

# LA\_Catahoula\_Concordia\_2017\_D17

## Survey Report

Contract Number: G17PC00044

Task Order Number: G17PD1255



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# Overview

Digital Aerial Solutions, LLC (DAS) with contract number G17PC00044 was contracted by the United States Geological Survey under task order number G17PD1255 collect a high-resolution LiDAR data set covering 1,261 square miles affecting Catahoula and Concordia Parishes in Louisiana. Each of these categories was spread out as evenly as possible throughout the Area of Interest (AOI). The survey was completed using the Global Positioning System (GPS). Each observation was identified in the field and surveyed utilizing GPS receivers, collecting GNSS and GLONASS information and utilizing a Leica Smart-Net RTK network. In accordance with section C.1.e.(i)(c) of the task order, the spatial reference system used was:

## **Spatial Reference System:**

Coordinate System: Universal Transverse Mercator UTM Zone 15

Horizontal Datum: North American Datum 1983 (2011)

Vertical Datum: North American Vertical Datum of 1988

Units: Meters

Geoid Model: Geoid 12B

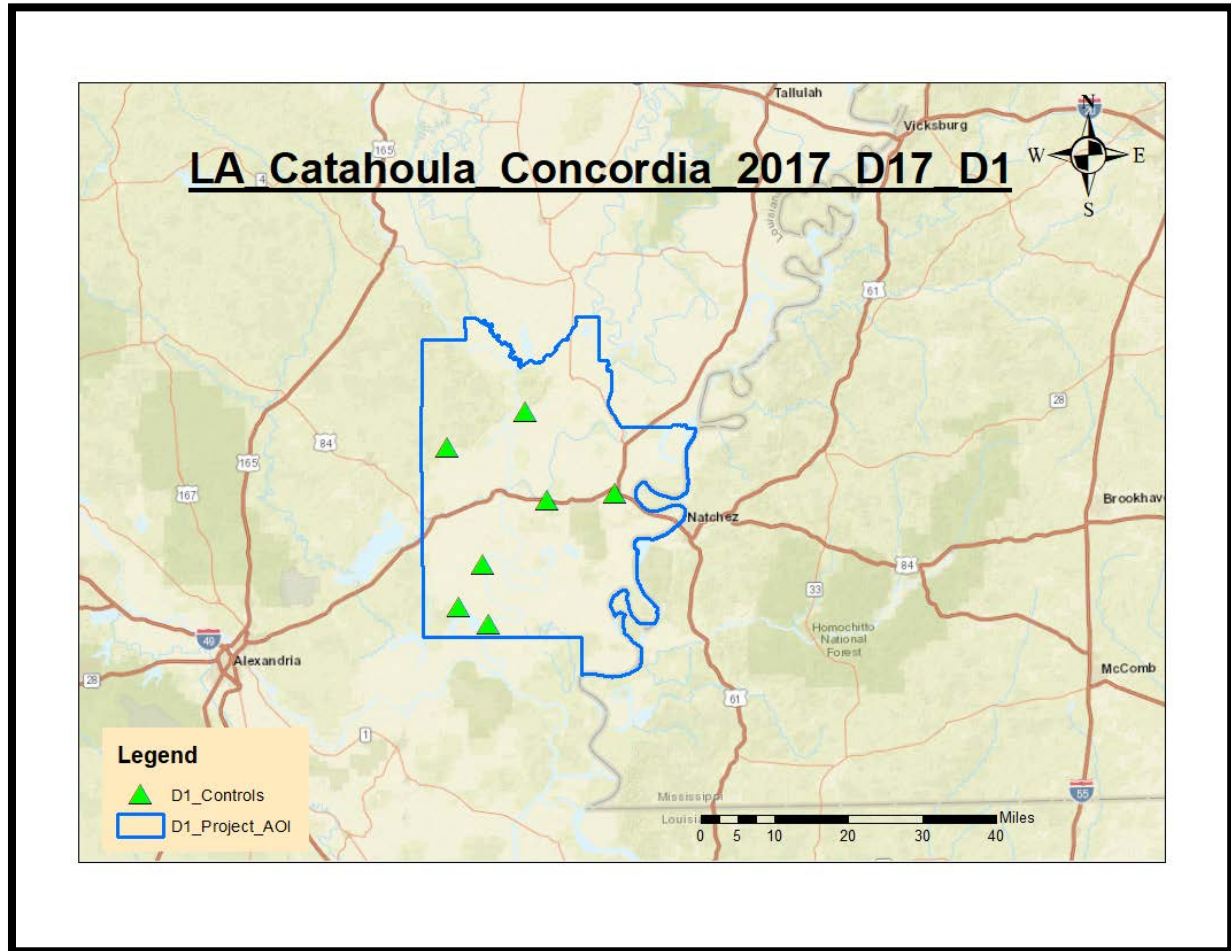
Section C.1.e.(i)(c) of the task order outlines the ground control minimum requirements and specifications for this LiDAR project. 7 Supplemental ground control points were collected and used to support the airborne GPS solution and positional accuracy. DAS also collected more than the required number of Non-Vegetated Vertical Accuracy (NVA) and Vegetated Vertical Accuracy (VVA) Quality Checkpoints as stated in the task order. These checkpoints serve as an independent delivery to the client and were not incorporated into the vertical solution.

# Glossary of Terms

<b>Term</b>	<b>-</b>	<b>Definition</b>
ATTN	-	Attention
BE	-	Bare Earth Checkpoint (see NVA)
CTRL	-	Control
DAS	-	Digital Aerial Solutions, LLC
Ellip	-	Ellipsoid Height
FIPS	-	Federal Information Processing Standard
GPS	-	Global Positioning Systems
UT	-	Urban Terrain (see NVA)
HV	-	High Vegetation (see VVA)
ID	-	Identification
LV	-	Low Vegetation (see VVA)
LiDAR	-	Light Detection and Ranging
MV	-	Medium Vegetation (see VVA)
NAD83	-	North American Datum of 1983
NAVD88	-	North American Vertical Datum of 1988
NGS	-	National Geodetic Survey
NGTOC	-	National Geospatial Technical Operations Center
NVA	-	Non-Vegetated Vertical Accuracy
Ortho	-	Orthometric Height
POC	-	Point of Contact
RTK	-	Real Time Kinematics
USGS	-	United States Geological Survey
VP	-	Vice President
VVA	-	Vegetated Vertical Accuracy

## Supplemental Ground Control

The Map shows the overall distribution of the Supplemental Ground Control throughout the AOI. The following tables contain a list of the control using Easting, Northing, and Orthometric height. The coordinate system displayed is Universal Transverse Mercator UTM Zone 15, North American Datum 1983 (2011), North American Vertical Datum of 1988, Geoid 12B and using Meters for measurement.



**TABLE: Ground Control Points**

<b>Point ID</b>	<b>Easting</b>	<b>Northing</b>	<b>Ortho</b>
<b>3_GS00002</b>	636192.807	3499335.093	16.994
<b>3_GS00007</b>	602176.796	3474469.542	20.018
<b>3_GS00001</b>	616573.25	3517105.716	17.573
<b>3_GS00003</b>	621279.198	3497796.315	17.754
<b>3_GS00004</b>	599482.794	3509326.095	25.681
<b>3_GS00005</b>	607421.396	3483723.11	17.774
<b>3_GS00006</b>	608491.665	3470809.549	19.05

