Contract #2503-13-61

Coastal Protection and Restoration Authority of Louisiana

Hydrologic Restoration in Lac Des Allemands Swamp Project (BA-34-2)
SURVEY REPORT

PREPARED BY: C & C TECHNOLOGIES INC.
May 19, 2015

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RONALD E. PRATHER, PLS
SENIOR MANAGER- LAND SURVEY SERVICES

Contents

1. Project Description & Overview

1.1 Project Description

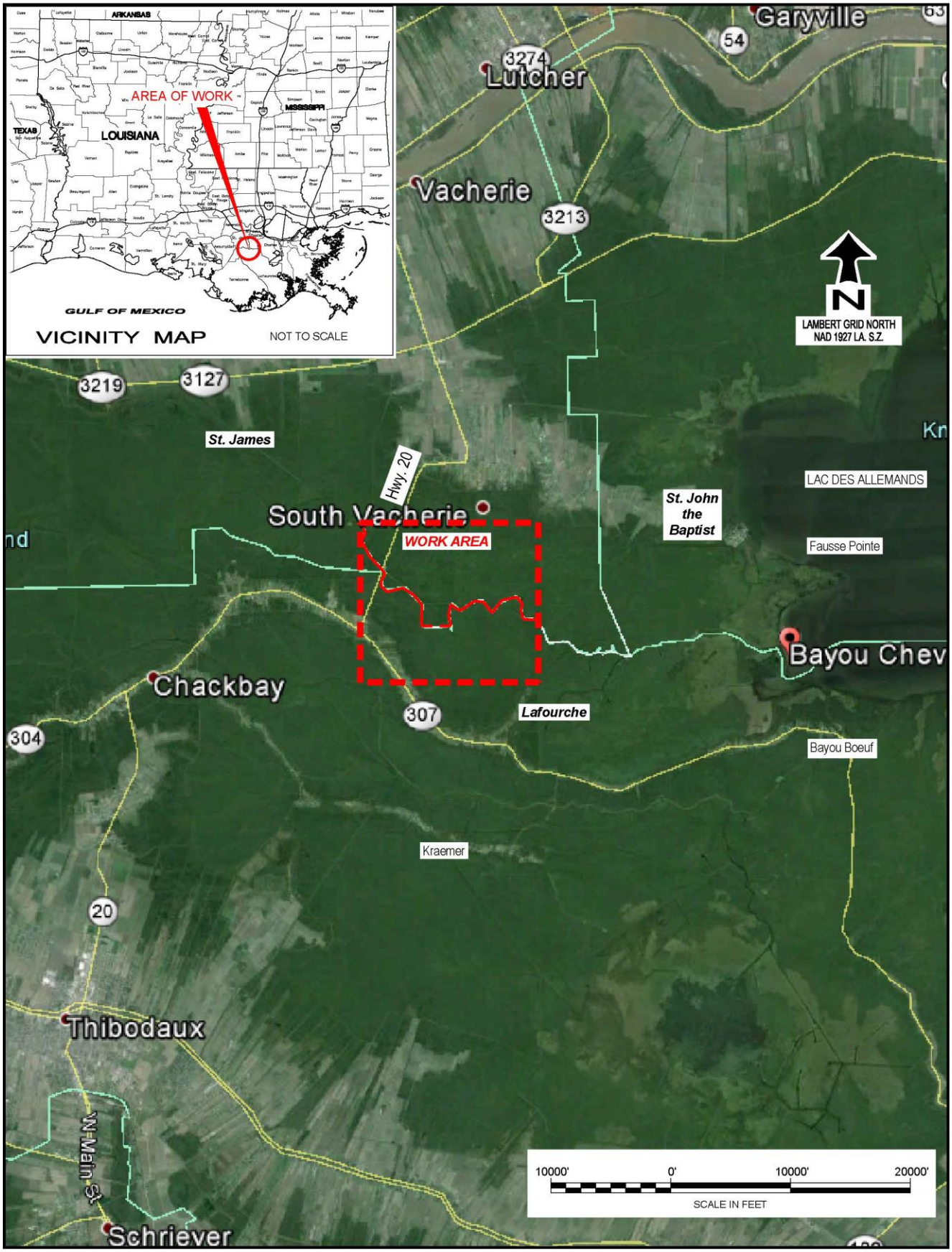
C & C Technologies, Inc. (C&C), working as a sub-contractor to Stantec Consultants under order #2503-13-61 was contracted by the State of Louisiana, Office of Coastal Protection and Restoration (herein referred to as CPRA) to provide survey services for the Lac Des Allemands Swamp Project (BA-34-2). This entailed providing a detailed topographic, bathymetric and magnetometer survey of the proposed work area (11 gaps) as well as a bathymetry and magnetometer survey of the center line of Bayou Chevreuil for access as outlined in the original Scope of Work provided by CPRA. The project site is located approximately 1 mile south of South Vacharie in St. James Parish, LA.

Landowner information was provided to C&C by CPRA in the Scope of Work under subsection 4.1 Permission and Access and Appendix “B”.

Notice to Proceed was received by C&C on February 19, 2015. Due to foul weather conditions we were not able to begin the data collection/field surveys until March 03, 2015 at which time we dispatched a four man survey crew with a 22’ Aluminum Hull survey vessel to be used for transportation to and from the project site via Bayou Chevreuil waterway. This crew would be responsible for the initial QC check on the provided monument (BA34 SM 02) that would be the basis of the entire survey. They would also be responsible for establishing TBM’s throughout the survey area and carrying out the required surveys at each of the Gap locations.

A second vessel and four man survey crew was dispatched on March 04, 2015 to conduct the centerline survey of Bayou Chevreuil.

1.2 Vicinity Map (Overview)



2. Equipment & Methodology

2.1 Gap Magnetometer & Topographic Surveys

Field surveys for this phase of the project began on March 03, 2015 and were completed on April 07, 2015. The survey was performed on foot and with the use of an airboat in the canal portions. All data collected for the field surveys was done so using the Lambert Conformal Conic Projection. Horizontal coordinates referenced to Louisiana State Plane Coordinate System South Zone (1702), NAD 83 (2011) while all elevations referenced to The North American Vertical Datum of 1988.

Lecia's GS10 VIVA system was used at the base station(s) and a Lecia GS14 system was used for the rovers obtaining field shots whenever coverage was acquired. A Geometrics G-858 cesium vapor magnetometer was utilized for the magnetometer survey at each of the 11 gap locations.

2.2 Survey Control & Gap Surveys

The first phase of the Lac Des Allemands survey was to verify the Horizontal and Vertical position of the Secondary Monument provided in the Scope of Work being designated as "BA34 SM 02" which would be used as the primary benchmark for the duration of the survey. This was accomplished by running a series of independent static sessions each consisting of a minimum of four hours on different days with different satellite constellations on the monument. Data collection for this and all phases of the Hydrologic Restoration survey was performed using a Leica RTK GPS. The data was then post processed individually utilizing Online Positioning User Service (OPUS). The results of this process with the published information, individual OPUS solutions and the average OPUS reading is shown below. Although the results of our independent statics surveys are shown with a Geoid 12B model, since that is what OPUS uses to process, the vertical difference in this case between the OPUS Geoid 12B Solution and the DNR Datasheet elevation in Geoid 03 is minimal so no adjustment is necessary. As instructed by CPRA, we held the published monument elevation and used it throughout the project. This was done to maintain relativity to previous surveys performed in the area that utilized the same control point. The results are shown in the chart below.

	X	Diff X	Y	Diff Y	Elev	Diff Elev	Data Source
BA34 SM-02	3472257.09		513837.33		1.20		DNR Datasheet (Geoid 03)
OPUS 03/03/2015	3472257.17	-0.08	513837.38	-0.05	1.20	0.00	(RF2011)(EPOCH: 2010)(GEOID12B)
OPUS 03/04/2015	3472257.08	0.01	513837.40	-0.07	1.26	-0.06	(RF2011)(EPOCH: 2010)(GEOID12B)
OPUS 03/05/2015	3472257.17	-0.08	513837.34	-0.01	1.20	0.00	(RF2011)(EPOCH: 2010)(GEOID12B)
OPUS 03/06/2015	3472257.17	-0.08	513837.34	-0.01	1.19	0.01	(RF2011)(EPOCH: 2010)(GEOID12B)
OPUS 03/16/2015	3472257.15	-0.06	513837.36	-0.03	1.20	0.00	(RF2011)(EPOCH: 2010)(GEOID12B)
OPUS Average Solution	3472257.15	-0.06	513837.36	-0.03	1.21	-0.01	(RF2011)(EPOCH: 2010)(GEOID12B)

During the course of the survey on Gap location 3, another control point (799-31) had to be set in the proximity due to limited radio range from the base station set up on BA34 SM-02 caused by the dense foliage (tree canopy). This point would then be occupied to set all subsequent TBM's and for any RTK shots. Independent static sessions were performed while occupying this control point (799-31) and the results of such are shown in the chart below.

	X	Diff X	Y	Diff Y	Elev	Diff Elev	Data Source
PT# 799-31	3478785.71		510713.04		3.29		Set on 03/16/2015
OPUS 03/17/2015	3478785.74	-0.03	510713.03	0.01	3.30	-0.01	(RF2011)(EPOCH: 2010)(GEOID12B)
OPUS 03/18/2015	3478785.82	-0.11	510713.02	0.02	3.33	-0.04	(RF2011)(EPOCH: 2010)(GEOID12B)
OPUS 03/28/2015	3478785.70	0.01	510713.06	-0.02	2.78	0.51	(RF2011)(EPOCH: 2010)(GEOID12B)
OPUS 03/29/2015	3478785.72	-0.01	510713.12	-0.08	3.41	-0.12	(RF2011)(EPOCH: 2010)(GEOID12B)
OPUS Average Solution	3478785.75	-0.04	510713.06	-0.02	3.21	0.09	(RF2011)(EPOCH: 2010)(GEOID12B)

As agreed upon with CPRA, Temporary Bench Marks where set in lieu of a baseline survey. In order to accomplish this, a 90d nail was set (utilizing Leica Smart Net Technology) in the top of a wooden piling at the boat launch to be used as a daily check in and check out control point. Then a TBM, consisting of a wooden 2" x 4" driven to resistance, was set near each of the Gap locations except for Gap No. 5 which utilized the water surface elevation at TBM 4 to transfer near Gap 5 and set a 90d nail in a 6" tallow tree. Gaps 9 and 10 also used the same TBM (9) due to their close proximity to each other. Whenever possible these TBM's were set with RTK in fixed mode. When fixed mode could not be acquired due to the dense foliage, the TBM was shot in (when possible) for horizontal position only and a level loop was ran from the previously established TBM to acquire the vertical value. The TBM values are listed below.

