

# Lidar Mapping Report

## Acquisition, Processing, and Delivery of Airborne Lidar Elevation Data for the TX\_WestTexas\_2018\_D19 Project

**USGS CONTRACT:** G16PC00029

**CONTRACTOR:** Merrick-Surdex JV

**TASK ORDER NUMBER:**  
140G0219F0011

**TASK NAME:** TX\_WestTexas\_2018\_D19

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## Glossary of Terms

Term	Description
AGL	Above Ground Level
AGPS	Airborne Global Positioning System
ANPD	Aggregate Nominal Pulse Density
ANPS	Aggregate Nominal Pulse Spacing
ASPRS	American Society of Photogrammetry and Remote Sensing
AT	Aerial Triangulation
CD	Compact Disk
CMS	Certified Mapping Scientist
CORS	Continuous Operating Reference Station
CP	Certified Photogrammetrist
CVA	Consolidated Vertical Accuracy
DACS™	Digital Airborne Camera System
DEM	Digital Elevation Model
DFIRM	Digital Flood Insurance Rate Maps
DSM	Digital Surface Model
DTM	Digital Terrain Model
DVD	Digital Versatile Disk / Digital Video Disk
DXF	Data Exchange Format / Drawing Interchange
FIRM	Flood Insurance Rate Maps
FEMA	Federal Emergency Management
FGDC	Federal Geographic Data Committee
FVA	Fundamental Vertical Accuracy
FY	Fiscal Year
GIS	Geographic Information System
GISP	Geographic Information System Professional
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GSD	Ground Sample Distance
HARN	High Accuracy Reference Network
HDD	Hard Drive Disk
HPGN	High Precision Geodetic Network
IMU	Inertial Measurement Unit
INS	Inertial Navigation System
LAS	(or .las) – industry accepted LIDAR data exchange file format
LB	License Business
LS	Land Surveyor
LIDAR	(or Lidar) Light Detection And Ranging
MARS®	Merrick Advanced Remote Sensing
Merrick	Merrick & Company
MSL	Mean Sea Level
NAD	North American Datum
NDEP	National Digital Elevation Program
NGP	National Geospatial Program
NGS	National Geodetic Survey
NMAS	National Map Accuracy Standards
No.	Number
NPS	Nominal Point Spacing

NSRS	National Spatial Reference System
NSSDA	National Standard for Spatial Data
NVA	Non-vegetated Vertical Accuracy
OPUS	Online Positioning User Service
PDOP	Positional Dilution Of Precision
PLS	Professional Land Surveyor
PLSS	Public Land Survey System
ppsm	Points (or pulses) per square meter
PSM	Professional Surveyor and Mapper
QL1	Quality Level One
QL2	Quality Level Two
RLS	Registered Land Surveyor
RGB	Red, Green, Blue (i.e., three-band image)
RGBNIR	Red, Green, Blue, Near Infra-Red (i.e., four-band image)
RMSE	Root Mean Square Error
SBET	Smoothed Best Estimated Trajectory
SHA	Secured Hash Standard
SPCS	State Plane Coordinate System
SVA	Supplemental Vertical Accuracy
TIN	Triangular Irregular Network
USGS	United State Geological Survey
VVA	Vegetated Vertical Accuracy
XML	eXtensible Markup Language



## Project Summary

The USGS awarded Merrick-Surdex Joint Venture, LLP (Merrick-Surdex JV) the TX\_WestTexas\_2018\_D19 (USGS Task Order Number 140G0219F0011) project to support the Federal Emergency Management (FEMA) Risk Mapping, Assessment, and Planning (MAP) program, the National Resources Conservation Service (NRCS) high resolution elevation enterprise program, and the 3DEP mission with high resolution digital elevation data. The area of interest (AOI) covers approximately 32,494 square miles in the state of Texas, including the full and partial counties of: Culberson, Jeff Davis, Reeves, Presidio, Brewster, Pecos, Terrell, Val Verde, Crockett, Crane, Ward, Maverick, Dimmit, Kinney, Webb, Zapata, and Jim Hogg. Portions of the AOI are along the U.S. and Mexico border. Lidar was acquired up to the border, but not extended across the border into Mexico.

The lidar mapping requirements and deliverables meet Quality Level Two (QL2) standards for final deliverables as outlined in the USGS-NGP Lidar Base Specifications, Techniques and Methods 11–B4, Version 1.3, February 2018 (TM11-B4) (<http://pubs.usgs.gov/tm/11b4/pdf/tm11-B4.pdf>). QL2 lidar specifications suggest a pulse density of greater than or equal to eight pulses per square meter ( $\geq 2\text{ppsm}$ ) Aggregate Nominal Pulse Density (ANPD), and pulse spacing of less than or equal to thirty-five centimeters ( $\leq 0.71\text{m}$ ) Aggregate Nominal Pulse Spacing (ANPS).

The vertical accuracy requirements of the lidar data meets or exceeds the following:

### Absolute Vertical Accuracy

- $\leq 10\text{cm}$  RMSE<sub>z</sub>
- $\leq 19.6\text{cm}$  Non-vegetated Vertical Accuracy (NVA) at the 95% confidence level
- $\leq 29.4\text{cm}$  Vegetated Vertical Accuracy (VVA) at the 95% percentile

### Relative Vertical Accuracy

- $\leq 6\text{cm}$  within individual swaths (smooth surface repeatability)
- $\leq 8\text{cm}$  RMSD<sub>z</sub> within swath overlap (between adjacent swaths)

## Project Spatial Reference

- Horizontal Datum – North American Datum of 1983 (NAD 83)
- Epoch – National Adjustment of 2011 (NA2011) (epoch 2010.00)
- Geoid – GEOID 12B
- Vertical Datum – North American Vertical Datum of 1988 (NAVD 88)
- Projection – Universal Transverse Mercator (UTM), Zone 13 North (13N) / Zone 14 North (14N)
- Units – Meters

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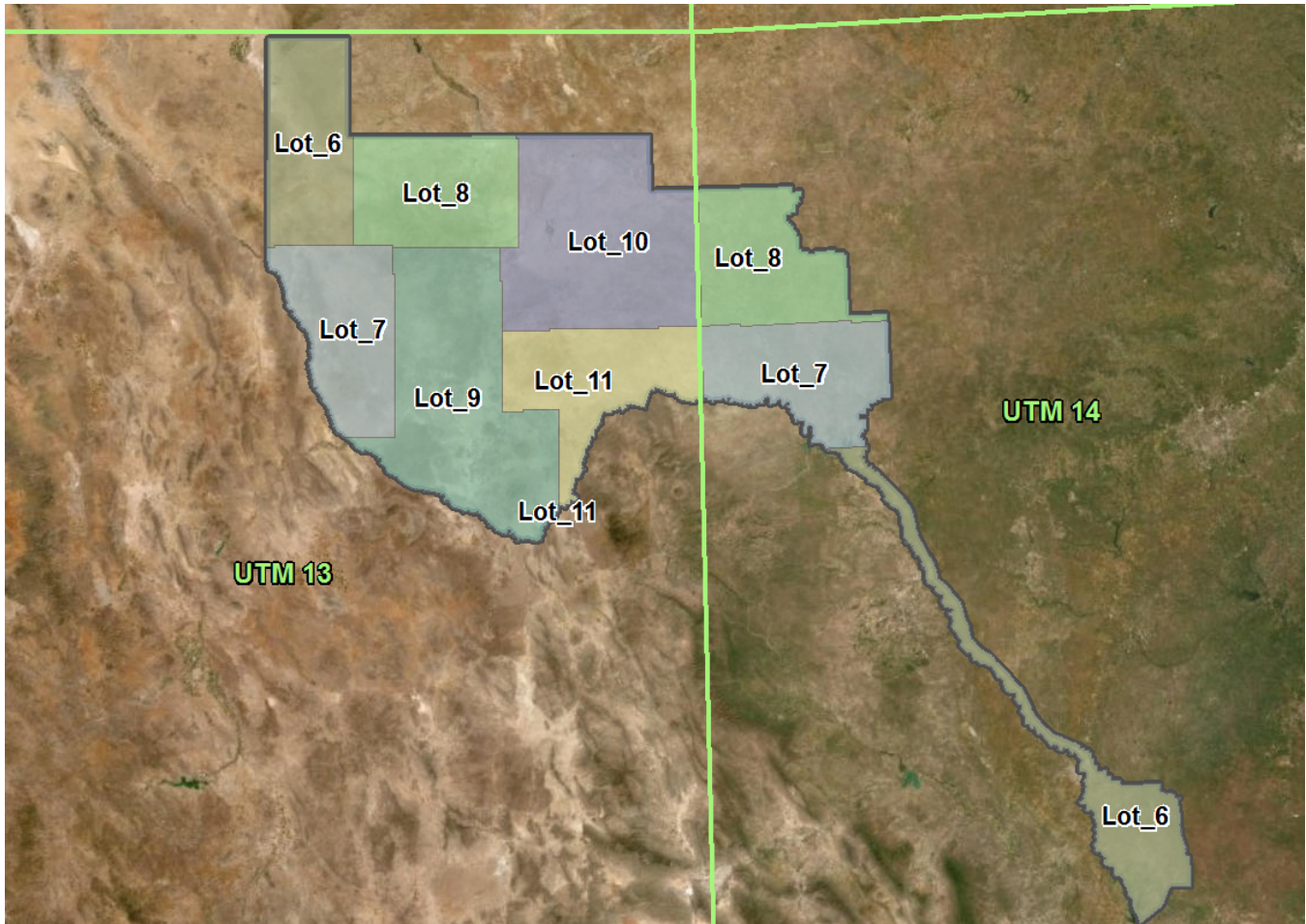
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## Project Report

The contents of this report summarize the methods used to calibrate and classify the lidar data as well as the results of these methods for the project TX\_WestTexas\_2018\_D19.

### Lidar Flight Information

The acquisition area for the TX\_WestTexas\_2018\_D19 project is delineated by the extent of the client approved Esri shapefile (*TX\_WestTexas\_AOI*). Merrick-Surdex JV acquired the QL2 lidar point cloud utilizing Optech Galaxy lidar sensors. The Galaxy is a high performance lidar sensor capable of collecting large areas efficiently. The project was flown and then processed and delivered in sections (Lots) by UTM zone; six total lots for UTM 13 and three total lots for UTM 14.



### Aerial Mission(s)

Lidar acquisition was collected using fixed wing aircrafts and Optech Galaxy lidar sensors staging from a variety of airports around the project area. Lidar data collection for the project was accomplished between February 20, 2019 and May 15, 2019. Each mission represents a lift of the aircraft and system from the ground, collects data, and lands again. Multiple lifts within a day are represented by Mission A, B, C, and D. The table below relates each mission to the date collected, the sensor and serial number used, and the actual average MSL in meters.

Mission(s)	Date	Sensor S/N	Actual Avg. MSL (m)
190220_A	February 20, 2019	5060380	4720
190301_A	March 1, 2019	5060380	4650
190302_A	March 2, 2019	5060380	4660
190305_A	March 5, 2019	5060380	4570
190306_A	March 6, 2019	5060380	4650
190306_A	March 6, 2019	5060385	2655
190306_B	March 6, 2019	5060385	2620
190307_A	March 7, 2019	5060380	4600
190307_B	March 7, 2019	5060385	2615
190308_A	March 8, 2019	5060380	4880
190308_A	March 8, 2019	5060385	2610
190310_A	March 10, 2019	5060385	2612
190315_A	March 15, 2019	5060385	2605
190317_A	March 17, 2019	5060385	2608
190317_B	March 17, 2019	5060385	2612
190317_C	March 17, 2019	5060385	2610
190317_D	March 17, 2019	5060385	2590
190318_A	March 18, 2019	5060385	2595
190319_A	March 19, 2019	5060385	2560
190323_A	March 23, 2019	5060380	4620
190324_A	March 24, 2019	5060380	4610
190324_B	March 24, 2019	5060380	4615
190324_C	March 24, 2019	5060380	4890
190326_A	March 26, 2019	5060380	4750
190328_A	March 28, 2019	5060380	4920
190329_A	March 29, 2019	5060380	4975
190331_A	March 31, 2019	5060380	4510
190331_A	March 31, 2019	5060385	2540
190401_A	April 1, 2019	5060380	4400
190401_A	April 1, 2019	5060385	2525
190401_C	April 1, 2019	5060385	2525
190401_A	April 1, 2019	5060386	4400
190401_B	April 1, 2019	5060386	4410
190402_A	April 2, 2019	5060380	4630
190402_A	April 2, 2019	5060385	2510
190402_B	April 2, 2019	5060385	2515
190402_A	April 2, 2019	5060386	4430
190402_B	April 2, 2019	5060386	4375
190403_A	April 3, 2019	5060380	4525

190403_B	April 3, 2019	5060380	4525
190403_A	April 3, 2019	5060386	4000
190403_B	April 3, 2019	5060386	4280
190404_A	April 4, 2019	5060380	4525
190404_A	April 4, 2019	5060385	2700
190404_B	April 4, 2019	5060385	2600
190404_B	April 4, 2019	5060386	4280
190404_E	April 4, 2019	5060386	4125
190405_A	April 5, 2019	5060385	2670
190406_A	April 6, 2019	5060385	2730
190406_B	April 6, 2019	5060385	2730
190407_A	April 7, 2019	5060385	2360
190408_A	April 8, 2019	5060385	2400
190411_A	April 11, 2019	5060386	4725
1904012_A	April 12, 2019	5060385	2450
1904012_B	April 12, 2019	5060385	2500
190412_A	April 12, 2019	5060386	4740
1904014_A	April 14, 2019	5060385	2530
1904014_B	April 14, 2019	5060385	2940
190414_A	April 14, 2019	5060386	4650
190414_B	April 14, 2019	5060386	4680
1904015_A	April 15, 2019	5060385	2610
190415_A	April 15, 2019	5060386	4520
190415_B	April 15, 2019	5060386	4470
1904016_C	April 16, 2019	5060385	2800
1904016_D	April 16, 2019	5060385	2810
190416_A	April 16, 2019	5060386	4475
190416_B	April 16, 2019	5060386	4370
190417_A	April 17, 2019	5060386	4420
190418_A	April 18, 2019	5060385	2900
190418_B	April 18, 2019	5060385	2930
190418_C	April 18, 2019	5060385	3100
190429_A	April 29, 2019	5060386	4100
190430_A	April 30, 2019	5060386	4700
190430_B	April 30, 2019	5060386	4640
190501_A	May 1, 2019	5060386	4700
190504_A	May 4, 2019	5060385	2170
190505_A	May 5, 2019	5060385	2800
190506_C	May 6, 2019	5060385	2230
190506_D	May 6, 2019	5060385	2220
190506_E	May 6, 2019	5060385	2200
190508_A	May 8, 2019	5060385	2190

190510_A	May 10, 2019	5060385	2155
190510_C	May 10, 2019	5060385	2170
190512_C	May 12, 2019	5060385	2450
190514_A	May 14, 2019	5060385	2860
190515_A	May 15, 2019	5060385	2855

## GNSS / IMU Data

A five-minute INS initialization is conducted on the ground, with the aircraft engines running, prior to flight, to establish fine-alignment of the INS. GPS ambiguities are resolved by flying within ten kilometers of the base stations. During the data collection, the operator recorded information on log sheets which includes weather conditions, lidar operation parameters, and flight line statistics. Near the end of the mission, GPS ambiguities were again resolved by flying within ten kilometers of the base stations to aid in post-processing. Data is sent back to the main office for preliminary processing to check overall quality of GPS / INS data and to ensure sufficient overlap between flight lines. Any problematic data may be re-flown immediately as required.

The airborne GPS data was post-processed using Applanix POSPac Mobile Mapping Suite version 8.x. A fixed-bias carrier phase solution was computed in both the forward and reverse chronological directions. Whenever practical, lidar acquisition was limited to periods when the PDOP was less than 4.0. PDOP indicates satellite geometry relating to position. Generally, PDOP's of 4.0 or less result in a good quality solution, however PDOP's between 4.0 and 5.0 can still yield good results most of the time. PDOP's over 6.0 are of questionable results and PDOP's of over 7.0 usually result in a poor solution. Usually as the number of satellites increase the PDOP decreases. Other quality control checks used for the GPS include analyzing the combined separation of the forward and reverse GPS processing from one base station and the results of the combined separation when processed from two different base stations. An analysis of the number of satellites, present during the flight and data collection times, is also performed.

The GPS trajectory was combined with the raw IMU data and post-processed using POSPac Mobile Mapping Suite version 8.x. The SBET and refined attitude data are then utilized in the LMS Post Processor to compute the laser point-positions – the trajectory is combined with the attitude data and laser range measurements to produce the 3-dimensional coordinates of the mass points. Up to four return values are produced within the Optech LMS processor software for each pulse which ensures the greatest chance of ground returns in a heavily forested area.

## GPS Controls

Virtual Ground GNSS Base Station(s) were used to control the lidar airborne flight lines. Trimble CenterPoint™ RTX™ correction service is a high-accuracy, satellite-delivered global positioning service. This technology provides high-accuracy GNSS positioning without the use of traditional reference station-based differential RTK infrastructure and delivers very high cm level accuracy. In addition, CORS (Continually Operating Reference Stations) are at times used to further enhance the airborne solution.

## Lidar Calibration – see appendix 1 for a more detailed workflow description

Merrick-Surdex JV takes great care to ensure all lidar acquisition missions are carried out in a manner conducive to post-processing an accurate data set. This begins in the flight-planning stage with attention to GPS baseline distances and GPS satellite constellation geometry and outages. Proper AGPS surveying techniques are always followed including pre- and post-mission static initializations. In-air IMU alignments (figure-eights) are

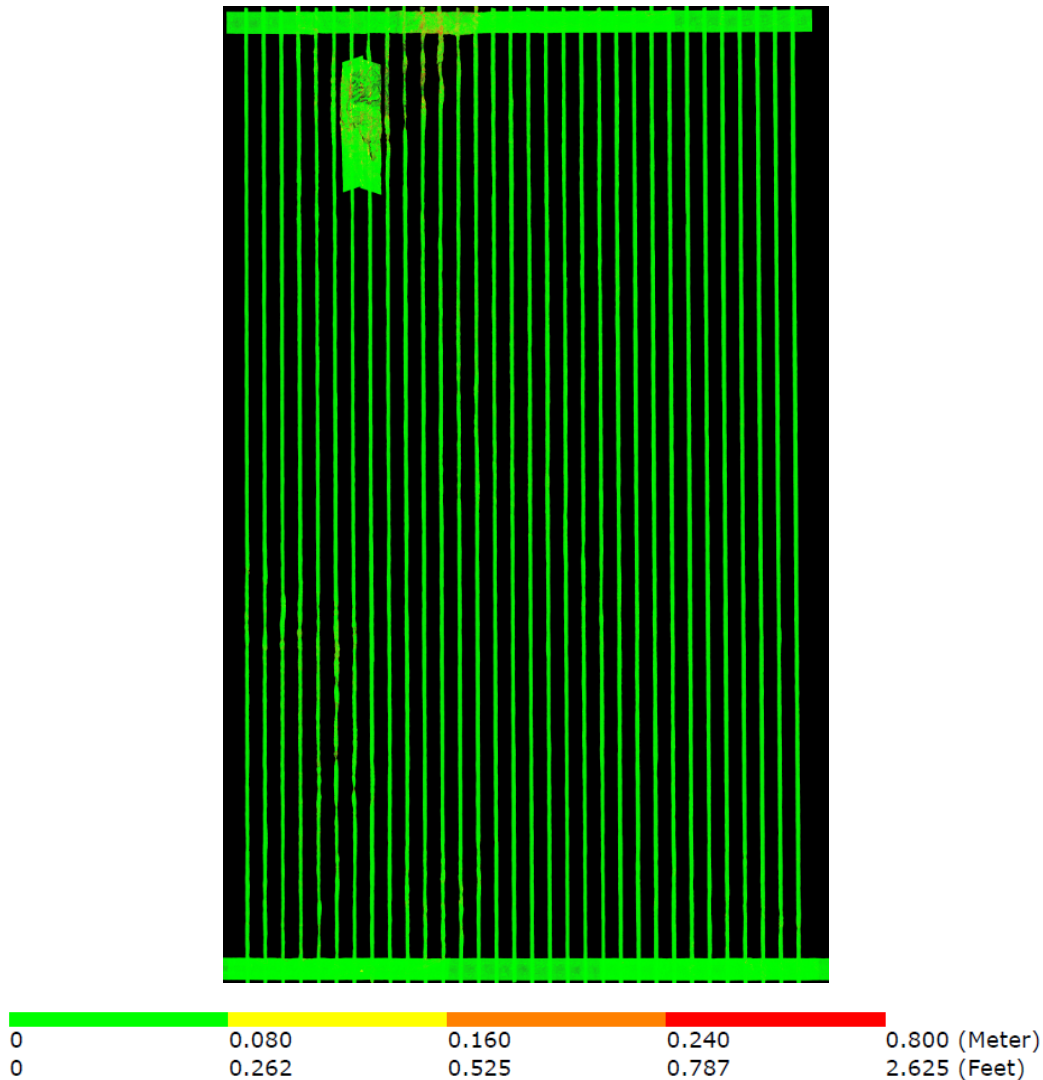
performed both before and after on-site collection to ensure proper calibration of the IMU accelerometers and gyros.

A minimum of one cross-flight is planned throughout the project area across all flightlines and over roadways where possible. The cross-flight provides a common control surface used to remove any vertical discrepancies in the lidar data between flightlines. The cross-flight is critical to ensure flightline ties across the project area. The areas of overlap between flightlines are used to boresight (calibrate) the lidar point cloud to achieve proper flightline to flightline alignment in all three axes. This includes adjustment of both IMU and scanner-related variables such as roll, pitch, heading, timing interval (range), and torsion. Each lidar mission flown is accompanied by a hands-on boresight in the office.

After boresighting is complete a detailed statistical report is generated to check relative and absolute accuracies before filtering of lidar begins.

### Relative Accuracy – flight line to flight line

The project representative flight line separation raster (below) depicts the vertical separation of flight lines by thematically coloring the separation magnitude on a color ramp based on relative distance.





## Survey – Lidar Calibration Control / Lidar Checkpoints

Merrick-Surdex JV surveyors established lidar calibration and lidar checkpoints spatially distributed across the project AOI as the method to validate absolute vertical accuracy. *See Appendix 2 for more detailed survey reporting.*

### Unfiltered Lidar Control Point Report

The following tables illustrate the results of the lidar data compared to the lidar control points post-calibration. The listing is sorted by the Z Error column showing, in ascending order, the vertical difference between the lidar points and the 335 surveyed ground points used for lidar calibration.

#### UTM13

Project Data Unit: Meter

Vertical Accuracy Class tested: 10.0-cm

Elevation Calculation Method: Interpolated from TIN

LiDAR Classifications Included: 2/0 Ground (All)/0W

Check Points in Report: 273

Check Points with LIDAR Coverage: 273

Check Points (NVA): 273

Check Points (VVA): 0

Average Vertical Error Reported: -0.001 Meter

Maximum (highest) Vertical Error Reported: 0.127 Meter

Median Vertical Error Reported: -0.002 Meter

Minimum (lowest) Vertical Error Reported: -0.139 Meter

Standard deviation of Vertical Error: 0.043 Meter

Skewness of Vertical Error: 0.402

Kurtosis of Vertical Error: 1.039

Non-vegetated Vertical Accuracy (NVA) RMSE(z): 4.256cm PASS

Non-vegetated Vertical Accuracy (NVA) at the 95% Confidence Level +/-: 8.342cm PASS

FGDC/NSSDA Vertical Accuracy at the 95% Confidence Level +/-: 8.342cm

Non-vegetated Vertical Accuracy (NVA) RMSE(z) (DEM): 4.507cm PASS

Non-vegetated Vertical Accuracy (NVA) at the 95% Confidence Level +/- (DEM): 8.834cm PASS

This data set was tested to meet ASPRS Positional Accuracy Standard for Digital Geospatial Data (2014) for a 10.0-cm RMSEz Vertical Accuracy Class. Actual NVA accuracy was found to be RMSEz = 4.256cm, equating to +/- 8.342cm at the 95% confidence level.

Check Point Id	Check Point X	Check Point Y	Check Point Z	Z from Lidar	Z Error
861008	757487.667	3417926.896	804.502	804.363	-0.139
3198	659491.597	3473666.813	785.936	785.801	-0.135
3197	607947.873	3339327.087	1443.371	1443.281	-0.09
3151	680487.825	3272912.906	825.199	825.111	-0.088
118101	646100.098	3284186.994	1115.326	1115.241	-0.085
118103	636879.909	3310476.109	1213.927	1213.844	-0.083
3073	679644.667	3239396.016	955.404	955.322	-0.082
3051	594425.738	3244697.022	821.994	821.924	-0.07
3005	607382.162	3349835.672	1493.532	1493.463	-0.069
3039	580056.687	3424677.365	1421.372	1421.304	-0.068
3014	516331.625	3433760.125	1229.578	1229.511	-0.067
109100	675506.731	3297168.291	891.371	891.305	-0.066
3160	664064.144	3447467.488	844.256	844.191	-0.065

3017	650972.274	3377523.529	1193.498	1193.435	-0.063
3004	628456.689	3359113.078	1366.657	1366.596	-0.061
1011011	574317.932	3397088.667	1825.336	1825.275	-0.061
3175	548138.171	3383809.782	1348.225	1348.166	-0.059
3085	778982.27	3326828.772	642.129	642.072	-0.057
3177	688738.839	3278706.678	768.909	768.852	-0.057
3192	774396.804	3432973.663	683.275	683.219	-0.056
971008	524313.946	3389151.666	1160.532	1160.477	-0.055
991003	581015.974	3415630.221	1530.789	1530.734	-0.055
861003	717398.814	3419628.232	871.029	870.975	-0.054
1061012	593797.891	3315626.973	1230.846	1230.793	-0.053
3126	574180.954	3341643.507	1529.049	1528.997	-0.052
3188	604009.048	3343319.694	1434.859	1434.808	-0.051
1051015	651635.284	3268584.545	1037.541	1037.492	-0.049
851008	699634.103	3402614.294	1094.54	1094.493	-0.047
1061002	601541.745	3335053.45	1407.149	1407.104	-0.045
3091	722822.158	3415046.601	885.972	885.927	-0.045
3063	534521.186	3486591.254	1498.717	1498.673	-0.044
3147	616550.003	3378593.064	1388.749	1388.705	-0.044
3083	665638.515	3325125.866	1149.861	1149.818	-0.043
951008	527263.051	3533829.737	1429.621	1429.579	-0.042
3163	612224.103	3241483.406	767.469	767.427	-0.042
911003	644809.967	3432810.863	905.988	905.946	-0.042
3181	641116.491	3268344.885	1048.328	1048.287	-0.041
3100	679974.113	3253165.942	868.527	868.486	-0.041
1041021	530113.695	3326395.54	867.322	867.282	-0.04
1061008	592670.541	3335563.975	1325.019	1324.979	-0.04
3027	568204.584	3301983.884	1314.704	1314.665	-0.039
1041007	558637.946	3334984.356	1759.959	1759.92	-0.039
108100	607940.067	3336838.455	1442.561	1442.523	-0.038
881005	642020.512	3465235.101	793.422	793.384	-0.038
821001	762740.754	3353419.519	799.688	799.65	-0.038
1011006	581475.545	3378989.618	1782.403	1782.366	-0.037
3105	595831.611	3294652.336	1091.127	1091.09	-0.037
3095	569117.227	3390631.049	1644.846	1644.809	-0.037
1061015	592965.603	3309063.919	1194.476	1194.439	-0.037
3146	637317.359	3295215.575	1187.024	1186.988	-0.036
1061001	607955.352	3336809.1	1442.552	1442.516	-0.036
1061010	594059.501	3329603.403	1303.486	1303.451	-0.035
951005	526962.516	3533810.525	1437.056	1437.021	-0.035
3119	736831.431	3431326.916	776.447	776.412	-0.035
3187	751109.715	3321259.345	682.769	682.735	-0.034



3066	517003.243	3525066.029	1652.437	1652.403	-0.034
851007	718944.402	3355666.278	1165.794	1165.76	-0.034
3202	534861.876	3537218.722	1348.353	1348.32	-0.033
3013	553099.031	3503935.274	1260.756	1260.723	-0.033
3092	698858.227	3373125.486	1332.097	1332.065	-0.032
3028	658176.917	3261601.204	1043.273	1043.241	-0.032
921010	646575.577	3406688.912	1079.233	1079.201	-0.032
3162	702833.914	3472810.243	753.065	753.033	-0.032
1061011	593909.839	3315872.89	1229.41	1229.378	-0.032
3136	653659.06	3413898.342	1016.061	1016.03	-0.031
3085A	677625.159	3286031.072	858.455	858.424	-0.031
3111	669730.194	3375836.121	1254.176	1254.145	-0.031
3114	643970.218	3255037.552	957.03	957	-0.03
3024	642454.574	3246162.992	801.019	800.989	-0.03
3054	578387.072	3270013.417	900.468	900.438	-0.03
1041001	581428.177	3347792.856	1422.031	1422.002	-0.029
1051019	660058.146	3276163.857	976.308	976.279	-0.029
3123	752747.223	3314111.021	594.614	594.585	-0.029
991004	594356.038	3394643.278	2023.238	2023.21	-0.028
3133	680853.594	3401193.578	1010.754	1010.726	-0.028
112101	646413.43	3274934.058	1001.83	1001.803	-0.027
991002	577025.137	3430139.753	1337.716	1337.69	-0.026
921004	650918.856	3414046.674	1025.464	1025.438	-0.026
1051010	636554.11	3335350.733	1438.479	1438.453	-0.026
3174	636618.461	3284472.108	1108.36	1108.335	-0.025
1041016	530840.41	3316938.617	842.561	842.536	-0.025
881003	652746.128	3462894.669	796.387	796.362	-0.025
1061005	590042.334	3342256.798	1375.309	1375.285	-0.024
3012	563377.535	3370190.802	1438.458	1438.435	-0.023
3140	593896.983	3323785.304	1280.175	1280.152	-0.023
811004	751195.388	3317179.264	647.091	647.068	-0.023
3058	769282.701	3391756.669	808.131	808.11	-0.021
871009	712239.782	3459736.26	737.527	737.506	-0.021
3037	639437.63	3274970.936	1018.797	1018.777	-0.02
3102	580068.082	3328862.212	1481.665	1481.646	-0.019
3200	715667.793	3472700.067	756.371	756.352	-0.019
3167	502994.717	3513537.262	1110.485	1110.466	-0.019
3118	727342.57	3339056.311	1028.307	1028.288	-0.019
931005	506731.083	3435155.498	1362.663	1362.645	-0.018
3041	608211.205	3387550.037	1459.829	1459.811	-0.018
3032	600423.443	3450687.687	1025.503	1025.485	-0.018
1011001	622157.688	3361879.568	1409.531	1409.513	-0.018

821003	764863.836	3355998.455	850.196	850.179	-0.017
3097	720286.707	3361007.959	1137.933	1137.916	-0.017
3057	553476.837	3481031.388	1245.143	1245.127	-0.016
3140A	593918.1	3323565.439	1278.789	1278.774	-0.015
3049	636468.969	3326498.663	1333.597	1333.582	-0.015
3152	553070.95	3327699.305	1636.131	1636.116	-0.015
3172A	601611.193	3335094.428	1407.533	1407.518	-0.015
3186	615079.811	3465178.172	887.207	887.192	-0.015
3086	676419.867	3351234.421	1307.537	1307.522	-0.015
911001	652523.959	3412481.78	1034.384	1034.369	-0.015
3022	767206.951	3365342.204	819.027	819.012	-0.015
3199	579698.572	3406930.886	1662.115	1662.101	-0.014
3134	703691.586	3341935.443	1282.773	1282.759	-0.014
871006	697975.184	3459733.557	762.606	762.592	-0.014
3006	740586.33	3403621.246	1003.821	1003.807	-0.014
3060	501536.176	3535456.795	1110.436	1110.422	-0.014
3021	601058.845	3260537.586	1265.747	1265.734	-0.013
811003	780943.481	3307606.189	585.174	585.161	-0.013
3099	665195.204	3427824.229	906.377	906.365	-0.012
3124	656168.024	3397390.038	1052.042	1052.03	-0.012
3128	731692.458	3414136.183	861.108	861.097	-0.011
3031	521476.825	3413819.28	1210.301	1210.291	-0.01
3076	585358.535	3397395.14	1783.713	1783.704	-0.009
921007	647623.783	3410410.188	1065.478	1065.469	-0.009
3154	744116.729	3443224.934	708.271	708.263	-0.008
1011003	619826.28	3375663.057	1355.9	1355.892	-0.008
3048	512793.988	3507818.063	1193.18	1193.173	-0.007
3204	502238.522	3443662.979	1466.957	1466.951	-0.006
3044	779997.458	3302773.941	534.239	534.233	-0.006
3210	565092.842	3459911.907	1193.79	1193.784	-0.006
3153	684512.812	3436794.096	866.292	866.286	-0.006
3003	514163.689	3453779.8	1285.705	1285.699	-0.006
861009	778309.833	3427537.282	750.73	750.724	-0.006
3088	787369.4209	3402600.585	852.016	852.011	-0.005
971003	520354.295	3407010.949	1232.184	1232.179	-0.005
3062	616352.81	3400332.131	1326.192	1326.189	-0.003
861013	751227.335	3433921.586	757.548	757.545	-0.003
841006	712407.27	3370219.218	1279.817	1279.814	-0.003
3093	554403.769	3531856.509	1118.775	1118.773	-0.002
841001	706603.417	3373827.558	1258.715	1258.713	-0.002
3142	539350.423	3508820.028	1335.276	1335.274	-0.002
3047	570081.608	3306978.268	1336.638	1336.637	-0.001

1051006	633860.115	3342337.656	1504.005	1504.004	-0.001
881002	701237.228	3438336.609	820.893	820.892	-0.001
981003	546248.08	3486004.044	1374.991	1374.99	-0.001
3025	589682.441	3378337.188	1663.382	1663.382	0
931006	534118.894	3442423.889	1152.871	1152.871	0
3080	549046.823	3525582.394	1131.108	1131.108	0
851005	707020.735	3365593.614	1298.03	1298.03	0
3141	530950.014	3333193.639	866.067	866.068	0.001
3161	675044.663	3437651.528	869.32	869.321	0.001
3132	755093.8	3457870.913	743.599	743.602	0.003
3201	711936.571	3439884.898	781.6	781.603	0.003
3008	706648.503	3429088.507	855.272	855.276	0.004
971007	518277.867	3389532.61	1161.892	1161.896	0.004
951001	513974.599	3492829.025	1104.965	1104.969	0.004
3166	622902.595	3261804.154	1190.331	1190.335	0.004
3173	725328.476	3457759.044	722.567	722.571	0.004
821007	774976.605	3358415.278	833.107	833.111	0.004
3143	659167.631	3284825.505	1115.541	1115.546	0.005
3115	750421.535	3337227.998	846.751	846.757	0.006
3164	697420.84	3386969.869	1149.814	1149.82	0.006
1051005	637953.28	3345061.182	1578.413	1578.419	0.006
941001	547538.589	3439718.77	1259.192	1259.198	0.006
1071008	686068.964	3298096.111	867.983	867.99	0.007
3150	611705.886	3447439.576	948.058	948.065	0.007
3121	570706.709	3266040.978	780.7	780.707	0.007
3158	538234.94	3452706.728	1157.215	1157.223	0.008
1041022	530165.488	3338201.146	875.036	875.044	0.008
3179	757429.328	3329478.546	799.942	799.95	0.008
1071003	668190.2	3316067.974	1066.545	1066.553	0.008
971001	522084.844	3418532.043	1202.645	1202.654	0.009
3117	520802.852	3401518.527	1246.406	1246.415	0.009
3182	700637.37	3419194.774	919.05	919.059	0.009
3019	559453.596	3270247.587	784.895	784.904	0.009
3165	537076.83	3318982.4	1012.669	1012.678	0.009
3137	752406.181	3474924.907	789.578	789.587	0.009
3002	758889.524	3377901.447	928.213	928.223	0.01
3068	514501.271	3477107.243	1103.634	1103.644	0.01
110100	589840.105	3342566.743	1375.529	1375.54	0.011
1011009	568244.536	3383479.333	1570.178	1570.19	0.012
911006	615551.002	3419376.383	1082.604	1082.616	0.012
3178	600993.425	3464633.083	955.194	955.207	0.013
1071006	671518.414	3301964.609	946.039	946.052	0.013

3090	685466.185	3347322.724	1270.254	1270.267	0.013
3018	537931.774	3393219.572	1284.103	1284.116	0.013
3130	541110.041	3462807.898	1252.229	1252.242	0.013
871001	732618.313	3441668.924	742.892	742.906	0.014
3131	517962.841	3404106.337	1279.861	1279.875	0.014
3206	701779.941	3268256.264	775.87	775.884	0.014
3050	612601.846	3270714.22	1340.079	1340.094	0.015
861011	764598.661	3434403.555	698.816	698.831	0.015
3070	513557.75	3497187.243	1110.708	1110.724	0.016
3040	615959.48	3238092.351	715.193	715.209	0.016
3196	637605.274	3297997.869	1154.112	1154.129	0.017
1051012	637385.846	3305213.498	1159.401	1159.42	0.019
971005	531438.614	3399101.555	1256.088	1256.107	0.019
3145	630887.328	3428929.15	906.71	906.73	0.02
3074	668902.751	3333594.958	1197.735	1197.755	0.02
3082	610831.684	3409663.935	1185.553	1185.574	0.021
3191	748547.068	3420353.627	776.851	776.873	0.022
3089	624962.797	3452521.169	871.455	871.477	0.022
3109	788331.6413	3351981.04	689.417	689.439	0.022
3108	665322.187	3248494.825	1122.927	1122.95	0.023
3104	583693.393	3251399.489	757.869	757.892	0.023
3016	769367.05	3421019.615	862.482	862.505	0.023
871005	710179.832	3448986.755	763.945	763.968	0.023
3113	769834.5	3404450.247	912.512	912.535	0.023
3061	517098.45	3468301.023	1115.797	1115.821	0.024
1051016	656390.687	3266171.214	1014.005	1014.03	0.025
3101	667882.528	3309831.081	1002.545	1002.571	0.026
3209	534830.6	3307674.206	897.768	897.794	0.026
3043	548455.908	3281665.133	798.46	798.486	0.026
1011002	630028.188	3367756.462	1298.415	1298.441	0.026
1071004	668880.017	3306048.049	988.14	988.167	0.027
3144	621566.312	3429570.831	962.287	962.314	0.027
3096	717419.875	3311239.51	886.593	886.62	0.027
1051003	634612.273	3352865.598	1569.729	1569.756	0.027
3055	501519.946	3427714.831	1290.502	1290.529	0.027
3056	695887.373	3359264.87	1267.814	1267.841	0.027
871011	731771.528	3475288.507	751.534	751.562	0.028
3106	600018.66	3373612.402	1545.533	1545.561	0.028
3171	723418.866	3468399.828	734.589	734.619	0.03
1011007	574581.774	3377479.21	1652.898	1652.928	0.03
3079	586486.95	3460478.787	1045.69	1045.721	0.031
3042	753171.622	3362014.152	937.886	937.917	0.031

3194	625460.061	3371151.084	1313.472	1313.503	0.031
3169	636892.279	3310462.752	1214.097	1214.128	0.031
3195	670879.857	3393956.483	1055.129	1055.16	0.031
931001	581440.34	3437206.648	1255.878	1255.909	0.031
3029	641929.384	3360745.376	1364.71	1364.744	0.034
3180	735386.268	3336367.967	968.091	968.126	0.035
1041013	544091.177	3317446.976	1239.859	1239.894	0.035
3075	756496.227	3420547.473	794.402	794.44	0.038
1041009	550866.611	3322003.865	1471.814	1471.854	0.04
3098	563376.731	3293948.018	1184.372	1184.412	0.04
3157	731775.405	3385759.529	1004.633	1004.673	0.04
3001	631073.239	3281713.537	1042.574	1042.614	0.04
3122	684074.152	3458162.503	795.978	796.019	0.041
3087	724931.987	3298140.833	814.012	814.053	0.041
841002	719196.324	3376132.088	1123.791	1123.832	0.041
3208	654733.32	3347288.071	1335.273	1335.314	0.041
3084	778978.026	3326833.212	641.991	642.033	0.042
871003	719089.61	3448202.055	744.675	744.717	0.042
941006	609643.679	3474329.252	903.483	903.529	0.046
3149	577708.974	3469464.366	1087.332	1087.378	0.046
991008	606074.001	3408582.267	1236.787	1236.833	0.046
3045	681833.237	3422318.823	924.43	924.476	0.046
3010	550208.127	3468748.249	1377.042	1377.089	0.047
3020	593549.69	3394628.87	1904.56	1904.608	0.048
3266B	789458.8826	3314934.862	629.9	629.949	0.049
911009	608917.738	3459921.201	936.739	936.789	0.05
3185	747439.807	3382961.785	927.573	927.624	0.051
3046	674868.377	3298098.735	902.832	902.884	0.052
3155	685665.462	3474462.825	754.643	754.696	0.053
911008	613420.075	3431398.03	1013.974	1014.028	0.054
3266	789624.2088	3317628.85	616.589	616.644	0.055
3129	574640.431	3437352.955	1284.924	1284.99	0.066
3211	670607.338	3346236.981	1280.686	1280.754	0.068
3069	650353.443	3218969.828	697.66	697.731	0.071
3139	745964.488	3356500.636	961.691	961.766	0.075
3065	711060.016	3259758.441	520.866	520.948	0.082
3193	624961.303	3470880.446	848.131	848.213	0.082
3170	561878.575	3284546.92	977.841	977.927	0.086
861001	721117.69	3396531.428	1054.298	1054.384	0.086
861005	742738.392	3419029.766	820.897	820.993	0.096
3125	701696.265	3299273.713	844.716	844.82	0.104
3135	704493.583	3277037.28	592.752	592.857	0.105

3015	634529.689	3444791.176	852.969	853.077	0.108
1071017	712514.764	3293821.535	878.023	878.134	0.111
3183	693162.875	3236988.129	695.37	695.483	0.113
1071011	694565.83	3299480.948	862.467	862.58	0.113
1001004	597131.735	3366020.19	1528.21	1528.326	0.116
3103	709458.635	3300372.124	857.643	857.763	0.12
1001002	595575.712	3360981.613	1479.217	1479.342	0.125
1071014	700324.919	3291014.955	851.924	852.051	0.127

## UTM 14

Project Data Unit: Meter

Vertical Accuracy Class tested: 10.0-cm

Elevation Calculation Method: Interpolated from TIN

LIDAR Classifications Included: 2/0 Ground (All)/0W

Check Points in Report: 62

Check Points with LiDAR Coverage: 62

Check Points (NVA): 62

Check Points (VVA): 0

Average Vertical Error Reported: 0.010 Meter

Maximum (highest) Vertical Error Reported: 0.091 Meter

Median Vertical Error Reported: 0.015 Meter

Minimum (lowest) Vertical Error Reported: -0.101 Meter

Standard deviation of Vertical Error: 0.043 Meter

Skewness of Vertical Error: -0.575

Kurtosis of Vertical Error: -0.142

Non-vegetated Vertical Accuracy (NVA) RMSE(z): 4.364cm PASS

Non-vegetated Vertical Accuracy (NVA) at the 95% Confidence Level +/-: 8.554cm PASS

FGDC/NSSDA Vertical Accuracy at the 95% Confidence Level +/-: 8.554cm

Non-vegetated Vertical Accuracy (NVA) RMSE(z) (DEM): 4.349cm PASS

Non-vegetated Vertical Accuracy (NVA) at the 95% Confidence Level +/- (DEM): 8.524cm PASS

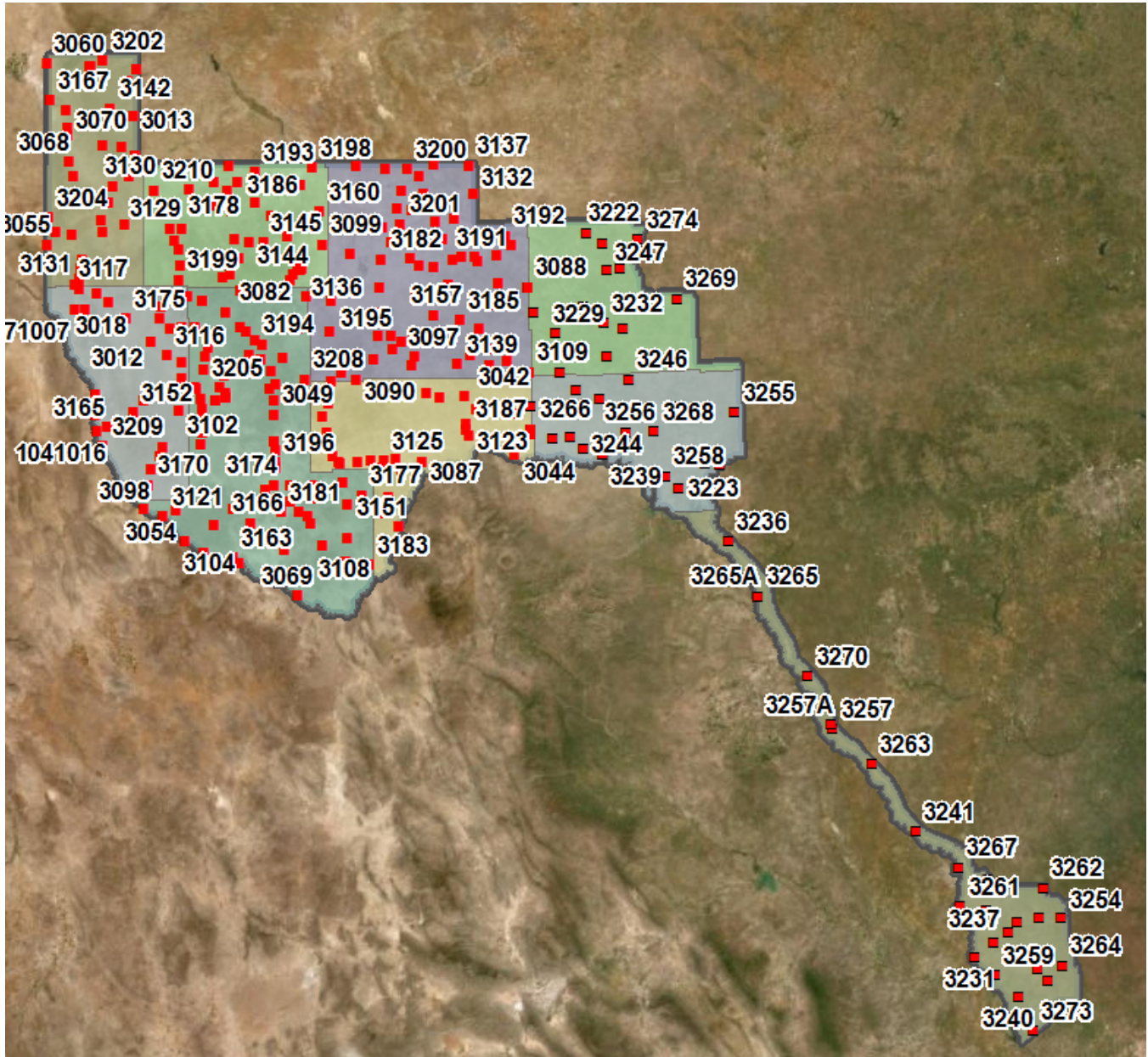
This data set was tested to meet ASPRS Positional Accuracy Standard for Digital Geospatial Data (2014) for a 10.0-cm RMSEz Vertical Accuracy Class. Actual NVA accuracy was found to be RMSEz = 4.364cm, equating to +/- 8.554cm at the 95% confidence level.

Check Point Id	Check Point X	Check Point Y	Check Point Z	Z from Lidar	Z Error
3127	211236.177	3331413.164	613.238	613.329	0.091
3239	251734.015	3300928.701	426.87	426.952	0.082
3227	497624.83	3013234.755	189.009	189.08	0.071
3223	296676.742	3278137.405	430.829	430.899	0.07
3247	260446.588	3410283.107	737.362	737.43	0.068
3266	210545.694	3317624.404	616.589	616.648	0.059
3217	258918.509	3425790.044	771.76	771.819	0.059
3244	240826.535	3304946.669	518.756	518.812	0.056
3233A	258060.562	3358888.382	566.021	566.072	0.051
3266B	210239.745	3314942.743	629.9	629.951	0.051
3232	256690.745	3378848.615	669.269	669.319	0.05
3261	451044.13	3021851.491	115.655	115.704	0.049
3222	249394.793	3432977.224	866.236	866.282	0.046

3260	474680.071	3033503.909	163.986	164.031	0.045
3270	367391.127	3162782.285	246.034	246.079	0.045
3237	478537.263	3005257.119	153.039	153.082	0.043
3109	211060.004	3351997.109	689.417	689.458	0.041
3252	283591.177	3356411.891	592.889	592.929	0.04
3224	222868.947	3311436.48	537.951	537.989	0.038
3219	245374.173	3388835.978	604.903	604.937	0.034
3218	268382.563	3410730.626	807.397	807.43	0.033
3251	283594.546	3356436.222	592.951	592.982	0.031
3256	267149.296	3313212.013	522.715	522.741	0.026
3255	331973.166	3321651.981	548.291	548.315	0.024
3176	215659.229	3387464.808	719.66	719.684	0.024
3246	270173.018	3344565.114	663.963	663.987	0.024
3263	402585.79	3108673.246	190.029	190.052	0.023
3267	450859.518	3045199.232	127.454	127.477	0.023
3235	494666.406	2982548.273	129.31	129.332	0.022
3268	283577.017	3312846.788	552.74	552.759	0.019
3214	233470.913	3312262.645	550.998	551.014	0.016
3258	289029.808	3285657.822	479.812	479.826	0.014
3233	258064.137	3358876.101	566.093	566.107	0.014
3236	324258.005	3244998.186	313.768	313.779	0.011
3231	458144.284	2991701.715	107.001	107.012	0.011
63100	484204.053	3010864.295	160.215	160.224	0.009
3230	469587.133	2999810.747	142.502	142.511	0.009
3243	252496.144	3333565.16	490.219	490.225	0.006
3216	313189.976	3292454.711	533.892	533.894	0.002
3229	228422.771	3373989.17	634.338	634.339	0.001
3265	340359.817	3211707.978	269.624	269.623	-0.001
3212	466459.579	3019007.597	125.004	125.002	-0.002
3241	426850.481	3067663.189	142.874	142.872	-0.002
3240	483391.358	2966991.103	123.546	123.538	-0.008
3265A	340383.008	3211694.356	269.661	269.652	-0.009
3088	212789.596	3402596.328	852.016	852.007	-0.009
3269	301305.419	3390847.306	745.329	745.318	-0.011
3249	229875.136	3350732.54	702.821	702.806	-0.015
3226	294477.726	3327110.824	500.242	500.227	-0.015
3234	321377.849	3290918.279	538.393	538.368	-0.025
62100	500822.091	2975653.579	161.961	161.936	-0.025
3254	510778.707	3012690.938	249.995	249.963	-0.032
3220	312820.662	3297483.207	434.506	434.473	-0.033
3221	468223.562	3036860.768	159.752	159.712	-0.04
3257A	379436.856	3133362.136	235.541	235.491	-0.05

3215	238473.788	3339725.968	607.039	606.988	-0.051
3273	490370.245	2946318.047	128.581	128.514	-0.067
3259	469256.92	2980376.268	101.237	101.17	-0.067
3257	380682.272	3130945.044	231.782	231.712	-0.07
3264	509472.033	2983714.791	163.761	163.685	-0.076
3262	500438.837	3030644.459	250.793	250.714	-0.079
3245	502930.872	2989937.332	183.037	182.936	-0.101

### Lidar Control Point Layout





## Lidar Filtering and Classification

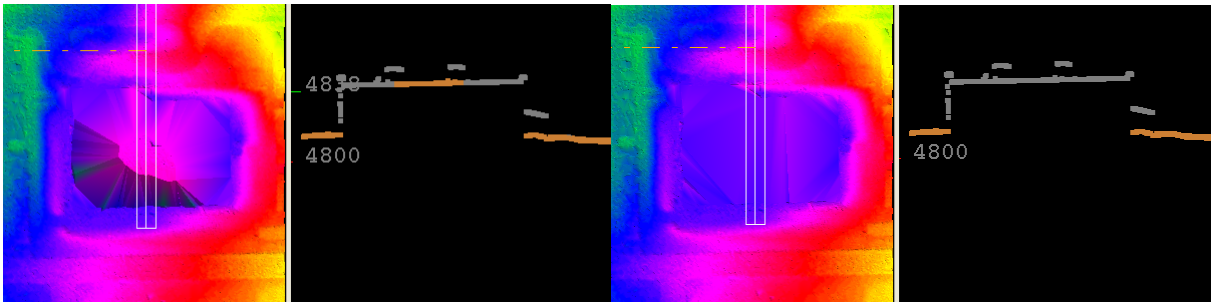
The lidar filtering process encompasses a series of automated and manual steps to classify the boresighted point cloud data set. Each project represents unique characteristics in terms of cultural features (urbanized vs. rural areas), terrain type and vegetation coverage. These characteristics are thoroughly evaluated at the onset of the project to ensure that the appropriate automated filters are applied and that subsequent manual filtering yields correctly classified data. Data is most often classified by ground and “unclassified”, but specific project applications can include a wide variety of classifications including but not limited to buildings, vegetation, power lines, etc. MARS® software is used for the auto-filtering, manual filtering and QC of the classified data.

Merrick-Surdex JV used the ASPRS LAS Specification Version 1.4 – R13, 15 July 2013, Point Data Record Format 6 for this project and classified the lidar point cloud in accordance with the following classification classes and bitflags. The following outlines project specific requirements.

- Class 1 = Unclassified
- Class 2 = Bare-earth Ground
- Class 7 = Low point (noise)
- Class 9 = Water
- Class 17 = Bridge decks
- Class 18 = High noise
- Class 20 = Ignored Ground (breakline proximity)
- Class 21 = Snow (if present and identifiable)
- Class22 = Temporal exclusion (typically non-favored data in intertidal zones)
  
- Bitflags
  - Overlap: Any part of a swath that also is covered by any part of any other swath.
  - Withheld: Within the LAS file specification, a single bit flag indicating that the associated lidar point is geometrically anomalous or unreliable and should be ignored for all normal processes.

Merrick-Surdex JV has developed several customized automated filters that are applied to the lidar data set based on project specifications, terrain, and vegetation characteristics. A filtering macro, which may contain one or more filtering algorithms, is executed to derive LAS files separated into the different classification groups as defined in the ASPRS classification table. The macros are tested in several portions of the project area to verify the appropriateness of the filters. Often, there is a combination of several filter macros that optimize the filtering based on the unique characteristics of the project. Automatic filtering generally yields a ground surface that is 85-90% valid, so additional editing (hand-filtering) is required to produce a more robust ground surface.

Lidar data is next taken into a graphic environment using MARS® to manually re-classify (or hand-filter) “noise” and other features that may remain in the ground classification after auto filter. A cross-section of the post auto-filtered surface is viewed to assist in the reclassification of non-ground data artifacts. The following is an example of re-classification of the non-ground points (elevated features) that need to be excluded from the true ground surface. Certain features such as berms, hilltops, cliffs and other features may have been aggressively auto-filtered and points will need to be re-classified into the ground classification. Data in the profile view displays non-ground (Unclassified, class 1) in grey and ground in brown/tan (Class 2). In figure 1, a small building was not auto-filtered and needs to be manually re-classified. Note that figure 2 has the building points reclassified to unclassified from the true ground surface.



**Figure 1**

**Figure 2**

A combination of automated and semi-automated routines to classify buildings and vegetation. We expect that the classified buildings will meet a filtering criterion in the range of 90-95%.

At this point, individual lidar points from the original point cloud have now been parsed into separate classifications.

### **Filtered Lidar Checkpoint Report**

After hand-filtering has been completed and quality checked, a Checkpoint Report is generated to validate that the accuracy of the ground surface is within the defined accuracy specifications. Each surveyed ground check point is compared to the lidar surface by interpolating an elevation from a Triangulated Irregular Network (TIN) of the surface. The MARS® derived report provides an in-depth statistical report, including an RMSE of the vertical errors; a primary component in most accuracy standards and a statistically valid assessment of the overall accuracy of the ground surface.

The below lidar check point reports provide statistics for 668 UTM 13 and 358 UTM 14 ground survey checkpoints used to validate the final filtered lidar surface.

## UTM 13

Vertical Accuracy Class tested: 10-cm

Check Points in defined project area (DPA):	668
Check Points with Lidar Coverage	668
Check Points with Lidar Coverage (NVA)	356
Check Points with Lidar Coverage (VVA)	312
Average Z Error (NVA)	-0.002/-0.006
Maximum Z Error (NVA)	0.216/0.708
Median Z Error (NVA)	-0.004/-0.013
Minimum Z Error (NVA)	-0.302/-0.990
Standard deviation of Vertical Error (NVA)	0.057/0.187
Skewness of Vertical Error (NVA)	-0.913
Kurtosis of Vertical Error (NVA)	5.928
Non-vegetated Vertical Accuracy (NVA) RMSE(z) <sup>1</sup>	0.057/0.187 PASS
Non-vegetated Vertical Accuracy (NVA) at the 95% Confidence Level +/- <sup>1</sup>	0.112/0.366 PASS
FGDC/NSSDA Vertical Accuracy at the 95% Confidence Level +/-	0.112/0.366
Non-vegetated Vertical Accuracy (NVA) RMSE(z) (DEM) <sup>2</sup>	0.057/0.188 PASS
Non-vegetated Vertical Accuracy (NVA) at the 95% Confidence Level (DEM) +/- <sup>2</sup>	0.113/0.369 PASS
Vegetated Vertical Accuracy (VVA) at the 95th Percentile (DEM) +/- <sup>2</sup>	0.217/0.711 PASS

This data set was tested to meet ASPRS Positional Accuracy Standard for Digital Geospatial Data (2014) for a 10-cm RMSEz Vertical Accuracy Class. Actual NVA accuracy was found to be RMSEz = 5.7cm, equating to +/- 11.2cm at the 95% confidence level. Actual VVA accuracy was found to be +/- 21.7cm at the 95th percentile.

<sup>1</sup> This value is calculated from TIN-based testing of the lidar point cloud data.

<sup>2</sup> This value is calculated from RAM-based grid testing of the lidar data. The grid cells are sized according to the Quality Level selected, and are defined in the USGS NGP Lidar Base Specification Version 1.3 (page 24, Table 6).