3\_GS00002



**Point ID:** 3\_GS00002

**Northing:** 3499335.093 Meters

**Easting:** 636192.807 Meters

**Orthometric Height:** 16.994 Meters

**Latitude:** 31° 37' 16.00739" N

**Longitude:** 91° 33' 50.64055" W

**Ellipsoid Height:** -9.175 Meters



3\_GS00007



**Point ID:** 3\_GS00007

**Northing:** 3474469.542 Meters

**Easting:** 602176.796 Meters

**Orthometric Height:** 20.018 Meters

**Latitude:** 31° 24' 01.19655" N

**Longitude:** 91° 55' 30.78564" W

**Ellipsoid Height:** -6.325 Meters

3\_GS00001



**Point ID:** 3\_GS00001

**Northing:** 3517105.716 Meters

**Easting:** 616573.25 Meters

**Orthometric Height:** 17.573 Meters

**Latitude:** 31° 47' 00.83452" N

**Longitude:** 91° 46' 07.54861" W

**Ellipsoid Height:** -8.372 Meters



3\_GS00003



**Point ID:** 3\_GS00003

**Northing:** 3497796.315 Meters

**Easting:** 621279.198 Meters

**Orthometric Height:** 17.754 Meters

**Latitude:** 31° 36' 32.05573" N

**Longitude:** 91° 43' 17.25991" W

**Ellipsoid Height:** -8.326 Meters

3\_GS00004



**Point ID:** 3\_GS00004

**Northing:** 3509326.095 Meters

**Easting:** 599482.794 Meters

**Orthometric Height:** 25.681 Meters

**Latitude:** 31° 42' 54.01863" N

**Longitude:** 91° 57' 00.12819" W

**Ellipsoid Height:** -0.129 Meters



3\_GS00005



**Point ID:** 3\_GS00005

**Northing:** 3483723.11 Meters

**Easting:** 607421.396 Meters

**Orthometric Height:** 17.774 Meters

**Latitude:** 31° 28' 59.99894" N

**Longitude:** 91° 52' 08.60822" W

**Ellipsoid Height:** -8.423 Meters

3\_GS00006



**Point ID:** 3\_GS00006

**Northing:** 3470809.549 Meters

**Easting:** 608491.665 Meters

**Orthometric Height:** 19.05 Meters

**Latitude:** 31° 22' 00.27103" N

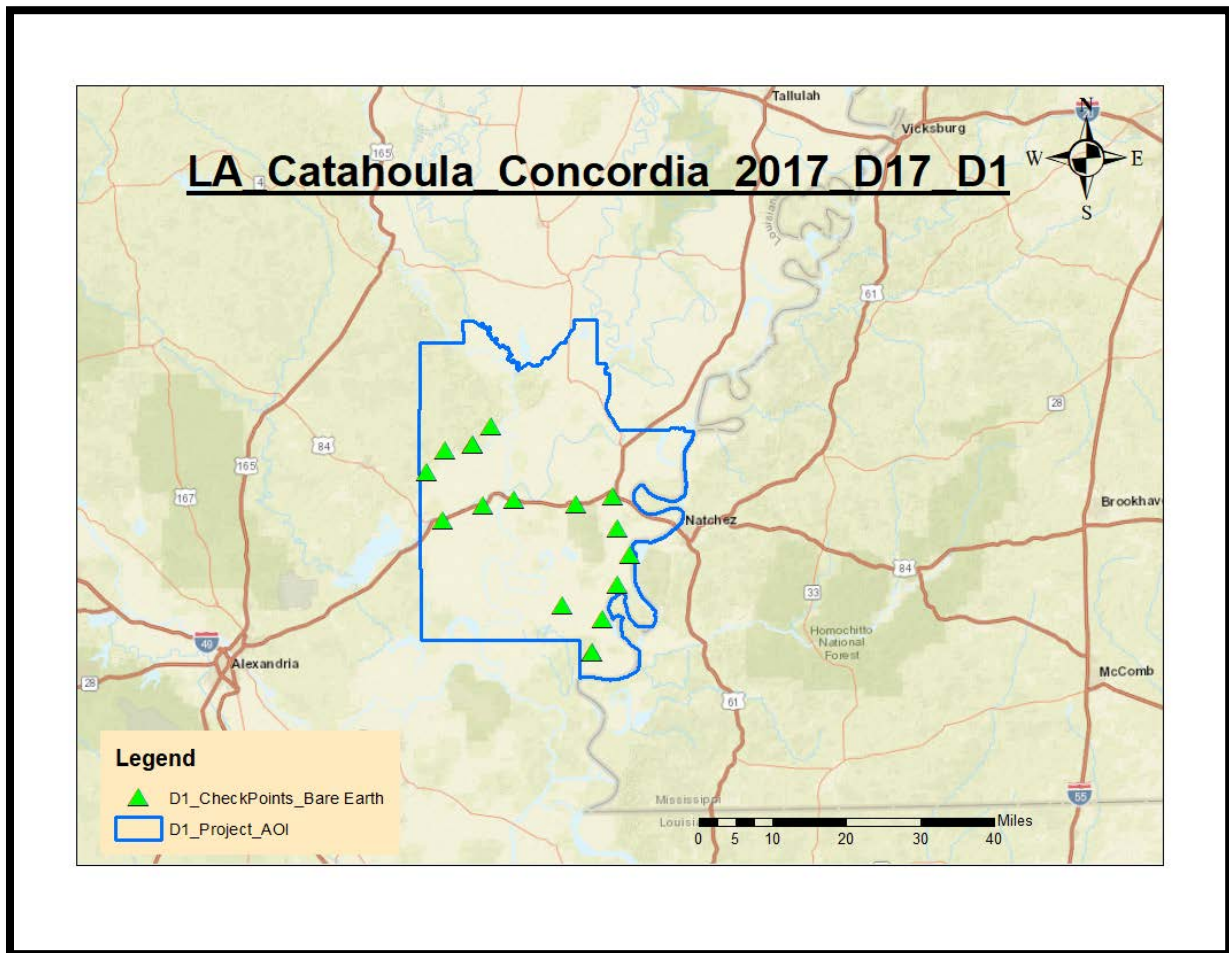
**Longitude:** 91° 51' 33.13137" W

**Ellipsoid Height:** -7.403 Meters



## Non-Vegetated Vertical Accuracy Checkpoints Bare Earth

The Map shows the overall distribution of the Non-Vegetated Vertical Accuracy Checkpoint, Bare Earth throughout the AOI. The following tables contain a list of the control using Easting, Northing, and Orthometric height. The coordinate system displayed is Universal Transverse Mercator UTM Zone 15, North American Datum 1983 (2011), North American Vertical Datum of 1988, Geoid 12B and using Meters for measurement.



**TABLE: Bare Earth**

<b>Point ID</b>	<b>Easting</b>	<b>Northing</b>	<b>Ortho</b>
<b>1_GS00002</b>	625085.067	3475452.375	14.182
<b>1_GS00004</b>	628279.633	3497672.884	16.624
<b>1_GS00007</b>	637248.915	3492276.021	16.461
<b>1_GS00008</b>	637294.59	3480113.842	24.97
<b>1_GS00009</b>	640058.895	3486478.4	26.32
<b>1_GS00010</b>	636204.663	3499312.685	16.899
<b>1_GS00013</b>	631644.674	3465227.496	13.612
<b>1_GS00017</b>	634003.396	3472614.767	15.221
<b>1_GS00018</b>	605560.123	3510671.327	21.367
<b>1_GS00020</b>	631643.82	3465211.885	13.854
<b>1_GS00021</b>	595515.297	3504770.325	17.657
<b>1_GS00022</b>	609481.409	3514627.253	31.193
<b>1_GS00024</b>	605549.053	3510662.067	21.622
<b>1_GS00026</b>	614720.819	3498682.782	17.413
<b>1_GS00030</b>	599165.202	3494219.386	17.128
<b>1_GS00031</b>	599544.233	3509339.302	26.57
<b>1_GS00033</b>	607809.779	3497279.117	17.238

