

Survey Area

Datum: NAD 1983
Projection: State Plane Texas
South Central
Units: Feet
Basemap: ERSI USA Topo

0 825 1,650 Feet



ATKINS
Member of the SNC-Lavalin Group

Figure 3
Topographic Survey Area Map
Wetland Delineation Report

**Legacy Wetlands at Sullivan Ranch
Freshwater Improvement Project
Galveston
Galveston County, Texas**

Job No.: 100079983

Scale: 1" = 1,650 feet

Prepared By: ATKINS/WHIT6392

Date: Aug 29, 2022

N:\Clients\S_T\Sullivan\100079983\geotiffs\wetwet_survarea_topo_v2.aprx

	1/2" IRON ROD FOUND
	[AS NOTED]
	IRON PIPE FOUND [AS NOTED]
	RIGHT OF WAY TYPE B
	MONUMENT FOUND
	NAIL FOUND
	1/2" IRON ROD WITH
	"DOLGUE" CAP SET
	CLEAN GUT
	BOLLARD
	ELECTRIC PULL BOX
	RADIO ANTENNA
	AIR CONDITIONING UNIT
	ELECTRIC MANHOLE
	FIRE HYDRANT
	GAS METER
	HANDICAP PARKING
	LIGHT POLE
	TRAFFIC SIGNAL
	FENCE POST FOUND [AS NOTED]
	MARKER POST [AS NOTED]
	VALVE
	WATER VALVE
	WATER METER
	STORM SEWER MANHOLE
	TELEPHONE PEDESTAL
	GREASE MANHOLE
	TELEPHONE MANHOLE
	SIGN [AS NOTED]
	POWER POLE
	DOWN GUY
	BENCHMARK FOUND
	CALCULATED POINT
	COTTON SPINDLE FOUND
	ELECTRIC METER
	ELECTRIC TRANSFORMER
	GAS VALVE
	IRRIGATION CONTROL VALVE
	MAILBOX
	TELEPHONE SERVICE BOX
	TRAFFIC SIGNAL BOX
	WASTEWATER MANHOLE
	WATER MANHOLE
	SERVICE POLE
	CABLE PEDESTAL
	CONTROL POINT

_____ PROPERTY LINE/SUBJECT EASEMENT
 _____ EXISTING PROPERTY LINE
 _____ EXISTING EASEMENT
 _____ ADJOINER PROPERTY LINE
 _____ BSL BUILDING SET BACK LINE
 _____ OE OVERHEAD ELECTRIC
 _____ OW OVERHEAD WIRES
 _____ X EXISTING WIRE FENCE
 _____ // EXISTING WOOD FENCE
 _____ /-/- EDGE OF PAVEMENT
 _____ S APPROXIMATE SURVEY LINE
 _____ C APPROXIMATE COUNTY LINE

E2EM WETLAND AREA (PER OTHERS)

E2SS WETLAND AREA (PER OTHERS)

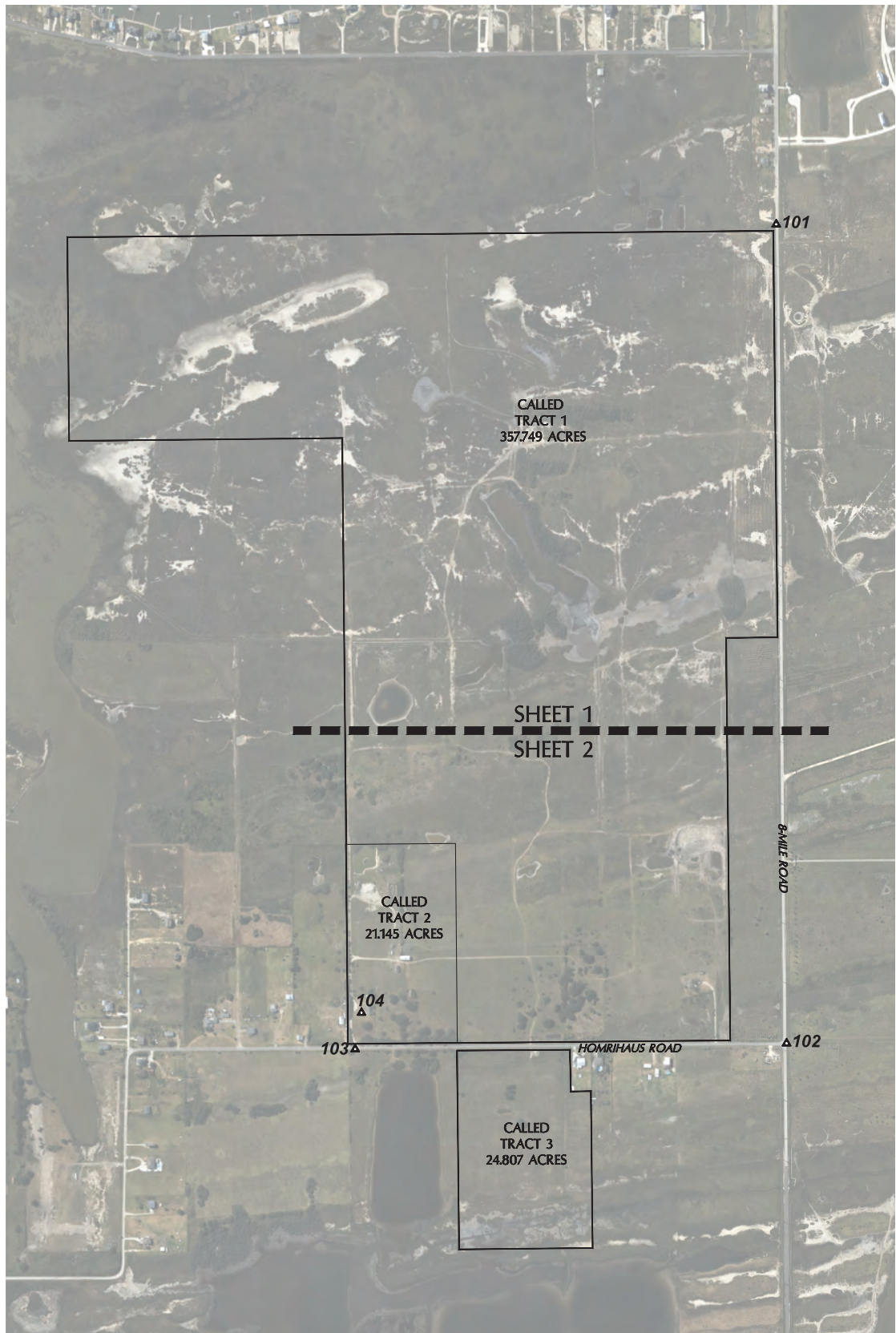
SURVEY NOTES:

BASIS OF BEARING IS THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), NORTH AMERICAN DATUM 1983 (NAD83), 2011 ADJUSTMENT (EPOCH 2010) AND A VERTICAL DATUM OF NAVD88, GEOID 12B. ALL COORDINATE VALUES AND DISTANCES SHOWN ARE SURFACE VALUES AND MAY BE CONVERTED TO SURFACE BY USING THE SURFACE ADJUSTMENT FACTOR OF 0.999868017.
UNITS: US SURVEY FEET.

BOUNDARY AND EASEMENT INFORMATION SHOWN HEREON IS BASED ON INFORMATION PROVIDED BY JUNE, 27, 2016 JOHN D. MERCER SURVEY (JOHN D. MERCER, RPLS TX 1924 SURVEYING FIRM NO. 10116600).

SURVEY COMPLETED ON THE GROUND SEPTEMBER 8, 2022. AERIAL IMAGERY AND LIDAR FLOWN JULY 2022.

SURVEY CONTROL				
POINT #	NORHTING	EASTING	ELEVATION	DESCRIPTION
101	13667125.78	3276855.57	4.03	MAGNL=CONTROL 101
102	13662391.67	3279287.29	4.57	MAGNL=CONTROL 102
103	13661108.57	3276794.06	6.08	MAGNL=CONTROL 103
104	13661338.75	3276725.60	6.46	IRS=5/8IN



LEGACY WETLANDS AT SULLIVAN RANCH
TOPOGRAPHIC SURVEY
EXHIBIT

SURVEYOR'S CERTIFICATION:

I HEREBY CERTIFY THIS SURVEY WAS MADE ON THE GROUND, AND THAT THIS PLAT CORRECTLY REPRESENTS THE FACTS FOUND AT THE TIME OF SURVEY AND THAT THIS PROFESSIONAL SERVICE CONFORMS TO THE TEXAS SOCIETY OF PROFESSIONAL SURVEYORS' STANDARDS AND SPECIFICATIONS FOR A CATEGORY 6, CONDITION II TOPOGRAPHIC SURVEY.

 05/25/2023
J. DILLON FUGATE DATE
REGISTERED PROFESSIONAL LAND SURVEYOR
TEXAS REGISTRATION NO. 6360
DOUCET & ASSOCIATES
DFUGATE@DOUCETENGINEERS.COM



LEGACY WETLANDS

AT SULLIVAN RANCH



Civil Engineering // Entitlements // Geospatial
7401 B. Highway 71 W, Ste. 160
Austin, TX 78735, Tel: (512)-583-2600
www.doucetengineers.com
TBPE Firm Number: 3937
TBPELS Firm Number: 10105800

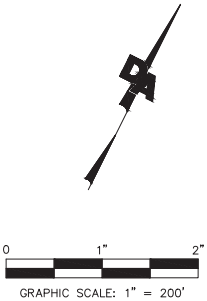
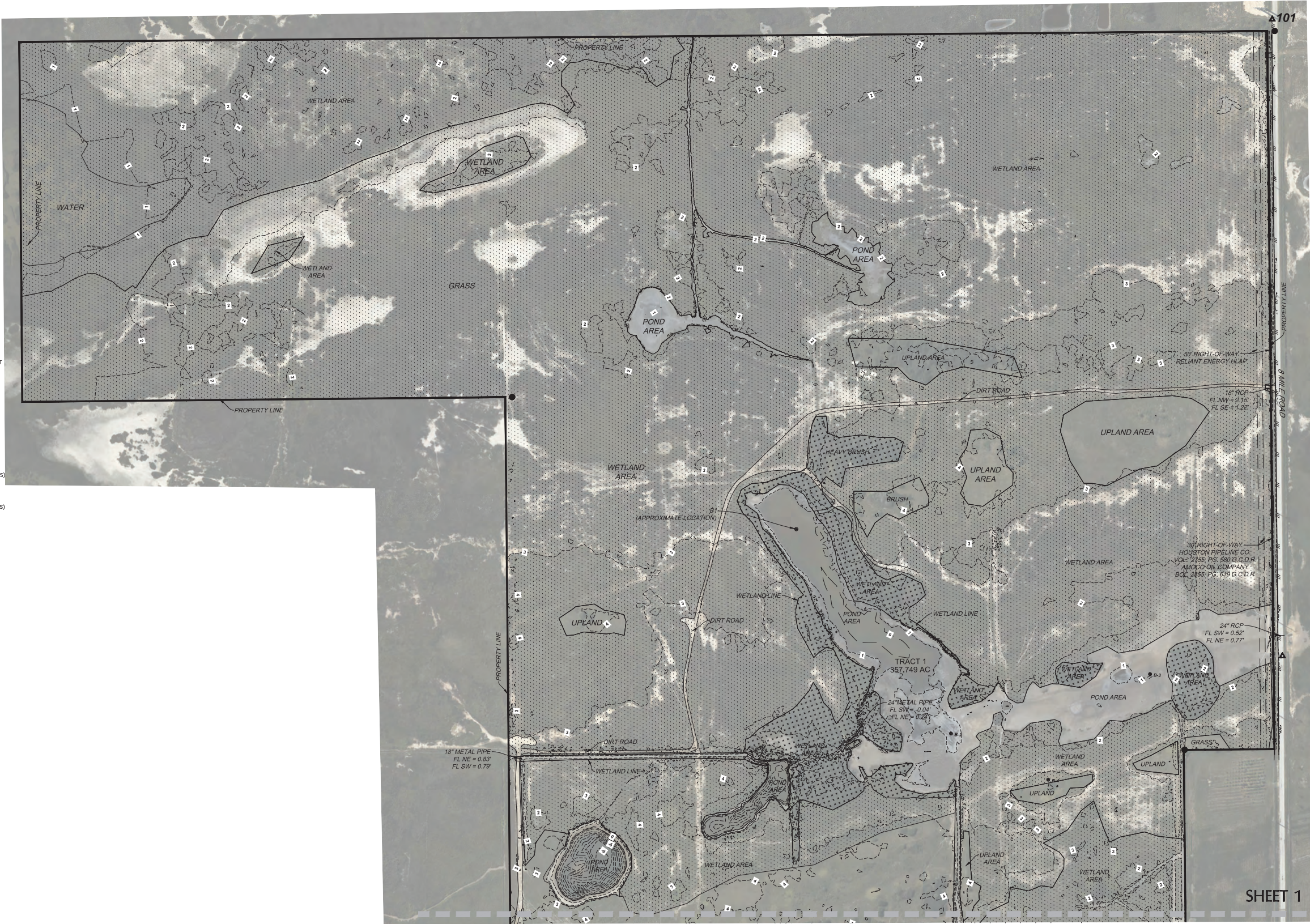
Date: 05/25/2023
Scale: 1" = 500'
Drawn by: JS
Reviewer: JDF
Project: 1554-010
Sheet: 1 OF 3
Field Book: 0000
Party Chief: SH
Survey Date: 09/07/2022

LEGEND

- 1/2" IRON ROD FOUND [UNLESS NOTED]
- IRON PIPE FOUND [AS NOTED]
- RIGHT OF WAY TYPE II MONUMENT FOUND
- NAIL FOUND
- 1/2" IRON ROD WITH "DOUCET" CAP SET CLEAN OUT
- BOLLARD
- ELECTRIC PULL BOX
- RADIO ANTENNA
- AIR CONDITIONING UNIT
- ELECTRIC MANHOLE
- FIRE HYDRANT
- GAS METER
- HANDICAP PARKING
- LIGHT POLE
- TRAFFIC SIGNAL
- FENCE POST FOUND [AS NOTED]
- MARKER POST [AS NOTED]
- VALVE
- WATER VALVE
- WATER METER
- STORM SENER MANHOLE
- TELEPHONE PEDESTAL
- GREASE MANHOLE
- TELEPHONE MANHOLE
- SIGN [AS NOTED]
- POWER POLE
- DOWN GUY
- BENCHMARK FOUND
- CALCULATED POINT
- COTTON SPINDLE FOUND
- ELECTRIC METER
- ELECTRIC TRANSFORMER
- GAS VALVE
- IRRIGATION CONTROL VALVE
- MAILBOX
- TELEPHONE SERVICE BOX
- TRAFFIC SIGNAL BOX
- WASTEWATER MANHOLE
- WATER MANHOLE
- SERVICE POLE
- CABLE PEDESTAL
- CONTROL POINT

- PROPERTY LINE/SUBJECT EASEMENT
- EXISTING PROPERTY LINE
- EXISTING EASEMENT
- ADJOINER PROPERTY LINE
- BSL BUILDING SET BACK LINE
- OE OVERHEAD ELECTRIC
- OW OVERHEAD WRES
- X EXISTING WIRE FENCE
- EXISTING WOOD FENCE
- EDGE OF PAVEMENT
- APPROXIMATE SURVEY LINE
- APPROXIMATE COUNTY LINE

- E2EM WETLAND AREA (PER OTHERS)
- E2SS WETLAND AREA (PER OTHERS)



REVISED: AUG 03, 2023

Sheet 3 of 33 Surveyed Wetlands and Topographic Map Legacy Wetlands at Sullivan Ranch Habitat Improvement Project Galveston Galveston County, Texas	
Job No.: 100079983	Date: July 26, 2023
Prepared by: Atkins/WHIT6392	



LEGACY WETLANDS
AT SULLIVAN RANCH

DOUCET
Civil Engineering // Entitlements // Geospatial
7401 B. Highway 71 W, Ste. 160
Austin, TX 78735, Tel: (512)-583-2600
www.doucetengineers.com
TBPE Firm Number: 3937
TBPELS Firm Number: 10105800

Date: 05/25/2023
Scale: 1" = 200'
Drawn by: JS
Reviewer: JDF
Project: 1554-010
Sheet: 2 OF 3
Field Book: 00000
Party Chief: SH
Survey Date: 09/07/2022

SURVEY NOTES:



BASIS OF BEARING IS THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), NORTH AMERICAN DATUM 1983 (NAD83), 2011 ADJUSTMENT (EPOCH 2010) AND A VERTICAL DATUM OF NAVD88, GEOID 12B. ALL COORDINATE VALUES AND DISTANCES SHOWN ARE SURFACE VALUES AND MAY BE CONVERTED TO SURFACE BY USING THE SURFACE ADJUSTMENT FACTOR OF 0.999868017.

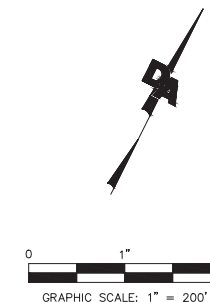
BOUNDARY AND EASEMENT INFORMATION SHOWN HEREON IS BASED ON INFORMATION PROVIDED BY JUNE, 27, 2016 JOHN D. MERCER SURVEY (JOHN D. MERCER, RPLS TX 1924 SURVEYING FIRM NO. 10116600).

SURVEY COMPLETED ON THE GROUND SEPTEMBER 8, 2022. AERIAL IMAGERY AND LIDAR FLOWN JULY 2022.