## UTM 14

Units: Meter (/Feet)

Vertical Accuracy Class tested: 10-cm

Check Points in defined project area (DPA):	358
Check Points with Lidar Coverage	358
Check Points with Lidar Coverage (NVA)	209
Check Points with Lidar Coverage (VVA)	149
Average Z Error (NVA)	0.019/0.063
Maximum Z Error (NVA)	0.189/0.620
Median Z Error (NVA)	0.016/0.054
Minimum Z Error (NVA)	-0.133/-0.437
Standard deviation of Vertical Error (NVA)	0.048/0.157
Skewness of Vertical Error (NVA)	0.193
Kurtosis of Vertical Error (NVA)	0.640
Non-vegetated Vertical Accuracy (NVA) RMSE(z) <sup>1</sup>	0.051/0.168 PASS
Non-vegetated Vertical Accuracy (NVA) at the 95% Confidence Level +/- <sup>1</sup>	0.101/0.330 PASS
FGDC/NSSDA Vertical Accuracy at the 95% Confidence Level +/-	0.101/0.330
Non-vegetated Vertical Accuracy (NVA) RMSE(z) (DEM) <sup>2</sup>	0.053/0.173 PASS
Non-vegetated Vertical Accuracy (NVA) at the 95% Confidence Level (DEM) +/- <sup>2</sup>	0.103/0.339 PASS
Vegetated Vertical Accuracy (VVA) at the 95th Percentile (DEM) +/- <sup>2</sup>	0.215/0.707 PASS

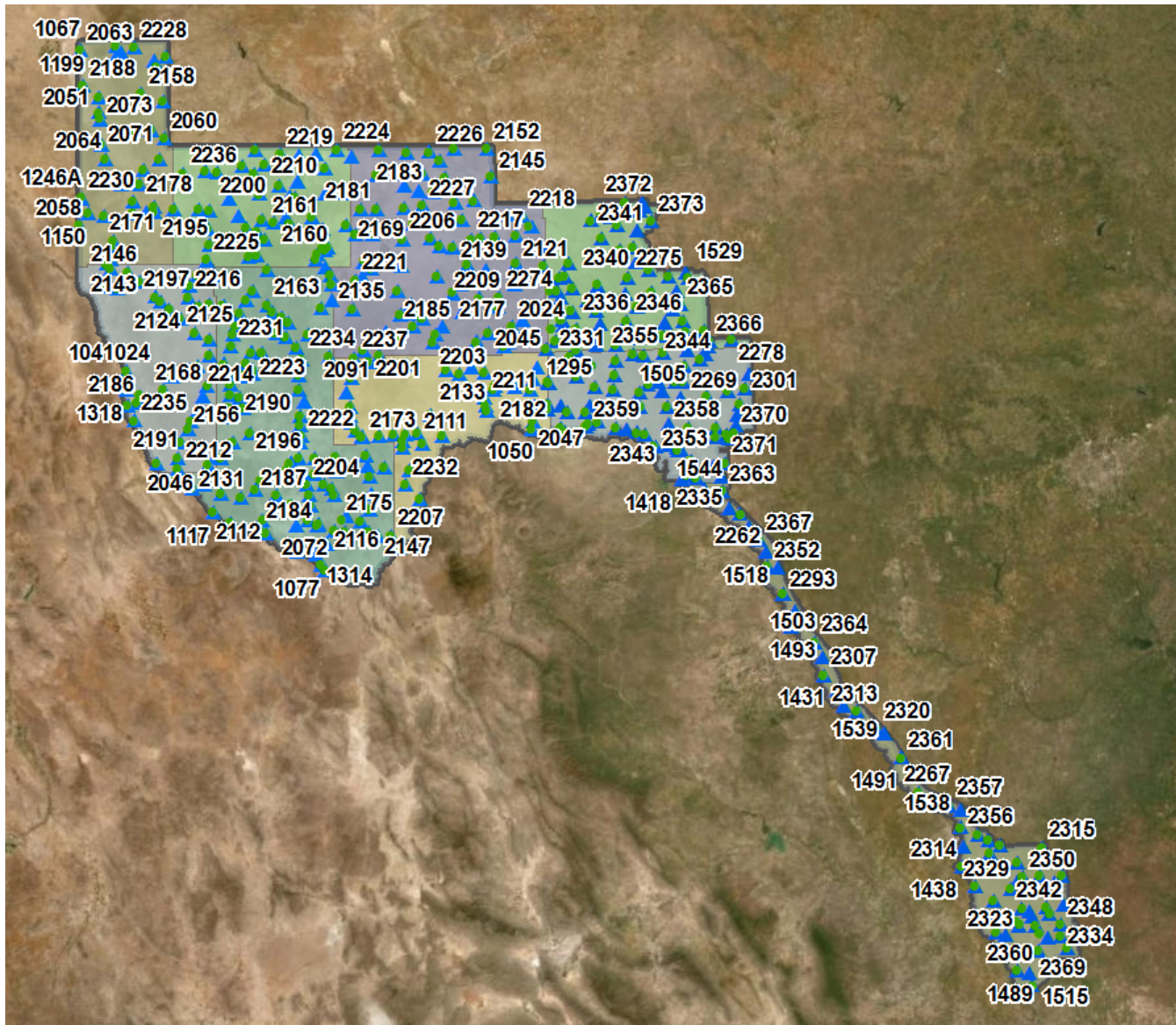
This data set was tested to meet ASPRS Positional Accuracy Standard for Digital Geospatial Data (2014) for a 10-cm RMSEz Vertical Accuracy Class. Actual NVA accuracy was found to be RMSEz = 5.1cm, equating to +/- 10.1cm at the 95% confidence level. Actual VVA accuracy was found to be +/- 21.5cm at the 95th percentile.

<sup>1</sup> This value is calculated from TIN-based testing of the lidar point cloud data.

<sup>2</sup> This value is calculated from RAM-based grid testing of the lidar data. The grid cells are sized according to the Quality Level selected, and are defined in the USGS NGP Lidar Base Specification Version 1.3 (page 24, Table 6).

## Lidar Checkpoint Layout

- ▲ NVA
- VVA



## Hydro-flattening Breakline Collection

Hydro- flattening breaklines are captured per the USGS National Geospatial Program Lidar Base Specification Version 1.3. Final hydro-flattened breaklines features are appropriately turned into polygons (flat elevations) and polylines (decreasing by elevation) and are used to reclassify ground points in water to Water (Class 9). The lidar points around the breaklines are reclassified to Ignored Ground (Class 10) based on predetermined buffer.

The next step in the process is the hydro-flattening breakline collection required for the development of the hydro-flattened DEMs. Merrick-Surdex JV will capture hydro-flattening breaklines for waterbodies greater than or equal to two ( $\geq 2$ ) acres ( $\sim 0.8$  hectare); double-sided streams and rivers that are greater than or equal to twenty-five feet ( $\geq 25'$ ), and; any visible islands greater than or equal to one ( $\geq 1$ ) acres ( $\sim 0.4$  hectare). Criteria for Tidal Waters are assumed not applicable. No single-line streams or drainages will be collected, nor will any planimetric features that could be utilized as traditional breaklines. All downstream hydro-flattening breaklines

require monotonicity (e.g., streams and rivers). Closed polygonal boundaries of water will maintain a fixed (i.e., flat) elevation. Breaklines are not required to conform to the EleHydro Breakline GIS Data Dictionary for this Task Order.

### **Linear hydrographic features**

To collect hydrographic features, Merrick-Surdex JV uses a methodology that directly interacts with the lidar bare-earth data to collect drainage breaklines. To determine the alignment of a drainageway, the technician first views the area as a TIN of bare-earth points using a color ramp to depict varying elevations. In areas of extremely flat terrain, the technician may need to determine the direction of flow based on measuring lidar bare-earth points at each end of the drain. The operator will then use the color ramped TIN to digitize the drainage in 2D with the elevation being attributed directly from the bare-earth LAS data. MARS® software has the capability of “flipping” views between the elevation TIN, Intensity and imagery, as necessary, to further assist in the determination of the drainage. All drainage breaklines are collected in a downhill direction. For each point collected, the software uses a five-foot (5’) search radius to identify the lowest point within that proximity. Within each radius, if a bare-earth point is not found that is lower than the previous point, the elevation for subsequent point remains the same as the previous point. This forces the drain to always flow in a downhill direction. Waterbodies that are embedded along a drainageway are validated to ensure consistency with the downhill direction of flow.

This methodology may differ from those of other vendors in that Merrick-Surdex JV relies on the bare-earth data to attribute breakline elevations. As a result of our methodology, there is no mismatch between lidar bare-earth data and breaklines that might otherwise be collected in stereo 3D as a separate process. This is particularly important in densely vegetated areas where breaklines collected in 3D from imagery will most likely not match (either horizontally or vertically), the more reliable lidar bare-earth data.

Merrick-Surdex JV has the capability of “draping” 2D breaklines to a bare-earth elevation model to attribute the “z” as opposed to the forced downhill attribution methodology described above. However, the problem with this process is the “pooling” effect or depressions along the drainageway caused by a lack of consistent penetration in densely vegetated areas.

Criteria of linear hydrographic breaklines are as follows:

- Linear hydrographic features (e.g., visible streams, rivers, shorelines, canals, etc.) greater than twenty-five feet (25’) wide will be captured as a double-lined polygon
  - linear hydrographic features must be flat and level bank-to-bank (perpendicular to the apparent flow centerline) with gradient following the immediately surrounding terrain
  - water surface edge must be at or just below the immediately surrounding terrain
  - streams should break at road crossings (e.g., culverts), and streams and rivers should not break at bridges

### **Waterbodies**

Waterbodies are digitized from the color ramped TIN, similar to the process described above. The elevation attribute is determined as the technician collects the hydro feature by using the lowest bare-earth point within the polygon.

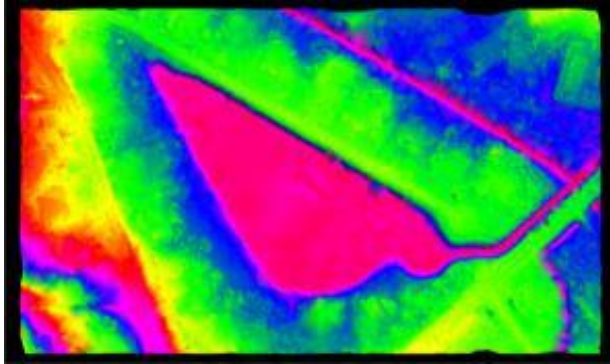
Criteria of waterbody breaklines are as follows:

- Waterbodies (e.g., lakes, ponds, reservoirs) greater than two (2) acres in size are surrounded by a water breakline (i.e., closed polygon)
  - waterbodies must be flat and level with a single elevation for every bank vertex

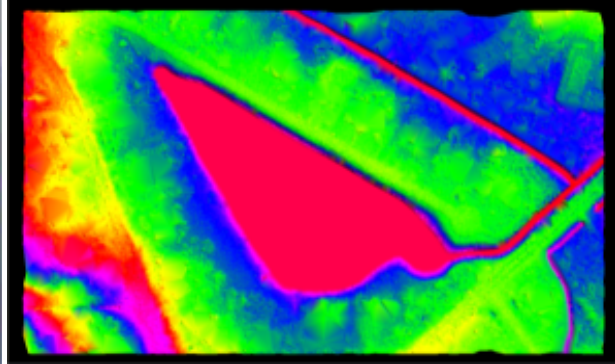


- water surface edge must be at or just below the immediately surrounding terrain
- long impoundments, such as reservoirs or inlets, whose water surface elevations drop when moving downstream should be treated as rivers

Color cycles provide a clear indication of where breaklines are to be collected, especially hydrographic breaklines. Figure 3 demonstrates no breaklines, where Figure 4 is breakline enforced displayed using color cycles within the MARS® software environment.



**Figure 3**



**Figure 4**

### **Bare-Earth DEM**

Merrick-Surdex JV exports the hydro-flattening breakline enforced Class 2 (ground) lidar points to a one-meter (1m) cell size, 32-bit format using MARS®, the DEMs are exported to the project tiling scheme. Projection information is applied that reflects the project requirements.

### **Intensity Images**

Merrick-Surdex JV exports all lidar points to a one-meter (1m) cell size 8-bit client desired format using MARS®, the intensity images are exported to the project tiling scheme and / or project-wide boundary. Projection information is applied that reflects the project requirements.

## List of Deliverables

- ❖ Lidar
  - Minimum standards as outlined in **TM11-B4 / Exhibit 1**
  - Classified lidar point cloud
    - Fully compliant ASPRS LAS 1.4-R13, point record format 6
    - By tile
    - Intensity values normalized (rescaled) to 16-bit
    - FGDC-compliant metadata
  - Bare-earth DEM
    - 1m cell size 32-bit floating point raster in GeoTIFF (.tif) format
    - Bare-earth (hydro-flattened)
      - Culverts will not be removed from the DEMs
      - Bridges will be removed from the DEMs
    - By tile
    - FGDC-compliant metadata
  - Hydro-flattened breaklines
    - Project-wide Esri feature class(es) for insertion into file geodatabase
      - PolylineZ
      - PolygonZ
    - FGDC-compliant metadata
  - Intensity Images
    - 1m cell size 8-bit, 256 color gray scale in GeoTIFF (.tif) format
    - By tile
    - FGDC-compliant metadata
  - Control
    - Esri shapefile format
      - NVA, VVA and calibration control
    - FGDC-compliant metadata
  - FGDC-compliant metadata (project level)
  - Detailed Lidar Mapping / Project Report
    - Survey report
  - Miscellaneous
    - Flight Index (feature class / file geodatabase)
    - Raw swath (Esri shapefile)
    - DPA and BPA boundaries (Esri shapefile)
    - 1,500m x 1,500m formatted tiles (Esri shapefile)

## Appendix 1

Following is a more detailed lidar calibration workflow description.



## **LIDAR CALIBRATION AND BLOCK LAS OUTPUT**

Note: All figures represented on the following pages are for general illustration purposes, and are not examples derived from the project.

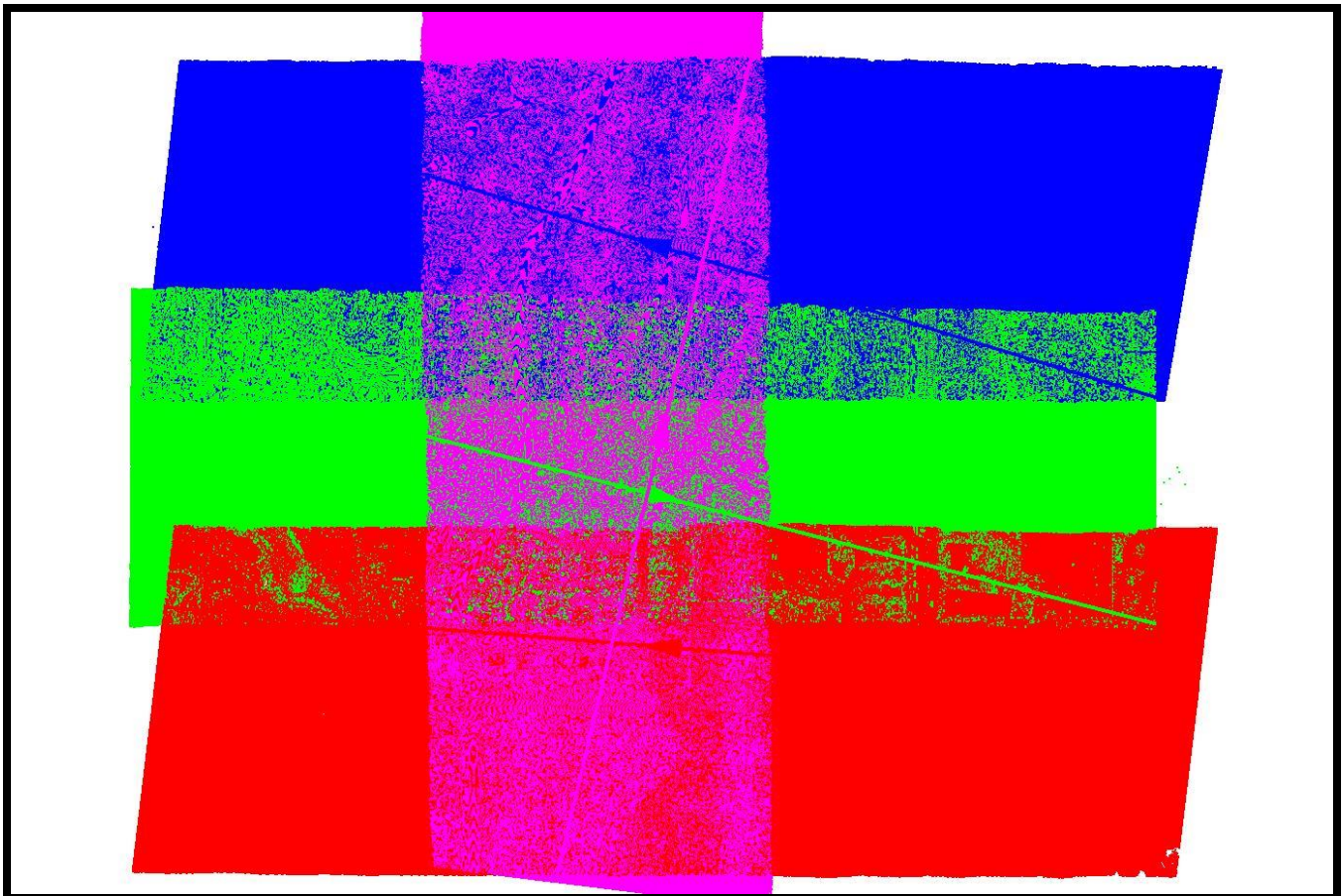
### **Initial Processing**

Lidar data is output as LAS point data using Optech's Lidar Mapping Suite (LMS). LMS matches ground and roof planes plus roof lines to self-calibrate and correct system biases. These biases occur within the hardware of the laser scanning systems, within the Inertial Measurement Unit (IMU) and because of environmental conditions which affect the refraction of light. The systemic biases that are corrected for include scale, roll, pitch, and heading.

In addition to the self-calibration mode LMS runs a "production" mode which applies the self-calibration parameters and then analyzes each individual flight line and applies small adjustments to each line to tie overlapping lidar points even more tightly together.

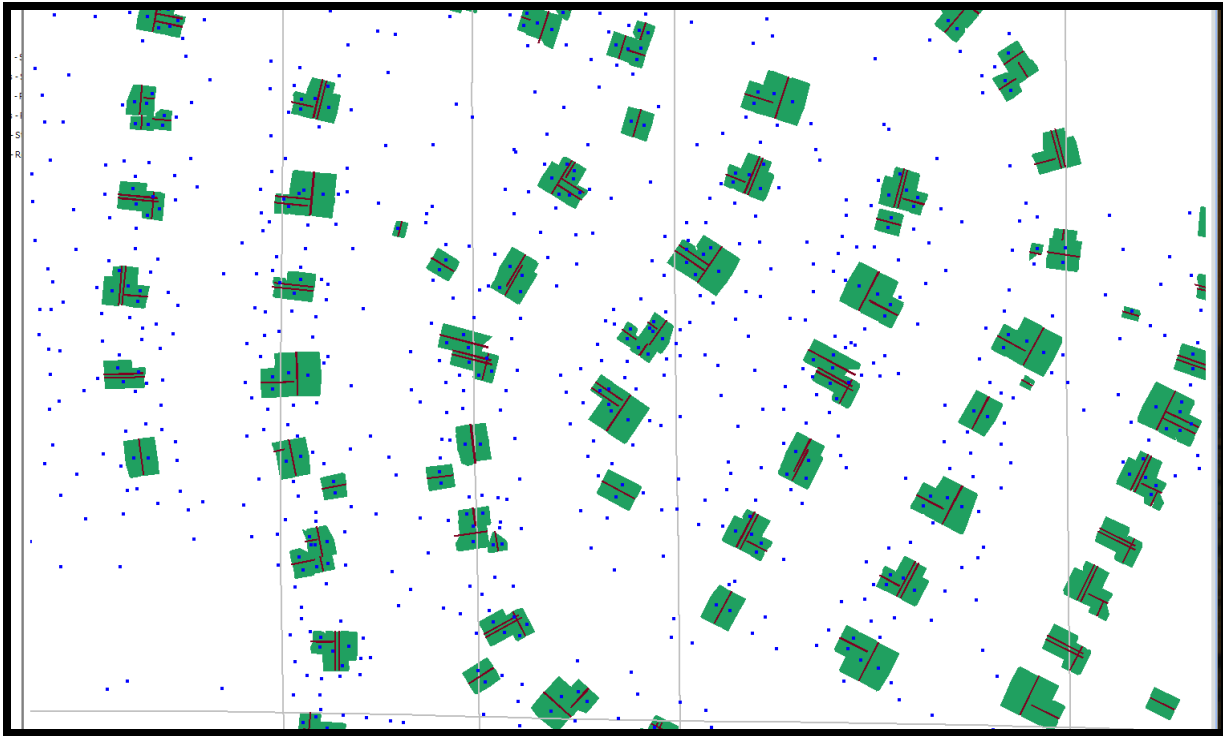
### **Boresight Self-Calibration Processing Procedures**

An LMS boresight calibration is performed on an as-needed basis to correct scale, roll, pitch and heading biases. A minimum of three overlapping flights are flown in opposing directions with one cross flight.



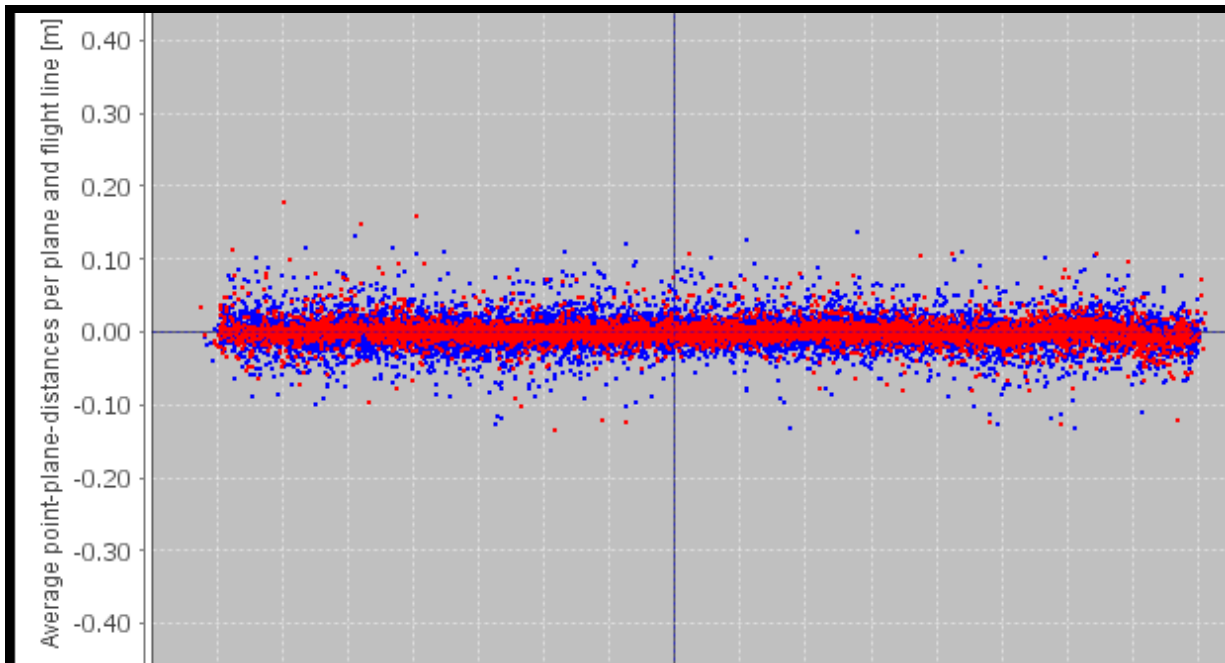
The Boresighting module frees scan angle scale, scan angle lag, XYZ boresight corrections and elevation position corrections while locking scan angle offset and XY position corrections.

The picked calibration site will have a good distribution of buildings for the self-calibration software to match ground planes, roof planes and roof lines.



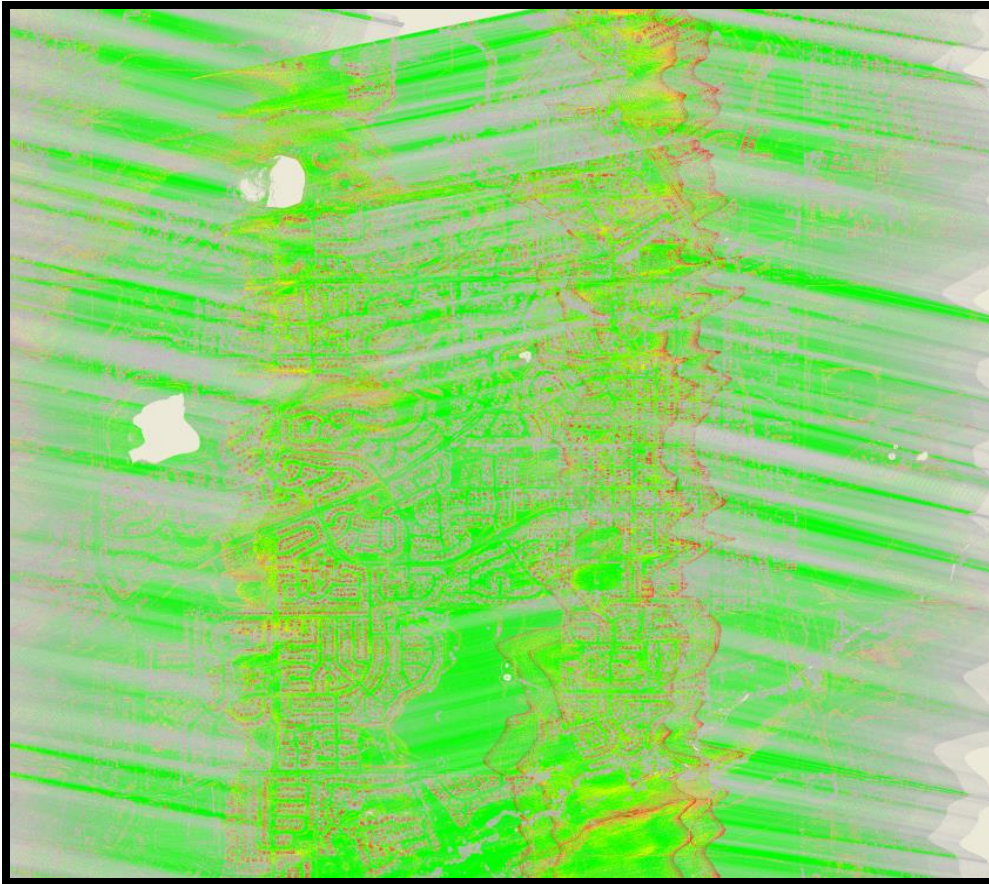
At the conclusion of the self-calibration run the data is quality checked with LMS plots

Plot of plane vertical distances from datum plane.

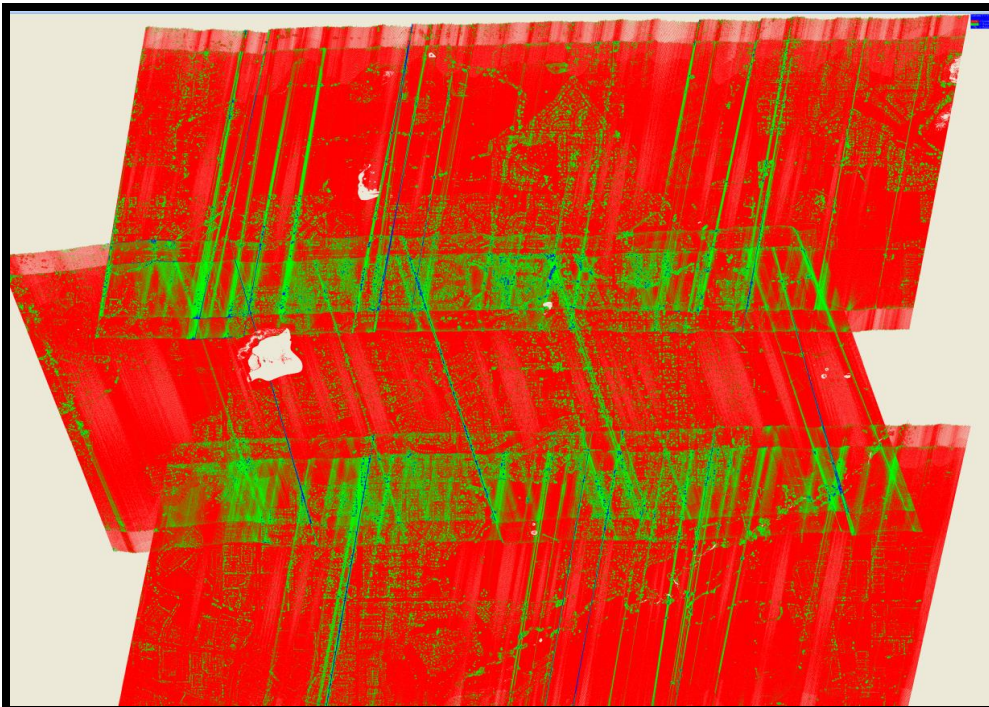




Plot of height differenced between flight lines. (Green=less than 5cm).

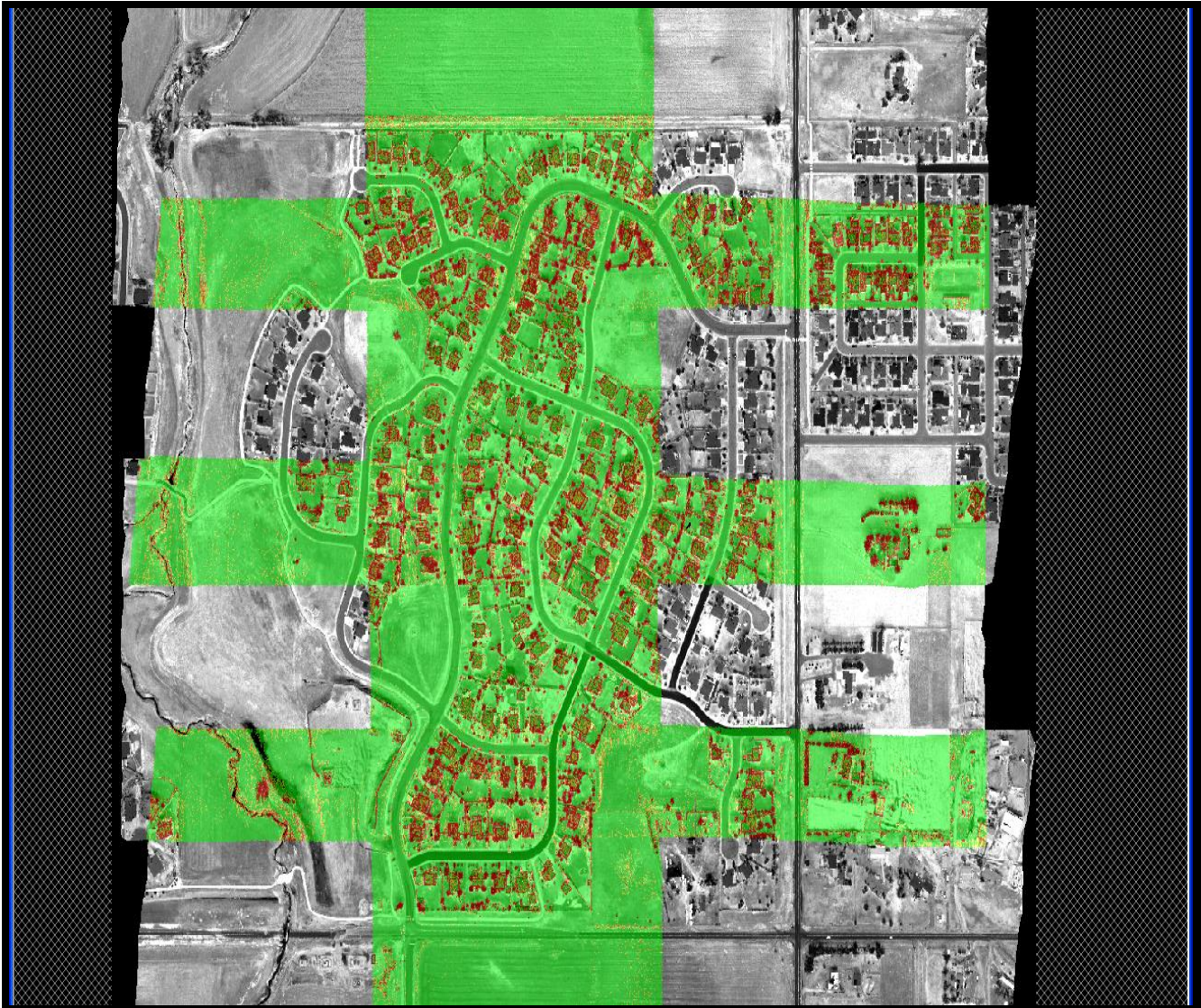


Plot of point densities. (Red=5-9 points per cell, green 10+ points per cell).



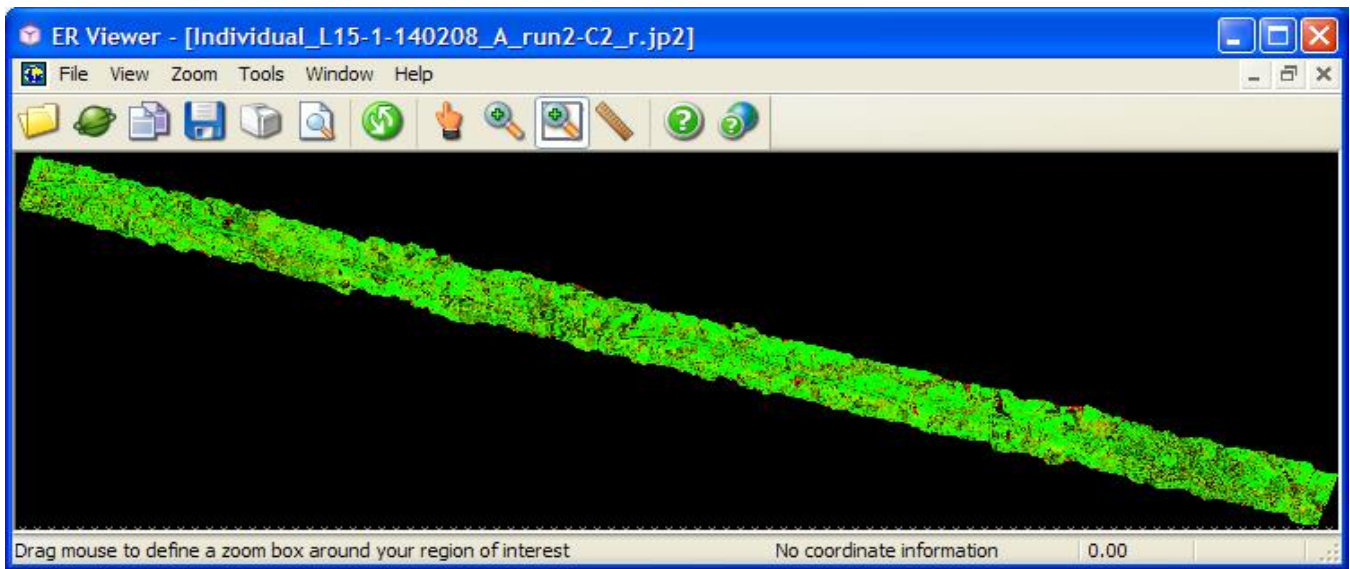


A Flight Line Separation Raster image is generated in Merrick Advanced Remote Sensing Software (MARS®), in this example ground returns from multiple flight lines that are fitting within 3 centimeters are colored green.

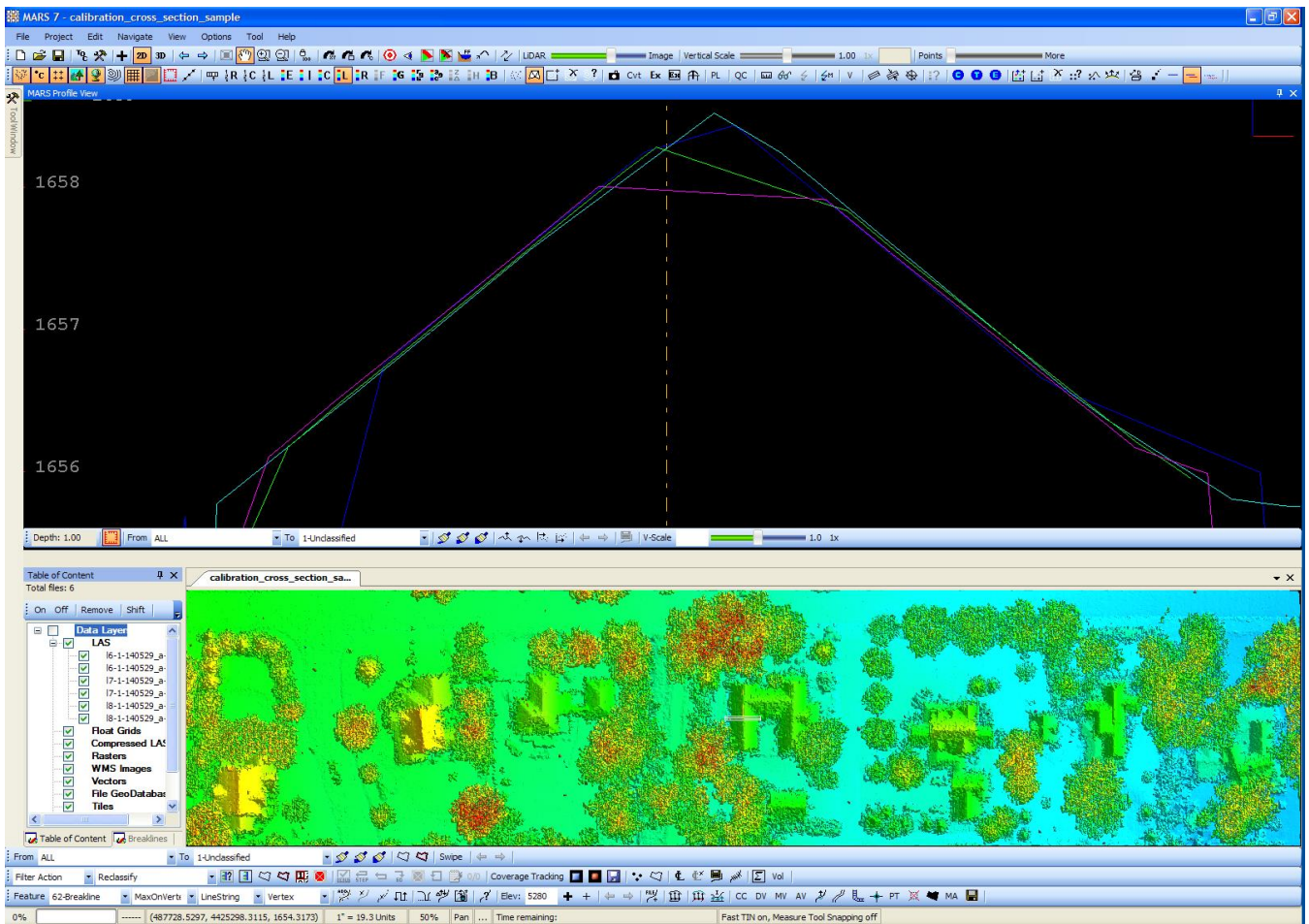




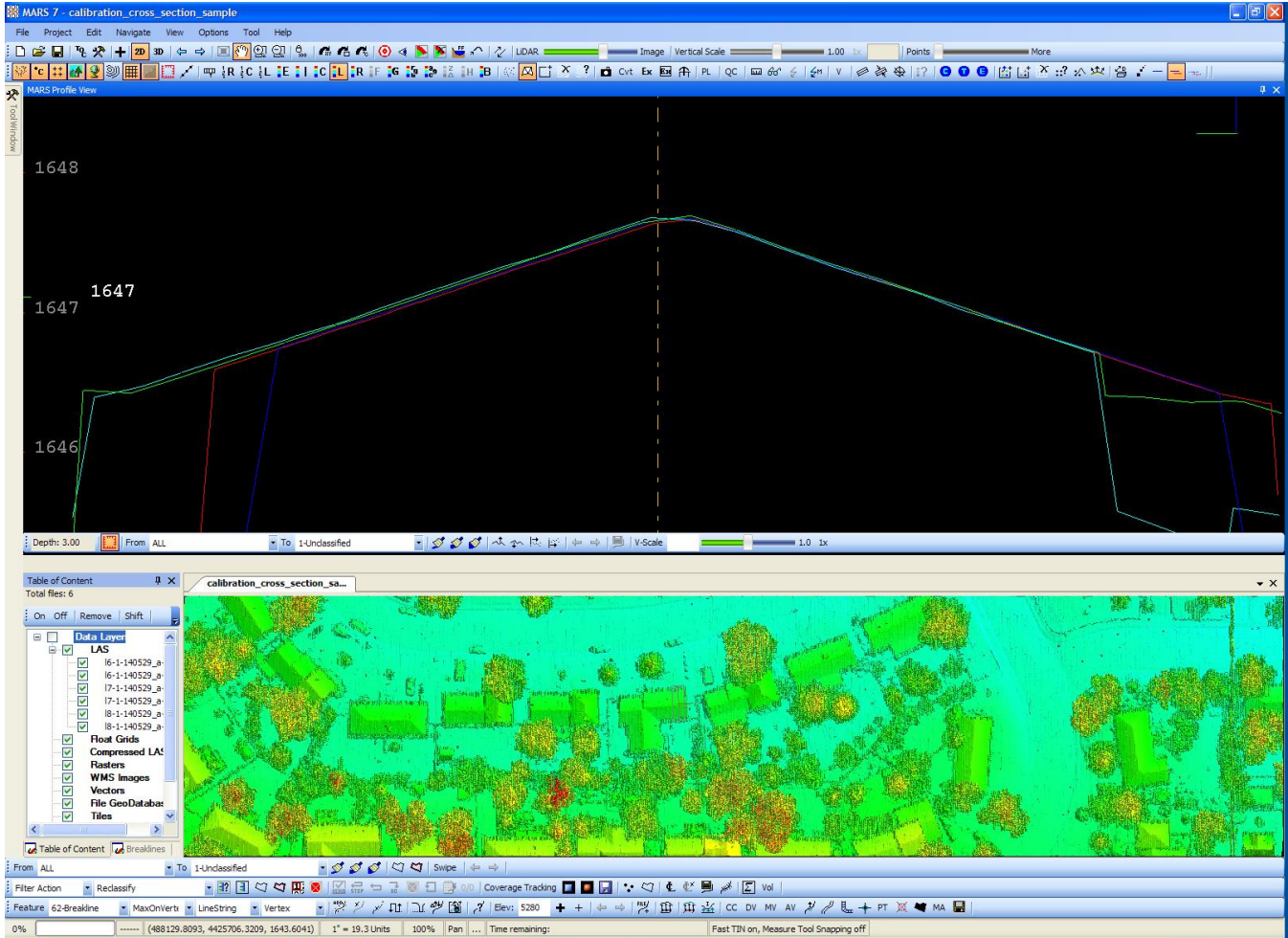
MARS® tests for internal relative vertical accuracy using inbound and outbound scan values. Again, Green is showing inbound and outbound scan data fitting to 3 centimeters.



Building cross sections are checked for good alignment. Pitch and heading are checked on roof planes parallel to the flight direction.



Roll and scale are checked on roof planes perpendicular to the flight direction.

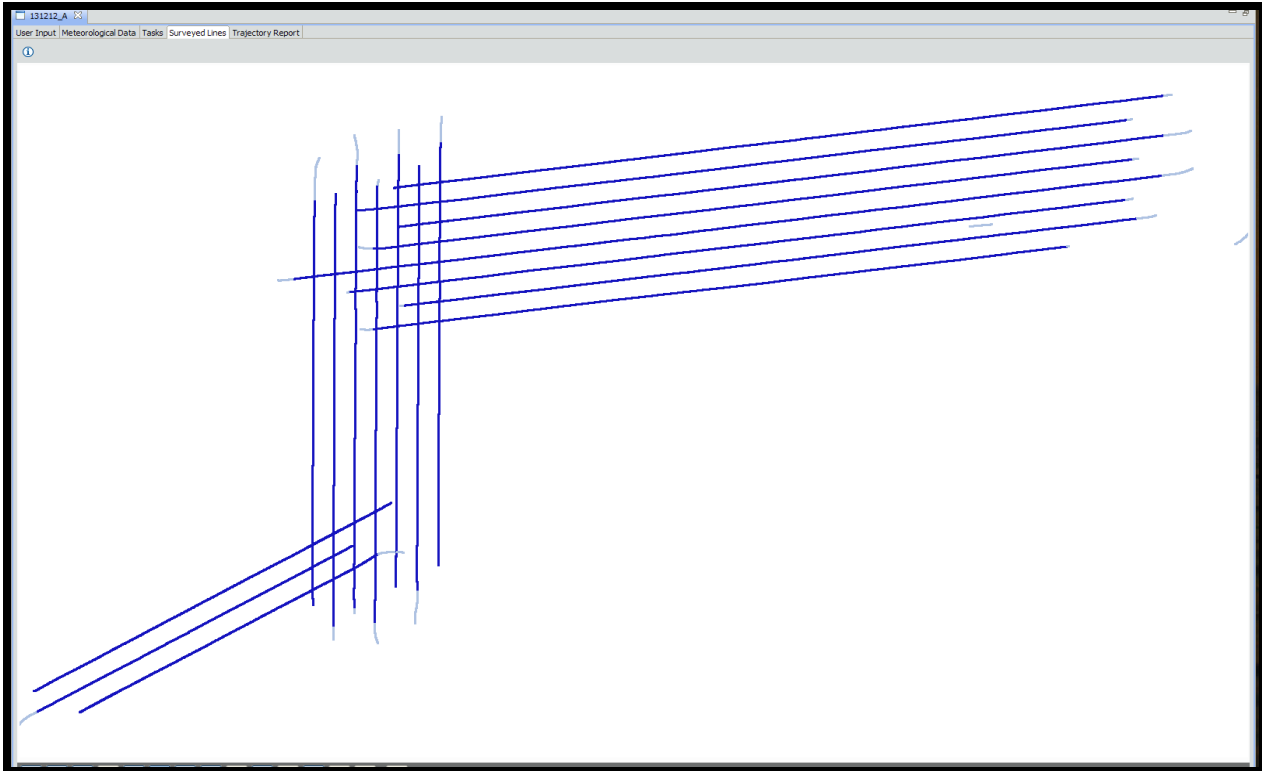


The LMS program outputs a "LCP" file with all the correction parameters. The calibration process may be run several times until the boresight adjustments are acceptable. When the boresight solution is acceptable the LCP file adjustments are saved and also applied to subsequent projects. Each new project is again analyzed and when the adjustment biases show too much drift a new boresight calibration is run. The LCP file may hold calibration tolerances for several projects.

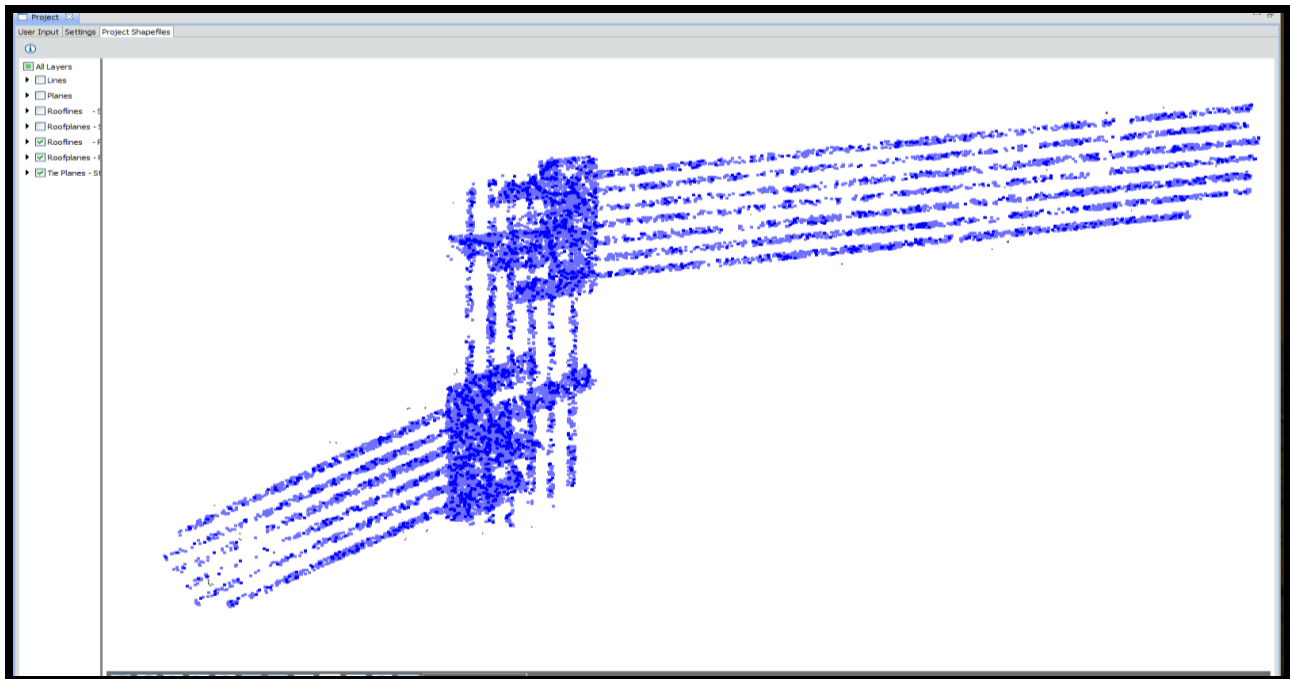
## Block LAS Production Processing Procedures

The LMS production mode is run on each flight line to further tie the final lidar LAS flight line files tightly together. Production settings allow scan angle scale, scan angle lag to float and allows elevation to move slightly during flight line to flight line comparison thus further tying flight lines together. A cross flight with locked elevation data is used for controlling flight line elevations.

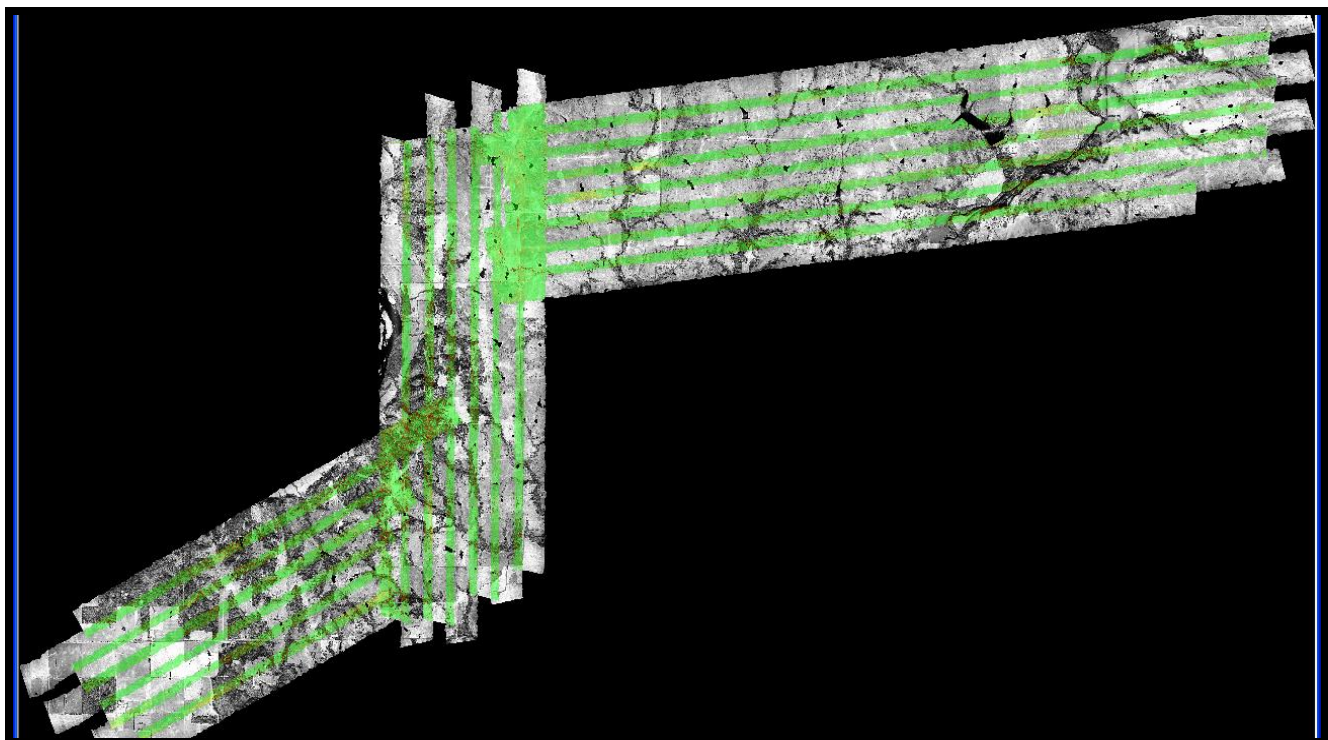
A block of data is selected to process with LMS production settings. Data collected during turns at the ends of flight lines is deselected (light blue lines).



As in self-calibration the LMS production program analyses ground, roof planes and rooflines. One cross flight is locked in elevation and all other lines are adjusted to it. Unlike the calibration site the distribution of roof planes is usually much less dense. Here matched ground tie planes are blue.



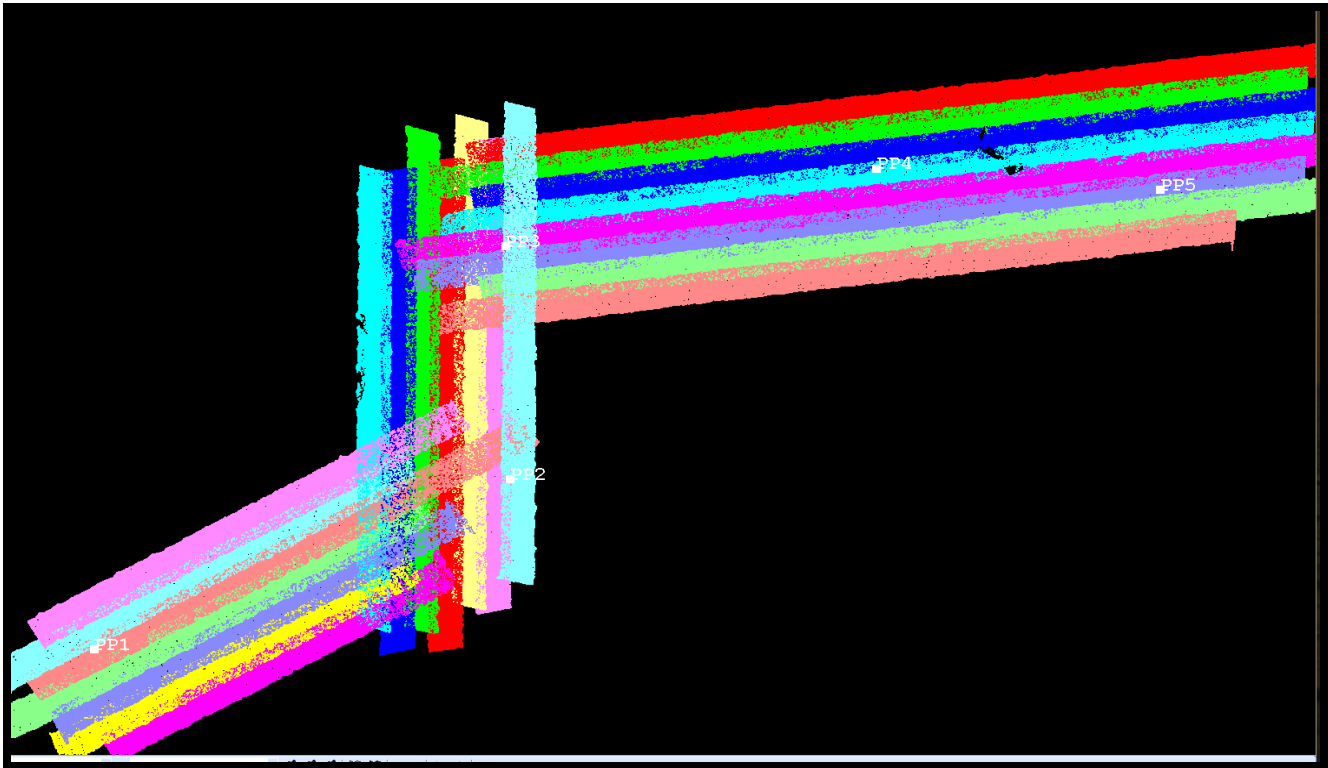
The same quality control outputs used to check self-calibrations are available to analyze the production run. Output plots are again available in LMS and cross sections plus a Flight Line Separation Raster are generated in MARS® to check coverage and quality.





## Correcting the Final Elevation

After all the lines are tied together a ground control network is imported into MARS®. The ground control network may be pre-existing or collected by a licensed surveyor.



The next step is to match the ground control elevations to the lidar data set. A control report is run and the data set is shifted slightly to zero out the average elevation error and points checked for quality.

The final step before boresighted, leveled LAS files are ready for filtering is to run the MARS® QC Module on the block data. The Boresighted lidar QC Report outputs individual reports on Point Density, Nominal Pulse Spacing, Data Voids, Spatial Distribution, Scan Angles, Control Report, Flight Line Separation, Flight Line Overlap, Buffered Boundary, LAS Formats, Datums and Coordinates.

These reports are checked with the required specifications in the Project Management Plan.

## Appendix 2

Following is a more detailed Survey report.



WEST TEXAS LIDAR MAPPING PROJECT  
GROUND CONTROL SURVEY REPORT

JOB NO. 65220171

DATE MARCH-APRIL 2019

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**WEST TEXAS  
LIDAR MAPPING PROJECT  
GROUND CONTROL SURVEY REPORT**

I. INTRODUCTION

II. HORIZONTAL AND VERTICAL CONTROL

III. JOB SUMMARY AND EQUIPMENT

A. COORDINATES

NAD-83 (North American Datum of 1983) 2011 GEODETIC SYSTEM  
NAD-83 UTM ZONE 13 AND UTM 14 NORTH  
NAVD-88 (North American Vertical Datum of 1988) GEOID 12B

B. BASE MAP AND SAMPLE OCCUPATION PHOTO

C. EXISTING NGS (NATIONAL GEODETIC SURVEY) HORIZONTAL AND  
VERTICAL CONTROL DATA SHEETS

## I. INTRODUCTION

This report summarizes the results of a ground control survey requested by USGS. The survey was conducted in Brewster, Crane, Crockett, Culberson, Jeff Davis, Maverick, Pecos, Presidio, Reagan, Reeves, Terrell, Val Verde, Ward, Webb, and Zapata Counties in Texas. The purpose of the survey of ground control and check points for LIDAR (Light Detection and Ranging) mapping of an area of interest covering approximately 32,494 square miles.

Ground control field observations were performed by Merrick & Company survey crew members Randy Hale, Chris Mathern, and Kevin Kenna. Field effort commenced on March 3<sup>rd</sup>, 2019 through April 28<sup>th</sup>, 2019. Equipment used for this project included Trimble R10 GNSS receivers with RTX service provided by Trimble (A satellite-based service using worldwide continuously operating reference stations). Horizontal and vertical measurement were verified by recovering and observing coordinates from the Trimble R10 GNSS receivers with the RTX service 41 NGS (National Geodetic Survey) ground stations. The quality of LiDAR data was verified with 1380 checkpoints. These checkpoints were utilized to verify confidence levels of the LIDAR datasets.

## II. HORIZONTAL AND VERTICAL CONTROL

The coordinate system for this project is UTM ZONES 13 AND 14 NORTH based on North American Datum of 1983 (NAD83), adjustment of 2011. The geodetic network was tied to CORS (Continuously Operating Reference Stations) via RTX and NGS ground stations. RTX coordinates are observed in International Terrestrial Reference Frame datum with the realization year of 2014 (ITRF 2014)).

Coordinate values measured utilizing the RTX network were converted into NAD83(2011) and NAVD88 values using the HTDP (Horizontal Time Dependent Positioning) program version 3.2.7. HTDP program is provided by the National Geodetic Survey. The following existing NGS control points were used as horizontal checks to control this survey.