1\_GS00002



**Point ID:** 1\_GS00002

**Northing:** 3475452.375 Meters

**Easting:** 625085.067 Meters

**Orthometric Height:** 14.182 Meters

**Latitude:** 31° 24' 25.02544" N

**Longitude:** 91° 41' 03.03027" W

**Ellipsoid Height:** -12.252 Meters

1\_GS00004



**Point ID:** 1\_GS00004

**Northing:** 3497672.884 Meters

**Easting:** 628279.633 Meters

**Orthometric Height:** 16.624 Meters

**Latitude:** 31° 36' 25.31197" N

**Longitude:** 91° 38' 51.70147" W

**Ellipsoid Height:** -9.506 Meters



1\_GS00007



**Point ID:** 1\_GS00007

**Northing:** 3492276.021 Meters

**Easting:** 637248.915 Meters

**Orthometric Height:** 16.461 Meters

**Latitude:** 31° 26' 51.69300" N

**Longitude:** 91° 33' 19.11717" W

**Ellipsoid Height:** -9.773 Meters

1\_GS00008



**Point ID:** 1\_GS00008

**Northing:** 3480113.842 Meters

**Easting:** 637294.59 Meters

**Orthometric Height:** 24.97 Meters

**Latitude:** 31° 26' 51.41121" N

**Longitude:** 91° 33' 18.45418" W

**Ellipsoid Height:** -1.43 Meters



1\_GS00009



**Point ID:** 1\_GS00009

**Northing:** 3486478.4 Meters

**Easting:** 640058.895 Meters

**Orthometric Height:** 26.32 Meters

**Latitude:** 31° 30' 16.87795" N

**Longitude:** 91° 31' 30.51414" W

**Ellipsoid Height:** 0.006 Meters

1\_GS00010



**Point ID:** 1\_GS00010

**Northing:** 3499312.685 Meters

**Easting:** 636204.663 Meters

**Orthometric Height:** 16.899 Meters

**Latitude:** 31° 37' 15.27473" N

**Longitude:** 91° 33' 50.20185" W

**Ellipsoid Height:** -9.27 Meters



1\_GS00013



**Point ID:** 1\_GS00013

**Northing:** 3465227.496 Meters

**Easting:** 631644.674 Meters

**Orthometric Height:** 13.612 Meters

**Latitude:** 31° 18' 50.38381" N

**Longitude:** 91° 36' 59.54358" W

**Ellipsoid Height:** -13.037 Meters

1\_GS00017



**Point ID:** 1\_GS00017

**Northing:** 3472614.767 Meters

**Easting:** 634003.396 Meters

**Orthometric Height:** 15.221 Meters

**Latitude:** 31° 22' 49.29335" N

**Longitude:** 91° 35' 26.75397" W

**Ellipsoid Height:** -11.298 Meters



1\_GS00018



**Point ID:** 1\_GS00018

**Northing:** 3510671.327 Meters

**Easting:** 605560.123 Meters

**Orthometric Height:** 21.367 Meters

**Latitude:** 31° 43' 35.74390" N

**Longitude:** 91° 53' 08.73222" W

**Ellipsoid Height:** -4.486 Meters

1\_GS00020



**Point ID:** 1\_GS00020

**Northing:** 3465211.885 Meters

**Easting:** 631643.82 Meters

**Orthometric Height:** 13.854 Meters

**Latitude:** 31° 18' 49.87726" N

**Longitude:** 91° 36' 59.58329" W

**Ellipsoid Height:** -12.795 Meters



1\_GS00021



**Point ID:** 1\_GS00021

**Northing:** 3504770.325 Meters

**Easting:** 595515.297 Meters

**Orthometric Height:** 17.657 Meters

**Latitude:** 31° 40' 27.28639" N

**Longitude:** 91° 59' 32.45322" W

**Ellipsoid Height:** -8.161 Meters

1\_GS00022



**Point ID:** 1\_GS00022

**Northing:** 3514627.253 Meters

**Easting:** 609481.409 Meters

**Orthometric Height:** 31.193 Meters

**Latitude:** 31° 45' 42.87892" N

**Longitude:** 91° 50' 38.15364" W

**Ellipsoid Height:** 5.321 Meters



1\_GS00024



**Point ID:** 1\_GS00024

**Northing:** 3510662.067 Meters

**Easting:** 605549.053 Meters

**Orthometric Height:** 21.622 Meters

**Latitude:** 31° 43' 35.44686" N

**Longitude:** 91° 53' 09.15642" W

**Ellipsoid Height:** -4.231 Meters



1\_GS00026



**Point ID:** 1\_GS00026

**Northing:** 3498682.782 Meters

**Easting:** 614720.819 Meters

**Orthometric Height:** 17.413 Meters

**Latitude:** 31° 37' 03.26607" N

**Longitude:** 91° 47' 25.74004" W

**Ellipsoid Height:** -8.613 Meters

1\_GS00030



**Point ID:** 1\_GS00030

**Northing:** 3494219.386 Meters

**Easting:** 599165.202 Meters

**Orthometric Height:** 17.128 Meters

**Latitude:** 31° 34' 43.52891" N

**Longitude:** 91° 57' 17.68649" W

**Ellipsoid Height:** -8.846 Meters



1\_GS00031



**Point ID:** 1\_GS00031

**Northing:** 3509339.302 Meters

**Easting:** 599544.233 Meters

**Orthometric Height:** 26.57 Meters

**Latitude:** 31° 42' 54.42831" N

**Longitude:** 91° 56' 57.78929" W

**Ellipsoid Height:** 0.759 Meters



1\_GS00033



**Point ID:** 1\_GS00033

**Northing:** 3497279.117 Meters

**Easting:** 607809.779 Meters

**Orthometric Height:** 17.238 Meters

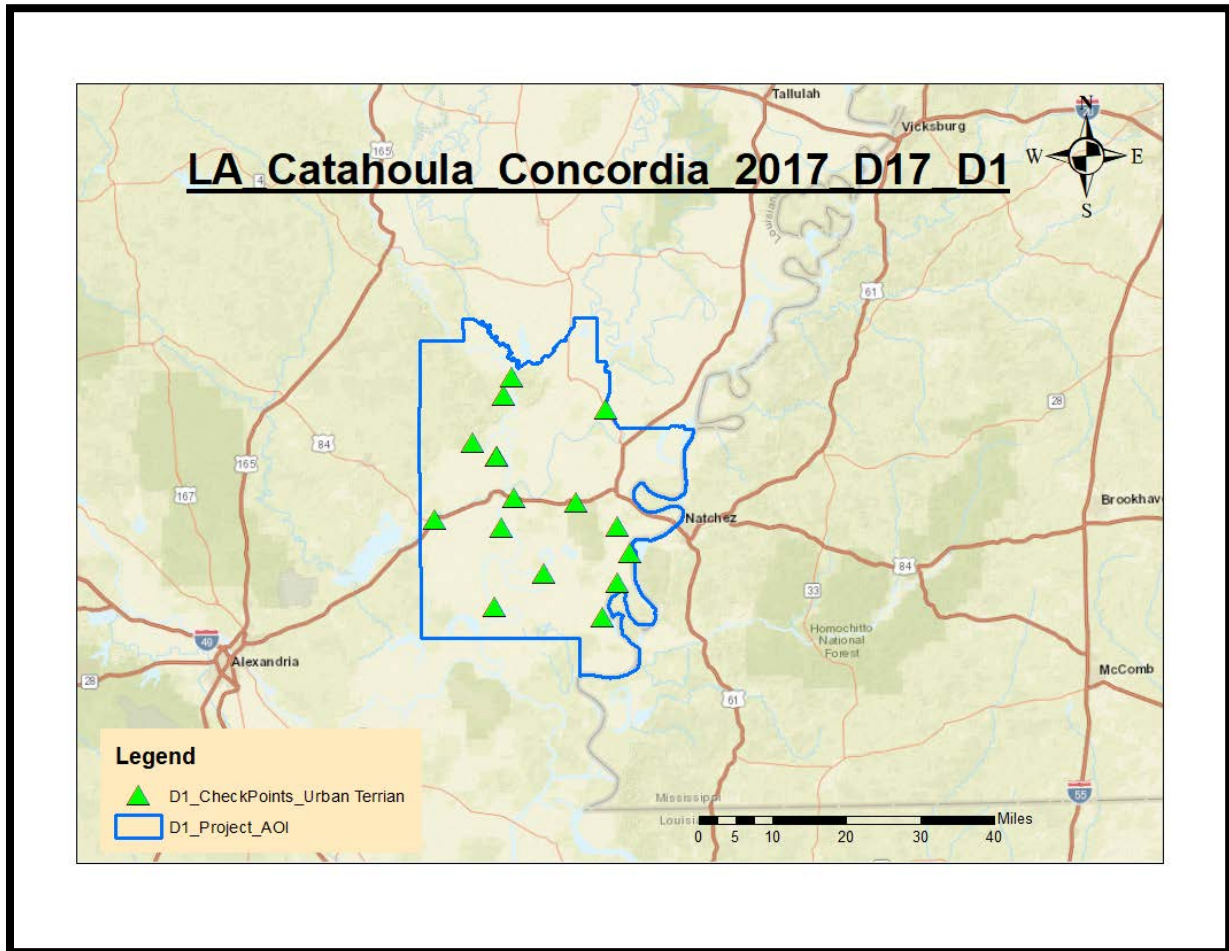
**Latitude:** 31° 36' 20.09259" N

**Longitude:** 91° 51' 48.55898" W

**Ellipsoid Height:** -8.756 Meters

## Non-Vegetated Vertical Accuracy Checkpoints Urban Terrain

The Map shows the overall distribution of the Non-Vegetated Vertical Accuracy Checkpoint, Urban Terrain throughout the AOI. The following tables contain a list of the control using Easting, Northing, and Orthometric height. The coordinate system displayed is Universal Transverse Mercator UTM Zone 15, North American Datum 1983 (2011), North American Vertical Datum of 1988, Geoid 12B and using Meters for measurement.



**TABLE: Urban Terrain**

<b>Point ID</b>	<b>Easting</b>	<b>Northing</b>	<b>Ortho</b>
<b>1_GS00001</b>	621026.397	3482034.442	16.477
<b>1_GS00003</b>	640044.118	3486471.016	24.642
<b>1_GS00005</b>	634583.74	3518053.574	19.976
<b>1_GS00006</b>	637276.974	3480122.289	23.188
<b>1_GS00011</b>	628251.504	3497692.465	17.44
<b>1_GS00012</b>	612385.7	3520862.09	17.643
<b>1_GS00014</b>	610731.181	3507640.082	18.559
<b>1_GS00015</b>	637259.042	3492277.689	16.714
<b>1_GS00016</b>	614186.442	3525062.401	16.698
<b>1_GS00019</b>	633982.296	3472618.091	15.921
<b>1_GS00023</b>	597248.794	3493929.788	16.344
<b>1_GS00025</b>	605521.26	3510657.335	22.29
<b>1_GS00027</b>	610750.224	3507630.915	19.458
<b>1_GS00028</b>	614729.876	3498650.112	17.365
<b>1_GS00029</b>	611970.997	3492011.484	17.59
<b>1_GS00032</b>	610316.289	3474847.048	18.77