LEGACY WETLANDS AT SULLIVAN RANCH
TOPOGRAPHIC SURVEY
EXHIBIT

SHEET 2

-  E2EM WETLAND AREA (PER OTHERS)
-  E2SS WETLAND AREA (PER OTHERS)



REVISÉ: AUG 03, 2023

<p align="center">Sheet 4 of 33</p> <p align="center">Surveyed Wetlands and Topographic Map</p> <p align="center">Legacy Wetlands at Sullivan Ranch</p> <p align="center">Habitat Improvement Project</p> <p align="center">Galveston</p> <p align="center">Galveston County, Texas</p>	
<p>Job No.: 100079983</p>	
<p>Prepared by: Atkins/WHIT6392</p>	<p>Date: July 26, 2023</p>



LEGACY WETLANDS AT SULLIVAN RANCH



Date: 05/25/2023
Scale: 1" = 200'
Drawn by: JS
Reviewer: JDF
Project: 1554-010
Sheet: 3 OF 3
Field Book: 0000
Party Chief: SH
Survey Date: 09/07/2022

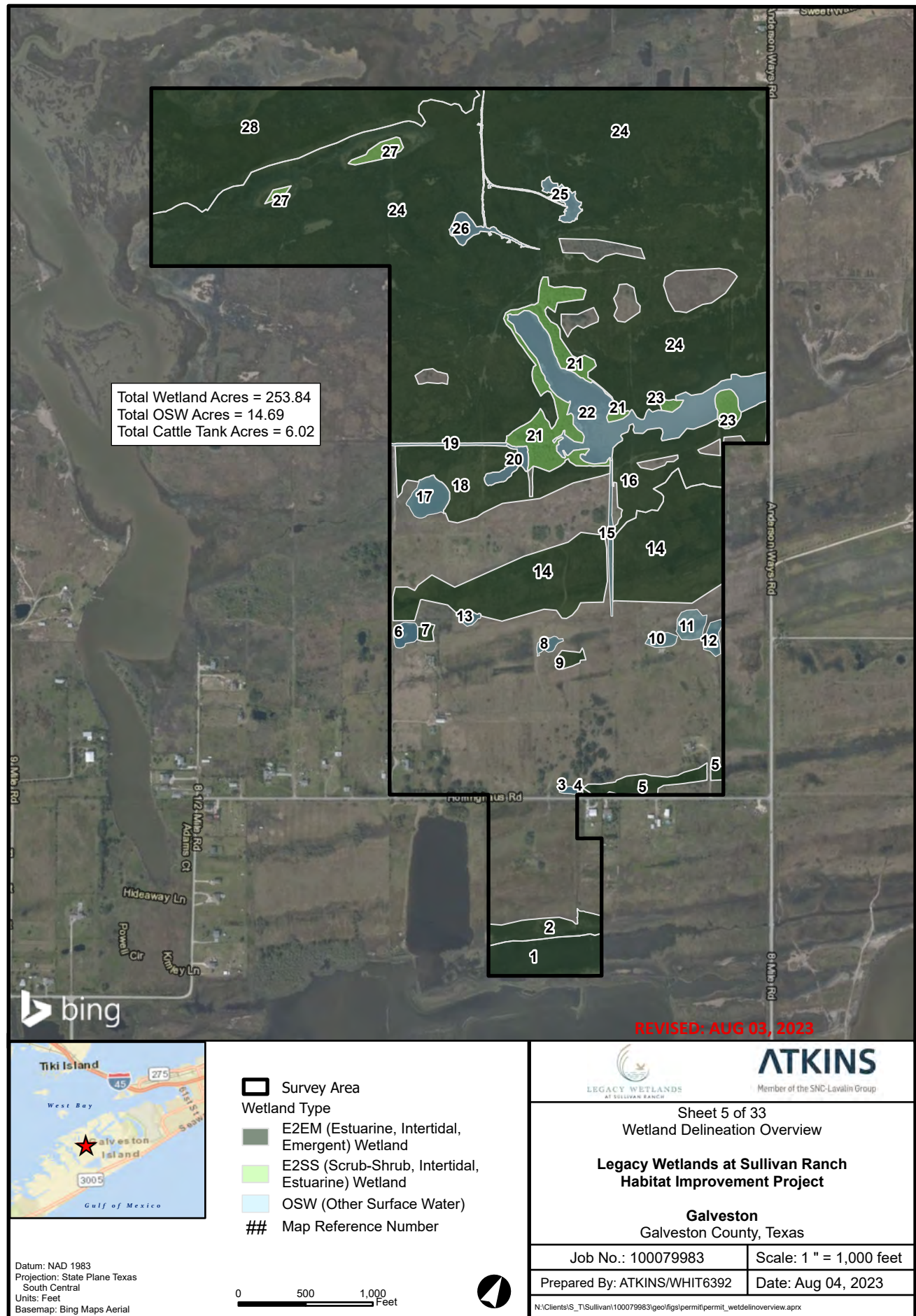
SURVEY NOTES:

BASIS OF BEARING IS THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), NORTH AMERICAN DATUM 1983 (NAD83), 2011 ADJUSTMENT (EPOCH 2010) AND A VERTICAL DATUM OF NAVD88, GEOID 12B. ALL COORDINATE VALUES AND DISTANCES SHOWN ARE SURFACE VALUES AND MAY BE CONVERTED TO SURFACE BY USING THE SURFACE ADJUSTMENT FACTOR OF 0.999868017.
UNITS: US SURVEY FEET.

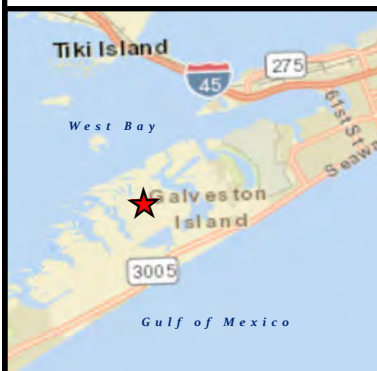
BOUNDARY AND EASEMENT INFORMATION SHOWN HEREON IS BASED ON INFORMATION PROVIDED BY JUNE, 27, 2016 JOHN D. MERCER SURVEY (JOHN D. MERCER, RPLS TX 1924 SURVEYING FIRM NO. 10116600).

SURVEY COMPLETED ON THE GROUND SEPTEMBER 8, 2022. AERIAL IMAGERY AND LIDAR
 FLOWN JULY 2022.

LEGACY WETLANDS AT SULLIVAN RANCH
TOPOGRAPHIC SURVEY
EXHIBIT



Name	Type	Acres	Lat (decimal degrees)	Long (decimal degrees)	Map Reference Number
Wetland 14	E2EM (Estuarine, Intertidal, Emergent)	5.33	29.242850	-94.893118	1
Wetland 13	E2EM (Estuarine, Intertidal, Emergent)	2.84	29.243374	-94.893096	2
OSW 01	Other Surface Water	0.13	29.245960	-94.894204	3
Wetland 01	E2EM (Estuarine, Intertidal, Emergent)	0.04	29.246075	-94.893900	4
Wetland 02	E2EM (Estuarine, Intertidal, Emergent)	2.25	29.246212	-94.893600	5
OSW 08	Other Surface Water	0.62	29.247452	-94.899282	6
Wetland 07	E2EM (Estuarine, Intertidal, Emergent)	0.32	29.247726	-94.898721	7
OSW 05	Other Surface Water	0.34	29.248499	-94.896082	8
Wetland 03	E2EM (Estuarine, Intertidal, Emergent)	0.49	29.248269	-94.895558	9
OSW 04	Other Surface Water	0.48	29.249565	-94.893756	10
OSW 03	Other Surface Water	0.94	29.250060	-94.893238	11
OSW 02	Other Surface Water	0.58	29.249966	-94.892621	12
OSW 06	Other Surface Water	0.29	29.248312	-94.898035	13
Wetland 04	E2EM (Estuarine, Intertidal, Emergent)	27.20	29.250291	-94.896187	14
OSW 07	Other Surface Water	0.68	29.251084	-94.895847	15
Wetland 05	E2EM (Estuarine, Intertidal, Emergent)	9.91	29.252177	-94.895535	16
OSW 09	Other Surface Water	1.58	29.250186	-94.900068	17
Wetland 08	E2EM (Estuarine, Intertidal, Emergent)	10.23	29.250313	-94.898972	18
OSW 10	Other Surface Water	0.37	29.251401	-94.900035	19
OSW 10-A	Other Surface Water	0.82	29.251653	-94.898530	20
Wetland 10	E2SS (Scrub-Shrub, Intertidal, Estuarine)	7.61	29.254128	-94.898034	21
OSW 11	Other Surface Water	11.66	29.253148	-94.897448	22
Wetland 06	E2SS (Scrub-Shrub, Intertidal, Estuarine)	1.24	29.254307	-94.894325	23
Wetland 09	E2EM (Estuarine, Intertidal, Emergent)	166.14	29.254656	-94.895786	24
OSW 12	Other Surface Water	1.05	29.256968	-94.900176	25
OSW 13	Other Surface Water	1.17	29.255475	-94.901936	26
Wetland 11	E2SS (Scrub-Shrub, Intertidal, Estuarine)	1.05	29.256376	-94.904273	27
Wetland 12	E2EM (Estuarine, Intertidal, Emergent)	27.37	29.255566	-94.906543	28



REVISED: AUG 03, 2023



Sheet 6 of 33
Wetland Delineation Table

**Legacy Wetlands at Sullivan Ranch
Habitat Improvement Project**

Galveston
Galveston County, Texas

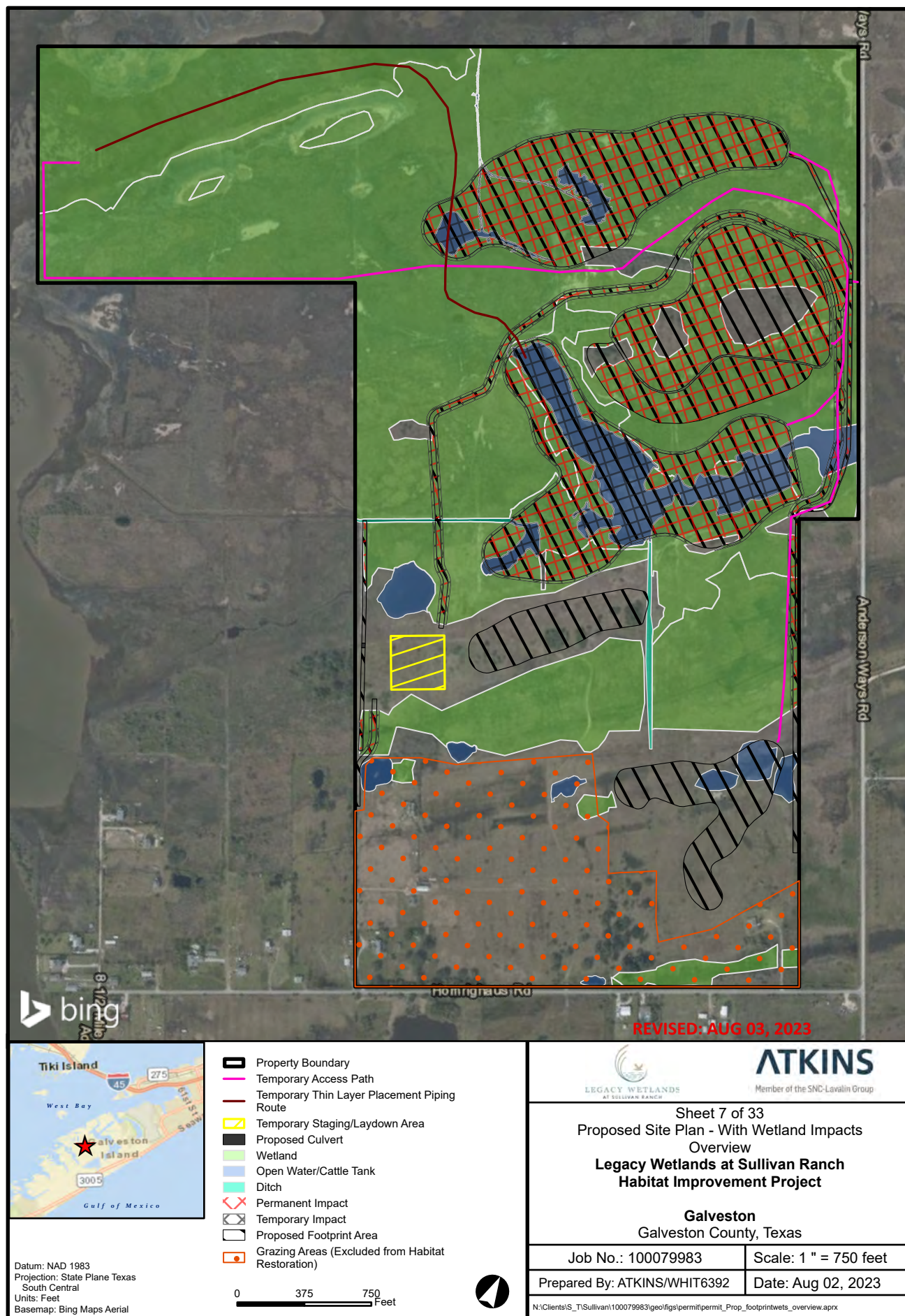
Job No.: 100079983

Scale: Not to Scale

Prepared By: Atkins/WHIT6392

Date: Aug 02, 2023

N:\Clients\S_T\Sullivan\100079983\geo\figs\permit\permit_wetdelin_table.aprx





- Property Boundary
- Temporary Access Path
- Temporary Staging/Laydown Area
- Proposed Culvert
- Wetland
- Open Water/Cattle Tank
- Ditch
- Permanent Impact
- Temporary Impact
- Proposed Footprint Area

- Temporary Thin Layer Placement Piping Route
- Grazing Areas (Excluded from Habitat Restoration)

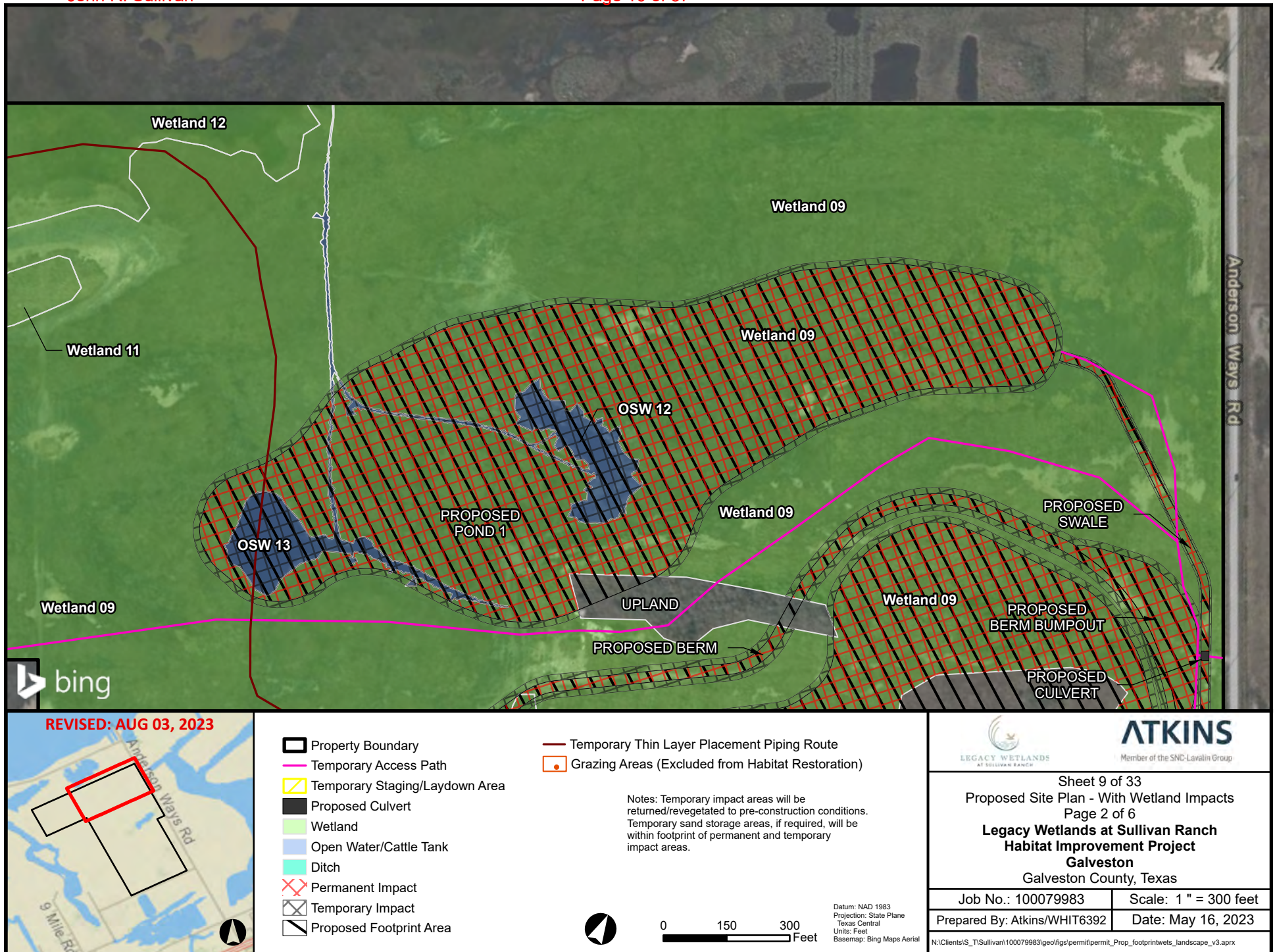
Notes: Temporary impact areas will be returned/revegetated to pre-construction conditions. Temporary sand storage areas, if required, will be within footprint of permanent and temporary impact areas.