TBM 1							
PT. NUMBER	**X**	**Diff. Ft.**	**Y**	**Diff. Ft.**	**Elev. Ft.**	**Diff. Ft.**	**Comment**
799-2	**3474165.74**		**512266.60**		**2.75**		**Set from Base**

TBM 2							
PT. NUMBER	**X**	**Diff. Ft.**	**Y**	**Diff. Ft.**	**Elev Ft.**	**Diff. Ft.**	**Comment**
799-10	**3474635.18**		**511786.94**		**2.73**		**Set from Base**

TBM 3							
PT. NUMBER	X		Y		Elev Ft.		Comment
799-23	3477318.55		510672.51		2.18		Set from Base

TBM 4							
PT. NUMBER	X		Y	Diff. Ft.	Elev. Ft.		Comment
799-32	3478754.83		510685.09		2.82		Set from Base

TBM 5							
PT. NUMBER	X		Y	Diff. Ft.	Elev Ft.		Comment
No Pt. #	N/A		N/A		5.59		Set from Water Surf.

TBM 6							
PT. NUMBER	X		Y	Diff. Ft.	Elev Ft.		Comment
801-1	3479551.23		510139.63		2.26		Set from Base

TBM 7							
PT. NUMBER	X		Y	Diff. Ft.	Elev. Ft.		Comment
801-19	3479810.12		510314.70		2.21		Set from TBM 6

TBM 8							
PT. NUMBER	X		Y	Diff. Ft.	Elev Ft.		Comment
801-20	3480596.94		510846.00		1.98		Set from Base

TBM 9							
PT. NUMBER	X		Y	Diff. Ft.	Elev Ft.		Comment
803-9	3481834.95		510920.24		2.02		Set from Base

TBM 11							
PT. NUMBER	X		Y	Diff. Ft.	Elev Ft.		Comment
803-22	3482312.79		510760.20		1.98		Set from Base

The tops of these 2” x 4”s were used for vertical control so that each day a physical measurement could be taken from the top of the TBM down to the water surface and it could be checked against the corresponding RTK or level shots taken throughout that day. Once the TBM elevation was confirmed, the profile and transect lines were conventionally surveyed utilizing an automatic level and a surveyors chain. Each profile and transect line had to be manually cut out using brush knives to clear line of sight. The surveyors chain was used to measure the offset between the lines and to lay out the grid pattern. Individual level loops were then run for each profile and transect line and closed on the corresponding TBM. The results of this water surface elevation QC procedure are shown in the table below. Level closures for each profile and transect line can be found in the field notes.

DATE	TIME	TBM 1 Measurement	Water Surface	POINT #
03/4/2014				
	7:30	2.02	0.73’	
	12:02	2.00	0.75’	
	7:15		0.68	799-7
			0.67	Level
DATE	**TIME**	**TBM 2 Measurement**	**Water Surface**	**POINT #**
03/04/2014				
	14:07	2.01	0.72	
	15:15	2.01	0.72	
	14:10		0.61	799-11
			0.69	Level
03/05/2015				
	9:20	2.00	0.73	
	16:27	2.01	0.72	
	16:11		0.55	799-20
			0.74	Level
DATE	**TIME**	**TBM 3 Measurement**	**Water Surface**	**POINT #**
3/06/2015				
	9:15	2.00	0.18	
	14:00	2.01	0.17	
	9:07		0.19	799-24
			0.18	Level
3/16/2015				
	8:00	1.34	0.84	
	16:30	1.38	0.80	
			0.84	Level
DATE	**TIME**	**TBM 4 Measurement**	**Water Surface**	**POINT #**
3/17/2015				
	7:45	2.41	0.41	
	14:04	2.44	0.38	
	16:55	2.49	0.33	
			0.38	Level

DATE	TIME	TBM 6 Measurement	Water Surface	POINT #
3/19/2015	7:42	1.92	0.34	
	16:08	1.86	0.40	
			0.34	Level
			0.38	Level
03/23/2015				
	8:20	2.03	0.23	
	15:30	2.11	0.15	
			0.24	Level
DATE	**TIME**	**TBM 4 Measurement**	**Water Surface**	**POINT #**
03/24/2015				
	8:00	2.94	-0.12	
	17:30	2.96	-0.14	
			-0.02	Level
			-0.14	Level
			-0.16	Level
			-0.18	Level
03/25/2015				
	7:20	2.76	0.06	
	15:45	2.75	0.07	
			0.14	Level
			0.13	Level
03/28/2015				
	8:20	2.92	-0.10	
	11:20	2.95	-0.13	
	16:55	2.98	-0.16	
03/29/2015				
	7:30	2.86	-0.04	
	16:15	2.78	0.04	
03/30/20152				
	7:10	2.65	0.17	
	17:00	2.74	0.08	
			0.08	Level
03/31/2015				
	7:30	2.85	-0.03	
	15:40	2.97	-0.15	
			0.04	Level
			0.02	Level

2.3 Magnetometer Survey and Tree Count Surveys

After the topographic survey was conducted at each of the gap locations, we conducted a magnetometer and tree count survey. Due to the lack of RTK DGPS at the gap locations, we could not digitally collect the magnetometer data. The magnetometer was run along the same profile and transect lines that were previously surveyed. Once an anomaly was detected it was temporarily marked by flagging and or wood stake to be investigated later. Once all anomalies were marked, an investigation of each occurred by running a minimum of 25' radius around each anomaly and probing at the marked location to determine the source of the object. Once investigation of the anomaly was concluded the distance along the line was measured so the location of each anomaly could be plotted. All anomalies found are shown on the plan view drawing for each Gap Survey. The tree count survey for each gap was conducted simultaneously and the results are shown on the corresponding plan view sheet in the drawings.

2.4 Bayou Chevreuil Bathymetry & Magnetometer Surveys

Field surveys for this phase of the project were conducted on March 04, 2015. The survey was performed on board the C-Star which is a 29' aluminum hull, shallow draft vessel with twin outboard engines. All data collected for the field surveys was done so using the Lambert Conformal Conic Projection. Horizontal coordinates referenced to Louisiana State Plane Coordinate System South Zone (1702), NAD 83 while all elevations referenced to The North American Vertical Datum of 1988.

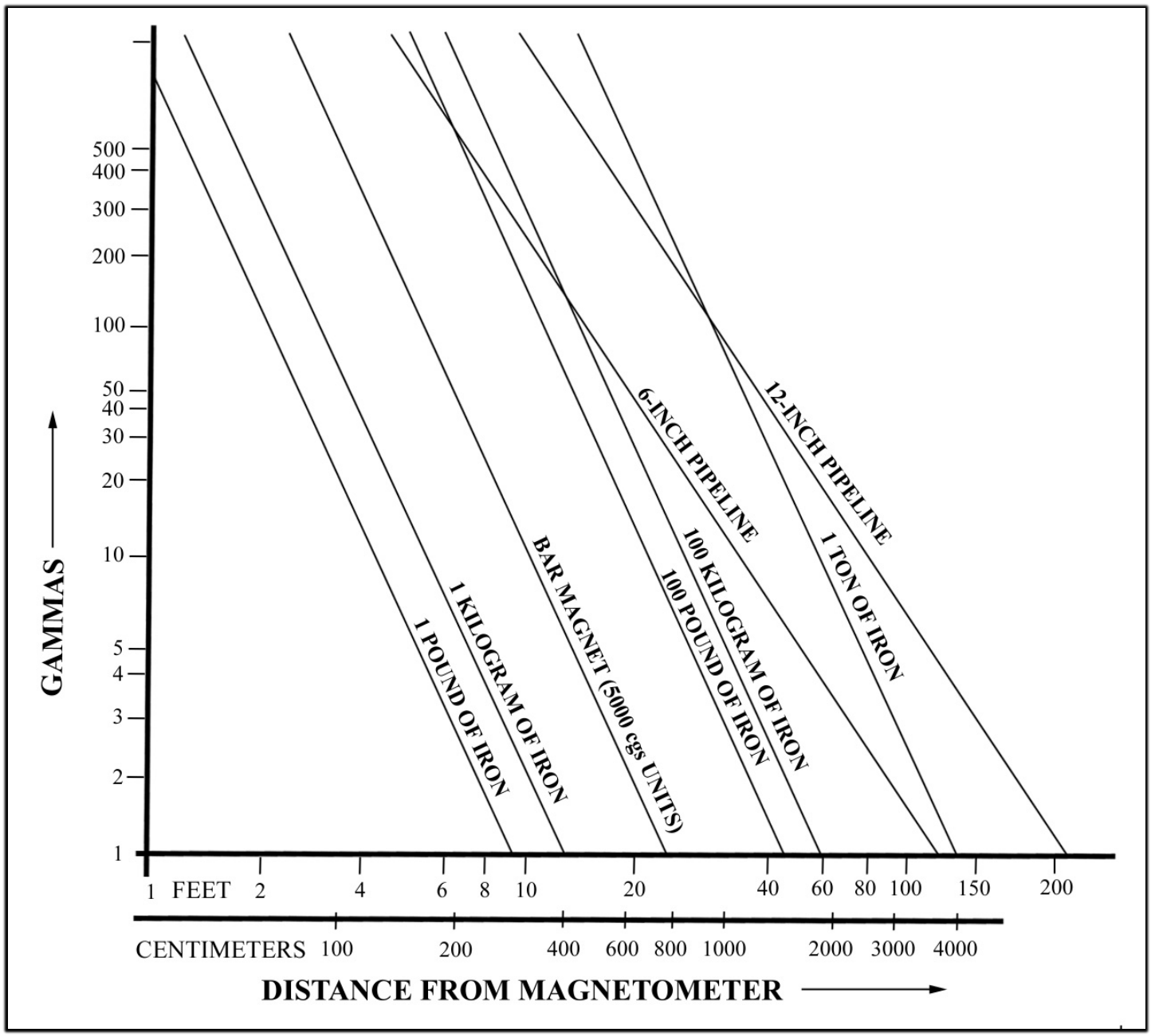
Leica GS14 RTK DGPS was used for vessel positioning and Winfrog version 3.1 was used as the primary vessel navigation and data collection software. The predetermined centerline of Bayou Chevreuil was uploaded into the vessel's navigation computer. Incoming raw data from the GPS was received at a rate of 1 update per second. The centerline was surveyed at a speed of approximately 4 knots and events (fixes) in Winfrog were set to record all incoming data at 25' intervals along the route.