<b>NGS Primary Horizontal Control Checkpoints</b>		
<b>PT# (NGS NAME)</b>	<b>RECORD POSITION NAD-83 (2011)</b>	
	<b>LATITUDE</b>	<b>LONGITUDE</b>
5T9 B	28°51'24.38462"N	100°30'53.94987"W
7850	30°40'49.77258"N	104°00'54.30052"W
A 1105	30°21'25.80429"N	104°00'44.29745"W
ALPPORT	30°23'13.08174"N	103°40'51.02134"W
B 703	30°41'57.95080"N	101°16'51.44596"W
B 1105	30°22'01.85744"N	104°00'32.56242"W
F 1114	30°23'54.76866"N	103°40'51.35174"W
F 1436	28°00'22.03265"N	99°32'03.77427"W
L 1114	30°23'18.37268"N	103°40'31.93029"W

M 1396	31°04'42.09783"N	104°06'59.13126"W
P 1070	31°03'43.45699"N	104°47'34.24289"W
P 1391	31°43'21.85539"N	103°49'14.83427"W
PRESIDIO S BASE	29°39'53.01199"N	104°21'40.38879"W
QUEBEC RESET	30°30'52.09269"N	104°24'18.84456"W
T 747	29°31'23.52609"N	103°07'23.35861"W
TERLINGUA	29°18'53.23913"N	103°36'37.98161"W
V 1439	28°52'18.94127"N	100°31'25.67879"W
Y 1403	30°54'32.90474"N	102°55'19.64068"W
Z 1397	31°23'23.83947"N	103°30'40.59435"W

**NGS Primary Control  
Horizontal NAD-83 (2011)  
Comparisons: Record Versus Measured**

<b>PT# (NGS NAME)</b>	<b>NORTH (meters)</b>	<b>EAST (meters)</b>
5T9 B	+0.229	-0.438
7850	+0.072	-0.022
A 1105	+0.028	+0.023
ALPPORT	+0.053	+0.053
B 703	+0.032	+0.040
B 1105	+0.035	+0.020
F 1114	+0.010	+0.014
F 1436	+0.603	+0.080
L 1114	+0.072	-0.012
M 1396	+0.050	-0.005
P 1070	+0.060	+0.005
P 1391	+0.049	+0.046
PRESIDIO S BASE	+0.073	+0.019
QUEBEC RESET	+0.033	+0.009
T 747	+0.080	+0.025
TERLINGUA	+0.085	+0.013
V 1439	-0.288	-0.095
Y 1403	+0.049	+0.038
Z 1397	+0.025	+0.038

<b>NGS Primary Vertical Control checks</b>			
<b>Comparisons: Record Versus Measured</b>			
<b>PT# (NGS NAME)</b>	<b>RECORD</b>	<b>MEASURED</b>	
	<b>NAVD 88 elevation in meters</b>	<b>NAVD 88 elevation in meters</b>	
			<b>Difference in meters</b>
1	719.668	719.567	-0.101
5T9 B	268.93	268.963	+0.033
18 WTF DI	260.381	260.429	+0.048
7850	2026.545	2026.524	-0.021
7851	2026.555	2026.529	-0.026
A 736	1332.939	1332.981	+0.042
A 1105	1462.846	1462.851	+0.005
A 1417	869.468	869.505	+0.037
ALPPORT	1360.06	1359.95	-0.11
B 1105	1473.097	1473.061	-0.036
B 703	774.220	774.166	-0.054
C 748	867.646	867.449	-0.197
D 1395	1176.167	1176.165	-0.002
D 1439	202.553	202.534	-0.019
E 1389	1274.557	1274.589	-0.032
F 1114	1350.620	1350.595	-0.025
F 1395	1178.881	1178.569	-0.012
F 1411	906.262	903.216	-0.046
F 1436	244.448	244.491	+0.043
L 1114	1354.652	1354.642	-0.010
M 1396	1244.446	1244.410	-0.036
P 1070	1207.140	1207.111	-0.029
P 1391	869.284	869.208	-0.076
PRESIDIO S BASE	943.215	943.236	+0.021
QUEBEC RESET	1407.138	1407.124	-0.014
QUEBEC RM2	1407.446	1407.472	+0.026
R 1404	101.086	101.169	+0.083
R 1439	252.360	252.399	+0.039
S 1405	116.766	116.752	-0.014
S 1439	248.154	248.309	+0.155
T 747	889.502	889.475	-0.027
T 1439	256.241	256.364	+0.123
V 104	719.674	719.608	-0.066
V 1422	213.859	213.911	+0.052
V 1439	269.586	269.583	-0.003
Y 1403	926.298	926.238	-0.060
Y 1417	811.732	811.673	-0.059
Z 1397	793.788	793.659	-0.129
Z 1410	868.834	868.775	-0.059
Z 1417	787.837	787.775	-0.062

### III. JOB SUMMARY AND EQUIPMENT

The coordinate systems are UTM Zone 13 North and UTM Zone 14 North. The units are in meters. The projection parameters are as follows:

UTM ZONE 13 NORTH  
PROJECTION: TRANSVERSE MERCATOR  
LATITUDE OF ORIGIN = N 0° 00' 00.000000"  
LONGITUDE OF ORIGIN = W 105° 00' 00.000000"  
FALSE NORTHING =0.000m  
FALSE EASTING =500000.000m  
SCALE FACTOR =0.9996000000

UTM ZONE 14 NORTH  
PROJECTION: TRANSVERSE MERCATOR  
LATITUDE OF ORIGIN = N 0° 00' 00.000000"  
LONGITUDE OF ORIGIN = W 105° 00' 00.000000"  
FALSE NORTHING =0.000m  
FALSE EASTING =500000.000m  
SCALE FACTOR =0.9996000000

The data collected was converted and checked with published ground station coordinates. The specifications for accuracy with RTX are 2 centimeters horizontally and 5 centimeters vertically. Existing NGS published control stations were surveyed to assure that there were no discrepancies in the field observation data. Close examinations of the residuals showed no distortions in orientation or scale.

Satellite data was collected using two Trimble R10 receivers. The coordinates were processed using Trimble Business Center (Version 5.0).



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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	ELEVATION		
			METERS	METERS	METERS	METERS		
						GEOID 12B		
1001	30°56'34.81814"N	102°04'29.36784"W	741.453	3426955.801	779478.574	764.918	LIPT	NVA
1003	30°30'13.13766"N	102°18'08.91216"W	906.501	3377690.85	758892.899	929.572	LIPT	NVA
1004	29°16'45.78665"N	103°22'06.97728"W	1090.596	3240043.379	658479.864	1112.147	LIPT	NVA
1005	31°13'06.36334"N	104°51'04.56984"W	1262.005	3453819.876	514166.264	1284.739	LIPT	NVA
1006	30°21'23.82412"N	103°39'51.53256"W	1345.988	3359058.829	628366.402	1367.001	LIPT	NVA
1007	30°16'31.12684"N	103°52'55.81920"W	1473.041	3349821.71	607516.467	1494.228	LIPT	NVA
1008	30°44'32.07966"N	102°29'31.04916"W	978.695	3403724.149	740111.35	1001.908	LIPT	NVA
1010	30°58'37.70951"N	102°50'08.90304"W	831.036	3429078.297	706679.585	854.59	LIPT	NVA
1011	29°16'11.90089"N	103°18'04.56948"W	1619.775	3239093.257	665037.202	1641.018	LIPT	NVA
1012	31°21'06.71440"N	104°28'19.91964"W	1353.514	3468718.797	550201.363	1376.291	LIPT	NVA
1013	30°29'49.00265"N	103°45'05.06592"W	1330.789	3374515.642	619824.002	1351.838	LIPT	NVA
1014	31°03'41.13504"N	104°30'12.69360"W	1218.024	3436515.439	547366.288	1240.417	LIPT	NVA
1015	30°27'49.61124"N	104°20'31.00092"W	1415.201	3370361.778	563171.398	1437.362	LIPT	NVA
1016	31°40'13.36976"N	104°26'23.11476"W	1236.164	3504037.13	553107.04	1260.284	LIPT	NVA
1017	31°02'14.08643"N	104°49'50.71188"W	1207.439	3433742.063	516151.043	1230.286	LIPT	NVA
1018	31°07'48.03539"N	103°35'34.91160"W	830.276	3444862.012	634141.537	853.846	LIPT	NVA
1019	30°53'35.88518"N	102°10'39.16020"W	835.854	3421190.862	769800.22	859.158	LIPT	NVA
1020	30°31'00.33071"N	103°25'54.31224"W	1182.674	3377094.501	650473.134	1204.628	LIPT	NVA
1021	30°40'12.75398"N	104°36'10.40508"W	1262.034	3393121.034	538040.485	1284.786	LIPT	NVA
1022	29°33'37.65085"N	104°23'06.48600"W	761.284	3270239.897	559562.486	784.431	LIPT	NVA
1023	30°40'57.31025"N	104°01'45.60024"W	1870.261	3394827.268	592973.378	1891.471	LIPT	NVA
1024	29°28'11.02318"N	103°57'27.89136"W	1244.832	3260481.567	601055.845	1266.677	LIPT	NVA
1025	30°23'28.13773"N	102°13'01.34220"W	794.663	3365416.17	767402.939	817.79	LIPT	NVA
1027	29°20'09.67974"N	103°31'57.77076"W	778.364	3246108.726	642457.042	800.354	LIPT	NVA
1028	30°31'59.49242"N	104°03'33.09552"W	1627.66	3378246.25	590251.625	1648.947	LIPT	NVA
1029	30°09'27.68566"N	103°52'43.82436"W	1421.246	3336789.666	607965.347	1442.539	LIPT	NVA
1029A	30°09'27.78476"N	103°52'43.81680"W	1421.227	3336792.719	607965.52	1442.52	LIPT	NVA

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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	ELEVATION		
			METERS	METERS	METERS	METERS		
						GEOID 12B		
1031	29°50'49.55402"N	104°17'34.05912"W	1290.316	3302052.638	568313.564	1312.611	LIPT	NVA
1032	29°28'25.26845"N	103°22'06.99780"W	1021.873	3261575.974	658178.473	1043.441	LIPT	NVA
1033	30°22'05.65982"N	103°31'05.91384"W	1344.912	3360521.222	642382.896	1366.27	LIPT	NVA
1035	30°51'48.53484"N	104°46'42.74400"W	1186.034	3414493.45	521171.998	1208.988	LIPT	NVA
1036	31°11'14.61768"N	103°56'39.20856"W	1001.188	3450850.156	600595.742	1024.275	LIPT	NVA
1037	29°52'25.23158"N	103°15'05.06772"W	966.688	3306071.486	668874.173	988.433	LIPT	NVA
1042	29°35'32.62628"N	103°33'41.11884"W	997.877	3274484.762	639318.577	1019.583	LIPT	NVA
1044	30°57'28.34266"N	104°09'41.25924"W	1388.804	3425234.701	580088.551	1410.708	LIPT	NVA
1045	29°28'31.84086"N	103°31'45.63336"W	987.985	3261570.641	642589.561	1009.726	LIPT	NVA
1046	29°16'00.86189"N	103°48'23.55444"W	692.309	3238147.524	615947.17	714.36	LIPT	NVA
1047	30°36'52.73410"N	103°52'18.40476"W	1439.388	3387438.826	608140.872	1460.563	LIPT	NVA
1048	30°21'45.29682"N	102°22'06.74328"W	916.638	3361900.546	752914.349	939.524	LIPT	NVA
1049	29°39'51.55052"N	104°29'55.96836"W	776.488	3281695.149	548494.004	799.816	LIPT	NVA
1050	29°49'26.17457"N	102°06'09.17712"W	512.336	3302799.461	780005.135	534.934	LIPT	NVA
1051	30°55'10.44721"N	103°05'55.88160"W	899.854	3422237.176	681662.734	923.347	LIPT	NVA
1052	29°48'03.84156"N	103°11'25.67184"W	881.28	3298115.124	674887.38	903.067	LIPT	NVA
1053	29°53'29.36915"N	104°16'27.93792"W	1314.376	3306982.896	570056.773	1336.635	LIPT	NVA
1054	31°41'52.01556"N	104°51'48.19572"W	1165.105	3506946.026	512945.913	1188.343	LIPT	NVA
1055	30°03'48.37961"N	103°35'02.58288"W	1312.681	3326659.88	636485.051	1333.893	LIPT	NVA
1056	29°33'41.74862"N	103°50'16.01520"W	1317.007	3270771.752	612586.64	1338.704	LIPT	NVA
1057	29°19'39.89752"N	104°01'40.97784"W	800.92	3244690.4	594370.113	823.082	LIPT	NVA
1058	31°03'03.40877"N	104°38'41.24004"W	1156.808	3435302.341	533892.665	1179.52	LIPT	NVA
1060	30°59'01.35229"N	104°59'06.23112"W	1268.076	3427796.576	501426.104	1291.036	LIPT	NVA
1060A	29°32'40.15637"N	104°11'54.51612"W	849.503	3268580.515	577656.981	872.165	LIPT	NVA
1062	30°21'00.33883"N	102°57'40.43808"W	1245.361	3359341.766	695960.906	1267.491	LIPT	NVA
1063	30°02'16.89821"N	104°35'59.06940"W	1043.061	3323066.568	538589.437	1066.028	LIPT	NVA
1064	31°27'54.22464"N	104°26'11.87124"W	1223.528	3481281.739	553520.243	1246.863	LIPT	NVA

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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	ELEVATION		
			METERS	METERS	METERS	METERS		
						GEOID 12B		
1065	30°37'35.49832"N	102°11'27.46932"W	785.369	3391577.211	769259.313	808.535	LIPT	NVA
1067	31°57'17.27338"N	104°59'02.38524"W	1087.645	3535425.54	501512.414	1110.368	LIPT	NVA
1068	31°21'08.22139"N	104°49'12.84492"W	1093.198	3468658.842	517098.085	1116.189	LIPT	NVA
1070	31°30'44.29501"N	104°38'20.36868"W	1459.13	3486436.81	534278.559	1482.177	LIPT	NVA
1072	29°26'58.69140"N	102°49'28.32600"W	503.469	3259773.148	710993.012	525.124	LIPT	NVA
1073	31°51'40.13035"N	104°49'14.40012"W	1630.186	3525059.104	516964.479	1652.886	LIPT	NVA
1074	29°18'27.29095"N	103°28'40.41660"W	843.283	3243024.986	647821.166	865.23	LIPT	NVA
1076	31°25'42.71822"N	104°50'51.54576"W	1081.186	3477105.755	514478.664	1104.232	LIPT	NVA
1077	29°05'23.76532"N	103°27'19.15704"W	675.749	3218935.06	650330.846	697.832	LIPT	NVA
1078	31°36'39.04992"N	104°51'26.05464"W	1088.177	3497311.206	513541.34	1111.482	LIPT	NVA
1079	30°31'34.18334"N	102°51'44.43048"W	1219.739	3379034.642	705099.091	1242.435	LIPT	NVA
1080	30°20'47.97143"N	104°09'15.05232"W	1472.52	3357502.136	581293.701	1494.26	LIPT	NVA
1081	29°16'12.47480"N	103°09'02.33532"W	930.328	3239332.562	679672.767	951.759	LIPT	NVA
1082	30°07'41.01589"N	103°14'37.27536"W	1182.706	3334277.391	669187.599	1204.408	LIPT	NVA
1083	31°16'07.14295"N	103°51'21.80196"W	912.418	3459940.154	608903.821	936.126	LIPT	NVA
1084	30°53'25.55628"N	102°18'51.49620"W	765.411	3420549.721	756730.236	788.681	LIPT	NVA
1085	30°42'15.92755"N	104°06'53.63676"W	1794.044	3397179.771	584758.221	1815.306	LIPT	NVA
1088	31°16'29.89834"N	104°05'33.82800"W	1023.565	3460431.369	586365.642	1046.818	LIPT	NVA
1089	31°51'53.03783"N	104°28'59.63484"W	1107.493	3525558.876	548883.329	1131.739	LIPT	NVA
1090	30°05'39.57119"N	104°01'26.17644"W	1281.513	3329639.16	594052.054	1303.246	LIPT	NVA
1090A	30°05'39.45509"N	104°01'26.56524"W	1281.324	3329635.498	594041.678	1303.058	LIPT	NVA
1092	30°48'55.23790"N	103°50'39.23592"W	1165.813	3409708.935	610552.228	1187.823	LIPT	NVA
1093	30°02'31.65529"N	103°16'58.82952"W	1120.917	3324695.344	665542.347	1142.594	LIPT	NVA
1094	30°02'18.23604"N	102°06'15.25248"W	629.172	3326574.531	779241.805	652.105	LIPT	NVA
1095	29°41'30.24348"N	103°09'48.62556"W	836.077	3286038.667	677685.97	857.89	LIPT	NVA
1096	30°16'41.53609"N	103°10'09.78960"W	1283.141	3351031.87	676078.771	1304.978	LIPT	NVA
1096A	30°43'56.52314"N	103°46'57.37260"W	1298.566	3400574.953	616547.583	1320.155	LIPT	NVA

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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	ELEVATION		
			METERS	METERS	METERS	METERS		
						GEOID 12B		
1097	30°31'06.91651"N	104°24'38.02752"W	1380.748	3376399.093	556552.395	1403.11	LIPT	NVA
1098	29°47'36.25886"N	102°40'21.94104"W	792.114	3298164.12	724951.781	814.031	LIPT	NVA
1100	31°12'00.07272"N	103°41'32.75196"W	850.371	3452505.972	624572.188	874.132	LIPT	NVA
1101	31°03'55.60531"N	104°08'50.42004"W	1233.615	3437167.374	581345.965	1255.886	LIPT	NVA
1102	30°14'46.25563"N	103°04'22.61352"W	1252.468	3347635.846	685416.576	1274.32	LIPT	NVA
1103	30°50'51.66074"N	102°40'11.31420"W	862.219	3415045.912	722836.25	885.777	LIPT	NVA
1104	30°28'17.58004"N	102°55'41.93904"W	1308.843	3372862.608	698878.888	1331.272	LIPT	NVA
1105	31°55'17.80399"N	104°25'30.06516"W	1094.557	3531891.271	554356.674	1118.996	LIPT	NVA
1107	30°38'58.06720"N	104°16'37.98840"W	1633.98	3390977.382	569253.054	1655.737	LIPT	NVA
1108	29°54'44.30934"N	102°44'53.38320"W	864.299	3311199.577	717403.597	886.195	LIPT	NVA
1109	30°21'39.40391"N	102°42'18.37512"W	1119.205	3361015.507	720561.073	1141.588	LIPT	NVA
1110	29°46'26.80486"N	104°20'42.28980"W	1161.879	3293935.293	563308.737	1184.375	LIPT	NVA
1111	30°58'28.04412"N	103°16'12.76320"W	882.171	3428054.696	665191.938	905.672	LIPT	NVA
1112	29°23'44.73402"N	103°08'43.18548"W	846.251	3253263.704	679968.802	867.813	LIPT	NVA
1113	30°55'23.32409"N	103°12'21.70980"W	912.591	3422463.904	671413.716	936.047	LIPT	NVA
1114	29°54'40.07124"N	103°15'42.54084"W	981.906	3310207.511	667805.942	1003.642	LIPT	NVA
1115	30°05'18.71783"N	104°10'08.93244"W	1458.91	3328886.606	580063.944	1480.74	LIPT	NVA
1116	29°48'52.48235"N	102°50'07.36908"W	832.605	3300204.675	709184.927	854.436	LIPT	NVA
1117	29°23'20.78567"N	104°08'16.35648"W	735.616	3251405.48	583655.977	758.079	LIPT	NVA
1118	29°46'41.15428"N	104°00'31.27356"W	1069.033	3294608.995	595824.269	1090.988	LIPT	NVA
1119	30°29'36.57851"N	103°57'24.72912"W	1519.407	3373933.007	600108.746	1540.635	LIPT	NVA
1121	29°21'18.20513"N	103°17'50.29692"W	1099.894	3248528.108	665285.209	1121.34	LIPT	NVA
1124	30°30'12.26466"N	103°13'48.21384"W	1231.397	3375900.963	669851.707	1253.532	LIPT	NVA
1126	30°44'30.22296"N	102°10'56.06508"W	890.016	3404372.179	769774.975	913.191	LIPT	NVA
1127	29°24'59.00137"N	103°30'59.57424"W	934.008	3255034.582	643913.594	955.806	LIPT	NVA
1129	30°08'25.34611"N	102°23'58.24140"W	823.346	3337195.746	750500.306	845.891	LIPT	NVA
1129A	30°33'45.32688"N	104°27'59.60592"W	1342.664	3381248.741	551157.006	1365.172	LIPT	NVA

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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	ELEVATION		
			METERS	METERS	METERS	METERS		
						GEOID 12B		
1130	30°23'11.99191"N	104°14'39.52536"W	1472.444	3361874.355	572601.129	1494.346	LIPT	NVA
1131	30°44'39.77858"N	104°46'56.58672"W	1225.057	3401293.926	520830.061	1248.04	LIPT	NVA
1132	30°26'12.98706"N	103°38'51.49284"W	1277.711	3367980.037	629863.025	1298.89	LIPT	NVA
1133	30°09'43.60828"N	102°38'33.77508"W	1008.449	3339096.318	727016.156	1030.665	LIPT	NVA
1136	29°31'20.53186"N	104°16'13.08972"W	757.839	3266083.883	570713.176	780.725	LIPT	NVA
1137	30°59'37.39106"N	102°30'57.14748"W	749.952	3431554.828	737200.398	773.15	LIPT	NVA
1137A	31°15'05.62856"N	103°04'04.51488"W	769.121	3459091.706	683978.231	792.828	LIPT	NVA
1138	29°55'55.30044"N	102°22'59.59416"W	567.964	3314133.003	752598.544	590.365	LIPT	NVA
1139	29°50'09.92594"N	103°13'28.60500"W	924.189	3301945.508	671526.673	945.945	LIPT	NVA
1140	30°41'57.39612"N	103°22'10.52616"W	1029.648	3397409.422	656145.228	1052.081	LIPT	NVA
1141	29°48'26.56886"N	102°54'38.29680"W	822.581	3299272.48	701924.958	844.412	LIPT	NVA
1142	30°12'05.10451"N	104°13'51.27348"W	1507.964	3341354.375	574027.872	1529.784	LIPT	NVA
1144	30°50'28.69523"N	102°34'42.43908"W	837.324	3414524.552	731590.23	860.791	LIPT	NVA
1145	31°04'09.46625"N	104°13'02.33724"W	1257.241	3437544.935	574666.775	1279.47	LIPT	NVA
1146	30°28'44.86980"N	102°50'51.54684"W	1235.471	3373847.79	706608.305	1258.017	LIPT	NVA
1147	31°17'43.45328"N	104°34'29.92332"W	1217.219	3462418.766	540449.664	1239.894	LIPT	NVA
1148	30°46'11.80718"N	104°48'44.22060"W	1256.552	3404121.73	517963.447	1279.567	LIPT	NVA
1149	30°46'13.78333"N	103°09'24.22908"W	1006.411	3405619.52	676404.333	1029.466	LIPT	NVA
1150	31°02'58.77218"N	104°55'48.19440"W	1341.16	3435107.514	506674.007	1363.944	LIPT	NVA
1151	31°13'49.19034"N	102°19'24.24216"W	720.414	3458217.801	754951.358	743.925	LIPT	NVA
1152	30°43'27.38039"N	104°40'18.23376"W	1232.783	3399091.033	531428.381	1255.618	LIPT	NVA
1153	29°14'49.66480"N	103°05'49.56504"W	763.386	3236866.548	684917.516	784.943	LIPT	NVA
1154	30°43'54.34090"N	103°06'28.52064"W	986.765	3401403.797	681148.669	1009.824	LIPT	NVA
1155	30°11'39.21918"N	102°53'23.26596"W	1268.591	3342189.666	703149.648	1290.434	LIPT	NVA
1156	29°36'21.75530"N	102°53'17.99304"W	571.657	3276995.237	704489.039	593.493	LIPT	NVA
1157	30°51'08.90996"N	103°23'25.18908"W	988.079	3414361.584	653914.554	1010.991	LIPT	NVA
1158	30°25'29.45827"N	102°08'38.86548"W	784.138	3369327.544	774317.035	807.319	LIPT	NVA

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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	ELEVATION		
			METERS	METERS	METERS	METERS		
						GEOID 12B		
1159	30°38'10.26769"N	102°32'23.36172"W	968.77	3391863.844	735785.439	991.841	LIPT	NVA
1160	31°22'45.21371"N	102°20'58.60140"W	764.636	3474667.875	752056.77	788.252	LIPT	NVA
1161	30°33'39.10954"N	103°55'03.46908"W	1476.322	3381434.82	603803.046	1497.495	LIPT	NVA
1163	30°19'01.54553"N	102°26'31.76628"W	940.746	3356695.41	745950.289	963.455	LIPT	NVA
1164	31°53'55.04111"N	104°29'53.34792"W	1146.88	3529308.676	547454.559	1171.029	LIPT	NVA
1165	30°02'19.23803"N	104°01'32.83392"W	1256.249	3323470.869	593926.387	1278.056	LIPT	NVA
1165A	30°02'19.07819"N	104°01'33.04236"W	1256.187	3323465.902	593920.847	1277.994	LIPT	NVA
1166	30°07'41.53811"N	104°40'40.18620"W	842.668	3333035.44	531032.663	865.82	LIPT	NVA
1167	31°42'49.78094"N	104°35'04.94736"W	1312.977	3508791.369	539348.088	1336.682	LIPT	NVA
1168	29°41'00.11648"N	103°21'18.57168"W	1094.793	3284832.036	659153.542	1116.321	LIPT	NVA
1169	30°59'34.36264"N	103°43'50.14776"W	942.134	3429504.109	621198.64	965.064	LIPT	NVA
1171	30°59'14.30801"N	103°37'46.11648"W	883.432	3429001.211	630861.685	906.407	LIPT	NVA
1172	29°46'07.02815"N	103°34'44.83272"W	1175.869	3293992.679	637364.551	1197.428	LIPT	NVA
1173	30°32'03.03533"N	103°47'06.10836"W	1366.847	3378606.737	616552.629	1387.924	LIPT	NVA
1175	31°21'18.67738"N	104°10'57.47232"W	1068.306	3469255.342	577741.478	1091.759	LIPT	NVA
1176	31°09'07.88292"N	103°49'39.86256"W	925.162	3447059.943	611736.607	948.451	LIPT	NVA
1177	29°34'24.94214"N	103°08'12.43860"W	802.775	3272986.408	680482.139	824.455	LIPT	NVA
1178	30°04'10.98440"N	104°27'13.92804"W	1627.262	3326636.397	552636.624	1649.486	LIPT	NVA
1179	31°03'30.99474"N	103°03'59.14116"W	844.228	3437703.847	684494	867.86	LIPT	NVA
1180	31°05'46.20005"N	102°26'23.88516"W	684.688	3443078.396	744188.743	707.93	LIPT	NVA
1181	31°06'49.67752"N	104°38'31.83792"W	1130.691	3442268.921	534119.404	1153.411	LIPT	NVA
1182	31°23'27.08282"N	103°02'57.40044"W	730.226	3474564.991	685480.371	753.998	LIPT	NVA
1183	30°40'13.29053"N	102°29'45.98304"W	973.926	3395745.196	739892.055	997.031	LIPT	NVA
1184	29°47'32.09683"N	103°11'05.22924"W	867.91	3297146.433	675451.678	889.706	LIPT	NVA
1185	30°33'16.30555"N	102°17'33.60408"W	825.836	3383354.849	759699.025	848.926	LIPT	NVA
1186	29°19'41.84742"N	103°12'21.21732"W	1115.666	3245694.553	674205.73	1137.03	LIPT	NVA
1188	30°35'03.99894"N	102°35'12.79068"W	981.161	3386029.646	731396.615	1004.139	LIPT	NVA

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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	ELEVATION		
			METERS	METERS	METERS	METERS		
						GEOID 12B		
1189	31°12'37.15398"N	104°35'56.90004"W	1131.721	3452980.331	538184.527	1154.379	LIPT	NVA
1191	31°08'58.79746"N	103°16'42.87180"W	820.602	3447464.213	664091.954	844.311	LIPT	NVA
1192	31°03'42.56402"N	103°10'07.47696"W	844.753	3437894.53	674723.961	868.42	LIPT	NVA
1193	30°02'36.80002"N	102°20'44.50992"W	736.32	3326581.058	755935.481	758.847	LIPT	NVA
1194	31°22'19.05748"N	102°52'05.84832"W	729.102	3472789.593	702733.226	752.491	LIPT	NVA
1195	29°17'51.66470"N	103°50'41.63496"W	745.783	3241520.688	612186.919	767.852	LIPT	NVA
1196	30°36'10.25672"N	102°56'31.02756"W	1121.805	3387393.441	697303.852	1144.678	LIPT	NVA
1197	30°00'05.09792"N	104°37'03.77544"W	987.752	3319003.77	536870.079	1010.851	LIPT	NVA
1198	29°28'44.64152"N	103°43'57.08064"W	1169.019	3261732.982	622883.898	1190.755	LIPT	NVA
1199	31°45'30.37093"N	104°57'45.80100"W	1092.376	3513661.302	503530.259	1115.49	LIPT	NVA
1200	30°56'30.41027"N	103°50'50.44128"W	1040.578	3423719.32	610109.775	1063.086	LIPT	NVA
1201	29°55'02.61426"N	103°34'55.45848"W	1192.286	3310476.698	636876.088	1213.825	LIPT	NVA
1202	29°41'22.02439"N	104°21'39.27924"W	954.866	3284545.643	561830.332	977.713	LIPT	NVA
1203	29°38'12.73024"N	103°09'23.20884"W	791.142	3279968.768	678466.052	812.911	LIPT	NVA
1204	31°19'31.84100"N	102°39'14.36292"W	711.834	3468054.512	723228.856	735.02	LIPT	NVA
1205	30°10'22.77224"N	103°53'23.51616"W	1416.722	3338475.046	606887.036	1438.029	LIPT	NVA
1205A	30°08'47.76972"N	103°56'16.57860"W	1391.078	3335506.437	602285.403	1412.543	LIPT	NVA
1206	31°13'36.53245"N	102°37'35.13252"W	699.022	3457167.804	726087.819	722.123	LIPT	NVA
1207	30°52'16.52988"N	104°09'08.71380"W	1508.848	3415641.785	581024.988	1530.531	LIPT	NVA
1208	29°41'00.80333"N	103°35'18.09708"W	1087.829	3284555.03	636586.353	1109.461	LIPT	NVA
1209	30°35'15.06451"N	104°30'00.21672"W	1326.06	3383996.428	547931.776	1348.637	LIPT	NVA
1211	29°37'25.53503"N	103°03'00.21384"W	747.213	3278684.436	688791.395	769.002	LIPT	NVA
1212	31°18'41.87513"N	103°55'54.80580"W	926.948	3464631.795	601637.828	950.709	LIPT	NVA
1213	30°12'44.05136"N	103°07'59.32704"W	1230.193	3343776.623	679685.152	1252.001	LIPT	NVA
1214	30°04'09.37668"N	102°19'46.95600"W	776.486	3329468.049	757410.971	799.064	LIPT	NVA
1215	30°08'08.31901"N	102°33'23.03460"W	946.403	3336337.054	735394.18	968.72	LIPT	NVA
1216	29°32'11.59080"N	103°32'38.40432"W	1027.181	3268317.311	641083.475	1048.904	LIPT	NVA

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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	ELEVATION		
			METERS	METERS	METERS	METERS		
						GEOID 12B		
1217	30°22'52.53614"N	103°43'39.68652"W	1390.602	3361719.799	622244.454	1411.552	LIPT	NVA
1218	30°53'20.24815"N	102°54'14.87268"W	899.213	3419177.386	700337.089	922.76	LIPT	NVA
1219	29°14'47.31151"N	103°00'45.96696"W	672.731	3236930.106	693115.625	694.247	LIPT	NVA
1221	30°33'17.14806"N	102°25'27.26472"W	909.604	3383084.684	747073.194	932.589	LIPT	NVA
1222	31°19'00.59765"N	103°47'25.29204"W	862.52	3465347.4	615100.062	886.607	LIPT	NVA
1223	29°59'56.31299"N	102°23'58.88616"W	664.89	3321519.039	750839.771	687.319	LIPT	NVA
1224	29°38'01.04356"N	104°21'30.61476"W	866.09	3278360.854	562097.466	889.084	LIPT	NVA
1225	30°12'58.85640"N	103°55'09.32160"W	1412.616	3343252.691	604011.484	1433.957	LIPT	NVA
1226	29°10'48.09720"N	102°57'38.86056"W	537.32	3229652.258	698295.456	558.813	LIPT	NVA
1228	30°34'54.46060"N	104°17'16.96596"W	1548.758	3383471.555	568263.091	1570.642	LIPT	NVA
1229	30°53'24.07520"N	102°23'59.24184"W	753.407	3420310.38	748556.935	776.689	LIPT	NVA
1230	31°00'06.80184"N	102°07'42.09780"W	658.457	3433352.309	774192.987	681.998	LIPT	NVA
1231	31°22'14.59805"N	103°41'11.70780"W	824.412	3471433.73	624903.865	848.852	LIPT	NVA
1232	30°27'58.33015"N	103°41'35.46888"W	1292.439	3371171.705	625451.239	1313.554	LIPT	NVA
1233	30°40'04.14689"N	103°12'48.83328"W	1031.486	3394149.997	671145.639	1054.172	LIPT	NVA
1234	29°48'17.90928"N	103°34'33.50100"W	1132.13	3298025.46	637619.134	1153.712	LIPT	NVA
1235	30°10'44.57060"N	103°52'46.68456"W	1422.191	3339155.721	607865.573	1443.462	LIPT	NVA
1236	31°23'25.72494"N	103°19'17.99940"W	760.131	3474095.739	659577.812	784.419	LIPT	NVA
1237	30°47'18.70663"N	104°10'04.49256"W	1653.24	3406462.007	579612.012	1674.76	LIPT	NVA
1238	31°22'16.72500"N	102°43'12.28224"W	734.246	3473000.471	716833.61	757.462	LIPT	NVA
1239	31°04'33.40844"N	102°46'33.18528"W	757.431	3440145.217	712184.134	780.83	LIPT	NVA
1240	31°05'08.40761"N	102°33'41.54832"W	720.051	3441652.96	732614.712	743.15	LIPT	NVA
1241	31°00'09.05314"N	104°11'36.22488"W	1314.773	3430159.824	577002.508	1336.814	LIPT	NVA
1242	30°44'23.90042"N	103°24'21.18348"W	1053.844	3401870.213	652604.796	1076.313	LIPT	NVA
1243	31°00'43.88036"N	102°22'05.81232"W	733.663	3433927.02	751249.614	756.931	LIPT	NVA
1245	30°38'04.75210"N	104°44'47.40756"W	1137.216	3389140.877	524292.256	1160.192	LIPT	NVA
1246	31°15'08.51033"N	102°46'16.08096"W	714.121	3459713.192	712243.573	737.399	LIPT	NVA



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			METERS	METERS	METERS	METERS		
						GEOID 12B		
1246A	31°07'44.52247"N	104°58'27.23988"W	1442.867	3443902.573	502456.527	1465.529	LIPT	NVA
1247	30°10'05.70630"N	102°28'38.86284"W	887.442	3340117.673	742920.629	909.912	LIPT	NVA
1248	30°42'16.03422"N	104°13'25.84596"W	1802.761	3397105.818	574324.986	1824.267	LIPT	NVA
1251	31°21'17.10104"N	103°13'32.64204"W	758.668	3470278.189	668764.371	782.716	LIPT	NVA
1252	31°12'33.36606"N	104°43'11.14212"W	1106.932	3452828.327	526694.695	1129.772	LIPT	NVA
1253	30°38'20.25096"N	104°48'33.35940"W	1136.979	3389606.099	518276.832	1160.072	LIPT	NVA
1254	31°01'44.64185"N	103°57'33.79320"W	1123.052	3433288.247	599315.656	1145.552	LIPT	NVA
1255	31°12'55.62230"N	103°34'23.13912"W	794.955	3454356.936	635920.4	818.83	LIPT	NVA
1256	30°57'11.41798"N	103°24'55.41336"W	927.317	3425488.898	651359.255	950.494	LIPT	NVA
1257	30°33'19.23977"N	103°21'46.66932"W	1102.976	3381465.112	657012.256	1125.146	LIPT	NVA
1257A	30°18'34.77593"N	104°01'12.03492"W	1407.979	3353505.696	594225.244	1429.499	LIPT	NVA
1258	30°01'45.09631"N	104°12'07.95708"W	1569.211	3322288.247	576923.689	1591.12	LIPT	NVA
1259	31°22'28.74814"N	103°27'31.94676"W	761.756	3472150.341	646555.027	786.183	LIPT	NVA
1260	30°28'55.25033"N	102°31'44.96160"W	1015.062	3374793.641	737183.052	1037.861	LIPT	NVA
1261	31°58'14.01240"N	104°37'51.84552"W	1324.541	3537231.812	534858.817	1347.886	LIPT	NVA
1262	30°54'07.38367"N	103°47'26.30580"W	1060.359	3419373.289	615574.712	1082.803	LIPT	NVA
1263	30°03'10.87938"N	102°12'21.23928"W	676.06	3327951.902	769394.729	698.849	LIPT	NVA
1264	31°03'29.02853"N	104°33'26.13672"W	1181.737	3436121.054	542241.191	1204.275	LIPT	NVA
1265	30°31'39.16492"N	104°13'20.60436"W	1633.412	3377501.205	574599.938	1655.069	LIPT	NVA
1267	30°51'44.93610"N	102°18'24.62976"W	785.556	3417467.792	757518.691	808.8	LIPT	NVA
1268	31°17'25.71684"N	103°23'42.31464"W	772.329	3462906.156	652757.558	796.393	LIPT	NVA
1269	29°45'23.60999"N	102°48'09.08208"W	855.703	3293833.515	712483.594	877.527	LIPT	NVA
1270	30°40'51.57257"N	102°41'30.70104"W	1031.392	3396522.015	721107.885	1054.643	LIPT	NVA
1271	30°13'44.70726"N	103°33'59.20632"W	1556.462	3345039.285	637951.429	1577.423	LIPT	NVA
1272	29°52'11.00921"N	103°34'39.42984"W	1136.848	3305199.265	637371.309	1158.444	LIPT	NVA
1273	30°48'18.39438"N	103°53'31.86348"W	1217.469	3408528.225	605976.438	1239.332	LIPT	NVA
1274	29°47'57.30709"N	103°04'33.35412"W	847.952	3298093.283	685962.114	869.783	LIPT	NVA

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			METERS	METERS	METERS	METERS		
						GEOID 12B		
1275	29°46'01.23100"N	102°55'45.05520"W	823.88	3294765.267	700212.768	845.737	LIPT	NVA
1276	29°43'58.85638"N	102°55'43.31100"W	830.101	3290998.298	700327.241	851.969	LIPT	NVA
1277	30°17'10.55332"N	102°16'01.14348"W	781.293	3353669.986	762882.555	804.288	LIPT	NVA
1278	30°08'30.23225"N	103°34'56.51796"W	1415.942	3335338.79	636539.759	1436.994	LIPT	NVA
1279	31°01'28.16882"N	103°39'15.25176"W	887.471	3433093.765	628447.462	910.58	LIPT	NVA
1282	30°41'24.62478"N	103°10'26.93964"W	1016.761	3396688.718	674882.007	1039.581	LIPT	NVA
1283	31°09'21.33871"N	102°47'41.31024"W	740.761	3448976.275	710201.921	764.099	LIPT	NVA
1284	30°24'16.59521"N	102°50'41.46000"W	1275.667	3365592.001	707034.838	1298.002	LIPT	NVA
1285	30°25'20.96173"N	103°59'18.26916"W	1506.978	3366036.419	597152.251	1528.324	LIPT	NVA
1287	30°10'41.88428"N	104°17'01.73796"W	1577.625	3338759.473	568951.36	1599.492	LIPT	NVA
1289	29°54'43.32035"N	104°02'20.84316"W	1190.753	3309425.897	592758.18	1212.725	LIPT	NVA
1289A	29°54'42.22656"N	104°02'20.04864"W	1190.02	3309392.406	592779.768	1211.992	LIPT	NVA
1290	30°47'45.33774"N	104°47'13.37856"W	1208.865	3407005.277	520372.722	1231.846	LIPT	NVA
1291	31°08'10.21366"N	103°37'34.65552"W	834.578	3445505.076	630961.538	858.16	LIPT	NVA
1292	30°16'06.56508"N	103°49'10.57224"W	1526.057	3349126.451	613542.791	1547.09	LIPT	NVA
1293	29°10'05.88061"N	103°36'14.31576"W	656.108	3227438.239	635758.844	678.174	LIPT	NVA
1294	29°59'50.90957"N	103°33'19.55304"W	1250.314	3319383.853	639336.263	1271.664	LIPT	NVA
1295	30°09'45.28098"N	102°03'53.52084"W	605.14	3340440.666	782685.878	628.332	LIPT	NVA
1296	29°49'37.93868"N	103°54'09.88236"W	1235.437	3300143.485	606013.853	1257.208	LIPT	NVA
1298	29°31'37.98228"N	102°55'06.10968"W	755.989	3268205.676	701736.806	777.604	LIPT	NVA
1299	29°20'39.34540"N	103°49'33.34908"W	828.702	3246700.271	613977.513	850.692	LIPT	NVA
1300	30°12'40.81568"N	104°03'59.04504"W	1353.979	3342572.043	589854	1375.64	LIPT	NVA
1300A	30°12'40.19281"N	104°03'57.58092"W	1353.445	3342553.19	589893.301	1375.105	LIPT	NVA
1301	31°17'08.92702"N	104°10'22.65708"W	1040.813	3461572.953	578719.024	1063.982	LIPT	NVA
1302	31°04'11.79426"N	104°22'38.73360"W	1329.329	3437519.932	559391.813	1351.513	LIPT	NVA
1303	31°01'13.05545"N	103°28'58.17720"W	882.595	3432839.159	644815.844	905.859	LIPT	NVA
1307	30°52'46.18841"N	102°27'40.30596"W	796.8	3419008.237	742711.709	820.106	LIPT	NVA

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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	ELEVATION		
			METERS	METERS	METERS	METERS		
						GEOID 12B		
1308	30°14'45.40636"N	103°23'23.64432"W	1314.13	3347135.304	654916.069	1335.585	LIPT	NVA
1309	30°44'22.58398"N	102°54'52.34832"W	1069.764	3402602.1	699650.671	1093.056	LIPT	NVA
1312	31°03'42.33028"N	102°53'27.09240"W	797.039	3438358.021	701242.912	820.565	LIPT	NVA
1313	29°12'35.00611"N	103°25'14.60064"W	955.219	3232254.279	653520.258	977.059	LIPT	NVA
1314	29°08'59.01209"N	103°29'13.35084"W	703.32	3225520.645	647158.205	725.416	LIPT	NVA
1315	31°23'19.98488"N	102°33'45.14004"W	728.154	3475270.204	731777.368	751.409	LIPT	NVA
1316	29°57'08.61307"N	104°14'00.07188"W	1424.418	3313757.195	573977.683	1446.488	LIPT	NVA
1318	29°53'58.09571"N	104°38'20.15880"W	875.734	3307700.766	534859.239	899.093	LIPT	NVA
1319	29°57'00.69646"N	102°05'05.86608"W	617.991	3316841.529	781350.191	640.781	LIPT	NVA
1320	31°00'38.05805"N	103°48'41.89356"W	990.984	3431379.682	613439.652	1013.822	LIPT	NVA
1322	31°16'08.63148"N	104°18'51.43068"W	1166.718	3459624.402	565278.585	1189.525	LIPT	NVA
1323	30°14'08.58689"N	103°13'36.82128"W	1258.935	3346235.035	670619.815	1280.699	LIPT	NVA
1325	30°24'00.39856"N	102°39'36.81036"W	1079.414	3365445.608	724785.825	1101.917	LIPT	NVA
1326	30°50'08.70814"N	103°24'19.30140"W	1011.75	3412487.369	652503.569	1034.57	LIPT	NVA
1326A	30°51'00.73829"N	103°25'15.13992"W	1003.532	3414068.289	650997.377	1026.372	LIPT	NVA
1327	29°39'32.08090"N	103°38'42.02412"W	1018.805	3281758.345	631136.847	1040.532	LIPT	NVA
1328	31°08'49.80520"N	102°42'05.70564"W	721.163	3448185.959	719110.464	744.383	LIPT	NVA
1329	31°18'52.31444"N	103°30'25.60572"W	767.643	3465422.824	642057.585	791.874	LIPT	NVA
1330	31°11'11.42664"N	102°53'29.79168"W	747.926	3452186.641	700908.177	771.372	LIPT	NVA
1333	31°16'51.81006"N	102°49'13.48896"W	712.079	3462800.721	707486.984	735.421	LIPT	NVA
1334	30°29'50.24962"N	102°42'58.29588"W	1101.309	3376109.089	719189.721	1123.993	LIPT	NVA
1335	29°18'44.04467"N	103°36'47.79828"W	804.493	3243377.267	634665.685	826.496	LIPT	NVA
1337	30°53'23.63690"N	102°43'32.30220"W	847.828	3419616.033	717400.498	871.41	LIPT	NVA
1339	30°54'00.73048"N	104°46'06.80052"W	1179.913	3418564.937	522118.081	1202.848	LIPT	NVA
1340	31°15'18.81227"N	102°55'14.98548"W	738.802	3459752.222	697979.825	762.282	LIPT	NVA
1341	30°42'50.48766"N	102°22'40.92564"W	953.465	3400845.059	751094.764	976.573	LIPT	NVA
1342	31°07'53.60056"N	104°01'05.99664"W	1110.182	3444596.292	593589.183	1132.876	LIPT	NVA

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			METERS	METERS	METERS	METERS		
						GEOID 12B		
1344	31°08'54.12332"N	103°23'56.48316"W	821.209	3447148.027	652611.113	844.882	LIPT	NVA
1345	29°37'17.70823"N	103°39'57.89664"W	1047.775	3277598.309	629144.574	1069.544	LIPT	NVA
1346	30°22'36.95786"N	104°00'19.47348"W	1457.552	3360973.217	595563.745	1478.979	LIPT	NVA
1347	31°00'48.69457"N	102°13'41.75904"W	675.409	3434400.419	764617.9	698.885	LIPT	NVA
1348	29°29'02.28847"N	103°07'55.58304"W	877.313	3263060.386	681095.422	898.883	LIPT	NVA
1349	31°21'57.08704"N	103°33'50.69664"W	782.473	3471040.096	636561.849	806.923	LIPT	NVA
1351	30°18'46.23739"N	102°43'22.86804"W	1142.843	3355648.337	718945.946	1165.123	LIPT	NVA
1352	30°22'36.78614"N	103°01'11.84448"W	1268.448	3362211.371	690263.489	1290.55	LIPT	NVA
1534	30°05'56.31806"N	102°05'20.21244"W	642.829	3333328.965	780545.627	665.885	LIPT	NVA
2001	29°39'29.29990"N	103°38'43.25964"W	1019.817	3281672.349	631104.631	1041.545	LIPT	VVA
2002	30°30'08.80636"N	102°18'09.43920"W	909.401	3377557.114	758882.034	932.472	LIPT	VVA
2003	29°16'45.49321"N	103°22'09.56136"W	1087.434	3240033.375	658410.25	1108.988	LIPT	VVA
2004	31°13'05.44300"N	104°51'04.77432"W	1262.609	3453791.536	514160.892	1285.343	LIPT	VVA
2005	30°21'22.35211"N	103°39'52.25076"W	1347.386	3359013.286	628347.761	1368.398	LIPT	VVA
2006	30°16'30.48690"N	103°52'55.40268"W	1472.793	3349802.12	607527.79	1493.98	LIPT	VVA
2007	30°44'32.81276"N	102°29'31.40448"W	979.046	3403746.515	740101.393	1002.259	LIPT	VVA
2009	30°58'38.14694"N	102°50'09.31956"W	830.852	3429091.553	706668.272	854.406	LIPT	VVA
2010	29°16'14.37992"N	103°18'04.60044"W	1617.894	3239169.559	665035.26	1639.138	LIPT	VVA
2011	31°21'06.52849"N	104°28'18.78348"W	1353.228	3468713.218	550231.409	1376.005	LIPT	VVA
2012	30°29'39.95268"N	103°45'02.00880"W	1332.858	3374237.933	619908.587	1353.907	LIPT	VVA
2013	31°03'40.19260"N	104°30'12.70116"W	1217.348	3436486.424	547366.217	1239.741	LIPT	VVA
2014	30°27'49.04273"N	104°20'30.38316"W	1415.226	3370344.373	563187.973	1437.386	LIPT	VVA
2015	31°40'13.39291"N	104°26'23.53632"W	1236.265	3504037.786	553095.936	1260.385	LIPT	VVA
2016	31°02'14.99374"N	104°49'46.40556"W	1207.045	3433770.169	516265.153	1229.892	LIPT	VVA
2017	31°07'47.87414"N	103°35'35.69856"W	829.842	3444856.783	634120.757	853.412	LIPT	VVA
2018	30°53'35.74770"N	102°10'38.28252"W	834.803	3421187.218	769823.641	858.108	LIPT	VVA
2019	30°30'59.65733"N	103°25'54.12144"W	1184.757	3377073.839	650478.508	1206.711	LIPT	VVA

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			METERS	METERS	METERS	METERS		
						GEOID 12B		
2020	30°40'12.87757"N	104°36'11.14596"W	1261.149	3393124.769	538020.757	1283.901	LIPT	VVA
2021	29°33'36.68458"N	104°23'07.63044"W	761.854	3270209.993	559531.847	785.002	LIPT	VVA
2022	30°40'56.87108"N	104°01'46.96824"W	1869.465	3394813.434	592937.096	1890.674	LIPT	VVA
2023	29°28'13.59217"N	103°57'26.82288"W	1243.488	3260560.899	601083.917	1265.332	LIPT	VVA
2024	30°23'30.98987"N	102°12'53.55324"W	791.581	3365509.131	767608.749	814.711	LIPT	VVA
2026	29°20'09.19327"N	103°31'58.82664"W	777.16	3246093.394	642428.75	799.15	LIPT	VVA
2027	30°32'02.77580"N	104°03'52.31592"W	1640.231	3378343.067	589738.594	1661.522	LIPT	VVA
2028	30°09'27.53730"N	103°52'44.61852"W	1421.265	3336784.89	607944.148	1442.559	LIPT	VVA
2028A	30°09'27.91343"N	103°52'45.31188"W	1421.229	3336796.286	607925.486	1442.523	LIPT	VVA
2030	29°50'49.07119"N	104°17'36.11580"W	1290.376	3302037.437	568258.469	1312.672	LIPT	VVA
2031	29°28'25.04820"N	103°22'07.44312"W	1022.179	3261569.026	658166.573	1043.747	LIPT	VVA
2032	30°22'06.52494"N	103°31'06.00132"W	1344.153	3360547.825	642380.213	1365.512	LIPT	VVA
2034	30°51'54.41004"N	104°46'46.18308"W	1184.996	3414674.132	521080.312	1207.95	LIPT	VVA
2035	31°11'13.98023"N	103°56'39.66684"W	1000.989	3450830.414	600583.799	1024.075	LIPT	VVA
2040	29°35'32.94204"N	103°33'41.61744"W	997.926	3274494.315	639305.042	1019.632	LIPT	VVA
2042	30°57'28.14538"N	104°09'40.73652"W	1387.866	3425228.732	580102.465	1409.769	LIPT	VVA
2043	29°16'00.26065"N	103°48'24.51384"W	693.03	3238128.754	615921.465	715.081	LIPT	VVA
2044	30°36'53.26308"N	103°52'18.48468"W	1438.402	3387455.089	608138.581	1459.577	LIPT	VVA
2045	30°21'45.83934"N	102°22'07.53564"W	917.167	3361916.762	752892.8	940.053	LIPT	VVA
2046	29°39'50.43330"N	104°29'55.56876"W	775.69	3281660.808	548504.895	799.018	LIPT	VVA
2047	29°49'25.17496"N	102°06'09.91296"W	511.679	3302768.176	779986.149	534.277	LIPT	VVA
2048	30°55'09.85526"N	103°05'52.06488"W	900.947	3422220.677	681764.37	924.44	LIPT	VVA
2049	29°48'03.94128"N	103°11'26.15028"W	880.639	3298117.992	674874.485	902.426	LIPT	VVA
2050	29°53'29.10354"N	104°16'30.90288"W	1314.112	3306974.219	569977.3	1336.373	LIPT	VVA
2051	31°41'52.00696"N	104°51'47.86596"W	1164.94	3506945.772	512954.594	1188.178	LIPT	VVA
2052	30°03'47.52407"N	103°35'02.57712"W	1312.049	3326633.544	636485.531	1333.262	LIPT	VVA
2053	29°33'39.04639"N	103°50'16.12968"W	1316.513	3270688.543	612584.391	1338.21	LIPT	VVA



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			METERS	METERS	METERS	METERS		
						GEOID 12B		
2054	29°19'37.31412"N	104°01'43.27752"W	794.487	3244610.37	594308.747	816.65	LIPT	VVA
2055	31°03'04.00784"N	104°38'41.69004"W	1155.722	3435320.745	533880.679	1178.434	LIPT	VVA
2057	29°32'39.47554"N	104°11'52.90404"W	853.945	3268559.858	577700.513	876.606	LIPT	VVA
2058	30°59'02.54983"N	104°59'07.59696"W	1268.517	3427833.438	501389.874	1291.477	LIPT	VVA
2059	30°21'02.98613"N	102°57'36.63036"W	1243.169	3359425.109	696061.123	1265.302	LIPT	VVA
2060	31°27'54.94288"N	104°26'11.78916"W	1223.273	3481303.863	553522.296	1246.609	LIPT	VVA
2061	30°37'36.34644"N	102°11'27.47220"W	785.162	3391603.332	769258.583	808.328	LIPT	VVA
2063	31°57'17.99230"N	104°59'01.13028"W	1088.058	3535447.68	501545.354	1110.78	LIPT	VVA
2064	31°21'12.71966"N	104°49'13.41840"W	1094.109	3468797.304	517082.707	1117.102	LIPT	VVA
2065	30°44'00.29393"N	103°46'47.87544"W	1295.595	3400693.789	616798.896	1317.194	LIPT	VVA
2066	31°30'43.99204"N	104°38'20.18076"W	1459.514	3486427.499	534283.547	1482.561	LIPT	VVA
2068	29°26'57.88784"N	102°49'29.11656"W	504.217	3259748.01	710972.17	525.871	LIPT	VVA
2069	31°51'39.86053"N	104°49'12.71532"W	1627.957	3525050.87	517008.764	1650.658	LIPT	VVA
2071	31°25'43.39488"N	104°50'51.23724"W	1080.674	3477126.598	514486.779	1103.72	LIPT	VVA
2072	29°05'22.48195"N	103°27'18.96480"W	675.843	3218895.624	650336.562	697.926	LIPT	VVA
2073	31°36'38.75746"N	104°51'26.54172"W	1087.649	3497302.185	513528.518	1110.954	LIPT	VVA
2074	30°31'34.00457"N	102°51'44.17992"W	1219.321	3379029.264	705105.875	1242.017	LIPT	VVA
2075	30°20'48.30698"N	104°09'14.73408"W	1471.127	3357512.529	581302.121	1492.866	LIPT	VVA
2076	29°16'13.14005"N	103°09'01.50588"W	930.673	3239353.395	679694.832	952.105	LIPT	VVA
2077	30°07'34.15843"N	103°14'41.35920"W	1180.848	3334064.583	669081.552	1202.549	LIPT	VVA
2078	31°16'06.60011"N	103°51'22.36392"W	912.547	3459923.287	608889.132	936.254	LIPT	VVA
2079	30°53'25.53277"N	102°18'50.93352"W	765.14	3420549.357	756745.199	788.41	LIPT	VVA
2080	30°42'16.17610"N	104°06'54.11376"W	1794.221	3397187.322	584745.472	1815.484	LIPT	VVA
2083	31°16'30.32778"N	104°05'33.89208"W	1023.347	3460444.576	586363.839	1046.6	LIPT	VVA
2084	31°51'52.77319"N	104°29'00.05244"W	1107.187	3525550.676	548872.395	1131.432	LIPT	VVA
2085	30°05'38.93572"N	104°01'26.23584"W	1281.366	3329619.585	594050.631	1303.1	LIPT	VVA
2085A	30°05'41.54752"N	104°01'26.10660"W	1280.864	3329700.013	594053.404	1302.597	LIPT	VVA

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			METERS	METERS	METERS	METERS		
						GEOID 12B		
2087	30°48'54.73904"N	103°50'39.37092"W	1166.115	3409693.54	610548.799	1188.124	LIPT	VVA
2089	30°02'18.28885"N	102°06'15.61644"W	629.114	3326575.911	779232.01	652.047	LIPT	VVA
2090	29°41'31.22470"N	103°09'49.63428"W	836.504	3286068.445	677658.375	858.316	LIPT	VVA
2091	30°16'42.94142"N	103°10'05.40624"W	1283.335	3351077.027	676195.208	1305.173	LIPT	VVA
2092	30°31'06.91097"N	104°24'37.22904"W	1380.342	3376399.034	556573.676	1402.703	LIPT	VVA
2093	29°47'35.60975"N	102°40'21.99288"W	791.779	3298144.104	724950.792	813.697	LIPT	VVA
2095	31°11'59.24242"N	103°41'32.97336"W	850.196	3452480.338	624566.631	873.956	LIPT	VVA
2096	31°03'57.72409"N	104°08'46.64364"W	1231.483	3437233.373	581445.544	1253.757	LIPT	VVA
2097	30°14'46.00720"N	103°04'22.45548"W	1252.356	3347628.268	685420.931	1274.208	LIPT	VVA
2098	30°50'52.12284"N	102°40'10.94052"W	861.93	3415060.35	722845.882	885.488	LIPT	VVA
2099	30°28'14.45056"N	102°55'41.74968"W	1308.662	3372766.338	698885.706	1331.089	LIPT	VVA
2100	31°55'16.78584"N	104°25'29.02836"W	1094.464	3531860.067	554384.067	1118.904	LIPT	VVA
2102	30°38'58.63373"N	104°16'37.37172"W	1634.245	3390994.928	569269.355	1656.001	LIPT	VVA
2103	29°54'44.61221"N	102°44'52.78272"W	864.375	3311209.219	717419.522	886.271	LIPT	VVA
2104	30°21'38.50758"N	102°42'19.09332"W	1119.971	3360987.517	720542.454	1142.353	LIPT	VVA
2105	29°46'26.17442"N	104°20'40.89660"W	1161.184	3293916.101	563346.257	1183.679	LIPT	VVA
2106	30°58'28.08163"N	103°16'12.05148"W	881.978	3428056.145	665210.803	905.479	LIPT	VVA
2107	29°23'41.20148"N	103°08'44.65104"W	846.637	3253154.325	679931.02	868.198	LIPT	VVA
2108	30°55'22.55495"N	103°12'17.98056"W	913.367	3422441.815	671513.093	936.823	LIPT	VVA
2109	29°54'39.92494"N	103°15'41.86656"W	981.995	3310203.281	667824.095	1003.731	LIPT	VVA
2110	30°05'20.68883"N	104°10'07.88916"W	1456.886	3328947.48	580091.43	1478.716	LIPT	VVA
2111	29°48'52.87684"N	102°50'07.56528"W	833.226	3300216.722	709179.43	855.057	LIPT	VVA
2112	29°23'19.53107"N	104°08'13.03656"W	735.694	3251367.526	583745.751	758.154	LIPT	VVA
2113	29°46'40.96160"N	104°00'28.93968"W	1070.121	3294603.603	595886.991	1092.076	LIPT	VVA
2114	30°29'36.81287"N	103°57'25.11180"W	1518.823	3373940.127	600098.477	1540.051	LIPT	VVA
2116	29°20'14.32471"N	103°19'17.66280"W	1105.186	3246527.529	662957.305	1126.654	LIPT	VVA
2119	30°30'11.82031"N	103°13'47.72892"W	1231.629	3375887.485	669864.85	1253.764	LIPT	VVA