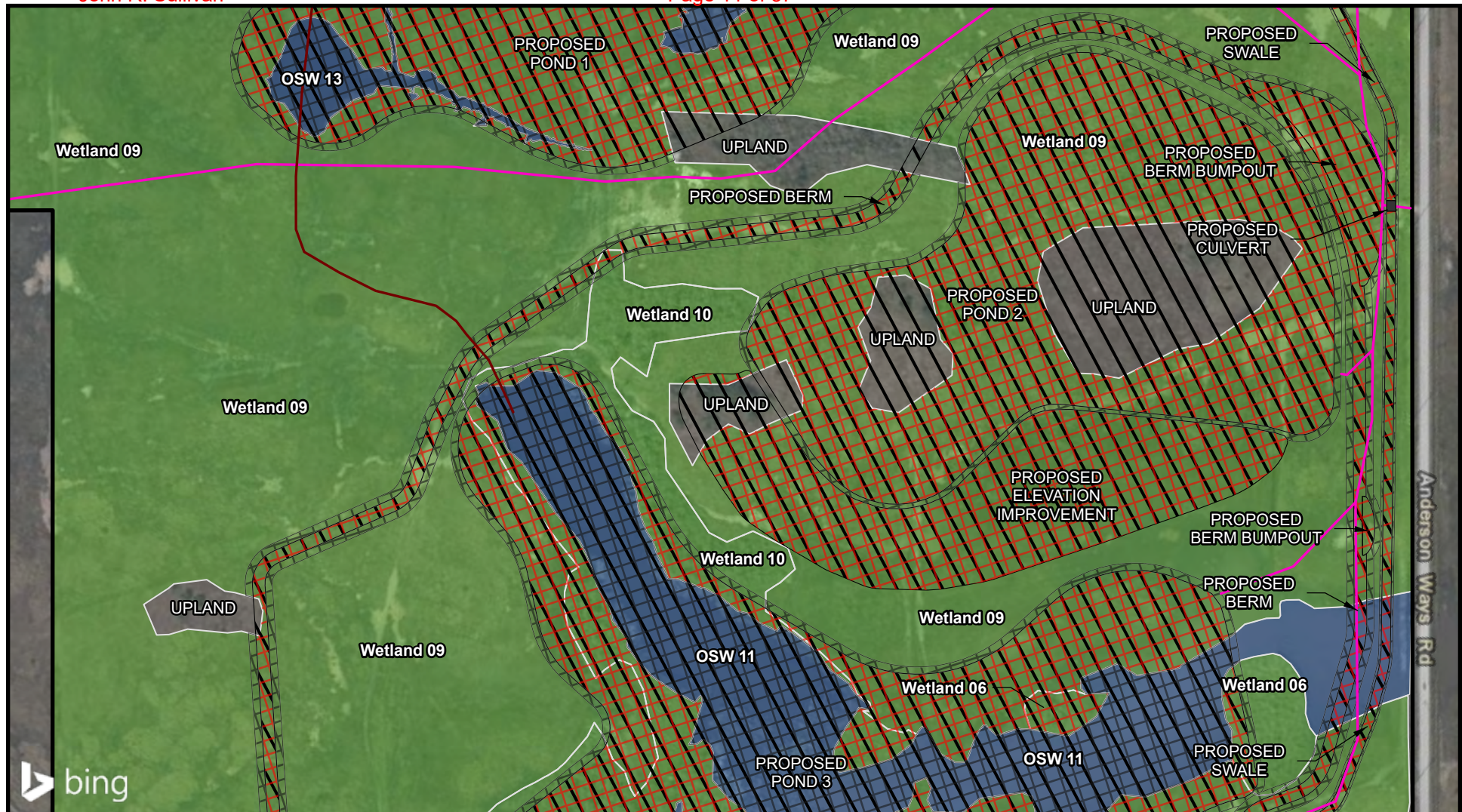


0 150 300 Feet

Datum: NAD 1983
Projection: State Plane
Texas Central
Units: Feet
Basemap: Bing Maps Aerial

Sheet 8 of 33 Proposed Site Plan - With Wetland Impacts Page 1 of 6 Legacy Wetlands at Sullivan Ranch Habitat Improvement Project Galveston Galveston County, Texas	
Job No.: 100079983	Scale: 1" = 300 feet
Prepared By: Atkins/WHIT6392	Date: May 16, 2023
N:\Clients\S_T\Sullivan\100079983\geo\figs\permit\permit_Prop_footprintwets_landscape_v3.aprx	





- Property Boundary
- Temporary Access Path
- Temporary Staging/Laydown Area
- Proposed Culvert
- Wetland
- Open Water/Cattle Tank
- Ditch
- Permanent Impact
- Temporary Impact
- Proposed Footprint Area



- Temporary Thin Layer Placement Piping Route
- Grazing Areas (Excluded from Habitat Restoration)

Notes: Temporary impact areas will be returned/revegetated to pre-construction conditions. Temporary sand storage areas, if required, will be within footprint of permanent and temporary impact areas.



0 150 300 Feet

Datum: NAD 1983
Projection: State Plane
Texas Central
Units: Feet
Basemap: Bing Maps Aerial

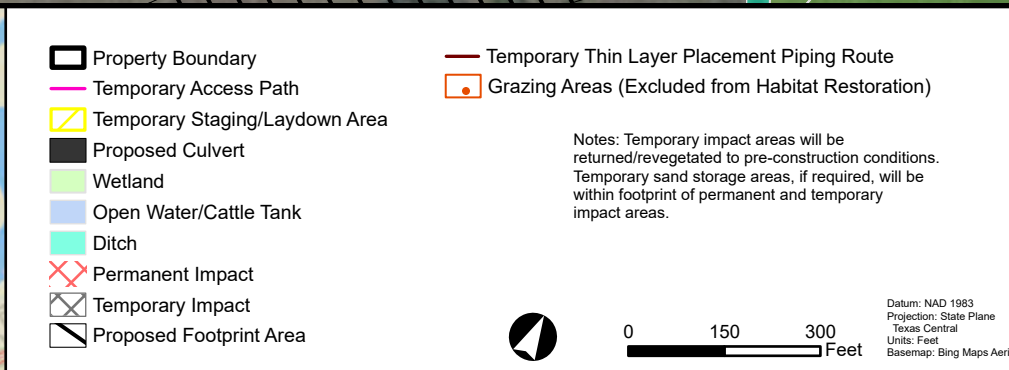
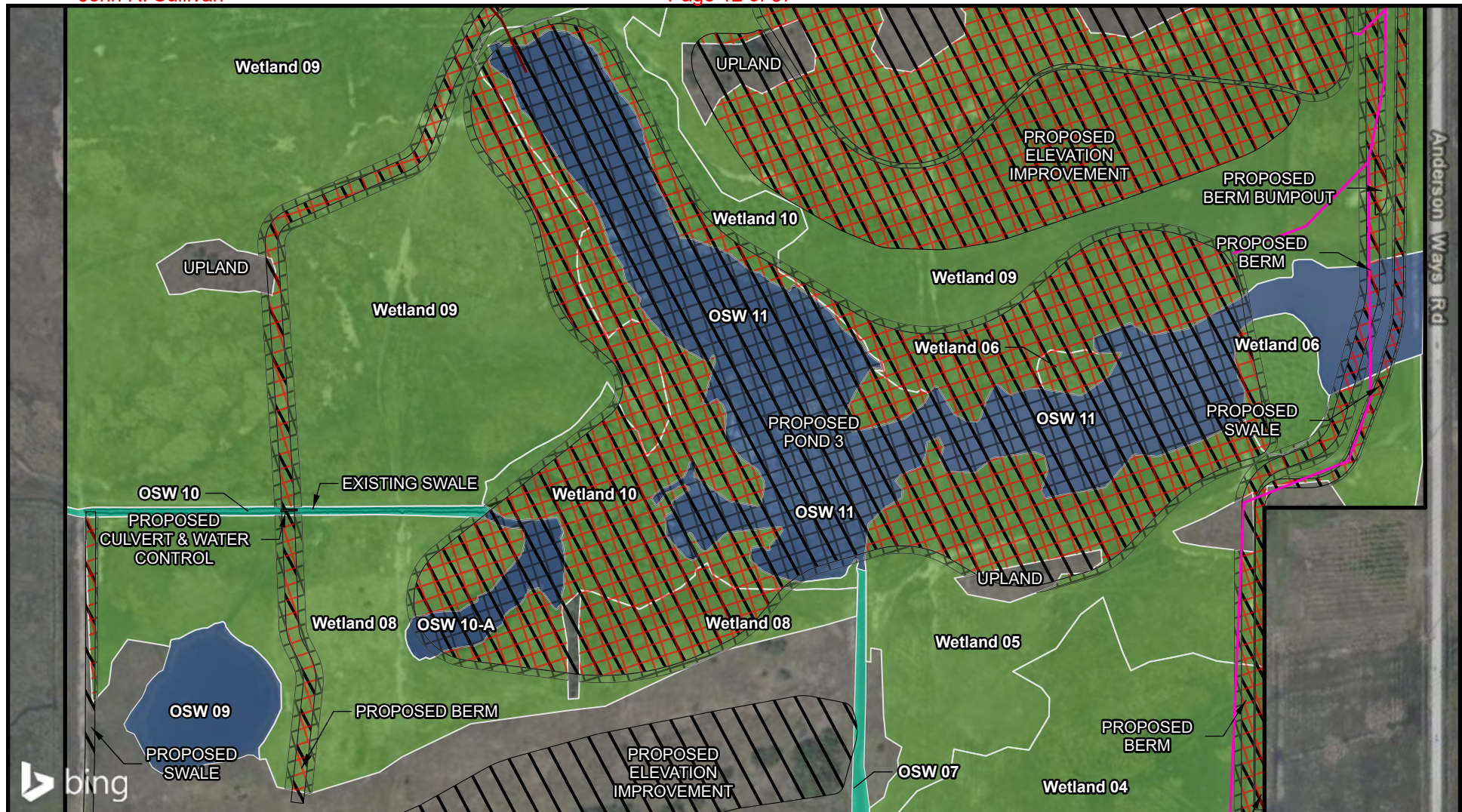



Member of the SNC-Lavalin Group

Sheet 10 of 33
Proposed Site Plan - With Wetland Impacts
Page 3 of 6
**Legacy Wetlands at Sullivan Ranch
Habitat Improvement Project
Galveston**
Galveston County, Texas

Job No.: 100079983	Scale: 1" = 300 feet
Prepared By: Atkins/WHIT6392	Date: May 16, 2023

N:\Clients\S_T\Sullivan\100079983\geo\figs\permit\permit_Prop_footprintwets_landscape_v3.aprx

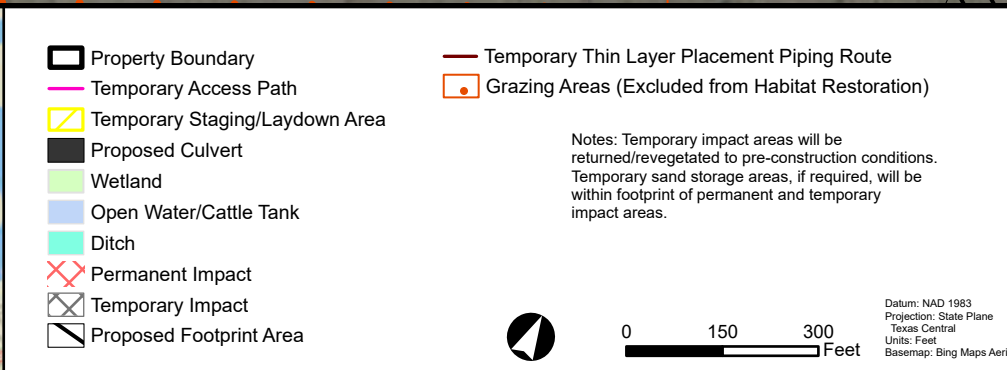


Member of the SNC-Lavalin Group

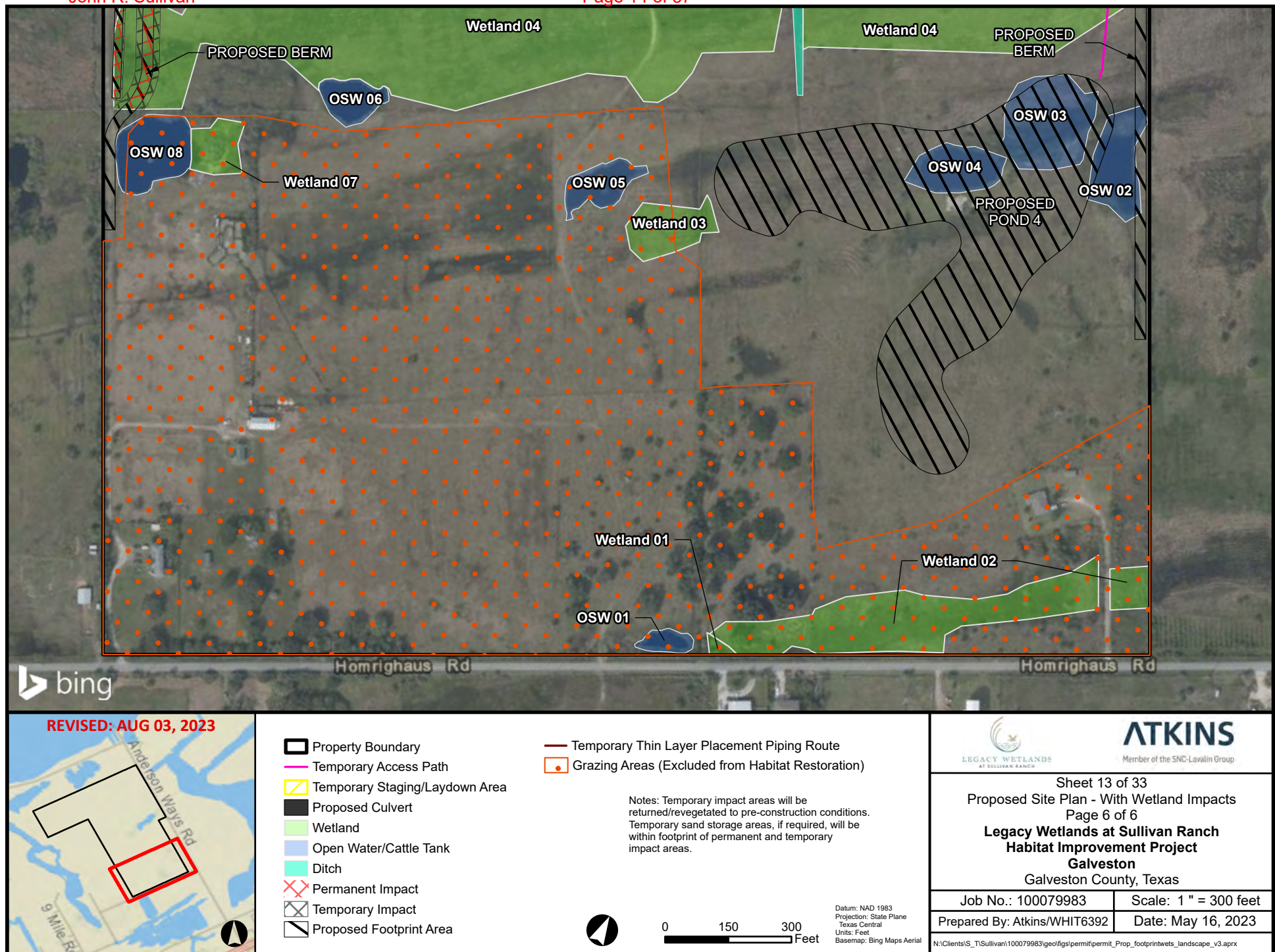
Sheet 11 of 33
Proposed Site Plan - With Wetland Impacts
Page 4 of 6
**Legacy Wetlands at Sullivan Ranch
Habitat Improvement Project
Galveston**
Galveston County, Texas

Job No.: 100079983	Scale: 1" = 300 feet
Prepared By: Atkins/WHIT6392	Date: May 16, 2023

N:\Clients\S_T\Sullivan\100079983\geo\figs\permit\permit_Prop_footprintwets_landscape_v3.aprx



<p>Member of the SNC-Lavalin Group</p>	
<p>Sheet 12 of 33 Proposed Site Plan - With Wetland Impacts Page 5 of 6 Legacy Wetlands at Sullivan Ranch Habitat Improvement Project Galveston Galveston County, Texas</p>	
Job No.: 100079983	Scale: 1" = 300 feet
Prepared By: Atkins/WHIT6392	Date: May 16, 2023
<p>N:\Clients\S_T\Sullivan\100079983\geofigs\permit\permit_Prop_footprintwets_landscape_v3.aprx</p>	



Overall Impacts				
Feature	Impact Area (acres)			
	Perm (wetland)	Perm (open water)	Temp (wetland)	Temp (open water)
Proposed Berms (fill)	3.64	0.16	3.91	0.18
Proposed Berm Bumpouts (fill)	0.93		0.20	
Proposed Elev Improvements (fill)	5.73			
Proposed Culverts (fill)	0.01			
TOTAL FILL	10.31	0.16	4.11	0.18
Proposed Swales (excavation)	1.34	0.10	0.52	0.05
Proposed Pond 1 (excavation)	19.03		1.57	2.10
Proposed Pond 2 (excavation)	11.74		1.04	
Proposed Pond 3 (excavation)	15.03		1.81	10.90
Proposed Pond 4 (excavation)				
TOTAL EXCAVATION	47.14	0.10	4.94	13.05
Temporary Access Path			2.47	0.01
Temporary Thin Layer Placement Pipeline			0.76	

Impacts by Wetland/OSW																		
Wetlands/OSWs	Fill								Excavation									
	Proposed Berms		Proposed Berm Bumpouts		Proposed Elev Improvements		Proposed Culverts		Proposed Swales		Proposed Pond 1		Proposed Pond 2		Proposed Pond 3		Proposed Pond 4	
	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp
OSW 10-A																0.77		
OSW 11	0.16	0.18							0.10	0.05						10.13		0.01
OSW 12												1.05						
OSW 13												1.05						
OSW TOTAL	0.16	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.05	0.00	2.10	0.00	0.00	0.00	10.90	0.00	0.00
Wetland 01																		
Wetland 02																		
Wetland 03																		
Wetland 04	0.59	0.54							0.21	0.03							0.23	
Wetland 05	0.34	0.30							0.30	0.07					2.74	0.26	0.03	
Wetland 06		0.02													0.47	0.10		
Wetland 07																		
Wetland 08	0.35	0.40							0.12	0.04					2.41	0.35		
Wetland 09	2.33	2.62	0.93	0.20	5.73		0.01		0.71	0.38	19.03	1.57	11.74	1.03	4.46	0.67	2.04	0.35
Wetland 10	0.03	0.03												0.01	4.95	0.43		0.003
Wetland 11																		
Wetland 12																	0.17	0.41
WETLAND TOTAL	3.64	3.91	0.93	0.20	5.73	0.00	0.01	0.00	1.34	0.52	19.03	1.57	11.74	1.04	15.03	1.81	0.00	0.00
TOTAL PERM	10.47								47.24									
TOTAL TEMP	4.29								17.99									



