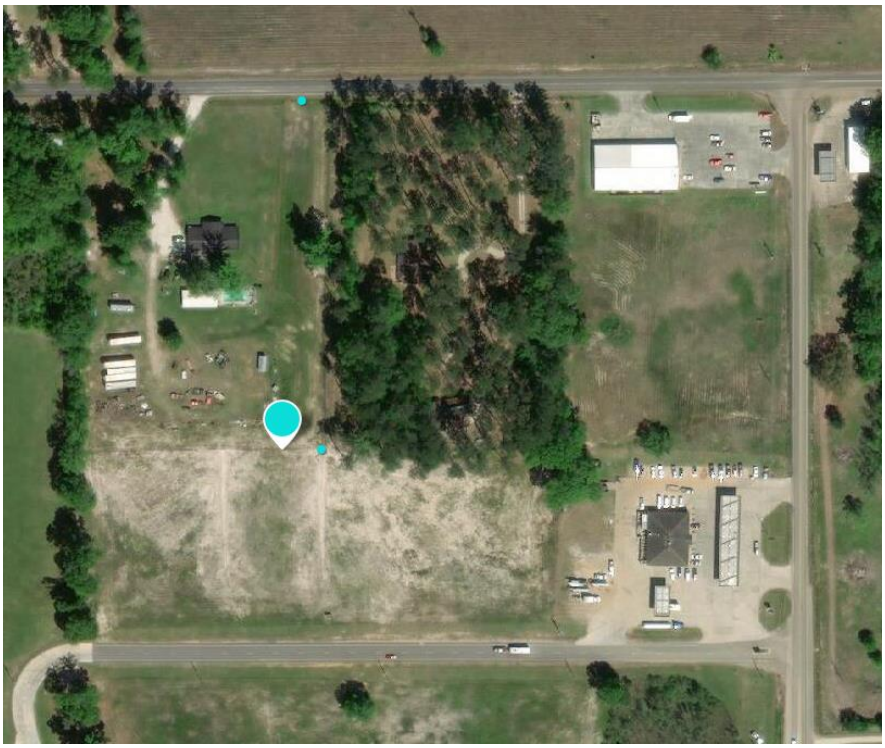


Looking North

Looking south

Waters photos – Heavy rains 2 days prior to visit

East west swale near field+/- 2’ wide

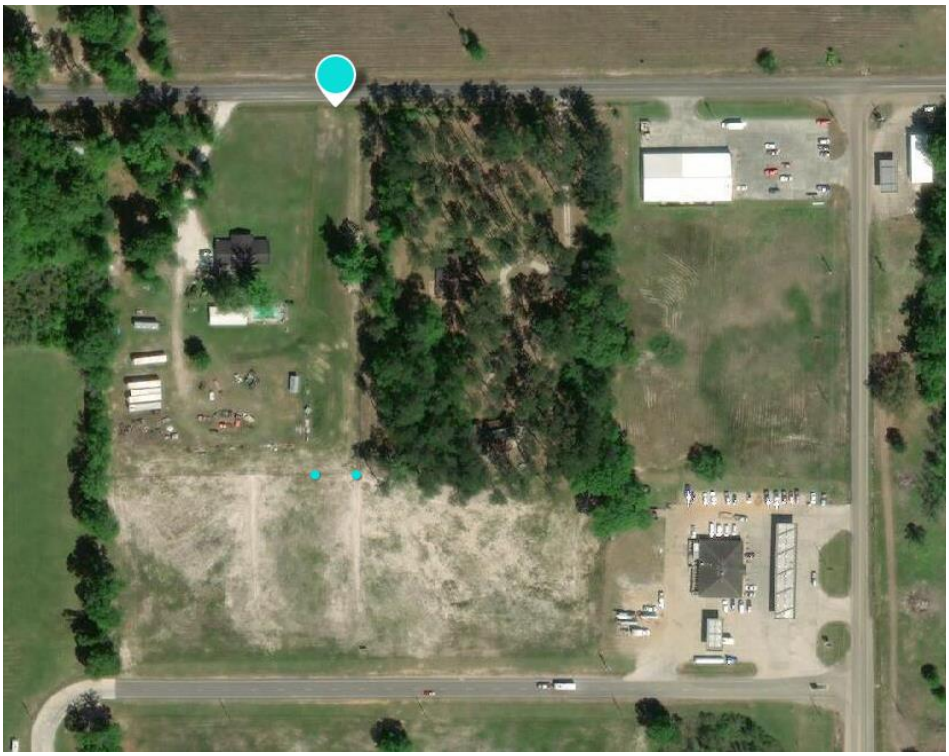