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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	ELEVATION		
			METERS	METERS	METERS	METERS		
						GEOID 12B		
2121	30°44'33.09655"N	102°10'54.23664"W	889.152	3404461.914	769821.393	912.328	LIPT	VVA
2122	29°25'01.13880"N	103°30'59.09076"W	934.716	3255100.543	643925.788	956.513	LIPT	VVA
2123	30°08'26.18257"N	102°24'01.55124"W	823.762	3337219.486	750411.124	846.306	LIPT	VVA
2124	30°33'46.01459"N	104°28'00.58440"W	1342.44	3381269.787	551130.84	1364.949	LIPT	VVA
2125	30°23'11.99234"N	104°14'39.19308"W	1472.552	3361874.428	572609.997	1494.454	LIPT	VVA
2126	30°44'39.58962"N	104°46'57.00324"W	1225.213	3401288.087	520818.997	1248.197	LIPT	VVA
2127	30°26'04.93354"N	103°38'45.14532"W	1277.429	3367734.125	630035.323	1298.609	LIPT	VVA
2128	30°09'43.93652"N	102°38'33.67896"W	1007.882	3339106.479	727018.519	1030.098	LIPT	VVA
2129	30°59'37.57027"N	102°30'56.62872"W	749.868	3431560.655	737214.038	773.066	LIPT	VVA
2131	29°31'18.58163"N	104°16'11.81712"W	756.422	3266024.072	570747.81	779.307	LIPT	VVA
2132	31°15'04.85964"N	103°04'05.15424"W	768.55	3459067.732	683961.731	792.257	LIPT	VVA
2133	29°55'55.84879"N	102°23'01.55904"W	570.233	3314148.688	752545.454	592.634	LIPT	VVA
2134	29°50'10.53172"N	103°13'28.34220"W	924.409	3301964.266	671533.439	946.165	LIPT	VVA
2135	30°41'56.78884"N	103°22'10.48908"W	1029.876	3397390.739	656146.487	1052.308	LIPT	VVA
2136	29°48'26.84416"N	102°54'38.29212"W	822.718	3299280.959	701924.93	844.549	LIPT	VVA
2137	30°12'05.44691"N	104°13'50.91492"W	1507.869	3341364.979	574037.388	1529.689	LIPT	VVA
2139	30°50'28.74934"N	102°34'42.99420"W	837.276	3414525.899	731575.442	860.743	LIPT	VVA
2140	31°04'09.48025"N	104°13'01.51932"W	1256.978	3437545.519	574688.447	1279.207	LIPT	VVA
2141	30°28'43.88228"N	102°50'55.63824"W	1237.24	3373815.302	706499.764	1259.785	LIPT	VVA
2142	31°17'43.86790"N	104°34'30.31428"W	1217.112	3462431.491	540439.279	1239.787	LIPT	VVA
2143	30°46'10.87550"N	104°48'43.78104"W	1257.18	3404093.069	517975.18	1280.195	LIPT	VVA
2144	30°46'19.36337"N	103°09'19.91520"W	1004.592	3405793.226	676516.201	1027.654	LIPT	VVA
2145	31°13'38.88534"N	102°19'19.46244"W	720.011	3457903.458	755085.565	743.522	LIPT	VVA
2146	30°43'27.23246"N	104°40'17.89176"W	1232.691	3399086.506	531437.49	1255.525	LIPT	VVA
2147	29°14'49.85336"N	103°05'51.20700"W	760.059	3236871.633	684873.09	781.616	LIPT	VVA
2148	30°43'53.90530"N	103°06'28.56024"W	986.901	3401390.367	681147.843	1009.96	LIPT	VVA
2149	30°11'37.30625"N	102°53'18.58308"W	1265.555	3342133.086	703275.997	1287.399	LIPT	VVA

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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	ELEVATION		
			METERS	METERS	METERS	METERS		
						GEOID 12B		
2150	29°36'21.49096"N	102°53'16.61640"W	570.506	3276987.772	704526.227	592.342	LIPT	VVA
2151	30°51'09.08410"N	103°23'24.73620"W	987.969	3414367.119	653926.507	1010.881	LIPT	VVA
2152	31°22'45.80598"N	102°20'58.28604"W	764.579	3474686.318	752064.664	788.196	LIPT	VVA
2153	30°33'50.84136"N	103°54'56.61252"W	1476.057	3381797.745	603982.239	1497.228	LIPT	VVA
2155	30°18'42.95002"N	102°26'28.78620"W	931.149	3356124.526	746042.83	953.854	LIPT	VVA
2156	30°02'20.69707"N	104°01'33.35772"W	1256.377	3323515.663	593911.976	1278.184	LIPT	VVA
2157	30°07'50.20003"N	104°40'43.44240"W	844.257	3333301.816	530944.787	867.407	LIPT	VVA
2158	31°42'49.65919"N	104°35'04.40232"W	1314.259	3508787.675	539362.447	1337.964	LIPT	VVA
2159	29°41'16.93784"N	103°21'14.21568"W	1113.324	3285351.548	659263.267	1134.856	LIPT	VVA
2160	30°59'34.89565"N	103°43'51.33180"W	941.594	3429520.161	621167.048	964.524	LIPT	VVA
2161	30°59'12.11478"N	103°37'44.62464"W	882.822	3428934.171	630902.089	905.795	LIPT	VVA
2162	29°46'07.34484"N	103°34'45.51960"W	1174.617	3294002.201	637345.984	1196.176	LIPT	VVA
2163	30°32'02.35727"N	103°47'05.56728"W	1366.539	3378586.018	616567.273	1387.615	LIPT	VVA
2165A	31°21'18.97308"N	104°10'58.01088"W	1068.439	3469264.34	577727.181	1091.892	LIPT	VVA
2165A	30°02'19.41014"N	104°01'32.42748"W	1255.783	3323476.26	593937.228	1277.59	LIPT	VVA
2166	31°09'07.50737"N	103°49'39.02160"W	924.462	3447048.616	611758.997	947.751	LIPT	VVA
2167	29°34'23.78928"N	103°08'11.02164"W	803.615	3272951.528	680520.842	825.294	LIPT	VVA
2168	30°04'10.74954"N	104°27'13.68468"W	1628.063	3326629.199	552643.174	1650.287	LIPT	VVA
2169	31°03'30.43616"N	103°03'59.26716"W	844.416	3437686.588	684490.959	868.047	LIPT	VVA
2170	31°05'40.00067"N	102°26'10.85316"W	683.309	3442895.438	744538.56	706.557	LIPT	VVA
2171	31°06'49.15001"N	104°38'31.95852"W	1130.522	3442252.671	534116.262	1153.242	LIPT	VVA
2172	31°23'27.55331"N	103°02'58.10604"W	730.488	3474579.149	685461.474	754.261	LIPT	VVA
2173	29°47'32.76899"N	103°11'05.28288"W	868.213	3297167.104	675449.912	890.009	LIPT	VVA
2175	29°19'42.33137"N	103°12'20.10348"W	1114.143	3245709.912	674235.549	1135.508	LIPT	VVA
2177	30°35'13.21634"N	102°35'28.01184"W	978.091	3386304.817	730984.984	1001.076	LIPT	VVA
2178	31°12'37.20179"N	104°35'56.42772"W	1131.471	3452981.848	538197.02	1154.129	LIPT	VVA
2180	31°08'55.56570"N	103°16'40.15632"W	820.834	3447365.819	664165.414	844.542	LIPT	VVA

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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	ELEVATION		
			METERS	METERS	METERS	METERS		
						GEOID 12B		
2181	31°03'48.33889"N	103°10'16.61304"W	844.233	3438068.36	674478.856	867.901	LIPT	VVA
2182	30°02'36.45593"N	102°20'44.32056"W	736.375	3326570.579	755940.8	758.902	LIPT	VVA
2183	31°22'19.51280"N	102°52'05.64024"W	729.215	3472803.722	702738.452	752.604	LIPT	VVA
2184	29°17'50.01680"N	103°50'43.05372"W	744.507	3241469.588	612149.14	766.576	LIPT	VVA
2185	30°36'10.52035"N	102°56'31.34868"W	1120.872	3387401.402	697295.15	1143.745	LIPT	VVA
2186	30°00'04.14104"N	104°37'04.10664"W	987.046	3318974.288	536861.304	1010.146	LIPT	VVA
2187	29°28'48.56124"N	103°43'55.24860"W	1166.215	3261854.174	622931.926	1187.953	LIPT	VVA
2188	31°45'30.73043"N	104°57'45.96372"W	1091.918	3513672.369	503525.975	1115.032	LIPT	VVA
2189	30°56'30.31372"N	103°50'49.91928"W	1039.864	3423716.491	610123.658	1062.373	LIPT	VVA
2190	29°55'03.17082"N	103°34'55.32600"W	1192.438	3310493.875	636879.429	1213.976	LIPT	VVA
2191	29°41'23.24501"N	104°21'38.89620"W	955.87	3284583.27	561840.418	978.716	LIPT	VVA
2192	31°19'32.69500"N	102°39'15.08112"W	711.219	3468080.409	723209.308	734.405	LIPT	VVA
2193	30°10'22.69686"N	103°53'23.06616"W	1416.867	3338472.843	606899.095	1438.173	LIPT	VVA
2193A	30°08'48.88385"N	103°56'12.40440"W	1391.755	3335541.774	602396.759	1413.216	LIPT	VVA
2194	31°13'36.64373"N	102°37'37.03188"W	698.919	3457170.151	726037.477	722.021	LIPT	VVA
2195	30°52'21.82476"N	104°09'08.40564"W	1507.754	3415804.854	581031.933	1529.439	LIPT	VVA
2196	29°41'00.41291"N	103°35'18.02364"W	1087.637	3284543.036	636588.473	1109.27	LIPT	VVA
2197	30°35'09.53311"N	104°29'52.37376"W	1325.416	3383827.083	548141.412	1347.989	LIPT	VVA
2199	29°37'27.11345"N	103°02'59.57736"W	746.592	3278733.32	688807.698	768.382	LIPT	VVA
2200	31°18'42.82297"N	103°55'55.58880"W	926.625	3464660.778	601616.848	950.387	LIPT	VVA
2201	30°12'43.26505"N	103°08'12.12576"W	1230.09	3343746.805	679343.299	1251.896	LIPT	VVA
2202	30°04'09.16550"N	102°19'46.51644"W	776.369	3329461.82	757422.898	798.947	LIPT	VVA
2203	30°08'09.16087"N	102°33'22.89780"W	944.859	3336363.058	735397.287	967.176	LIPT	VVA
2204	29°32'12.42755"N	103°32'40.26480"W	1025.947	3268342.441	641033.07	1047.671	LIPT	VVA
2205	30°22'58.04040"N	103°43'43.41144"W	1388.375	3361888.134	622143.129	1409.324	LIPT	VVA
2206	30°53'19.57020"N	102°54'14.96124"W	899.281	3419156.465	700335.129	922.828	LIPT	VVA
2207	29°14'49.75404"N	103°00'45.46404"W	676.15	3237005.533	693127.929	697.664	LIPT	VVA

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			METERS	METERS	METERS	METERS		
						GEOID 12B		
2209	30°33'14.52316"N	102°25'21.31860"W	910.447	3383007.468	747233.531	933.433	LIPT	VVA
2210	31°18'58.74073"N	103°47'23.06544"W	862.277	3465290.873	615159.546	886.363	LIPT	VVA
2211	29°59'56.28426"N	102°23'58.67592"W	664.888	3321518.282	750845.426	687.317	LIPT	VVA
2212	29°38'00.08480"N	104°21'32.01624"W	865.701	3278331.136	562059.944	888.697	LIPT	VVA
2213	30°12'58.66164"N	103°55'11.46360"W	1412.224	3343246.152	603954.274	1433.567	LIPT	VVA
2214	30°16'06.53041"N	103°49'10.37100"W	1525.976	3349125.439	613548.179	1547.008	LIPT	VVA
2214A	29°10'56.69911"N	102°57'43.26984"W	540.516	3229915.013	698171.734	562.01	LIPT	VVA
2216	30°34'55.08988"N	104°17'17.46312"W	1548.394	3383490.843	568249.727	1570.278	LIPT	VVA
2217	30°53'24.29423"N	102°23'59.91972"W	753.416	3420316.706	748538.773	776.698	LIPT	VVA
2218	31°00'07.10338"N	102°07'42.11904"W	658.429	3433361.582	774192.184	681.97	LIPT	VVA
2219	31°22'14.79162"N	103°41'12.12216"W	824.138	3471439.56	624892.847	848.578	LIPT	VVA
2220	30°27'57.38112"N	103°41'34.85256"W	1292.487	3371142.678	625468.013	1313.602	LIPT	VVA
2221	30°40'06.20033"N	103°12'46.51092"W	1031.482	3394214.207	671206.445	1054.17	LIPT	VVA
2222	29°48'16.93195"N	103°34'33.44052"W	1131.79	3297995.394	637621.129	1153.372	LIPT	VVA
2223	30°10'46.90664"N	103°52'45.84684"W	1422.183	3339227.853	607887.271	1443.453	LIPT	VVA
2224	31°23'29.53849"N	103°19'16.26780"W	759.414	3474213.866	659621.759	783.704	LIPT	VVA
2225	30°47'27.10248"N	104°10'03.70416"W	1647.872	3406720.632	579631.044	1669.397	LIPT	VVA
2226	31°22'16.12585"N	102°43'12.50796"W	734.286	3472981.895	716828.028	757.502	LIPT	VVA
2227	31°04'32.40750"N	102°46'33.44844"W	757.353	3440114.252	712177.776	780.752	LIPT	VVA
2228	31°58'13.75694"N	104°37'52.28724"W	1324.478	3537223.907	534847.251	1347.822	LIPT	VVA
2230	31°08'15.81572"N	104°58'31.86156"W	1465.323	3444865.92	502333.92	1487.975	LIPT	VVA
2231	30°18'40.33303"N	104°00'36.86148"W	1413.03	3353684.915	595163.214	1434.526	LIPT	VVA
2232	29°31'41.35238"N	102°55'01.13772"W	751.637	3268311.835	701868.822	773.259	LIPT	VVA
2234	30°14'44.92885"N	103°23'23.30016"W	1313.652	3347120.733	654925.476	1335.107	LIPT	VVA
2235	29°53'56.19437"N	104°38'22.28964"W	874.118	3307642.064	534802.277	897.48	LIPT	VVA
2236	31°16'08.80187"N	104°18'51.08508"W	1166.117	3459629.705	565287.692	1188.924	LIPT	VVA
2237	30°14'07.95376"N	103°13'36.97536"W	1258.866	3346215.477	670616	1280.63	LIPT	VVA

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			METERS	METERS	METERS	METERS		
						GEOID 12B		
2274	30°33'20.45657"N	102°17'30.45588"W	824.425	3383484.715	759779.866	847.516	LIPT	VVA
3001	29°39'30.64964"N	103°38'44.40912"W	1020.846	3281713.537	631073.239	1042.574	LIPT	CAL
3002	30°30'19.97413"N	102°18'08.84988"W	905.142	3377901.447	758889.524	928.213	LIPT	CAL
3003	31°13'05.06168"N	104°51'04.66920"W	1262.971	3453779.8	514163.689	1285.705	LIPT	CAL
3004	30°21'25.55147"N	103°39'48.12732"W	1345.642	3359113.078	628456.689	1366.657	LIPT	CAL
3005	30°16'31.62320"N	103°53'00.84012"W	1472.341	3349835.672	607382.162	1493.532	LIPT	CAL
3006	30°44'28.39463"N	102°29'13.28964"W	980.616	3403621.246	740586.33	1003.821	LIPT	CAL
3008	30°58'38.06054"N	102°50'10.06656"W	831.718	3429088.507	706648.503	855.272	LIPT	CAL
3009	29°16'11.41237"N	103°18'01.88424"W	1624.257	3239079.27	665109.898	1645.498	LIPT	CAL
3010	31°21'07.66994"N	104°28'19.65828"W	1354.264	3468748.249	550208.127	1377.042	LIPT	CAL
3011	31°03'41.70499"N	104°30'04.53636"W	1226.195	3436533.954	547582.391	1248.582	LIPT	CAL
3012	30°27'44.01817"N	104°20'23.30844"W	1416.304	3370190.802	563377.535	1438.458	LIPT	CAL
3013	31°40'10.06295"N	104°26'23.43876"W	1236.638	3503935.274	553099.031	1260.756	LIPT	CAL
3014	31°02'14.66416"N	104°49'43.89852"W	1206.731	3433760.125	516331.625	1229.578	LIPT	CAL
3015	31°07'45.57482"N	103°35'20.29308"W	829.401	3444791.176	634529.689	852.969	LIPT	CAL
3016	30°53'30.68459"N	102°10'55.61976"W	839.182	3421019.615	769367.05	862.482	LIPT	CAL
3017	30°31'14.03713"N	103°25'35.36616"W	1171.523	3377523.529	650972.274	1193.498	LIPT	CAL
3018	30°40'15.96742"N	104°36'14.47740"W	1261.35	3393219.572	537931.774	1284.103	LIPT	CAL
3019	29°33'37.91941"N	104°23'10.53096"W	761.745	3270247.587	559453.596	784.895	LIPT	CAL
3020	30°40'50.70385"N	104°01'24.00708"W	1883.353	3394628.87	593549.69	1904.56	LIPT	CAL
3021	29°28'12.84211"N	103°57'27.76140"W	1243.902	3260537.586	601058.845	1265.747	LIPT	CAL
3022	30°23'25.89400"N	102°13'08.74596"W	795.902	3365342.204	767206.951	819.027	LIPT	CAL
3024	29°20'11.44338"N	103°31'57.83700"W	779.03	3246162.992	642454.574	801.019	LIPT	CAL
3025	30°32'02.59998"N	104°03'54.42480"W	1642.09	3378337.188	589682.441	1663.382	LIPT	CAL
3027	29°50'47.34215"N	104°17'38.13612"W	1292.407	3301983.884	568204.584	1314.704	LIPT	CAL
3028	29°28'26.08856"N	103°22'07.04244"W	1021.705	3261601.204	658176.917	1043.273	LIPT	CAL
3029	30°22'13.13173"N	103°31'22.78956"W	1343.358	3360745.376	641929.384	1364.71	LIPT	CAL



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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	ELEVATION		
			METERS	METERS	METERS	METERS		
						GEOID 12B		
3031	30°51'26.61530"N	104°46'31.31652"W	1187.349	3413819.28	521476.825	1210.301	LIPT	CAL
3032	31°11'09.39451"N	103°56'45.77604"W	1002.427	3450687.687	600423.443	1025.503	LIPT	CAL
3037	29°35'48.36941"N	103°33'36.47016"W	997.096	3274970.936	639437.63	1018.797	LIPT	CAL
3039	30°57'10.24798"N	104°09'42.61824"W	1399.484	3424677.365	580056.687	1421.372	LIPT	CAL
3040	29°15'59.06552"N	103°48'23.11920"W	693.142	3238092.351	615959.48	715.193	LIPT	CAL
3041	30°36'56.32322"N	103°52'15.72168"W	1438.653	3387550.037	608211.205	1459.829	LIPT	CAL
3042	30°21'48.78954"N	102°21'57.01644"W	914.994	3362014.152	753171.622	937.886	LIPT	CAL
3043	29°39'50.58068"N	104°29'57.39036"W	775.132	3281665.133	548455.908	798.46	LIPT	CAL
3044	29°49'25.35276"N	102°06'09.48672"W	511.641	3302773.941	779997.458	534.239	LIPT	CAL
3045	30°55'13.00350"N	103°05'49.40844"W	900.936	3422318.823	681833.237	924.43	LIPT	CAL
3046	29°48'03.31906"N	103°11'26.38896"W	881.045	3298098.735	674868.377	902.832	LIPT	CAL
3047	29°53'29.21370"N	104°16'27.01308"W	1314.379	3306978.268	570081.608	1336.638	LIPT	CAL
3048	31°42'20.34544"N	104°51'53.92620"W	1169.953	3507818.063	512793.988	1193.18	LIPT	CAL
3049	30°03'43.15000"N	103°35'03.25788"W	1312.382	3326498.663	636468.969	1333.597	LIPT	CAL
3050	29°33'39.87479"N	103°50'15.47160"W	1318.382	3270714.22	612601.846	1340.079	LIPT	CAL
3051	29°19'40.09764"N	104°01'38.91360"W	799.833	3244697.022	594425.738	821.994	LIPT	CAL
3052	31°03'05.01458"N	104°38'21.54048"W	1155.13	3435353.459	534414.631	1177.836	LIPT	CAL
3054	29°33'26.54348"N	104°11'27.01968"W	877.846	3270013.417	578387.072	900.468	LIPT	CAL
3055	30°58'58.69646"N	104°59'02.69340"W	1267.542	3427714.831	501519.946	1290.502	LIPT	CAL
3056	30°20'57.88525"N	102°57'43.24248"W	1245.686	3359264.87	695887.373	1267.814	LIPT	CAL
3057	31°27'46.10056"N	104°26'13.56468"W	1221.819	3481031.388	553476.837	1245.143	LIPT	CAL
3058	30°37'41.30209"N	102°11'26.42352"W	784.966	3391756.669	769282.701	808.131	LIPT	CAL
3060	31°57'18.28840"N	104°59'01.47984"W	1087.714	3535456.795	501536.176	1110.436	LIPT	CAL
3061	31°20'56.59879"N	104°49'12.85320"W	1092.811	3468301.023	517098.45	1115.797	LIPT	CAL
3062	30°43'48.70549"N	103°47'04.79436"W	1304.618	3400332.131	616352.81	1326.192	LIPT	CAL
3063	31°30'49.28537"N	104°38'11.15052"W	1475.669	3486591.254	534521.186	1498.717	LIPT	CAL
3065	29°26'58.17325"N	102°49'25.85064"W	499.211	3259758.441	711060.016	520.866	LIPT	CAL

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			METERS	METERS	METERS	METERS		
						GEOID 12B		
3066	31°51'40.35319"N	104°49'12.92448"W	1629.737	3525066.029	517003.243	1652.437	LIPT	CAL
3068	31°25'42.76556"N	104°50'50.68932"W	1080.587	3477107.243	514501.271	1103.634	LIPT	CAL
3069	29°05'24.88502"N	103°27'18.30456"W	675.577	3218969.828	650353.443	697.66	LIPT	CAL
3070	31°36'35.02285"N	104°51'25.43796"W	1087.403	3497187.243	513557.75	1110.708	LIPT	CAL
3072	30°20'44.15993"N	104°09'06.33276"W	1472.123	3357386.545	581527.381	1493.859	LIPT	CAL
3073	29°16'14.54988"N	103°09'03.33900"W	933.974	3239396.016	679644.667	955.404	LIPT	CAL
3074	30°07'18.99768"N	103°14'48.30792"W	1176.034	3333594.958	668902.751	1197.735	LIPT	CAL
3075	30°53'25.66612"N	102°19'00.30288"W	771.132	3420547.473	756496.227	794.402	LIPT	CAL
3076	30°42'22.76863"N	104°06'31.00680"W	1762.455	3397395.14	585358.535	1783.713	LIPT	CAL
3079	31°16'31.40598"N	104°05'29.22612"W	1022.433	3460478.787	586486.95	1045.69	LIPT	CAL
3080	31°51'53.77630"N	104°28'53.40864"W	1106.855	3525582.394	549046.823	1131.108	LIPT	CAL
3082	30°48'53.68248"N	103°50'28.73760"W	1163.541	3409663.935	610831.684	1185.553	LIPT	CAL
3083	30°02'45.58906"N	103°16'54.99876"W	1128.185	3325125.866	665638.515	1149.861	LIPT	CAL
3084	30°02'26.84602"N	102°06'24.84540"W	619.058	3326833.212	778978.026	641.991	LIPT	CAL
3085	30°02'26.69849"N	102°06'24.69132"W	619.196	3326828.772	778982.27	642.129	LIPT	CAL
3085A	29°41'30.02820"N	103°09'50.89176"W	836.643	3286031.072	677625.159	858.455	LIPT	CAL
3086	30°16'47.93437"N	103°09'56.90628"W	1285.696	3351234.421	676419.867	1307.537	LIPT	CAL
3087	29°47'35.51590"N	102°40'22.69524"W	792.095	3298140.833	724931.987	814.012	LIPT	CAL
3089	31°12'00.41602"N	103°41'17.98836"W	847.689	3452521.169	624962.797	871.455	LIPT	CAL
3090	30°14'36.06158"N	103°04'20.95680"W	1248.404	3347322.724	685466.185	1270.254	LIPT	CAL
3091	30°50'51.69264"N	102°40'11.84376"W	862.414	3415046.601	722822.158	885.972	LIPT	CAL
3092	30°28'26.12665"N	102°55'42.53268"W	1309.662	3373125.486	698858.227	1332.097	LIPT	CAL
3093	31°55'16.66690"N	104°25'28.27884"W	1094.334	3531856.509	554403.769	1118.775	LIPT	CAL
3095	30°38'46.84567"N	104°16'43.17492"W	1623.079	3390631.049	569117.227	1644.846	LIPT	CAL
3096	29°54'45.59537"N	102°44'52.74744"W	864.697	3311239.51	717419.875	886.593	LIPT	CAL
3097	30°21'39.33918"N	102°42'28.65096"W	1115.553	3361007.959	720286.707	1137.933	LIPT	CAL
3098	29°46'27.20572"N	104°20'39.75504"W	1161.879	3293948.018	563376.731	1184.372	LIPT	CAL

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			METERS	METERS	METERS	METERS		
						GEOID 12B		
3099	30°58'20.55947"N	103°16'12.77508"W	882.881	3427824.229	665195.204	906.377	LIPT	CAL
3100	29°23'41.55652"N	103°08'43.04616"W	846.966	3253165.942	679974.113	868.527	LIPT	CAL
3101	29°54'27.80939"N	103°15'39.89844"W	980.807	3309831.081	667882.528	1002.545	LIPT	CAL
3102	30°05'17.92442"N	104°10'08.78448"W	1459.835	3328862.212	580068.082	1481.665	LIPT	CAL
3103	29°48'57.75167"N	102°49'57.06156"W	835.813	3300372.124	709458.635	857.643	LIPT	CAL
3104	29°23'20.58205"N	104°08'14.97012"W	735.407	3251399.489	583693.393	757.869	LIPT	CAL
3105	29°46'42.56015"N	104°00'30.98628"W	1069.172	3294652.336	595831.611	1091.127	LIPT	CAL
3106	30°29'26.19204"N	103°57'28.21896"W	1524.304	3373612.402	600018.66	1545.533	LIPT	CAL
3108	29°21'17.10670"N	103°17'48.94404"W	1101.482	3248494.825	665322.187	1122.927	LIPT	CAL
3111	30°30'10.22105"N	103°13'52.80852"W	1232.043	3375836.121	669730.194	1254.176	LIPT	CAL
3113	30°44'32.70732"N	102°10'53.75532"W	889.336	3404450.247	769834.5	912.512	LIPT	CAL
3114	29°24'59.07445"N	103°30'57.47220"W	935.233	3255037.552	643970.218	957.03	LIPT	CAL
3115	30°08'26.45113"N	102°24'01.15524"W	824.207	3337227.998	750421.535	846.751	LIPT	CAL
3116	30°23'12.63289"N	104°14'39.11100"W	1474.072	3361894.161	572612.056	1495.974	LIPT	CAL
3117	30°44'47.07640"N	104°46'57.59364"W	1223.422	3401518.527	520802.852	1246.406	LIPT	CAL
3118	30°09'42.09034"N	102°38'21.61284"W	1006.086	3339056.311	727342.57	1028.307	LIPT	CAL
3119	30°59'30.26191"N	102°31'11.23860"W	753.245	3431326.916	736831.431	776.447	LIPT	CAL
3121	29°31'19.13927"N	104°16'13.33992"W	757.814	3266040.978	570706.709	780.7	LIPT	CAL
3122	31°14'35.40858"N	103°04'01.50492"W	772.279	3458162.503	684074.152	795.978	LIPT	CAL
3123	29°55'54.47694"N	102°22'54.07284"W	572.211	3314111.021	752747.223	594.614	LIPT	CAL
3124	30°41'56.75593"N	103°22'09.68016"W	1029.609	3397390.038	656168.024	1052.042	LIPT	CAL
3125	29°48'26.74346"N	102°54'46.81008"W	822.885	3299273.713	701696.265	844.716	LIPT	CAL
3126	30°12'14.46325"N	104°13'45.47532"W	1507.229	3341643.507	574180.954	1529.049	LIPT	CAL
3128	30°50'16.01866"N	102°34'38.91072"W	837.641	3414136.183	731692.458	861.108	LIPT	CAL
3129	31°04'03.23674"N	104°13'03.38232"W	1262.702	3437352.955	574640.431	1284.924	LIPT	CAL
3130	31°17'56.00940"N	104°34'04.88640"W	1229.56	3462807.898	541110.041	1252.229	LIPT	CAL
3131	30°46'11.30718"N	104°48'44.24436"W	1256.846	3404106.337	517962.841	1279.861	LIPT	CAL

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			METERS	METERS	METERS	METERS		
						GEOID 12B		
3132	31°13'37.82287"N	102°19'19.18128"W	720.088	3457870.913	755093.8	743.599	LIPT	CAL
3133	30°43'47.67726"N	103°06'39.74400"W	987.706	3401193.578	680853.594	1010.754	LIPT	CAL
3134	30°11'30.63926"N	102°53'03.18840"W	1260.927	3341935.443	703691.586	1282.773	LIPT	CAL
3135	29°36'23.11769"N	102°53'17.79576"W	570.916	3277037.28	704493.583	592.752	LIPT	CAL
3136	30°50'53.98724"N	103°23'35.05596"W	993.171	3413898.342	653659.06	1016.061	LIPT	CAL
3137	31°22'53.28012"N	102°20'45.15216"W	765.952	3474924.907	752406.181	789.578	LIPT	CAL
3139	30°18'55.21381"N	102°26'31.39944"W	938.983	3356500.636	745964.488	961.691	LIPT	CAL
3140	30°02'29.46016"N	104°01'33.83184"W	1258.371	3323785.304	593896.983	1280.175	LIPT	CAL
3140A	30°02'22.31228"N	104°01'33.11328"W	1256.983	3323565.439	593918.1	1278.789	LIPT	CAL
3141	30°07'46.68517"N	104°40'43.25844"W	842.916	3333193.639	530950.014	866.067	LIPT	CAL
3142	31°42'50.71147"N	104°35'04.85448"W	1311.571	3508820.028	539350.423	1335.276	LIPT	CAL
3143	29°40'59.89789"N	103°21'18.05112"W	1094.013	3284825.505	659167.631	1115.541	LIPT	CAL
3144	30°59'36.39304"N	103°43'36.25860"W	939.35	3429570.831	621566.312	962.287	LIPT	CAL
3145	30°59'11.95760"N	103°37'45.18336"W	883.738	3428929.15	630887.328	906.71	LIPT	CAL
3146	29°46'46.76632"N	103°34'46.02900"W	1165.458	3295215.575	637317.359	1187.024	LIPT	CAL
3147	30°32'02.59217"N	103°47'06.21240"W	1367.672	3378593.064	616550.003	1388.749	LIPT	CAL
3149	31°21'25.47400"N	104°10'58.64376"W	1063.872	3469464.366	577708.974	1087.332	LIPT	CAL
3150	31°09'20.22246"N	103°49'40.87092"W	924.757	3447439.576	611705.886	948.058	LIPT	CAL
3151	29°34'22.55232"N	103°08'12.27120"W	803.52	3272912.906	680487.825	825.199	LIPT	CAL
3152	30°04'45.44713"N	104°26'57.51456"W	1613.926	3327699.305	553070.95	1636.131	LIPT	CAL
3153	31°03'01.44925"N	103°03'59.02920"W	842.666	3436794.096	684512.812	866.292	LIPT	CAL
3154	31°05'51.00925"N	102°26'26.47320"W	685.029	3443224.934	744116.729	708.271	LIPT	CAL
3155	31°23'23.65958"N	103°02'50.46468"W	730.875	3474462.825	685665.462	754.643	LIPT	CAL
3157	30°34'54.96802"N	102°34'58.79820"W	981.662	3385759.529	731775.405	1004.633	LIPT	CAL
3158	31°12'28.26094"N	104°35'55.03236"W	1134.559	3452706.728	538234.94	1157.215	LIPT	CAL
3160	31°08'58.91780"N	103°16'43.91976"W	820.547	3447467.488	664064.144	844.256	LIPT	CAL
3161	31°03'34.50265"N	103°09'55.53324"W	845.655	3437651.528	675044.663	869.32	LIPT	CAL

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			METERS	METERS	METERS	METERS		
						GEOID 12B		
3162	31°22'19.66444"N	102°52'02.02404"W	729.677	3472810.243	702833.914	753.065	LIPT	CAL
3163	29°17'50.44168"N	103°50'40.27056"W	745.4	3241483.406	612224.103	767.469	LIPT	CAL
3164	30°35'56.43614"N	102°56'26.92788"W	1126.953	3386969.869	697420.84	1149.814	LIPT	CAL
3165	30°00'04.38116"N	104°36'56.06100"W	989.579	3318982.4	537076.83	1012.669	LIPT	CAL
3166	29°28'46.94682"N	103°43'56.35776"W	1168.594	3261804.154	622902.595	1190.331	LIPT	CAL
3167	31°45'26.34764"N	104°58'06.16044"W	1087.374	3513537.262	502994.717	1110.485	LIPT	CAL
3168	30°56'30.68171"N	103°50'49.73208"W	1040.67	3423727.872	610128.508	1063.179	LIPT	CAL
3169	29°55'02.15483"N	103°34'54.86124"W	1192.558	3310462.752	636892.279	1214.097	LIPT	CAL
3170	29°41'22.05722"N	104°21'37.48392"W	954.995	3284546.92	561878.575	977.841	LIPT	CAL
3171	31°19'42.91669"N	102°39'06.90084"W	711.403	3468399.828	723418.866	734.589	LIPT	CAL
3172	30°10'23.37384"N	103°53'22.61832"W	1416.61	3338493.799	606910.87	1437.916	LIPT	CAL
3172A	30°08'34.58994"N	103°56'41.91936"W	1386.045	3335094.428	601611.193	1407.533	LIPT	CAL
3173	31°13'56.24962"N	102°38'03.33240"W	699.456	3457759.044	725328.476	722.567	LIPT	CAL
3174	29°40'58.09728"N	103°35'16.94040"W	1086.727	3284472.108	636618.461	1108.36	LIPT	CAL
3175	30°35'08.97158"N	104°29'52.49832"W	1325.652	3383809.782	548138.171	1348.225	LIPT	CAL
3177	29°37'26.28599"N	103°03'02.15316"W	747.12	3278706.678	688738.839	768.909	LIPT	CAL
3178	31°18'42.11906"N	103°56'19.18104"W	931.447	3464633.083	600993.425	955.194	LIPT	CAL
3179	30°04'09.70342"N	102°19'46.26192"W	777.363	3329478.546	757429.328	799.942	LIPT	CAL
3180	30°08'09.32788"N	102°33'23.30532"W	945.774	3336367.967	735386.268	968.091	LIPT	CAL
3181	29°32'12.47298"N	103°32'37.16520"W	1026.605	3268344.885	641116.491	1048.328	LIPT	CAL
3182	30°53'20.62936"N	102°54'03.55752"W	895.501	3419194.774	700637.37	919.05	LIPT	CAL
3183	29°14'49.16965"N	103°00'44.18100"W	673.856	3236988.129	693162.875	695.37	LIPT	CAL
3185	30°33'12.88735"N	102°25'13.62288"W	904.586	3382961.785	747439.807	927.573	LIPT	CAL
3186	31°18'55.10923"N	103°47'26.12832"W	863.127	3465178.172	615079.811	887.207	LIPT	CAL
3187	29°59'47.68559"N	102°23'49.04088"W	660.338	3321259.345	751109.715	682.769	LIPT	CAL
3188	30°13'01.03354"N	103°55'09.38892"W	1413.518	3343319.694	604009.048	1434.859	LIPT	CAL
3189	29°10'56.16520"N	102°57'41.79420"W	540.629	3229899.268	698211.886	562.122	LIPT	CAL

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PT #	NAD83(2011)		ELLIPSOID	UTM ZONE 13 NORTH		NAVD 88	CODE	NOTE
	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	ELEVATION		
			METERS	METERS	METERS	METERS		
						GEOID 12B		
3191	30°53'25.48608"N	102°23'59.57520"W	753.569	3420353.627	748547.068	776.851	LIPT	CAL
3192	30°59'54.34667"N	102°07'34.79016"W	659.737	3432973.663	774396.804	683.275	LIPT	CAL
3193	31°21'56.60888"N	103°41'09.78396"W	823.711	3470880.446	624961.303	848.131	LIPT	CAL
3194	30°27'57.65713"N	103°41'35.14704"W	1292.357	3371151.084	625460.061	1313.472	LIPT	CAL
3195	30°39'58.00075"N	103°12'58.93200"W	1032.453	3393956.483	670879.857	1055.129	LIPT	CAL
3196	29°48'17.01868"N	103°34'34.02984"W	1132.53	3297997.869	637605.274	1154.112	LIPT	CAL
3197	30°10'50.11054"N	103°52'43.54464"W	1422.104	3339327.087	607947.873	1443.371	LIPT	CAL
3198	31°23'11.84143"N	103°19'21.51012"W	761.659	3473666.813	659491.597	785.936	LIPT	CAL
3199	30°47'33.91548"N	104°10'01.10460"W	1640.586	3406930.886	579698.572	1662.115	LIPT	CAL
3200	31°22'07.75715"N	102°43'56.61624"W	733.144	3472700.067	715667.793	756.371	LIPT	CAL
3201	31°04'25.11980"N	102°46'42.71772"W	758.196	3439884.898	711936.571	781.6	LIPT	CAL
3202	31°58'13.58692"N	104°37'51.73068"W	1325.008	3537218.722	534861.876	1348.353	LIPT	CAL
3204	31°07'36.74132"N	104°58'35.47380"W	1444.293	3443662.979	502238.522	1466.957	LIPT	CAL
3205	30°18'37.55243"N	104°00'57.72960"W	1405.844	3353594.472	594606.59	1427.354	LIPT	CAL
3206	29°31'39.59976"N	102°55'04.47456"W	754.252	3268256.264	701779.941	775.87	LIPT	CAL
3208	30°14'50.45140"N	103°23'30.39900"W	1313.822	3347288.071	654733.32	1335.273	LIPT	CAL
3209	29°53'57.23574"N	104°38'21.22980"W	874.407	3307674.206	534830.6	897.768	LIPT	CAL
3210	31°16'18.00703"N	104°18'58.38696"W	1170.979	3459911.907	565092.842	1193.79	LIPT	CAL
3211	30°14'08.65640"N	103°13'37.28676"W	1258.922	3346236.981	670607.338	1280.686	LIPT	CAL
108100	30°09'29.27848"N	103°52'44.75136"W	1421.268	3336838.455	607940.067	1442.561	LIPT	CAL
108101	30°16'06.34548"N	103°49'09.48900"W	1526.008	3349119.991	613571.807	1547.04	LIPT	VVA
109100	29°47'32.77849"N	103°11'03.16680"W	869.574	3297168.291	675506.731	891.371	LIPT	CAL
110100	30°12'40.64724"N	104°03'59.56632"W	1353.868	3342566.743	589840.105	1375.529	LIPT	CAL
110101	30°12'38.64442"N	104°03'57.62304"W	1352.906	3342505.516	589892.566	1374.566	LIPT	VVA
110102	30°01'35.83002"N	103°57'49.75884"W	1248.19	3322187.129	599913.036	1269.889	LIPT	VVA
110103	30°01'37.40873"N	103°57'50.35140"W	1246.93	3322235.582	599896.724	1268.629	LIPT	NVA
110104	29°58'01.37230"N	103°56'18.07044"W	1282.162	3315608.047	602430.176	1303.886	LIPT	NVA

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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	ELEVATION		
			METERS	METERS	METERS	METERS		
						GEOID 12B		
110105	29°58'02.90460"N	103°56'16.86192"W	1282.067	3315655.516	602462.13	1303.79	LIPT	VVA
110106	29°54'43.22225"N	104°02'19.05396"W	1190.242	3309423.279	592806.186	1212.214	LIPT	VVA
110107	29°49'36.77146"N	103°54'10.45656"W	1237.37	3300107.408	605998.783	1259.141	LIPT	VVA
111100	30°02'17.70000"N	104°36'00.20808"W	1039.912	3323091.141	538558.856	1062.881	LIPT	VVA
112100	29°37'16.35812"N	103°39'56.61828"W	1047.987	3277557.145	629179.435	1069.756	LIPT	VVA
112101	29°35'44.28852"N	103°29'17.23920"W	980.191	3274934.058	646413.43	1001.83	LIPT	CAL
112102	29°35'43.50660"N	103°29'17.87136"W	979.914	3274909.766	646396.736	1001.554	LIPT	VVA
112103	29°35'44.03058"N	103°29'20.02704"W	980.026	3274925.14	646338.53	1001.666	LIPT	NVA
112104	29°28'29.23252"N	103°31'46.34040"W	985.443	3261490.108	642571.531	1007.186	LIPT	VVA
112105	29°18'26.08574"N	103°28'40.37844"W	842.81	3242987.9	647822.678	864.757	LIPT	VVA
115100	29°30'30.18510"N	103°52'17.79348"W	1350.373	3264842.921	609366.744	1372.07	LIPT	VVA
115101	29°30'31.43146"N	103°52'17.50224"W	1349.715	3264881.361	609374.214	1371.412	LIPT	NVA
115102	29°29'33.93179"N	104°05'16.45152"W	1094.773	3262927.564	588415.489	1116.967	LIPT	NVA
115103	29°29'34.25784"N	104°05'15.28836"W	1095.775	3262937.845	588446.732	1117.967	LIPT	VVA
116100	29°20'36.34015"N	103°49'02.58060"W	854.641	3246616.132	614808.225	876.62	LIPT	VVA
116101	29°39'00.29236"N	104°09'54.38844"W	985.697	3280303.806	580805.877	1008.037	LIPT	VVA
116102	29°38'58.78878"N	104°09'54.97920"W	986.007	3280257.412	580790.328	1008.349	LIPT	NVA
116103	29°41'26.24309"N	104°05'13.39008"W	1060.316	3284853.254	588325.397	1082.412	LIPT	NVA
116104	29°41'27.91896"N	104°05'13.59780"W	1060.413	3284904.794	588319.407	1082.509	LIPT	VVA
116105	29°41'53.51410"N	104°06'54.34056"W	1033.744	3285671.583	585605.887	1055.873	LIPT	NVA
117100	29°25'29.90737"N	103°38'34.74528"W	875.567	3255836.546	631635.341	897.462	LIPT	VVA
117101	29°25'28.74000"N	103°38'34.15848"W	874.586	3255800.796	631651.572	896.482	LIPT	NVA
117102	29°18'50.79722"N	103°28'10.93800"W	854.758	3243758.943	648607.037	876.677	LIPT	NVA
117103	29°18'51.12940"N	103°28'08.60988"W	854.915	3243769.989	648669.712	876.832	LIPT	VVA
117104	29°10'04.02028"N	103°36'35.78580"W	637.676	3227374.101	635179.491	659.723	LIPT	VVA
117105	29°03'28.76260"N	103°26'03.06384"W	621.041	3215422.221	652435.229	643.109	LIPT	NVA
117106	29°03'28.54274"N	103°26'02.05584"W	620.251	3215415.816	652462.581	642.319	LIPT	VVA



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			METERS	METERS	METERS	METERS		
						GEOID 12B		
118100	29°40'46.22063"N	103°29'24.88884"W	1092.868	3284226.006	646086.484	1114.367	LIPT	VVA
118101	29°40'44.94778"N	103°29'24.40140"W	1093.827	3284186.994	646100.098	1115.326	LIPT	CAL
118102	29°40'46.73420"N	103°29'26.90916"W	1091.035	3284241.107	646031.968	1112.535	LIPT	NVA
118103	29°55'02.59360"N	103°34'55.31628"W	1192.388	3310476.109	636879.909	1213.927	LIPT	CAL
118104	29°55'03.76086"N	103°34'55.27128"W	1192.869	3310512.057	636880.673	1214.407	LIPT	VVA
118105	29°55'01.58347"N	103°34'54.78888"W	1192.307	3310445.187	636894.437	1213.846	LIPT	NVA
811001	29°52'01.85074"N	102°05'29.38128"W	562.635	3307621.158	780952.647	585.287	LIPT	NVA
811002	29°52'01.52713"N	102°05'29.18796"W	562.572	3307611.323	780958.089	585.224	LIPT	VVA
811003	29°52'01.37255"N	102°05'29.73660"W	562.522	3307606.189	780943.481	585.174	LIPT	CAL
811004	29°57'35.20318"N	102°23'49.30224"W	624.687	3317179.264	751195.388	647.091	LIPT	CAL
811005	29°57'35.67474"N	102°23'49.46496"W	624.972	3317193.687	751190.695	647.376	LIPT	NVA
811006	29°57'35.31708"N	102°23'49.96788"W	624.638	3317182.367	751177.459	647.041	LIPT	VVA
821001	30°17'02.53637"N	102°16'06.67092"W	776.697	3353419.519	762740.754	799.688	LIPT	CAL
821002	30°16'58.84730"N	102°16'08.17500"W	775.155	3353304.934	762703.283	798.145	LIPT	VVA
821003	30°18'24.55726"N	102°14'44.94912"W	827.166	3355998.455	764863.836	850.196	LIPT	CAL
821004	30°18'24.96820"N	102°14'44.96712"W	827.558	3356011.1	764863.048	850.588	LIPT	VVA
821005	30°18'24.88612"N	102°14'44.20320"W	827.718	3356009.068	764883.524	850.748	LIPT	NVA
821006	30°19'35.47841"N	102°08'24.26460"W	810.388	3358434.581	774982.192	833.552	LIPT	NVA
821007	30°19'34.85665"N	102°08'24.49176"W	809.943	3358415.278	774976.605	833.107	LIPT	CAL
821008	30°19'34.76734"N	102°08'25.26324"W	810.151	3358412.007	774956.061	833.315	LIPT	VVA
841001	30°28'44.21600"N	102°50'51.74448"W	1236.169	3373827.558	706603.417	1258.715	LIPT	CAL
841002	30°29'50.99183"N	102°42'58.03092"W	1101.106	3376132.088	719196.324	1123.791	LIPT	CAL
841003	30°29'50.11386"N	102°42'57.63420"W	1100.936	3376105.266	719207.451	1123.62	LIPT	VVA
841004	30°26'42.69545"N	102°47'16.21428"W	1257.62	3370196.627	712425.084	1280.104	LIPT	VVA
841005	30°26'43.35868"N	102°47'16.23444"W	1258.144	3370217.04	712424.146	1280.629	LIPT	NVA
841006	30°26'43.44011"N	102°47'16.86516"W	1257.332	3370219.218	712407.27	1279.817	LIPT	CAL
851004	30°24'16.82561"N	102°50'41.41500"W	1275.473	3365599.119	707035.904	1297.808	LIPT	VVA

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			METERS	METERS	METERS	METERS		
						GEOID 12B		
851005	30°24'16.65626"N	102°50'41.98704"W	1275.695	3365593.614	707020.735	1298.03	LIPT	CAL
851006	30°18'46.54782"N	102°43'22.35360"W	1143.019	3355658.172	718959.498	1165.299	LIPT	VVA
851007	30°18'46.82077"N	102°43'22.91232"W	1143.514	3355666.278	718944.402	1165.794	LIPT	CAL
851008	30°44'22.98984"N	102°54'52.96248"W	1071.248	3402614.294	699634.103	1094.54	LIPT	CAL
861001	30°40'51.87155"N	102°41'30.32556"W	1031.046	3396531.428	721117.69	1054.298	LIPT	CAL
861002	30°40'52.42714"N	102°41'31.21764"W	1031.12	3396548.049	721093.594	1054.372	LIPT	VVA
861003	30°53'24.03398"N	102°43'32.35620"W	847.448	3419628.232	717398.814	871.029	LIPT	CAL
861004	30°53'24.11977"N	102°43'33.31848"W	846.866	3419630.353	717373.203	870.448	LIPT	VVA
861005	30°52'46.86737"N	102°27'39.28356"W	797.592	3419029.766	742738.392	820.897	LIPT	CAL
861006	30°52'46.55485"N	102°27'38.54808"W	797.135	3419020.586	742758.148	820.44	LIPT	VVA
861007	30°51'45.03344"N	102°18'24.90336"W	785.749	3417470.615	757511.349	808.993	LIPT	VVA
861008	30°51'59.85752"N	102°18'25.38000"W	781.253	3417926.896	757487.667	804.502	LIPT	CAL
861009	30°56'54.67654"N	102°05'12.78456"W	727.264	3427537.282	778309.833	750.73	LIPT	CAL
861010	30°56'54.97328"N	102°05'12.58980"W	727.03	3427546.558	778314.765	750.496	LIPT	VVA
861011	31°00'48.81190"N	102°13'42.48084"W	675.34	3434403.555	764598.661	698.816	LIPT	CAL
861012	31°00'44.04478"N	102°22'06.32964"W	733.69	3433931.759	751235.771	756.958	LIPT	VVA
861013	31°00'43.72114"N	102°22'06.65652"W	734.281	3433921.586	751227.335	757.548	LIPT	CAL
871001	31°05'08.92313"N	102°33'41.39928"W	719.793	3441668.924	732618.313	742.892	LIPT	CAL
871002	31°05'11.53831"N	102°33'50.44140"W	718.957	3441744.2	732376.875	742.056	LIPT	VVA
871003	31°08'50.34167"N	102°42'06.48000"W	721.455	3448202.055	719089.61	744.675	LIPT	CAL
871004	31°08'49.41244"N	102°42'05.49180"W	721.335	3448173.981	719116.379	744.555	LIPT	VVA
871005	31°09'21.69317"N	102°47'42.13608"W	740.607	3448986.755	710179.832	763.945	LIPT	CAL
871006	31°15'18.20923"N	102°55'15.17412"W	739.126	3459733.557	697975.184	762.606	LIPT	CAL
871007	31°15'18.83200"N	102°55'15.80628"W	739.008	3459752.42	697958.099	762.489	LIPT	VVA
871008	31°15'08.64533"N	102°46'16.76316"W	714.217	3459716.985	712225.44	737.496	LIPT	VVA
871009	31°15'09.26154"N	102°46'16.20660"W	714.249	3459736.26	712239.782	737.527	LIPT	CAL
871010	31°23'20.29412"N	102°33'44.57376"W	728.381	3475280.06	731792.118	751.637	LIPT	VVA

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			METERS	METERS	METERS	METERS		
						GEOID 12B		
871011	31°23'20.58306"N	102°33'45.34560"W	728.279	3475288.507	731771.528	751.534	LIPT	CAL
881001	31°03'42.10114"N	102°53'26.98152"W	796.937	3438351.021	701245.986	820.463	LIPT	VVA
881002	31°03'41.63872"N	102°53'27.32208"W	797.367	3438336.609	701237.228	820.893	LIPT	CAL
881003	31°17'25.34924"N	103°23'42.75312"W	772.323	3462894.669	652746.128	796.387	LIPT	CAL
881004	31°17'25.15682"N	103°23'42.02628"W	771.9	3462889.023	652765.434	795.963	LIPT	VVA
881005	31°18'46.23520"N	103°30'27.10404"W	769.198	3465235.101	642020.512	793.422	LIPT	CAL
881006	31°18'46.28372"N	103°30'27.56628"W	769.138	3465236.43	642008.272	793.363	LIPT	VVA
881007	31°12'56.62325"N	103°34'22.89864"W	794.108	3454387.838	635926.366	817.984	LIPT	NVA
911001	30°50'08.51719"N	103°24'18.53712"W	1011.564	3412481.78	652523.959	1034.384	LIPT	CAL
911002	30°50'08.41538"N	103°24'19.14444"W	1011.58	3412478.415	652507.868	1034.4	LIPT	VVA
911003	31°01'12.13921"N	103°28'58.41336"W	882.725	3432810.863	644809.967	905.988	LIPT	CAL
911004	31°01'11.89074"N	103°28'58.87848"W	882.525	3432803.044	644797.737	905.788	LIPT	VVA
911005	30°54'07.75818"N	103°47'26.46816"W	1060.064	3419384.772	615570.277	1082.508	LIPT	VVA
911006	30°54'07.49250"N	103°47'27.19752"W	1060.16	3419376.383	615551.002	1082.604	LIPT	CAL
911007	31°00'38.25353"N	103°48'43.33320"W	990.728	3431385.293	613401.411	1013.566	LIPT	VVA
911008	31°00'38.66072"N	103°48'42.62436"W	991.136	3431398.03	613420.075	1013.974	LIPT	CAL
911009	31°16'06.52274"N	103°51'21.28320"W	913.031	3459921.201	608917.738	936.739	LIPT	CAL
921001	30°38'36.70472"N	103°21'48.78720"W	1048.993	3391238.704	656813.676	1071.327	LIPT	NVA
921002	30°38'36.89495"N	103°21'48.06792"W	1048.34	3391244.839	656832.74	1070.674	LIPT	VVA
921003	30°38'36.49560"N	103°21'47.97360"W	1048.488	3391232.58	656835.43	1070.822	LIPT	VVA
921004	30°51'00.07243"N	103°25'18.10668"W	1002.626	3414046.674	650918.856	1025.464	LIPT	CAL
921005	30°51'00.51365"N	103°25'17.99544"W	1003.026	3414060.301	650921.62	1025.864	LIPT	VVA
921006	30°49'03.11790"N	103°27'23.92992"W	1042.365	3410399.023	647626.157	1065.006	LIPT	NVA
921007	30°49'03.48154"N	103°27'24.01344"W	1042.837	3410410.188	647623.783	1065.478	LIPT	CAL
921008	30°49'03.70603"N	103°27'24.40980"W	1043.4	3410416.955	647613.155	1066.041	LIPT	VVA
921009	30°47'04.41028"N	103°28'00.96312"W	1056.133	3406730.585	646692.151	1078.643	LIPT	NVA
921010	30°47'03.10888"N	103°28'05.36916"W	1056.727	3406688.912	646575.577	1079.233	LIPT	CAL

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			METERS	METERS	METERS	METERS		
						GEOID 12B		
921011	30°47'03.33964"N	103°28'06.48804"W	1056.769	3406695.61	646545.737	1079.275	LIPT	VVA
931001	31°03'56.85736"N	104°08'46.84776"W	1233.605	3437206.648	581440.34	1255.878	LIPT	CAL
931002	31°04'11.06742"N	104°22'30.69516"W	1332.637	3437498.752	559604.956	1354.82	LIPT	CAL
931003	31°04'11.67712"N	104°22'30.21600"W	1333.382	3437517.593	559617.548	1355.565	LIPT	VVA
931004	31°02'59.61170"N	104°55'45.79968"W	1339.099	3435133.399	506737.462	1361.883	LIPT	VVA
931005	31°03'00.32969"N	104°55'46.03980"W	1339.88	3435155.498	506731.083	1362.663	LIPT	CAL
931006	31°06'54.71129"N	104°38'31.83828"W	1130.15	3442423.889	534118.894	1152.871	LIPT	CAL
941001	31°05'25.16057"N	104°30'05.64948"W	1236.824	3439718.77	547538.589	1259.192	LIPT	CAL
941002	31°05'24.75701"N	104°30'06.16356"W	1237.229	3439706.285	547525.025	1259.598	LIPT	VVA
941003	31°05'24.37912"N	104°30'06.51240"W	1237.293	3439694.61	547515.835	1259.662	LIPT	NVA
941004	31°17'09.07400"N	104°10'23.33604"W	1041.122	3461577.344	578701.039	1064.291	LIPT	VVA
941005	31°17'08.35836"N	104°10'23.50704"W	1040.971	3461555.277	578696.682	1064.139	LIPT	NVA
941006	31°23'54.18380"N	103°50'48.13368"W	879.107	3474329.252	609643.679	903.483	LIPT	CAL
941007	31°23'58.89174"N	103°50'52.31256"W	879.52	3474473.05	609531.796	903.9	LIPT	NVA
941008	31°23'59.22758"N	103°50'51.49896"W	879.724	3474483.616	609553.175	904.105	LIPT	VVA
951001	31°34'13.44770"N	104°51'09.83988"W	1081.682	3492829.025	513974.599	1104.965	LIPT	CAL
951002	31°34'13.21871"N	104°51'09.18828"W	1081.282	3492821.998	513991.785	1104.565	LIPT	NVA
951003	31°34'27.91621"N	104°51'12.19320"W	1080.971	3493274.391	513911.971	1104.257	LIPT	VVA
951004	31°55'20.27158"N	104°44'46.51404"W	1459.714	3531851.115	523987.901	1482.487	LIPT	NVA
951005	31°56'23.66995"N	104°42'53.04204"W	1414.153	3533810.525	526962.516	1437.056	LIPT	CAL
951006	31°58'36.19646"N	104°45'07.16040"W	1504.348	3537882.28	523431.914	1526.94	LIPT	NVA
951007	31°58'34.86457"N	104°45'00.31284"W	1497.232	3537841.685	523611.718	1519.837	LIPT	VVA
951008	31°56'24.26809"N	104°42'41.59332"W	1406.7	3533829.737	527263.051	1429.621	LIPT	CAL
951009	31°56'23.73594"N	104°42'42.34536"W	1406.698	3533813.3	527243.35	1429.618	LIPT	NVA
971001	30°53'59.66419"N	104°46'08.05512"W	1179.71	3418532.043	522084.844	1202.645	LIPT	CAL
971002	30°54'00.13018"N	104°46'07.71204"W	1179.688	3418546.407	522093.922	1202.623	LIPT	VVA
971003	30°47'45.52314"N	104°47'14.07156"W	1209.203	3407010.949	520354.295	1232.184	LIPT	CAL

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			METERS	METERS	METERS	METERS		
						GEOID 12B		
971004	30°47'44.91690"N	104°47'14.39664"W	1209.093	3406992.271	520345.692	1232.074	LIPT	VVA
971005	30°43'27.72120"N	104°40'17.84784"W	1233.254	3399101.555	531438.614	1256.088	LIPT	CAL
971006	30°38'20.10354"N	104°48'33.76980"W	1136.532	3389601.543	518265.916	1159.626	LIPT	VVA
971007	30°38'17.86358"N	104°48'33.32520"W	1138.798	3389532.61	518277.867	1161.892	LIPT	CAL
971008	30°38'05.10097"N	104°44'46.59180"W	1137.557	3389151.666	524313.946	1160.532	LIPT	CAL
971009	30°38'05.28209"N	104°44'47.29668"W	1137.507	3389157.199	524295.171	1160.482	LIPT	VVA
981001	31°30'32.32109"N	104°30'56.03508"W	1354.763	3486113.356	545999.866	1378.047	LIPT	VVA
981002	31°30'31.86004"N	104°30'55.15992"W	1355.086	3486099.263	546023.013	1378.371	LIPT	NVA
981003	31°30'28.73495"N	104°30'46.64340"W	1351.703	3486004.044	546248.08	1374.991	LIPT	CAL
991001	31°00'08.10929"N	104°11'35.87208"W	1315.255	3430130.834	577012.074	1337.295	LIPT	VVA
991002	31°00'08.39592"N	104°11'35.37708"W	1315.676	3430139.753	577025.137	1337.716	LIPT	CAL
991003	30°52'16.15649"N	104°09'09.05652"W	1509.107	3415630.221	581015.974	1530.789	LIPT	CAL
991004	30°40'50.94300"N	104°00'53.70012"W	2002.029	3394643.278	594356.038	2023.238	LIPT	CAL
991005	30°40'52.26589"N	104°00'53.92188"W	1999.885	3394683.952	594349.78	2021.094	LIPT	VVA
991007	30°48'18.72007"N	103°53'31.71516"W	1217.033	3408538.291	605980.281	1238.897	LIPT	VVA
991008	30°48'20.11820"N	103°53'28.17240"W	1214.921	3408582.267	606074.001	1236.787	LIPT	CAL
991009	30°57'58.23032"N	103°54'33.05376"W	1108.225	3426363.578	604175.859	1130.667	LIPT	CAL
991010	30°57'58.30020"N	103°54'32.56344"W	1107.731	3426365.857	604188.846	1130.173	LIPT	VVA
991011	30°57'58.26449"N	103°54'33.54516"W	1108.411	3426364.502	604162.811	1130.852	LIPT	NVA
1001001	30°22'37.50308"N	104°00'19.36260"W	1457.437	3360990.027	595566.557	1478.864	LIPT	VVA
1001002	30°22'37.22718"N	104°00'19.02240"W	1457.791	3360981.613	595575.712	1479.217	LIPT	CAL
1001003	30°25'20.30419"N	103°59'18.57660"W	1506.398	3366016.104	597144.229	1527.745	LIPT	VVA
1001004	30°25'20.44052"N	103°59'19.04352"W	1506.863	3366020.19	597131.735	1528.21	LIPT	CAL
1011001	30°22'57.75690"N	103°43'42.86964"W	1388.582	3361879.568	622157.688	1409.531	LIPT	CAL
1011002	30°26'05.66174"N	103°38'45.40272"W	1277.235	3367756.462	630028.188	1298.415	LIPT	CAL
1011003	30°30'26.26798"N	103°45'04.50432"W	1334.843	3375663.057	619826.28	1355.9	LIPT	CAL
1011004	30°32'27.89783"N	104°09'03.17772"W	1763.264	3379050.88	581448.932	1784.659	LIPT	NVA