SUBJECT TRACT

= 379 ACRES

TOTAL HABITAT IMPROVEMENT AREA

= 327 ACRES

TOTAL WETLANDS

= 253.84 ACRES

TOTAL OSW

= 14.69 ACRES

TOTAL CATTLE TANKS

= 6.02

REVISED: AUG 03, 2023

10.47 ACRES OF FILL IN WETLAND/OSWS

= 10.31 ACRES OF FILL IN WETLANDS

= 0.16 ACRES OF FILL IN OSWS

47.24 ACRES OF EXCAVATION IN WETLAND/OSWS

= 47.14 ACRES OF EXCAVATION IN WETLANDS

= 0.10 ACRES OF EXCAVATION IN OSWS



ATKINS

Member of the SNC-Lavalin Group

Sheet 14 of 33
Impacts Tables

Legacy Wetlands at Sullivan Ranch Habitat Improvement Project

Galveston
Galveston County, Texas

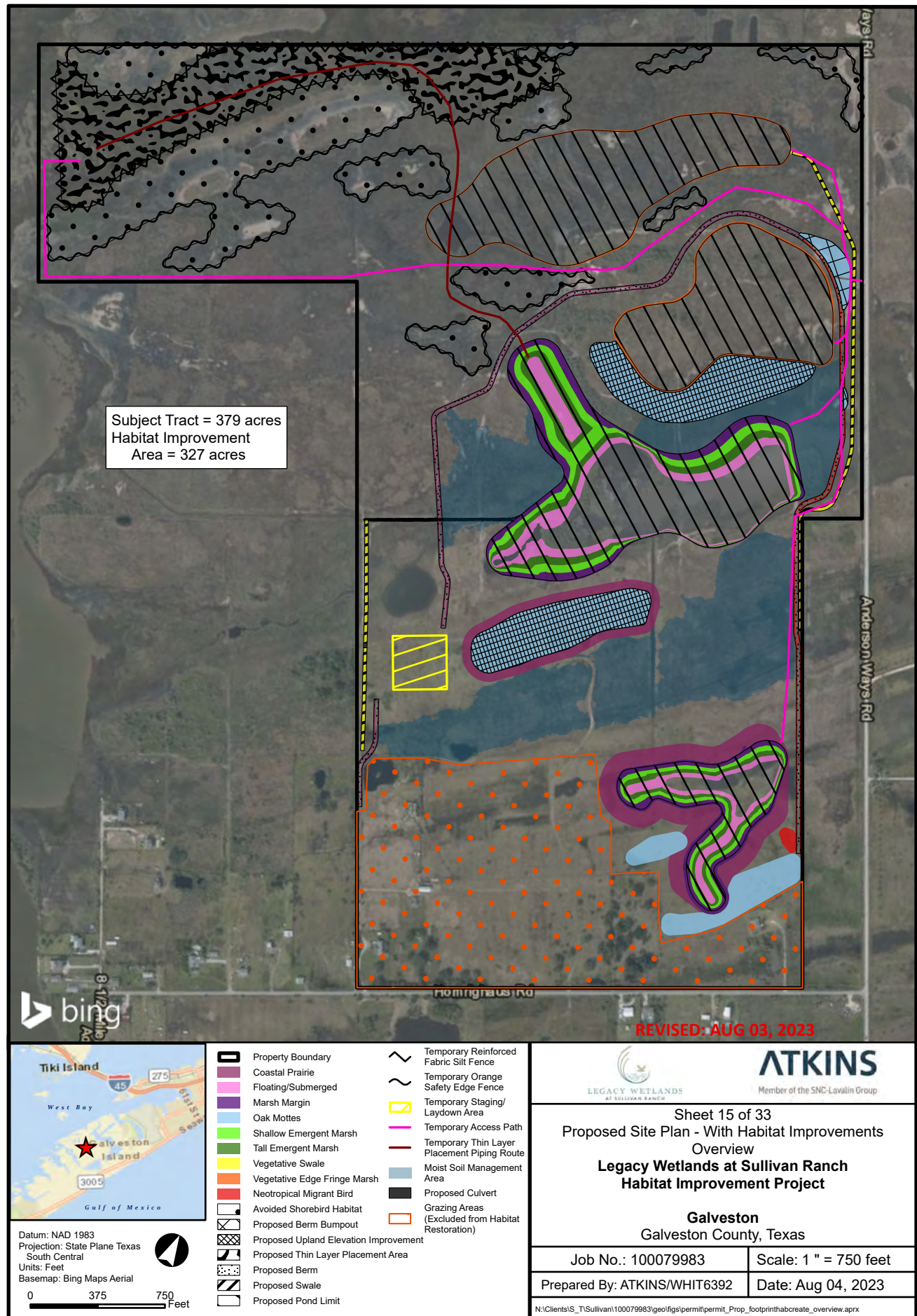
Job No.: 100079983

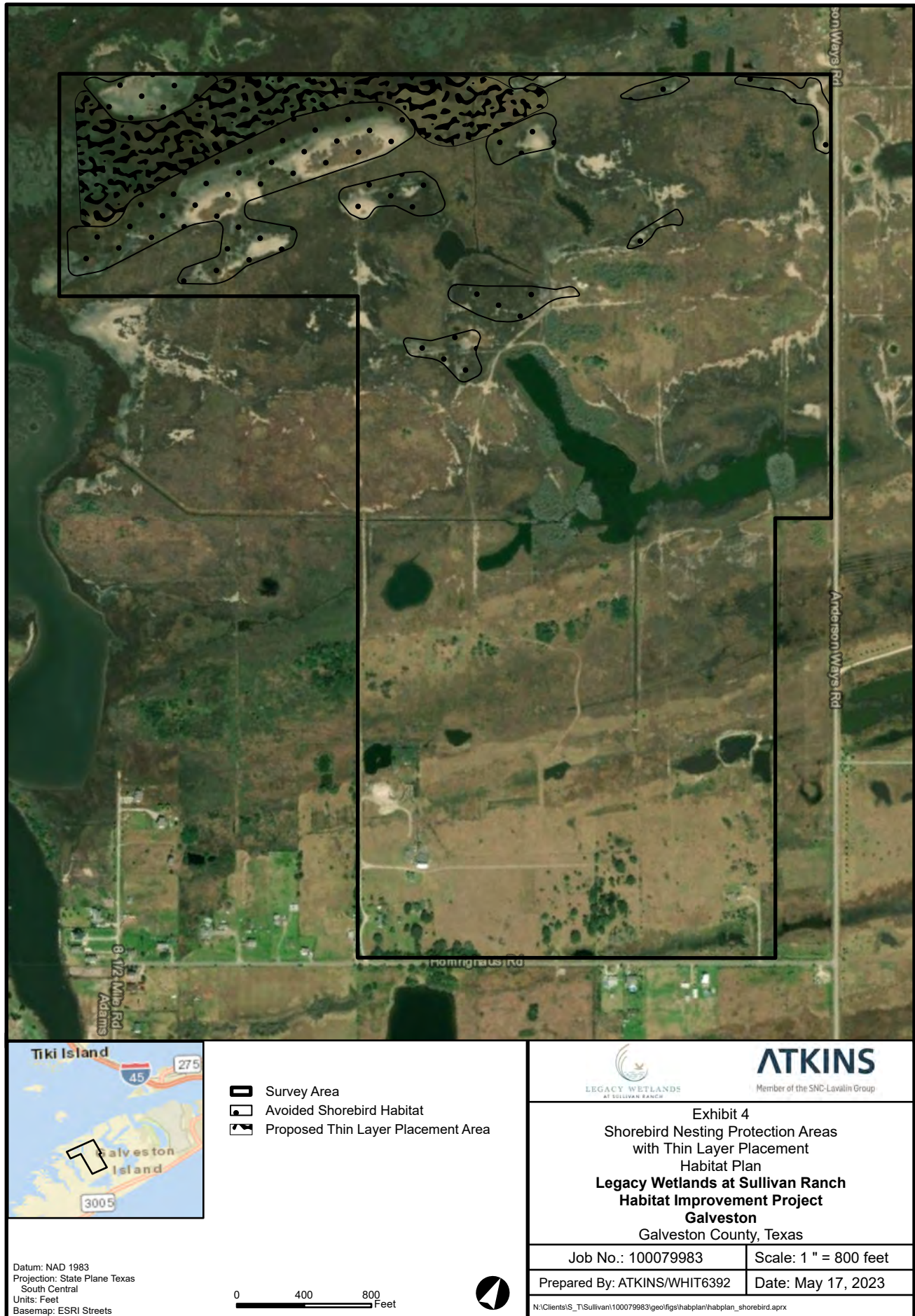
Scale: Not to Scale

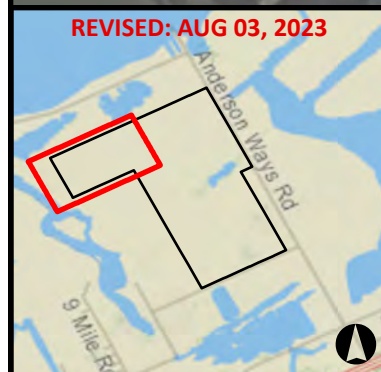
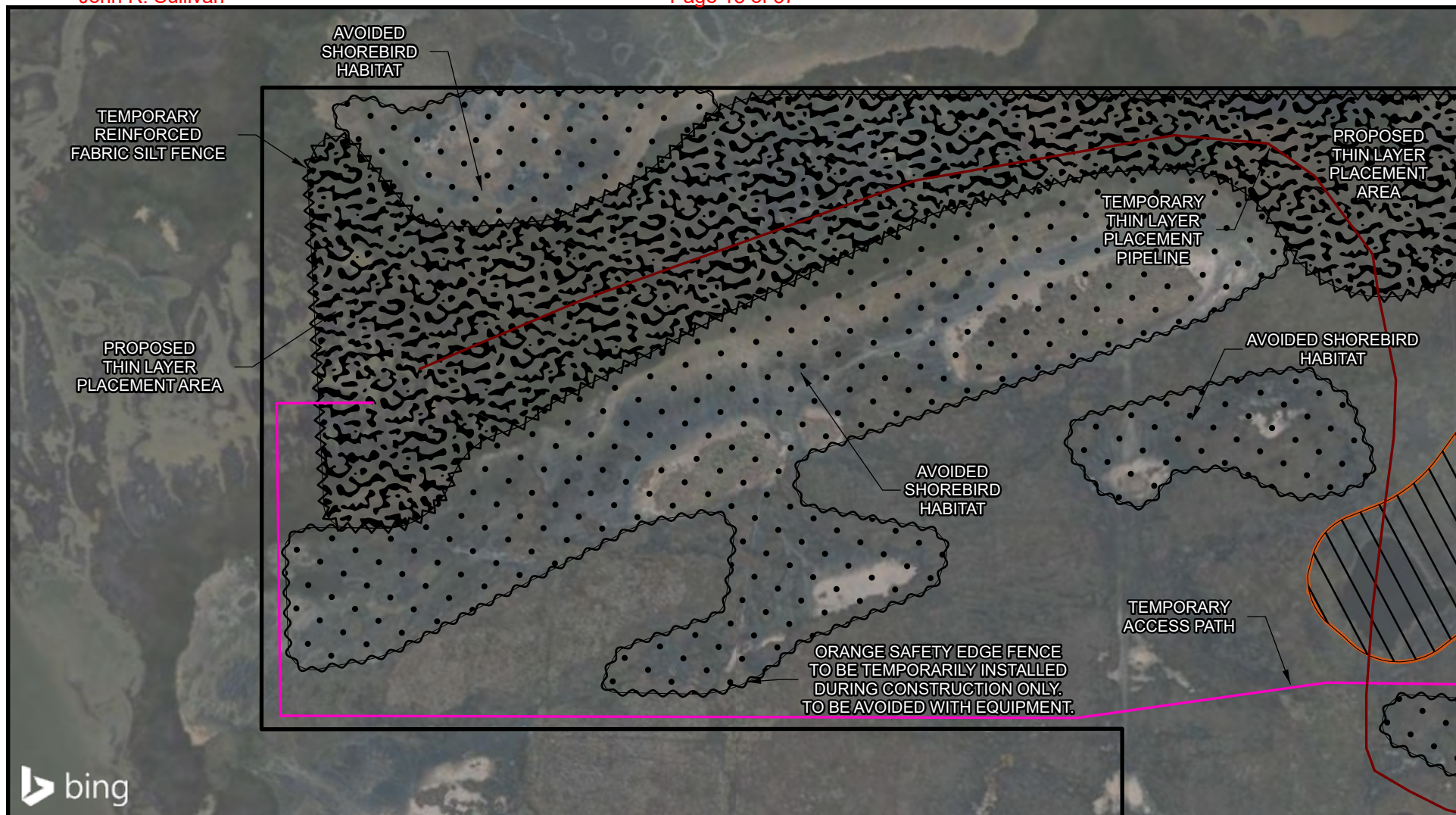
Prepared By: Atkins/WHIT6392