Looking west

Looking East

Waters photos – Heavy rains 2 days prior to visit

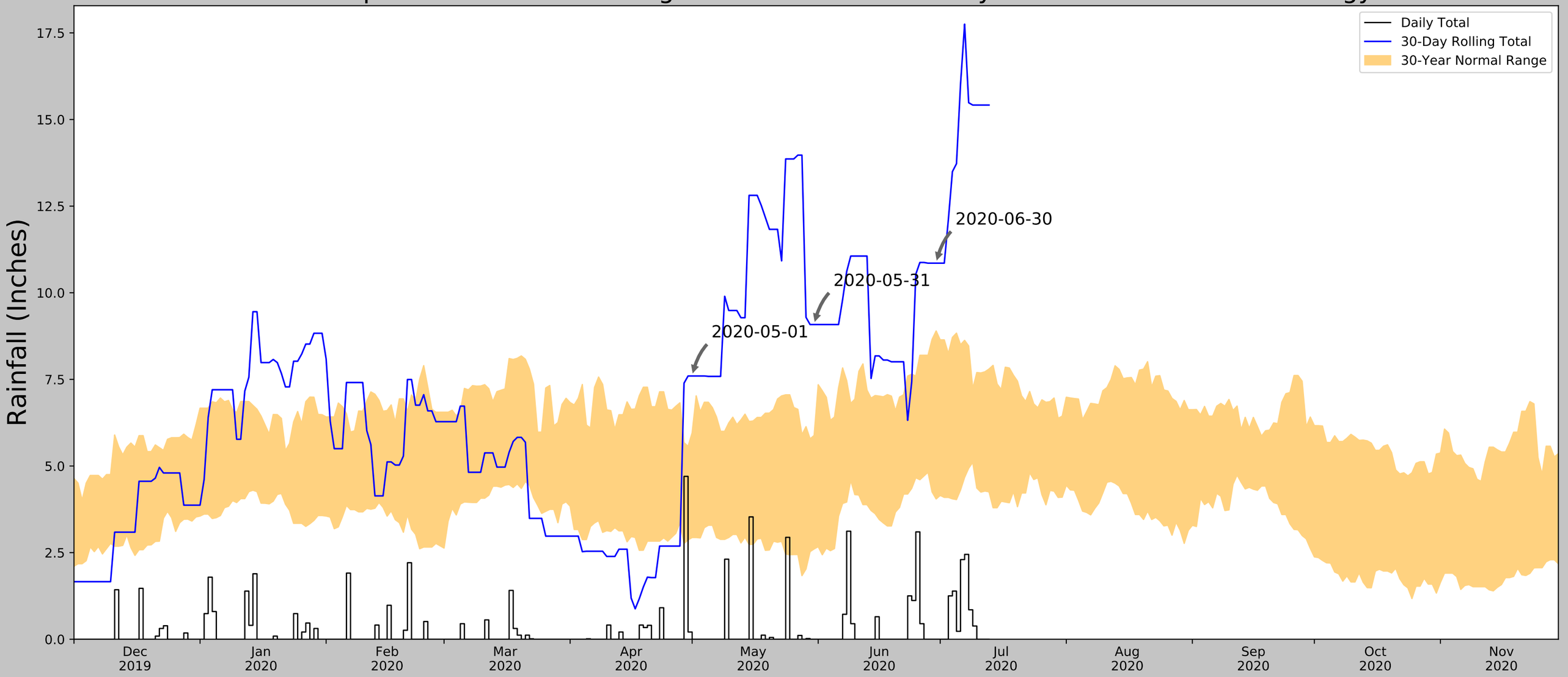
Ditch at highway – north end +/- 3’ wide