1\_GS00001



**Point ID:** 1\_GS00001

**Northing:** 3482034.442 Meters

**Easting:** 621026.397 Meters

**Orthometric Height:** 16.477 Meters

**Latitude:** 31° 28' 00.31920" N

**Longitude:** 91° 43' 33.80872" W

**Ellipsoid Height:** -9.824 Meters

1\_GS00003



**Point ID:** 1\_GS00003

**Northing:** 3486471.016 Meters

**Easting:** 640044.118 Meters

**Orthometric Height:** 24.642 Meters

**Latitude:** 31° 30' 16.64465" N

**Longitude:** 91° 31' 31.07793" W

**Ellipsoid Height:** -1.672 Meters

1\_GS00005



**Point ID:** 1\_GS00005

**Northing:** 3518053.574 Meters

**Easting:** 634583.74 Meters

**Orthometric Height:** 19.976 Meters

**Latitude:** 31° 16' 02.84562" N

**Longitude:** 91° 39' 24.60748" W

**Ellipsoid Height:** -6.138 Meters



1\_GS00006



**Point ID:** 1\_GS00006

**Northing:** 3480122.289 Meters

**Easting:** 637276.974 Meters

**Orthometric Height:** 23.188 Meters

**Latitude:** 31° 47' 24.47945" N

**Longitude:** 91° 34' 42.43475" W

**Ellipsoid Height:** -3.212 Meters

1\_GS00011



**Point ID:** 1\_GS00011

**Northing:** 3497692.465 Meters

**Easting:** 628251.504 Meters

**Orthometric Height:** 17.44 Meters

**Latitude:** 31° 36' 25.95911" N

**Longitude:** 91° 38' 52.75955" W

**Ellipsoid Height:** -8.69 Meters

1\_GS00012



**Point ID:** 1\_GS00012

**Northing:** 3520862.09 Meters

**Easting:** 612385.7 Meters

**Orthometric Height:** 17.643 Meters

**Latitude:** 31° 49' 04.32524" N

**Longitude:** 91° 48' 45.18180" W

**Ellipsoid Height:** -8.255 Meters



1\_GS00014



**Point ID:** 1\_GS00014

**Northing:** 3507640.082 Meters

**Easting:** 610731.181 Meters

**Orthometric Height:** 18.559 Meters

**Latitude:** 31° 41' 55.55008" N

**Longitude:** 91° 49' 53.50169" W

**Ellipsoid Height:** -7.363 Meters

1\_GS00015



**Point ID:** 1\_GS00015

**Northing:** 3492277.689 Meters

**Easting:** 637259.042 Meters

**Orthometric Height:** 16.714 Meters

**Latitude:** 31° 33' 26.39500" N

**Longitude:** 91° 33' 13.72281" W

**Ellipsoid Height:** -9.52 Meters



1\_GS00016



**Point ID:** 1\_GS00016

**Northing:** 3525062.401 Meters

**Easting:** 614186.442 Meters

**Orthometric Height:** 16.698 Meters

**Latitude:** 31° 51' 20.07419" N

**Longitude:** 91° 47' 34.92453" W

**Ellipsoid Height:** -9.231 Meters



1\_GS00019



**Point ID:** 1\_GS00019

**Northing:** 3472618.091 Meters

**Easting:** 633982.296 Meters

**Orthometric Height:** 15.921 Meters

**Latitude:** 31° 22' 49.41006" N

**Longitude:** 91° 35' 27.55098" W

**Ellipsoid Height:** -10.598 Meters

1\_GS00023



**Point ID:** 1\_GS00023

**Northing:** 3493929.788 Meters

**Easting:** 597248.794 Meters

**Orthometric Height:** 16.344 Meters

**Latitude:** 31° 34' 34.71287" N

**Longitude:** 91° 58' 30.48765" W

**Ellipsoid Height:** -9.621 Meters

1\_GS00025