Date: Aug 04, 2023

N:\Clients\S_T\Sullivan\100079983\geo\figs\permit\permit_impact_table.aprx





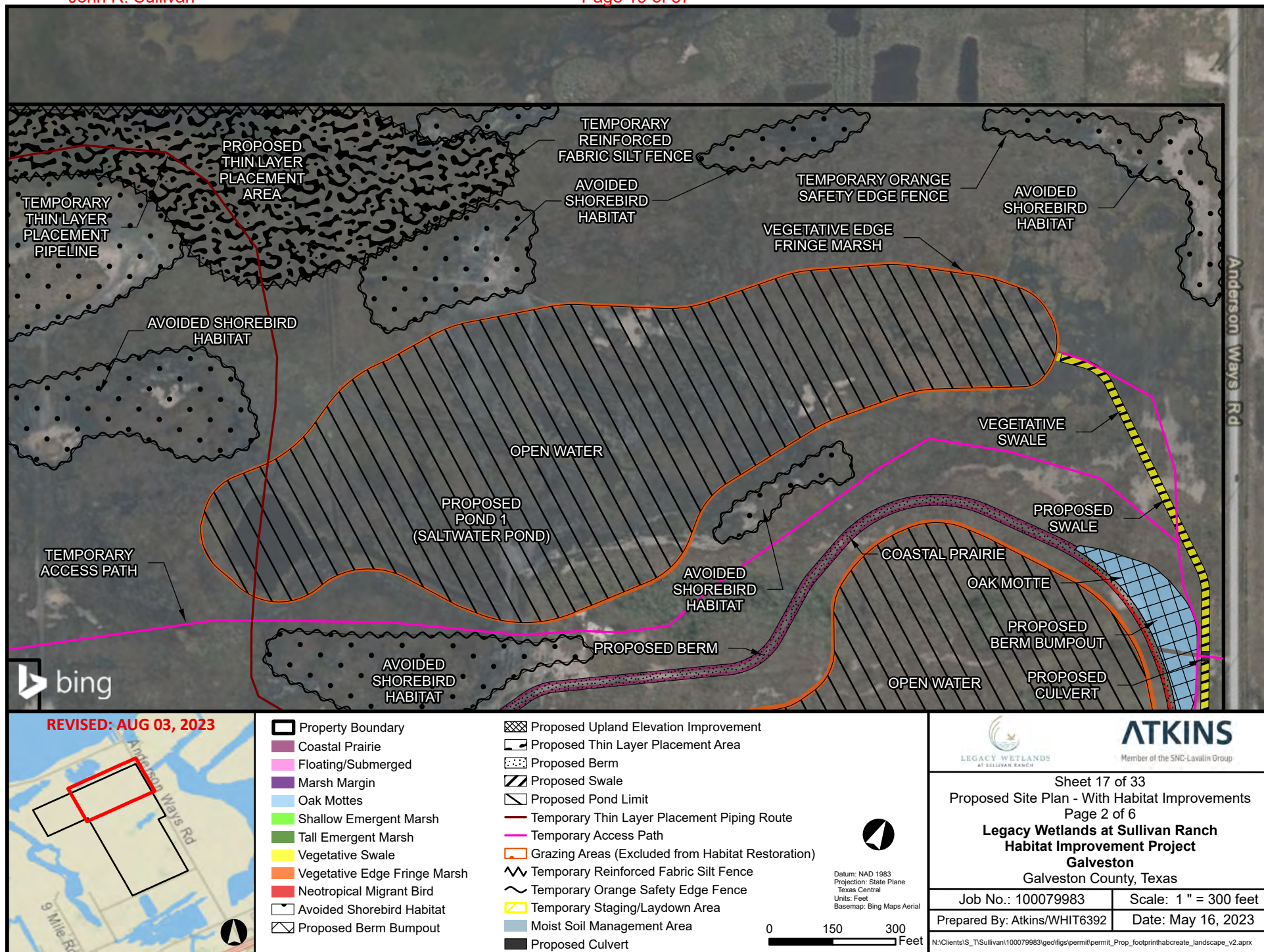


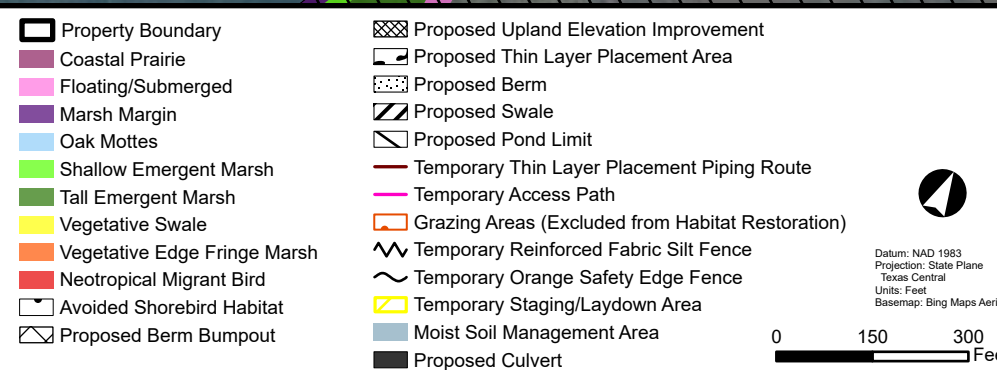
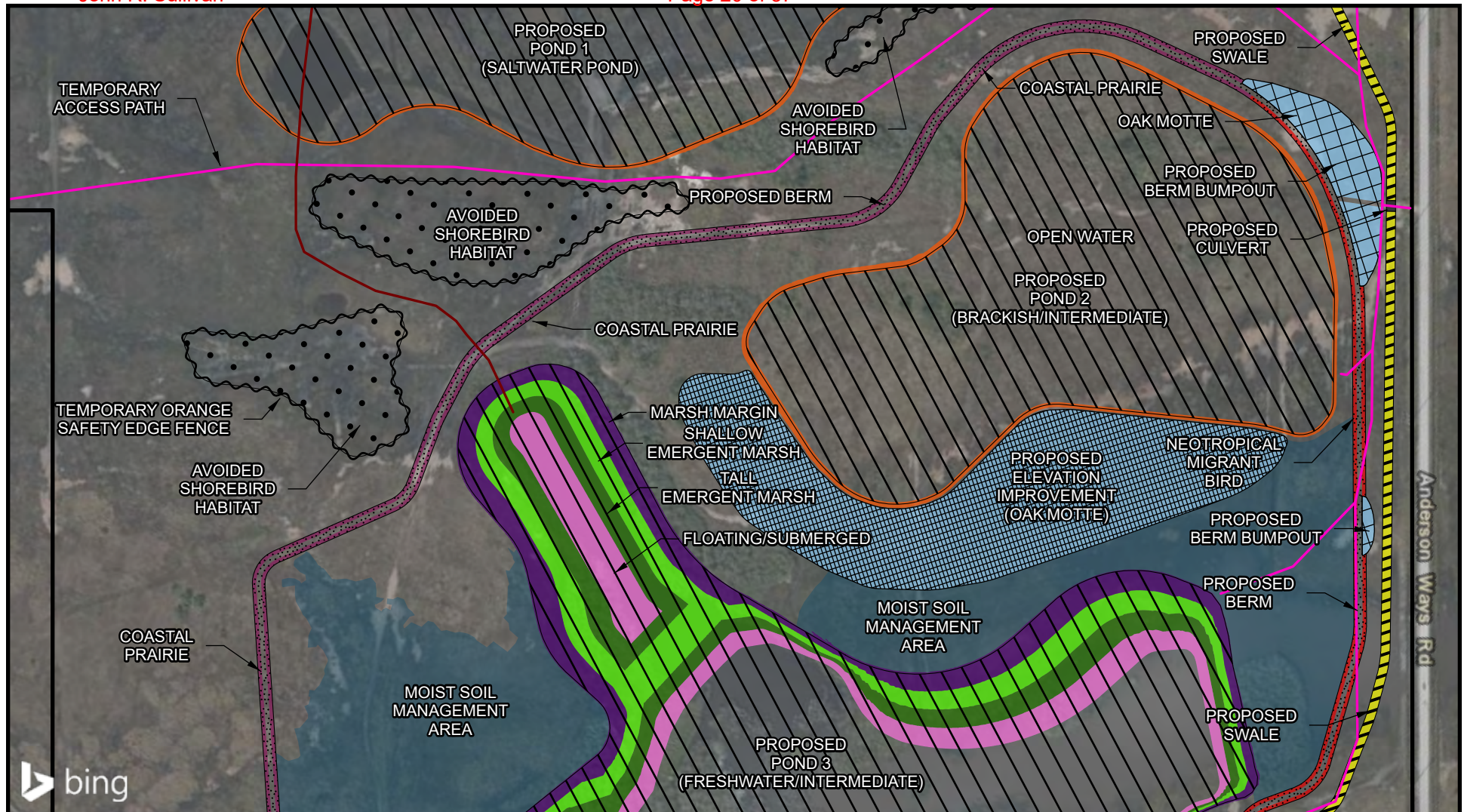
- | | |
|---|---|
| <ul style="list-style-type: none"> Property Boundary Coastal Prairie Floating/Submerged Marsh Margin Oak Mottes Shallow Emergent Marsh Tall Emergent Marsh Vegetative Swale Vegetative Edge Fringe Marsh Neotropical Migrant Bird Avoided Shorebird Habitat Proposed Berm Bumpout | <ul style="list-style-type: none"> Proposed Upland Elevation Improvement Proposed Thin Layer Placement Area Proposed Berm Proposed Swale Proposed Pond Limit Temporary Thin Layer Placement Piping Route Temporary Access Path Grazing Areas (Excluded from Habitat Restoration) Temporary Reinforced Fabric Silt Fence Temporary Orange Safety Edge Fence Temporary Staging/Laydown Area Moist Soil Management Area Proposed Culvert |
|---|---|

Datum: NAD 1983
Projection: State Plane
Texas Central
Units: Feet
Basemap: Bing Maps Aerial

0 150 300 Feet

<p>Member of the SNC-Lavalin Group</p>	
<p>Sheet 16 of 33 Proposed Site Plan - With Habitat Improvements Page 1 of 6 Legacy Wetlands at Sullivan Ranch Habitat Improvement Project Galveston Galveston County, Texas</p>	
Job No.: 100079983	Scale: 1" = 300 feet
Prepared By: Atkins/WHIT6392	Date: May 16, 2023
<p>N:\Clients\S_T\Sullivan\100079983\geofigs\permit\permit_Prop_footprint\habcreate_landscape_v2.aprx</p>	



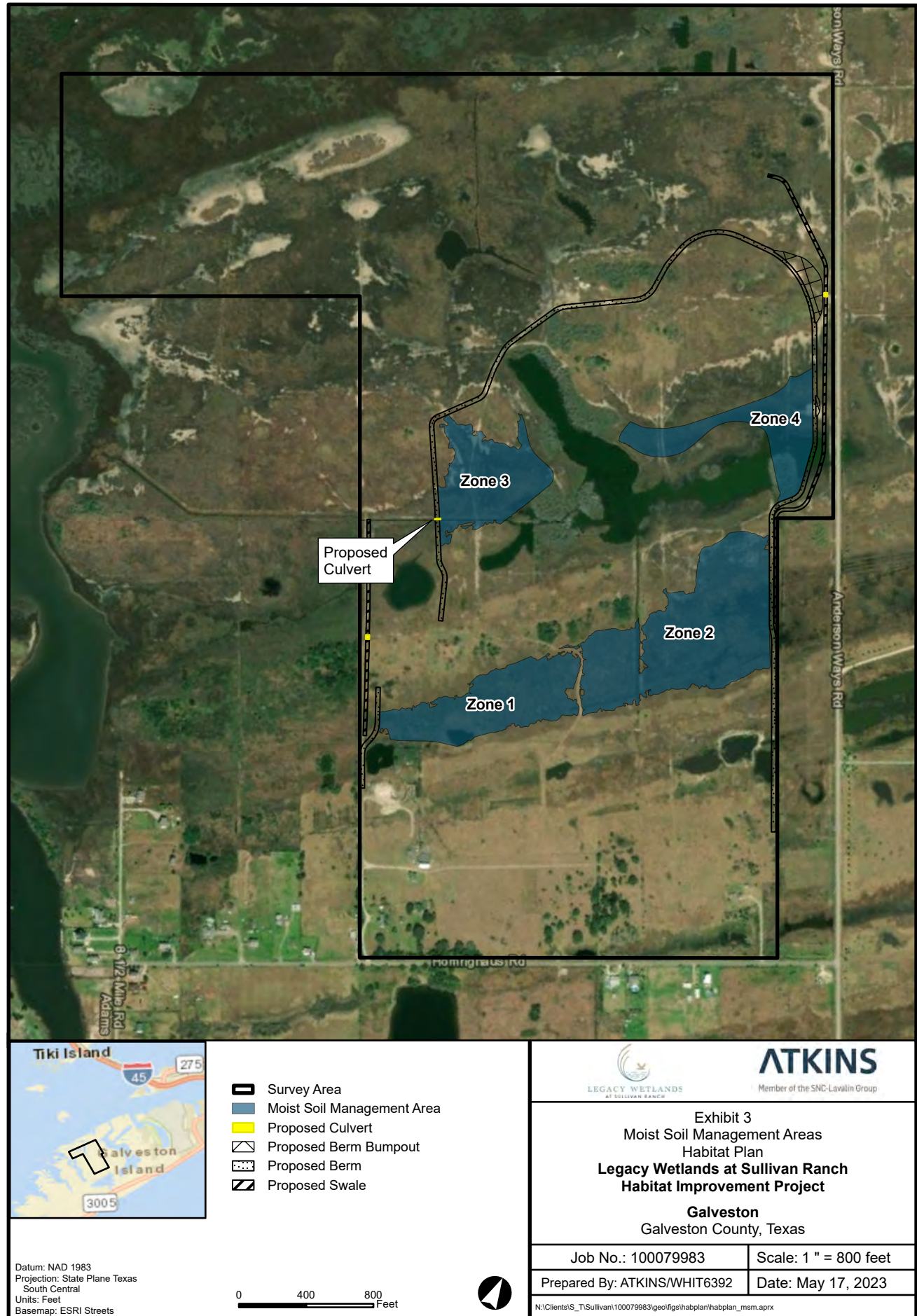


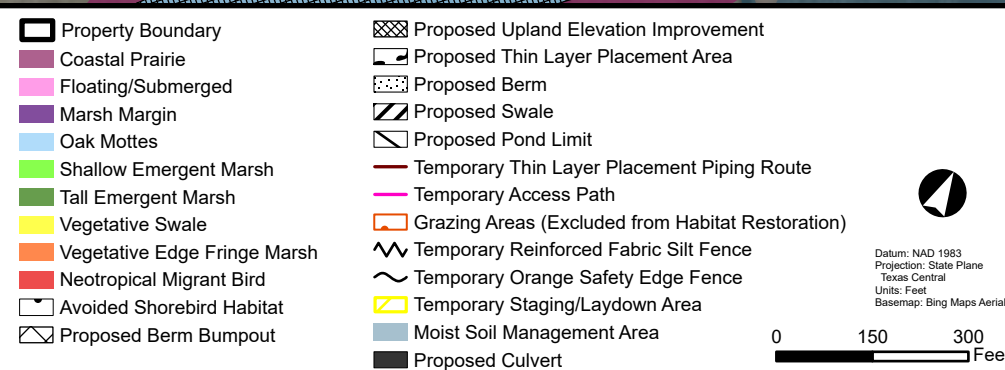
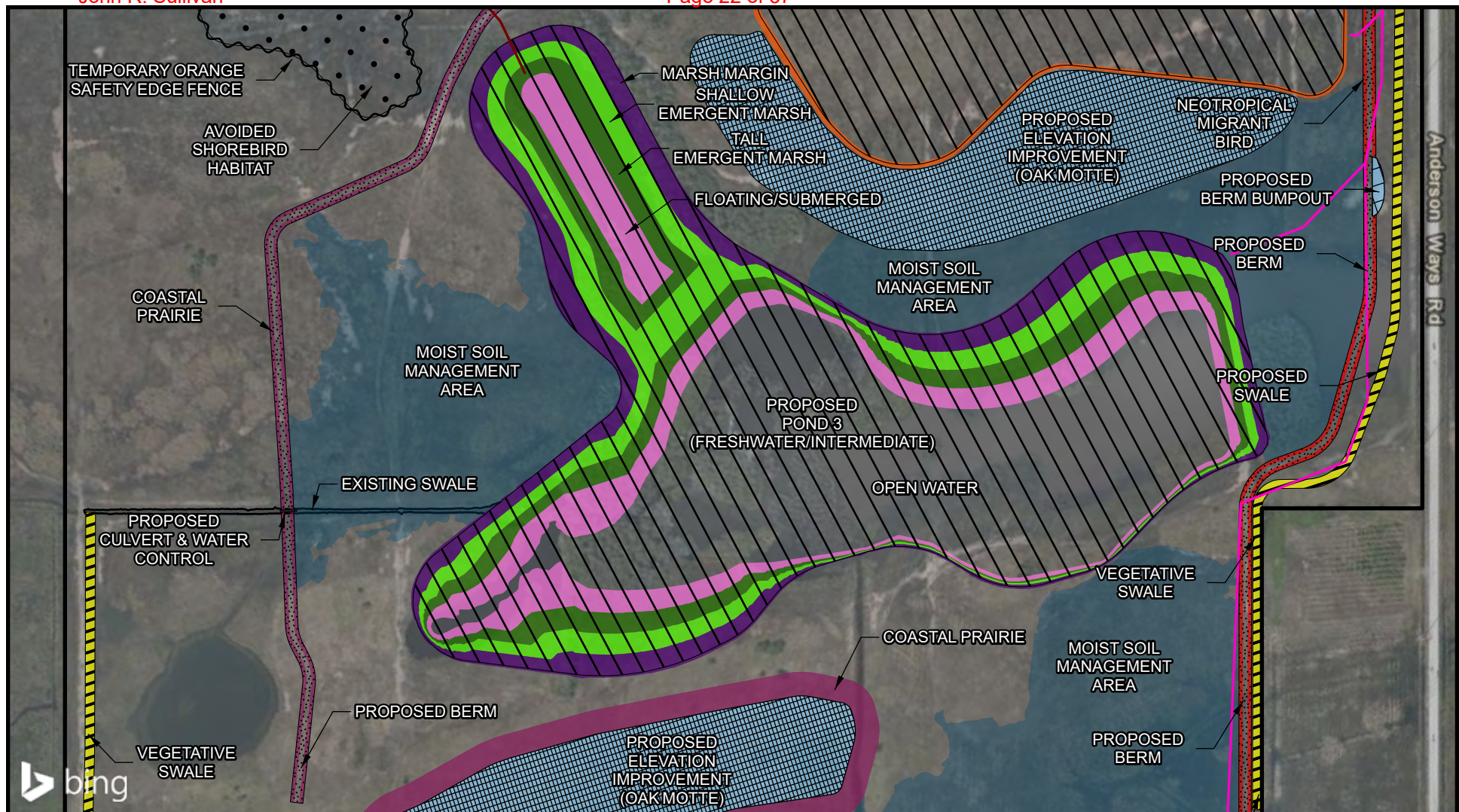
Member of the SNC-Lavalin Group

Sheet 18 of 33
Proposed Site Plan - With Habitat Improvements
Page 3 of 6
**Legacy Wetlands at Sullivan Ranch
Habitat Improvement Project
Galveston**
Galveston County, Texas

Job No.: 100079983	Scale: 1" = 300 feet
Prepared By: Atkins/WHIT6392	Date: May 16, 2023

N:\Clients\S_T\Sullivan\100079983\geo\figs\permit\permit_Prop_footprint\habcacre_landscapes_v2.aprx