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			METERS	METERS	METERS	METERS		
						GEOID 12B		
1011005	30°32'25.96445"N	104°09'02.80800"W	1761.542	3378991.437	581459.232	1782.938	LIPT	VVA
1011006	30°32'25.90138"N	104°09'02.19636"W	1761.007	3378989.618	581475.545	1782.403	LIPT	CAL
1011007	30°31'38.45449"N	104°13'21.29160"W	1631.24	3377479.21	574581.774	1652.898	LIPT	CAL
1011008	30°31'38.72899"N	104°13'21.49968"W	1631.578	3377487.621	574576.171	1653.237	LIPT	VVA
1011009	30°34'54.71706"N	104°17'17.66076"W	1548.294	3383479.333	568244.536	1570.178	LIPT	CAL
1011010	30°42'16.08584"N	104°13'26.63544"W	1802.656	3397107.262	574303.974	1824.163	LIPT	VVA
1011011	30°42'15.47870"N	104°13'26.11560"W	1803.83	3397088.667	574317.932	1825.336	LIPT	CAL
1041001	30°15'32.54706"N	104°09'12.72672"W	1400.248	3347792.856	581428.177	1422.031	LIPT	CAL
1041002	30°15'28.28412"N	104°09'23.85288"W	1394.966	3347659.421	581131.83	1416.752	LIPT	NVA
1041003	30°15'27.71975"N	104°09'23.80860"W	1394.271	3347642.057	581133.142	1416.057	LIPT	VVA
1041004	30°10'41.46622"N	104°17'01.28904"W	1577.55	3338746.68	568963.447	1599.417	LIPT	NVA
1041005	30°10'41.41391"N	104°17'00.66300"W	1577.489	3338745.175	568980.2	1599.356	LIPT	VVA
1041006	30°08'41.06162"N	104°23'28.86756"W	1737.904	3334980.178	558617.858	1759.905	LIPT	VVA
1041007	30°08'41.19385"N	104°23'28.11588"W	1737.958	3334984.356	558637.946	1759.959	LIPT	CAL
1041008	30°08'41.58175"N	104°23'28.36968"W	1737.301	3334996.26	558631.092	1759.302	LIPT	NVA
1041009	30°01'40.75745"N	104°28'20.83656"W	1449.441	3322003.865	550866.611	1471.814	LIPT	CAL
1041010	30°01'40.85245"N	104°28'20.06004"W	1450.088	3322006.885	550887.396	1472.461	LIPT	NVA
1041011	30°01'40.77484"N	104°28'19.68276"W	1451.498	3322004.542	550897.512	1473.87	LIPT	VVA
1041012	29°59'17.14834"N	104°32'23.16804"W	1197.294	3317555.496	544393.762	1220.007	LIPT	NVA
1041013	29°59'13.66210"N	104°32'34.47672"W	1217.128	3317446.976	544091.177	1239.859	LIPT	CAL
1041014	29°59'13.36708"N	104°32'34.43892"W	1216.516	3317437.899	544092.226	1239.247	LIPT	VVA
1041015	29°59'13.30285"N	104°32'34.95732"W	1217.082	3317435.867	544078.344	1239.814	LIPT	VVA
1041016	29°58'58.60506"N	104°40'49.05264"W	819.282	3316938.617	530840.41	842.561	LIPT	CAL
1041017	29°58'58.83269"N	104°40'48.33840"W	820.098	3316945.677	530859.529	843.377	LIPT	NVA
1041018	29°58'59.42032"N	104°40'48.28008"W	820.442	3316963.769	530861.041	843.721	LIPT	VVA
1041019	30°04'06.78677"N	104°41'15.49680"W	843.757	3326422.614	530105.939	866.985	LIPT	VVA
1041020	30°04'06.09143"N	104°41'15.66096"W	843.887	3326401.199	530101.603	867.115	LIPT	NVA

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						GEOID 12B		
1041021	30°04'05.90653"N	104°41'15.20988"W	844.094	3326395.54	530113.695	867.322	LIPT	CAL
1041022	30°10'29.43667"N	104°41'12.06528"W	851.937	3338201.146	530165.488	875.036	LIPT	CAL
1041023	30°10'28.68654"N	104°41'11.92344"W	851.897	3338178.067	530169.345	874.996	LIPT	NVA
1041024	30°10'28.40729"N	104°41'11.74956"W	851.814	3338169.484	530174.019	874.913	LIPT	VVA
1051001	30°18'01.14782"N	103°36'00.55692"W	1547.242	3352893.627	634610.091	1568.224	LIPT	NVA
1051002	30°18'00.39323"N	103°36'01.06812"W	1547.924	3352870.227	634596.721	1568.905	LIPT	VVA
1051003	30°18'00.23666"N	103°36'00.48816"W	1548.748	3352865.598	634612.273	1569.729	LIPT	CAL
1051004	30°13'44.73872"N	103°33'59.73732"W	1557.314	3345040.075	637937.221	1578.275	LIPT	VVA
1051005	30°13'45.41765"N	103°33'59.12676"W	1557.452	3345061.182	637953.28	1578.413	LIPT	CAL
1051006	30°12'18.61330"N	103°36'33.45948"W	1483.07	3342337.656	633860.115	1504.005	LIPT	CAL
1051007	30°12'18.36806"N	103°36'34.35228"W	1482.396	3342329.815	633836.334	1503.331	LIPT	NVA
1051008	30°12'18.28930"N	103°36'33.79752"W	1482.998	3342327.571	633851.198	1503.933	LIPT	VVA
1051009	30°08'30.02392"N	103°34'56.31240"W	1415.838	3335332.445	636545.339	1436.89	LIPT	VVA
1051010	30°08'30.61435"N	103°34'55.97616"W	1417.427	3335350.733	636554.11	1438.479	LIPT	CAL
1051011	29°52'11.81532"N	103°34'39.42840"W	1137.013	3305224.081	637371.041	1158.609	LIPT	VVA
1051012	29°52'11.46565"N	103°34'38.88156"W	1137.805	3305213.498	637385.846	1159.401	LIPT	CAL
1051013	29°32'16.70244"N	103°26'06.39420"W	1016.682	3268611.842	651634.063	1038.287	LIPT	NVA
1051014	29°32'16.70701"N	103°26'06.78372"W	1016.457	3268611.841	651623.575	1038.062	LIPT	VVA
1051015	29°32'15.81533"N	103°26'06.36252"W	1015.936	3268584.545	651635.284	1037.541	LIPT	CAL
1051016	29°30'55.32242"N	103°23'10.98888"W	992.417	3266171.214	656390.687	1014.005	LIPT	CAL
1051017	29°30'55.96618"N	103°23'10.67100"W	991.835	3266191.15	656398.971	1013.424	LIPT	NVA
1051018	29°30'56.06399"N	103°23'10.22064"W	991.637	3266194.329	656411.056	1013.226	LIPT	VVA
1051019	29°36'18.18310"N	103°20'49.52832"W	954.724	3276163.857	660058.146	976.308	LIPT	CAL
1051020	29°36'17.79120"N	103°20'48.37272"W	954.201	3276152.236	660089.407	975.786	LIPT	NVA
1051021	29°36'17.84167"N	103°20'49.22520"W	954.424	3276153.463	660066.451	976.008	LIPT	VVA
1061001	30°09'28.32008"N	103°52'44.19084"W	1421.259	3336809.1	607955.352	1442.552	LIPT	CAL
1061002	30°08'33.27972"N	103°56'44.52900"W	1385.659	3335053.45	601541.745	1407.149	LIPT	CAL

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						GEOID 12B		
1061003	30°08'31.80538"N	103°56'47.77800"W	1385.166	3335007.262	601455.237	1406.659	LIPT	NVA
1061004	30°08'32.45935"N	103°56'47.68008"W	1385.17	3335027.418	601457.671	1406.662	LIPT	VVA
1061005	30°12'30.52530"N	104°03'52.09812"W	1353.65	3342256.798	590042.334	1375.309	LIPT	CAL
1061006	30°12'30.05888"N	104°03'52.38180"W	1353.107	3342242.378	590034.867	1374.766	LIPT	VVA
1061007	30°08'52.37369"N	104°02'16.10340"W	1303.212	3335562.819	592665.609	1324.887	LIPT	VVA
1061008	30°08'52.40990"N	104°02'15.91872"W	1303.344	3335563.975	592670.541	1325.019	LIPT	CAL
1061009	30°08'52.53677"N	104°02'15.38124"W	1303.285	3335568.002	592684.887	1324.959	LIPT	NVA
1061010	30°05'38.40760"N	104°01'25.90968"W	1281.752	3329603.403	594059.501	1303.486	LIPT	CAL
1061011	29°58'12.43085"N	104°01'35.86188"W	1207.511	3315872.89	593909.839	1229.41	LIPT	CAL
1061012	29°58'04.47330"N	104°01'40.11636"W	1208.943	3315626.973	593797.891	1230.846	LIPT	CAL
1061013	29°58'04.32494"N	104°01'40.72008"W	1209.168	3315622.269	593781.749	1231.071	LIPT	VVA
1061014	29°54'43.63402"N	104°02'20.29920"W	1190.855	3309435.674	592772.687	1212.827	LIPT	VVA
1061015	29°54'31.50529"N	104°02'13.22196"W	1172.504	3309063.919	592965.603	1194.476	LIPT	CAL
1071001	29°57'51.08692"N	103°15'25.27776"W	1045.648	3316095.315	668179.649	1067.357	LIPT	NVA
1071002	29°57'51.03554"N	103°15'24.68268"W	1044.909	3316093.976	668195.625	1066.618	LIPT	VVA
1071003	29°57'50.19383"N	103°15'24.89976"W	1044.836	3316067.974	668190.2	1066.545	LIPT	CAL
1071004	29°52'24.46763"N	103°15'04.86324"W	966.395	3306048.049	668880.017	988.14	LIPT	CAL
1071005	29°52'24.30253"N	103°15'05.38344"W	965.298	3306042.754	668866.137	987.043	LIPT	VVA
1071006	29°50'10.55036"N	103°13'28.90164"W	924.283	3301964.609	671518.414	946.039	LIPT	CAL
1071007	29°47'56.90040"N	103°04'33.45492"W	848.264	3298080.716	685959.616	870.095	LIPT	VVA
1071008	29°47'57.34100"N	103°04'29.37432"W	846.152	3298096.111	686068.964	867.983	LIPT	CAL
1071009	29°48'35.39894"N	102°59'20.45544"W	828.604	3299409.53	694343.867	850.429	LIPT	NVA
1071010	29°48'34.98206"N	102°59'20.09832"W	828.598	3299396.862	694353.68	850.423	LIPT	VVA
1071011	29°48'37.59196"N	102°59'12.14484"W	840.643	3299480.948	694565.83	862.467	LIPT	CAL
1071012	29°46'01.20428"N	102°55'44.44068"W	823.86	3294764.741	700229.29	845.717	LIPT	VVA
1071013	29°45'57.94650"N	102°55'47.28576"W	825.686	3294663.064	700154.665	847.544	LIPT	CAL
1071014	29°43'59.39857"N	102°55'43.38624"W	830.056	3291014.955	700324.919	851.924	LIPT	CAL



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						GEOID 12B		
1071015	29°43'59.41006"N	102°55'43.03236"W	830.592	3291015.479	700334.422	852.459	LIPT	VVA
1071016	29°45'23.42952"N	102°48'09.43272"W	855.912	3293827.779	712474.279	877.736	LIPT	VVA
1071017	29°45'23.20175"N	102°48'07.93080"W	856.199	3293821.535	712514.764	878.023	LIPT	CAL
A736	29°33'19.64970"N	103°50'19.59432"W	1311.286	3270090.556	612497.124	1332.981	MFBC	
A 1105	30°21'25.80520"N	104°00'44.29656"W	1441.39	3358777.056	594920.278	1462.851	MFBC	
ALPPORT	30°23'13.08343"N	103°40'51.01932"W	1338.923	3362403.864	626739.046	1359.946	MFIR	
B 1105	30°22'01.85855"N	104°00'32.56164"W	1451.617	3359889.657	595223.856	1473.061	MFBC	
C 748	29°23'43.20503"N	103°08'42.64872"W	845.887	3253216.863	679984.021	867.449	MFBC	
D 1395	31°02'48.52824"N	104°40'55.98336"W	1153.411	3434833.422	530322.677	1176.165	MFIR	
E 1389	31°02'11.16197"N	104°52'12.43920"W	1251.76	3433646.977	512394.229	1274.589	MFIR	
F 1114	30°23'54.76898"N	103°40'51.39120"W	1329.559	3363687.075	626714.171	1350.595	MFBC	
F 1395	31°03'03.72154"N	104°38'56.30028"W	1156.152	3435310.7	533493.471	1178.869	MFIR	
F 1411	30°52'35.71939"N	102°52'03.11880"W	882.654	3417872.465	703862.369	906.216	MFIR	
L 1114	30°23'18.37504"N	103°40'31.93068"W	1333.609	3362572.717	627246.616	1354.642	MFBC	
M 1396	31°04'42.09946"N	104°06'59.13144"W	1222.066	3438621.842	584283.904	1244.41	MFBC	
P 1070	31°03'43.45895"N	104°47'34.24272"W	1184.274	3436499.53	519763.452	1207.111	MFBC	
P 1391	31°43'21.85694"N	103°49'14.83248"W	843.614	3510308.527	611720.414	869.208	MFIR	
PRESIDIO S BASE	29°39'53.01436"N	104°21'40.38804"W	920.312	3281805.794	561815.656	943.236	MFBC	
QUEBEC RESET	30°30'52.09373"N	104°24'18.84420"W	1384.778	3375945.483	557066.061	1407.124	MFBC	
QUEBEC REF 2	30°30'51.72574"N	104°24'18.58752"W	1385.126	3375934.191	557072.962	1407.472	MFBC	
T747	29°31'23.52868"N	103°07'23.35764"W	867.885	3267422.613	681893.273	889.475	MFBC	
TERLINGUA	29°18'53.24188"N	103°36'37.98108"W	846.179	3243663.514	634927.171	868.183	MFBC	
Y 1403	30°54'32.90630"N	102°55'19.63920"W	902.687	3421382.638	698575.37	926.238	MFIR	
Z 1397	31°23'23.84027"N	103°30'40.59288"W	769.135	3473778.083	641548.346	793.659	MFIR	
Z 1410	30°59'00.37622"N	102°53'02.57964"W	845.213	3429687.677	702058.073	868.775	MFIR	
Y 1417	30°06'36.60948"N	102°22'25.83336"W	789.119	3333903.696	753050.894	811.673	MFBC	
Z 1417	30°05'10.08031"N	102°21'38.12364"W	765.225	3331268.34	754389.952	787.775	MFBC	

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PT #	NAD83(2011)		ELLIPSOID	UTM ZONE 13 NORTH		NAVD 88	CODE	NOTE
	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	ELEVATION		
			METERS	METERS	METERS	METERS		
						GEOID 12B		
A 1417	30°09'05.12654"N	102°24'30.99744"W	846.878	3338400.88	749595.681	869.425	MFBC	
7850	30°40'49.77494"N	104°00'54.30132"W	2005.315	3394607.178	594340.357	2026.524	MFBC	
7851	30°40'49.79377"N	104°00'54.35316"W	2005.32	3394607.746	594338.972	2026.529	MFBC	

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MARCH 2019

PT#	NAD83(2011)		ELLIPSOID	UTM ZONE 14 NORTH		ELEVATION	CODE	NOTE
	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	NAV° 88		
			METERS	METERS	METERS	METERS		
1099	30°43'18.28294"N	101°59'58.52436"W	828.709	3402608.494	212749.655	852.060	LIPT	NVA
1122	30°15'58.05126"N	102°00'06.19236"W	666.748	3352089.918	211201.162	690.057	LIPT	NVA
1143	30°04'52.01537"N	102°00'00.64872"W	593.862	3331570.848	210808.951	617.009	LIPT	NVA
1170	30°39'27.88297"N	101°58'44.61636"W	810.663	3395458.929	214528.019	833.996	LIPT	NVA
1310	30°48'28.13486"N	101°59'31.56036"W	723.612	3412133.923	213722.429	747.020	LIPT	NVA
1353	27°17'36.90870"N	99°20'15.83182"W	103.572	3018998.412	466579.294	127.532	LIPT	NVA
1355	29°54'33.24744"N	101°45'37.80072"W	522.331	3311931.162	233461.977	545.302	LIPT	NVA
1357	29°44'53.79137"N	100°55'53.61744"W	511.144	3292455.333	313219.010	533.781	LIPT	NVA
1358	30°56'10.12268"N	101°31'03.75672"W	745.046	3425243.384	259447.347	768.891	LIPT	NVA
1359	30°48'36.12676"N	101°25'16.82472"W	783.874	3411057.348	268354.214	807.680	LIPT	NVA
1360	30°36'31.26694"N	101°39'21.92472"W	582.990	3389242.351	245359.781	606.732	LIPT	NVA
1361	29°47'39.67933"N	100°56'11.79744"W	411.718	3297570.866	312816.333	434.413	LIPT	NVA
1362	27°27'17.15659"N	99°19'35.47578"W	136.831	3036848.749	467735.387	161.001	LIPT	NVA
1363	28°30'26.04809"N	100°18'39.24252"W	200.636	3154094.052	371711.380	223.805	LIPT	NVA
1364	31°00'22.01465"N	101°37'08.61672"W	848.722	3433224.996	249943.427	872.573	LIPT	NVA
1365	29°37'01.90348"N	101°06'04.14144"W	410.436	3278212.842	296552.164	433.018	LIPT	NVA
1366	29°54'28.09948"N	101°52'46.84872"W	524.138	3312055.375	221945.860	547.053	LIPT	NVA
1368	30°03'28.71119"N	101°07'55.45344"W	476.022	3327125.522	294462.567	499.199	LIPT	NVA
1369	27°14'31.72466"N	99°01'24.35210"W	165.247	3013255.790	497680.275	189.592	LIPT	NVA
1370	30°28'48.59497"N	101°24'41.14908"W	624.612	3374465.311	268517.520	648.468	LIPT	NVA
1371	30°27'57.79908"N	101°49'33.31272"W	613.707	3373824.187	228675.255	637.175	LIPT	NVA
1372	27°07'00.39284"N	99°18'40.03589"W	119.646	2999407.504	469163.923	143.290	LIPT	NVA
1373	27°02'44.50492"N	99°25'28.99578"W	83.375	2991567.479	457878.039	106.501	LIPT	NVA
1374	30°31'05.64697"N	101°32'05.46072"W	643.588	3378945.757	256761.116	667.388	LIPT	NVA
1375	30°20'22.07508"N	101°30'55.04508"W	543.046	3359083.888	258197.673	566.775	LIPT	NVA
1376	29°44'08.17937"N	100°50'50.20980"W	515.122	3290917.650	321347.845	537.752	LIPT	NVA
1377	26°42'42.06906"N	99°06'40.10818"W	94.131	2954507.270	488945.122	117.327	LIPT	NVA

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PT#	NAD83(2011)		ELLIPSOID	UTM ZONE 14 NORTH		ELEVATION	CODE	NOTE
	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	NAV° 88		
			METERS	METERS	METERS	METERS		
1378	26°58'18.86088"N	99°03'34.78018"W	108.597	2983324.956	494079.236	132.430	LIPT	NVA
1379	29°18'54.70362"N	100°48'05.43780"W	283.281	3244254.293	325052.852	306.028	LIPT	NVA
1380	27°10'33.83677"N	99°12'25.41996"W	124.607	3005953.318	479488.459	148.587	LIPT	NVA
1381	30°20'10.37720"N	101°06'24.49224"W	632.549	3357922.969	297469.615	656.216	LIPT	NVA
1382	29°48'48.25944"N	101°34'08.32908"W	404.481	3300877.921	251723.210	427.244	LIPT	NVA
1383	26°49'26.63702"N	99°09'59.51210"W	101.159	2966960.011	483451.933	124.427	LIPT	NVA
1384	27°44'04.07648"N	99°44'38.94331"W	125.489	3068010.012	426653.458	149.157	LIPT	NVA
1386	30°08'43.04785"N	101°07'09.66612"W	494.137	3336781.477	295868.605	517.486	LIPT	NVA
1387	30°06'38.39526"N	101°34'07.35708"W	464.238	3333832.671	252487.699	487.600	LIPT	NVA
1388	30°58'59.50265"N	101°33'54.18072"W	782.677	3430563.388	255043.088	806.533	LIPT	NVA
1389	29°51'03.97944"N	101°41'15.32508"W	488.517	3305319.331	240353.670	511.359	LIPT	NVA
1390	27°01'55.22081"N	98°58'25.10821"W	161.396	2989980.458	502614.456	185.502	LIPT	NVA
1391	30°12'35.22715"N	101°22'43.35708"W	654.064	3344424.054	271030.267	677.551	LIPT	NVA
1392	30°48'00.59476"N	101°30'21.09672"W	719.640	3410141.279	260241.366	743.425	LIPT	NVA
1393	30°38'38.61092"N	101°12'12.17448"W	673.011	3392225.822	288849.386	696.704	LIPT	NVA
1394	30°15'18.59522"N	101°48'30.70872"W	681.053	3350399.076	229765.764	704.505	LIPT	NVA
1395	27°12'20.18070"N	98°56'03.95221"W	179.228	3009210.002	506493.551	203.643	LIPT	NVA
1396	30°33'48.15090"N	101°18'53.35308"W	736.064	3383495.875	277983.385	759.854	LIPT	NVA
1397	30°16'50.37442"N	100°48'42.41160"W	645.85	3351274.947	325737.334	668.949	LIPT	NVA
1398	30°03'52.00312"N	100°51'48.70944"W	543.135	3327390.248	320367.159	566.034	LIPT	NVA
1399	29°47'09.76344"N	101°26'15.14508"W	423.348	3297568.710	264365.954	446.031	LIPT	NVA
1400	30°15'06.16799"N	100°57'46.92564"W	530.887	3348308.188	311131.131	554.284	LIPT	NVA
1401	29°54'13.84326"N	100°59'39.66144"W	404.887	3309801.886	307444.656	427.760	LIPT	NVA
1402	30°18'56.53904"N	101°15'03.99708"W	567.151	3355915.906	283548.623	590.908	LIPT	NVA
1403	26°55'25.59295"N	99°14'55.03600"W	91.286	2978017.009	475316.354	114.580	LIPT	NVA
1404	29°48'00.01955"N	101°53'43.15272"W	394.950	3300140.775	220134.131	417.689	LIPT	NVA
1405	30°03'36.70319"N	101°10'52.96944"W	470.123	3327461.297	289712.503	493.331	LIPT	NVA
1406	26°58'26.09692"N	99°09'44.24807"W	78.769	2983556.530	483894.529	102.406	LIPT	NVA

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PT#	NAD83(2011)		ELLIPSOID	UTM ZONE 14 NORTH		ELEVATION	CODE	NOTE
	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	NAV° 88		
			METERS	METERS	METERS	METERS		
1407	30°18'30.00708"N	101°24'51.51708"W	617.824	3355421.612	267834.607	641.525	LIPT	NVA
1408	29°14'33.37966"N	100°44'41.17380"W	275.446	3236126.119	330444.014	298.196	LIPT	NVA
1410	30°13'09.42726"N	101°51'08.20872"W	659.880	3346525.600	225454.650	683.276	LIPT	NVA
1411	27°19'13.17266"N	99°09'03.67600"W	131.847	3021924.111	485059.091	156.152	LIPT	NVA
1412	29°48'00.41537"N	101°06'20.80944"W	503.537	3298496.117	296473.217	526.228	LIPT	NVA
1413	30°01'41.35930"N	101°34'32.95308"W	542.985	3324700.611	251596.181	566.175	LIPT	NVA
1414	28°51'50.49187"N	100°32'46.50216"W	237.483	3193903.467	349188.771	260.314	LIPT	NVA
1415	30°12'23.14350"N	100°58'50.69028"W	522.106	3343318.191	309339.238	545.456	LIPT	NVA
1416	30°21'55.06312"N	101°47'57.73272"W	724.130	3362588.387	230948.820	747.601	LIPT	NVA
1418	29°31'10.11158"N	101°09'45.39744"W	326.838	3267490.906	290397.910	349.518	LIPT	NVA
1419	30°02'37.69933"N	101°41'50.96472"W	582.748	3326706.232	239899.387	605.963	LIPT	NVA
1420	30°30'13.33894"N	101°23'16.40508"W	639.296	3377026.989	270833.079	663.141	LIPT	NVA
1421	30°20'24.62273"N	100°59'02.26068"W	564.32	3358148.543	309288.699	587.826	LIPT	NVA
1422	29°57'22.12344"N	101°59'59.67672"W	592.897	3317712.889	210471.677	615.803	LIPT	NVA
1423	30°06'29.68330"N	101°48'44.42472"W	619.300	3334118.003	228996.705	642.587	LIPT	NVA
1424	27°14'14.04866"N	98°52'55.88825"W	228.233	3012717.215	511663.801	252.772	LIPT	NVA
1425	30°00'42.85915"N	100°44'29.79780"W	517.144	3321381.686	332032.731	539.839	LIPT	NVA
1426	29°55'44.56333"N	101°24'37.58508"W	502.484	3313365.940	267318.686	525.461	LIPT	NVA
1427	30°35'41.80297"N	101°49'03.43272"W	790.483	3388095.893	229829.796	813.963	LIPT	NVA
1428	28°17'57.24820"N	100°13'00.08688"W	208.744	3130951.523	380699.010	231.996	LIPT	NVA
1429	26°49'36.17699"N	99°02'57.01621"W	105.033	2967243.609	495114.017	128.596	LIPT	NVA
1430	27°29'05.94859"N	99°23'28.03571"W	143.131	3040214.593	461362.540	167.211	LIPT	NVA
1431	28°24'23.02416"N	100°18'33.48252"W	179.145	3142919.431	371746.295	202.319	LIPT	NVA
1432	29°40'58.74748"N	101°10'47.78544"W	456.905	3285646.191	289058.636	479.444	LIPT	NVA
1434	26°56'36.11695"N	99°18'21.67592"W	86.371	2980199.269	469622.779	109.565	LIPT	NVA
1435	27°25'26.34859"N	99°15'22.75585"W	139.689	3033423.080	474665.078	163.959	LIPT	NVA
1436	29°53'45.00730"N	101°09'08.71344"W	457.779	3309189.533	292162.795	480.683	LIPT	NVA
1437	28°11'51.74027"N	100°06'57.38688"W	171.027	3119607.578	390474.934	194.379	LIPT	NVA

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PT#	NAD83(2011)		ELLIPSOID	UTM ZONE 14 NORTH		ELEVATION	CODE	NOTE
	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	NAV° 88		
			METERS	METERS	METERS	METERS		
1438	27°18'52.29274"N	99°29'44.16367"W	92.003	3021369.958	450966.036	115.674	LIPT	NVA
1439	27°23'56.02456"N	98°59'42.40010"W	226.668	3030617.877	500483.326	251.238	LIPT	NVA
1440	29°58'22.06322"N	100°59'01.46544"W	455.388	3317426.607	308601.373	478.335	LIPT	NVA
1441	30°03'06.82326"N	101°21'33.22908"W	600.368	3326881.762	272543.909	623.580	LIPT	NVA
1442	29°51'59.02326"N	100°47'43.04580"W	515.041	3305334.113	326602.510	537.711	LIPT	NVA
1443	27°22'48.81266"N	99°19'19.27582"W	119.415	3028591.033	468158.680	143.517	LIPT	NVA
1444	30°39'30.36697"N	101°54'17.20836"W	708.028	3395348.836	221650.954	731.463	LIPT	NVA
1445	28°05'58.94030"N	99°59'30.59099"W	164.947	3108644.586	402567.872	188.436	LIPT	NVA
1446	30°00'34.90330"N	101°24'33.48108"W	560.496	3322304.246	267616.680	583.637	LIPT	NVA
1447	29°32'26.53955"N	101°07'47.13744"W	368.952	3269785.231	293625.658	391.611	LIPT	NVA
1448	27°04'14.07284"N	99°08'23.21207"W	94.193	2994259.894	486140.249	118.096	LIPT	NVA
1449	30°11'08.97119"N	101°33'06.19308"W	481.596	3342128.582	254311.848	505.079	LIPT	NVA
1450	30°13'28.79512"N	101°15'10.65708"W	546.544	3345827.191	283170.551	570.100	LIPT	NVA
1451	29°55'19.43522"N	100°46'20.49780"W	581.097	3311469.843	328912.713	603.762	LIPT	NVA
1452	30°16'18.82315"N	101°33'20.19708"W	525.860	3351679.281	254151.608	549.466	LIPT	NVA
1453	30°38'37.91486"N	101°27'34.74072"W	643.930	3392714.182	264283.733	667.744	LIPT	NVA
1454	27°12'00.74081"N	99°25'12.61574"W	83.025	3008679.937	458386.512	106.629	LIPT	NVA
1457	30°27'52.79504"N	101°40'08.40072"W	581.461	3373303.342	243743.443	605.159	LIPT	NVA
1459	26°54'19.13688"N	98°54'43.42032"W	156.977	2975951.199	508732.162	180.983	LIPT	NVA
1460	29°31'22.99955"N	101°04'08.79744"W	336.453	3267722.700	299469.163	359.134	LIPT	NVA
1461	30°24'16.29104"N	101°28'50.19708"W	570.132	3366223.309	261690.592	593.949	LIPT	NVA
1462	30°18'33.21119"N	101°56'17.84472"W	713.448	3356709.407	217430.220	736.799	LIPT	NVA
1463	30°40'59.86283"N	101°19'38.67708"W	700.373	3396815.456	277050.791	724.180	LIPT	NVA
1464	30°31'44.59901"N	101°43'57.32472"W	738.819	3380588.858	237808.722	762.430	LIPT	NVA
1465	30°52'07.26676"N	101°37'38.53272"W	790.238	3418005.577	248790.272	813.963	LIPT	NVA
1466	30°58'24.47468"N	101°41'33.28872"W	730.866	3429772.457	242833.980	754.645	LIPT	NVA
1467	29°35'19.48348"N	100°57'32.07780"W	344.060	3274818.280	310274.398	366.706	LIPT	NVA
1468	27°04'03.48881"N	98°59'33.61621"W	125.307	2993926.585	500726.696	149.447	LIPT	NVA

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PT#	NAD83(2011)		ELLIPSOID	UTM ZONE 14 NORTH		ELEVATION	CODE	NOTE
	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	NAV° 88		
			METERS	METERS	METERS	METERS		
1469	29°46'26.16744"N	101°23'12.44508"W	410.756	3296123.581	269245.566	433.429	LIPT	NVA
1470	30°10'43.54597"N	101°01'14.02572"W	511.569	3340318.907	305451.535	534.913	LIPT	NVA
1471	27°19'19.40063"N	98°58'11.93214"W	236.233	3022107.052	502969.794	260.732	LIPT	NVA
1472	30°23'43.61957"N	101°07'05.11716"W	650.409	3364509.366	296507.32	674.105	LIPT	NVA
1473	29°59'46.48319"N	100°50'49.66944"W	620.716	3319805.470	321826.292	643.518	LIPT	NVA
1474	26°58'11.40884"N	98°54'20.45232"W	142.027	2983097.780	509360.356	166.156	LIPT	NVA
1475	29°44'13.14744"N	101°12'55.11744"W	490.419	3291696.912	285749.957	513.003	LIPT	NVA
1476	27°14'20.81670"N	99°07'48.76003"W	134.261	3012926.667	487108.510	158.471	LIPT	NVA
1477	29°26'41.22755"N	100°54'31.24980"W	331.326	3258781.804	314878.281	354.048	LIPT	NVA
1478	29°01'09.03180"N	100°38'23.31816"W	241.138	3211218.902	340300.419	263.820	LIPT	NVA
1479	29°42'16.79548"N	101°19'30.64944"W	413.120	3288323.245	275049.028	435.667	LIPT	NVA
1480	29°55'50.75548"N	102°00'02.48472"W	607.136	3314900.627	210322.727	629.989	LIPT	NVA
1481	31°00'46.13461"N	101°22'10.38072"W	769.929	3433433.105	273788.160	793.784	LIPT	NVA
1482	30°13'21.88315"N	101°26'48.08508"W	551.640	3345999.596	264515.599	575.161	LIPT	NVA
1483	27°31'49.20859"N	99°29'52.22760"W	103.734	3045275.743	450840.075	127.683	LIPT	NVA
1484	27°39'14.67252"N	99°33'38.84749"W	140.401	3059009.167	444686.035	164.321	LIPT	NVA
1485	29°55'17.45530"N	101°14'27.24144"W	518.521	3312199.531	283672.565	541.480	LIPT	NVA
1486	29°49'37.43548"N	101°45'28.65672"W	504.434	3302814.992	233488.761	527.245	LIPT	NVA
1487	30°32'47.99504"N	101°53'56.97636"W	657.536	3382941.055	221870.176	680.926	LIPT	NVA
1488	29°49'36.35537"N	101°13'48.46944"W	442.772	3301676.379	284508.795	465.545	LIPT	NVA
1489	26°43'25.26910"N	99°11'07.30010"W	80.025	2955844.919	481564.604	103.039	LIPT	NVA
1490	27°25'17.34866"N	99°28'51.60364"W	115.825	3033211.975	452456.282	139.698	LIPT	NVA
1491	27°55'55.29238"N	99°50'39.12317"W	165.448	3089959.179	416942.313	189.080	LIPT	NVA
1492	30°38'01.01479"N	101°04'25.68108"W	720.804	3390831.721	301248.555	744.392	LIPT	NVA
1493	28°40'39.59602"N	100°30'06.05052"W	194.051	3173197.413	353275.816	217.095	LIPT	NVA
1494	29°56'33.55940"N	101°44'06.90072"W	529.565	3315578.091	235989.227	552.600	LIPT	NVA
1495	30°54'33.24668"N	101°23'44.26872"W	746.887	3422002.542	271050.553	770.721	LIPT	NVA
1496	29°56'51.01944"N	101°55'03.18072"W	546.550	3316549.649	218399.573	569.509	LIPT	NVA

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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	NAV° 88		
			METERS	METERS	METERS	METERS		
1498	31°03'22.44658"N	101°21'14.04072"W	798.702	3438215.316	275384.625	822.594	LIPT	NVA
1499	30°43'55.61479"N	101°24'34.30872"W	688.239	3402394.078	269298.399	712.063	LIPT	NVA
1500	29°41'03.78744"N	101°09'59.47344"W	443.796	3285776.961	290360.445	466.339	LIPT	NVA
1501	28°46'10.90394"N	100°28'46.13016"W	212.692	3183367.881	355571.753	235.647	LIPT	NVA
1502	29°27'55.89158"N	101°01'17.11380"W	334.048	3261264.985	303981.301	356.767	LIPT	NVA
1503	28°35'15.27205"N	100°21'27.72252"W	224.008	3163046.725	367231.755	247.148	LIPT	NVA
1504	28°04'01.76030"N	99°56'53.12702"W	164.696	3105004.269	406836.785	188.238	LIPT	NVA
1505	30°14'05.78267"N	101°06'06.11640"W	546.040	3346687.405	297752.647	569.577	LIPT	NVA
1506	27°04'39.23677"N	98°52'52.72028"W	180.447	2995031.961	511767.647	204.785	LIPT	NVA
1507	29°55'19.32737"N	101°34'51.34908"W	468.049	3312946.792	250838.260	491.054	LIPT	NVA
1509	30°29'17.77304"N	101°07'52.34016"W	652.314	3374822.463	295440.794	676.02	LIPT	NVA
1510	30°16'41.42478"N	100°57'12.49236"W	538.502	3351225.303	312101.982	561.915	LIPT	NVA
1511	30°23'51.73908"N	101°38'43.47672"W	585.962	3365825.951	245835.419	609.633	LIPT	NVA
1512	29°10'01.86769"N	100°40'54.91416"W	268.759	3227678.812	336432.929	291.469	LIPT	NVA
1514	29°00'40.59180"N	100°34'20.96616"W	240.037	3210254.280	346845.889	262.723	LIPT	NVA
1515	26°38'27.98113"N	99°05'52.73221"W	94.440	2946689.165	490248.106	117.536	LIPT	NVA
1516	29°48'19.27930"N	100°48'17.10180"W	486.597	3298583.151	325582.611	509.257	LIPT	NVA
1517	26°50'18.18892"N	98°52'05.95639"W	151.226	2968541.977	513083.167	175.234	LIPT	NVA
1518	29°05'56.38373"N	100°38'40.31016"W	260.616	3220070.682	339964.024	283.294	LIPT	NVA
1519	29°31'32.43151"N	100°54'26.96580"W	334.408	3267745.061	315140.681	357.101	LIPT	NVA
1520	30°00'50.49126"N	101°15'55.54908"W	568.671	3322500.868	281506.571	591.790	LIPT	NVA
1521	30°23'25.24297"N	101°14'12.66108"W	589.548	3364163.046	285083.433	613.383	LIPT	NVA
1522	29°20'55.84362"N	100°52'07.21380"W	292.202	3248085.978	318589.267	314.935	LIPT	NVA
1523	26°54'08.44492"N	98°59'30.91625"W	138.530	2975619.243	500802.233	162.364	LIPT	NVA
1524	29°45'56.68333"N	100°48'56.62980"W	480.867	3294209.734	324452.151	503.508	LIPT	NVA
1525	30°33'53.19554"N	101°09'26.95248"W	648.925	3383351.521	293079.962	672.619	LIPT	NVA
1526	30°08'33.70319"N	101°19'20.67708"W	619.935	3336874.734	276299.464	643.291	LIPT	NVA
1527	30°33'30.36694"N	101°28'49.29672"W	621.234	3383286.323	262089.570	645.069	LIPT	NVA



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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	NAV° 88		
			METERS	METERS	METERS	METERS		
1528	29°24'43.83162"N	101°01'00.58980"W	285.290	3255344.248	304324.150	308.025	LIPT	NVA
1529	30°39'49.05076"N	101°05'12.58908"W	724.700	3394181.587	300061.298	748.263	LIPT	NVA
1530	30°05'10.77108"N	100°42'42.15780"W	560.322	3329586.446	335040.260	583.011	LIPT	NVA
1531	29°48'26.51544"N	101°29'54.81708"W	421.498	3300058.554	258516.590	444.224	LIPT	NVA
1532	30°23'33.27115"N	101°53'17.05272"W	731.705	3365827.455	222497.420	755.079	LIPT	NVA
1533	30°27'33.56500"N	101°11'06.06408"W	614.255	3371712.339	290212.445	638.021	LIPT	NVA
1536	29°58'05.93526"N	101°08'58.66944"W	438.449	3317218.635	292582.736	461.491	LIPT	NVA
1537	29°36'04.73544"N	100°53'06.75780"W	392.555	3276093.137	317436.438	415.220	LIPT	NVA
1538	27°37'48.59652"N	99°29'18.71156"W	140.708	3056330.323	451803.072	164.736	LIPT	NVA
1539	28°13'53.16827"N	100°11'36.56688"W	174.217	3123417.088	382899.930	197.475	LIPT	NVA
1540	27°00'56.43292"N	99°21'11.09189"W	74.688	2988220.508	464973.722	97.949	LIPT	NVA
1541	31°02'14.65858"N	101°20'12.04872"W	798.467	3436092.918	276984.298	822.320	LIPT	NVA
1542	27°01'20.19284"N	99°04'47.06814"W	119.687	2988904.996	492090.025	143.584	LIPT	NVA
1543	27°40'26.16852"N	99°40'13.29938"W	120.785	3061263.036	433890.225	144.527	LIPT	NVA
1544	29°42'37.38744"N	101°14'20.36544"W	460.711	3288792.578	283402.034	483.263	LIPT	NVA
1545	31°03'36.77458"N	101°27'42.91272"W	770.084	3438880.263	265083.936	794.043	LIPT	NVA
1546	30°57'15.78661"N	101°18'05.72472"W	780.251	3426818.762	280143.680	804.009	LIPT	NVA
1547	30°16'49.31515"N	101°40'40.51272"W	689.291	3352889.552	242403.457	712.849	LIPT	NVA
2094	30°43'18.93094"N	101°59'58.23636"W	828.781	3402628.250	212757.854	852.132	LIPT	VVA
2117	30°16'02.15526"N	101°59'52.94472"W	682.677	3352206.974	211558.707	705.989	LIPT	VVA
2138	30°04'51.11537"N	101°59'56.47272"W	593.831	3331540.189	210920.088	616.979	LIPT	VVA
2198	30°35'10.12301"N	101°57'54.39636"W	696.516	3387483.760	215655.888	719.856	LIPT	VVA
2238	27°17'35.46870"N	99°20'18.67582"W	102.590	3018954.317	466500.997	126.548	LIPT	VVA
2240	29°54'34.79544"N	101°45'38.88072"W	523.388	3311979.533	233434.146	546.360	LIPT	VVA
2241	30°09'42.75126"N	101°42'42.87672"W	581.744	3339829.782	238819.444	605.158	LIPT	VVA
2242	29°44'54.29537"N	100°55'53.97744"W	511.093	3292471.012	313209.598	533.730	LIPT	VVA
2243	30°56'14.47868"N	101°31'08.18472"W	745.769	3425380.201	259332.826	769.614	LIPT	VVA
2244	30°48'35.80276"N	101°25'17.29272"W	783.422	3411047.640	268341.557	807.228	LIPT	VVA

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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	NAV° 88		
			METERS	METERS	METERS	METERS		
2245	30°36'36.37894"N	101°39'23.07672"W	582.322	3389400.521	245332.811	606.063	LIPT	VVA
2246	29°47'41.55133"N	100°56'11.65344"W	410.724	3297628.436	312821.168	433.420	LIPT	VVA
2247	27°27'16.00459"N	99°19'36.51978"W	136.588	3036813.379	467706.638	160.757	LIPT	VVA
2248	31°00'18.48665"N	101°37'16.32072"W	842.263	3433121.151	249736.480	866.112	LIPT	VVA
2249	29°37'00.35548"N	101°06'03.81744"W	410.234	3278165.023	296560.016	432.816	LIPT	VVA
2250	29°54'28.78348"N	101°52'45.12072"W	523.827	3312075.278	221992.756	546.742	LIPT	VVA
2252	30°03'30.36719"N	101°07'51.88944"W	474.852	3327174.732	294558.978	498.029	LIPT	VVA
2253	27°14'30.60866"N	99°01'25.21610"W	164.883	3013221.458	497656.508	189.227	LIPT	VVA
2254	30°28'48.70297"N	101°24'42.84108"W	626.183	3374469.601	268472.460	650.039	LIPT	VVA
2255	30°28'12.99108"N	101°50'00.74472"W	612.556	3374310.453	227955.089	636.013	LIPT	VVA
2256	27°07'01.47284"N	99°18'40.10789"W	120.046	2999440.737	469162.023	143.691	LIPT	VVA
2257	27°02'34.78492"N	99°25'41.81178"W	82.282	2991269.618	457523.954	105.387	LIPT	VVA
2258	30°31'05.32297"N	101°32'05.17272"W	643.694	3378935.606	256768.571	667.494	LIPT	VVA
2259	30°20'25.60308"N	101°30'52.12908"W	543.336	3359190.809	258277.975	567.067	LIPT	VVA
2260	29°44'07.99937"N	100°50'49.84980"W	515.333	3290911.954	321357.430	537.963	LIPT	VVA
2261	26°58'19.18488"N	99°03'34.24018"W	108.404	2983334.917	494094.127	132.237	LIPT	VVA
2262	29°18'29.28762"N	100°47'40.12980"W	289.558	3243461.374	325723.662	312.307	LIPT	VVA
2263	27°10'33.98077"N	99°12'23.58396"W	124.681	3005957.665	479538.987	148.662	LIPT	VVA
2264	30°20'10.16754"N	101°06'24.92784"W	633.203	3357916.729	297457.861	656.87	LIPT	VVA
2265	29°48'47.86344"N	101°34'07.78908"W	404.232	3300865.402	251737.440	426.995	LIPT	VVA
2266	26°49'19.86902"N	99°09'52.52810"W	105.739	2966751.537	483644.439	129.007	LIPT	VVA
2267	27°44'01.26848"N	99°44'39.33931"W	122.585	3067923.672	426642.094	146.252	LIPT	VVA
2269	30°08'43.83733"N	101°07'09.86268"W	494.666	3336805.883	295863.797	518.015	LIPT	VVA
2270	30°06'35.83926"N	101°34'07.71708"W	465.795	3333754.174	252476.288	489.155	LIPT	VVA
2271	29°51'02.14344"N	101°41'10.03308"W	488.457	3305259.470	240494.419	511.298	LIPT	VVA
2272	27°01'53.42081"N	98°58'12.11221"W	159.798	2989925.159	502972.534	183.909	LIPT	VVA
2273	30°12'41.56315"N	101°22'43.53708"W	642.025	3344619.266	271029.531	665.515	LIPT	VVA
2274	30°48'01.17076"N	101°30'20.62872"W	718.910	3410158.739	260254.206	742.695	LIPT	VVA

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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	NAV° 88		
			METERS	METERS	METERS	METERS		
2275	30°38'53.89112"N	101°12'17.17668"W	675.236	3392698.975	288725.432	698.929	LIPT	VVA
2276	30°15'19.27922"N	101°48'30.99672"W	680.836	3350420.334	229758.584	704.288	LIPT	VVA
2277	30°33'48.18690"N	101°18'52.30908"W	735.937	3383496.411	278011.230	759.726	LIPT	VVA
2278	30°16'49.37106"N	100°48'41.08140"W	645.715	3351243.488	325772.387	668.813	LIPT	VVA
2279	30°03'46.99912"N	100°51'49.14144"W	543.935	3327236.371	320353.078	566.833	LIPT	VVA
2280	29°47'07.45944"N	101°26'09.96108"W	424.876	3297494.819	264503.700	447.558	LIPT	VVA
2281	30°15'06.05934"N	100°57'47.43972"W	530.738	3348305.08	311117.332	554.135	LIPT	VVA
2282	29°54'10.38726"N	100°59'36.31344"W	404.276	3309693.920	307532.620	427.147	LIPT	VVA
2283	30°19'00.85904"N	101°15'04.35708"W	566.476	3356049.124	283541.645	590.236	LIPT	VVA
2284	29°47'56.95955"N	101°53'35.52072"W	384.002	3300041.379	220336.775	406.740	LIPT	VVA
2285	30°03'36.34319"N	101°10'54.66144"W	468.728	3327451.077	289666.972	491.936	LIPT	VVA
2286	26°58'37.90492"N	99°09'23.83607"W	78.550	2983919.109	484457.660	102.207	LIPT	VVA
2287	30°18'30.33108"N	101°24'52.02108"W	618.082	3355431.876	267821.353	641.783	LIPT	VVA
2289	30°13'09.75126"N	101°51'08.13672"W	659.852	3346535.531	225456.826	683.249	LIPT	VVA
2290	27°19'12.56066"N	99°09'04.54000"W	131.742	3021905.310	485035.325	156.046	LIPT	VVA
2291	29°48'00.88337"N	101°06'19.22544"W	505.203	3298509.750	296516.017	527.894	LIPT	VVA
2292	30°01'40.17130"N	101°34'35.18508"W	544.498	3324665.372	251535.546	567.688	LIPT	VVA
2293	28°51'54.81187"N	100°32'42.61416"W	236.045	3194035.068	349295.853	258.875	LIPT	VVA
2294	30°21'54.95512"N	101°47'57.26472"W	723.697	3362584.752	230961.238	747.169	LIPT	VVA
2296	30°02'37.48333"N	101°41'50.85672"W	582.651	3326699.512	239902.124	605.866	LIPT	VVA
2297	30°20'24.12244"N	100°59'02.87376"W	563.912	3358133.425	309272.055	587.418	LIPT	VVA
2298	29°57'25.43544"N	102°00'03.88872"W	592.133	3317817.859	210361.376	615.040	LIPT	VVA
2299	30°06'29.35930"N	101°48'44.92872"W	620.351	3334108.357	228982.963	643.638	LIPT	VVA
2300	27°14'13.32866"N	98°52'58.51625"W	228.245	3012694.994	511591.547	252.783	LIPT	VVA
2301	30°00'42.71515"N	100°44'29.43780"W	516.473	3321377.106	332042.310	539.168	LIPT	VVA
2302	29°55'51.43933"N	101°24'31.75308"W	502.660	3313574.392	267479.557	525.641	LIPT	VVA
2303	30°35'36.90697"N	101°49'01.41672"W	791.199	3387943.746	229879.737	814.679	LIPT	VVA
2304	28°17'56.88820"N	100°13'00.01488"W	208.727	3130940.424	380700.860	231.979	LIPT	VVA

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			METERS	METERS	METERS	METERS		
2305	26°49'37.54499"N	99°02'57.05221"W	105.667	2967285.696	495113.040	129.231	LIPT	VVA
2306	27°29'07.31659"N	99°23'28.50371"W	143.614	3040256.726	461349.830	167.694	LIPT	VVA
2307	28°24'21.80016"N	100°18'32.72652"W	178.845	3142881.536	371766.459	202.019	LIPT	VVA
2308	29°40'59.86348"N	101°10'48.00144"W	456.941	3285680.662	289053.476	479.480	LIPT	VVA
2310	26°56'32.76895"N	99°18'18.54392"W	84.328	2980096.055	469708.891	107.522	LIPT	VVA
2311	27°25'27.71659"N	99°15'21.35185"W	139.666	3033465.092	474703.713	163.937	LIPT	VVA
2312	29°53'44.97130"N	101°09'08.02944"W	457.571	3309188.081	292181.125	480.475	LIPT	VVA
2313	28°11'51.34427"N	100°06'57.42288"W	171.510	3119595.400	390473.840	194.861	LIPT	VVA
2314	27°18'53.37274"N	99°29'43.83967"W	91.927	3021403.153	450975.073	115.599	LIPT	VVA
2315	27°23'57.46456"N	98°59'44.20010"W	225.904	3030662.181	500433.893	250.474	LIPT	VVA
2316	29°58'24.33122"N	100°59'03.69744"W	455.938	3317497.472	308542.749	478.885	LIPT	VVA
2317	30°03'03.90726"N	101°21'15.84108"W	590.210	3326782.368	273007.858	613.419	LIPT	VVA
2318	27°22'46.04066"N	99°19'19.13182"W	119.424	3028505.732	468162.415	143.525	LIPT	VVA
2319	30°39'30.87097"N	101°54'17.56836"W	708.011	3395364.608	221641.769	731.446	LIPT	VVA
2320	28°06'00.02030"N	99°59'30.37499"W	166.656	3108677.774	402574.037	190.145	LIPT	VVA
2321	30°00'34.39930"N	101°24'35.17308"W	558.105	3322289.681	267571.007	581.246	LIPT	VVA
2322	29°32'26.03555"N	101°07'46.48944"W	368.367	3269769.394	293642.820	391.026	LIPT	VVA
2323	27°04'13.38884"N	99°08'22.06007"W	93.727	2994238.814	486171.955	117.630	LIPT	VVA
2324	30°11'07.38719"N	101°33'05.36508"W	481.461	3342079.304	254332.908	504.944	LIPT	VVA
2325	30°13'28.79512"N	101°14'59.82108"W	543.833	3345821.456	283460.313	567.389	LIPT	VVA
2326	29°55'18.60722"N	100°46'22.76580"W	584.333	3311445.290	328851.495	606.998	LIPT	VVA
2327	30°16'18.60715"N	101°33'20.62908"W	525.805	3351672.889	254139.911	549.410	LIPT	VVA
2328	30°38'38.31086"N	101°27'34.56072"W	643.954	3392726.272	264288.793	667.768	LIPT	VVA
2329	27°12'00.95681"N	99°25'13.76774"W	82.619	3008686.689	458354.841	106.222	LIPT	VVA
2330	30°22'13.99915"N	101°57'32.94036"W	749.227	3363562.262	215600.864	772.545	LIPT	VVA
2331	30°22'13.71115"N	101°57'32.40036"W	748.948	3363553.014	215615.054	772.266	LIPT	VVA
2332	30°27'52.79504"N	101°40'08.94072"W	581.324	3373303.682	243729.036	605.022	LIPT	VVA
2334	26°54'18.84888"N	98°54'42.19632"W	156.656	2975942.362	508765.930	180.662	LIPT	VVA

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	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	NAV° 88		
			METERS	METERS	METERS	METERS		
2335	29°31'22.20755"N	101°04'09.55344"W	337.236	3267698.678	299448.372	359.917	LIPT	VVA
2336	30°24'17.01104"N	101°28'50.26908"W	569.454	3366245.524	261689.156	593.272	LIPT	VVA
2337	30°18'28.45919"N	101°56'22.59672"W	709.935	3356566.329	217299.430	733.286	LIPT	VVA
2338	30°40'57.41483"N	101°19'49.94508"W	702.527	3396746.292	276749.314	726.336	LIPT	VVA
2339	30°31'43.95101"N	101°43'56.20872"W	737.195	3380568.178	237837.993	760.806	LIPT	VVA
2340	30°52'07.66276"N	101°37'37.88472"W	789.569	3418017.369	248807.775	813.294	LIPT	VVA
2341	30°58'06.29472"N	101°41'30.12072"W	727.620	3429210.466	242904.510	751.394	LIPT	VVA
2342	27°04'01.97681"N	98°59'33.25621"W	125.179	2993880.066	500736.614	149.318	LIPT	VVA
2343	29°46'27.31944"N	101°23'11.25708"W	411.686	3296158.394	269278.214	434.359	LIPT	VVA
2344	30°10'46.32218"N	101°01'05.93616"W	512.306	3340400.552	305669.454	535.649	LIPT	VVA
2345	27°19'18.82463"N	98°58'10.74414"W	236.165	3022089.338	503002.446	260.664	LIPT	VVA
2346	30°23'45.19702"N	101°07'05.01168"W	650.566	3364557.886	296511.045	674.262	LIPT	VVA
2347	29°59'46.30319"N	100°50'48.76944"W	619.186	3319799.539	321850.321	641.987	LIPT	VVA
2348	26°57'59.34884"N	98°54'21.17232"W	143.216	2982726.723	509340.784	167.339	LIPT	VVA
2349	29°44'14.26344"N	101°12'56.34144"W	491.359	3291731.906	285717.725	513.944	LIPT	VVA
2350	27°14'21.64470"N	99°07'47.60803"W	134.166	3012952.109	487140.218	158.377	LIPT	VVA
2352	29°01'12.37980"N	100°38'23.46216"W	242.224	3211322.015	340297.954	264.905	LIPT	VVA
2353	29°42'16.50748"N	101°19'31.54944"W	412.301	3288314.864	275024.656	434.848	LIPT	VVA
2354	29°55'52.62748"N	102°00'05.18472"W	607.150	3314960.181	210251.799	630.003	LIPT	VVA
2355	30°13'21.84715"N	101°26'45.99708"W	552.342	3345997.287	264571.414	575.863	LIPT	VVA
2356	27°31'49.02859"N	99°29'51.57960"W	103.684	3045270.133	450857.828	127.633	LIPT	VVA
2357	27°39'13.62852"N	99°33'39.27949"W	140.316	3058977.097	444674.053	164.235	LIPT	VVA
2358	29°55'20.04730"N	101°14'27.56544"W	519.352	3312279.512	283665.433	542.312	LIPT	VVA
2359	29°49'37.11148"N	101°45'29.01672"W	504.174	3302805.246	233478.854	526.985	LIPT	VVA
2360	26°43'25.95310"N	99°11'06.18410"W	81.863	2955865.917	481595.467	104.878	LIPT	VVA
2361	27°55'48.27238"N	99°50'37.21517"W	165.344	3089742.797	416992.970	188.976	LIPT	VVA
2362	30°38'00.61879"N	101°04'23.95308"W	721.232	3390818.678	301294.343	744.820	LIPT	VVA
2363	29°26'41.98355"N	100°54'29.52180"W	329.646	3258804.316	314925.226	352.368	LIPT	VVA

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			METERS	METERS	METERS	METERS		
2364	28°35'16.53205"N	100°21'28.37052"W	223.887	3163085.705	367214.591	247.027	LIPT	VVA
2365	30°29'16.70903"N	101°07'53.24160"W	652.891	3374790.153	295416.136	676.597	LIPT	VVA
2366	30°16'41.86686"N	100°57'11.40624"W	538.718	3351238.416	312131.241	562.131	LIPT	VVA
2367	29°10'02.01169"N	100°40'55.20216"W	268.749	3227683.356	336425.211	291.459	LIPT	VVA
2369	26°38'14.22913"N	99°05'47.36821"W	106.498	2946265.973	490396.084	129.592	LIPT	VVA
2370	29°45'55.53133"N	100°48'56.52180"W	480.962	3294174.222	324454.493	503.603	LIPT	VVA
2371	29°36'04.37544"N	100°53'06.25380"W	392.418	3276081.833	317449.818	415.083	LIPT	VVA
2372	31°03'43.43458"N	101°27'46.44072"W	772.919	3439087.456	264994.950	796.880	LIPT	VVA
2373	30°57'15.35461"N	101°18'05.94072"W	780.720	3426805.577	280137.672	804.479	LIPT	VVA
3088	30°43'17.92294"N	101°59'57.01236"W	828.664	3402596.328	212789.596	852.016	LIPT	CAL
3109	30°15'54.91926"N	102°00'11.37636"W	666.109	3351997.109	211060.004	689.417	LIPT	CAL
3127	30°04'47.26337"N	101°59'44.55672"W	590.088	3331413.164	211236.177	613.238	LIPT	CAL
3176	30°35'09.51101"N	101°57'54.25236"W	696.320	3387464.808	215659.229	719.660	LIPT	CAL
3212	27°17'37.19670"N	99°20'20.18782"W	101.046	3019007.597	466459.579	125.004	LIPT	CAL
3214	29°54'44.01144"N	101°45'37.76472"W	528.021	3312262.645	233470.913	550.998	LIPT	CAL
3215	30°09'39.11526"N	101°42'55.69272"W	583.628	3339725.968	238473.788	607.039	LIPT	CAL
3216	29°44'53.75537"N	100°55'54.69744"W	511.255	3292454.711	313189.976	533.892	LIPT	CAL
3217	30°56'27.47468"N	101°31'24.13272"W	747.915	3425790.044	258918.509	771.760	LIPT	CAL
3218	30°48'25.54276"N	101°25'15.49272"W	783.590	3410730.626	268382.563	807.397	LIPT	CAL
3219	30°36'18.09094"N	101°39'21.02472"W	581.161	3388835.978	245374.173	604.903	LIPT	CAL
3220	29°47'36.83533"N	100°56'11.58144"W	411.812	3297483.207	312820.662	434.506	LIPT	CAL
3221	27°27'17.58859"N	99°19'17.69178"W	135.573	3036860.768	468223.562	159.752	LIPT	CAL
3222	31°00'13.55465"N	101°37'29.06472"W	842.391	3432977.224	249394.793	866.236	LIPT	CAL
3223	29°36'59.52748"N	101°05'59.46144"W	408.246	3278137.405	296676.742	430.829	LIPT	CAL
3224	29°54'08.76748"N	101°52'11.89272"W	515.040	3311436.480	222868.947	537.951	LIPT	CAL
3226	30°03'28.24319"N	101°07'54.87744"W	477.066	3327110.824	294477.726	500.242	LIPT	CAL
3227	27°14'31.04066"N	99°01'26.36810"W	164.665	3013234.755	497624.830	189.009	LIPT	CAL
3228	30°28'47.91097"N	101°24'40.82508"W	623.430	3374444.062	268525.712	647.286	LIPT	CAL