**Point ID:** 1\_GS00025

**Northing:** 3510657.335 Meters

**Easting:** 605521.26 Meters

**Orthometric Height:** 22.29 Meters

**Latitude:** 31° 43' 35.30244" N

**Longitude:** 91° 53' 10.21422" W

**Ellipsoid Height:** -3.563 Meters



1\_GS00027



**Point ID:** 1\_GS00027

**Northing:** 3507630.915 Meters

**Easting:** 610750.224 Meters

**Orthometric Height:** 19.458 Meters

**Latitude:** 31° 41' 55.24574" N

**Longitude:** 91° 49' 52.78215" W

**Ellipsoid Height:** -6.465 Meters

1\_GS00028



**Point ID:** 1\_GS00028

**Northing:** 3498650.112 Meters

**Easting:** 614729.876 Meters

**Orthometric Height:** 17.365 Meters

**Latitude:** 31° 37' 02.20192" N

**Longitude:** 91° 47' 25.41009" W

**Ellipsoid Height:** -8.662 Meters

1\_GS00029



**Point ID:** 1\_GS00029

**Northing:** 3492011.484 Meters

**Easting:** 611970.997 Meters

**Orthometric Height:** 17.59 Meters

**Latitude:** 31° 33' 27.60073" N

**Longitude:** 91° 49' 12.82211" W

**Ellipsoid Height:** -8.502 Meters



1\_GS00032



**Point ID:** 1\_GS00032

**Northing:** 3474847.048 Meters

**Easting:** 610316.289 Meters

**Orthometric Height:** 18.77 Meters

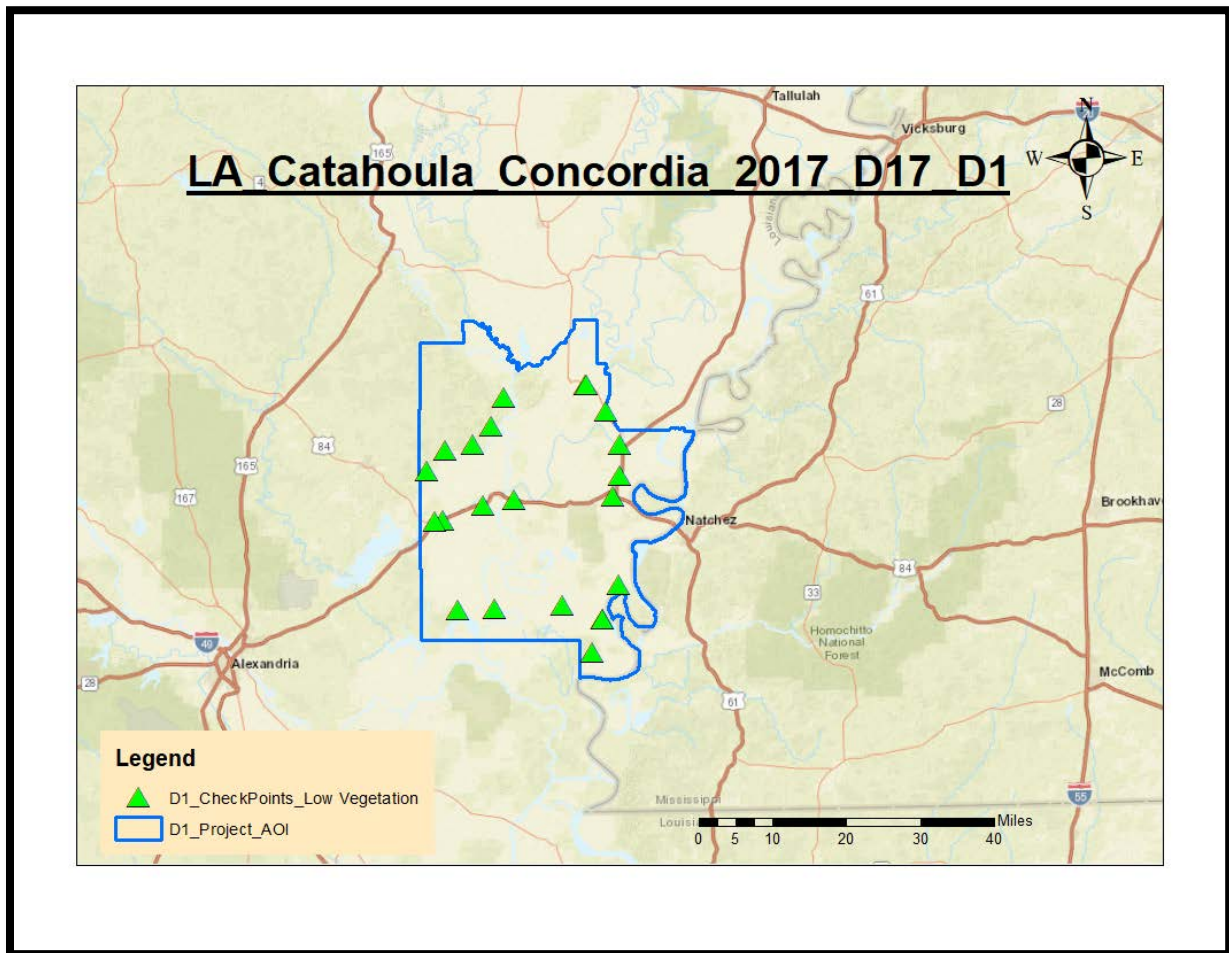
**Latitude:** 31° 24' 10.76937" N

**Longitude:** 91° 50' 22.46154" W

**Ellipsoid Height:** -7.609 Meters

## Vegetated Vertical Accuracy Checkpoints Low Vegetation

The Map shows the overall distribution of the Vegetated Vertical Accuracy Checkpoint, Low Vegetation throughout the AOI. The following tables contain a list of the control using Easting, Northing, and Orthometric height. The coordinate system displayed is Universal Transverse Mercator UTM Zone 15, North American Datum 1983 (2011), North American Vertical Datum of 1988, Geoid 12B and using Meters for measurement.



**TABLE: Low Vegetation**

<b>Point ID</b>	<b>Easting</b>	<b>Northing</b>	<b>Ortho</b>
<b>1_GS00034</b>	625087.364	3475479.348	14.234
<b>1_GS00035</b>	630290.688	3523686.524	16.926
<b>1_GS00036</b>	637332.888	3480088.59	16.645
<b>1_GS00038</b>	612413.586	3520881.676	17.325
<b>1_GS00039</b>	634598.564	3518082.613	19.697
<b>1_GS00041</b>	636141.286	3499317.507	16.35
<b>1_GS00042</b>	630351.669	3523643.326	16.418
<b>1_GS00046</b>	602186.752	3474507.917	15.38
<b>1_GS00047</b>	595471.404	3504876.033	17.726
<b>1_GS00048</b>	633938.842	3472612.297	14.454
<b>1_GS00049</b>	637798.94	3503926.008	17.726
<b>1_GS00050</b>	634046.707	3472600.958	14.954
<b>1_GS00051</b>	609463.448	3514608.815	30.93
<b>1_GS00052</b>	631660.016	3465199.583	13.612
<b>1_GS00053</b>	637666.765	3510772.162	18.24
<b>1_GS00054</b>	599131.332	3494216.271	16.261
<b>1_GS00056</b>	597238.251	3493955.861	16.314
<b>1_GS00057</b>	605534.822	3510655.156	21.832
<b>1_GS00059</b>	614705.957	3498689.658	17.396
<b>1_GS00061</b>	610328.717	3474859.983	16.028
<b>1_GS00062</b>	599491.493	3509318.178	24.44
<b>1_GS00067</b>	607831.64	3497462.762	17.207