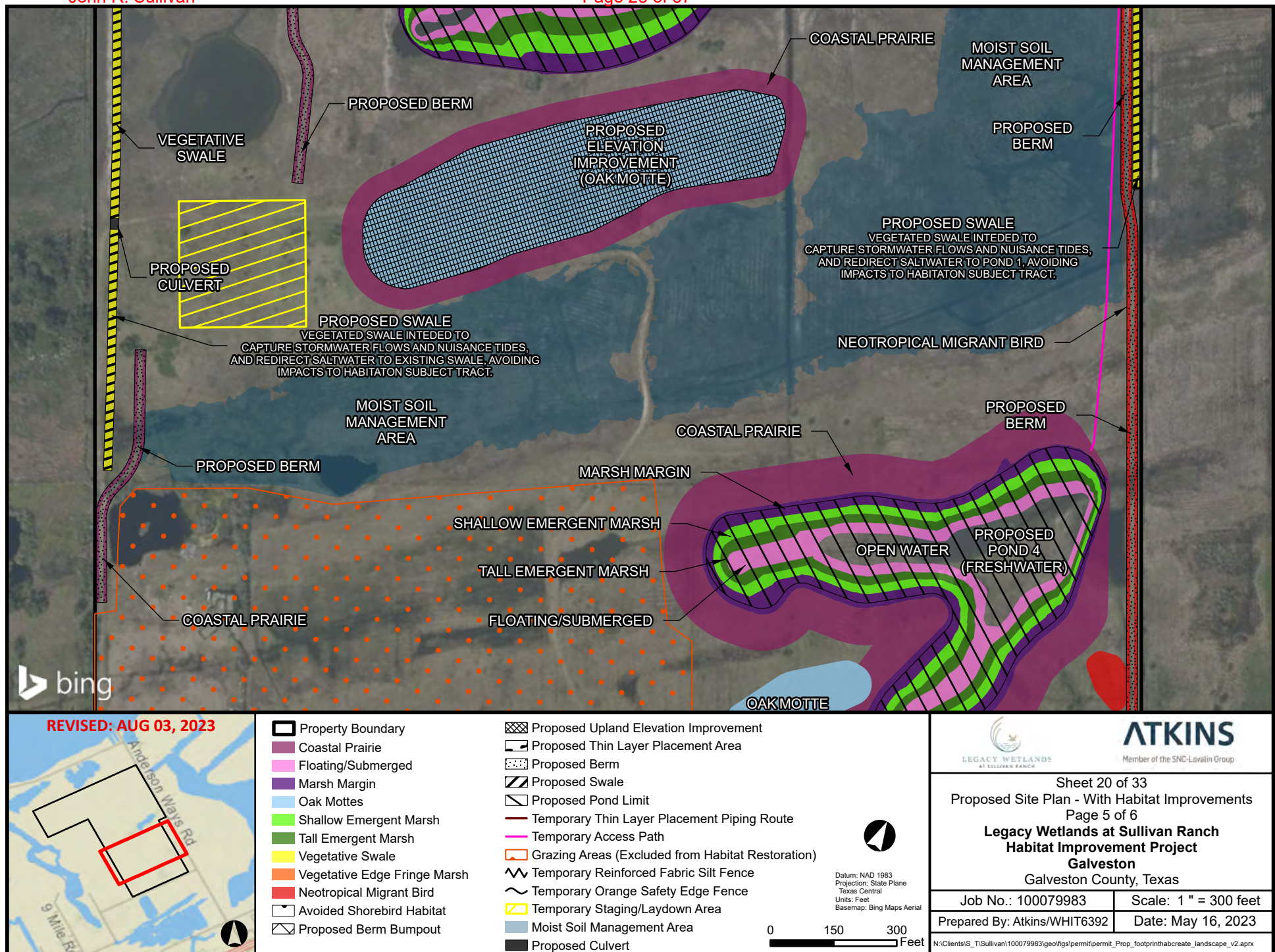


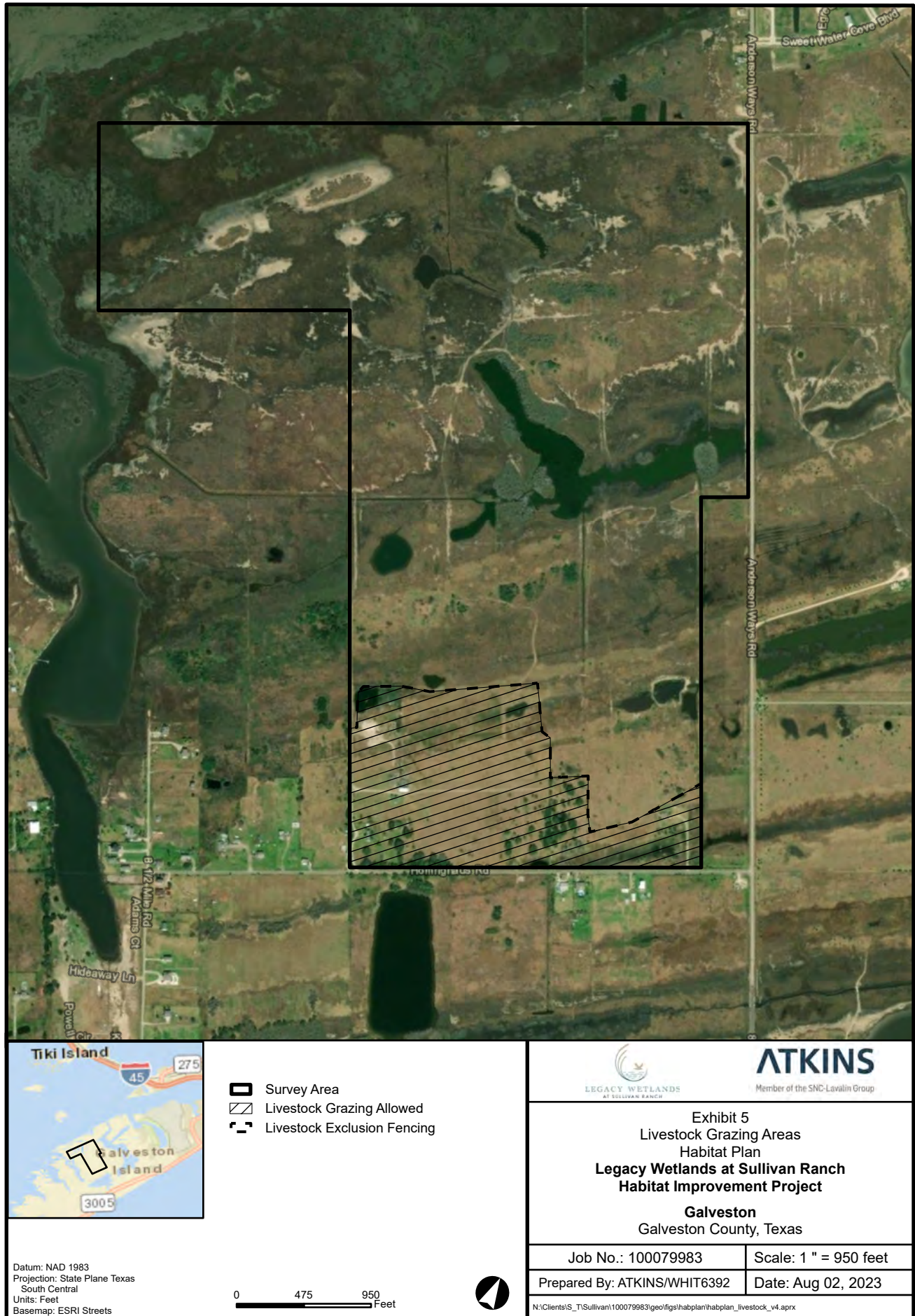
Member of the SNC-Lavalin Group

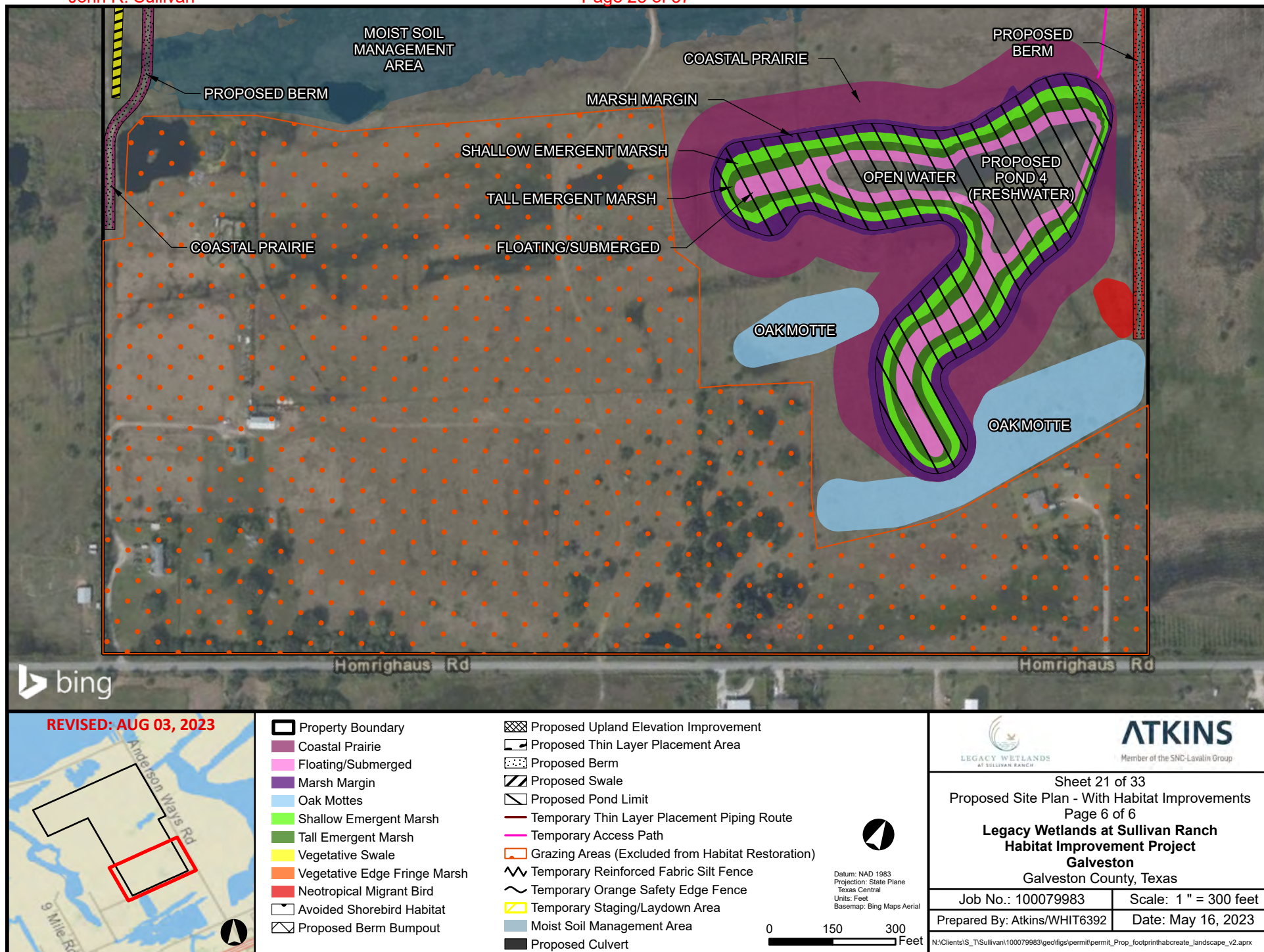
Sheet 19 of 33
Proposed Site Plan - With Habitat Improvements
Page 4 of 6
**Legacy Wetlands at Sullivan Ranch
Habitat Improvement Project
Galveston**
Galveston County, Texas

Job No.: 100079983	Scale: 1" = 300 feet
Prepared By: Atkins/WHIT6392	Date: May 16, 2023

N:\Clients\S_T\Sullivan\100079983\geofigs\permit\permit_Footprint\haccreate_landscape_v2.aprx





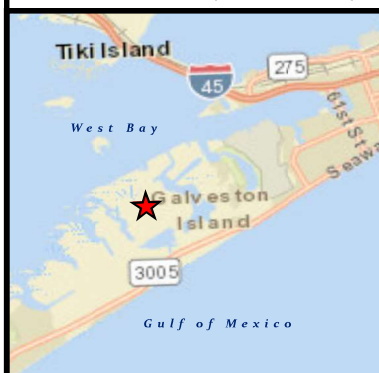


	Overall Habitat Improvement Area (acres)											
	Dry Habitat (28.14 acres)			Moist Habitat (128.23 acres)								
Feature	Coastal Prairie	Oak Mottes	Neotropical Migrant Bird	Floating/ Submerged	Marsh Margin	Shallow Emergent Marsh	Tall Emergent Marsh	Vegetative Swale	Vegetative Edge Fringe Marsh	Open Water	Thin Layer Placement	Moist Soil Management
Proposed Swales								1.85				
Proposed Berms	1.60		1.21									
Proposed Berm Bumpouts		0.91										
Proposed Elev Improvements	2.92	11.72										
Proposed Pond 1									1.03	20.89		
Proposed Pond 2									0.99	15.31		
Proposed Pond 3				3.95	3.88	3.81	3.51			4.80		
Proposed Pond 4	5.86			1.69	2.64	1.55	1.52			1.71		
Other		3.68	0.24									
TOTAL	10.38	16.31	1.45	5.64	6.52	5.36	5.03	1.85	2.02	42.71	22.00	37.10

Habitat Features by Wetland/OSW										
Wetlands/OSWs	Features									
	Coastal Prairie	Oak Mottes	Neotropical Migrant Bird	Floating/ Submerged	Marsh Margin	Shallow Emergent Marsh	Tall Emergent Marsh	Vegetative Swale	Vegetative Edge Fringe Marsh	Open Water
OSW 10-A				0.39	0.03	0.04	0.06			
OSW 11			0.10	1.46	0.26	0.97	0.99	0.10		
OSW 12									0.001	
OSW 13									0.006	
Wetland 01										
Wetland 02										
Wetland 03	0.14									
Wetland 04	0.20		0.27					0.21		
Wetland 05			0.21	0.13	0.12	0.06	0.07	0.30		2.41
Wetland 06				0.16	0.12	0.08	0.04			0.08
Wetland 07										
Wetland 08	0.21			0.43	0.77	0.65	0.64	0.12		0.02
Wetland 09	1.09	6.64	0.30	0.50	1.72	1.35	0.90	0.71	1.90	30.18
Wetland 10	0.02			0.83	0.80	0.61	0.75		0.005	2.00
Wetland 11										
Wetland 12										
TOTAL	1.66	6.64	0.88	3.90	3.82	3.76	3.45	1.44	1.91	34.69

Avoided Habitat Areas	
Area	Acres
Unimpacted Sand Flats (Avoided Shorebird Habitat)	35.10
Unimpacted Existing Wetlands	128.56
Unimpacted Open Water	7.15

REVISED: AUG 03, 2023



SUBJECT TRACT = 379 ACRES
TOTAL HABITAT IMPROVEMENT AREA = 327 ACRES

2.6:1 HABITAT CREATION TO WETLAND/OSW IMPACT RATIO
= 27.46 ACRES OF HABITAT IMPROVEMENTS IN WETLAND/OSWS
= 10.47 ACRES OF FILL IN WETLANDS/OSWS

156.37 ACRES OF OVERALL IMPROVEMENTS
= 28.14 ACRES OF DRY HABITAT
= 128.23 ACRES OF MOIST HABITAT

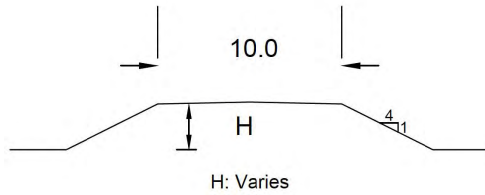


Sheet 22 of 33
Habitat Improvements Tables
Legacy Wetlands at Sullivan Ranch
Habitat Improvement Project
Galveston
Galveston County, Texas

Job No.: 100079983	Scale: Not to Scale
Prepared By: Atkins/WHIT6392	Date: Aug 08, 2023

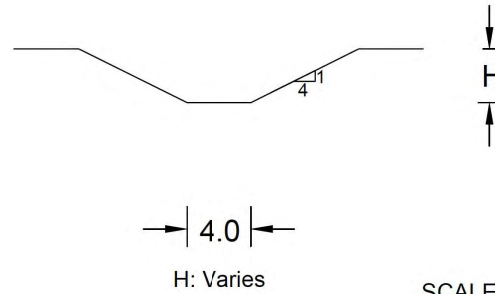
N:\C\ents\S_T\Sullivan\100079983\geo\figs\permit\permit_ben_table.aprx

TYPICAL CROSS SECTION BERM



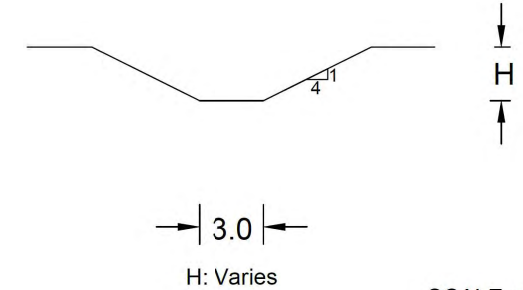
SCALE : NTS

TYPICAL CROSS SECTION SWALE 01



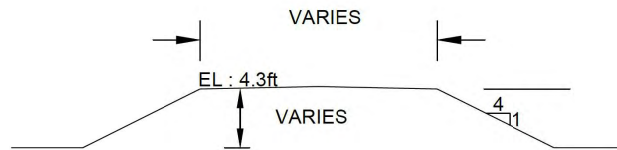
SCALE : NTS

TYPICAL CROSS SECTION SWALE 02



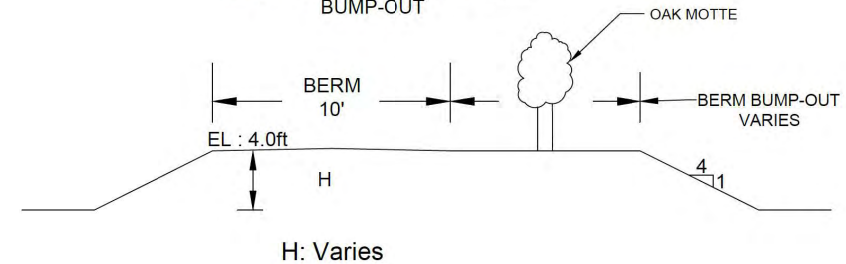
SCALE : NTS

TYPICAL CROSS SECTION MATERIAL
PLACEMENT AREA SECTION



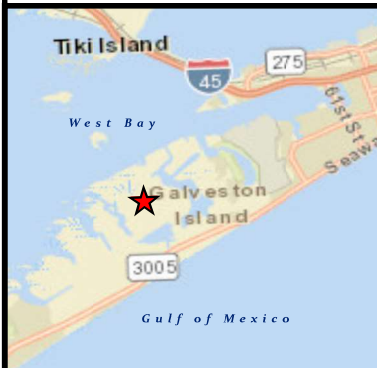
SCALE : NTS

TYPICAL CROSS SECTION BERM
BUMP-OUT



SCALE : NTS

REVISED: AUG 03, 2023



NOTES:

1. Install silt fence around salt flats to prevent access to equipment during construction activities to protect shorebird habitat.
2. Spray/apply up to 5" of flowable excavated material to thin layer placement area. Place silt fencing, hay bales, and employ sediment best management practices to prevent temporary turbidity impact. Minimize heavy equipment use in the thin layer placement area.
3. Provide floating sediment boom/curtain along northwestern boundary of property to prevent turbidity from entering adjoining bayou. Location to be determined by contractor and confirmed by the engineer.
4. Provide 24" Tideflex (TM) check valve (series TF-1) for backflow prevention or engineered approved equivalent.



Sheet 23 of 33
Typical Cross Sections

Legacy Wetlands at Sullivan Ranch
Habitat Improvement Project

Galveston
Galveston County, Texas

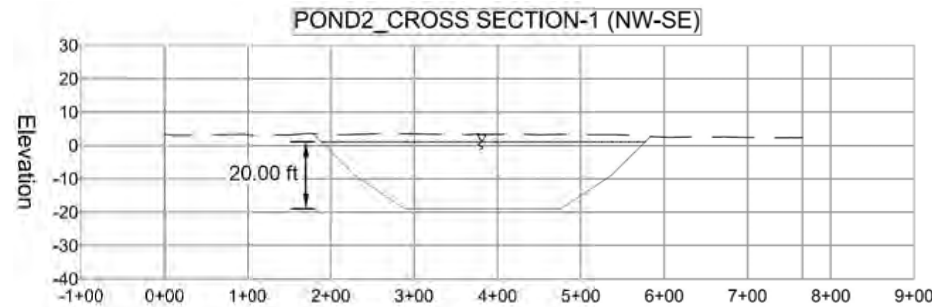
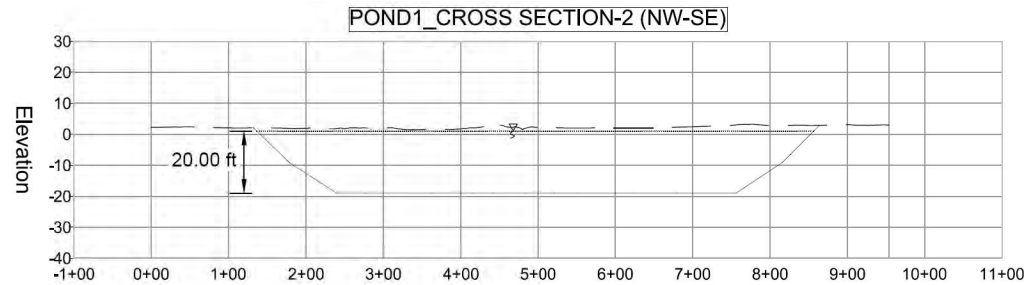
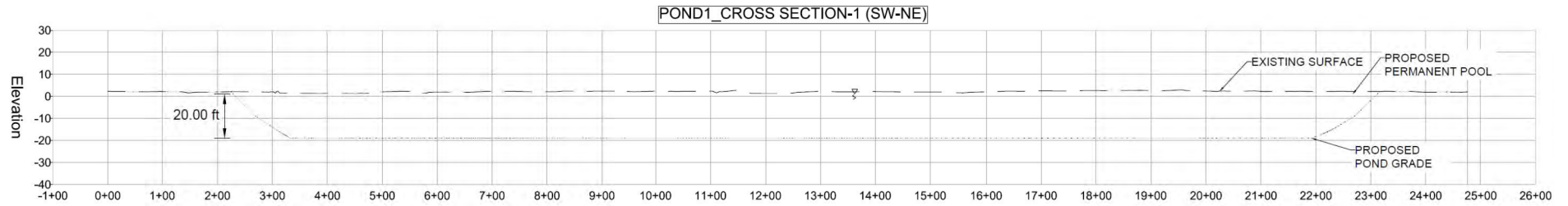
Job No.: 100079983