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			METERS	METERS	METERS	METERS		
3229	30°28'02.94708"N	101°49'42.92472"W	610.873	3373989.170	228422.771	634.338	LIPT	CAL
3230	27°07'13.53284"N	99°18'24.69989"W	118.840	2999810.747	469587.133	142.502	LIPT	CAL
3231	27°02'48.89692"N	99°25'19.34782"W	83.862	2991701.715	458144.284	107.001	LIPT	CAL
3232	30°31'02.44297"N	101°32'08.01672"W	645.469	3378848.615	256690.745	669.269	LIPT	CAL
3233	30°20'15.23508"N	101°30'59.86908"W	542.367	3358876.101	258064.137	566.093	LIPT	CAL
3234	29°44'08.21537"N	100°50'49.09380"W	515.763	3290918.279	321377.849	538.393	LIPT	CAL
3235	26°57'53.62488"N	99°03'13.46818"W	105.479	2982548.273	494666.406	129.310	LIPT	CAL
3236	29°19'18.46362"N	100°48'35.31780"W	291.024	3244998.186	324258.005	313.768	LIPT	CAL
3237	27°10'11.15677"N	99°12'59.94396"W	129.091	3005257.119	478537.263	153.039	LIPT	CAL
3238	30°19'58.01848"N	101°06'13.38552"W	633.356	3357536.913	297759.206	657.018	LIPT	CAL
3239	29°48'49.91544"N	101°34'07.96908"W	404.106	3300928.701	251734.015	426.870	LIPT	CAL
3240	26°49'27.64502"N	99°10'01.70810"W	100.279	2966991.103	483391.358	123.546	LIPT	CAL
3241	27°43'52.84452"N	99°44'31.67131"W	119.206	3067663.189	426850.481	142.874	LIPT	CAL
3242	30°08'33.03460"N	101°07'11.50068"W	493.081	3336474.069	295813.779	516.424	LIPT	CAL
3243	30°06'29.71926"N	101°34'06.81708"W	466.862	3333565.160	252496.144	490.219	LIPT	CAL
3244	29°50'52.24348"N	101°40'57.39708"W	495.922	3304946.669	240826.535	518.756	LIPT	CAL
3245	27°01'53.81681"N	98°58'13.62421"W	158.926	2989937.332	502930.872	183.037	LIPT	CAL
3246	30°12'39.22315"N	101°23'15.50508"W	640.474	3344565.114	270173.018	663.963	LIPT	CAL
3247	30°48'05.34676"N	101°30'13.50072"W	713.575	3410283.107	260446.588	737.362	LIPT	CAL
3248	30°38'24.38725"N	101°12'07.36632"W	670.894	3391785.308	288968.823	694.587	LIPT	CAL
3249	30°15'29.50322"N	101°48'26.92872"W	679.366	3350732.540	229875.136	702.821	LIPT	CAL
3250	30°16'49.67965"N	100°48'41.25924"W	645.977	3351253.065	325767.786	669.075	LIPT	CAL
3251	30°19'13.45904"N	101°15'02.66508"W	569.185	3356436.222	283594.546	592.951	LIPT	CAL
3252	30°19'12.66704"N	101°15'02.77308"W	569.124	3356411.891	283591.177	592.889	LIPT	CAL
3254	27°14'13.22066"N	98°53'28.07225"W	225.472	3012690.938	510778.707	249.995	LIPT	CAL
3255	30°00'51.60715"N	100°44'32.17380"W	525.594	3321651.981	331973.166	548.291	LIPT	CAL
3256	29°55'39.45133"N	101°24'43.77708"W	499.741	3313212.013	267149.296	522.715	LIPT	CAL
3257	28°17'57.03220"N	100°13'00.69888"W	208.530	3130945.044	380682.272	231.782	LIPT	CAL

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			METERS	METERS	METERS	METERS		
3258	29°40'59.10748"N	101°10'48.86544"W	457.273	3285657.822	289029.808	479.812	LIPT	CAL
3259	26°56'41.84095"N	99°18'34.95992"W	78.048	2980376.268	469256.920	101.237	LIPT	CAL
3260	27°25'28.97659"N	99°15'22.21585"W	139.715	3033503.909	474680.071	163.986	LIPT	CAL
3261	27°19'07.95274"N	99°29'41.39167"W	91.973	3021851.491	451044.130	115.655	LIPT	CAL
3262	27°23'56.88856"N	98°59'44.02010"W	226.223	3030644.459	500438.837	250.793	LIPT	CAL
3263	28°05'59.87630"N	99°59'29.94299"W	166.539	3108673.246	402585.790	190.029	LIPT	CAL
3264	26°58'31.46084"N	98°54'16.38432"W	139.620	2983714.791	509472.033	163.761	LIPT	CAL
3265	29°01'24.94380"N	100°38'21.37416"W	246.944	3211707.978	340359.817	269.624	LIPT	CAL
3266	29°57'19.31544"N	101°59'56.83272"W	593.684	3317624.404	210545.694	616.589	LIPT	CAL
3267	27°31'46.72459"N	99°29'51.50760"W	103.505	3045199.232	450859.518	127.454	LIPT	CAL
3268	29°55'38.40730"N	101°14'31.27344"W	529.772	3312846.788	283577.017	552.740	LIPT	CAL
3269	30°38'01.55479"N	101°04'23.55708"W	721.741	3390847.306	301305.419	745.329	LIPT	CAL
3270	28°35'06.74005"N	100°21'21.74652"W	222.892	3162782.285	367391.127	246.034	LIPT	CAL
3271	30°29'28.41475"N	101°07'58.82376"W	652.815	3375153.416	295274.083	676.522	LIPT	CAL
3273	26°38'15.92113"N	99°05'48.30421"W	105.487	2946318.047	490370.245	128.581	LIPT	CAL
3274	30°57'24.96661"N	101°18'10.87272"W	776.869	3427104.298	280012.894	800.630	LIPT	CAL
62100	26°54'09.56092"N	98°59'30.19625"W	138.126	2975653.579	500822.091	161.961	LIPT	CAL
62101	26°50'17.36092"N	98°52'04.94839"W	150.719	2968516.532	513111.013	174.727	LIPT	VVA
63100	27°13'13.67674"N	99°09'34.27600"W	136.077	3010864.295	484204.053	160.215	LIPT	CAL
63101	27°13'14.90074"N	99°09'34.67200"W	136.501	3010901.968	484193.208	160.640	LIPT	NVA
64100	26°59'42.23688"N	99°10'41.38003"W	93.484	2985901.210	482322.923	117.132	LIPT	VVA
64101	26°59'41.66088"N	99°10'41.52403"W	93.658	2985883.494	482318.929	117.306	LIPT	VVA
64103	26°55'17.56492"N	99°02'12.80821"W	114.115	2977746.302	496337.299	137.891	LIPT	VVA
64104	26°55'16.91692"N	99°02'13.24021"W	114.838	2977726.369	496325.379	138.614	LIPT	VVA
64105	27°02'54.98084"N	99°05'41.93210"W	113.407	2991822.350	490580.481	137.335	LIPT	NVA
761000	30°25'28.68712"N	101°53'50.02872"W	640.181	3369404.924	221707.973	663.557	LIPT	VVA
761001	30°25'28.54312"N	101°53'48.15672"W	639.126	3369399.208	221757.828	662.503	LIPT	NVA
761002	30°25'28.86712"N	101°53'48.26472"W	639.473	3369409.261	221755.201	662.850	LIPT	VVA



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			METERS	METERS	METERS	METERS		
761003	30°35'12.17501"N	101°55'11.24436"W	783.169	3387433.249	220005.406	806.535	LIPT	VVA
761004	30°35'12.35501"N	101°55'10.63236"W	783.435	3387438.370	220021.859	806.801	LIPT	CAL
761005	30°35'31.03901"N	101°55'17.94036"W	785.513	3388018.935	219842.056	808.879	LIPT	NVA
761006	30°39'57.22294"N	101°52'02.64036"W	671.788	3396083.928	225255.458	695.290	LIPT	CAL
761007	30°39'56.61094"N	101°52'02.20836"W	671.140	3396064.783	225266.479	694.642	LIPT	NVA
761008	30°39'56.50294"N	101°52'02.96436"W	671.099	3396061.971	225246.265	694.600	LIPT	VVA
791000	30°44'13.50690"N	101°50'29.00436"W	647.168	3403914.478	227948.678	670.746	LIPT	NVA
791001	30°44'14.15490"N	101°50'29.61636"W	644.708	3403934.851	227932.902	668.286	LIPT	VVA
791002	30°44'12.71490"N	101°50'29.18436"W	647.145	3403890.204	227943.270	670.723	LIPT	NVA
801001	29°50'38.20348"N	101°44'48.84072"W	514.592	3304660.913	234602.618	537.432	LIPT	NVA
801002	29°50'38.31148"N	101°44'49.05672"W	514.517	3304664.378	234596.898	537.357	LIPT	VVA
801003	29°49'29.08351"N	101°54'57.31272"W	494.967	3302934.147	218211.499	517.734	LIPT	NVA
801004	29°49'29.37151"N	101°54'57.45672"W	495.069	3302943.115	218207.856	517.836	LIPT	VVA
801005	30°04'37.29137"N	101°59'04.05672"W	583.764	3331077.610	212313.059	606.922	LIPT	NVA
801006	30°04'37.11137"N	101°59'03.62472"W	583.836	3331071.763	212324.487	606.994	LIPT	VVA
801007	30°04'36.71537"N	101°59'03.58872"W	584.034	3331059.541	212325.132	607.192	LIPT	NVA
7910023	30°12'37.81919"N	101°38'44.30472"W	498.611	3345071.298	245329.381	522.120	LIPT	NVA
1357A	29°45'29.93533"N	100°51'57.92580"W	462.981	3293463.942	319569.076	485.624	LIPT	NVA
1375A	30°20'21.96708"N	101°30'54.72108"W	543.442	3359080.370	258206.254	567.171	LIPT	NVA
1414A	28°51'50.23987"N	100°32'46.17816"W	237.844	3193895.596	349197.449	260.675	LIPT	NVA
1428A	28°19'15.65620"N	100°13'47.67852"W	212.298	3133377.747	379427.210	235.538	LIPT	NVA
1432A	29°41'38.45544"N	101°11'17.37744"W	447.850	3286883.828	288286.169	470.394	LIPT	NVA
1460A	29°31'23.39555"N	101°04'09.01344"W	336.236	3267734.995	299463.564	358.917	LIPT	NVA
1491B	27°55'55.00438"N	99°50'40.34717"W	165.733	3089950.548	416908.799	189.365	LIPT	NVA
1493A	28°40'40.13602"N	100°30'05.25852"W	193.475	3173213.764	353297.523	216.519	LIPT	NVA
1500A	29°41'03.46344"N	101°10'25.10544"W	448.088	3285779.917	289671.133	470.630	LIPT	NVA
1504A	28°04'02.33630"N	99°56'52.65902"W	164.748	3105021.895	406849.698	188.291	LIPT	NVA
1520A	30°03'59.95922"N	101°17'32.20908"W	597.641	3328386.641	279033.196	620.858	LIPT	NVA

USGS WET TEXAS MAPPING UTM 14 NORTH

65220171

MARCH 2019

PT#	NAD83(2011)		ELLIPSOID	UTM ZONE 14 NORTH		ELEVATION	CODE	NOTE
	LATITUDE	LONGITUDE	HEIGHT	NORTHING	EASTING	NAV° 88		
			METERS	METERS	METERS	METERS		
1543A	27°40'26.16852"N	99°40'13.29938"W	120.566	3061263.036	433890.225	144.308	LIPT	NVA
2246A	29°45'29.71933"N	100°51'58.10580"W	463.242	3293457.370	319564.133	485.885	LIPT	VVA
2259A	30°20'25.38708"N	101°30'52.34508"W	543.247	3359184.285	258272.058	566.978	LIPT	VVA
2304A	28°19'15.04420"N	100°13'47.57052"W	212.205	3133358.882	379429.959	235.445	LIPT	VVA
2317A	30°08'32.29919"N	101°19'21.10908"W	619.586	3336831.735	276287.021	642.941	LIPT	VVA
2356B	27°31'47.26459"N	99°29'51.39960"W	103.653	3045215.836	450862.547	127.602	LIPT	VVA
3233A	30°20'15.63108"N	101°31'00.01308"W	542.295	3358888.382	258060.562	566.021	LIPT	CAL
3242A	30°08'33.02646"N	101°07'11.32752"W	493.112	3336473.732	295818.409	516.455	LIPT	CAL
3257A	28°19'15.15220"N	100°13'47.31852"W	212.301	3133362.136	379436.856	235.541	LIPT	CAL
3265A	29°01'24.51180"N	100°38'20.51016"W	246.981	3211694.356	340383.008	269.661	LIPT	CAL
3266B	29°55'52.05148"N	102°00'05.61672"W	607.048	3314942.743	210239.745	629.900	LIPT	CAL
1	30°42'39.29098"N	101°12'02.05740"W	695.895	3399632.089	289264.068	719.567	MFNL	NGS
18 WTF DI	28°51'50.77987"N	100°32'46.53816"W	237.598	3193912.345	349187.911	260.429	MFAC	NGS
5T9 B	28°51'24.39187"N	100°30'53.96616"W	246.123	3193060.762	352227.799	268.963	MFIR	NGS
B703	30°41'57.95189"N	101°16'51.44448"W	750.402	3398512.918	281538.218	774.166	MFBC	NGS
D 1439	28°37'52.19594"N	100°07'15.63852"W	179.330	3167636.721	390424.478	202.534	MFIR	NGS
F 1436	28°00'22.05227"N	99°32'03.77142"W	220.304	3097995.988	447460.859	244.491	MFIR	NGS
R 1404	27°02'04.68892"N	99°25'43.46778"W	78.093	2990343.805	457475.182	101.169	MFIR	NGS
R1439	28°41'25.20798"N	100°22'22.26252"W	229.354	3174449.717	365880.882	252.399	MFIR	NGS
S1405	27°05'37.98888"N	99°25'30.39978"W	93.475	2996905.234	457857.383	116.752	MFIR	NGS
S1439	28°41'41.33598"N	100°23'27.20652"W	225.267	3174966.532	364124.084	248.309	MFIR	NGS
T1439	28°42'02.03598"N	100°24'30.13452"W	233.331	3175623.693	362423.802	256.364	MFIR	NGS
V 1422	27°47'14.30041"N	99°27'19.33556"W	189.707	3073724.604	455138.902	213.911	MFIR	NGS
V104	30°42'39.33968"N	101°12'02.05992"W	695.936	3399633.59	289264.03	719.608	MFBC	NGS
V1439	28°52'18.93187"N	100°31'25.68216"W	246.761	3194750.540	351389.921	269.583	MFIR	NGS

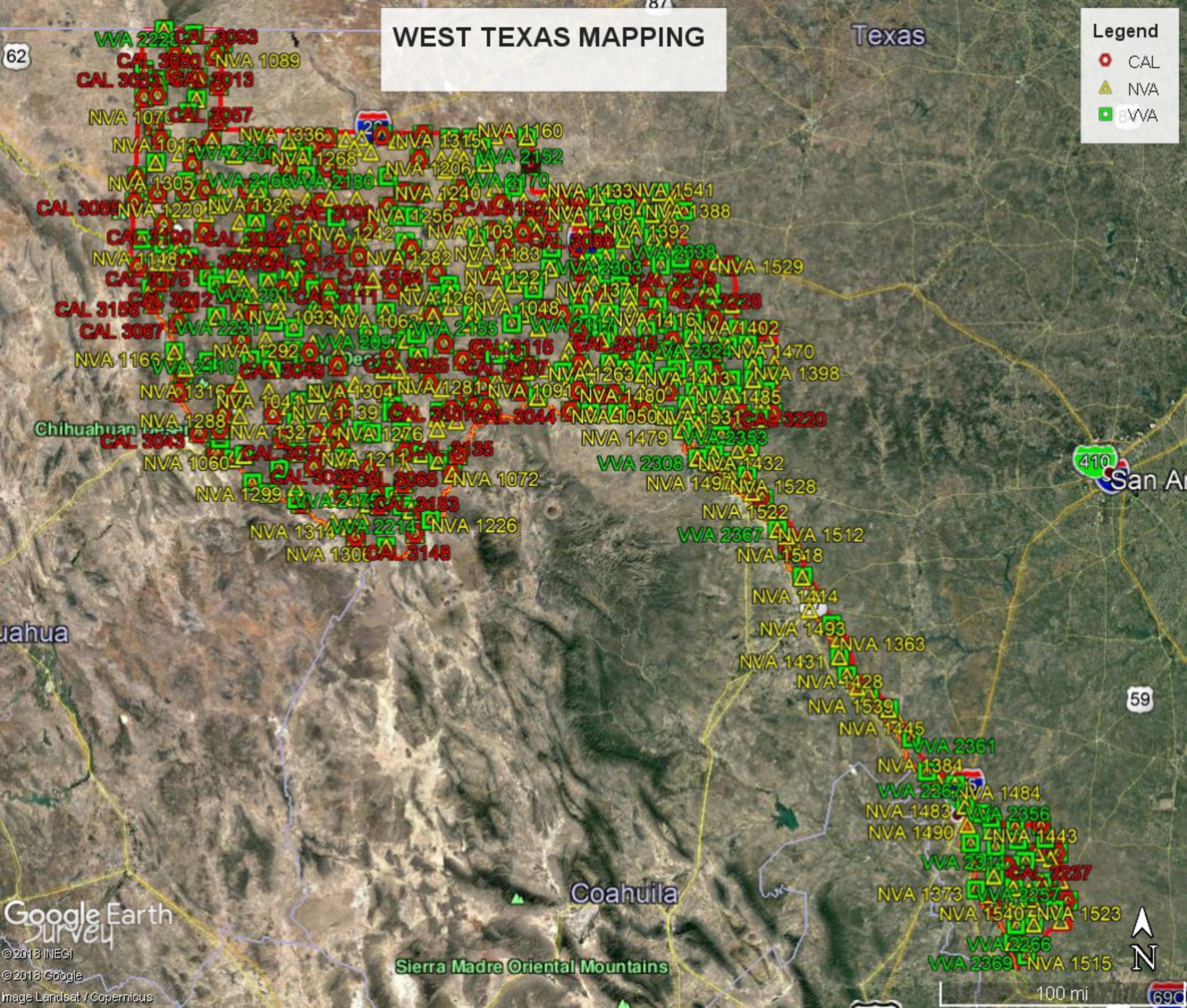


# WEST TEXAS MAPPING

Texas

## Legend

- CAL
- △ NVA
- VVA



62

87

410

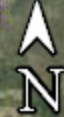
59

690

Google Earth  
Survey

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Image Landsat / Copernicus

Sierra Madre Oriental Mountains



100 mi



# NGS GROUND STATION CHECKPOINTS

**Legend**

- Feature 1
- San Antonio



Google Earth

Image Landsat / Copernicus  
©2018 Google  
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Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Sierra Madre Oriental Mountains

100 mi







# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST 11, 2019
BO0159 *****
BO0159 DESIGNATION - 1
BO0159 PID - BO0159
BO0159 STATE/COUNTY- TX/CROCKETT
BO0159 COUNTRY - US
BO0159 USGS QUAD - OZONA (1979)
BO0159
BO0159 *CURRENT SURVEY CONTROL
BO0159
BO0159* NAD 83(1986) POSITION- 30 42 39.5 (N) 101 12 01.8 (W) HD_HELD2
BO0159* NAVD 88 ORTHO HEIGHT - 719.668 (meters) 2361.11 (feet) ADJUSTED
BO0159
BO0159 GEOID HEIGHT - -23.672 (meters) GEOID12B
BO0159 DYNAMIC HEIGHT - 718.609 (meters) 2357.64 (feet) COMP
BO0159 MODELED GRAVITY - 979,146.1 (mgal) NAVD 88
BO0159
BO0159 VERT ORDER - FIRST CLASS II
BO0159
BO0159.The horizontal coordinates were established by autonomous hand held GPS
BO0159.observations and have an estimated accuracy of +/- 10 meters.
BO0159.
BO0159.The orthometric height was determined by differential leveling and
BO0159.adjusted by the NATIONAL GEODETIC SURVEY
BO0159.in June 1991.
BO0159
BO0159.Significant digits in the geoid height do not necessarily reflect accuracy.
BO0159.GEOID12B height accuracy estimate available here.
BO0159
BO0159.Photographs are available for this station.
BO0159
BO0159.The dynamic height is computed by dividing the NAVD 88
BO0159.geopotential number by the normal gravity value computed on the
BO0159.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
BO0159.degrees latitude (g = 980.6199 gals.).
BO0159
BO0159.The modeled gravity was interpolated from observed gravity values.
BO0159
BO0159; North East Units Estimated Accuracy
BO0159;SPC TX C - 3,116,090. 616,943. MT (+/- 10 meters HH2 GPS)
BO0159
BO0159_U.S. NATIONAL GRID SPATIAL ADDRESS: 14RKU8927199638(NAD 83)
BO0159
BO0159 SUPERSEDED SURVEY CONTROL
BO0159
BO0159 NGVD 29 (??/??/92) 719.454 (m) 2360.41 (f) ADJ UNCH 1 2
BO0159
BO0159.Superseded values are not recommended for survey control.
BO0159
BO0159.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

```

BO0159. See file [dsdata.pdf](#) to determine how the superseded data were derived.

BO0159

BO0159\_MARKER: N = NAIL

BO0159\_SETTING: 31 = SET IN A PAVEMENT SUCH AS STREET, SIDEWALK, CURB, ETC.

BO0159\_SP\_SET: STEP

BO0159\_STAMPING: 2360.40

BO0159\_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY

BO0159

BO0159	HISTORY	- Date	Condition	Report By
BO0159	HISTORY	- UNK	MONUMENTED	LOCENG
BO0159	HISTORY	- 1958	GOOD	CGS
BO0159	HISTORY	- 20180503	GOOD	USPSQD

BO0159

BO0159 STATION DESCRIPTION

BO0159

BO0159'DESCRIBED BY COAST AND GEODETIC SURVEY 1958

BO0159'IN OZONA.

BO0159'AT OZONA, IN THE TOP OF AND THE CENTER OF THE FIRST STONE STEP AT THE  
BO0159'WEST ENTRANCE OF THE COURTHOUSE, 5 FEET SOUTH OF BENCH MARK V 104, AND  
BO0159'ABOUT 3 INCHES ABOVE THE SIDEWALK.

BO0159

BO0159 STATION RECOVERY (2018)

BO0159

BO0159'RECOVERY NOTE BY US POWER SQUADRON 2018 (RBP)

BO0159'THE MARK IS A LARGE NAIL EMBEDDED IN A CONCRETE STEP.

\*\*\* retrieval complete.

Elapsed Time = 00:00:04

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
DF5857 *****
DF5857 PACS          -  This is a Primary Airport Control Station.
DF5857 DESIGNATION -  5T9 B
DF5857 PID          -  DF5857
DF5857 STATE/COUNTY-  TX/MAVERICK
DF5857 COUNTRY     -  US
DF5857 USGS QUAD   -  QUEMADO SE (1974)
DF5857
DF5857                      *CURRENT SURVEY CONTROL
DF5857
DF5857* NAD 83(2011) POSITION- 28 51 24.38462(N) 100 30 53.94987(W) ADJUSTED
DF5857* NAD 83(2011) ELLIP HT- 246.153 (meters) (06/27/12) ADJUSTED
DF5857* NAD 83(2011) EPOCH   - 2010.00
DF5857* NAVD 88 ORTHO HEIGHT - 268.93 (meters) 882.3 (feet) GPS OBS
DF5857
DF5857 NAVD 88 orthometric height was determined with geoid model GEOID99
DF5857 GEOID HEIGHT - -22.651 (meters) GEOID99
DF5857 GEOID HEIGHT - -22.840 (meters) GEOID12B
DF5857 NAD 83(2011) X - -1,020,267.848 (meters) COMP
DF5857 NAD 83(2011) Y - -5,496,848.511 (meters) COMP
DF5857 NAD 83(2011) Z - 3,060,126.289 (meters) COMP
DF5857 LAPLACE CORR - -0.01 (seconds) DEFLEC12B
DF5857
DF5857 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
DF5857 Standards:
DF5857      FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
DF5857      Horiz Ellip              SD_N   SD_E   SD_h      (unitless)
DF5857 -----
DF5857 NETWORK      1.04   1.67              0.44   0.41   0.85      -0.04400664
DF5857 -----
DF5857 Click here for local accuracies and other accuracy information.
DF5857
DF5857
DF5857.This mark is at Maverick County Memorial Airport (5T9)
DF5857
DF5857.The horizontal coordinates were established by GPS observations
DF5857.and adjusted by the National Geodetic Survey in June 2012.
DF5857
DF5857.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
DF5857.been affixed to the stable North American tectonic plate. See
DF5857.NA2011 for more information.
DF5857
DF5857.The horizontal coordinates are valid at the epoch date displayed above
DF5857.which is a decimal equivalence of Year/Month/Day.
DF5857
DF5857.The orthometric height was determined by GPS observations and a
DF5857.high-resolution geoid model.
DF5857
DF5857.GPS derived orthometric heights for airport stations designated as

```



DF5857.PACS or SACS are published to 2 decimal places. This maintains DF5857.centimeter relative accuracy between the PACS and SACS. It does DF5857.not indicate centimeter accuracy relative to other marks which are DF5857.part of the NAVD 88 network.

DF5857

DF5857.Significant digits in the geoid height do not necessarily reflect accuracy. DF5857.GEOID12B height accuracy estimate available [here](#).

DF5857

DF5857.[Photographs](#) are available for this station.

DF5857

DF5857.The X, Y, and Z were computed from the position and the ellipsoidal ht.

DF5857

DF5857.The Laplace correction was computed from DEFLEC12B derived deflections.

DF5857

DF5857.The ellipsoidal height was determined by GPS observations

DF5857.and is referenced to NAD 83.

DF5857

DF5857. The following values were computed from the NAD 83(2011) position.

DF5857

DF5857;	North	East	Units	Scale	Factor	Converg.
DF5857;SPC TXSC	- 4,114,382.901	452,197.613	MT	0.99989782	-0 44 32.0	
DF5857;SPC TXSC	-13,498,604.57	1,483,585.00	sFT	0.99989782	-0 44 32.0	
DF5857;UTM 14	- 3,193,060.533	352,228.237	MT	0.99986948	-0 43 52.7	

DF5857

DF5857! - Elev Factor x Scale Factor = Combined Factor

DF5857!SPC TXSC - 0.99996134 x 0.99989782 = 0.99985916

DF5857!UTM 14 - 0.99996134 x 0.99986948 = 0.99983082

DF5857

DF5857\_U.S. NATIONAL GRID SPATIAL ADDRESS: 14RLS5222893060 (NAD 83)

DF5857

DF5857

SUPERSEDED SURVEY CONTROL

DF5857

DF5857 NAD 83(2007)- 28 51 24.38456(N) 100 30 53.95021(W) AD(2002.00) 0

DF5857 ELLIP H (02/10/07) 246.151 (m) GP(2002.00)

DF5857 NAD 83(1993)- 28 51 24.38367(N) 100 30 53.94978(W) AD( ) B

DF5857 ELLIP H (05/20/03) 246.177 (m) GP( ) 3 1

DF5857

DF5857.Superseded values are not recommended for survey control.

DF5857

DF5857.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

DF5857.See file [dsdata.pdf](#) to determine how the superseded data were derived.

DF5857

DF5857\_MARKER: F = FLANGE-ENCASED ROD

DF5857\_SETTING: 15 = METAL ROD DRIVEN INTO GROUND. SEE TEXT FOR ADDITIONAL

DF5857+WITH SETTING: INFORMATION.

DF5857\_STAMPING: 5T9 B 2003

DF5857\_MARK LOGO: NGS

DF5857\_PROJECTION: FLUSH

DF5857\_MAGNETIC: I = MARKER IS A STEEL ROD

DF5857\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

DF5857\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

DF5857+SATELLITE: SATELLITE OBSERVATIONS - December 15, 2007

DF5857\_ROD/PIPE-DEPTH: 2.5 meters

DF5857\_SLEEVE-DEPTH : 0.9 meters

DF5857

DF5857	HISTORY	- Date	Condition	Report By
DF5857	HISTORY	- 20030403	MONUMENTED	NGS
DF5857	HISTORY	- 20030403	GOOD	NGS
DF5857	HISTORY	- 20071215	GOOD	BAKER

DF5857

DF5857 STATION DESCRIPTION  
DF5857  
DF5857'DESCRIBED BY NATIONAL GEODETIC SURVEY 2003 (AJL)  
DF5857'THE STATION IS LOCATED IN MAVERICK COUNTY, ABOUT 11 MILES NORTH OF  
DF5857'EAGLE PASS ON THE MAVERICK COUNTY MEMORIAL INTERNATIONAL AIRPORT.  
DF5857'NEAR CENTER FIELD NEXT TO A CONCRETE CIRCLE SEGMENT AROUND THE  
DF5857'WINDSOCK. OWNERSHIP--MAVERICK COUNTY MEMORIAL INTERNATIONAL AIRPORT,  
DF5857'500 QUARRY, EAGLE PASS, TEXAS 78852. MANAGER--LESLIE BEATTIE,  
DF5857'PHONE-830-773-9636.  
DF5857'  
DF5857'TO REACH THE STATION FROM THE JUNCTION OF US HIGHWAYS 277 AND 57 IN  
DF5857'EAGLE PASS. GO 10.5 MILES NORTHERLY ON HIGHWAY 277 TO AIRPORT ROAD,  
DF5857'TURN RIGHT, NORTH, GO 1.3 MILES TO A CROSS ROAD, TURN RIGHT, EAST, GO  
DF5857'0.1 MILE ALONG A FIELD ENTRANCE ROAD TO A GATE, PASS THRU THE GATE  
DF5857'AND GO 0.6 MILE EASTERLY CROSSING A RAMP AND THEN ALONG A TAXIWAY TO  
DF5857'THE RUNWAY. TURN RIGHT, SOUTHEAST, GO 0.25 MILE ALONG THE RUNWAY TO A  
DF5857'TRACK ROAD LEADING TO THE WIND SOCK, TURN RIGHT, SOUTHWEST, GO 0.1  
DF5857'MILE TOWARD THE WINDSOCK AND THE STATION AHEAD.  
DF5857'  
DF5857'THE STATION IS 15.0 M NORTH OF THE WINDSOCK, 0.8 M SOUTHEAST OF AND  
DF5857'LEVEL WITH THE EXTENDED CENTER OF THE TRACK ROAD, 0.4 M SOUTH OF A  
DF5857'WITNESS POST AND THE SOUTHEAST CORNER OF A 4 X 8 CONCRETE SLAB OF A  
DF5857'CIRCLE SEGMENT. THE MONUMENT IS FLUSH WITH THE GROUND.  
DF5857'NOTE--ACCESS TO THE DATUM POINT IS THRU A 5-INCH LOGO CAP. THE SLEEVE  
DF5857'DEPTH DOES NOT MEET CLASS A REQUIREMENTS.  
DF5857'NOTE--THIS IS A PRIMARY AIRPORT CONTROL STATION. (PACS)  
DF5857  
DF5857 STATION RECOVERY (2003)  
DF5857  
DF5857'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2003 (AJL)  
DF5857'RECOVERED AS DESCRIBED.  
DF5857  
DF5857 STATION RECOVERY (2007)  
DF5857  
DF5857'RECOVERY NOTE BY M BAKER JR INCORPORATED 2007 (SU)  
DF5857'RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.  
Elapsed Time = 00:00:05

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
AP0157 *****
AP0157 DESIGNATION - 18 WTF DI
AP0157 PID - AP0157
AP0157 STATE/COUNTY- TX/MAVERICK
AP0157 COUNTRY - US
AP0157 USGS QUAD - QUEMADO SE (1974)
AP0157
AP0157 *CURRENT SURVEY CONTROL
AP0157
AP0157* NAD 83(1986) POSITION- 28 51 50.8 (N) 100 32 46.6 (W) HD_HELD2
AP0157* NAVD 88 ORTHO HEIGHT - 260.381 (meters) 854.27 (feet) ADJUSTED
AP0157
AP0157 GEOID HEIGHT - -22.831 (meters) GEOID12B
AP0157 DYNAMIC HEIGHT - 259.995 (meters) 853.00 (feet) COMP
AP0157 MODELED GRAVITY - 979,158.3 (mgal) NAVD 88
AP0157
AP0157 VERT ORDER - FIRST CLASS II
AP0157
AP0157.The horizontal coordinates were established by autonomous hand held GPS
AP0157.observations and have an estimated accuracy of +/- 10 meters.
AP0157.
AP0157.The orthometric height was determined by differential leveling and
AP0157.adjusted by the NATIONAL GEODETIC SURVEY
AP0157.in June 1991.
AP0157
AP0157.Significant digits in the geoid height do not necessarily reflect accuracy.
AP0157.GEOID12B height accuracy estimate available here.
AP0157
AP0157.The dynamic height is computed by dividing the NAVD 88
AP0157.geopotential number by the normal gravity value computed on the
AP0157.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AP0157.degrees latitude (g = 980.6199 gals.).
AP0157
AP0157.The modeled gravity was interpolated from observed gravity values.
AP0157
AP0157; North East Units Estimated Accuracy
AP0157;SPC TXSC - 4,115,236. 449,156. MT (+/- 10 meters HH2 GPS)
AP0157
AP0157_U.S. NATIONAL GRID SPATIAL ADDRESS: 14RLS4918693912(NAD 83)
AP0157
AP0157 SUPERSEDED SURVEY CONTROL
AP0157
AP0157.No superseded survey control is available for this station.
AP0157
AP0157_MARKER: DD = SURVEY DISK
AP0157_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
AP0157_STAMPING: 18 WTF 1975
AP0157_MARK LOGO: DI
AP0157_PROJECTION: PROJECTING 15 CENTIMETERS

```

AP0157\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
AP0157+STABILITY: SURFACE MOTION

AP0157

AP0157	HISTORY	- Date	Condition	Report By
AP0157	HISTORY	- 1975	MONUMENTED	USGS
AP0157	HISTORY	- 1982	GOOD	NGS

AP0157

AP0157

STATION DESCRIPTION

AP0157

AP0157'DESCRIBED BY NATIONAL GEODETIC SURVEY 1982

AP0157'19.3 KM (12.0 MI) NORTH FROM EAGLE PASS.

AP0157'0.25 KM (0.15 MI) EAST ALONG QUARRY STREET FROM THE COURTHOUSE IN  
AP0157'EAGLE PASS, THENCE 19.1 KM (11.85 MI) NORTH ALONG CEYLON STREET AND  
AP0157'U.S. HIGHWAY 277, AT THE JUNCTION OF U.S. HIGHWAY 277 AND STATE  
AP0157'HIGHWAY 131, 49.3 METERS (162.0 FT) NORTHEAST OF THE CENTERLINE OF  
AP0157'U.S. HIGHWAY 277, 18.9 METERS (62.5 FT) WEST NORTHWEST OF THE  
AP0157'CENTERLINE OF STATE HIGHWAY 131, 3.0 METERS (10.0 FT) NORTHEAST OF  
AP0157'CORNER FENCE POST, AND 0.2 METER (0.8 FT) EAST SOUTHEAST OF FENCE  
AP0157'LINE.

AP0157'THE MARK IS 0.3 METERS SW FROM A WITNESS POST.

AP0157'THE MARK IS ABOVE LEVEL WITH STATE HIGHWAY 131.

\*\*\* retrieval complete.

Elapsed Time = 00:00:04

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
AC5717 *****
AC5717 DESIGNATION - 7850
AC5717 PID - AC5717
AC5717 STATE/COUNTY- TX/JEFF DAVIS
AC5717 COUNTRY - US
AC5717 USGS QUAD - MOUNT LOCKE (1978)
AC5717
AC5717 *CURRENT SURVEY CONTROL
AC5717
AC5717* NAD 83(2011) POSITION- 30 40 49.77258(N) 104 00 54.30052(W) ADJUSTED
AC5717* NAD 83(2011) ELLIP HT- 2005.339 (meters) (06/27/12) ADJUSTED
AC5717* NAD 83(2011) EPOCH - 2010.00
AC5717* NAVD 88 ORTHO HEIGHT - 2026.545 (meters) 6648.76 (feet) ADJUSTED
AC5717
AC5717 GEOID HEIGHT - -21.209 (meters) GEOID12B
AC5717 NAD 83(2011) X - -1,330,007.619 (meters) COMP
AC5717 NAD 83(2011) Y - -5,328,393.011 (meters) COMP
AC5717 NAD 83(2011) Z - 3,236,502.796 (meters) COMP
AC5717 LAPLACE CORR - -0.32 (seconds) DEFLEC12B
AC5717 DYNAMIC HEIGHT - 2023.109 (meters) 6637.48 (feet) COMP
AC5717 MODELED GRAVITY - 978,871.0 (mgal) NAVD 88
AC5717
AC5717 VERT ORDER - FIRST CLASS II
AC5717
AC5717 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
AC5717 Standards:
AC5717 FGDC (95% conf, cm) Standard deviation (cm) CorrNE
AC5717 Horiz Ellip SD_N SD_E SD_h (unitless)
AC5717 -----
AC5717 NETWORK 0.47 1.55 0.20 0.18 0.79 -0.03794682
AC5717 -----
AC5717 Click here for local accuracies and other accuracy information.
AC5717
AC5717
AC5717.This is a reference station for the MCDONALD VLBI STA
AC5717.National Continuously Operating Reference Station (MD01).
AC5717
AC5717.The horizontal coordinates were established by GPS observations
AC5717.and adjusted by the National Geodetic Survey in June 2012.
AC5717
AC5717.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
AC5717.been affixed to the stable North American tectonic plate. See
AC5717.NA2011 for more information.
AC5717
AC5717.The horizontal coordinates are valid at the epoch date displayed above
AC5717.which is a decimal equivalence of Year/Month/Day.
AC5717
AC5717.The orthometric height was determined by differential leveling and
AC5717.adjusted by the NATIONAL GEODETIC SURVEY

```

AC5717.in July 2002.

AC5717

AC5717.Significant digits in the geoid height do not necessarily reflect accuracy.  
AC5717.GEOID12B height accuracy estimate available [here](#).

AC5717

AC5717.The X, Y, and Z were computed from the position and the ellipsoidal ht.  
AC5717

AC5717.The Laplace correction was computed from DEFLEC12B derived deflections.  
AC5717

AC5717.The ellipsoidal height was determined by GPS observations  
AC5717.and is referenced to NAD 83.

AC5717

AC5717.The dynamic height is computed by dividing the NAVD 88  
AC5717.geopotential number by the normal gravity value computed on the  
AC5717.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
AC5717.degrees latitude (g = 980.6199 gals.).

AC5717

AC5717.The modeled gravity was interpolated from observed gravity values.

AC5717

AC5717. The following values were computed from the NAD 83(2011) position.

AC5717

AC5717;	North	East	Units	Scale	Factor	Converg.
AC5717;SPC TX C	- 3,118,224.844	347,310.893	MT	0.99989733	-1 53	46.7
AC5717;SPC TX C	-10,230,376.01	1,139,469.15	sFT	0.99989733	-1 53	46.7
AC5717;UTM 13	- 3,394,607.106	594,340.379	MT	0.99970979	+0 30	09.3

AC5717

AC5717!	Elev Factor	x	Scale Factor	=	Combined Factor
AC5717!SPC TX C	- 0.99968518	x	0.99989733	=	0.99958254
AC5717!UTM 13	- 0.99968518	x	0.99970979	=	0.99939506

AC5717

AC5717\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13REP9434094607(NAD 83)

AC5717

AC5717	PID	Reference Object	Distance	Geod. Az
AC5717				ddmmss.s
AC5717	AA7437	MCDONALD VLBI STA CORS L1 PHASE CEN	9.788 METERS	08049

AC5717

#### SUPERSEDED SURVEY CONTROL

AC5717

AC5717	NAD 83(2007)-	30 40 49.77275(N)	104 00 54.30118(W)	AD(2002.00)	0
AC5717	ELLIP H (02/10/07)	2005.353 (m)		GP(2002.00)	
AC5717	ELLIP H (10/23/00)	2005.356 (m)		GP( )	4 2
AC5717	NAD 83(1993)-	30 40 49.77247(N)	104 00 54.30121(W)	AD( )	B
AC5717	ELLIP H (07/06/97)	2005.392 (m)		GP( )	2 1
AC5717	NAVD 88	2026.55 (m)	6648.8 (f)	LEVELING	3

AC5717

AC5717.Superseded values are not recommended for survey control.

AC5717

AC5717.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
AC5717.See file [dsdata.pdf](#) to determine how the superseded data were derived.

AC5717

AC5717\_MARKER: DD = SURVEY DISK

AC5717\_SETTING: 31 = SET IN A PAVEMENT SUCH AS STREET, SIDEWALK, CURB, ETC.

AC5717\_SP\_SET: SLAB

AC5717\_STAMPING: 7850 1988

AC5717\_MARK LOGO: NASA

AC5717\_MAGNETIC: N = NO MAGNETIC MATERIAL

AC5717\_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY

AC5717\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

AC5717+SATELLITE: SATELLITE OBSERVATIONS - November 12, 2013

AC5717

AC5717	HISTORY	- Date	Condition	Report By
AC5717	HISTORY	- 1988	MONUMENTED	NASA
AC5717	HISTORY	- 19961108	GOOD	NGS
AC5717	HISTORY	- 19970303	GOOD	NGS
AC5717	HISTORY	- 20030322	GOOD	USPSQD
AC5717	HISTORY	- 20131112	GOOD	PROFLN

AC5717

AC5717 STATION DESCRIPTION

AC5717

AC5717'DESCRIBED BY NATIONAL GEODETIC SURVEY 1996 (GAS)

AC5717'24.7 KM (15.35 MI) NORTHERLY ALONG STATE HIGHWAY 118 FROM THE JUNCTION  
AC5717'OF STATE HIGHWAY 17 IN FORT DAVIS, THENCE 1.4 KM (0.85 MI) EASTERLY  
AC5717'ALONG STATE ROAD SPUR 78 LEADING TO THE MCDONALD OBSERVATORY, THENCE  
AC5717'0.7 KM (0.45 MI) NORTHERLY ALONG A PAVED ROAD, THENCE 0.1 KM (0.05 MI)  
AC5717'SOUTHERLY ALONG A DIRT ROAD, NEAR THE CENTER OF A 4 BY 4-FOOT CONCRETE  
AC5717'SLAB THAT IS SURROUNDED BY A 12 BY 20-FOOT CONCRETE SLAB, 60.2 M  
AC5717'(197.5 FT) NORTHEAST OF 7850 REFERENCE MARK 2, 44.5 M (146.0 FT) EAST  
AC5717'OF 7850 REFERENCE MARK 3, 34.4 M (112.9 FT) WEST OF 7850 REFERENCE  
AC5717'MARK 1, 28.9 M (94.8 FT) NORTH OF MONUMENT MLRS-TLRS, 18.5 M (60.7 FT)  
AC5717'WEST OF THE ROAD CENTER, 10.3 M (33.8 FT) NORTHEAST OF THE NORTHEAST  
AC5717'CORNER OF THE MLRS OFFICE TRAILER, 9.6 M (31.5 FT) WEST OF THE CORS  
AC5717'ANTENNA, 1.5 M (4.9 FT) SOUTHEAST OF STATION 7851, AND 0.5 M (1.6 FT)  
AC5717'ABOVE THE LEVEL OF THE ROAD.

AC5717

AC5717 STATION RECOVERY (1997)

AC5717

AC5717'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1997 (RWD)

AC5717'ALL MEASUREMENTS AND DIRECTIONS ARE ADDEQUATE.

AC5717

AC5717 STATION RECOVERY (2003)

AC5717

AC5717'RECOVERY NOTE BY US POWER SQUADRON 2003 (GLF)

AC5717'RECOVERED IN GOOD CONDITION.

AC5717

AC5717 STATION RECOVERY (2013)

AC5717

AC5717'RECOVERY NOTE BY PROFESSIONAL LAND SURVEYOR 2013 (JRO)

AC5717'RECOVERED IN GOOD CONDITION WITH THE ASSISTANCE OF MR JERRY WIANT OF  
AC5717'MCDONALD OBSERVATORY LUNAR LASER RANGING PROGRAM.

\*\*\* retrieval complete.

Elapsed Time = 00:00:10

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
AC5718 *****
AC5718 DESIGNATION - 7851
AC5718 PID - AC5718
AC5718 STATE/COUNTY- TX/JEFF DAVIS
AC5718 COUNTRY - US
AC5718 USGS QUAD - MOUNT LOCKE (1978)
AC5718
AC5718 *CURRENT SURVEY CONTROL
AC5718
AC5718* NAD 83(1986) POSITION- 30 40 51. (N) 104 00 57. (W) SCALED
AC5718* NAVD 88 ORTHO HEIGHT - 2026.555 (meters) 6648.79 (feet) ADJUSTED
AC5718
AC5718 GEOID HEIGHT - -21.209 (meters) GEOID12B
AC5718 DYNAMIC HEIGHT - 2023.118 (meters) 6637.51 (feet) COMP
AC5718 MODELED GRAVITY - 978,871.0 (mgal) NAVD 88
AC5718
AC5718 VERT ORDER - FIRST CLASS II
AC5718
AC5718.The horizontal coordinates were scaled from a topographic map and have
AC5718.an estimated accuracy of +/- 6 seconds.
AC5718.
AC5718.The orthometric height was determined by differential leveling and
AC5718.adjusted by the NATIONAL GEODETIC SURVEY
AC5718.in July 2002.
AC5718
AC5718.Significant digits in the geoid height do not necessarily reflect accuracy.
AC5718.GEOID12B height accuracy estimate available here.
AC5718
AC5718.Photographs are available for this station.
AC5718
AC5718.The dynamic height is computed by dividing the NAVD 88
AC5718.geopotential number by the normal gravity value computed on the
AC5718.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC5718.degrees latitude (g = 980.6199 gals.).
AC5718
AC5718.The modeled gravity was interpolated from observed gravity values.
AC5718
AC5718; North East Units Estimated Accuracy
AC5718;SPC TX C - 3,118,270. 347,240. MT (+/- 180 meters Scaled)
AC5718
AC5718_U.S. NATIONAL GRID SPATIAL ADDRESS: 13REP942946(NAD 83)
AC5718
AC5718 SUPERSEDED SURVEY CONTROL
AC5718
AC5718.No superseded survey control is available for this station.
AC5718
AC5718_MARKER: DD = SURVEY DISK
AC5718_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
AC5718_STAMPING: 7851 1988

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AC5718\_MARK LOGO: NASA  
 AC5718\_PROJECTION: FLUSH  
 AC5718\_MAGNETIC: N = NO MAGNETIC MATERIAL  
 AC5718\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
 AC5718+STABILITY: SURFACE MOTION  
 AC5718\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
 AC5718+SATELLITE: SATELLITE OBSERVATIONS - November 08, 1996

AC5718  
 AC5718 HISTORY - Date Condition Report By  
 AC5718 HISTORY - 1988 MONUMENTED NASA  
 AC5718 HISTORY - 19961108 GOOD NGS  
 AC5718 HISTORY - 20030322 GOOD USPSQD  
 AC5718 HISTORY - 20131112 GOOD PROFLN

AC5718

AC5718

AC5718

STATION DESCRIPTION

AC5718'DESCRIBED BY NATIONAL GEODETIC SURVEY 1996 (GAS)  
 AC5718'24.7 KM (15.35 MI) NORTHERLY ALONG STATE HIGHWAY 118 FROM THE JUNCTION  
 AC5718'OF STATE HIGHWAY 17 IN FORT DAVIS, THENCE 1.4 KM (0.85 MI) EASTERLY  
 AC5718'ALONG STATE ROAD SPUR 78 LEADING TO THE MCDONALD OBSERVATORY, THENCE  
 AC5718'0.7 KM (0.45 MI) NORTHERLY ALONG A PAVED ROAD, THENCE 0.1 KM (0.05 MI)  
 AC5718'SOUTHERLY ALONG A DIRT ROAD, 20.0 M (65.6 FT) WEST OF THE ROAD CENTER,  
 AC5718'11.0 M (36.1 FT) WEST OF THE CORS ANTENNA, 9.3 M (30.5 FT) NORTHEAST  
 AC5718'OF THE NORTHEAST CORNER OF A MLRS OFFICE TRAILER, 1.7 M (5.6 FT) SOUTH  
 AC5718'OF THE NORTH EDGE OF A CONCRETE SLAB, 1.5 M (4.9 FT) NORTHWEST OF  
 AC5718'STATION 7850, 0.5 M (1.6 FT) ABOVE THE LEVEL OF THE ROAD, AND THE  
 AC5718'MONUMENT IS FLUSH WITH AND SURROUNDED BY A CONCRETE SLAB.

AC5718

AC5718

AC5718

STATION RECOVERY (2003)

AC5718'RECOVERY NOTE BY US POWER SQUADRON 2003 (GLF)  
 AC5718'RECOVERED IN GOOD CONDITION.

AC5718

AC5718

AC5718

STATION RECOVERY (2013)

AC5718'RECOVERY NOTE BY PROFESSIONAL LAND SURVEYOR 2013 (JRO)  
 AC5718'RECOVERED IN GOOD CONDITION WITH THE ASSISTANCE OF MR. JERRY WIANT OF  
 AC5718'MCDONALD OBSERVATORY LUNAR LASER RANGING PROGRAM.

\*\*\* retrieval complete.  
 Elapsed Time = 00:00:05

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
BA0358 *****
BA0358 DESIGNATION -  A 736
BA0358 PID          -  BA0358
BA0358 STATE/COUNTY-  TX/PRESIDIO
BA0358 COUNTRY      -  US
BA0358 USGS QUAD    -  BANDERA MESA SOUTH (1983)
BA0358
BA0358                      *CURRENT SURVEY CONTROL
BA0358
BA0358* NAD 83(1986) POSITION- 29 33 24.      (N) 103 50 18.      (W) SCALED
BA0358* NAVD 88 ORTHO HEIGHT - 1332.939 (meters)      4373.15 (feet) ADJUSTED
BA0358
BA0358 GEOID HEIGHT   -      -21.695 (meters)                      GEOID12B
BA0358 DYNAMIC HEIGHT -      1330.689 (meters)      4365.77 (feet) COMP
BA0358 MODELED GRAVITY -      978,908.2 (mgal)                      NAVD 88
BA0358
BA0358 VERT ORDER     -  SECOND      CLASS 0
BA0358
BA0358.The horizontal coordinates were scaled from a topographic map and have
BA0358.an estimated accuracy of +/- 6 seconds.
BA0358.
BA0358.The orthometric height was determined by differential leveling and
BA0358.adjusted by the NATIONAL GEODETIC SURVEY
BA0358.in June 1991.
BA0358
BA0358.Significant digits in the geoid height do not necessarily reflect accuracy.
BA0358.GEOID12B height accuracy estimate available here.
BA0358
BA0358.The dynamic height is computed by dividing the NAVD 88
BA0358.geopotential number by the normal gravity value computed on the
BA0358.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
BA0358.degrees latitude (g = 980.6199 gals.).
BA0358
BA0358.The modeled gravity was interpolated from observed gravity values.
BA0358
BA0358;
BA0358;          North      East      Units  Estimated Accuracy
BA0358;SPC TXSC   - 4,200,690.    131,300.    MT  (+/- 180 meters Scaled)
BA0358
BA0358_U.S. NATIONAL GRID SPATIAL ADDRESS: 13RFN125702(NAD 83)
BA0358
BA0358                      SUPERSEDED SURVEY CONTROL
BA0358
BA0358 NGVD 29 (??/??/92) 1332.562 (m)      4371.91 (f) ADJ UNCH      2 0
BA0358
BA0358.Superseded values are not recommended for survey control.
BA0358
BA0358.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
BA0358.See file dsdata.pdf to determine how the superseded data were derived.
BA0358

```

BA0358\_MARKER: DB = BENCH MARK DISK  
BA0358\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
BA0358\_STAMPING: A 736 1943  
BA0358\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
BA0358+STABILITY: SURFACE MOTION

BA0358

BA0358	HISTORY	- Date	Condition	Report By
BA0358	HISTORY	- 1943	MONUMENTED	CGS
BA0358	HISTORY	- 1958	GOOD	CGS

BA0358

BA0358 STATION DESCRIPTION

BA0358

BA0358'DESCRIBED BY COAST AND GEODETIC SURVEY 1958

BA0358'11.05 MI NE FROM FOWLKES BROS RANCH.

BA0358'ABOUT 11.05 MILES NORTHEAST ALONG A WINDING DIRT ROAD FROM THE FOWLKES

BA0358'BROTHERS RANCH, 27 FEET EAST OF THE CENTER LINE OF THE ROAD, ABOUT

BA0358'1.05 MILES SOUTH OF A POWER LINE CROSSING OVER THE ROAD, ABOUT 0.7

BA0358'MILE SOUTH OF THE JUNCTION WITH A PRIVATE ROAD LEADING TO THE RAWLS

BA0358'RANCH, ABOUT 0.4 MILE SOUTH OF A CATTLE GUARD, ABOUT 0.15 MILE NORTH

BA0358'OF A WASH, 166 FEET EAST AND ACROSS THE ROAD FROM A FENCE, 2 FEET

BA0358'NORTH OF A WHITE WOODEN WITNESS POST, AND IN THE TOP OF A CONCRETE

BA0358'POST PROJECTING 8 INCHES.

\*\*\* retrieval complete.

Elapsed Time = 00:00:04

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
BQ0125 *****
BQ0125 SACS          -  This is a Secondary Airport Control Station.
BQ0125 DESIGNATION -  A 1105
BQ0125 PID          -  BQ0125
BQ0125 STATE/COUNTY-  TX/PRESIDIO
BQ0125 COUNTRY     -  US
BQ0125 USGS QUAD   -  MARFA (1983)
BQ0125
BQ0125                      *CURRENT SURVEY CONTROL
BQ0125
BQ0125* NAD 83(2011) POSITION- 30 21 25.80429(N) 104 00 44.29745(W) ADJUSTED
BQ0125* NAD 83(2011) ELLIP HT- 1441.362 (meters) (06/27/12) ADJUSTED
BQ0125* NAD 83(2011) EPOCH   - 2010.00
BQ0125* NAVD 88 ORTHO HEIGHT - 1462.846 (meters) 4799.35 (feet) ADJUSTED
BQ0125
BQ0125 GEOID HEIGHT   -      -21.461 (meters) GEOID12B
BQ0125 NAD 83(2011) X - -1,334,040.123 (meters) COMP
BQ0125 NAD 83(2011) Y - -5,345,651.685 (meters) COMP
BQ0125 NAD 83(2011) Z -  3,205,329.672 (meters) COMP
BQ0125 LAPLACE CORR  -          2.74 (seconds) DEFLEC12B
BQ0125 DYNAMIC HEIGHT -          1460.406 (meters) 4791.35 (feet) COMP
BQ0125 MODELED GRAVITY -          978,922.4 (mgal) NAVD 88
BQ0125
BQ0125 VERT ORDER     -  FIRST      CLASS II
BQ0125
BQ0125 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
BQ0125 Standards:
BQ0125      FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
BQ0125      Horiz Ellip              SD_N   SD_E   SD_h      (unitless)
BQ0125 -----
BQ0125 NETWORK      0.78   1.86              0.32   0.32   0.95      0.00600038
BQ0125 -----
BQ0125 Click here for local accuracies and other accuracy information.
BQ0125
BQ0125
BQ0125.This mark is at Marfa Muni (MRF) Airport (MRF)
BQ0125
BQ0125.The horizontal coordinates were established by GPS observations
BQ0125.and adjusted by the National Geodetic Survey in June 2012.
BQ0125
BQ0125.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
BQ0125.been affixed to the stable North American tectonic plate. See
BQ0125.NA2011 for more information.
BQ0125
BQ0125.The horizontal coordinates are valid at the epoch date displayed above
BQ0125.which is a decimal equivalence of Year/Month/Day.
BQ0125
BQ0125.The orthometric height was determined by differential leveling and
BQ0125.adjusted by the NATIONAL GEODETIC SURVEY

```

BQ0125.in June 1991.

BQ0125

BQ0125.Significant digits in the geoid height do not necessarily reflect accuracy.

BQ0125.GEOID12B height accuracy estimate available [here](#).

BQ0125

BQ0125.The X, Y, and Z were computed from the position and the ellipsoidal ht.

BQ0125

BQ0125.The Laplace correction was computed from DEFLEC12B derived deflections.

BQ0125

BQ0125.The ellipsoidal height was determined by GPS observations

BQ0125.and is referenced to NAD 83.

BQ0125

BQ0125.The dynamic height is computed by dividing the NAVD 88

BQ0125.geopotential number by the normal gravity value computed on the

BQ0125.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

BQ0125.degrees latitude (g = 980.6199 gals.).

BQ0125

BQ0125.The modeled gravity was interpolated from observed gravity values.

BQ0125

BQ0125. The following values were computed from the NAD 83(2011) position.

BQ0125

BQ0125;	North	East	Units	Scale	Factor	Converg.
BQ0125;SPC TXSC	- 4,290,046.802	118,259.385	MT	1.00002216	-2	27 20.1
BQ0125;SPC TXSC	-14,074,928.55	387,989.33	sFT	1.00002216	-2	27 20.1
BQ0125;UTM 13	- 3,358,777.028	594,920.255	MT	0.99971115	+0	29 57.1

BQ0125

BQ0125! - Elev Factor x Scale Factor = Combined Factor

BQ0125!SPC TXSC - 0.99977369 x 1.00002216 = 0.99979585

BQ0125!UTM 13 - 0.99977369 x 0.99971115 = 0.99948491

BQ0125

BQ0125\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13REP9492058777(NAD 83)

BQ0125

BQ0125 SUPERSEDED SURVEY CONTROL

BQ0125

BQ0125	NAD 83(2007)-	30 21 25.80398(N)	104 00 44.29814(W)	AD(2002.00)	0
BQ0125	ELLIP H (02/10/07)	1441.371 (m)		GP(2002.00)	
BQ0125	ELLIP H (03/15/01)	1441.373 (m)		GP( )	4 2
BQ0125	NAD 83(1993)-	30 21 25.80366(N)	104 00 44.29771(W)	AD( )	1
BQ0125	ELLIP H (12/13/96)	1441.422 (m)		GP( )	4 2
BQ0125	NAVD 88	1462.85 (m)	4799.4	(f) LEVELING	3
BQ0125	NGVD 29 (??/??/92)	1462.255 (m)	4797.41	(f) ADJ UNCH	1 2

BQ0125

BQ0125.Superseded values are not recommended for survey control.

BQ0125

BQ0125.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

BQ0125.See file [dsdata.pdf](#) to determine how the superseded data were derived.

BQ0125

BQ0125\_MARKER: DB = BENCH MARK DISK

BQ0125\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

BQ0125\_STAMPING: A 1105 1957

BQ0125\_MARK LOGO: CGS

BQ0125\_PROJECTION: PROJECTING 10 CENTIMETERS

BQ0125\_MAGNETIC: O = OTHER; SEE DESCRIPTION

BQ0125\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

BQ0125+STABILITY: SURFACE MOTION

BQ0125\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

BQ0125+SATELLITE: SATELLITE OBSERVATIONS - October 09, 1995

BQ0125

BQ0125 HISTORY - Date Condition Report By

BQ0125 HISTORY - 1957 MONUMENTED CGS

BQ0125 HISTORY - 1981 GOOD NGS  
 BQ0125 HISTORY - 1990 GOOD USPSQD  
 BQ0125 HISTORY - 19951009 GOOD NGS  
 BQ0125 HISTORY - 19990629 GOOD NGS

BQ0125

BQ0125

BQ0125

STATION DESCRIPTION

BQ0125'DESCRIBED BY COAST AND GEODETIC SURVEY 1957

BQ0125'3.4 MI N FROM MARFA.

BQ0125'ABOUT 3.4 MILES NORTH ALONG STATE HIGHWAY 17 FROM THE TEXAS AND NEW  
 BQ0125'ORLEANS RAILROAD STATION AT MARFA, 57 1/2 FEET EAST OF THE CENTER LINE  
 BQ0125'OF THE HIGHWAY, 194 YARDS NORTH OF THE EAST END OF A 36-INCH CULVERT,  
 BQ0125'2 1/2 FEET WEST OF A FENCE, 2 FEET NORTH OF A WHITE WOODEN WITNESS  
 BQ0125'POST, ABOUT 1 FOOT ABOVE THE LEVEL OF THE HIGHWAY, AND IN THE TOP OF A  
 BQ0125'CONCRETE POST PROJECTING 7 INCHES.

BQ0125

BQ0125

BQ0125

STATION RECOVERY (1981)

BQ0125'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1981

BQ0125'5.6 KM (3.5 MI) NORTHERLY ALONG STATE HIGHWAY 17 FROM ITS JUNCTION  
 BQ0125'WITH U.S. HIGHWAYS 67 AND 90 IN MARFA, 17.5 METERS (57.5 FT) EAST OF  
 BQ0125'THE CENTERLINE OF THE HIGHWAY, 0.8 METER (2.5 FT) WEST OF A FENCE, AND  
 BQ0125'0.6 METER (2.0 FT) NORTH OF A 4X4 INCH WOODEN WITNESS POST.  
 BQ0125'THE MARK IS 0.3 METERS N FROM A WITNESS POST.  
 BQ0125'THE MARK IS ABOVE LEVEL WITH THE HIGHWAY.