1\_GS00034



**Point ID:** 1\_GS00034

**Northing:** 3475479.348 Meters

**Easting:** 625087.364 Meters

**Orthometric Height:** 14.234 Meters

**Latitude:** 31° 24' 25.90043" N

**Longitude:** 91° 41' 02.93106" W

**Ellipsoid Height:** -12.199 Meters

1\_GS00035



**Point ID:** 1\_GS00035

**Northing:** 3523686.524 Meters

**Easting:** 630290.688 Meters

**Orthometric Height:** 16.926 Meters

**Latitude:** 31° 50' 29.17498" N

**Longitude:** 91° 37' 22.92410" W

**Ellipsoid Height:** -9.173 Meters



1\_GS00036



**Point ID:** 1\_GS00036

**Northing:** 3480088.59 Meters

**Easting:** 637332.888 Meters

**Orthometric Height:** 16.645 Meters

**Latitude:** 31° 26' 50.57489" N

**Longitude:** 91° 33' 17.01618" W

**Ellipsoid Height:** -9.755 Meters



1\_GS00038



**Point ID:** 1\_GS00038

**Northing:** 3520881.676 Meters

**Easting:** 612413.586 Meters

**Orthometric Height:** 17.325 Meters

**Latitude:** 31° 49' 04.95135" N

**Longitude:** 91° 48' 44.11313" W

**Ellipsoid Height:** -8.574 Meters

1\_GS00039



**Point ID:** 1\_GS00039

**Northing:** 3518082.613 Meters

**Easting:** 634598.564 Meters

**Orthometric Height:** 19.697 Meters

**Latitude:** 31° 47' 25.41605" N

**Longitude:** 91° 34' 41.85677" W

**Ellipsoid Height:** -6.417 Meters



1\_GS00041



**Point ID:** 1\_GS00041

**Northing:** 3499317.507 Meters

**Easting:** 636141.286 Meters

**Orthometric Height:** 16.35 Meters

**Latitude:** 31° 37' 15.45833" N

**Longitude:** 91° 33' 52.60433" W

**Ellipsoid Height:** -9.818 Meters



1\_GS00042



**Point ID:** 1\_GS00042

**Northing:** 3523643.326 Meters

**Easting:** 630351.669 Meters

**Orthometric Height:** 16.418 Meters

**Latitude:** 31° 50' 27.74724" N

**Longitude:** 91° 37' 20.62542" W

**Ellipsoid Height:** -9.68 Meters

1\_GS00046



**Point ID:** 1\_GS00046

**Northing:** 3474507.917 Meters

**Easting:** 602186.752 Meters

**Orthometric Height:** 15.38 Meters

**Latitude:** 31° 24' 02.43964" N

**Longitude:** 91° 55' 30.39448" W

**Ellipsoid Height:** -10.961 Meters



1\_GS00047



**Point ID:** 1\_GS00047

**Northing:** 3504876.033 Meters

**Easting:** 595471.404 Meters

**Orthometric Height:** 17.726 Meters

**Latitude:** 31° 40' 30.73244" N

**Longitude:** 91° 59' 34.08295" W

**Ellipsoid Height:** -8.091 Meters



1\_GS00048



**Point ID:** 1\_GS00048

**Northing:** 3472612.297 Meters

**Easting:** 633938.842 Meters

**Orthometric Height:** 14.454 Meters

**Latitude:** 31° 22' 49.23998" N

**Longitude:** 91° 35' 29.19848" W

**Ellipsoid Height:** -12.065 Meters

1\_GS00049



**Point ID:** 1\_GS00049

**Northing:** 3503926.008 Meters

**Easting:** 637798.94 Meters

**Orthometric Height:** 17.726 Meters

**Latitude:** 31° 39' 44.38437" N

**Longitude:** 91° 32' 47.37558" W

**Ellipsoid Height:** -8.43 Meters



1\_GS00050



**Point ID:** 1\_GS00050

**Northing:** 3472600.958 Meters

**Easting:** 634046.707 Meters

**Orthometric Height:** 14.954 Meters

**Latitude:** 31° 22' 48.82692" N

**Longitude:** 91° 35' 25.12136" W

**Ellipsoid Height:** -8.43 Meters



1\_GS00051



**Point ID:** 1\_GS00051

**Northing:** 3514608.815 Meters

**Easting:** 609463.448 Meters

**Orthometric Height:** 30.93 Meters

**Latitude:** 31° 45' 42.28638" N

**Longitude:** 91° 50' 38.84374" W

**Ellipsoid Height:** 5.058 Meters

1\_GS00052