Scale: Not to Scale

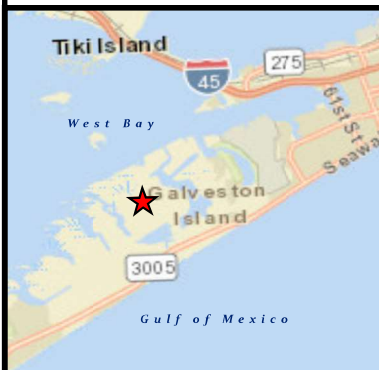
Prepared By: Atkins/WHIT6392

Date: May 16, 2023

N:\Clients\S_T\Sullivan\100079983\geo\figs\permit\permit_XS_Berm_Swale_PA.aprx



REVISED: AUG 03, 2023



LEGEND:

---	EXISTING SURFACE
---	PROPOSED POND GRADE
---	PROPOSED PERMANENT POOL

SCALE : H-1:100
V-1:25



Sheet 24 of 33
Grading Sections

**Legacy Wetlands at Sullivan Ranch
Habitat Improvement Project**

**Galveston
Galveston County, Texas**

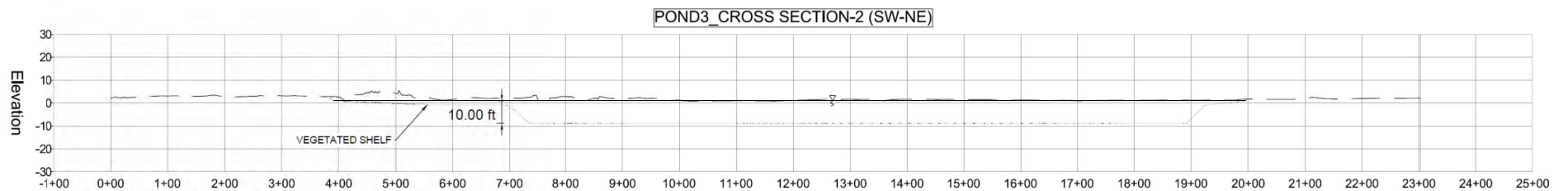
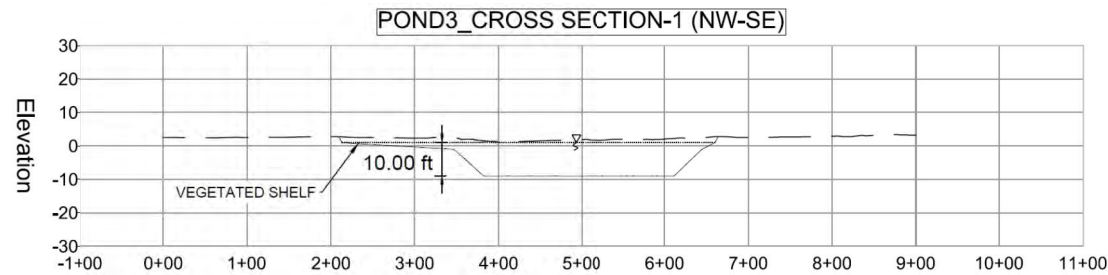
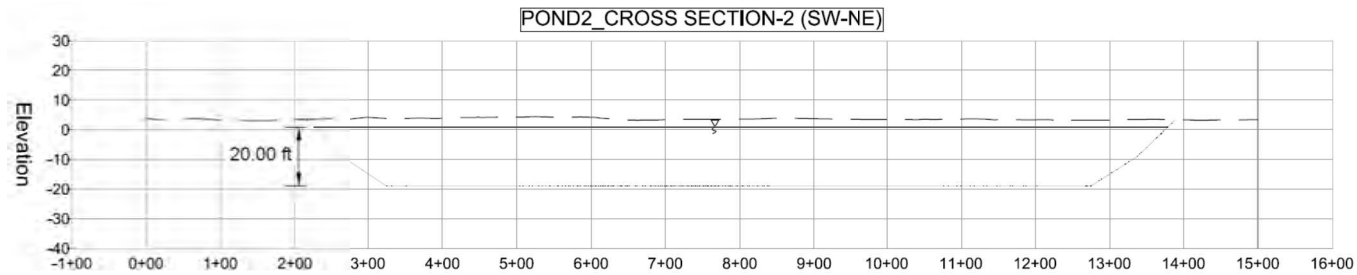
Job No.: 100079983

Scale: Not to Scale

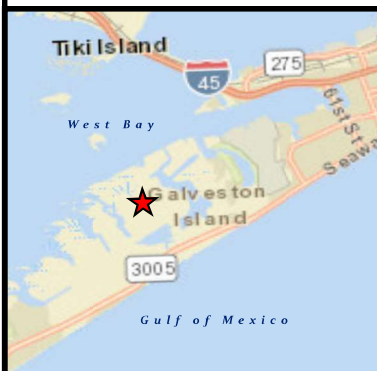
Prepared By: Atkins/WHIT6392

Date: May 16, 2023

N:\Clients\S_T\Sullivan\100079983\geo\figs\permit\permit_GradingSections_pg1.aprx



REVISED: AUG 03, 2023



LEGEND:

---	EXISTING SURFACE
—	PROPOSED POND GRADE
----	PROPOSED PERMANENT POOL

SCALE : H-1:100
V-1:25



ATKINS

Member of the SNC-Landis Group

Sheet 25 of 33
Grading Sections

**Legacy Wetlands at Sullivan Ranch
Habitat Improvement Project**

**Galveston
Galveston County, Texas**

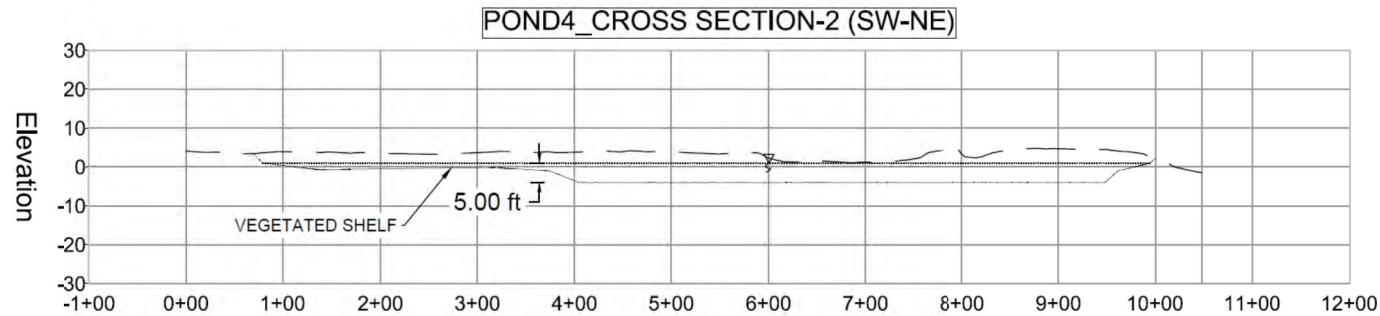
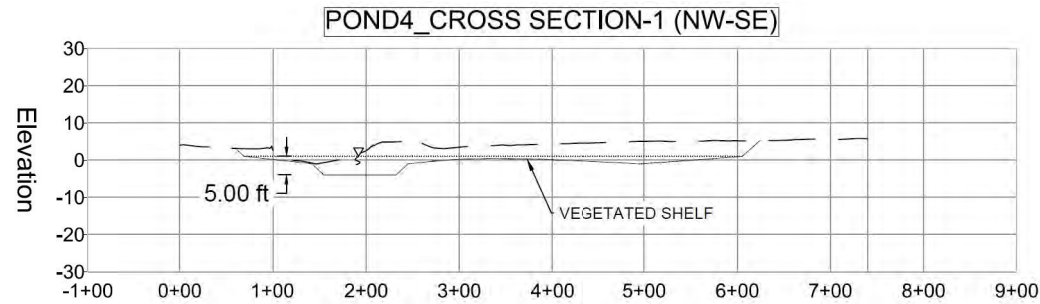
Job No.: 100079983

Scale: Not to Scale

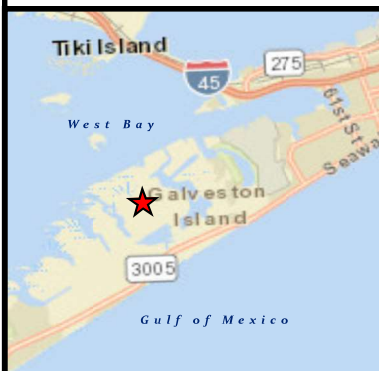
Prepared By: Atkins/WHIT6392

Date: May 16, 2023

N:\Clients\Sullivan\100079983\geo\figs\permit\permit_GradingSections_pg2.aprx



REVISED: AUG 03, 2023



LEGEND:

	EXISTING SURFACE
	PROPOSED POND GRADE
	PROPOSED PERMANENT POOL

SCALE : H-1:100
V-1:25



ATKINS

Member of the SNC-Landis Group

Sheet 26 of 33
Grading Sections

**Legacy Wetlands at Sullivan Ranch
Habitat Improvement Project**

**Galveston
Galveston County, Texas**

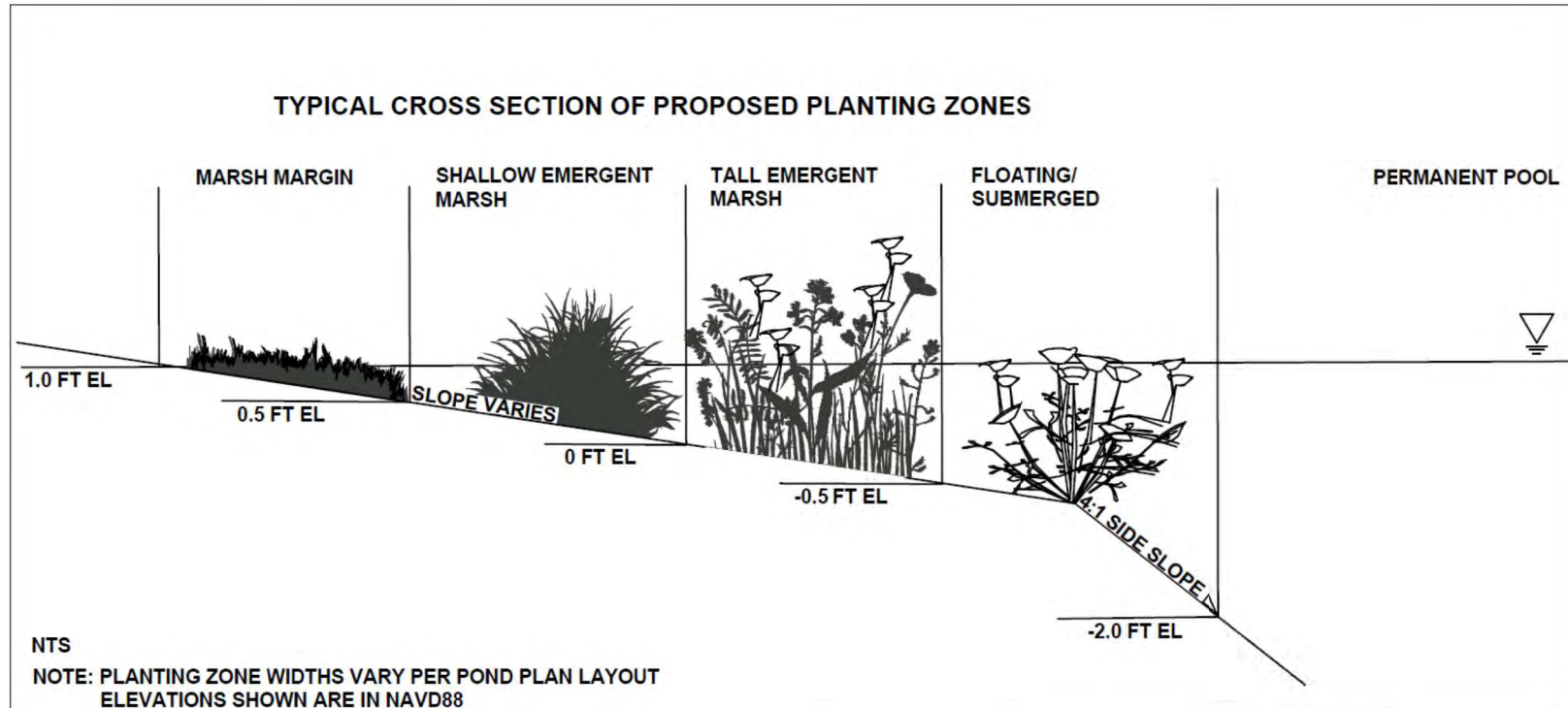
Job No.: 100079983

Scale: Not to Scale

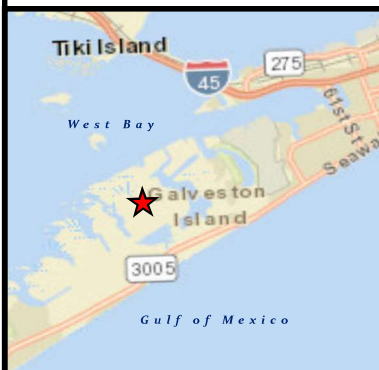
Prepared By: Atkins/WHIT6392

Date: May 16, 2023

N:\Clients\S_T\Sullivan\100079983\geo\figs\permit\permit_GradingSections_pg3.aprx



REVISED: AUG 03, 2023



Sheet 27 of 33
Pond Planting Zones

**Legacy Wetlands at Sullivan Ranch
Habitat Improvement Project**

**Galveston
Galveston County, Texas**

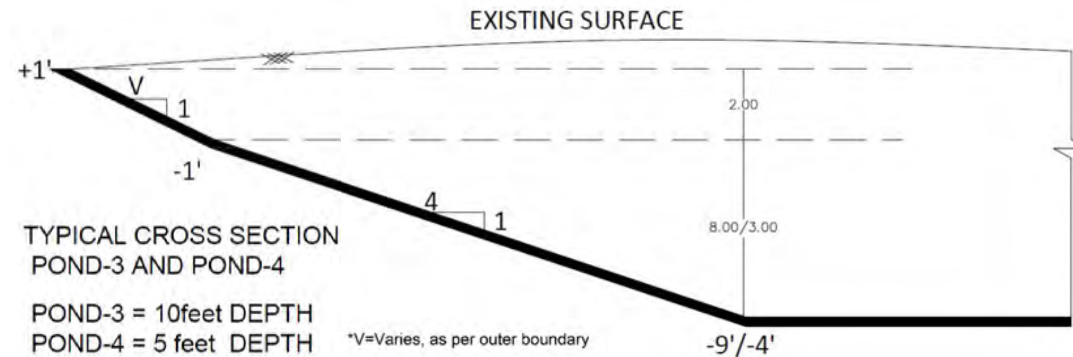
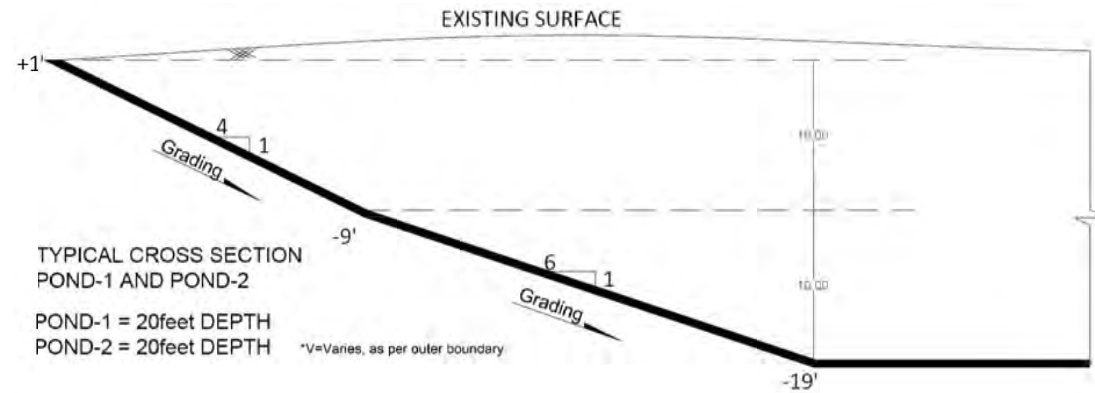
Job No.: 100079983

Scale: Not to Scale

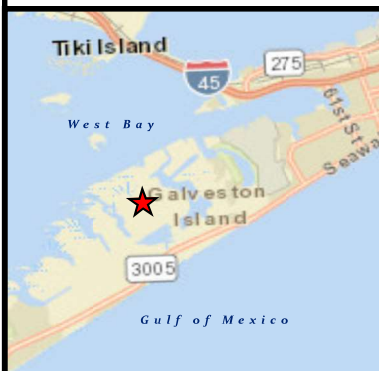
Prepared By: Atkins/WHIT6392

Date: Aug 02, 2023

N:\Clients\S_T\Sullivan\100079983\geo\figs\permit\permit_GradingSections_pg4.aprx