Water depths were collected utilizing an Odom Echotrac 3200 digital fathometer. Incoming data from the Echotrac was uploaded real time into the vessel navigation software so that water depths would be recorded and merged with the RTK position at each 25' event (fix). While the majority of the bayou centerline maintained an average water depth of 9.0' to 10.0' we did record a high and low depth of 6.8' and 11.6' within the survey area.

A Geometrics 882 Cesium Vapor Marine Magnetometer was used to conduct the magnetometer survey of the centerline on Bayou Chevreuil. The tow fish was pulled from the stern of the vessel at a distance (layback) of 107.0'' along the provided centerline to prevent any interference from the vessel. Magnetometer readings were recorded at a rate of 1 per second along the line. DGPS data from the Leica RTK was input into C & C's proprietary Maglog data collection software at a rate of 1 per second to correlate the vessel position with the towfish.

The magnetometer detected 19 magnetic anomalies along the Bayou Chevreuil centerline which range in amplitude from 25 to 212 gammas. These anomalies with corresponding amplitudes are shown on Sheet 2 of 36 in the drawings. To help determine the source of these anomalies, additional survey lines were run parallel and adjacent to both sides of the centerline. These lines did not uncover any additional anomalies of any significance and no linear relationships between the three mag line anomalies were visible. The anomalies along the centerline were investigated and are believed to be debris. No pipelines were detected in this area during the course of this survey.

Illustration 1. Nomogram provided for reference showing that the magnetic intensity is proportional to the weight of the ferrous object, at a given distance (Breiner Nomogram, 1973).



3. Project Drawings

4. Appendices

A: Monument Datasheet & OPUS Solutions

B: Survey Field Notes

APPENDIX A

Monument Datasheet & OPUS Solutions

VICINITY MAP Not to Scale Reproduced from Louisiana 2005 DOQQ

Station Name: "BA34 SM 02"

Location: From the intersection of LA Highway 20 and Hwy 3127 in Vacherie, Louisiana, proceed southerly on Hwy 20 for approximately 5 miles to a boat landing on the left at the Bayou Cheveuil Bridge. Turn left and proceed southerly on parking lot to the monument on the right near the northeast corner of the bridge.

Monument Description: NGS Style floating sleeve monument; 9/16" stainless steel rods driven 56 feet to refusal, set in a sand filled 6" PVC pipe with access cover set flush with the ground.

Stamping: BA34-SM-02

Installation Date: 2002 **Date of Survey:** February 2003

Monument Established By: JCLS

For: CPRA, OCPR

Adjusted NAD83 Geodetic Position (NSRS 2007)
Lat. 29°54'41.63846" N
Long. 090°43'44.80610" W

Adjusted NAD83 Datum LSZ (1702) Ft (NSRS 2007)
N= 513,837.33
E= 3,472,257.09

Adjusted NAVD88 Height (2006.81)
Elevation = 1.20 feet (0.366 mtrs)

Ellipsoid Height = -25.671 mtrs.
Geoid03 Height = -26.037 mtrs. (2004.65)

FOR REFERENCE ONLY
LCZ Adjusted NAVD88 Height (Geoid99)
Elevation = 1.94 feet (0.590 mtrs)

Adjusted Position Established John Chance Land Surveys, Inc. for the Coastal Protection & Restoration Authority of Louisiana, OCPR

FILE: BA340620.15o OP1431614182800

NGS OPUS SOLUTION REPORT
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All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy

USER: lance.richard@cctech.us DATE: May 14, 2015
RINEX FILE: ba34062o.15o TIME: 14:37:02 UTC

SOFTWARE: page5 1209.04 master92.pl 022814 START: 2015/03/03 14:12:00
EPHEMERIS: igs18342.eph **[precise]** STOP: 2015/03/03 22:56:00
NAV FILE: brdc0620.15n OBS USED: 19483 / 22371 : 87%
ANT NAME: LEIAS10 NONE # FIXED AMB: 127 / 149 : 85%
ARP HEIGHT: 2.00 OVERALL RMS: 0.019(m)

REF FRAME:	NAD_83(2011)(EPOCH:2010.0000)		IGS08 (EPOCH:2015.1692)	
X:	-70409.466(m)	0.009(m)	-70410.246(m)	0.009(m)
Y:	-5532681.373(m)	0.006(m)	-5532679.876(m)	0.006(m)
Z:	3161867.508(m)	0.003(m)	3161867.327(m)	0.003(m)
LAT:	29 54 41.63888	0.005(m)	29 54 41.65786	0.005(m)
E LON:	269 16 15.19479	0.009(m)	269 16 15.16500	0.009(m)
W LON:	90 43 44.80521	0.009(m)	90 43 44.83500	0.009(m)
EL HGT:	-25.637(m)	0.005(m)	-27.016(m)	0.005(m)
ORTHO HGT:	0.365(m)	0.014(m)	[NAVD88 (Computed using GEOID12B)]	
ORTHO HGT:	1.198(ft)	0.046(ft)		

	UTM COORDINATES UTM (Zone 15)	STATE PLANE COORDINATES SPC (1702 LA S)
Northing (Y) [meters]	3311153.574	156617.945
Easting (X) [meters]	719244.836	1058346.103
Convergence [degrees]	1.13285941	0.30211805
Point Scale	1.00019310	0.99992695
Combined Factor	1.00019713	0.99993098

US NATIONAL GRID DESIGNATOR: 15RYP1924411153(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DL8631	AWES AWES 147 BC ALWES CORS ARP	N300600.962	W0905858.634	32207.9
DJ9603	LWES LAKEWOOD ELMENTRY CORS ARP	N295401.295	W0902057.833	36692.6
DG5315	HOUM HOUMA CORS ARP	N293532.109	W0904324.988	35399.2

NEAREST NGS PUBLISHED CONTROL POINT

DJ9341	BA34 SM 02	N295441.638	W0904344.805	0.0

STATE PLANE COORDINATES - U.S. Survey Foot
SPC (1702 LA S)

Northing (Y) [feet]	513837.375
Easting (X) [feet]	3472257.173
Convergence [degrees]	0.30211805
Point Scale	0.99992695
Combined Factor	0.99993098

FILE: BA340630.15o OP1431614206436

NGS OPUS SOLUTION REPORT
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All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy

USER: lance.richard@cctech.us DATE: May 14, 2015
RINEX FILE: ba34063n.15o TIME: 14:37:21 UTC

SOFTWARE: page5 1209.04 master51.pl 022814 START: 2015/03/04 13:01:00
EPHEMERIS: igs18343.eph **[precise]** STOP: 2015/03/04 21:36:00
NAV FILE: brdc0630.15n OBS USED: 15016 / 19034 : 79%
ANT NAME: LEIAS10 NONE # FIXED AMB: 122 / 156 : 78%
ARP HEIGHT: 2.00 OVERALL RMS: 0.020(m)

REF FRAME:	NAD_83(2011)(EPOCH:2010.0000)		IGS08 (EPOCH:2015.1718)	
X:	-70409.494(m)	0.010(m)	-70410.274(m)	0.010(m)
Y:	-5532681.386(m)	0.028(m)	-5532679.889(m)	0.028(m)
Z:	3161867.523(m)	0.009(m)	3161867.342(m)	0.009(m)
LAT:	29 54 41.63908	0.006(m)	29 54 41.65807	0.006(m)
E LON:	269 16 15.19375	0.010(m)	269 16 15.16396	0.010(m)
W LON:	90 43 44.80625	0.010(m)	90 43 44.83604	0.010(m)
EL HGT:	-25.617(m)	0.029(m)	-26.997(m)	0.029(m)
ORTHO HGT:	0.385(m)	0.050(m)	[NAVD88 (Computed using GEOID12B)]	
ORTHO HGT:	1.263(ft)	0.164(ft)		

	UTM COORDINATES UTM (Zone 15)	STATE PLANE COORDINATES SPC (1702 LA S)
Northing (Y) [meters]	3311153.580	156617.952
Easting (X) [meters]	719244.808	1058346.075
Convergence [degrees]	1.13285927	0.30211791
Point Scale	1.00019310	0.99992695
Combined Factor	1.00019712	0.99993097

US NATIONAL GRID DESIGNATOR: 15RYP1924411153(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DJ9603	LWES LAKEWOOD ELMENTRY CORS ARP	N295401.295	W0902057.833	36692.6
DH9596	DSTR DESTREHAN H.S. CORS ARP	N295752.395	W0902256.006	34001.8
DL8631	AWES AWES 147 BC ALWES CORS ARP	N300600.962	W0905858.634	32207.9

NEAREST NGS PUBLISHED CONTROL POINT

DJ9341	BA34 SM 02	N295441.638	W0904344.805	0.0

STATE PLANE COORDINATES - U.S. Survey Foot
SPC (1702 LA S)

Northing (Y) [feet]	513837.398
Easting (X) [feet]	3472257.081
Convergence [degrees]	0.30211791
Point Scale	0.99992695
Combined Factor	0.99993097

FILE: BA340640.15o OP1431614400825

NGS OPUS SOLUTION REPORT
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All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy

USER: lance.richard@cctech.us DATE: May 14, 2015
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NAV FILE: brdc0640.15n OBS USED: 15877 / 18150 : 87%
ANT NAME: LEIAS10 NONE # FIXED AMB: 133 / 149 : 89%
ARP HEIGHT: 2.00 OVERALL RMS: 0.019(m)

REF FRAME:	NAD_83(2011)(EPOCH:2010.0000)		IGS08 (EPOCH:2015.1747)	
X:	-70409.467(m)	0.008(m)	-70410.247(m)	0.008(m)
Y:	-5532681.378(m)	0.008(m)	-5532679.881(m)	0.008(m)
Z:	3161867.498(m)	0.002(m)	3161867.317(m)	0.002(m)
LAT:	29 54 41.63852	0.006(m)	29 54 41.65750	0.006(m)
E LON:	269 16 15.19475	0.008(m)	269 16 15.16497	0.008(m)
W LON:	90 43 44.80525	0.008(m)	90 43 44.83503	0.008(m)
EL HGT:	-25.637(m)	0.006(m)	-27.016(m)	0.006(m)
ORTHO HGT:	0.365(m)	0.015(m)	[NAVD88 (Computed using GEOID12B)]	
ORTHO HGT:	1.198(ft)	0.049(ft)		

	UTM COORDINATES (Zone 15)	STATE PLANE COORDINATES SPC (1702 LA S)
Northing (Y) [meters]	3311153.563	156617.934
Easting (X) [meters]	719244.835	1058346.102
Convergence [degrees]	1.13285940	0.30211805
Point Scale	1.00019310	0.99992695
Combined Factor	1.00019713	0.99993098

US NATIONAL GRID DESIGNATOR: 15RYP1924411153(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DL8631	AWES AWES 147 BC ALWES CORS ARP	N300600.962	W0905858.634	32207.9
DL8635	GVMS GALVEZ MIDDLE SCH CORS ARP	N301851.796	W0905413.029	47716.4
DH9596	DSTR DESTREHAN H.S. CORS ARP	N295752.395	W0902256.006	34001.8

NEAREST NGS PUBLISHED CONTROL POINT

DJ9341	BA34 SM 02	N295441.638	W0904344.805	0.0

STATE PLANE COORDINATES - U.S. Survey Foot
SPC (1702 LA S)

Northing (Y) [feet]	513837.338
Easting (X) [feet]	3472257.170
Convergence [degrees]	0.30211805
Point Scale	0.99992695
Combined Factor	0.99993098

FILE: BA340650.15o OP1431614715039

NGS OPUS SOLUTION REPORT

All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy

USER: lance.richard@cctech.us DATE: May 14, 2015
RINEX FILE: ba34065n.15o TIME: 14:45:46 UTC

SOFTWARE: page5 1209.04 master50.pl 022814 START: 2015/03/06 13:08:00
EPHEMERIS: igs18345.eph **[precise]** STOP: 2015/03/06 19:52:00
NAV FILE: brdc0650.15n OBS USED: 15576 / 17987 : 87% ANT
NAME: LEIAS10 NONE # FIXED AMB: 114 / 133 : 86%
ARP HEIGHT: 2.00 OVERALL RMS: 0.017(m)

	REF FRAME: NAD_83(2011)(EPOCH:2010.0000)		IGS08 (EPOCH:2015.1772)	
X:	-70409.468(m)	0.002(m)	-70410.248(m)	0.002(m)
Y:	-5532681.377(m)	0.010(m)	-5532679.880(m)	0.010(m)
Z:	3161867.498(m)	0.009(m)	3161867.317(m)	0.009(m)
LAT:	29 54 41.63853	0.009(m)	29 54 41.65752	0.009(m)
E LON:	269 16 15.19471	0.002(m)	269 16 15.16493	0.002(m)
W LON:	90 43 44.80529	0.002(m)	90 43 44.83507	0.002(m)
EL HGT:	-25.638(m)	0.011(m)	-27.017(m)	0.011(m)
ORTHO HGT:	0.364(m)	0.022(m)	[NAVD88 (Computed using GEOID12B)]	
ORTHO HGT:	1.194(ft)	0.072(ft)		

	UTM COORDINATES UTM (Zone 15)	STATE PLANE COORDINATES SPC (1702 LA S)
Northing (Y) [meters]	3311153.564	156617.935
Easting (X) [meters]	719244.834	1058346.101
Convergence [degrees]	1.13285940	0.30211804
Point Scale	1.00019310	0.99992695
Combined Factor	1.00019713	0.99993098

US NATIONAL GRID DESIGNATOR: 15RYP1924411153(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DL8635	GVMS GALVEZ MIDDLE SCH CORS ARP	N301851.796	W0905413.029	47716.4
DL8631	AWES AWES 147 BC ALWES CORS ARP	N300600.962	W0905858.634	32207.9
DH9596	DSTR DESTREHAN H.S. CORS ARP	N295752.395	W0902256.006	34001.8

NEAREST NGS PUBLISHED CONTROL POINT

DJ9341	BA34 SM 02	N295441.638	W0904344.805	0.0

STATE PLANE COORDINATES - U.S. Survey Foot

SPC (1702 LA S)

Northing (Y) [feet]	513837.342
Easting (X) [feet]	3472257.166
Convergence [degrees]	0.30211804
Point Scale	0.99992695
Combined Factor	0.99993098

FILE: BA340650.15o OP1431614715039

NGS OPUS SOLUTION REPORT

All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy

USER: lance.richard@cctech.us DATE: May 14, 2015
RINEX FILE: ba34065n.15o TIME: 14:45:46 UTC

RINEX FILE: ba__075m.15o TIME: 14:36:11 UTC

SOFTWARE: page5 1209.04 master93.pl 022814 START: 2015/03/16 12:50:00
EPHEMERIS: igs18361.eph **[precise]** STOP: 2015/03/16 22:08:00
NAV FILE: brdc0750.15n OBS USED: 21266 / 23627 : 90% ANT
NAME: LEIAS10 NONE # FIXED AMB: 166 / 177 : 94%
ARP HEIGHT: 2.00 OVERALL RMS: 0.016(m)

	REF FRAME: NAD_83(2011)(EPOCH:2010.0000)		IGS08 (EPOCH:2015.2047)	
X:	-70409.474(m)	0.004(m)	-70410.254(m)	0.004(m)
Y:	-5532681.375(m)	0.021(m)	-5532679.878(m)	0.021(m)
Z:	3161867.503(m)	0.008(m)	3161867.322(m)	0.008(m)
LAT:	29 54 41.63870	0.003(m)	29 54 41.65769	0.003(m)
E LON:	269 16 15.19449	0.004(m)	269 16 15.16470	0.004(m)
W LON:	90 43 44.80551	0.004(m)	90 43 44.83530	0.004(m)
EL HGT:	-25.637(m)	0.023(m)	-27.016(m)	0.023(m)
ORTHO HGT:	0.365(m)	0.040(m)	[NAVD88 (Computed using GEOID12B)]	
ORTHO HGT:	1.198(ft)	0.131(ft)		

	UTM COORDINATES UTM (Zone 15)	STATE PLANE COORDINATES SPC (1702 LA S)
Northing (Y) [meters]	3311153.569	156617.940
Easting (X) [meters]	719244.828	1058346.095
Convergence [degrees]	1.13285937	0.30211801
Point Scale	1.00019310	0.99992695
Combined Factor	1.00019713	0.99993098

US NATIONAL GRID DESIGNATOR: 15RYP1924411153(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)	DL8631
AWES	AWES 147 BC ALWES CORS ARP	N300600.962	W0905858.634	32207.9	
DG5315	HOUM HOUMA CORS ARP	N293532.109	W0904324.988	35399.2	
DL8635	GVMS GALVEZ MIDDLE SCH CORS ARP	N301851.796	W0905413.029	47716.4	

NEAREST NGS PUBLISHED CONTROL POINT

DJ9341	BA34 SM 02	N295441.638	W0904344.805	0.0

STATE PLANE COORDINATES - U.S. Survey Foot SPC (1702 LA S)	
Northing (Y) [feet]	513837.358
Easting (X) [feet]	3472257.147
Convergence [degrees]	0.30211801
Point Scale	0.99992695
Combined Factor	0.99993098

FILE: 799-31 OP1431541230968

NGS OPUS SOLUTION REPORT
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All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy

USER: lance.richard@cctech.us DATE: May 13, 2015
RINEX FILE: 799_076n.15o TIME: 18:21:04 UTC

SOFTWARE: page5 1209.04 master93.pl 022814 START: 2015/03/17 13:07:00
EPHEMERIS: igs18362.eph **[precise]** STOP: 2015/03/17 21:54:00
NAV FILE: brdc0760.15n OBS USED: 9283 / 17494 : 53% ANT
NAME: LEIAS10 NONE # FIXED AMB: 143 / 161 : 89%
ARP HEIGHT: 2.0001 OVERALL RMS: 0.021(m)

	REF FRAME: NAD_83(2011)(EPOCH:2010.0000)		IGS08 (EPOCH:2015.2075)	
X:	-68430.742(m)	0.011(m)	-68431.522(m)	0.011(m)
Y:	-5533186.982(m)	0.027(m)	-5533185.485(m)	0.027(m)
Z:	3161033.061(m)	0.015(m)	3161032.880(m)	0.015(m)
LAT:	29 54 10.36350	0.006(m)	29 54 10.38248	0.006(m)
E LON:	269 17 29.18539	0.011(m)	269 17 29.15563	0.011(m)
W LON:	90 42 30.81461	0.011(m)	90 42 30.84437	0.011(m)
EL HGT:	-24.963(m)	0.029(m)	-26.343(m)	0.029(m)
ORTHO HGT:	1.006(m)	0.050(m)	[NAVD88 (Computed using GEOID12B)]	
ORTHO HGT:	3.301(ft)	0.164(ft)		

	UTM COORDINATES UTM (Zone 15)	STATE PLANE COORDINATES SPC (1702 LA S)
Northing (Y) [meters]	3310229.968	155665.644
Easting (X) [meters]	721248.885	1060336.013
Convergence [degrees]	1.14281958	0.31239479
Point Scale	1.00020399	0.99992720
Combined Factor	1.00020791	0.99993112