Looking east

Looking west

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	30.48418701, -90.54506548
Observation Date	2020-06-30
Elevation (ft)	33.46
Drought Index (PDSI)	Mild wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2020-06-30	4.048425	8.898425	10.854331	Wet	3	3	9
2020-05-31	2.606299	5.882284	9.082677	Wet	3	2	6
2020-05-01	2.935433	5.957087	7.598425	Wet	3	1	3
Result							Wetter than Normal - 18

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days (Normal)	Days (Antecedent)
LIVINGSTON	30.5197, -90.7544	42.979	12.701	9.519	5.836	11243	72
HAMMOND 4.9 WNW	30.5252, -90.5402	49.869	2.848	16.409	1.329	0	1
HAMMOND	30.4839, -90.4731	89.895	4.285	56.435	2.17	70	0
HAMMOND 2.5 NNW	30.536, -90.482	48.885	5.187	15.425	2.414	0	17
PONCHATOULA	30.4603, -90.4497	20.997	5.914	12.463	2.735	8	0
AMITE	30.7094, -90.525	169.948	15.606	136.488	9.153	31	0

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 Tangipahoa Parish, Louisiana

July 10, 2020

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.

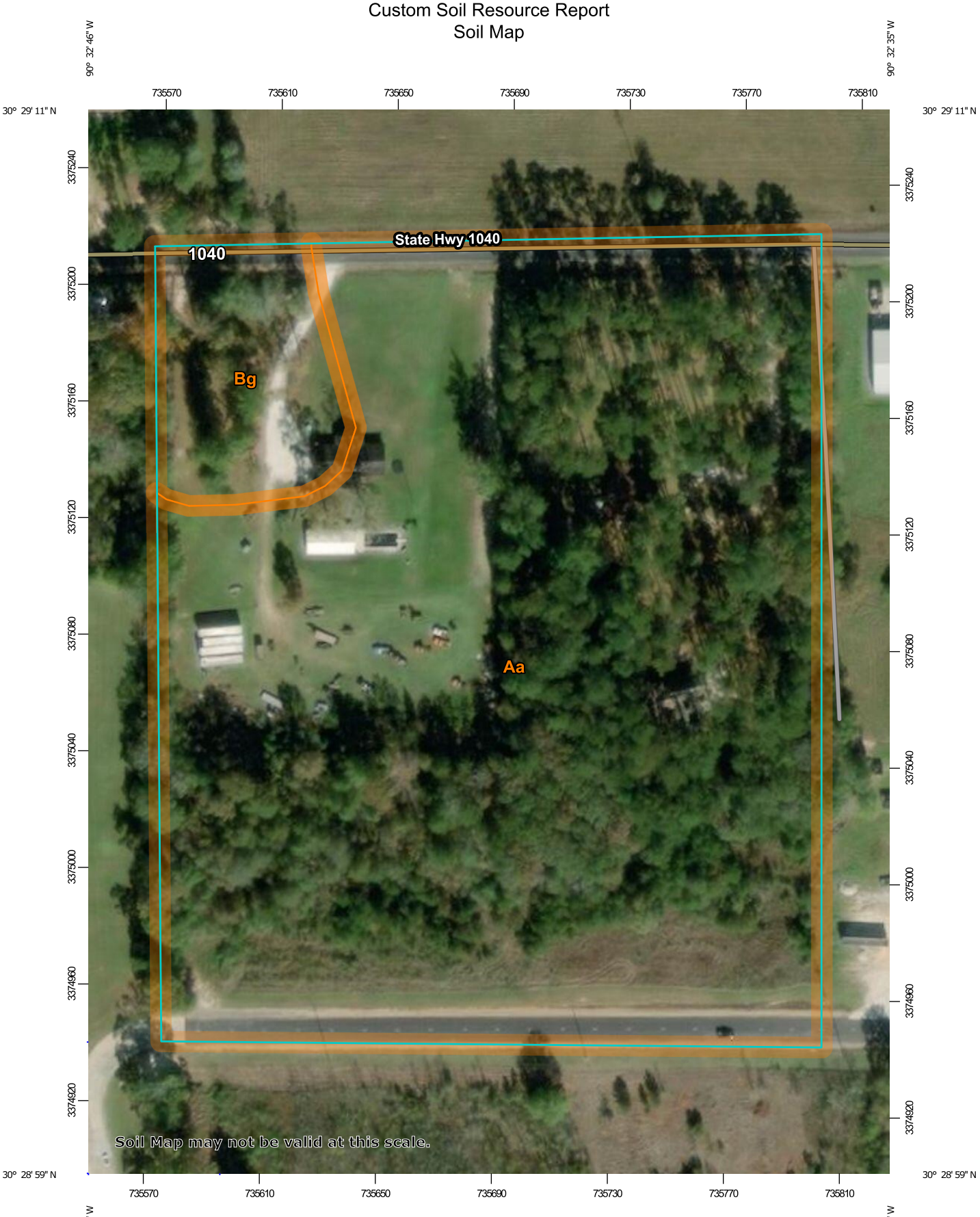
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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