REVISED: AUG 03, 2023



Sheet 28 of 33
Grading Sections

Legacy Wetlands at Sullivan Ranch
Habitat Improvement Project

Galveston
Galveston County, Texas

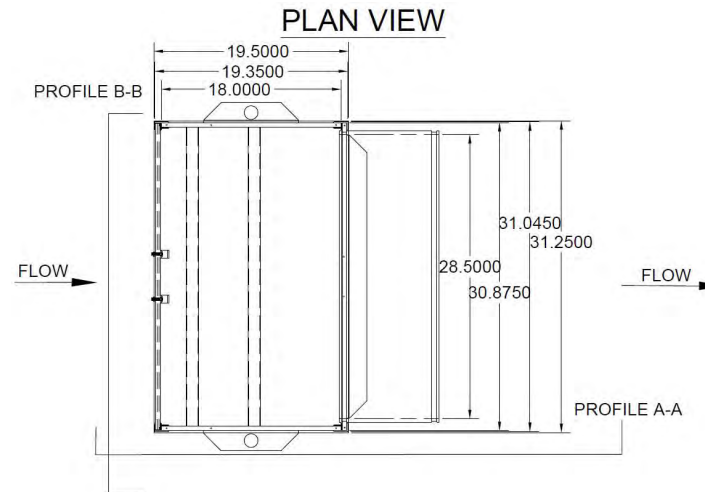
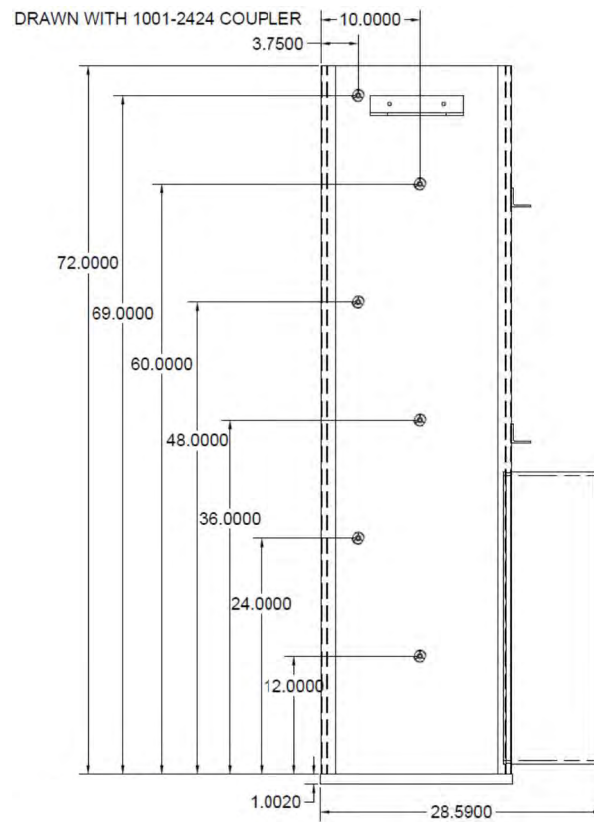
Job No.: 100079983

Scale: Not to Scale

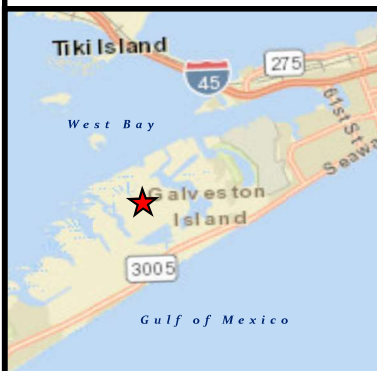
Prepared By: Atkins/WHIT6392

Date: May 16, 2023

N:\Clients\S_T\Sullivan\100079983\geo\figs\permit\permit_GradingSections_pg5.aprx



REVISED: AUG 03, 2023



NOTES:

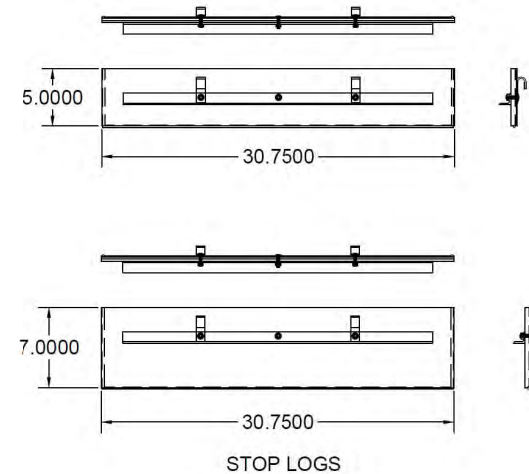
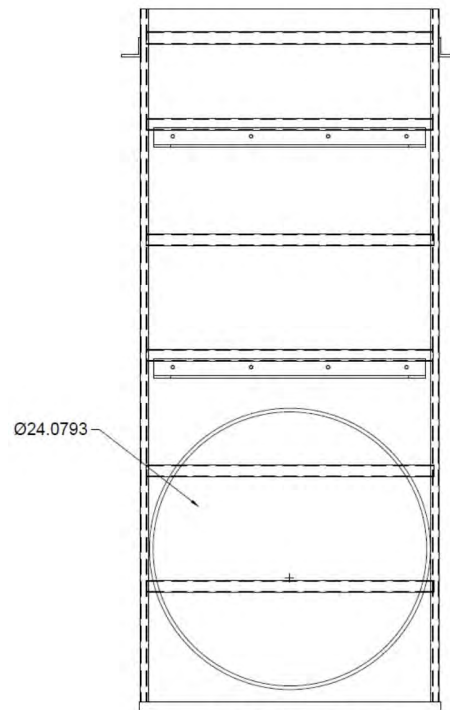
1. All dimensions are in inches.
2. The information in the drawing is for reference.
3. All information contained in this document is proprietary to Agri Drain Corp.



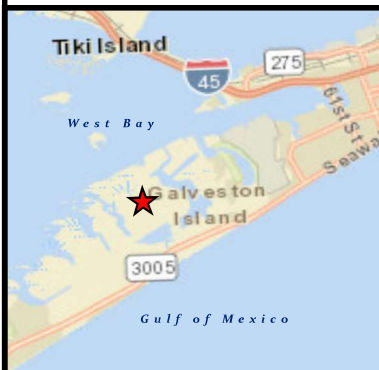
Sheet 29 of 33
Water Level Control Structure Details
**Legacy Wetlands at Sullivan Ranch
Habitat Improvement Project**
Galveston
Galveston County, Texas

Job No.: 100079983	Scale: Not to Scale
Prepared By: Atkins/WHIT6392	Date: May 16, 2023

N:\Clients\S_T\Sullivan\100079983\geo\figs\permit\permit_WatLevConStrucDetail_pg1.aprx



REVISED: AUG 03, 2023



NOTES:

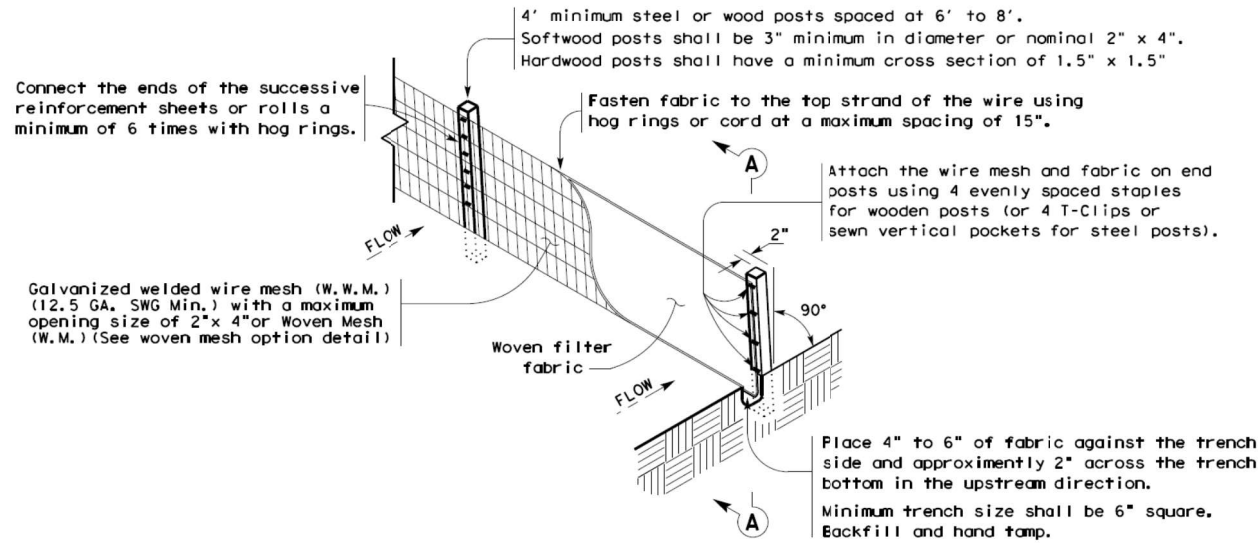
1. All dimensions are in inches.
2. The information in the drawing is for reference.
3. All information contained in this document is proprietary to Agri Drain Corp.



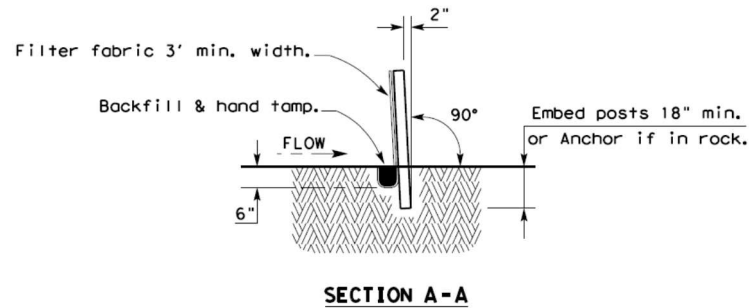
Sheet 30 of 33
Water Level Control Structure Details
**Legacy Wetlands at Sullivan Ranch
Habitat Improvement Project**
Galveston
Galveston County, Texas

Job No.: 100079983	Scale: Not to Scale
Prepared By: Atkins/WHIT6392	Date: May 16, 2023

N:\Clients\S_T\Sullivan\100079983\geo\figs\permit\permit_WatLevConStrucDetail_pg2.aprx

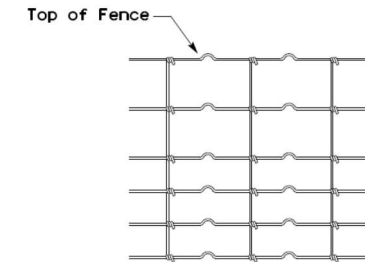


TEMPORARY SEDIMENT CONTROL FENCE



REVISED: AUG 03, 2023

Warning Sign Details



HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA. SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.



SEDIMENT CONTROL FENCE USAGE GUIDELINES:

1. A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.
2. Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FTSQ.
Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.
*Standard designed by TxDOT, 2016.



Sheet 31 of 33
Temporary Reinforced Fabric Silt Fence Detail

Legacy Wetlands at Sullivan Ranch
Habitat Improvement Project

Galveston
Galveston County, Texas

Job No.: 100079983

Scale: Not to Scale

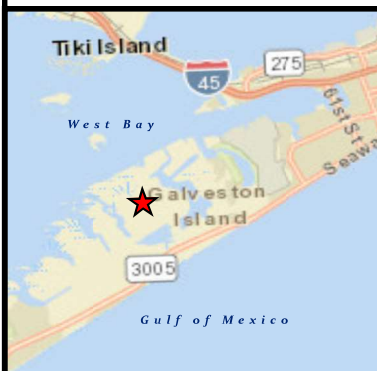
Prepared By: Atkins/WHIT6392

Date: May 16, 2023

N:\Clients\S_T\Sullivan\100079983\geo\figs\permit\permit_siltfence_detail.aprx

Planting Zone	Common Name	Genus/Species	Lower Elevation	Upper Elevation	Approximate Area Planted (acres)
Marsh Margin	Water Hyssop	Bacopa spp.	0.5	1	6.52
	Sedges	Carex spp.	0.5	1	
	Sand Spike Rush	Eleocharis montevidensis	0.5	1	
	Swamp Rose Mallow	Hibiscus moscheutos	0.5	1	
	Blue flag Iris	Iris virginicus	0.5	1	
	Soft Rush	Juncus effusus	0.5	1	
	Smartweed	Polygonum hydropiperoides	0.5	1	
	Prairie Cordgrass	Spartina pectinate	0.5	1	
	Maidencane	Panicum hemitomon	0.5	1	
	White Topped sedge	Rhynchospora colorata	0.5	1	
Shallow Emergent Marsh	Mountain Spike Rush	Eleocharis Montana	0	0.5	5.36
	Squarestem Spike Rush	Eleocharis quadrangulate	0	0.5	
	Duck Potato	Sagittaria lancifolia	0	0.5	
	Grassy Arrowhead	Sagittaria graminea	0	0.5	
	Delta Arrowhead	Sagittaria platyphylla	0	0.5	
	Pickernelweed	Pontederia cordata	0	0.5	
	Fire Flag	Thalia dealbata	0	0.5	
	Olney Bulrush	Scirpus americanus	0	0.5	
	Giant Bulrush	Scirpus californicus	-0.5	0	
Tall Emergent Marsh	Softstem Bulrush	Scirpus Validus	-0.5	0	5.03
	Hardstem Bulrush	Scirpus Acutus	-0.5	0	
	Giant Cutgrass	Zizaniopsis milacea	-0.5	0	
Moist Soil Management			1	3	37.10
Floating/Submerged	Pondweed	Potamogeton spp.	-2	-0.5	5.64
	Widgeon Grass	Ruppia maritima	-2	-0.5	
	Water Shield	Brasenia schreberi	-2	-0.5	
	Coontail	Ceratophyllum demersum	-2	-0.5	
	White Water Lily	Nymphaea odorata	-2	-0.5	
	Floating Hearts	Nymphoides aquatica	-2	-0.5	

REVISED: AUG 03, 2023



NOTES:

1. Majority of marsh plantings will be installed as bare root plugs with a root mass approximately 3" x 3" with multiple stems, depending on individual species.
2. Tree and shrub species will be provided as contained grown, to add to diversity they will be either 1, 6, or 16 gallon size. 1-gallon will have a trunk caliper of less than .6 inch. 6-gallon will have a trunk caliper of .75-1.0 inch. 15-gallon will have a trunk caliper of 1.25-1.75 inch.
3. Oak Mottes will have tree sizes of 5, 15, 30 and 45 gallon size. Caliper size will range from .5 inch to 3.5 inch.
4. Actual plant species used will be based on availability at time of planting.


ATKINS
Member of the SNC-Lavalin Group

 Sheet 32 of 33
Planting Summary

**Legacy Wetlands at Sullivan Ranch
Habitat Improvement Project**
**Galveston
Galveston County, Texas**

Job No.: 100079983

Scale: Not to Scale

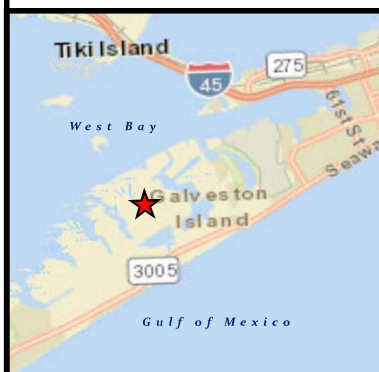
Prepared By: Atkins/WHIT6392

Date: May 16, 2023

N:\Clients\S_T\Sullivan\100079983\geo\figs\permit\permits_PlantingSum_pg1_v2.aprx

Planting Zone	Common Name	Genus/Species	Lower Elevation	Upper Elevation	Approximate Area Planted (acres)
Vegetative Edge Fringe Marsh	Saltwort	Batis maritima	1	3	2.02
	Saltgrass	Distichlis spicata	1	3	
	American Glasswort	Salicornia virginica	1	3	
	Gulf Cordgrass	Spartina spartinae	1	3	
	Seashore Paspalum	Paspalum vaginatum	1	3	
	Sea Ox Eye Daisy	Borrchia frutescens	1	3	
	Marsh Hay Cordgrass	Spartina patens	1	3	
	Black Needle Rush	Juncus roemarianus	1	3	
	Seaside Heliotrope	Heliotropium curassavicum	1	3	
	Eastern Baccharis	Baccharis halimifolia	1	3	
	Carolina Wolfberry	Lycium carolinianum	1	3	
Vegetative Swale	Marsh Hay Cordgrass	Spartina patens	1	2	1.85
	Alkali Bulrush	Schoenoplectus robustus	1	2	
	Smooth Cordgrass	Spartina alterniflora	1	2	
Coastal Prairie	Gulf Cordgrass	Spartina spartinea	3	5	10.38
	Marsh Hay Cordgrass	Spartina patens	1	5	
	Prairie Cordgrass	Spartina pectinate	3	5	
	Eastern Gama Grass	Tripsacum dactyloides	3	5	
	Big Bluestem	Andropogon gerardii	3	5	
	Little Bluegrass	Schizachyrium scoparium	3	5	
	Switchgrass	Panicum virgatum	3	5	
	Sugar Cane Plumegrass	Erianthus giganteus	3	5	
	Buttonbush	Cephalanthus occidentalis	3.5	5	
	Swamp Privet	Foresteria accuminata	3.5	5	
Neotropical Migrant Bird	Possum Haw	Ilex decidua	3.5	5	1.45
	Native Yaupon	Ilex decidua	4	N/A	
	Wax Myrtle	Myrica cerifera	4	N/A	
	Eastern Baccharis	Baccharis halimifolia	3.5	5	
	Swamp Dogwood	Cornus drummondii	3.5	5	
	Willow Oak	Quercus phellos	3.5	5	
	Swamp Laurel Oak	Quercus laurifolia	3.5	5	
	Live Oak	Quercus fusiformus	4	N/A	
	Cedar Elm	Ulmus crassifolia	3.5	5	
	Texas Ebony	Ebenopsis ebano	3.5	5	
	Hackberry	Celtis occidentalis	3.5	5	
	Black Willow	Salix nigra	3.5	5	
Oak Mottes	Live Oak	Quercus fusiformus	4	N/A	16.31
	Native Yaupon	Ilex decidua	4	N/A	
	Wax Myrtle	Myrica cerifera	4	N/A	

REVISED: AUG 03, 2023



NOTES:

1. Majority of marsh plantings will be installed as bare root plugs with a root mass approximately 3" x 3" with multiple stems, depending on individual species.
2. Tree and shrub species will be provided as contained grown, to add to diversity they will be either 1, 6, or 16 gallon size. 1-gallon will have a trunk caliper of less than .6 inch. 6-gallon will have a trunk caliper of .75-1.0 inch. 15-gallon will have a trunk caliper of 1.25-1.75 inch.
3. Oak Mottes will have tree sizes of 5, 15, 30 and 45 gallon size. Caliper size will range from .5 inch to 3.5 inch.
4. Actual plant species used will be based on availability at time of planting.



Sheet 33 of 33
Planting Summary

Legacy Wetlands at Sullivan Ranch
Habitat Improvement Project

Galveston
Galveston County, Texas

Job No.: 100079983

Scale: Not to Scale

Prepared By: Atkins/WHIT6392

Date: May 16, 2023

N:\Clients\S_T\Sullivan\100079983\geo\figs\permit\perm_L_PlantingSum_pg2_v2.aprx