US NATIONAL GRID DESIGNATOR: 15RYP2124810229(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DG5315	HOUM HOUMA CORS ARP	N293532.109	W0904324.988	34463.0
DL8635	GVMS GALVEZ MIDDLE SCH CORS ARP	N301851.796	W0905413.029	49339.4
DH9596	DSTR DESTREHAN H.S. CORS ARP	N295752.395	W0902256.006	32240.9

NEAREST NGS PUBLISHED CONTROL POINT

DJ9341	BA34 SM 02	N295441.638	W0904344.805	2206.5

STATE PLANE COORDINATES - U.S. Survey Foot
SPC (1702 LA S)

Northing (Y) [feet]	510713.034
Easting (X) [feet]	3478785.736
Convergence [degrees]	0.31239479
Point Scale	0.99992720
Combined Factor	0.99993112

FILE: 31__0770.15o OP1431614029284

NGS OPUS SOLUTION REPORT
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All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy

USER: lance.richard@cctech.us DATE: May 14, 2015
RINEX FILE: 31__077m.15o TIME: 14:34:22 UTC

SOFTWARE: page5 1209.04 master50.pl 022814 START: 2015/03/18 12:36:00
EPHEMERIS: igs18363.eph **[precise]** STOP: 2015/03/18 21:11:00
NAV FILE: brdc0770.15n OBS USED: 8925 / 17194 : 52%
ANT NAME: LEIAS10 NONE # FIXED AMB: 138 / 162 : 85%
ARP HEIGHT: 2.00 OVERALL RMS: 0.021(m)

REF FRAME:	NAD_83(2011)(EPOCH:2010.0000)		IGS08 (EPOCH:2015.2101)	
X:	-68430.718(m)	0.010(m)	-68431.498(m)	0.010(m)
Y:	-5533186.993(m)	0.076(m)	-5533185.496(m)	0.076(m)
Z:	3161033.062(m)	0.027(m)	3161032.881(m)	0.027(m)
LAT:	29 54 10.36336	0.014(m)	29 54 10.38234	0.014(m)
E LON:	269 17 29.18629	0.010(m)	269 17 29.15653	0.010(m)
W LON:	90 42 30.81371	0.010(m)	90 42 30.84347	0.010(m)
EL HGT:	-24.954(m)	0.080(m)	-26.333(m)	0.080(m)
ORTHO HGT:	1.015(m)	0.136(m)	[NAVD88 (Computed using GEOID12B)]	
ORTHO HGT:	3.330(ft)	**0.446(ft)**		

	UTM COORDINATES (Zone 15)	STATE PLANE COORDINATES SPC (1702 LA S)
Northing (Y) [meters]	3310229.964	155665.640
Easting (X) [meters]	721248.910	1060336.037
Convergence [degrees]	1.14281971	0.31239491
Point Scale	1.00020399	0.99992720
Combined Factor	1.00020791	0.99993112

US NATIONAL GRID DESIGNATOR: 15RYP2124810229(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DG5315	HOUM HOUMA CORS ARP	N293532.109	W0904324.988	34463.0
DL8631	AWES AWES 147 BC ALWES CORS ARP	N300600.962	W0905858.634	34346.6
DJ9603	LWES LAKEWOOD ELMENTRY CORS ARP	N295401.295	W0902057.833	34689.2

NEAREST NGS PUBLISHED CONTROL POINT

DJ9341	BA34 SM 02	N295441.638	W0904344.805	2206.5

STATE PLANE COORDINATES - U.S. Survey Foot

SPC (1702 LA S)	
Northing (Y) [feet]	510713.021
Easting (X) [feet]	3478785.815
Convergence [degrees]	0.31239491
Point Scale	0.99992720
Combined Factor	0.99993112

FILE: 31__0870.15o OP1431614050751

NGS OPUS SOLUTION REPORT

All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy

USER: lance.richard@cctech.us DATE: May 14, 2015
RINEX FILE: 31__087n.15o TIME: 14:34:42 UTC

SOFTWARE: page5 1209.04 master51.pl 022814 START: 2015/03/28 13:16:00
EPHEMERIS: igs18376.eph **[precise]** STOP: 2015/03/28 21:55:00
NAV FILE: brdc0870.15n OBS USED: 9061 / 16670 : 54%
ANT NAME: LEIAS10 NONE # FIXED AMB: 136 / 157 : 87%
ARP HEIGHT: 2.00 OVERALL RMS: 0.023(m)

REF FRAME:	NAD_83(2011)(EPOCH:2010.0000)		IGS08 (EPOCH:2015.2376)	
X:	-68430.751(m)	0.038(m)	-68431.532(m)	0.038(m)
Y:	-5533186.841(m)	0.040(m)	-5533185.344(m)	0.040(m)
Z:	3161032.990(m)	0.025(m)	3161032.809(m)	0.025(m)
LAT:	29 54 10.36378	0.025(m)	29 54 10.38277	0.025(m)
E LON:	269 17 29.18499	0.038(m)	269 17 29.15519	0.038(m)
W LON:	90 42 30.81501	0.038(m)	90 42 30.84481	0.038(m)
EL HGT:	-25.121(m)	0.041(m)	-26.500(m)	0.041(m)
ORTHO HGT:	0.848(m)	0.070(m)	[NAVD88 (Computed using GEOID12B)]	
ORTHO HGT:	2.782(ft)	**0.230(ft)**		

	UTM COORDINATES (Zone 15)	STATE PLANE COORDINATES SPC (1702 LA S)
Northing (Y) [meters]	3310229.977	155665.653
Easting (X) [meters]	721248.874	1060336.002
Convergence [degrees]	1.14281953	0.31239473
Point Scale	1.00020399	0.99992720
Combined Factor	1.00020794	0.99993115

US NATIONAL GRID DESIGNATOR: 15RYP2124810229(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DH9596	DSTR DESTREHAN H.S. CORS ARP	N295752.395	W0902256.006	32240.9
DJ9603	LWES LAKEWOOD ELMENTRY CORS ARP	N295401.295	W0902057.833	34689.3
DL8635	GVMS GALVEZ MIDDLE SCH CORS ARP	N301851.796	W0905413.029	49339.4

NEAREST NGS PUBLISHED CONTROL POINT

DJ9341	BA34 SM 02	N295441.638	W0904344.805	2206.5

STATE PLANE COORDINATES - U.S. Survey Foot SPC (1702 LA S)	
Northing (Y) [feet]	510713.063
Easting (X) [feet]	3478785.700
Convergence [degrees]	0.31239473
Point Scale	0.99992720
Combined Factor	0.99993115

FILE: 31__0880.15o OP1431614080850

NGS OPUS SOLUTION REPORT

All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy

USER: lance.richard@cctech.us DATE: May 14, 2015
RINEX FILE: 31__88 TIME: 14:35:11 UTC

SOFTWARE: page5 1209.04 master52.pl 022814 START: 2015/03/29 12:35:00
EPHEMERIS: igs18380.eph **[precise]** STOP: 2015/03/29 21:22:00
NAV FILE: brdc0880.15n OBS USED: 7839 / 16732 : 47%
ANT NAME: LEIAS10 NONE # FIXED AMB: 134 / 175 : 77%
ARP HEIGHT: 2.00 OVERALL RMS: 0.023(m)

REF FRAME:	NAD_83(2011)(EPOCH:2010.0000)		IGS08 (EPOCH:2015.2403)	
X:	-68430.748(m)	0.020(m)	-68431.529(m)	0.020(m)
Y:	-5533187.000(m)	0.039(m)	-5533185.503(m)	0.039(m)
Z:	3161033.101(m)	0.021(m)	3161032.920(m)	0.021(m)
LAT:	29 54 10.36433	0.015(m)	29 54 10.38332	0.015(m)
E LON:	269 17 29.18518	0.020(m)	269 17 29.15538	0.020(m)
W LON:	90 42 30.81482	0.020(m)	90 42 30.84462	0.020(m)
EL HGT:	-24.928(m)	0.044(m)	-26.307(m)	0.044(m)
ORTHO HGT:	1.041(m)	0.076(m)	[NAVD88 (Computed using GEOID12B)]	
ORTHO HGT:	3.415(ft)	**0.249(ft)**		

	UTM COORDINATES UTM (Zone 15)	STATE PLANE COORDINATES SPC (1702 LA S)
Northing (Y) [meters]	3310229.994	155665.670
Easting (X) [meters]	721248.879	1060336.007
Convergence [degrees]	1.14281956	0.31239476
Point Scale	1.00020399	0.99992720
Combined Factor	1.00020791	0.99993111

US NATIONAL GRID DESIGNATOR: 15RYP2124810229(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DH9596	DSTR DESTREHAN H.S. CORS ARP	N295752.395	W0902256.006	32240.9
DL8631	AWES AWES 147 BC ALWES CORS ARP	N300600.962	W0905858.634	34346.6
DJ9603	LWES LAKEWOOD ELMENTRY CORS ARP	N295401.295	W0902057.833	34689.2

NEAREST NGS PUBLISHED CONTROL POINT

DJ9341	BA34 SM 02	N295441.638	W0904344.805	2206.5

STATE PLANE COORDINATES - U.S. Survey Foot SPC (1702 LA S)	
Northing (Y) [feet]	510713.119
Easting (X) [feet]	3478785.716
Convergence [degrees]	0.31239476
Point Scale	0.99992720
Combined Factor	0.99993111

SURVEY NOTES:

1. ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83) LOUISIANA STATE PLANE, SOUTH ZONE.
2. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF NAVD88 IN U.S. SURVEY FEET.
3. PROJECT BENCH MARK "CP-3"
   N = 513,653.40
   E = 3,472,344.28
   ELEV. 1.771' NAVD88
4. MAGNETOMETER SURVEY WAS CONDUCTED ON NOVEMBER 15, 2017 UTILIZING GEOMETRICS G-882 MARINE MAGNETOMETER

POINT No.	NORTHING	EASTING	AMPLITUDE	WIDTH	TYPE
1	512,424.25	3,474,217.22	86.37	10.3	MONO
2	511,809.33	3,474,613.86	52.35	20.3	MONO
3	512,006.75	3,474,823.66	123.32	8.9	MONO
4	511,894.82	3,474,711.81	66.36	21.1	MONO
5	510,653.43	3,478,702.79	120.97	44.2	MONO
6	510,191.34	3,479,176.29	140.73	15.3	MONO

LEGEND

- 51–100 GAMMAS
- 101–500 GAMMAS
- 501–1000 GAMMAS
- >1001 GAMMAS
- MAG SURVEY LINES
- CHANNEL 1 BASELINE

PROJECT NO:
DIRECTORY: Z:\JOBS BY YEAR\2017\17-204
FILE: MAG TARGETS.DWG
FIELD BOOK:
MAP NO.