Map Scale: 1:1,780 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 25 50 100 150

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N 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: Tangipahoa Parish, Louisiana
Survey Area Data: Version 14, Jun 5, 2020

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

Date(s) aerial images were photographed: Sep 28, 2016—Dec 11, 2017

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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Aa	Abita silt loam, 0 to 2 percent slopes	14.3	91.5%
Bg	Brimstone-Guyton silt loams, 0 to 1 percent slopes, rarely flooded	1.3	8.5%
Totals for Area of Interest		**15.6**	**100.0%**

Map Unit Descriptions

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.

Tangipahoa Parish, Louisiana

Aa—Abita silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2rs47
Elevation: 0 to 30 feet
Mean annual precipitation: 55 to 76 inches
Mean annual air temperature: 55 to 79 degrees F
Frost-free period: 219 to 277 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Abita

Setting

Landform: Flats
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Silty marine deposits

Typical profile

A - 0 to 5 inches: silt loam
Bt - 5 to 34 inches: silt loam
Btg1 - 34 to 45 inches: silty clay loam
Btg2 - 45 to 64 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Guyton

Percent of map unit: 2 percent
Landform: Depressions

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: Yes

Stough

Percent of map unit: 2 percent
Landform: Ridges on stream terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Myatt

Percent of map unit: 2 percent
Landform: Depressions on stream terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Prentiss

Percent of map unit: 2 percent
Landform: Interfluves
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Brimstone

Percent of map unit: 2 percent
Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Bg—Brimstone-Guyton silt loams, 0 to 1 percent slopes, rarely flooded

Map Unit Setting

National map unit symbol: 2w8y6
Elevation: 10 to 200 feet
Mean annual precipitation: 57 to 69 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 215 to 270 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brimstone and similar soils: 55 percent
Guyton and similar soils: 35 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brimstone

Setting

Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Late plisetocene age terraces with high exchangeable sodium loamy fluviomarine deposits

Typical profile

Ap - 0 to 5 inches: silt loam
Eg - 5 to 17 inches: silt loam
Btng/E - 17 to 33 inches: silt loam
Btng - 33 to 66 inches: silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 10 to 31 inches to natric
Natural drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Description of Guyton

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Late plisetocene age terraces with loamy alluvium derived from sedimentary rock

Typical profile

A - 0 to 3 inches: silt loam

E - 3 to 27 inches: silt loam
Btg/E - 27 to 41 inches: silty clay loam
Btg - 41 to 70 inches: silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 10.0
Available water storage in profile: Very high (about 12.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Myatt

Percent of map unit: 5 percent
Landform: Drainageways on stream terraces, depressions on stream terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Abita

Percent of map unit: 5 percent
Landform: Fluviomarine terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

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