BQ0125

BQ0125

BQ0125

STATION RECOVERY (1990)

BQ0125'RECOVERY NOTE BY US POWER SQUADRON 1990 (MVM)

BQ0125'RECOVERED IN GOOD CONDITION.

BQ0125

BQ0125

BQ0125

STATION RECOVERY (1995)

BQ0125'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995

BQ0125'RECOVERED IN GOOD CONDITION.

BQ0125

BQ0125

BQ0125

STATION RECOVERY (1999)

BQ0125'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1999 (HWE)

BQ0125'STATION RECOVERED IN GOOD GONDITION. 3.45 MILES (5.55 KM) NORTH ALONG  
 BQ0125'S.H. 17 FROM ITS INTERSECTION WITH US 67 AND US 90 IN MARFA, 0.3 M  
 BQ0125'(1.0 FT) NNE FROM A WITNESS POST.

\*\*\* retrieval complete.

Elapsed Time = 00:00:05

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
BP0648 *****
BP0648 DESIGNATION -  A 1417
BP0648 PID          -  BP0648
BP0648 STATE/COUNTY-  TX/TERRELL
BP0648 COUNTRY      -  US
BP0648 USGS QUAD    -  SANDERSON (1969)
BP0648
BP0648                      *CURRENT SURVEY CONTROL
BP0648
BP0648* NAVD 88 NAD 83(1986) POSITION- 30 09 05.1      (N) 102 24 31.0      (W)  HD_HELD2
BP0648* NAVD 88 ORTHO HEIGHT - 869.468 (meters)      2852.58 (feet) ADJUSTED
BP0648
BP0648 GEOID HEIGHT - -22.547 (meters)                GEOID12B
BP0648 DYNAMIC HEIGHT - 868.123 (meters)      2848.17 (feet) COMP
BP0648 MODELED GRAVITY - 979,066.3 (mgal)                NAVD 88
BP0648
BP0648 VERT ORDER - FIRST CLASS II
BP0648
BP0648.The horizontal coordinates were established by autonomous hand held GPS
BP0648.observations and have an estimated accuracy of +/- 10 meters.
BP0648.
BP0648.The orthometric height was determined by differential leveling and
BP0648.adjusted by the NATIONAL GEODETIC SURVEY
BP0648.in June 1991.
BP0648
BP0648.Significant digits in the geoid height do not necessarily reflect accuracy.
BP0648.GEOID12B height accuracy estimate available here.
BP0648
BP0648.The dynamic height is computed by dividing the NAVD 88
BP0648.geopotential number by the normal gravity value computed on the
BP0648.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
BP0648.degrees latitude (g = 980.6199 gals.).
BP0648
BP0648.The modeled gravity was interpolated from observed gravity values.
BP0648
BP0648;
BP0648;          North      East      Units  Estimated Accuracy
BP0648;SPC TXSC - 4,261,698.    271,674.    MT  (+/- 10 meters HH2 GPS)
BP0648
BP0648_U.S. NATIONAL GRID SPATIAL ADDRESS: 13RGP4959538400(NAD 83)
BP0648
BP0648                      SUPERSEDED SURVEY CONTROL
BP0648
BP0648.No superseded survey control is available for this station.
BP0648
BP0648_MARKER: DB = BENCH MARK DISK
BP0648_SETTING: 66 = SET IN ROCK OUTCROP
BP0648_STAMPING: A 1417 1981
BP0648_MARK LOGO: NGS
BP0648_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD

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BP0648+STABILITY: POSITION/ELEVATION WELL

BP0648\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

BP0648+SATELLITE: SATELLITE OBSERVATIONS - January 25, 2007

BP0648

BP0648	HISTORY	- Date	Condition	Report By
BP0648	HISTORY	- 1981	MONUMENTED	NGS
BP0648	HISTORY	- 1981	GOOD	NGS
BP0648	HISTORY	- 20051210	GOOD	NGS
BP0648	HISTORY	- 20070125	GOOD	NGS

BP0648

BP0648 STATION DESCRIPTION

BP0648

BP0648'DESCRIBED BY NATIONAL GEODETIC SURVEY 1981

BP0648'2.0 KM (1.25 MI) NORTH FROM SANDERSON.

BP0648'0.2 KM (0.1 MI) NORTH ALONG PERSIMMON STREET FROM THE SOUTHERN PACIFIC

BP0648'RAILROAD STATION IN SANDERSON, THENCE 1.1 KM (0.7 MI) WEST ALONG U.S.

BP0648'HIGHWAY 90, THENCE 0.7 KM (0.45 MI) NORTH ALONG U.S. HIGHWAY 285, 0.2

BP0648'KM (0.1 MI) SOUTH OF THE TEXAS HIGHWAY DEPARTMENT MAINTENANCE YARD

BP0648'OFFICE, IN TOP OF A 4 BY 12 FT EXPOSED AREA OF OUTCROPPING BEDROCK,

BP0648'38.4 METERS (126.0 FT) EAST OF THE CENTERLINE OF THE HIGHWAY, 9.1

BP0648'METERS (29.9 FT) EAST OF A FENCE AND 7.8 METERS (25.6 FT)

BP0648'EAST-SOUTHEAST OF A UTILITY POLE.

BP0648'THE MARK IS 0.4 METERS W FROM A WITNESS POST.

BP0648'THE MARK IS 2.0 M ABOVE THE HIGHWAY.

BP0648

BP0648 STATION RECOVERY (1981)

BP0648

BP0648'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1981

BP0648'RECOVERED IN GOOD CONDITION.

BP0648

BP0648 STATION RECOVERY (2005)

BP0648

BP0648'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2005 (DMM)

BP0648'RECOVERED IN GOOD CONDITION.

BP0648

BP0648 STATION RECOVERY (2007)

BP0648

BP0648'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2007 (DMM)

BP0648'RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.

Elapsed Time = 00:00:05



# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
BP0956 *****
BP0956 PACS          -  This is a Primary Airport Control Station.
BP0956 DESIGNATION -  ALPPORT
BP0956 PID          -  BP0956
BP0956 STATE/COUNTY-  TX/BREWSTER
BP0956 COUNTRY     -  US
BP0956 USGS QUAD   -  ALPINE NORTH (1972)
BP0956
BP0956                      *CURRENT SURVEY CONTROL
BP0956
BP0956* NAD 83(2011) POSITION- 30 23 13.08174(N) 103 40 51.02134(W) ADJUSTED
BP0956* NAD 83(2011) ELLIP HT- 1338.915 (meters) (06/27/12) ADJUSTED
BP0956* NAD 83(2011) EPOCH   - 2010.00
BP0956* NAVD 88 ORTHO HEIGHT - 1360.06 (meters) 4462.1 (feet) GPS OBS
BP0956
BP0956 NAVD 88 orthometric height was determined with an earlier geoid model
BP0956 GEOID HEIGHT   -      -21.023 (meters) GEOID12B
BP0956 NAD 83(2011) X - -1,302,676.451 (meters) COMP
BP0956 NAD 83(2011) Y - -5,351,570.687 (meters) COMP
BP0956 NAD 83(2011) Z -  3,208,128.636 (meters) COMP
BP0956 LAPLACE CORR   -      -2.28 (seconds) DEFLEC12B
BP0956
BP0956 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
BP0956 Standards:
BP0956          FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
BP0956          Horiz  Ellip              SD_N   SD_E   SD_h          (unitless)
BP0956 -----
BP0956 NETWORK    0.51   0.92              0.21   0.21   0.47          -0.04416536
BP0956 -----
BP0956 Click here for local accuracies and other accuracy information.
BP0956
BP0956
BP0956.This mark is at Alpine-Casparis Muni (E38) Airport (E38)
BP0956
BP0956.The horizontal coordinates were established by GPS observations
BP0956.and adjusted by the National Geodetic Survey in June 2012.
BP0956
BP0956.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
BP0956.been affixed to the stable North American tectonic plate. See
BP0956.NA2011 for more information.
BP0956
BP0956.The horizontal coordinates are valid at the epoch date displayed above
BP0956.which is a decimal equivalence of Year/Month/Day.
BP0956
BP0956.The orthometric height was determined by GPS observations and a
BP0956.high-resolution geoid model.
BP0956
BP0956.GPS derived orthometric heights for airport stations designated as
BP0956.PACS or SACS are published to 2 decimal places. This maintains

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BP0956.centimeter relative accuracy between the PACS and SACS. It does  
 BP0956.not indicate centimeter accuracy relative to other marks which are  
 BP0956.part of the NAVD 88 network.

BP0956

BP0956.Significant digits in the geoid height do not necessarily reflect accuracy.  
 BP0956.GEOID12B height accuracy estimate available [here](#).

BP0956

BP0956.The X, Y, and Z were computed from the position and the ellipsoidal ht.

BP0956

BP0956.The Laplace correction was computed from DEFLEC12B derived deflections.

BP0956

BP0956.The ellipsoidal height was determined by GPS observations

BP0956.and is referenced to NAD 83.

BP0956

BP0956. The following values were computed from the NAD 83(2011) position.

BP0956

BP0956;	North	East	Units	Scale	Factor	Converg.
BP0956;SPC TXSC	- 4,292,027.515	150,231.643	MT	1.00003158	-2 17	35.5
BP0956;SPC TXSC	-14,081,426.94	492,884.98	sFT	1.00003158	-2 17	35.5
BP0956;UTM 13	- 3,362,403.811	626,738.993	MT	0.99979816	+0 40	02.5

BP0956

BP0956!  
 - Elev Factor x Scale Factor = Combined Factor

BP0956!SPC TXSC - 0.99978978 x 1.00003158 = 0.99982135

BP0956!UTM 13 - 0.99978978 x 0.99979816 = 0.99958798

BP0956

BP0956\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13RFP2673862403(NAD 83)

BP0956

BP0956 SUPERSEDED SURVEY CONTROL

BP0956

BP0956	NAD 83(2007)-	30 23 13.08146(N)	103 40 51.02203(W)	AD(2002.00)	0
BP0956	ELLIP H (02/10/07)	1338.926 (m)		GP(2002.00)	
BP0956	ELLIP H (10/24/00)	1338.924 (m)		GP( )	4 2
BP0956	NAD 83(1993)-	30 23 13.08111(N)	103 40 51.02150(W)	AD( )	B
BP0956	ELLIP H (08/15/96)	1338.974 (m)		GP( )	2 2
BP0956	NAD 83(1993)-	30 23 13.08077(N)	103 40 51.02120(W)	AD( )	3
BP0956	ELLIP H (02/16/96)	1339.012 (m)		GP( )	5 1
BP0956	ELLIP H (12/21/93)	1338.971 (m)		GP( )	4 1
BP0956	NAD 83(1986)-	30 23 13.08236(N)	103 40 51.01990(W)	AD( )	3
BP0956	NGVD 29 (10/23/89)	1359.39 (m)	RAPSU86 model used	GPS OBS	

BP0956

BP0956.Superseded values are not recommended for survey control.

BP0956

BP0956.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

BP0956.See file [dsdata.pdf](#) to determine how the superseded data were derived.

BP0956

BP0956\_MARKER: I = METAL ROD

BP0956\_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)

BP0956\_STAMPING: ALPPORT 1989

BP0956\_MARK LOGO: NGS

BP0956\_PROJECTION: FLUSH

BP0956\_MAGNETIC: I = MARKER IS A STEEL ROD

BP0956\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

BP0956\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

BP0956+SATELLITE: SATELLITE OBSERVATIONS - May 06, 1995

BP0956\_ROD/PIPE-DEPTH: 1.95 meters

BP0956\_SLEEVE-DEPTH : 0.76 meters

BP0956

BP0956	HISTORY	- Date	Condition	Report By
BP0956	HISTORY	- 1989	MONUMENTED	NGS
BP0956	HISTORY	- 19950506	GOOD	NGS

BP0956 HISTORY - 19961007 GOOD USPSQD

BP0956

BP0956

BP0956

STATION DESCRIPTION

BP0956'DESCRIBED BY NATIONAL GEODETIC SURVEY 1989

BP0956'THE STATION IS LOCATED ABOUT 4 KM (2.50 MI) NORTHWEST OF ALPINE, AT  
BP0956'THE ALPINE MUNICIPAL AIRPORT, IN THE SOUTHEAST ANGLE OF THE JUNCTION  
BP0956'OF RUNWAYS 1-19 AND 5-23. OWNERSHIP--CITY OF ALPINE, POST OFFICE BOX  
BP0956'149, ALPINE, TEXAS 79830. THE AIRPORT MANAGER IS TOM LONGMAN,  
BP0956'TELEPHONE 915-837-2744.

BP0956'TO REACH THE STATION FROM THE EASTBOUND JUNCTION OF U.S. HIGHWAYS 67,  
BP0956'90 AND STATE HIGHWAY 118 IN ALPINE, GO NORTH ON STATE HIGHWAY 118 FOR  
BP0956'2.64 KM (1.65 MI) TO A STATE HIGHWAY DEPARTMENT OFFICE ON THE RIGHT.  
BP0956'CONTINUE AHEAD FOR 1.09 KM (0.70 MI) TO THE AIRPORT ENTRANCE ON THE  
BP0956'LEFT. TURN LEFT AND GO SOUTHWEST FOR 0.15 KM (0.10 MI) TO THE OFFICE  
BP0956'AND A GATE ON THE RIGHT. TURN RIGHT, PASS THROUGH THE GATE, AND GO  
BP0956'NORTHWEST ON THE TARMAC AND RAMP FOR 0.12 KM (0.05 MI) TO RUNWAY 5-23.  
BP0956'TURN LEFT AND GO SOUTHWEST ALONG THE SOUTHWEST SIDE OF THE RUNWAY FOR  
BP0956'0.40 KM (0.25 MI) TO RUNWAY 1-19 AND THE STATION ON THE LEFT.

BP0956'THE STATION IS 29.3 M (96.1 FT) SOUTH-SOUTHEAST OF THE CENTERLINE OF  
BP0956'RUNWAY 5-23, 29.0 M (95.1 FT) EAST OF THE CENTERLINE OF RUNWAY 1-19,  
BP0956'20.2 M (66.3 FT) EAST OF A RUNWAY LIGHT, AND 0.67 M (2.2 FT) NORTHWEST  
BP0956'OF A WITNESS POST.

BP0956'ACCESS TO THE DATUM POINT IS THROUGH A 5-INCH LOGO CAP.

BP0956'DESCRIBED BY R.D.B.

BP0956

BP0956

BP0956

STATION RECOVERY (1995)

BP0956'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (AJL)

BP0956'THE STATION IS LOCATED ABOUT 4 KM (2.50 MI) NORTHWEST OF ALPINE, AT  
BP0956'THE ALPINE-CASPARIS MUNICIPAL AIRPORT. IN THE GRASS, NEAR THE  
BP0956'SOUTHEAST ANGLE OF THE JUNCTION OF RUNWAYS 1-19 AND 5-23.  
BP0956'OWNERSHIP--TERLINGUA RANCH INC. TERLINGUA, RT BOX 220 ALPINE, TX.  
BP0956'79830. AIRPORT MANAGER GEORGE ELLINGTON, PHONE 915-837-3009. TO  
BP0956'REACH THE STATION FROM THE EASTBOUND JUNCTION OF U.S. HIGHWAYS 67, 90  
BP0956'AND STATE HIGHWAY 118 IN ALPINE, GO NORTH, 3.69 KM (2.30 MI) TO THE  
BP0956'AIRPORT ENTRANCE ON THE LEFT. TURN LEFT, SOUTHWEST, 0.16 KM (0.10 MI)  
BP0956'TO THE OFFICE AND GATE ON THE RIGHT. TURN RIGHT, NORTHWEST, THROUGH  
BP0956'GATE THEN SOUTHWESTERLY, 0.43 KM (0.25 MI) ACROSS APRON AND ALONG TAXI  
BP0956'TO THE STATION ON THE RIGHT. STATION IS 51.6 M (169.3 FT) NORTHWEST  
BP0956'OF A TAXI CENTERLINE, 29.0 M (95.1 FT) EAST OF RUNWAY 1-19 CENTERLINE,  
BP0956'24.3 M (79.7 FT) SOUTHEAST OF RUNWAY 5-23 CENTERLINE, 0.6 M (2.0 FT)  
BP0956'NORTHWEST OF A WITNESS POST, AND LEVEL WITH THE RUNWAY. NOTE--ACCESS  
BP0956'TO THE DATUM POINT IS THROUGH A 5-INCH LOGO CAP. BY R.G. HAYES THIS  
BP0956'IS A PAC STATION.

BP0956

BP0956

BP0956

STATION RECOVERY (1996)

BP0956'RECOVERY NOTE BY US POWER SQUADRON 1996

BP0956'RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.

Elapsed Time = 00:00:05

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST 11, 2019
BO0170 *****
BO0170 FBN          -  This is a Federal Base Network Control Station.
BO0170 DESIGNATION -  B 703
BO0170 PID          -  BO0170
BO0170 STATE/COUNTY-  TX/CROCKETT
BO0170 COUNTRY      -  US
BO0170 USGS QUAD    -  MITCHELL CANYON NE (1979)
BO0170
BO0170                      *CURRENT SURVEY CONTROL
BO0170
BO0170* NAD 83(2011) POSITION- 30 41 57.95080(N) 101 16 51.44596(W) ADJUSTED
BO0170* NAD 83(2011) ELLIP HT- 750.430 (meters) (06/27/12) ADJUSTED
BO0170* NAD 83(2011) EPOCH - 2010.00
BO0170* NAVD 88 ORTHO HEIGHT - 774.220 (meters) 2540.09 (feet) ADJUSTED
BO0170
BO0170 GEOID HEIGHT - -23.764 (meters) GEOID12B
BO0170 NAD 83(2011) X - -1,073,901.025 (meters) COMP
BO0170 NAD 83(2011) Y - -5,383,661.168 (meters) COMP
BO0170 NAD 83(2011) Z - 3,237,668.216 (meters) COMP
BO0170 LAPLACE CORR - 1.28 (seconds) DEFLEC12B
BO0170 DYNAMIC HEIGHT - 773.078 (meters) 2536.34 (feet) COMP
BO0170 MODELED GRAVITY - 979,140.8 (mgal) NAVD 88
BO0170
BO0170 VERT ORDER - FIRST CLASS II
BO0170
BO0170 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
BO0170 Standards:
BO0170 FGDC (95% conf, cm) Standard deviation (cm) CorrNE
BO0170 Horiz Ellip SD_N SD_E SD_h (unitless)
BO0170 -----
BO0170 NETWORK 0.64 1.72 0.26 0.26 0.88 -0.03992224
BO0170 -----
BO0170 Click here for local accuracies and other accuracy information.
BO0170
BO0170
BO0170.The horizontal coordinates were established by GPS observations
BO0170.and adjusted by the National Geodetic Survey in June 2012.
BO0170
BO0170.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
BO0170.been affixed to the stable North American tectonic plate. See
BO0170.NA2011 for more information.
BO0170
BO0170.The horizontal coordinates are valid at the epoch date displayed above
BO0170.which is a decimal equivalence of Year/Month/Day.
BO0170
BO0170.The orthometric height was determined by differential leveling and
BO0170.adjusted by the NATIONAL GEODETIC SURVEY
BO0170.in June 1991.
BO0170

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BO0170. Significant digits in the geoid height do not necessarily reflect accuracy.  
BO0170. GEOID12B height accuracy estimate available [here](#).  
BO0170  
BO0170. The X, Y, and Z were computed from the position and the ellipsoidal ht.  
BO0170  
BO0170. The Laplace correction was computed from DEFLEC12B derived deflections.  
BO0170  
BO0170. The ellipsoidal height was determined by GPS observations  
BO0170. and is referenced to NAD 83.  
BO0170  
BO0170. The dynamic height is computed by dividing the NAVD 88  
BO0170. geopotential number by the normal gravity value computed on the  
BO0170. Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
BO0170. degrees latitude ( $g = 980.6199$  gals.).  
BO0170  
BO0170. The modeled gravity was interpolated from observed gravity values.  
BO0170  
BO0170. The following values were computed from the NAD 83(2011) position.  
BO0170  
BO0170;

	North	East	Units	Scale	Factor	Converg.
BO0170;SPC TX C	- 3,114,873.847	609,225.845	MT	0.99989555	-0 29 17.1	
BO0170;SPC TX C	-10,219,381.95	1,998,768.46	sFT	0.99989555	-0 29 17.1	
BO0170;UTM 14	- 3,398,512.886	281,538.178	MT	1.00018877	-1 09 53.9	

BO0170  
BO0170!  
BO0170!SPC TX C  
BO0170!UTM 14  
BO0170  
BO0170\_U.S. NATIONAL GRID SPATIAL ADDRESS: 14RKU8153898512 (NAD 83)  
BO0170  
BO0170  
BO0170 SUPERSEDED SURVEY CONTROL  
BO0170  
BO0170 NAD 83(2007)- 30 41 57.95074(N) 101 16 51.44664(W) AD(2002.00) 0  
BO0170 ELLIP H (02/10/07) 750.435 (m) GP(2002.00)  
BO0170 ELLIP H (05/01/00) 750.444 (m) GP( ) 3 1  
BO0170 NAD 83(1993)- 30 41 57.95015(N) 101 16 51.44561(W) AD( ) B  
BO0170 ELLIP H (05/09/94) 750.513 (m) GP( ) 4 2  
BO0170 NAD 83(1986)- 30 41 57.95936(N) 101 16 51.43153(W) AD( ) 2  
BO0170 NAD 27 - 30 41 57.34100(N) 101 16 50.02000(W) AD( ) 2  
BO0170 NAVD 88 774.22 (m) 2540.1 (f) LEVELING 3  
BO0170 NAVD 88 (07/24/98) 774.1 (m) GEOID96 model used GPS OBS  
BO0170 NAVD 88 774.22 (m) 2540.1 (f) LEVELING 3  
BO0170 NGVD 29 (??/??/92) 774.002 (m) 2539.37 (f) ADJ UNCH 1 2  
BO0170 NGVD 29 774.00 (m) 2539.4 (f) LEVELING 3  
BO0170  
BO0170. Superseded values are not recommended for survey control.  
BO0170  
BO0170. NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
BO0170. See file [dsdata.pdf](#) to determine how the superseded data were derived.  
BO0170  
BO0170\_MARKER: DB = BENCH MARK DISK  
BO0170\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
BO0170\_STAMPING: B 703 1942  
BO0170\_MARK LOGO: CGS  
BO0170\_MAGNETIC: N = NO MAGNETIC MATERIAL  
BO0170\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
BO0170+STABILITY: SURFACE MOTION  
BO0170\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
BO0170+SATELLITE: SATELLITE OBSERVATIONS - September 13, 2011  
BO0170

BO0170	HISTORY	- Date	Condition	Report By
BO0170	HISTORY	- 1942	MONUMENTED	CGS
BO0170	HISTORY	- 1949	GOOD	LOCSUR
BO0170	HISTORY	- 19930222	GOOD	NGS
BO0170	HISTORY	- 19980218	GOOD	NGS
BO0170	HISTORY	- 20110913	GOOD	WOOLPT
BO0170	HISTORY	- 20110913	GOOD	WOOLPT

BO0170

BO0170

## STATION DESCRIPTION

BO0170

BO0170'DESCRIBED BY COAST AND GEODETIC SURVEY 1942

BO0170'5.0 MI W FROM OZONA.

BO0170'THIS MARK IS ABOUT 5.0 MILES WEST ALONG HIGHWAY 290 FROM THE  
 BO0170'INTERSECTION OF HIGHWAYS 290 AND 163 AT OZONA, CROCKETT COUNTY, 1.5  
 BO0170'FEET NORTH OF THE NORTHEAST CORNER OF THE OZONA AIRPORT OFFICE  
 BO0170'BUILDING, 260.2 FEET SOUTH OF THE CENTER LINE OF THE HIGHWAY, 3.0 FEET  
 BO0170'WEST OF A WIRE FENCE WHICH RUNS NORTH AND SOUTH, 209.0 FEET SOUTHWEST  
 BO0170'OF THE SOUTHWEST CORNER OF THE AIRPORT HANGER, ABOUT LEVEL WITH THE  
 BO0170'HIGHWAY.

BO0170

BO0170

## STATION RECOVERY (1949)

BO0170

BO0170'RECOVERY NOTE BY LOCAL SURVEYOR (INDIVIDUAL OR FIRM) 1949

BO0170'RECOVERED IN GOOD CONDITION.

BO0170

BO0170

## STATION RECOVERY (1993)

BO0170

BO0170'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1993

BO0170'STATION IS LOCATED ABOUT 7 KM (4.35 MI) WEST OF OZONA, 1 KM (0.60 MI)  
 BO0170'NORTH OF INTERSTATE HIGHWAY 10, AT THE OLD COMPLETELY ABANDONED OZONA  
 BO0170'AIRPORT, AREA NOW OVERGROWN, BUILDINGS REMOVED AND REVERTED TO  
 BO0170'NATURE, AND JUST SOUTH OF A ROAD RIGHT-OF-WAY FENCE. OWNERSHIP--BY  
 BO0170'LOCAL RANCHER, ROBERT PHLUGER.

BO0170'TO REACH FROM THE OVERPASS AT THE JUNCTION OF INTERSTATE HIGHWAY 10  
 BO0170'AND RANCH ROAD 2083 (PANDALE ROAD, EXIT 361), ABOUT 6 KM (3.70 MI)  
 BO0170'WEST OF OZONA, GO NORTH ON ROAD 2083 FOR 0.99 KM (0.60 MI) TO A  
 BO0170'T-ROAD. TURN LEFT, WEST, ON RANCH ROAD 2398 (OLD HIGHWAY 290) FOR  
 BO0170'0.32 KM (0.20 MI) TO A SLAT BOARD GATE ON THE LEFT AND STATION ON THE  
 BO0170'LEFT.

BO0170'MARK IS SET IN THE TOP OF A 20 CM SQUARE CONCRETE POST PROJECTING 5 CM  
 BO0170'ABOVE GROUND IN WEEDS. IT IS 79.7 M (261.5 FT) SOUTH OF AND LEVEL  
 BO0170'WITH THE ROAD CENTER, 63.3 M (207.7 FT) SOUTH OF A FIBERGLASS WITNESS  
 BO0170'POST IN THE RIGHT-OF-WAY FENCE, 64.2 M (210.6 FT) SOUTH-SOUTHEAST OF  
 BO0170'THE EAST GATEPOST TO BOARD GATE, 33.8 M (110.9 FT) SOUTHWEST OF THE  
 BO0170'SOUTHWEST CORNER OF A LARGE CONCRETE FOUNDATION, 0.6 M (2.0 FT) NORTH  
 BO0170'OF A FIBERGLASS WITNESS POST AND 60.1 M (197.2 FT) SOUTH OF  
 BO0170'TRIANGULATION STATION AIR 1944.

BO0170

BO0170

## STATION RECOVERY (1998)

BO0170

BO0170'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1998 (CSM)

BO0170'RECOVERED AS DESCRIBED. BY R.G. HAYES

BO0170

BO0170

## STATION RECOVERY (2011)

BO0170

BO0170'RECOVERY NOTE BY WOOLPERT CONSULTANTS 2011 (DCW)

BO0170'NO WITNESS POST NEXT TO MONUMENT.

BO0170

BO0170

## STATION RECOVERY (2011)

BO0170

BO0170'RECOVERY NOTE BY WOOLPERT CONSULTANTS 2011 (DCW)  
BO0170'NO WITNESS POST NEXT TO MONUMENT.

\*\*\* retrieval complete.  
Elapsed Time = 00:00:05

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
BQ0126 *****
BQ0126 SACS          -  This is a Secondary Airport Control Station.
BQ0126 DESIGNATION -  B 1105
BQ0126 PID          -  BQ0126
BQ0126 STATE/COUNTY-  TX/PRESIDIO
BQ0126 COUNTRY      -  US
BQ0126 USGS QUAD    -  MARFA (1983)
BQ0126
BQ0126                      *CURRENT SURVEY CONTROL
BQ0126
BQ0126* NAD 83(2011) POSITION- 30 22 01.85744(N) 104 00 32.56242(W) ADJUSTED
BQ0126* NAD 83(2011) ELLIP HT- 1451.634 (meters) (06/27/12) ADJUSTED
BQ0126* NAD 83(2011) EPOCH   - 2010.00
BQ0126* NAVD 88 ORTHO HEIGHT - 1473.097 (meters) 4832.99 (feet) ADJUSTED
BQ0126
BQ0126 GEOID HEIGHT   -      -21.444 (meters) GEOID12B
BQ0126 NAD 83(2011) X - -1,333,602.258 (meters) COMP
BQ0126 NAD 83(2011) Y - -5,345,191.563 (meters) COMP
BQ0126 NAD 83(2011) Z -  3,206,293.035 (meters) COMP
BQ0126 LAPLACE CORR   -          2.86 (seconds) DEFLEC12B
BQ0126 DYNAMIC HEIGHT -      1470.640 (meters) 4824.92 (feet) COMP
BQ0126 MODELED GRAVITY -    978,921.4 (mgal) NAVD 88
BQ0126
BQ0126 VERT ORDER     -  FIRST      CLASS II
BQ0126
BQ0126 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
BQ0126 Standards:
BQ0126      FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
BQ0126      Horiz  Ellip              SD_N   SD_E   SD_h      (unitless)
BQ0126 -----
BQ0126 NETWORK    0.61   1.72              0.25   0.25   0.88      -0.04937905
BQ0126 -----
BQ0126 Click here for local accuracies and other accuracy information.
BQ0126
BQ0126
BQ0126.This mark is at Marfa Muni (MRF) Airport (MRF)
BQ0126
BQ0126.The horizontal coordinates were established by GPS observations
BQ0126.and adjusted by the National Geodetic Survey in June 2012.
BQ0126
BQ0126.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
BQ0126.been affixed to the stable North American tectonic plate. See
BQ0126.NA2011 for more information.
BQ0126
BQ0126.The horizontal coordinates are valid at the epoch date displayed above
BQ0126.which is a decimal equivalence of Year/Month/Day.
BQ0126
BQ0126.The orthometric height was determined by differential leveling and
BQ0126.adjusted by the NATIONAL GEODETIC SURVEY

```



BQ0126.in June 1991.

BQ0126

BQ0126.Significant digits in the geoid height do not necessarily reflect accuracy.  
 BQ0126.GEOID12B height accuracy estimate available [here](#).

BQ0126

BQ0126.The X, Y, and Z were computed from the position and the ellipsoidal ht.  
 BQ0126

BQ0126.The Laplace correction was computed from DEFLEC12B derived deflections.  
 BQ0126

BQ0126.The ellipsoidal height was determined by GPS observations  
 BQ0126.and is referenced to NAD 83.

BQ0126

BQ0126.The dynamic height is computed by dividing the NAVD 88  
 BQ0126.geopotential number by the normal gravity value computed on the  
 BQ0126.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
 BQ0126.degrees latitude (g = 980.6199 gals.).

BQ0126

BQ0126.The modeled gravity was interpolated from observed gravity values.

BQ0126

BQ0126. The following values were computed from the NAD 83(2011) position.

BQ0126

BQ0126;	North	East	Units	Scale	Factor	Converg.
BQ0126;SPC TXSC	- 4,291,142.609	118,620.029	MT	1.00002530	-2	27 14.4
BQ0126;SPC TXSC	-14,078,523.71	389,172.55	sFT	1.00002530	-2	27 14.4
BQ0126;UTM 13	- 3,359,889.622	595,223.836	MT	0.99971186	+0	30 03.6

BQ0126

BQ0126!	Elev Factor	x	Scale Factor	=	Combined Factor
BQ0126!SPC TXSC	- 0.99977208	x	1.00002530	=	0.99979738
BQ0126!UTM 13	- 0.99977208	x	0.99971186	=	0.99948401

BQ0126

BQ0126:	Primary Azimuth Mark	Grid Az
BQ0126:SPC TXSC	- MARFAPORT	326 05 50.2
BQ0126:UTM 13	- MARFAPORT	323 08 32.2

BQ0126

BQ0126\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13REP9522359889(NAD 83)

BQ0126

BQ0126	PID	Reference Object	Distance	Geod. Az
BQ0126			dddmmss.s	
BQ0126	BQ0485	MARFAPORT	APPROX. 0.5 KM	3233835.8

BQ0126

SUPERSEDED SURVEY CONTROL

BQ0126

BQ0126	NAD 83(2007)-	30 22 01.85713(N)	104 00 32.56311(W)	AD(2002.00)	0
BQ0126	ELLIP H (02/10/07)	1451.643 (m)		GP(2002.00)	
BQ0126	ELLIP H (10/24/00)	1451.641 (m)		GP( )	4 2
BQ0126	NAD 83(1993)-	30 22 01.85660(N)	104 00 32.56280(W)	AD( )	B
BQ0126	ELLIP H (08/15/96)	1451.692 (m)		GP( )	2 2
BQ0126	NAD 83(1993)-	30 22 01.85771(N)	104 00 32.56271(W)	AD( )	3
BQ0126	ELLIP H (02/16/96)	1451.842 (m)		GP( )	5 1
BQ0126	ELLIP H (12/21/93)	1451.789 (m)		GP( )	4 1
BQ0126	NAD 83(1986)-	30 22 01.85568(N)	104 00 32.56663(W)	AD( )	3
BQ0126	NAVD 88	1473.10 (m)	4833.0 (f)	LEVELING	3
BQ0126	NGVD 29 (??/??/92)	1472.509 (m)	4831.06 (f)	ADJ UNCH	1 2
BQ0126	NGVD 29 (10/23/89)	1472.5 (m)	RAPSU86 model used	GPS OBS	

BQ0126

BQ0126.Superseded values are not recommended for survey control.

BQ0126

BQ0126.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

BQ0126. See file [dsdata.pdf](#) to determine how the superseded data were derived.

BQ0126

BQ0126\_MARKER: DB = BENCH MARK DISK

BQ0126\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

BQ0126\_STAMPING: B 1105 1957

BQ0126\_MARK LOGO: CGS

BQ0126\_PROJECTION: PROJECTING 5 CENTIMETERS

BQ0126\_MAGNETIC: N = NO MAGNETIC MATERIAL

BQ0126\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

BQ0126+STABILITY: SURFACE MOTION

BQ0126\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

BQ0126+SATELLITE: SATELLITE OBSERVATIONS - July 12, 1995

BQ0126

BQ0126	HISTORY	- Date	Condition	Report By
BQ0126	HISTORY	- 1957	MONUMENTED	CGS
BQ0126	HISTORY	- 1981	GOOD	NGS
BQ0126	HISTORY	- 19890210	GOOD	NGS
BQ0126	HISTORY	- 1990	GOOD	USPSQD
BQ0126	HISTORY	- 19950712	GOOD	NGS
BQ0126	HISTORY	- 19961009	GOOD	USPSQD

BQ0126

BQ0126 STATION DESCRIPTION

BQ0126

BQ0126'DESCRIBED BY COAST AND GEODETIC SURVEY 1957

BQ0126'4.1 MI N FROM MARFA.

BQ0126'ABOUT 4.1 MILES NORTH ALONG STATE HIGHWAY 17 FROM THE TEXAS AND NEW

BQ0126'ORLEANS RAILROAD STATION AT MARFA, 62 1/2 FEET WEST OF THE CENTER LINE

BQ0126'OF THE HIGHWAY, AT THE EAST AND MAIN ENTRANCE TO THE MARFA AIRPORT, 41

BQ0126'FEET SOUTH OF THE CENTER OF THE AIRPORT ENTRANCE, 0.1 MILE EAST OF THE

BQ0126'MOST EASTERLY HANGER, 131 FEET NORTH OF A TEE-FENCE, 2 1/2 FEET WEST

BQ0126'OF A FENCE, 2 1/2 FEET NORTH OF A WHITE WOODEN WITNESS POST, AND IN

BQ0126'THE TOP OF A CONCRETE POST PROJECTING 7 INCHES.

BQ0126

BQ0126 STATION RECOVERY (1981)

BQ0126

BQ0126'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1981

BQ0126'6.8 KM (4.2 MI) NORTHERLY ALONG STATE HIGHWAY 17 FROM ITS JUNCTION

BQ0126'WITH U.S. HIGHWAYS 67 AND 90 IN MARFA, AT THE ENTRANCE ROAD TO THE

BQ0126'MARFA AIRPORT, 39.9 METERS (131.0 FT) NORTH OF A T-FENCE CORNER, 19.1

BQ0126'METERS (62.5 FT) WEST OF THE CENTERLINE OF THE HIGHWAY, 12.5 METERS

BQ0126'(41.0 FT) SOUTH OF THE CENTER OF THE ROAD, AND 0.8 METER (2.5 FT) WEST

BQ0126'OF A FENCE.

BQ0126'THE MARK IS 0.9 METERS W FROM A WITNESS POST.

BQ0126'THE MARK IS 0.3 M BELOW THE HIGHWAY.

BQ0126

BQ0126 STATION RECOVERY (1989)

BQ0126

BQ0126'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1989

BQ0126'THE STATION IS LOCATED ABOUT 6.5 KM (4.05 MI) NORTH OF MARFA, AT THE

BQ0126'MARFA MUNICIPAL AIRPORT. OWNERSHIP--PRESIDIO COUNTY, BOX 787, MARFA,

BQ0126'TEXAS 79843. THE AIRPORT MANAGER IS JOE W. MOORE, TELEPHONE

BQ0126'915-729-3102.

BQ0126'TO REACH THE STATION FROM THE JUNCTION OF U.S. HIGHWAYS 67, 90 AND

BQ0126'STATE HIGHWAY 17 IN MARFA, GO NORTHWEST ON STATE HIGHWAY 17 (INCLUDES

BQ0126'RIGHT AND LEFT TURNS AROUND COURTHOUSE) FOR 6.81 KM (4.25 MI) TO THE

BQ0126'AIRPORT ENTRANCE ON THE LEFT AND THE AZIMUTH MARK INSIDE THE FENCE.

BQ0126'THE STATION IS 19.1 M (62.7 FT) NORTHWEST OF THE HIGHWAY CENTERLINE,

BQ0126'14.4 M (47.2 FT) SOUTHWEST OF A SOUTHWESTERN MOST 25 CM PIPE GATEPOST,

BQ0126'13.3 M (43.6 FT) SOUTHWEST OF THE CENTER OF THE AIRPORT ENTRANCE ROAD,

BQ0126'0.9 M (3.0 FT) NORTHWEST OF A WITNESS POST AND FENCE, AND 0.5 M

BQ0126'(1.6 FT) NORTHEAST OF A WITNESS POST.

BQ0126'DESCRIBED BY R.D.B.

BQ0126

BQ0126

STATION RECOVERY (1990)

BQ0126

BQ0126'RECOVERY NOTE BY US POWER SQUADRON 1990 (MVM)

BQ0126'RECOVERED IN GOOD CONDITION.

BQ0126

BQ0126

STATION RECOVERY (1995)

BQ0126

BQ0126'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (RDB)

BQ0126'THE STATION IS LOCATED ABOUT 6.5 KM (4.05 MI) NORTH OF MARFA, AT THE

BQ0126'MARFA MUNICIPAL AIRPORT. OWNERSHIP--PRESIDIO COUNTY, BOX 787, MARFA,

BQ0126'TEXAS 79843. THE AIRPORT MANAGER IS JOE W. MOORE, TELEPHONE

BQ0126'915-729-3102. TO REACH THE STATION FROM THE JUNCTION OF U.S. HIGHWAYS

BQ0126'67, 90 AND STATE HIGHWAY 17 IN MARFA, GO NORTHWEST ON STATE HIGHWAY 17

BQ0126'(INCLUDES RIGHT AND LEFT TURNS AROUND COURTHOUSE) FOR 6.81 KM (4.25

BQ0126'MI) TO THE AIRPORT ENTRANCE ON THE LEFT AND THE AZIMUTH MARK INSIDE

BQ0126'THE FENCE. THE STATION IS 19.1 M (62.7 FT) NORTHWEST OF THE HIGHWAY

BQ0126'CENTERLINE, 14.4 M (47.2 FT) SOUTHWEST OF A SOUTHWESTERN MOST 25 CM

BQ0126'PIPE GATEPOST, 13.3 M (43.6 FT) SOUTHWEST OF THE CENTER OF THE AIRPORT

BQ0126'ENTRANCE ROAD, 0.9 M (3.0 FT) NORTHWEST OF A WITNESS POST AND FENCE,

BQ0126'AND 0.5 M (1.6 FT) NORTHEAST OF A WITNESS POST. DESCRIBED BY R.D.B.

BQ0126

BQ0126

STATION RECOVERY (1996)

BQ0126

BQ0126'RECOVERY NOTE BY US POWER SQUADRON 1996

BQ0126'RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.

Elapsed Time = 00:00:04

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
BA0181 *****
BA0181 DESIGNATION -  C 748
BA0181 PID          -  BA0181
BA0181 STATE/COUNTY-  TX/BREWSTER
BA0181 COUNTRY      -  US
BA0181 USGS QUAD    -  GRAPEVINE HILLS (1971)
BA0181
BA0181                      *CURRENT SURVEY CONTROL
BA0181
BA0181* NAD 83(1986) POSITION- 29 23 44.      (N) 103 08 43.      (W) SCALED
BA0181* NAVD 88 ORTHO HEIGHT - 867.646 (meters)      2846.60 (feet) ADJUSTED
BA0181
BA0181 GEOID HEIGHT   -      -21.562 (meters)                      GEOID12B
BA0181 DYNAMIC HEIGHT -      866.247 (meters)      2842.01 (feet) COMP
BA0181 MODELED GRAVITY -      979,001.4 (mgal)                      NAVD 88
BA0181
BA0181 VERT ORDER    -  FIRST      CLASS II
BA0181
BA0181.The horizontal coordinates were scaled from a topographic map and have
BA0181.an estimated accuracy of +/- 6 seconds.
BA0181.
BA0181.The orthometric height was determined by differential leveling and
BA0181.adjusted by the NATIONAL GEODETIC SURVEY
BA0181.in June 1991.
BA0181
BA0181.Significant digits in the geoid height do not necessarily reflect accuracy.
BA0181.GEOID12B height accuracy estimate available here.
BA0181
BA0181.The dynamic height is computed by dividing the NAVD 88
BA0181.geopotential number by the normal gravity value computed on the
BA0181.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
BA0181.degrees latitude (g = 980.6199 gals.).
BA0181
BA0181.The modeled gravity was interpolated from observed gravity values.
BA0181
BA0181;
BA0181;          North      East      Units  Estimated Accuracy
BA0181;SPC TXSC    - 4,180,270.      197,780.      MT  (+/- 180 meters Scaled)
BA0181
BA0181_U.S. NATIONAL GRID SPATIAL ADDRESS: 13RFN799532(NAD 83)
BA0181
BA0181                      SUPERSEDED SURVEY CONTROL
BA0181
BA0181 NGVD 29 (??/??/92) 867.271 (m)      2845.37 (f) ADJ UNCH      1 2
BA0181
BA0181.Superseded values are not recommended for survey control.
BA0181
BA0181.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
BA0181.See file dsdata.pdf to determine how the superseded data were derived.
BA0181

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BA0181\_STAMPING: C 748 1943

BA0181

BA0181	HISTORY	- Date	Condition	Report By
BA0181	HISTORY	- 1943	MONUMENTED	CGS
BA0181	HISTORY	- 1967	GOOD	CGS
BA0181	HISTORY	- 20010331	MARK NOT FOUND	NGS
BA0181	HISTORY	- 20160511	MARK NOT FOUND	PROFLN

BA0181

BA0181

STATION DESCRIPTION

BA0181

BA0181'DESCRIBED BY COAST AND GEODETIC SURVEY 1967

BA0181'6.75 MI NE FROM PARK HEADQUARTERS.

BA0181'ABOUT 0.5 MILES NORTH FROM THE PARK HEADQUARTERS BUILDING ALONG A  
BA0181'PAVED ROAD, THENCE 6.25 MILES NORTHEAST ALONG U. S. HIGHWAY 385, 45  
BA0181'FEET EAST OF THE CENTERLINE OF THE HIGHWAY, 101 YARDS NORTH OF THE  
BA0181'NORTH END OF A LARGE BOX CULVERT, 1 FOOT SOUTH OF A WHITE WOODEN  
BA0181'WITNESS POST, 2 1/2 FEET BELOW THE LEVEL OF THE HIGHWAY, AND IN THE  
BA0181'TOP OF A CONCRETE POST PROJECTING 4 INCHES.

BA0181

STATION RECOVERY (2001)

BA0181

BA0181'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2001 (DB)

BA0181'THIS REPORT WAS SUBMITTED BY THE US POWER SQUADRONS.

BA0181

BA0181

STATION RECOVERY (2016)

BA0181

BA0181'RECOVERY NOTE BY PROFESSIONAL LAND SURVEYOR 2016 (JRO)

BA0181'SEARCHED FOR, NOT RECOVERED. THE DISTANCE OF 45 FT (13.7 M) EAST OF  
BA0181'THE HIGHWAY FALLS AT THE TOE OF SLOPE, 6 FT (1.8 M) BELOW THE ROAD,  
BA0181'SILT ALL OVER THE AREA, NO WITNESS POST VISIBLE. LOOKS LIKE THE  
BA0181'HIGHWAY WAS RAISED. TWO BUREAU OF PUBLIC ROADS MARKS ARE ON EITHER  
BA0181'SIDE OF THE HIGHWAY IN THIS AREA. MARK MAY STILL EXIST.

\*\*\* retrieval complete.

Elapsed Time = 00:00:04

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
CD0856 *****
CD0856 DESIGNATION -  D 1395
CD0856 PID          -  CD0856
CD0856 STATE/COUNTY-  TX/CULBERSON
CD0856 COUNTRY      -  US
CD0856 USGS QUAD    -  WILD HORSE (1979)
CD0856
CD0856                      *CURRENT SURVEY CONTROL
CD0856
CD0856* NAD 83(1986) POSITION- 31 02 47.      (N) 104 40 57.      (W) SCALED
CD0856* NAVD 88 ORTHO HEIGHT - 1176.167 (meters)      3858.81 (feet) ADJUSTED
CD0856
CD0856 GEOID HEIGHT   -      -22.755 (meters)                      GEOID12B
CD0856 DYNAMIC HEIGHT -      1174.332 (meters)      3852.79 (feet) COMP
CD0856 MODELED GRAVITY -      979,040.0 (mgal)                      NAVD 88
CD0856
CD0856 VERT ORDER     -  FIRST      CLASS II
CD0856
CD0856.The horizontal coordinates were scaled from a topographic map and have
CD0856.an estimated accuracy of +/- 6 seconds.
CD0856.
CD0856.The orthometric height was determined by differential leveling and
CD0856.adjusted by the NATIONAL GEODETIC SURVEY
CD0856.in June 1991.
CD0856
CD0856.Significant digits in the geoid height do not necessarily reflect accuracy.
CD0856.GEOID12B height accuracy estimate available here.
CD0856
CD0856.The dynamic height is computed by dividing the NAVD 88
CD0856.geopotential number by the normal gravity value computed on the
CD0856.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
CD0856.degrees latitude (g = 980.6199 gals.).
CD0856
CD0856.The modeled gravity was interpolated from observed gravity values.
CD0856
CD0856;
CD0856;          North      East      Units  Estimated Accuracy
CD0856;SPC TX C   - 3,161,060.      284,990.      MT  (+/- 180 meters Scaled)
CD0856
CD0856_U.S. NATIONAL GRID SPATIAL ADDRESS: 13REQ302347(NAD 83)
CD0856
CD0856                      SUPERSEDED SURVEY CONTROL
CD0856
CD0856.No superseded survey control is available for this station.
CD0856
CD0856_MARKER: I = METAL ROD
CD0856_SETTING: 15 = METAL ROD DRIVEN INTO GROUND. SEE TEXT FOR ADDITIONAL
CD0856+WITH SETTING: INFORMATION.
CD0856_STAMPING: D 1395 1981
CD0856_MARK LOGO: NGS

```

CD0856\_PROJECTION: FLUSH

CD0856\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

CD0856\_ROD/PIPE-DEPTH: 2.1 meters

CD0856

CD0856	HISTORY	- Date	Condition	Report By
CD0856	HISTORY	- 1981	MONUMENTED	NGS
CD0856	HISTORY	- 1990	GOOD	USPSQD

CD0856

CD0856 STATION DESCRIPTION

CD0856

CD0856'DESCRIBED BY NATIONAL GEODETIC SURVEY 1981

CD0856'14.5 KM (9.0 MI) EAST FROM VAN HORN.

CD0856'14.5 KM (9.0 MI) EASTERLY ALONG INTERSTATE HIGHWAY 10 FROM ITS

CD0856'JUNCTION WITH U.S. HIGHWAY 90 IN VAN HORN, 43.9 METERS (144.0 FT)

CD0856'SOUTH-SOUTHWEST AND ACROSS THE FRONTAGE ROAD FROM MILE POST 149,

CD0856'AND 15.2 METERS (49.8 FT) SOUTH OF THE CENTER OF A FRONTAGE ROAD.

CD0856'NOTE=ACCESS TO THE DATUM POINT IS THROUGH A 5-INCH LOGO CAP.

CD0856'THE MARK IS 0.3 METERS N FROM A WITNESS POST AND FENCE

CD0856'THE MARK IS 0.3 M BELOW THE FRONTAGE ROAD.

CD0856

CD0856 STATION RECOVERY (1990)

CD0856

CD0856'RECOVERY NOTE BY US POWER SQUADRON 1990 (GGB)

CD0856'RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.

Elapsed Time = 00:00:03



# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
AP0128 *****
AP0128 DESIGNATION -  D 1439
AP0128 PID          -  AP0128
AP0128 STATE/COUNTY-  TX/MAVERICK
AP0128 COUNTRY      -  US
AP0128 USGS QUAD    -  COMETA (1974)
AP0128
AP0128                                *CURRENT SURVEY CONTROL
AP0128
AP0128* NAD 83(1986) POSITION- 28 37 52.      (N) 100 07 16.      (W) SCALED
AP0128* NAVD 88 ORTHO HEIGHT - 202.553 (meters)      664.54 (feet) ADJUSTED
AP0128
AP0128 GEOID HEIGHT - -23.204 (meters)      GEOID12B
AP0128 DYNAMIC HEIGHT - 202.251 (meters)      663.55 (feet) COMP
AP0128 MODELED GRAVITY - 979,150.4 (mgal)      NAVD 88
AP0128
AP0128 VERT ORDER - FIRST CLASS II
AP0128
AP0128.The horizontal coordinates were scaled from a topographic map and have
AP0128.an estimated accuracy of +/- 6 seconds.
AP0128.
AP0128.The orthometric height was determined by differential leveling and
AP0128.adjusted by the NATIONAL GEODETIC SURVEY
AP0128.in June 1991.
AP0128
AP0128.Significant digits in the geoid height do not necessarily reflect accuracy.
AP0128.GEOID12B height accuracy estimate available here.
AP0128
AP0128.The dynamic height is computed by dividing the NAVD 88
AP0128.geopotential number by the normal gravity value computed on the
AP0128.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AP0128.degrees latitude (g = 980.6199 gals.).
AP0128
AP0128.The modeled gravity was interpolated from observed gravity values.
AP0128
AP0128;
AP0128;          North      East      Units  Estimated Accuracy
AP0128;SPC TXSC - 4,088,940.  490,380.  MT  (+/- 180 meters Scaled)
AP0128
AP0128_U.S. NATIONAL GRID SPATIAL ADDRESS: 14RLS904676(NAD 83)
AP0128
AP0128                                SUPERSEDED SURVEY CONTROL
AP0128
AP0128.No superseded survey control is available for this station.
AP0128
AP0128_MARKER: I = METAL ROD
AP0128_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)
AP0128_STAMPING: D 1439 1982
AP0128_MARK LOGO: NGS
AP0128_PROJECTION: RECESSED 3 CENTIMETERS

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AP0128\_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD

AP0128+STABILITY: POSITION/ELEVATION WELL

AP0128\_ROD/PIPE-DEPTH: 10.6 meters

AP0128\_SLEEVE-DEPTH : 8.5 meters

AP0128

AP0128	HISTORY	- Date	Condition	Report By
AP0128	HISTORY	- 1982	MONUMENTED	NGS

AP0128

AP0128 STATION DESCRIPTION

AP0128

AP0128'DESCRIBED BY NATIONAL GEODETIC SURVEY 1982

AP0128'32.1 KM (19.95 MI) NW FROM CARRIZO SPRINGS.

AP0128'0.2 KM (0.1 MI) SOUTHWEST FROM THE POST OFFICE IN CARRIZO SPRINGS,

AP0128'THENCE 31.95 KM (19.85 MI) NW ALONG U.S. HIGHWAY 277 AND ABOUT

AP0128'0.25 METERS (0.15 MI) NORTHWEST OF COMANCHE CREEK AND AT A PICNIC AREA

AP0128'BY A DIRT ROAD LEADING SOUTHEAST WITH A METAL PIPE GATE, 26.5 METERS

AP0128'(87.0 FT) SOUTH OF THE CENTERLINE OF THE HIGHWAY, 20.1 METERS

AP0128'(66.0 FT) EAST SOUTHEAST OF THE SOUTHEAST PIPE POST SUPPORTING THE

AP0128'MOST EASTERLY ONE OF TWO PICNIC SHELTERS, 10.6 METERS (35.0 FT) WEST OF

AP0128'THE CENTER OF THE DIRT ROAD AND METAL GATE, 9.7 METERS (32.0 FT) EAST

AP0128'OF THE EAST CURB OF THE PICNIC AREA, AND 0.8 METER (2.5 FT) NORTH OF

AP0128'THE FENCE.

AP0128'THE MARK IS 0.7 METERS N FROM A WITNESS POST.

AP0128'THE MARK IS 0.6 M BELOW HIGHWAY.

\*\*\* retrieval complete.

Elapsed Time = 00:00:04

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
CD0822 *****
CD0822 DESIGNATION -  E 1389
CD0822 PID          -  CD0822
CD0822 STATE/COUNTY-  TX/CULBERSON
CD0822 COUNTRY      -  US
CD0822 USGS QUAD    -  VAN HORN (1979)
CD0822
CD0822                      *CURRENT SURVEY CONTROL
CD0822
CD0822* NAD 83(1986) POSITION- 31 02 11.      (N) 104 52 15.      (W)  SCALED
CD0822* NAVD 88 ORTHO HEIGHT - 1274.557 (meters)      4181.61 (feet) ADJUSTED
CD0822
CD0822 GEOID HEIGHT   -      -22.828 (meters)                      GEOID12B
CD0822 DYNAMIC HEIGHT -      1272.545 (meters)      4175.01 (feet) COMP
CD0822 MODELED GRAVITY -      979,017.3 (mgal)                      NAVD 88
CD0822
CD0822 VERT ORDER     -  FIRST      CLASS II
CD0822
CD0822.The horizontal coordinates were scaled from a topographic map and have
CD0822.an estimated accuracy of +/- 6 seconds.
CD0822.
CD0822.The orthometric height was determined by differential leveling and
CD0822.adjusted by the NATIONAL GEODETIC SURVEY
CD0822.in June 1991.
CD0822
CD0822.Significant digits in the geoid height do not necessarily reflect accuracy.
CD0822.GEOID12B height accuracy estimate available here.
CD0822
CD0822.The dynamic height is computed by dividing the NAVD 88
CD0822.geopotential number by the normal gravity value computed on the
CD0822.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
CD0822.degrees latitude (g = 980.6199 gals.).
CD0822
CD0822.The modeled gravity was interpolated from observed gravity values.
CD0822
CD0822;
CD0822;          North      East      Units  Estimated Accuracy
CD0822;SPC TX C   - 3,160,670.      266,990.      MT  (+/- 180 meters Scaled)
CD0822
CD0822_U.S. NATIONAL GRID SPATIAL ADDRESS: 13REQ123336(NAD 83)
CD0822
CD0822                      SUPERSEDED SURVEY CONTROL
CD0822
CD0822.No superseded survey control is available for this station.
CD0822
CD0822_MARKER: I = METAL ROD
CD0822_SETTING: 15 = METAL ROD DRIVEN INTO GROUND. SEE TEXT FOR ADDITIONAL
CD0822+WITH SETTING: INFORMATION.
CD0822_STAMPING: E 1389 1981
CD0822_MARK LOGO: NGS

```

CD0822\_PROJECTION: FLUSH

CD0822\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

CD0822\_ROD/PIPE-DEPTH: 1.2 meters

CD0822

CD0822	HISTORY	- Date	Condition	Report By
CD0822	HISTORY	- 1981	MONUMENTED	NGS
CD0822	HISTORY	- 1990	GOOD	USPSQD

CD0822

CD0822 STATION DESCRIPTION

CD0822

CD0822'DESCRIBED BY NATIONAL GEODETIC SURVEY 1981

CD0822'3.8 KM (2.35 MI) WEST FROM VAN HORN.

CD0822'3.8 KM (2.35 MI) WESTERLY ALONG INTERSTATE HIGHWAY 10 FROM ITS

CD0822'JUNCTION WITH U.S. HIGHWAY 90 IN VAN HORN, 0.3 KM (0.2 MI) WEST

CD0822'OF MILE POST 138, 49.7 METERS (163.0 FT) SOUTH OF THE CENTERLINE

CD0822'OF THE EAST BOUND LANES OF THE HIGHWAY, 14.9 METERS (49.0 FT) SOUTH

CD0822'OF THE CENTER OF A FRONTAGE ROAD AND 2.9 METERS (9.5 FT) EAST OF

CD0822'A UTILITY POLE. ACCESS TO THE DATUM POINT IS THROUGH A 5-INCH LOGO

CD0822'CAP.

CD0822'THE MARK IS 0.5 METERS N FROM A WITNESS POST AND FENCE

CD0822'THE MARK IS ABOVE LEVEL WITH THE ROAD.

CD0822

CD0822 STATION RECOVERY (1990)

CD0822

CD0822'RECOVERY NOTE BY US POWER SQUADRON 1990 (GGB)

CD0822'RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.

Elapsed Time = 00:00:05

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
BP0420 *****
BP0420 SACS          -  This is a Secondary Airport Control Station.
BP0420 DESIGNATION -  F 1114
BP0420 PID          -  BP0420
BP0420 STATE/COUNTY-  TX/BREWSTER
BP0420 COUNTRY     -  US
BP0420 USGS QUAD   -  ALPINE NORTH (1972)
BP0420
BP0420                      *CURRENT SURVEY CONTROL
BP0420
BP0420* NAD 83(2011) POSITION- 30 23 54.76866(N) 103 40 51.39174(W) ADJUSTED
BP0420* NAD 83(2011) ELLIP HT- 1329.587 (meters) (06/27/12) ADJUSTED
BP0420* NAD 83(2011) EPOCH   - 2010.00
BP0420* NAVD 88 ORTHO HEIGHT - 1350.620 (meters) 4431.16 (feet) ADJUSTED
BP0420
BP0420 GEOID HEIGHT   -      -21.036 (meters) GEOID12B
BP0420 NAD 83(2011) X - -1,302,530.518 (meters) COMP
BP0420 NAD 83(2011) Y - -5,350,929.360 (meters) COMP
BP0420 NAD 83(2011) Z -  3,209,231.453 (meters) COMP
BP0420 LAPLACE CORR   -      -2.52 (seconds) DEFLEC12B
BP0420 DYNAMIC HEIGHT -      1348.448 (meters) 4424.03 (feet) COMP
BP0420 MODELED GRAVITY -      978,986.0 (mgal) NAVD 88
BP0420 OBS GRAVITY    -      978,985.7 (mgal) GRAV_OBS
BP0420
BP0420 VERT ORDER     -  FIRST      CLASS I
BP0420
BP0420 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
BP0420 Standards:
BP0420          FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
BP0420          Horiz Ellip              SD_N   SD_E   SD_h          (unitless)
BP0420 -----
BP0420 NETWORK      1.68   1.35              0.78   0.55   0.69          0.10513520
BP0420 -----
BP0420 Click here for local accuracies and other accuracy information.
BP0420
BP0420
BP0420.This mark is at Alpine-Casparis Muni (E38) Airport (E38)
BP0420
BP0420.The horizontal coordinates were established by GPS observations
BP0420.and adjusted by the National Geodetic Survey in June 2012.
BP0420
BP0420.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
BP0420.been affixed to the stable North American tectonic plate. See
BP0420.NA2011 for more information.
BP0420
BP0420.The horizontal coordinates are valid at the epoch date displayed above
BP0420.which is a decimal equivalence of Year/Month/Day.
BP0420
BP0420.The orthometric height was determined by differential leveling and

```

BP0420.adjusted by the NATIONAL GEODETIC SURVEY

BP0420.in June 1991.