**Point ID:** 1\_GS00052

**Northing:** 3465199.583 Meters

**Easting:** 631660.016 Meters

**Orthometric Height:** 13.612 Meters

**Latitude:** 31° 18' 49.47116" N

**Longitude:** 91° 36' 58.97656" W

**Ellipsoid Height:** -9.847 Meters



1\_GS00053



**Point ID:** 1\_GS00053

**Northing:** 3510772.162 Meters

**Easting:** 637666.765 Meters

**Orthometric Height:** 18.24 Meters

**Latitude:** 31° 43' 26.73356" N

**Longitude:** 91° 32' 48.92968" W

**Ellipsoid Height:** -7.9 Meters



1\_GS00054



**Point ID:** 1\_GS00054

**Northing:** 3494216.271 Meters

**Easting:** 599131.332 Meters

**Orthometric Height:** 16.261 Meters

**Latitude:** 31° 34' 43.43827" N

**Longitude:** 91° 57' 18.97245" W

**Ellipsoid Height:** -9.713 Meters

1\_GS00056



**Point ID:** 1\_GS00056

**Northing:** 3493955.861 Meters

**Easting:** 597238.251 Meters

**Orthometric Height:** 16.314 Meters

**Latitude:** 31° 34' 35.56283" N

**Longitude:** 91° 58' 30.87831" W

**Ellipsoid Height:** -9.651 Meters



1\_GS00057



**Point ID:** 1\_GS00057

**Northing:** 3510655.156 Meters

**Easting:** 605534.822 Meters

**Orthometric Height:** 21.832 Meters

**Latitude:** 31° 43' 35.22718" N

**Longitude:** 91° 53' 09.69978" W

**Ellipsoid Height:** -4.021 Meters



1\_GS00059



**Point ID:** 1\_GS00059

**Northing:** 3498689.658 Meters

**Easting:** 614705.957 Meters

**Orthometric Height:** 17.396 Meters

**Latitude:** 31° 37' 15.45833" N

**Longitude:** 91° 33' 52.60433" W

**Ellipsoid Height:** -8.63 Meters

1\_GS00061



**Point ID:** 1\_GS00061

**Northing:** 3474859.983 Meters

**Easting:** 610328.717 Meters

**Orthometric Height:** 16.028 Meters

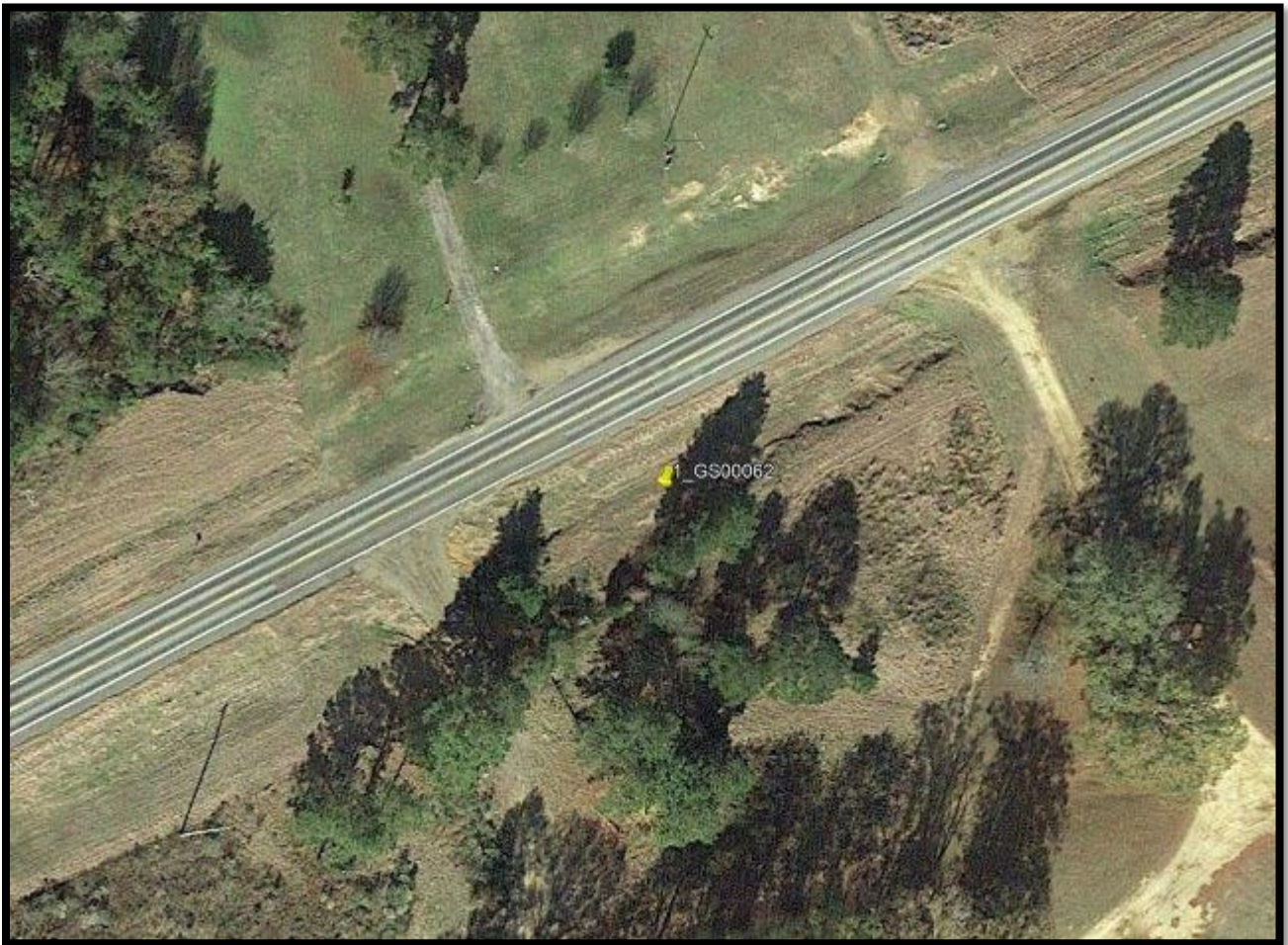
**Latitude:** 31° 24' 11.18519" N

**Longitude:** 91° 50' 21.98585" W

**Ellipsoid Height:** -10.351 Meters



1\_GS00062



**Point ID:** 1\_GS00062  
**Northing:** 3509318.178 Meters  
**Easting:** 599491.493 Meters  
**Orthometric Height:** 24.44 Meters  
**Latitude:** 31° 42' 53.75880" N  
**Longitude:** 91° 56' 59.80060" W  
**Ellipsoid Height:** -1.371 Meters



1\_GS00067



**Point ID:** 1\_GS00067

**Northing:** 3497462.762 Meters

**Easting:** 607831.64 Meters

**Orthometric Height:** 17.207 Meters

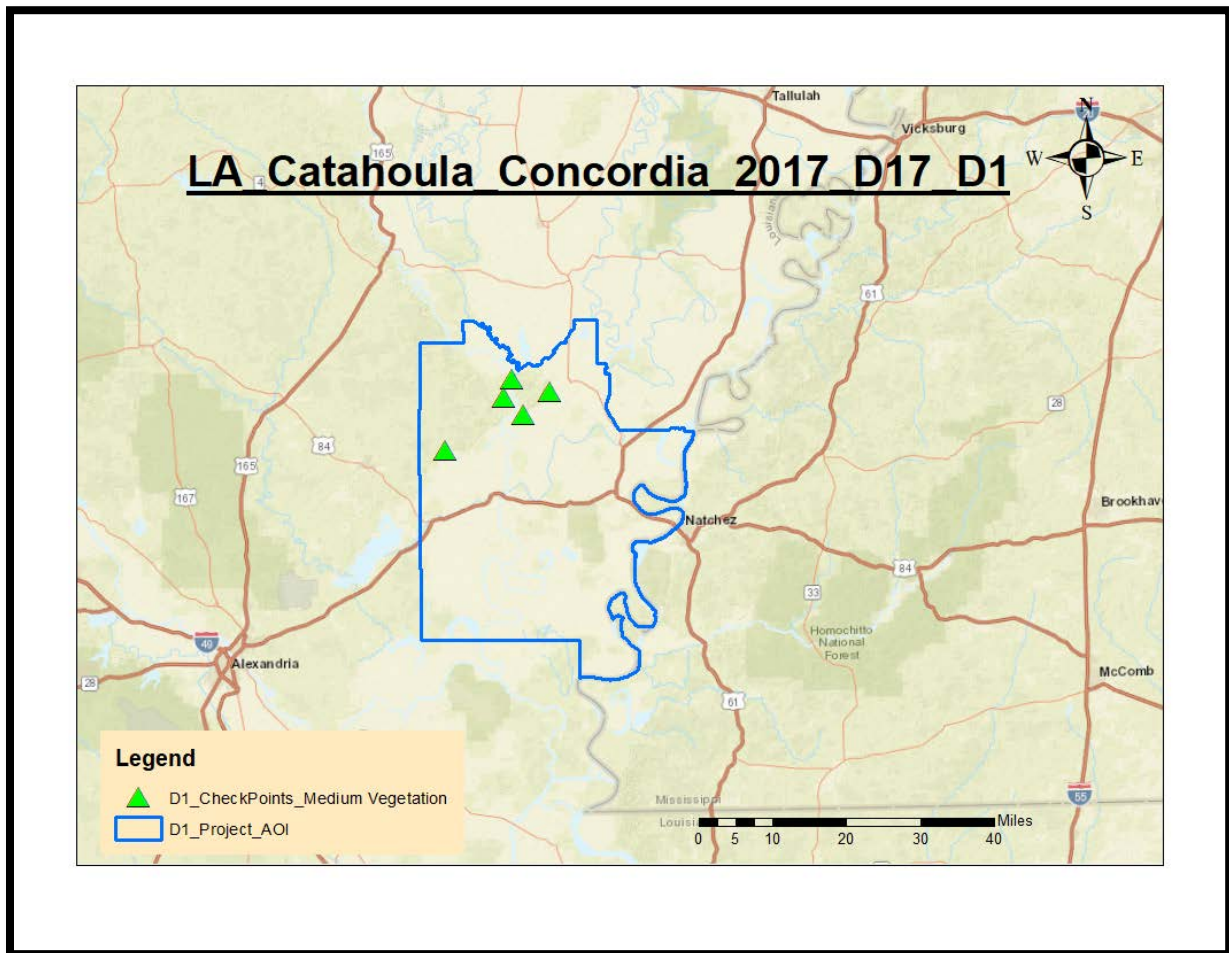
**Latitude:** 31° 36' 26.04891" N

**Longitude:** 91° 51' 47.65701" W

**Ellipsoid Height:** -8.784 Meters

## Vegetated Vertical Accuracy Checkpoints Medium Vegetation

The Map shows the overall distribution of the Vegetated Vertical Accuracy Checkpoint, Medium Vegetation throughout the AOI. The following tables contain a list of the control using Easting, Northing, and Orthometric height. The coordinate system displayed is Universal Transverse Mercator UTM Zone 15, North American Datum 1983 (2011), North American Vertical Datum of 1988, Geoid 12B and using Meters for measurement.



**TABLE: Medium Vegetation**

<b>Point ID</b>	<b>Easting</b>	<b>Northing</b>	<b>Ortho</b>
<b>1_GS00040</b>	614204.979	3525050.739	16.794
<b>1_GS00043</b>	616580.136	3517120.444	17.457
<b>1_GS00044</b>	612441.09	3520852.796	17.083
<b>1_GS00045</b>	622319.127	3522342.106	20.891
<b>1_GS00066</b>	599527.808	3509328.39	25.938