DATE	DESCRIPTION	BY
	REVISION	

SCALE:

HORIZONTAL SCALE IN FEET
30' 15' 0 30' 60' 90'

STAMP

STATE OF LOUISIANA
HENRY E. SCHWARTZ IV
License No. 4899
PROFESSIONAL
LAND SURVEYOR

SIGNATURE:

11/27/17
DATE:

BAYOU COUNTRY SURVEYING, LLC
Professional Land Surveyors
PO Box 156 Labadieville, LA. 70372
Office 985-369-2722

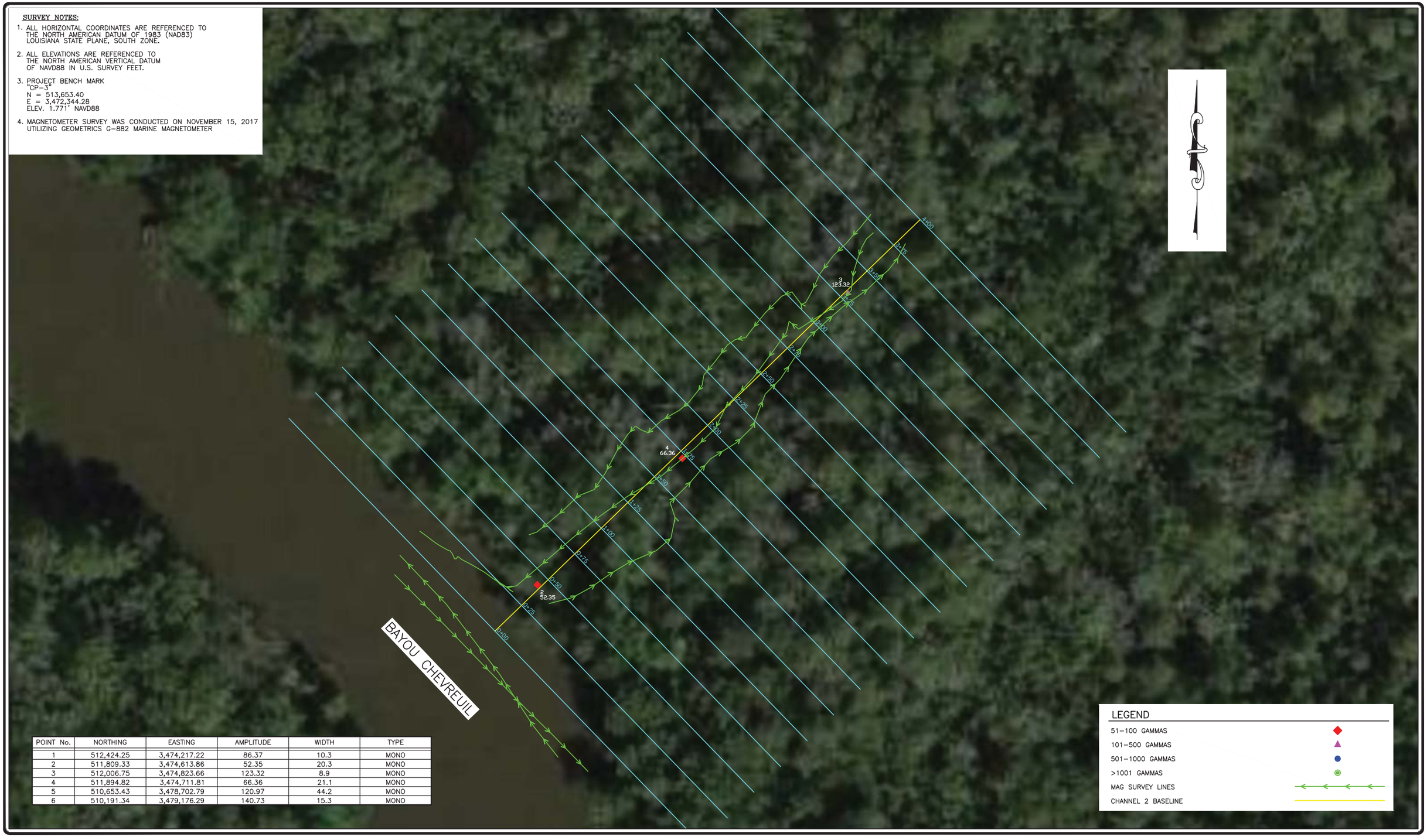
DESIGNED:	DETAILED:	TRACED:
CHECKED:	CHECKED:	CHECKED:
DATE: 11/27/2017		PROJECT:

STATE OF LOUISIANA COASTAL
PROTECTION AND RESTORATION AUTHORITY
PROJECT NO. BA-34-2
ST. JAMES PARISH, LOUISIANA
Magnolia Dredge & Dock, LLC
HYDROLOGIC RESTORATION AND VEGATATIVE
PLANTING IN THE DES ALLEMANDS SWAMP
CHANNEL 1 MAG SURVEY

SHEET
1
OF 8 SHEETS

SURVEY NOTES:

1. ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83) LOUISIANA STATE PLANE, SOUTH ZONE.
2. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF NAVD88 IN U.S. SURVEY FEET.
3. PROJECT BENCH MARK "CP-3"
   N = 513,653.40
   E = 3,472,344.28
   ELEV. 1.771' NAVD88
4. MAGNETOMETER SURVEY WAS CONDUCTED ON NOVEMBER 15, 2017 UTILIZING GEOMETRICS G-882 MARINE MAGNETOMETER



POINT No.	NORTHING	EASTING	AMPLITUDE	WIDTH	TYPE
1	512,424.25	3,474,217.22	86.37	10.3	MONO
2	511,809.33	3,474,613.86	52.35	20.3	MONO
3	512,006.75	3,474,823.66	123.32	8.9	MONO
4	511,894.82	3,474,711.81	66.36	21.1	MONO
5	510,653.43	3,478,702.79	120.97	44.2	MONO
6	510,191.34	3,479,176.29	140.73	15.3	MONO

LEGEND

- 51-100 GAMMAS
- 101-500 GAMMAS
- 501-1000 GAMMAS
- >1001 GAMMAS
- MAG SURVEY LINES
- CHANNEL 2 BASELINE

PROJECT NO:

DIRECTORY: Z:\JOBS BY YEAR\2017\17-204

FILE: MAG TARGETS.DWG

FIELD BOOK:

MAP NO.

DATE	DESCRIPTION	BY
	REVISION	

SCALE:

HORIZONTAL SCALE IN FEET

30' 15' 0 30' 60' 90'

STAMP

STATE OF LOUISIANA
HENRY E. SCHWARTZ IV
License No. 4899
PROFESSIONAL LAND SURVEYOR

SIGNATURE:

11/27/17
DATE:

BAYOU COUNTRY SURVEYING, LLC
Professional Land Surveyors
PO Box 156 Labadieville, LA. 70372
Office 985-369-2722

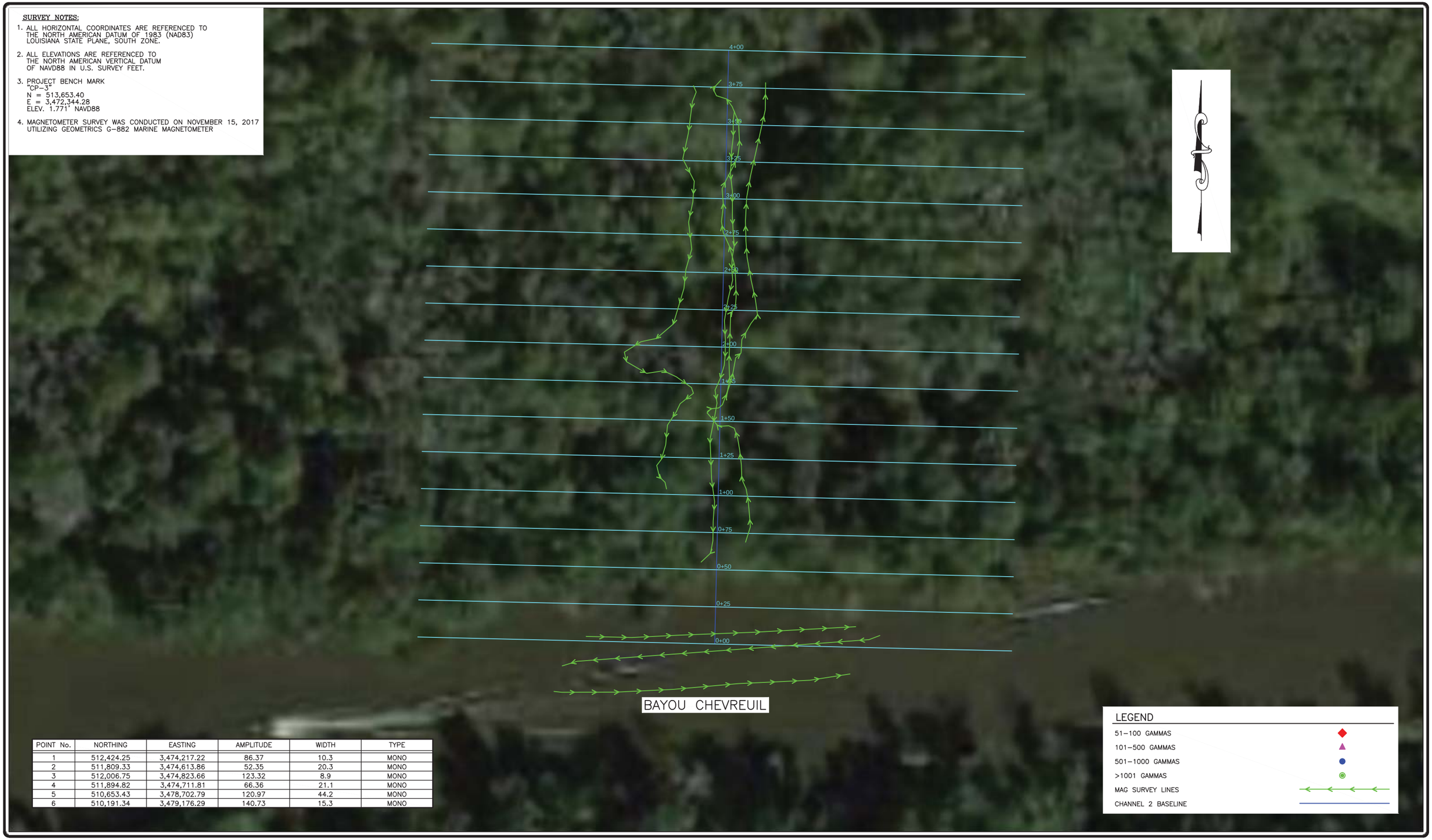
DESIGNED:	DETAILED:	TRACED:
CHECKED:	CHECKED:	CHECKED:
DATE: 11/27/2017		PROJECT:

STATE OF LOUISIANA COASTAL PROTECTION AND RESTORATION AUTHORITY
PROJECT NO. BA-34-2
ST. JAMES PARISH, LOUISIANA
Magnolia Dredge & Dock, LLC
HYDROLOGIC RESTORATION AND VEGATATIVE PLANTING IN THE DES ALLEMANDS SWAMP
CHANNEL 2 MAG SURVEY

SHEET 2 OF 8 SHEETS

SURVEY NOTES:

1. ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83) LOUISIANA STATE PLANE, SOUTH ZONE.
2. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF NAVD88 IN U.S. SURVEY FEET.
3. PROJECT BENCH MARK "CP-3"
   N = 513,653.40
   E = 3,472,344.28
   ELEV. 1.771' NAVD88
4. MAGNETOMETER SURVEY WAS CONDUCTED ON NOVEMBER 15, 2017 UTILIZING GEOMETRICS G-882 MARINE MAGNETOMETER



POINT No.	NORTHING	EASTING	AMPLITUDE	WIDTH	TYPE
1	512,424.25	3,474,217.22	86.37	10.3	MONO
2	511,809.33	3,474,613.86	52.35	20.3	MONO
3	512,006.75	3,474,823.66	123.32	8.9	MONO
4	511,894.82	3,474,711.81	66.36	21.1	MONO
5	510,653.43	3,478,702.79	120.97	44.2	MONO
6	510,191.34	3,479,176.29	140.73	15.3	MONO

LEGEND

- 51-100 GAMMAS
- 101-500 GAMMAS
- 501-1000 GAMMAS
- >1001 GAMMAS
- MAG SURVEY LINES
- CHANNEL 2 BASELINE

PROJECT NO:

DIRECTORY: Z:\JOBS BY YEAR\2017\17-204

FILE: MAG TARGETS.DWG

FIELD BOOK:

MAP NO.

DATE	DESCRIPTION	BY

REVISION

SCALE:

HORIZONTAL SCALE IN FEET

30' 15' 0 30' 60' 90'

STAMP

STATE OF LOUISIANA
HENRY E. SCHWARTZ IV
License No. 4899
PROFESSIONAL
LAND SURVEYOR

SIGNATURE:

11/16/17
DATE:

BAYOU COUNTRY SURVEYING, LLC
Professional Land Surveyors
PO Box 156 Labadieville, LA. 70372
Office 985-369-2722

DESIGNED:	DETAILED:	TRACED:
CHECKED:	CHECKED:	CHECKED:
DATE: 11/16/2017		PROJECT:

STATE OF LOUISIANA COASTAL
PROTECTION AND RESTORATION AUTHORITY
PROJECT NO. BA-34-2
ST. JAMES PARISH, LOUISIANA
Magnolia Dredge & Dock, LLC
HYDROLOGIC RESTORATION AND VEGATATIVE
PLANTING IN THE DES ALLEMANDS SWAMP
CHANNEL 3 MAG SURVEY

SHEET
3
OF 8 SHEETS

SURVEY NOTES:

1. ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83) LOUISIANA STATE PLANE, SOUTH ZONE.
2. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF NAVD88 IN U.S. SURVEY FEET.
3. PROJECT BENCH MARK "CP-3"
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   E = 3,472,344.28
   ELEV. 1.771' NAVD88
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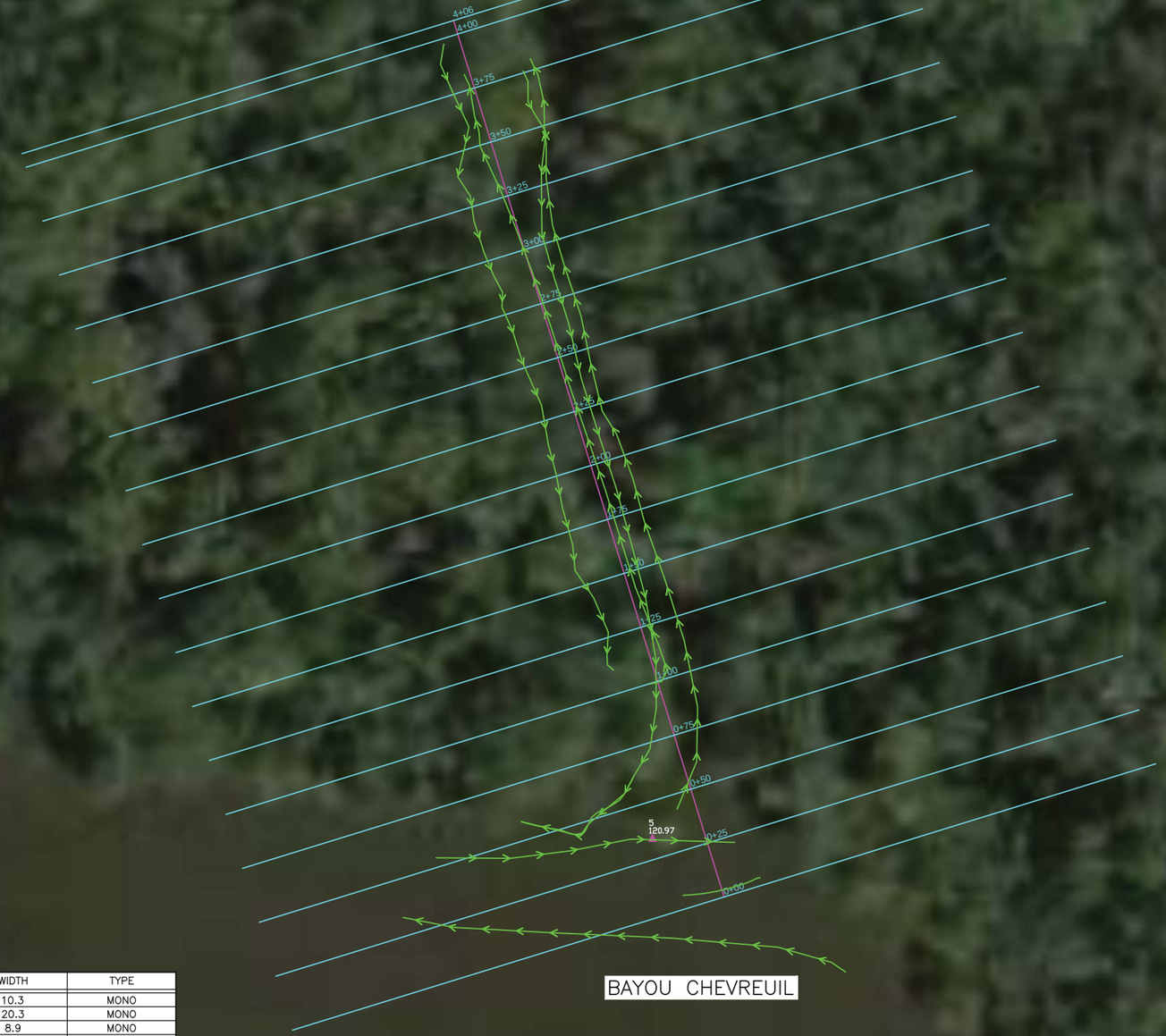

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6	510,191.34	3,479,176.29	140.73	15.3	MONO

LEGEND

- 51-100 GAMMAS
- 101-500 GAMMAS
- 501-1000 GAMMAS
- >1001 GAMMAS
- MAG SURVEY LINES
- CHANNEL 2 BASELINE

PROJECT NO:
DIRECTORY: Z:\JOBS BY YEAR\2017\17-204
FILE: MAG TARGETS.DWG
FIELD BOOK:
MAP NO.