1\_GS00040



**Point ID:** 1\_GS00040

**Northing:** 3525050.739 Meters

**Easting:** 614204.979 Meters

**Orthometric Height:** 16.794 Meters

**Latitude:** 31° 51' 19.68880" N

**Longitude:** 91° 47' 34.22420" W

**Ellipsoid Height:** -9.136 Meters

1\_GS00043



**Point ID:** 1\_GS00043

**Northing:** 3517120.444 Meters

**Easting:** 616580.136 Meters

**Orthometric Height:** 17.457 Meters

**Latitude:** 31° 47' 01.31022" N

**Longitude:** 91° 46' 07.28051" W

**Ellipsoid Height:** -8.488 Meters



1\_GS00044



**Point ID:** 1\_GS00044

**Northing:** 3520852.796 Meters

**Easting:** 612441.09 Meters

**Orthometric Height:** 17.083 Meters

**Latitude:** 31° 49' 04.00379" N

**Longitude:** 91° 48' 43.07915" W

**Ellipsoid Height:** -8.816 Meters



1\_GS00045



**Point ID:** 1\_GS00045

**Northing:** 3522342.106 Meters

**Easting:** 622319.127 Meters

**Orthometric Height:** 20.891 Meters

**Latitude:** 31° 49' 48.70237" N

**Longitude:** 91° 42' 26.75287" W

**Ellipsoid Height:** -5.125 Meters

1\_GS00066



**Point ID:** 1\_GS00066

**Northing:** 3509328.39 Meters

**Easting:** 599527.808 Meters

**Orthometric Height:** 25.938 Meters

**Latitude:** 31° 42' 54.07909" N

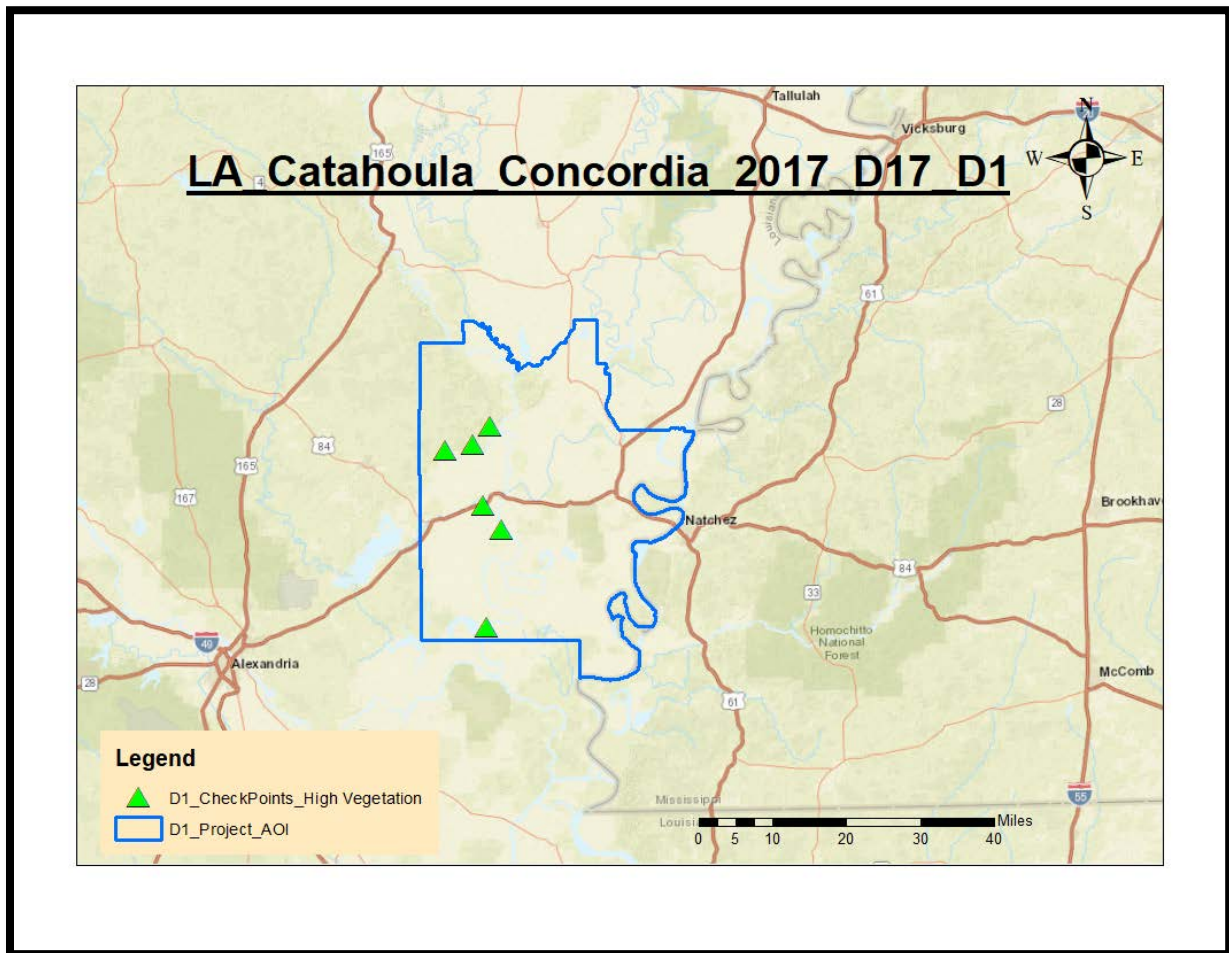
**Longitude:** 91° 56' 58.41724" W

**Ellipsoid Height:** 0.127 Meters



## Vegetated Vertical Accuracy Checkpoints High Vegetation

The Map shows the overall distribution of the Vegetated Vertical Accuracy Checkpoint, High Vegetation throughout the AOI. The following tables contain a list of the control using Easting, Northing, and Orthometric height. The coordinate system displayed is Universal Transverse Mercator UTM Zone 15, North American Datum 1983 (2011), North American Vertical Datum of 1988, Geoid 12B and using Meters for measurement.





**TABLE: High Vegetation**

<b>Point ID</b>	<b>Easting</b>	<b>Northing</b>	<b>Ortho</b>
<b>1_GS00037</b>	636119.478	3499320.122	16.251
<b>1_GS00055</b>	609457.283	3514631.928	30.71
<b>1_GS00058</b>	611953.852	3491993.991	17.282
<b>1_GS00060</b>	599505.497	3509314.153	26.194
<b>1_GS00063</b>	605537.709	3510638.599	21.644
<b>1_GS00064</b>	607805.834	3497318.133	17.138
<b>1_GS00065</b>	608489.192	3470783.796	18.285

1\_GS00037



**Point ID:** 1\_GS00037

**Northing:** 3499320.122 Meters

**Easting:** 636119.478 Meters

**Orthometric Height:** 16.251 Meters

**Latitude:** 31° 37' 15.55256" N

**Longitude:** 91° 33' 53.43054" W

**Ellipsoid Height:** -9.917 Meters

1\_GS00055



**Point ID:** 1\_GS00055

**Northing:** 3514631.928 Meters

**Easting:** 609457.283 Meters

**Orthometric Height:** 30.71 Meters

**Latitude:** 31° 45' 43.03906" N

**Longitude:** 91° 50' 39.06875" W

**Ellipsoid Height:** -4.209 Meters



1\_GS00058



**Point ID:** 1\_GS00058

**Northing:** 3491993.991 Meters

**Easting:** 611953.852 Meters

**Orthometric Height:** 17.282 Meters

**Latitude:** 31° 33' 27.03868" N

**Longitude:** 91° 49' 13.47947" W

**Ellipsoid Height:** -8.809 Meters

1\_GS00060



**Point ID:** 1\_GS00060

**Northing:** 3509314.153 Meters

**Easting:** 599505.497 Meters

**Orthometric Height:** 26.194 Meters

**Latitude:** 31° 42' 53.62371" N

**Longitude:** 91° 56' 59.27008" W

**Ellipsoid Height:** 0.383 Meters



1\_GS00063



**Point ID:** 1\_GS00063

**Northing:** 3510638.599 Meters

**Easting:** 605537.709 Meters

**Orthometric Height:** 21.644 Meters

**Latitude:** 31° 43' 34.68854" N

**Longitude:** 91° 53' 09.59653" W

**Ellipsoid Height:** -4.209 Meters



1\_GS00064



**Point ID:** 1\_GS00064

**Northing:** 3497318.133 Meters

**Easting:** 607805.834 Meters

**Orthometric Height:** 17.138 Meters

**Latitude:** 31° 36' 21.36093" N

**Longitude:** 91° 51' 48.69327" W

**Ellipsoid Height:** -8.855 Meters

1\_GS00065



**Point ID:** 1\_GS00065

**Northing:** 3470783.796 Meters

**Easting:** 608489.192 Meters

**Orthometric Height:** 18.285 Meters

**Latitude:** 31° 21' 59.43550" N

**Longitude:** 91° 51' 33.23504" W

**Ellipsoid Height:** -8.168 Meters