DATE	DESCRIPTION	BY
	REVISION	

SCALE:

HORIZONTAL SCALE IN FEET
30' 15' 0 30' 60' 90'

STAMP

STATE OF LOUISIANA
HENRY E. SCHWARTZ IV
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LAND SURVEYOR

SIGNATURE:

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DATE:

BAYOU COUNTRY SURVEYING, LLC
Professional Land Surveyors
PO Box 156 Labadieville, LA. 70372
Office 985-369-2722

DESIGNED:	DETAILED:	TRACED:
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DATE: 11/27/2017		PROJECT:

STATE OF LOUISIANA COASTAL
PROTECTION AND RESTORATION AUTHORITY
PROJECT NO. BA-34-2
ST. JAMES PARISH, LOUISIANA
Magnolia Dredge & Dock, LLC
HYDROLOGIC RESTORATION AND VEGATATIVE
PLANTING IN THE DES ALLEMANDS SWAMP
CHANNEL ALT 2 MAG SURVEY

SHEET
4
OF 8 SHEETS

SURVEY NOTES:

1. ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83) LOUISIANA STATE PLANE, SOUTH ZONE.
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   ELEV. 1.771' NAVD88
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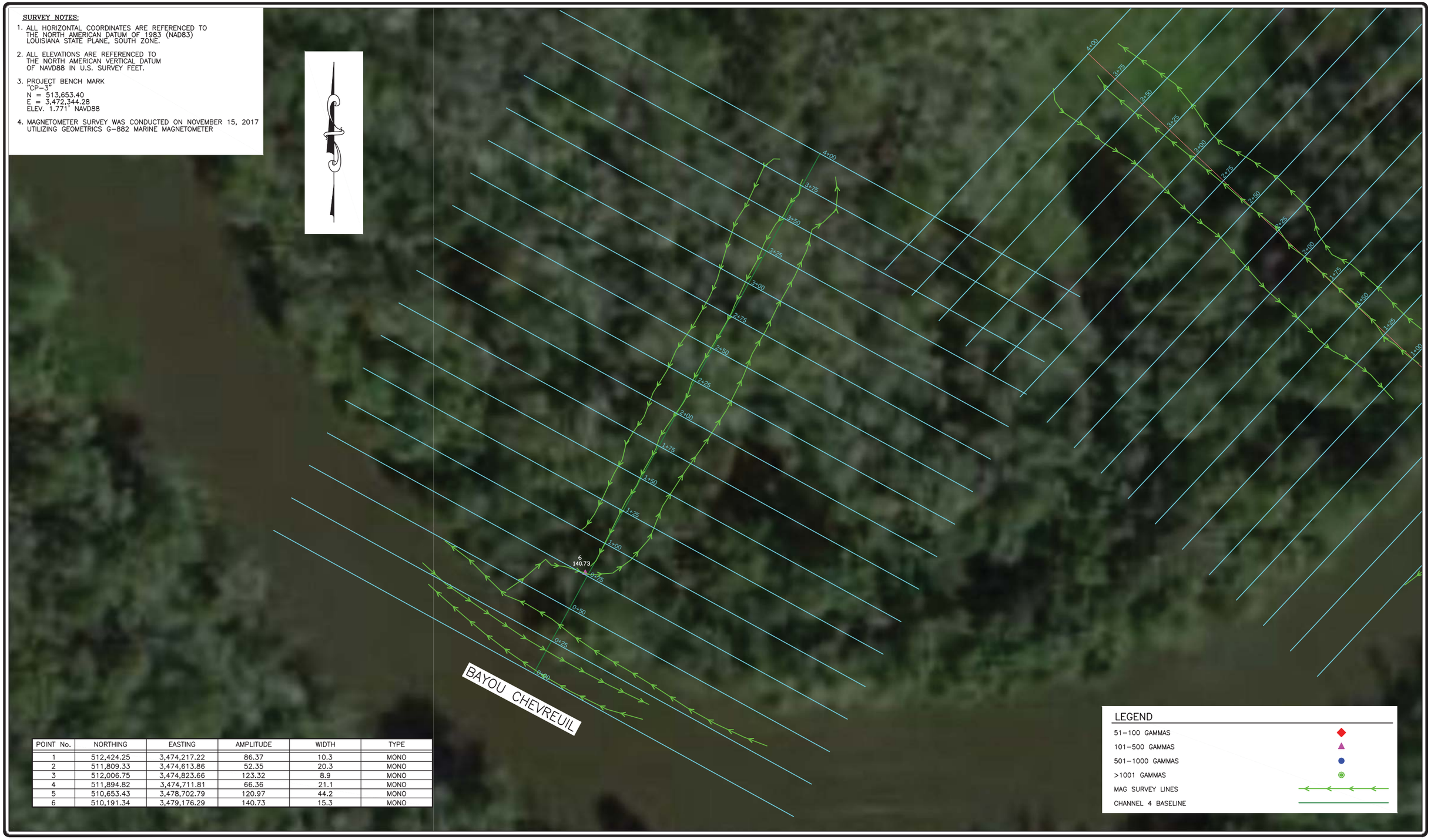

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6	510,191.34	3,479,176.29	140.73	15.3	MONO

LEGEND

- 51–100 GAMMAS
- 101–500 GAMMAS
- 501–1000 GAMMAS
- >1001 GAMMAS
- MAG SURVEY LINES
- CHANNEL 4 BASELINE

PROJECT NO:
DIRECTORY: Z:\JOBS BY YEAR\2017\17-204
FILE: MAG TARGETS.DWG
FIELD BOOK:
MAP NO.

DATE	DESCRIPTION	BY

REVISION

SCALE:

HORIZONTAL SCALE IN FEET
30' 15' 0 30' 60' 90'

STAMP

STATE OF LOUISIANA
HENRY E. SCHWARTZ IV
License No. 4899
PROFESSIONAL
LAND SURVEYOR

SIGNATURE:

11/27/17
DATE:

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PO Box 156 Labadieville, LA. 70372
Office 985-369-2722

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DATE: 11/27/2017		PROJECT:

STATE OF LOUISIANA COASTAL
PROTECTION AND RESTORATION AUTHORITY
PROJECT NO. BA-34-2
ST. JAMES PARISH, LOUISIANA
Magnolia Dredge & Dock, LLC
HYDROLOGIC RESTORATION AND VEGATATIVE
PLANTING IN THE DES ALLEMANDS SWAMP
CHANNEL 4 MAG SURVEY

SHEET
5
OF 8 SHEETS

SURVEY NOTES:

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3. PROJECT BENCH MARK "CP-3"
   N = 513,653.40
   E = 3,472,344.28
   ELEV. 1.771' NAVD88
4. MAGNETOMETER SURVEY WAS CONDUCTED ON NOVEMBER 15, 2017 UTILIZING GEOMETRICS G-882 MARINE MAGNETOMETER

4+00 3+75 3+50 3+25 3+00 2+75 2+50 2+25 2+00 1+75 1+50 1+25 1+00 0+75 0+50 0+25 0+00

BAYOU CHEVREUIL

POINT No.	NORTHING	EASTING	AMPLITUDE	WIDTH	TYPE
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LEGEND

- 51–100 GAMMAS
- 101–500 GAMMAS
- 501–1000 GAMMAS
- >1001 GAMMAS
- MAG SURVEY LINES
- CHANNEL 5 BASELINE

PROJECT NO:

DIRECTORY: Z:\JOBS BY YEAR\2017\17-204

FILE: MAG TARGETS.DWG

FIELD BOOK:

MAP NO.

DATE	DESCRIPTION	BY

REVISION

SCALE:

HORIZONTAL SCALE IN FEET

30' 15' 0 30' 60' 90'

STAMP

STATE OF LOUISIANA · HENRY E. SCHWARTZ IV License No. 4899 PROFESSIONAL LAND SURVEYOR

SIGNATURE:

11/27/17
DATE:

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Professional Land Surveyors
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DESIGNED:	DETAILED:	TRACED:
CHECKED:	CHECKED:	CHECKED:
DATE: 11/27/2017		PROJECT:

STATE OF LOUISIANA COASTAL PROTECTION AND RESTORATION AUTHORITY
PROJECT NO. BA-34-2
ST. JAMES PARISH, LOUISIANA
Magnolia Dredge & Dock, LLC
HYDROLOGIC RESTORATION AND VEGATATIVE PLANTING IN THE DES ALLEMANDS SWAMP
CHANNEL 5 MAG SURVEY

SURVEY NOTES:

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4+06
4+00
3+75
3+50
3+25
3+00
2+75
2+50
2+25
2+00
1+75
1+50
1+25
1+00
0+75
0+50
0+25
0+00

BAYOU CHEVREUIL

POINT No.	NORTHING	EASTING	AMPLITUDE	WIDTH	TYPE
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LEGEND

- 51-100 GAMMAS
- 101-500 GAMMAS
- 501-1000 GAMMAS
- >1001 GAMMAS
- MAG SURVEY LINES
- CHANNEL ALT 1 BASELINE

PROJECT NO:
DIRECTORY: Z:\JOBS BY YEAR\2017\17-204
FILE: MAG TARGETS.DWG
FIELD BOOK:
MAP NO.

DATE	DESCRIPTION	BY
	REVISION	

SCALE:

HORIZONTAL SCALE IN FEET
30' 15' 0 30' 60' 90'

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PROJECT NO. BA-34-2
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Magnolia Dredge & Dock, LLC
HYDROLOGIC RESTORATION AND VEGATATIVE PLANTING IN THE DES ALLEMANDS SWAMP
CHANNEL ALT. 1 MAG SURVEY

SHEET
7
OF 8 SHEETS

SURVEY NOTES:

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3+99
3+75
3+50
3+25
3+00
2+75
2+50
2+25
2+00
1+75
1+50
1+25
1+00
0+75
0+50
0+25
0+00

BAYOU CHEVREUIL

POINT No.	NORTHING	EASTING	AMPLITUDE	WIDTH	TYPE
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LEGEND

- 51-100 GAMMAS
- 101-500 GAMMAS
- 501-1000 GAMMAS
- >1001 GAMMAS
- MAG SURVEY LINES
- CHANNEL 6 BASELINE

PROJECT NO:
DIRECTORY: Z:\JOBS BY YEAR\2017\17-204
FILE: MAG TARGETS.DWG
FIELD BOOK:
MAP NO.

DATE	DESCRIPTION	BY
	REVISION	

SCALE:

HORIZONTAL SCALE IN FEET
30' 15' 0 30' 60' 90'

STAMP

STATE OF LOUISIANA
HENRY E. SCHWARTZ IV
License No. 4899
PROFESSIONAL
LAND SURVEYOR

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DATE: 11/27/2017		PROJECT:

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PROTECTION AND RESTORATION AUTHORITY
PROJECT NO. BA-34-2
ST. JAMES PARISH, LOUISIANA
Magnolia Dredge & Dock, LLC
HYDROLOGIC RESTORATION AND VEGATATIVE
PLANTING IN THE DES ALLEMANDS SWAMP
CHANNEL 6 MAG SURVEY

SHEET
8
OF 8 SHEETS