BP0420

BP0420.Significant digits in the geoid height do not necessarily reflect accuracy.

BP0420.GEOID12B height accuracy estimate available [here](#).

BP0420

BP0420.The X, Y, and Z were computed from the position and the ellipsoidal ht.

BP0420

BP0420.The Laplace correction was computed from DEFLEC12B derived deflections.

BP0420

BP0420.The ellipsoidal height was determined by GPS observations

BP0420.and is referenced to NAD 83.

BP0420

BP0420.The dynamic height is computed by dividing the NAVD 88

BP0420.geopotential number by the normal gravity value computed on the

BP0420.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

BP0420.degrees latitude (g = 980.6199 gals.).

BP0420

BP0420.The modeled gravity was interpolated from observed gravity values.

BP0420

BP0420.The observed gravity was obtained from relative gravimeter ties

BP0420.to the IGSN71 gravity network.

BP0420

BP0420. The following values were computed from the NAD 83(2011) position.

BP0420

BP0420;	North	East	Units	Scale	Factor	Converg.
BP0420;SPC TXSC	- 4,293,310.640	150,273.131	MT	1.00003531	-2 17 35.7	
BP0420;SPC TXSC	-14,085,636.66	493,021.10	sFT	1.00003531	-2 17 35.7	
BP0420;UTM 13	- 3,363,687.065	626,714.157	MT	0.99979808	+0 40 03.2	

BP0420

BP0420! - Elev Factor x Scale Factor = Combined Factor

BP0420!SPC TXSC - 0.99979124 x 1.00003531 = 0.99982654

BP0420!UTM 13 - 0.99979124 x 0.99979808 = 0.99958936

BP0420

BP0420\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13RFP2671463687(NAD 83)

BP0420

#### SUPERSEDED SURVEY CONTROL

BP0420

BP0420	NAD 83(2007)-	30 23 54.76838(N)	103 40 51.39243(W)	AD(2002.00)	0
BP0420	ELLIP H (02/10/07)	1329.597 (m)		GP(2002.00)	
BP0420	ELLIP H (01/31/01)	1329.596 (m)		GP( )	5 1
BP0420	NAD 83(1993)-	30 23 54.76803(N)	103 40 51.39191(W)	AD( )	1
BP0420	ELLIP H (02/18/97)	1329.646 (m)		GP( )	5 1
BP0420	NAVD 88	1350.75 (m)	4431.6	(f) LEVELING	3
BP0420	NGVD 29 (??/??/92)	1350.175 (m)	4429.70	(f) ADJ UNCH	1 1

BP0420

BP0420.Superseded values are not recommended for survey control.

BP0420

BP0420.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

BP0420.See file [dsdata.pdf](#) to determine how the superseded data were derived.

BP0420

BP0420\_MARKER: DB = BENCH MARK DISK

BP0420\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

BP0420\_STAMPING: F 1114 1958

BP0420\_MARK LOGO: CGS

BP0420\_MAGNETIC: N = NO MAGNETIC MATERIAL

BP0420\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

BP0420+STABILITY: SURFACE MOTION

BP0420\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

BP0420+SATELLITE: SATELLITE OBSERVATIONS - May 06, 1995

BP0420	HISTORY	- Date	Condition	Report By
BP0420	HISTORY	- 1958	MONUMENTED	CGS
BP0420	HISTORY	- 1977	GOOD	NGS
BP0420	HISTORY	- 1981	GOOD	NGS
BP0420	HISTORY	- 1988	GOOD	USPSQD
BP0420	HISTORY	- 1989	GOOD	USPSQD
BP0420	HISTORY	- 19950506	GOOD	NGS
BP0420	HISTORY	- 19961007	GOOD	USPSQD
BP0420	HISTORY	- 19990629	GOOD	NGS
BP0420	HISTORY	- 20030214	GOOD	USPSQD

BP0420

BP0420

BP0420

## STATION DESCRIPTION

BP0420'DESCRIBED BY COAST AND GEODETIC SURVEY 1958

BP0420'3.05 MI NW FROM ALPINE.

BP0420'ABOUT 3.05 MILES NORTHWEST ALONG STATE HIGHWAY 118 FROM THE TEXAS AND  
 BP0420'NEW ORLEANS RAILROAD STATION AT ALPINE, 62 FEET NORTHEAST OF THE  
 BP0420'CENTER LINE OF THE HIGHWAY, 0.1 MILE NORTHWEST OF A HIGHWAY BRIDGE,  
 BP0420'0.1 MILE SOUTH OF A FARMHOUSE, 52 FEET SOUTHEAST OF THE CENTER LINE OF  
 BP0420'A PRIVATE DRIVEWAY, 1 1/2 FEET SOUTHWEST OF A FENCE, 2 FEET SOUTHEAST  
 BP0420'OF A CONCRETE WITNESS POST, AND IN THE TOP OF A CONCRETE POST  
 BP0420'PROJECTING 1 FOOT.

BP0420

BP0420

BP0420

## STATION RECOVERY (1977)

BP0420'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1977

BP0420'RECOVERED IN GOOD CONDITION.

BP0420

BP0420

BP0420

## STATION RECOVERY (1981)

BP0420'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1981

BP0420'RECOVERED IN GOOD CONDITION.

BP0420

BP0420

BP0420

## STATION RECOVERY (1988)

BP0420'RECOVERY NOTE BY US POWER SQUADRON 1988 (MVM)

BP0420'RECOVERED IN GOOD CONDITION.

BP0420

BP0420

BP0420

## STATION RECOVERY (1989)

BP0420'RECOVERY NOTE BY US POWER SQUADRON 1989 (MVM)

BP0420'RECOVERED IN GOOD CONDITION.

BP0420

BP0420

BP0420

## STATION RECOVERY (1995)

BP0420'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (AJL)

BP0420'THE STATION IS LOCATED ABOUT 5.26 KM (3.25 MI) NORTHWEST OF ALPINE, IN  
 BP0420'THE GRASS, ALONG THE NORTHEAST SIDE HIGHWAY 118, SOUTHWEST OF A  
 BP0420'BOUNDRY FENCE, AND SOUTHEAST OF A GATE. OWNERSHIP--TEXAS HIGHWAY  
 BP0420'DEPARTMENT. TO REACH THE STATION FROM THE EASTBOUND JUNCTION OF U.S.  
 BP0420'HIGHWAYS 67, 90 AND STATE HIGHWAY 118 IN ALPINE, GO NORTH ON HIGHWAY  
 BP0420'118, 5.26 KM (3.25 MI) PASSED THE AIRPORT ENTRANCE ON THE LEFT, TO THE  
 BP0420'STATION ON THE RIGHT, ALONG THE BOUNDRY FENCE. STATION IS 18.4 M  
 BP0420'(60.4 FT) NORTHEAST OF THE HIGHWAY CENTERLINE, 16.0 M (52.5 FT)  
 BP0420'SOUTHEAST OF A DRIVEWAY AND GATE, 0.7 M (2.3 FT) SOUTHEAST OF A  
 BP0420'CONCRETE BOUNDRY MARKER POST, 0.5 M (1.6 FT) SOUTHWEST OF A FENCE, 0.3  
 BP0420'M (1.0 FT) NORTHWEST OF A METAL WITNESS POST, 0.3 M (1.0 FT) BELOW THE  
 BP0420'LEVEL OF THE HIGHWAY, AND THE MONUMENT IS 0.1 M (0.3 FT) ABOVE THE  
 BP0420'GROUND SURFACE. NOTE--THIS STATION WAS SELECTED AS A SACS.

BP0420  
BP0420 STATION RECOVERY (1996)  
BP0420  
BP0420'RECOVERY NOTE BY US POWER SQUADRON 1996  
BP0420'RECOVERED IN GOOD CONDITION.  
BP0420  
BP0420 STATION RECOVERY (1999)  
BP0420  
BP0420'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1999 (HWE)  
BP0420'STATION IS 3.06 MILES (4.92 KM) NORTH ALONG S.H. 118 FROM ITS  
BP0420'INTERSECTION WITH EAST BOUND US HIGHWAYS 90 AND 67 (ALSO SIGNED  
BP0420'HOLLAND ST.)  
BP0420  
BP0420 STATION RECOVERY (2003)  
BP0420  
BP0420'RECOVERY NOTE BY US POWER SQUADRON 2003 (DH)  
BP0420'RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.  
Elapsed Time = 00:00:04



# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
CD0858 *****
CD0858 DESIGNATION - F 1395
CD0858 PID - CD0858
CD0858 STATE/COUNTY- TX/CULBERSON
CD0858 COUNTRY - US
CD0858 USGS QUAD - WILD HORSE (1979)
CD0858
CD0858 *CURRENT SURVEY CONTROL
CD0858
CD0858* NAD 83(1986) POSITION- 31 03 02. (N) 104 38 56. (W) SCALED
CD0858* NAVD 88 ORTHO HEIGHT - 1178.881 (meters) 3867.71 (feet) ADJUSTED
CD0858
CD0858 GEOID HEIGHT - -22.717 (meters) GEOID12B
CD0858 DYNAMIC HEIGHT - 1177.048 (meters) 3861.70 (feet) COMP
CD0858 MODELED GRAVITY - 979,045.5 (mgal) NAVD 88
CD0858
CD0858 VERT ORDER - FIRST CLASS II
CD0858
CD0858.The horizontal coordinates were scaled from a topographic map and have
CD0858.an estimated accuracy of +/- 6 seconds.
CD0858.
CD0858.The orthometric height was determined by differential leveling and
CD0858.adjusted by the NATIONAL GEODETIC SURVEY
CD0858.in June 1991.
CD0858
CD0858.Significant digits in the geoid height do not necessarily reflect accuracy.
CD0858.GEOID12B height accuracy estimate available here.
CD0858
CD0858.The dynamic height is computed by dividing the NAVD 88
CD0858.geopotential number by the normal gravity value computed on the
CD0858.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
CD0858.degrees latitude (g = 980.6199 gals.).
CD0858
CD0858.The modeled gravity was interpolated from observed gravity values.
CD0858
CD0858;
CD0858;          North      East      Units  Estimated Accuracy
CD0858;SPC TX C - 3,161,400. 288,220. MT (+/- 180 meters Scaled)
CD0858
CD0858_U.S. NATIONAL GRID SPATIAL ADDRESS: 13REQ335352(NAD 83)
CD0858
CD0858 SUPERSEDED SURVEY CONTROL
CD0858
CD0858.No superseded survey control is available for this station.
CD0858
CD0858_MARKER: I = METAL ROD
CD0858_SETTING: 15 = METAL ROD DRIVEN INTO GROUND. SEE TEXT FOR ADDITIONAL
CD0858+WITH SETTING: INFORMATION.
CD0858_STAMPING: F 1395 1981
CD0858_MARK LOGO: NGS

```

CD0858\_PROJECTION: FLUSH

CD0858\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

CD0858\_ROD/PIPE-DEPTH: 1.2 meters

CD0858

CD0858	HISTORY	- Date	Condition	Report By
CD0858	HISTORY	- 1981	MONUMENTED	NGS

CD0858

CD0858

STATION DESCRIPTION

CD0858

CD0858'DESCRIBED BY NATIONAL GEODETIC SURVEY 1981

CD0858'17.7 KM (11.0 MI) EAST FROM VAN HORN.

CD0858'17.7 KM (11.0 MI) EASTERLY ALONG INTERSTATE HIGHWAY 10 FROM ITS  
CD0858'JUNCTION WITH U.S. HIGHWAY 90 IN VAN HORN, 81.8 METERS (268.5 FT)  
CD0858'NORTH-NORTHWEST AND ACROSS A FRONTAGE ROAD FROM MILE POST 151,  
CD0858'46.9 METERS (154.0 FT) NORTH OF THE CENTERLINE OF A FRONTAGE ROAD,  
CD0858'AND 2.4 METERS (7.8 FT) EAST-NORTHEAST OF A UTILITY POLE.

CD0858'NOTE=THE LOGO CAP IS CORRECTLY STAMPED, BUT THE DATUM POINT IS  
CD0858'ERRONEOUSLY STAMPED G 1395 1981. ACCESS TO THE DATUM POINT IS  
CD0858'THROUGH A 5-INCH LOGO CAP.

CD0858'THE MARK IS 0.3 METERS S FROM A WITNESS POST AND FENCE

CD0858'THE MARK IS 0.3 M BELOW THE FRONTAGE ROAD.

\*\*\* retrieval complete.

Elapsed Time = 00:00:04

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
BP0593 *****
BP0593 DESIGNATION - F 1411
BP0593 PID - BP0593
BP0593 STATE/COUNTY- TX/PECOS
BP0593 COUNTRY - US
BP0593 USGS QUAD - FORT STOCKTON EAST (1970)
BP0593
BP0593 *CURRENT SURVEY CONTROL
BP0593
BP0593* NAD 83(1986) POSITION- 30 52 36. (N) 102 52 02. (W) SCALED
BP0593* NAVD 88 ORTHO HEIGHT - 906.262 (meters) 2973.29 (feet) ADJUSTED
BP0593
BP0593 GEOID HEIGHT - -23.562 (meters) GEOID12B
BP0593 DYNAMIC HEIGHT - 904.880 (meters) 2968.76 (feet) COMP
BP0593 MODELED GRAVITY - 979,086.3 (mgal) NAVD 88
BP0593
BP0593 VERT ORDER - FIRST CLASS II
BP0593
BP0593.The horizontal coordinates were scaled from a topographic map and have
BP0593.an estimated accuracy of +/- 6 seconds.
BP0593.
BP0593.The orthometric height was determined by differential leveling and
BP0593.adjusted by the NATIONAL GEODETIC SURVEY
BP0593.in June 1991.
BP0593
BP0593.Significant digits in the geoid height do not necessarily reflect accuracy.
BP0593.GEOID12B height accuracy estimate available here.
BP0593
BP0593.The dynamic height is computed by dividing the NAVD 88
BP0593.geopotential number by the normal gravity value computed on the
BP0593.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
BP0593.degrees latitude (g = 980.6199 gals.).
BP0593
BP0593.The modeled gravity was interpolated from observed gravity values.
BP0593
BP0593; North East Units Estimated Accuracy
BP0593;SPC TX C - 3,136,890. 457,740. MT (+/- 180 meters Scaled)
BP0593
BP0593_U.S. NATIONAL GRID SPATIAL ADDRESS: 13RGQ038178(NAD 83)
BP0593
BP0593 SUPERSEDED SURVEY CONTROL
BP0593
BP0593.No superseded survey control is available for this station.
BP0593
BP0593_MARKER: I = METAL ROD
BP0593_SETTING: 15 = METAL ROD DRIVEN INTO GROUND. SEE TEXT FOR ADDITIONAL
BP0593+WITH SETTING: INFORMATION.
BP0593_STAMPING: F 1411 1981
BP0593_MARK LOGO: NGS

```

BP0593\_PROJECTION: FLUSH

BP0593\_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY

BP0593\_ROD/PIPE-DEPTH: 0.9 meters

BP0593

BP0593	HISTORY	- Date	Condition	Report By
BP0593	HISTORY	- 1981	MONUMENTED	NGS

BP0593

BP0593

STATION DESCRIPTION

BP0593

BP0593'DESCRIBED BY NATIONAL GEODETIC SURVEY 1981

BP0593'1.9 KM (1.2 MI) SE FROM FORT STOCKTON.

BP0593'1.9 KM (1.2 MI) SOUTHEAST ALONG U.S. HIGHWAY 285 FROM ITS JUNCTION

BP0593'WITH U.S. HIGHWAYS 67, 290, AND 385 IN FORT STOCKTON, 92.7 METERS

BP0593'(304.1 FT) SOUTH-SOUTHEAST OF THE CENTER OF A PAVED ROAD LEADING EAST,

BP0593'18.0 METERS (59.1 FT) WEST-SOUTHWEST OF THE CENTERLINE OF THE HIGHWAY,

BP0593'2.4 METERS (7.9 FT) NORTHWEST OF A UTILITY POLE AND 1.4 METERS (4.6

BP0593'FT) SOUTH-SOUTHEAST OF A UTILITY POLE. NOTE=ACCESS TO THE DATUM

BP0593'POINT IS THROUGH A 5-INCH LOGO CAP.

BP0593'THE MARK IS 0.4 METERS ENE FROM A FENCE AND WITNESS POST

BP0593'THE MARK IS 0.3 M BELOW THE HIGHWAY.

\*\*\* retrieval complete.

Elapsed Time = 00:00:04

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
AO0496 *****
AO0496 FBN          -  This is a Federal Base Network Control Station.
AO0496 DESIGNATION -  F 1436
AO0496 PID          -  AO0496
AO0496 STATE/COUNTY-  TX/WEBB
AO0496 COUNTRY     -  US
AO0496 USGS QUAD   -  TELEPHONE TANKS (1982)
AO0496
AO0496                      *CURRENT SURVEY CONTROL
AO0496
AO0496* NAD 83(2011) POSITION- 28 00 22.03265(N) 099 32 03.77427(W) ADJUSTED
AO0496* NAD 83(2011) ELLIP HT- 220.275 (meters) (06/27/12) ADJUSTED
AO0496* NAD 83(2011) EPOCH  - 2010.00
AO0496* NAVD 88 ORTHO HEIGHT - 244.448 (meters) 801.99 (feet) ADJUSTED
AO0496
AO0496 GEOID HEIGHT  -  -24.187 (meters) GEOID12B
AO0496 NAD 83(2011) X  -  -933,476.848 (meters) COMP
AO0496 NAD 83(2011) Y  -  -5,557,747.973 (meters) COMP
AO0496 NAD 83(2011) Z  -  2,977,207.540 (meters) COMP
AO0496 LAPLACE CORR   -  -2.01 (seconds) DEFLEC12B
AO0496 DYNAMIC HEIGHT -  244.069 (meters) 800.75 (feet) COMP
AO0496 MODELED GRAVITY -  979,091.6 (mgal) NAVD 88
AO0496
AO0496 VERT ORDER      -  FIRST CLASS II
AO0496
AO0496 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
AO0496 Standards:
AO0496      FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
AO0496      Horiz Ellip              SD_N   SD_E   SD_h      (unitless)
AO0496 -----
AO0496 NETWORK      0.66   1.59              0.26   0.28   0.81      -0.04684626
AO0496 -----
AO0496 Click here for local accuracies and other accuracy information.
AO0496
AO0496
AO0496.The horizontal coordinates were established by GPS observations
AO0496.and adjusted by the National Geodetic Survey in June 2012.
AO0496
AO0496.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
AO0496.been affixed to the stable North American tectonic plate. See
AO0496.NA2011 for more information.
AO0496
AO0496.The horizontal coordinates are valid at the epoch date displayed above
AO0496.which is a decimal equivalence of Year/Month/Day.
AO0496
AO0496.The orthometric height was determined by differential leveling and
AO0496.adjusted by the NATIONAL GEODETIC SURVEY
AO0496.in June 1991.
AO0496

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AO0496. Significant digits in the geoid height do not necessarily reflect accuracy.  
 AO0496. GEOID12B height accuracy estimate available [here](#).  
 AO0496  
 AO0496. The X, Y, and Z were computed from the position and the ellipsoidal ht.  
 AO0496  
 AO0496. The Laplace correction was computed from DEFLEC12B derived deflections.  
 AO0496  
 AO0496. The ellipsoidal height was determined by GPS observations  
 AO0496. and is referenced to NAD 83.  
 AO0496  
 AO0496. The dynamic height is computed by dividing the NAVD 88  
 AO0496. geopotential number by the normal gravity value computed on the  
 AO0496. Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
 AO0496. degrees latitude ( $g = 980.6199$  gals.).  
 AO0496  
 AO0496. The modeled gravity was interpolated from observed gravity values.  
 AO0496  
 AO0496. The following values were computed from the NAD 83(2011) position.  
 AO0496  

AO0496;	North	East	Units	Scale	Factor	Converg.
AO0496;SPC TX S	- 5,259,622.527	198,258.253	MT	1.00004830	-0 28	10.6
AO0496;SPC TX S	-17,255,944.91	650,452.29	sFT	1.00004830	-0 28	10.6
AO0496;UTM 14	- 3,097,995.385	447,460.779	MT	0.99963407	-0 15	03.4

AO0496!	Elev Factor	x	Scale Factor	=	Combined Factor
AO0496!SPC TX S	- 0.99996540	x	1.00004830	=	1.00001370
AO0496!UTM 14	- 0.99996540	x	0.99963407	=	0.99959948

  
 AO0496\_U.S. NATIONAL GRID SPATIAL ADDRESS: 14RMR4746097995 (NAD 83)  
 AO0496  
 AO0496 SUPERSEDED SURVEY CONTROL  
 AO0496  

AO0496	NAD 83(2007)-	28 00	22.03253(N)	099 32	03.77513(W)	AD(2002.00)	0
AO0496	ELLIP H (02/10/07)		220.292 (m)			GP(2002.00)	
AO0496	NAD 83(1993)-	28 00	22.03221(N)	099 32	03.77451(W)	AD( )	A
AO0496	ELLIP H (05/01/00)		220.305 (m)			GP( )	3 1
AO0496	NAVD 88		244.45 (m)		802.0 (f)	LEVELING	3

  
 AO0496. Superseded values are not recommended for survey control.  
 AO0496  
 AO0496. NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
 AO0496. See file [dsdata.pdf](#) to determine how the superseded data were derived.  
 AO0496  
 AO0496\_MARKER: I = METAL ROD  
 AO0496\_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)  
 AO0496\_STAMPING: F 1436 1982  
 AO0496\_MARK LOGO: NGS  
 AO0496\_PROJECTION: RECESSED 3 CENTIMETERS  
 AO0496\_MAGNETIC: O = OTHER; SEE DESCRIPTION  
 AO0496\_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD  
 AO0496+STABILITY: POSITION/ELEVATION WELL  
 AO0496\_SATELLITE: THE SITE LOCATION WAS REPORTED AS NOT SUITABLE FOR  
 AO0496+SATELLITE: SATELLITE OBSERVATIONS - March 26, 2002  
 AO0496\_ROD/PIPE-DEPTH: 9.4 meters  
 AO0496\_SLEEVE-DEPTH : 9.1 meters  
 AO0496  

AO0496	HISTORY	- Date	Condition	Report By
AO0496	HISTORY	- 1982	MONUMENTED	NGS
AO0496	HISTORY	- 19980302	GOOD	NGS
AO0496	HISTORY	- 20020326	GOOD	USPSQD

AO0496

AO0496

## STATION DESCRIPTION

AO0496

AO0496'DESCRIBED BY NATIONAL GEODETIC SURVEY 1982

AO0496'29.7 KM (18.45 MI) NW FROM WEBB.

AO0496'29.7 KM (18.45 MI) NORTHWEST ALONG U.S. HIGHWAY 83 FROM THE JUNCTION

AO0496'OF INTERSTATE 35 AND OVERPASS BRIDGE AT WEBB, AND ABOUT 1.1 KM

AO0496'(0.7 MI) NORTHWEST OF A LARGE MICROWAVE TOWER ON THE EAST SIDE OF

AO0496'HIGHWAY 83, SET BY FENCE AT A PICNIC AREA, ABOUT 0.25 KM (0.15 MI)

AO0496'SOUTH SOUTHEAST OF A SMALL CONCRETE CULVERT UNDER THE HIGHWAY AND ALSO

AO0496'ABOUT 0.25 KM (0.15 MI) NORTHWEST OF A LARGE METAL PIPE GATE IN THE

AO0496'EAST FENCE LINE, 45.1 METERS (148.0 FT) EAST NORTHEAST OF THE CENTER

AO0496'OF U.S. HIGHWAY 83, 22.8 METERS (75.0 FT) EAST NORTHEAST OF THE CENTER

AO0496'OF A ASPHALT DRIVE IN THE REST AREA, 14.3 METERS (47.0 FT) NORTHEAST

AO0496'OF THE SOUTHEAST BRICK PILLAR OF THE PICNIC SHELTER, 14.3 METERS

AO0496'(47.0 FT) EAST OF THE NORTHEAST PILLAR OF THE SHELTER, 3.0 METERS

AO0496'(10.0 FT) NORTH OF THE CENTER OF A SET OF CROSSOVER STEPS OVER THE

AO0496'FENCE, 0.9 METER (3.0 FT) WEST SOUTHWEST OF THE HIGHWAY RIGHT OF WAY

AO0496'FENCE LINE.

AO0496'THE MARK IS 0.46 METERS SSE FROM A WITNESS POST.

AO0496'THE MARK IS ABOVE LEVEL WITH HIGHWAY.

AO0496

AO0496

## STATION RECOVERY (1998)

AO0496

AO0496'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1998 (CSM)

AO0496'THE STATION IS LOCATED ABOUT 53 KM (32.95 MI) NORTH OF LAREDO, 2.4 KM

AO0496'(1.50 MI) SOUTH OF STATE HIGHWAY 44, AT AN ABANDONED REST AREA AND IN

AO0496'THE ROAD RIGHT-OF-WAY. OWNERSHIP-- TEXAS DEPARTMENT OF

AO0496'TRANSPORTATION, 11TH AND BRAZOS, AUSTIN, TX 78701, PHONE 512-465-7337.

AO0496'TO REACH THE STATION FROM THE JUNCTION OF U.S. HIGHWAY 83 AND STATE

AO0496'HIGHWAY 44, ABOUT 19.3 KM (12.00 MI) WEST OF ENCINAL, GO SOUTH ON

AO0496'HIGHWAY 83 FOR 2.4 KM (1.50 MI) TO THE STATION ON THE LEFT. ACCESS

AO0496'THE STATION VIA ONE OF THE ENTRANCES TO THE ABANDONED REST AREA AND

AO0496'RETURN TO THIS POINT. THE MARK IS A PUNCH MARK TOP CENTER OF A DATUM

AO0496'POINT ON A STAINLESS STEEL ROD ENCASED IN A 12.7 CM PVC PIPE WITH NGS

AO0496'VERTICAL LOGO CAP. THE STATION IS LOCATED 232.3 M (762.1 FT)

AO0496'NORTH-NORTHWEST FROM A STEEL PIPE FENCE CORNER AT A GATE, 231.5 M

AO0496'(759.5 FT) NORTH-NORTHWEST FROM A CONCRETE RIGHT-OF-WAY MARKER, 45.1 M

AO0496'(148.0 FT) EAST-NORTHEAST FROM THE CENTER OF THE HIGHWAY, 2.2 M (7.2

AO0496'FT) SOUTH FROM A CONCRETE FILLED 7.5 CM DIAMETER STEEL PIPE IN A FENCE

AO0496'LINE, 1.1 M (3.6 FT) WEST-SOUTHWEST FROM A 1.5 M (4.9 FT) TALL WIRE

AO0496'FENCE, 0.4 M (1.3 FT) NORTH FROM A METAL NGS WITNESS POST AND 0.4 M

AO0496'(1.3 FT) SOUTH FROM ANOTHER METAL NGS WITNESS POST.

AO0496

AO0496

## STATION RECOVERY (2002)

AO0496

AO0496'RECOVERY NOTE BY US POWER SQUADRON 2002 (WHM)

AO0496'RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.

Elapsed Time = 00:00:05

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
BP0418 *****
BP0418 FBN          -  This is a Federal Base Network Control Station.
BP0418 SACS         -  This is a Secondary Airport Control Station.
BP0418 DESIGNATION -  L 1114
BP0418 PID          -  BP0418
BP0418 STATE/COUNTY-  TX/BREWSTER
BP0418 COUNTRY      -  US
BP0418 USGS QUAD    -  ALPINE NORTH (1972)
BP0418
BP0418                      *CURRENT SURVEY CONTROL
BP0418
BP0418* NAD 83(2011) POSITION- 30 23 18.37268(N) 103 40 31.93029(W) ADJUSTED
BP0418* NAD 83(2011) ELLIP HT- 1333.616 (meters) (06/27/12) ADJUSTED
BP0418* NAD 83(2011) EPOCH   - 2010.00
BP0418* NAVD 88 ORTHO HEIGHT - 1354.652 (meters) 4444.39 (feet) ADJUSTED
BP0418
BP0418 GEOID HEIGHT   -      -21.033 (meters) GEOID12B
BP0418 NAD 83(2011) X   - -1,302,160.555 (meters) COMP
BP0418 NAD 83(2011) Y   - -5,351,606.694 (meters) COMP
BP0418 NAD 83(2011) Z   -  3,208,266.532 (meters) COMP
BP0418 LAPLACE CORR    -      -2.28 (seconds) DEFLEC12B
BP0418 DYNAMIC HEIGHT -      1352.472 (meters) 4437.24 (feet) COMP
BP0418 MODELED GRAVITY -      978,983.9 (mgal) NAVD 88
BP0418
BP0418 VERT ORDER      -  FIRST      CLASS I
BP0418
BP0418 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
BP0418 Standards:
BP0418      FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
BP0418      Horiz Ellip              SD_N   SD_E   SD_h      (unitless)
BP0418 -----
BP0418 NETWORK      0.34   0.80              0.14   0.14   0.41      -0.03908817
BP0418 -----
BP0418 Click here for local accuracies and other accuracy information.
BP0418
BP0418
BP0418.This mark is at Alpine-Casparis Muni (E38) Airport (E38)
BP0418
BP0418.The horizontal coordinates were established by GPS observations
BP0418.and adjusted by the National Geodetic Survey in June 2012.
BP0418
BP0418.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
BP0418.been affixed to the stable North American tectonic plate. See
BP0418.NA2011 for more information.
BP0418
BP0418.The horizontal coordinates are valid at the epoch date displayed above
BP0418.which is a decimal equivalence of Year/Month/Day.
BP0418
BP0418.The orthometric height was determined by differential leveling and

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BP0418.adjusted by the NATIONAL GEODETIC SURVEY

BP0418.in June 1991.

BP0418

BP0418.Significant digits in the geoid height do not necessarily reflect accuracy.

BP0418.GEOID12B height accuracy estimate available [here](#).

BP0418

BP0418.The X, Y, and Z were computed from the position and the ellipsoidal ht.

BP0418

BP0418.The Laplace correction was computed from DEFLEC12B derived deflections.

BP0418

BP0418.The ellipsoidal height was determined by GPS observations

BP0418.and is referenced to NAD 83.

BP0418

BP0418.The dynamic height is computed by dividing the NAVD 88

BP0418.geopotential number by the normal gravity value computed on the

BP0418.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

BP0418.degrees latitude (g = 980.6199 gals.).

BP0418

BP0418.The modeled gravity was interpolated from observed gravity values.

BP0418

BP0418. The following values were computed from the NAD 83(2011) position.

BP0418

BP0418;	North	East	Units	Scale Factor	Converg.
BP0418;SPC TXSC	- 4,292,169.937	150,747.440	MT	1.00003205	-2 17 26.2
BP0418;SPC TXSC	-14,081,894.20	494,577.23	sFT	1.00003205	-2 17 26.2
BP0418;UTM 13	- 3,362,572.645	627,246.628	MT	0.99979975	+0 40 12.3

BP0418

BP0418!	Elev Factor	x	Scale Factor	=	Combined Factor
BP0418!SPC TXSC	- 0.99979061	x	1.00003205	=	0.99982265
BP0418!UTM 13	- 0.99979061	x	0.99979975	=	0.99959040

BP0418

BP0418\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13RFP2724662572(NAD 83)

BP0418

#### SUPERSEDED SURVEY CONTROL

BP0418

BP0418	NAD 83(2007)-	30 23 18.37248(N)	103 40 31.93099(W)	AD(2002.00)	0
BP0418	ELLIP H (02/10/07)	1333.627 (m)		GP(2002.00)	
BP0418	ELLIP H (05/01/00)	1333.644 (m)		GP( )	3 1
BP0418	NAD 83(1993)-	30 23 18.37196(N)	103 40 31.93048(W)	AD( )	B
BP0418	ELLIP H (05/09/94)	1333.727 (m)		GP( )	4 2
BP0418	ELLIP H (12/21/93)	1333.688 (m)		GP( )	4 1
BP0418	NAD 83(1986)-	30 23 18.37355(N)	103 40 31.92919(W)	AD( )	3
BP0418	NAVD 88	1354.65 (m)	4444.4 (f)	LEVELING	3
BP0418	NAVD 88 (08/15/96)	1354.79 (m)	UNKNOWN model used	GPS OBS	
BP0418	NAVD 88	1354.65 (m)	4444.4 (f)	LEVELING	3
BP0418	NGVD 29 (??/??/92)	1354.207 (m)	4442.93 (f)	ADJ UNCH	1 1
BP0418	NGVD 29 (10/23/89)	1354.2 (m)	RAPSU86 model used	GPS OBS	

BP0418

BP0418.Superseded values are not recommended for survey control.

BP0418

BP0418.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

BP0418.See file [dsdata.pdf](#) to determine how the superseded data were derived.

BP0418

BP0418\_MARKER: DB = BENCH MARK DISK

BP0418\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

BP0418\_STAMPING: L 1114 1958

BP0418\_MARK LOGO: CGS

BP0418\_PROJECTION: PROJECTING 20 CENTIMETERS

BP0418\_MAGNETIC: N = NO MAGNETIC MATERIAL

BP0418\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

BP0418+STABILITY: SURFACE MOTION

BP0418\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

BP0418+SATELLITE: SATELLITE OBSERVATIONS - October 23, 2006

BP0418

BP0418	HISTORY	- Date	Condition	Report By
BP0418	HISTORY	- 1958	MONUMENTED	CGS
BP0418	HISTORY	- 1977	GOOD	NGS
BP0418	HISTORY	- 1981	GOOD	NGS
BP0418	HISTORY	- 1989	GOOD	USPSQD
BP0418	HISTORY	- 19890210	GOOD	NGS
BP0418	HISTORY	- 19930222	GOOD	NGS
BP0418	HISTORY	- 19950506	GOOD	NGS
BP0418	HISTORY	- 19950712	GOOD	NGS
BP0418	HISTORY	- 19961007	GOOD	USPSQD
BP0418	HISTORY	- 19980219	GOOD	NGS
BP0418	HISTORY	- 20030419	GOOD	USPSQD
BP0418	HISTORY	- 20061023	GOOD	CDSMS

BP0418

STATION DESCRIPTION

BP0418

BP0418'DESCRIBED BY COAST AND GEODETIC SURVEY 1958

BP0418'2.3 MI NW FROM ALPINE.

BP0418'ABOUT 2.3 MILES NORTHWEST ALONG STATE HIGHWAY 118 FROM THE TEXAS AND

BP0418'NEW ORLEANS RAILROAD STATION AT ALPINE, AT THE STARN'S AIRPORT, 158

BP0418'FEET SOUTHWEST OF THE CENTER LINE OF THE HIGHWAY, 24 1/2 FEET

BP0418'SOUTHEAST OF THE EAST CORNER OF A CONCRETE APRON IN FRONT OF THE

BP0418'MAINTENANCE HANGAR, 3 FEET NORTHEAST OF THE NORTHEAST FACE OF A STUCCO

BP0418'BUILDING, 1 FOOT NORTHEAST OF A FENCE, AND IN THE TOP OF A CONCRETE

BP0418'POST PROJECTING 6 INCHES.

BP0418

STATION RECOVERY (1977)

BP0418

BP0418

BP0418'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1977

BP0418'RECOVERED IN GOOD CONDITION.

BP0418

STATION RECOVERY (1981)

BP0418

BP0418

BP0418'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1981

BP0418'IN ALPINE, AT THE ALPINE MUNICIPAL AIRPORT, 28.4 METERS (93.2 FT)

BP0418'NORTHWEST OF THE CENTER OF A PAVED ROAD LEADING SOUTHWEST TO THE

BP0418'AIRPORT, 2.5 METERS (8.2 FT) NORTHWEST OF THE SOUTHEAST CORNER OF THE

BP0418'A STUCCO BUILDING AND 0.3 METER (1.0 FT) NORTHWEST OF A METAL WITNESS

BP0418'POST.

BP0418

STATION RECOVERY (1989)

BP0418

BP0418

BP0418'RECOVERY NOTE BY US POWER SQUADRON 1989 (MVM)

BP0418'RECOVERED IN GOOD CONDITION.

BP0418

STATION RECOVERY (1989)

BP0418

BP0418

BP0418'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1989

BP0418'THE STATION IS LOCATED ABOUT 4 KM (2.50 MI) NORTHWEST OF ALPINE, AT

BP0418'THE ALPINE MUNICIPAL AIRPORT. OWNERSHIP--CITY OF ALPINE, POST OFFICE

BP0418'BOX 149, ALPINE, TEXAS 79830. THE AIRPORT MANAGER IS TOM LONGMAN,

BP0418'TELEPHONE 915-837-2744.

BP0418'TO REACH THE STATION FROM THE EASTBOUND JUNCTION OF U.S. HIGHWAYS 67,

BP0418'90 AND STATE HIGHWAY 118 IN ALPINE, GO NORTH ON STATE HIGHWAY 118 FOR

BP0418'2.64 KM (1.65 MI) TO A STATE HIGHWAY DEPARTMENT OFFICE ON THE RIGHT.

BP0418'CONTINUE AHEAD FOR 1.09 KM (0.70 MI) TO THE AIRPORT ENTRANCE ON THE

BP0418'LEFT. TURN LEFT AND GO SOUTHWEST FOR 0.15 KM (0.10 MI) TO THE OFFICE  
BP0418'AND A GATE ON THE RIGHT. TURN RIGHT, PASS THROUGH THE GATE, AND GO  
BP0418'NORTHEAST ACROSS THE AIRCRAFT PARKING AREA FOR 0.10 KM (0.05 MI) TO  
BP0418'THE STATION, NEAR THE PERIMETER FENCE.

BP0418'THE STATION IS 29.5 M (96.8 FT) SOUTHWEST OF THE PERIMETER FENCE, 23.3  
BP0418'M (76.4 FT) NORTHWEST OF THE PERIMETER FENCE, 20.1 M (65.9 FT) SOUTH  
BP0418'OF THE SOUTHEAST BRICK COLUMN SUPPORTING AN AIRPORT SIGN, 0.8 M  
BP0418'(2.6 FT) NORTHEAST OF A FOUNDATION EDGE, AND 0.4 M (1.3 FT) NORTHWEST  
BP0418'OF A WITNESS POST.

BP0418'DESCRIBED BY R.D.B.

BP0418

BP0418

STATION RECOVERY (1993)

BP0418

BP0418'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1993

BP0418'STATION IS LOCATED ABOUT 3.5 KM (2.15 MI) NORTHWEST OF ALPINE, AT THE  
BP0418'ALPINE MUNICIPAL AIRPORT. OWNERSHIP--CITY OF ALPINE, P.O. BOX 149,  
BP0418'ALPINE, TX 79830. AIRPORT MANAGER AND FBO IS NEIL MURDOCH, PHONE  
BP0418'915-837-2744.

BP0418'TO REACH FROM THE JUNCTION OF U.S. HIGHWAY 90 WESTBOUND AND STATE  
BP0418'HIGHWAY 118 IN ALPINE, GO NORTH ON HIGHWAY 118 FOR 2.49 KM (1.55 MI)  
BP0418'TO A STATE HIGHWAY DEPARTMENT OFFICE ON THE RIGHT. CONTINUE AHEAD ON  
BP0418'HIGHWAY 118 FOR 1.12 KM (0.70 MI) TO A PAVED ROAD LEFT. TURN LEFT,  
BP0418'SOUTHWEST, ON AIRPORT ENTRANCE ROAD FOR 0.17 KM (0.10 MI) TO A LOCKED  
BP0418'GATE ON THE RIGHT AT THE TERMINAL BUILDING. TURN RIGHT, PASSING  
BP0418'THROUGH GATE, THEN TURN RIGHT, NORTHEAST, ON APRON FOR 0.10 KM  
BP0418'(0.05 MI) TO THE SOUTHEAST CORNER OF THE PERIMETER FENCE AND THE  
BP0418'STATION.

BP0418'STATION MARK IS SET IN THE TOP OF A 30 CM ROUND CONCRETE POST IN METAL  
BP0418'SLEEVE PROJECTING 20 CM ABOVE GROUND AT MOWED AREA. IT IS 29.4 M  
BP0418'(96.5 FT) SOUTHWEST OF THE FENCE, 23.3 M (76.4 FT) NORTHWEST OF THE  
BP0418'FENCE, 22.4 M (73.5 FT) SOUTH OF THE NORTHWEST POST SUPPORTING THE  
BP0418'AIRPORT SIGN, ON THE NORTHEAST SIDE OF THE FLUSH FOUNDATION, 4.0 M  
BP0418'(13.1 FT) EAST-SOUTHEAST OF THE NORTH CORNER OF THE FOUNDATION AND  
BP0418'0.4 M (1.3 FT) NORTHWEST OF A METAL WITNESS POST.

BP0418

BP0418

STATION RECOVERY (1995)

BP0418

BP0418'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (AJL)

BP0418'THE STATION IS LOCATED ABOUT 4.0 KM (2.50 MI) NORTHWEST OF ALPINE, AT  
BP0418'THE ALPINE-CASPARIS MUNICIPAL AIRPORT. IN THE GRASS, ON THE NORTHWEST  
BP0418'SIDE OF THE ENTRANCE ROAD, ABOUT 48.1 M (157.8 FT) FROM THE HIGHWAY  
BP0418'CENTERLINE, INSIDE THE CHAIN LINK BOUNDARY FENCE. OWNERSHIP--TERLINGUA  
BP0418'RANCH INC. TERLINGUA, RT BOX 220 ALPINE, TX. 79830. AIRPORT MANAGER  
BP0418'GEORGE ELLINGTON, PHONE 915-837-3009. TO REACH THE STATION FROM THE  
BP0418'EASTBOUND JUNCTION OF U.S. HIGHWAYS 67, 90 AND STATE HIGHWAY 118 IN  
BP0418'ALPINE, GO NORTH ON HIGHWAY 118, 3.69 KM (2.30 MI) TO THE AIRPORT  
BP0418'ENTRANCE ON THE LEFT. TURN LEFT, SOUTHWEST, 0.04 KM (0.00 MI) TO THE  
BP0418'STATION ON THE RIGHT. STATION IS 48.1 M (157.8 FT) SOUTHWEST OF THE  
BP0418'HIGHWAY CENTERLINE, 29.5 M (96.8 FT) SOUTHWEST OF A FENCE, 23.2 M  
BP0418'(76.1 FT) NORTHWEST OF A FENCE, 0.8 M (2.6 FT) EAST OF A CONCRETE  
BP0418'SLAB, 0.4 M (1.3 FT) NORTH OF A WITNESS POST, AND THE MONUMENT IS 0.2  
BP0418'M (0.7 FT) ABOVE THE GROUND SURFACE. NOTE--THIS STATION WAS SELECTED  
BP0418'AS A SACS.

BP0418

BP0418

STATION RECOVERY (1995)

BP0418

BP0418'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (BWM)

BP0418'THE STATION IS LOCATED ABOUT 4 KM (2.50 MI) NORTHWEST OF ALPINE, AT  
BP0418'THE ALPINE MUNICIPAL AIRPORT. OWNERSHIP--CITY OF ALPINE, POST OFFICE  
BP0418'BOX 149, ALPINE, TEXAS 79830. THE AIRPORT MANAGER IS TOM LONGMAN,

BP0418'TELEPHONE 915-837-2744. TO REACH THE STATION FROM THE EASTBOUND  
BP0418'JUNCTION OF U.S. HIGHWAYS 67, 90 AND STATE HIGHWAY 118 IN ALPINE, GO  
BP0418'NORTH ON STATE HIGHWAY 118 FOR 2.64 KM (1.65 MI) TO A STATE HIGHWAY  
BP0418'DEPARTMENT OFFICE ON THE RIGHT. CONTINUE AHEAD FOR 1.09 KM (0.65 MI)  
BP0418'TO THE AIRPORT ENTRANCE ON THE LEFT. TURN LEFT AND GO SOUTHWEST FOR  
BP0418'0.15 KM (0.10 MI) TO THE OFFICE AND A GATE ON THE RIGHT. TURN RIGHT,  
BP0418'PASS THROUGH THE GATE, AND GO NORTHEAST ACROSS THE AIRCRAFT PARKING  
BP0418'AREA FOR 0.10 KM (0.05 MI) TO THE STATION, NEAR THE PERIMETER FENCE.  
BP0418'THE STATION IS 29.5 M (96.8 FT) SOUTHWEST OF THE PERIMETER FENCE, 23.3  
BP0418'M (76.4 FT) NORTHWEST OF THE PERIMETER FENCE, 20.1 M (65.9 FT) SOUTH  
BP0418'OF THE SOUTHEAST BRICK COLUMN SUPPORTING AN AIRPORT SIGN, 0.8 M (2.6  
BP0418'FT) NORTHEAST OF A FOUNDATION EDGE, AND 0.4 M (1.3 FT) NORTHWEST OF A  
BP0418'WITNESS POST. DESCRIBED BY R.D.B. THIS IS A SAC STATION

BP0418

BP0418

STATION RECOVERY (1996)

BP0418

BP0418'RECOVERY NOTE BY US POWER SQUADRON 1996

BP0418'RECOVERED IN GOOD CONDITION.

BP0418

BP0418

STATION RECOVERY (1998)

BP0418

BP0418'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1998 (CSM)

BP0418'THE STATION IS LOCATED ABOUT 3.2 KM (2.00 MI) NORTHWEST OF ALPINE, AT

BP0418'THE ALPINE-CASPARIS MUNICIPAL AIRPORT. IN THE GRASS NEAR THE

BP0418'ENTRANCE, ON THE NORTHWEST SIDE OF THE ENTRANCE ROAD, INSIDE A

BP0418'CHAIN-LINK PERIMETER FENCE, NEAR THE EAST EDGE OF A CONCRETE SLAB.

BP0418'OWNERSHIP--CITY OF ALPINE, P.O. BOX 149, ALPINE, TX. 79830. AIRPORT

BP0418'MANAGER DOUG LIVELEY, F.B.O. IS BOBBY LEONARD. PHONE 915-837-2744.

BP0418'TO REACH THE STATION FROM THE EASTBOUND JUNCTION OF U.S. HIGHWAYS 67,

BP0418'90 AND STATE HIGHWAY 118 NEAR THE CENTER OF ALPINE, GO

BP0418'NORTH-NORTHWEST, FOR 3.69 KM (2.30 MI) ALONG HIGHWAY 118 TO THE

BP0418'AIRPORT ENTRANCE ON THE LEFT. TURN LEFT, SOUTHWEST, FOR 0.15 KM (0.10

BP0418'MI) TO THE AIRPORT OFFICE AND GATE ON THE RIGHT. TURN RIGHT, PASSING

BP0418'THROUGH GATE, THEN RIGHT, NORTHEAST, FOR 0.10 KM (0.05 MI) CROSSING

BP0418'THE TIE DOWN AREA AND GRASS TO THE CONCRETE SLAB AND THE STATION ON

BP0418'THE LEFT. STATION IS 48.1 M (157.8 FT) SOUTHWEST OF THE HIGHWAY

BP0418'CENTERLINE, 29.5 M (96.8 FT) SOUTHWEST OF A CHAIN-LINK FENCE, 23.2 M

BP0418'(76.1 FT) NORTHWEST OF A CHAIN-LINK FENCE, 0.8 M (2.6 FT) EAST OF A

BP0418'CONCRETE SLAB, 0.4 M (1.3 FT) NORTH OF A METAL WITNESS POST, AND THE

BP0418'MONUMENT IS PROJECTING 0.2 M (0.7 FT) ABOVE THE GROUND SURFACE. BY

BP0418'R.G. HAYES

BP0418

BP0418

STATION RECOVERY (2003)

BP0418

BP0418'RECOVERY NOTE BY US POWER SQUADRON 2003 (CAG)

BP0418'RECOVERED IN GOOD CONDITION.

BP0418

BP0418

STATION RECOVERY (2006)

BP0418

BP0418

BP0418'RECOVERY NOTE BY CDS/MUERY SERVICES 2006 (MDM)

BP0418'RECOVERED IN GOOD CONDITION. CURRENT AIRPORT MANAGER IS JOHNNY

BP0418'GALVAN, PHONE NUMBER (432) 837-5929, FAX NUMBER (432) 837-2341.

\*\*\* retrieval complete.

Elapsed Time = 00:00:05

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
CD0892 *****
CD0892 FBN          -  This is a Federal Base Network Control Station.
CD0892 DESIGNATION -  M 1396
CD0892 PID          -  CD0892
CD0892 STATE/COUNTY-  TX/JEFF DAVIS
CD0892 COUNTRY      -  US
CD0892 USGS QUAD    -  GOMEZ PEAK (1970)
CD0892
CD0892                      *CURRENT SURVEY CONTROL
CD0892
CD0892* NAD 83(2011) POSITION- 31 04 42.09783(N) 104 06 59.13126(W) ADJUSTED
CD0892* NAD 83(2011) ELLIP HT- 1222.090 (meters) (06/27/12) ADJUSTED
CD0892* NAD 83(2011) EPOCH   - 2010.00
CD0892* NAVD 88 ORTHO HEIGHT - 1244.446 (meters) 4082.82 (feet) ADJUSTED
CD0892
CD0892 GEOID HEIGHT   -      -22.344 (meters) GEOID12B
CD0892 NAD 83(2011) X - -1,333,743.284 (meters) COMP
CD0892 NAD 83(2011) Y - -5,303,419.402 (meters) COMP
CD0892 NAD 83(2011) Z -  3,273,968.242 (meters) COMP
CD0892 LAPLACE CORR   -      -0.69 (seconds) DEFLEC12B
CD0892 DYNAMIC HEIGHT -      1242.520 (meters) 4076.50 (feet) COMP
CD0892 MODELED GRAVITY -      979,049.8 (mgal) NAVD 88
CD0892
CD0892 VERT ORDER      -  FIRST      CLASS II
CD0892
CD0892 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
CD0892 Standards:
CD0892      FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
CD0892      Horiz Ellip              SD_N   SD_E   SD_h      (unitless)
CD0892 -----
CD0892 NETWORK      0.44   1.18              0.18   0.18   0.60      -0.04422698
CD0892 -----
CD0892 Click here for local accuracies and other accuracy information.
CD0892
CD0892
CD0892.The horizontal coordinates were established by GPS observations
CD0892.and adjusted by the National Geodetic Survey in June 2012.
CD0892
CD0892.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
CD0892.been affixed to the stable North American tectonic plate. See
CD0892.NA2011 for more information.
CD0892
CD0892.The horizontal coordinates are valid at the epoch date displayed above
CD0892.which is a decimal equivalence of Year/Month/Day.
CD0892
CD0892.The orthometric height was determined by differential leveling and
CD0892.adjusted by the NATIONAL GEODETIC SURVEY
CD0892.in June 1991.
CD0892

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CD0892

CD0892

## STATION DESCRIPTION

CD0892

CD0892'DESCRIBED BY NATIONAL GEODETIC SURVEY 1981

CD0892'10.0 KM (6.2 MI) EAST FROM KENT.

CD0892'10.0 KM (6.2 MI) EASTERLY ALONG INTERSTATE HIGHWAY 10 FROM ITS

CD0892'JUNCTION WITH FARM ROAD 2424 AND STATE HIGHWAY 118 IN KENT, AT THE

CD0892'APPROXIMATE MIDDLE OF A CUTBANK, IN TOP OF A 4X8 FT EXPOSED AREA OF

CD0892'BEDROCK, 0.2 KM (0.15 MI) EAST OF MILE POST 183, 26.0 METERS (85.3 FT)

CD0892'SOUTH-SOUTHEAST OF A FENCE, 19.1 METERS (62.7 FT) NORTH-NORTHWEST OF

CD0892'THE CENTERLINE OF THE WEST BOUND OF THE HIGHWAY, AND 3.4 METERS

CD0892'(11.0 FT) NORTH-NORTHWEST OF THE SOUTH-SOUTHEAST END OF THE CUTBANK.

CD0892'THE MARK IS 0.3 METERS SW FROM A WITNESS POST.

CD0892'THE MARK IS 4.0 M ABOVE THE HIGHWAY.

CD0892

CD0892

## STATION RECOVERY (1993)

CD0892

CD0892'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1993

CD0892'STATION IS LOCATED ABOUT 65 KM (40.40 MI) EAST OF VAN HORN, ALONG

CD0892'INTERSTATE HIGHWAY 10, 4.5 KM (2.80 MI) SOUTHWEST OF THE JUNCTION OF

CD0892'INTERSTATE HIGHWAYS 10 AND 20, AT MILE 183.1, 4.18 KM (2.60 MI)

CD0892'NORTHEAST ALONG THE HIGHWAY FROM THE CHERRY CREEK ROAD EXIT, 1.46 KM

CD0892'(0.90 MI) SOUTHWEST OF THE SPRINGHILLS EXIT, ON A SHORT, 4 METER

CD0892'(13.1 FT) HIGH ROCK CUT ALONG THE WESTBOUND LANES OF THE HIGHWAY.

CD0892'OWNERSHIP--TEXAS DEPARTMENT OF TRANSPORTATION.

CD0892'TO REACH FROM THE OVERPASS AT THE SPRINGHILLS INTERCHANGE (EXIT 184),

CD0892'GO SOUTHWEST ON HIGHWAY 10 FOR 1.46 KM (0.90 MI) TO THE STATION ON

CD0892'THE RIGHT.

CD0892'STATION MARK IS SET FLUSH IN A DRILL HOLE IN A FLUSH ROCK LEDGE WITH A

CD0892'SLIGHT SLOPE TO THE SOUTH. IT IS 19.1 M (62.7 FT) NORTHWEST OF AND

CD0892'3.5 M (11.5 FT) HIGHER THAN THE CENTER OF THE WESTBOUND LANES, 3.5 M

CD0892'(11.5 FT) NORTHWEST OF THE CUT EDGE AND 0.3 M (1.0 FT) SOUTHWEST OF A

CD0892'METAL WITNESS POST.

CD0892

CD0892

## STATION RECOVERY (1998)

CD0892

CD0892'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1998 (CSM)

CD0892'RECOVERED AS DESCRIBED WITH THIS NOTE. BY R.G. HAYES NOTE--THE

CD0892'PREVIOUS DESCRIPTIONS STATE DB = BENCH MARK DISK, THIS IS INCORRECT.

CD0892'IT IS A VERTICAL CONTROL DISK.

\*\*\* retrieval complete.

Elapsed Time = 00:00:05

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
CD0205 *****
CD0205 SACS          -  This is a Secondary Airport Control Station.
CD0205 DESIGNATION -  P 1070
CD0205 PID          -  CD0205
CD0205 STATE/COUNTY-  TX/CULBERSON
CD0205 COUNTRY     -  US
CD0205 USGS QUAD   -  VAN HORN (1979)
CD0205
CD0205                      *CURRENT SURVEY CONTROL
CD0205
CD0205* NAD 83(2011) POSITION- 31 03 43.45699(N) 104 47 34.24289(W) ADJUSTED
CD0205* NAD 83(2011) ELLIP HT- 1184.312 (meters) (06/27/12) ADJUSTED
CD0205* NAD 83(2011) EPOCH   - 2010.00
CD0205* NAVD 88 ORTHO HEIGHT - 1207.140 (meters) 3960.43 (feet) ADJUSTED
CD0205
CD0205 GEOID HEIGHT   -      -22.837 (meters) GEOID12B
CD0205 NAD 83(2011) X - -1,396,489.510 (meters) COMP
CD0205 NAD 83(2011) Y - -5,288,174.382 (meters) COMP
CD0205 NAD 83(2011) Z -  3,272,401.561 (meters) COMP
CD0205 LAPLACE CORR   -      -0.30 (seconds) DEFLEC12B
CD0205 DYNAMIC HEIGHT -      1205.246 (meters) 3954.21 (feet) COMP
CD0205 MODELED GRAVITY -    979,030.5 (mgal) NAVD 88
CD0205
CD0205 VERT ORDER     -  FIRST      CLASS II
CD0205
CD0205 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
CD0205 Standards:
CD0205      FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
CD0205      Horiz Ellip              SD_N   SD_E   SD_h      (unitless)
CD0205 -----
CD0205 NETWORK      1.27   1.98              0.49   0.54   1.01      0.19971889
CD0205 -----
CD0205 Click here for local accuracies and other accuracy information.
CD0205
CD0205
CD0205.This mark is at Culberson Co (VHN) Airport (VHN)
CD0205
CD0205.The horizontal coordinates were established by GPS observations
CD0205.and adjusted by the National Geodetic Survey in June 2012.
CD0205
CD0205.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
CD0205.been affixed to the stable North American tectonic plate. See
CD0205.NA2011 for more information.
CD0205
CD0205.The horizontal coordinates are valid at the epoch date displayed above
CD0205.which is a decimal equivalence of Year/Month/Day.
CD0205
CD0205.The orthometric height was determined by differential leveling and
CD0205.adjusted by the NATIONAL GEODETIC SURVEY

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CD0205.in June 1991.

CD0205

CD0205.Significant digits in the geoid height do not necessarily reflect accuracy.

CD0205.GEOID12B height accuracy estimate available [here](#).

CD0205

CD0205.The X, Y, and Z were computed from the position and the ellipsoidal ht.

CD0205

CD0205.The Laplace correction was computed from DEFLEC12B derived deflections.

CD0205

CD0205.The ellipsoidal height was determined by GPS observations

CD0205.and is referenced to NAD 83.

CD0205

CD0205.The dynamic height is computed by dividing the NAVD 88

CD0205.geopotential number by the normal gravity value computed on the

CD0205.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

CD0205.degrees latitude (g = 980.6199 gals.).

CD0205

CD0205.The modeled gravity was interpolated from observed gravity values.

CD0205

CD0205. The following values were computed from the NAD 83(2011) position.

CD0205

CD0205;	North	East	Units	Scale	Factor	Converg.
CD0205;SPC TX C	- 3,163,216.885	274,537.803	MT	0.99988230	-2 17 48.9	
CD0205;SPC TX C	-10,377,987.40	900,712.78	sFT	0.99988230	-2 17 48.9	
CD0205;UTM 13	- 3,436,499.470	519,763.447	MT	0.99960482	+0 06 24.8	

CD0205

CD0205!  
- Elev Factor x Scale Factor = Combined Factor

CD0205!SPC TX C - 0.99981406 x 0.99988230 = 0.99969638

CD0205!UTM 13 - 0.99981406 x 0.99960482 = 0.99941895

CD0205

CD0205\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13REQ1976336499(NAD 83)

CD0205

#### SUPERSEDED SURVEY CONTROL

CD0205

CD0205	NAD 83(2007)-	31 03 43.45652(N)	104 47 34.24380(W)	AD(2002.00)	0
CD0205	ELLIP H (02/10/07)	1184.321 (m)		GP(2002.00)	
CD0205	ELLIP H (03/15/01)	1184.324 (m)		GP( )	4 2
CD0205	NAD 83(1993)-	31 03 43.45618(N)	104 47 34.24359(W)	AD( )	1
CD0205	ELLIP H (12/16/96)	1184.373 (m)		GP( )	4 2
CD0205	NAD 83(1993)-	31 03 43.45600(N)	104 47 34.24238(W)	AD( )	3
CD0205	ELLIP H (02/16/96)	1184.482 (m)		GP( )	5 1
CD0205	ELLIP H (12/21/93)	1184.687 (m)		GP( )	4 1
CD0205	NAD 83(1986)-	31 03 43.45180(N)	104 47 34.24965(W)	AD( )	3
CD0205	NAVD 88	1207.22 (m)	3960.7 (f)	LEVELING	3
CD0205	NGVD 29 (??/??/92)	1206.654 (m)	3958.83 (f)	ADJ UNCH	1 2
CD0205	NGVD 29 (10/23/89)	1206.7 (m)	RAPSU86 model used	GPS OBS	

CD0205

CD0205.Superseded values are not recommended for survey control.

CD0205

CD0205.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

CD0205.See file [dsdata.pdf](#) to determine how the superseded data were derived.

CD0205

CD0205\_MARKER: DB = BENCH MARK DISK

CD0205\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

CD0205\_STAMPING: P 1070 1956

CD0205\_MARK LOGO: CGS

CD0205\_PROJECTION: PROJECTING 10 CENTIMETERS

CD0205\_MAGNETIC: N = NO MAGNETIC MATERIAL

CD0205\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

CD0205+STABILITY: SURFACE MOTION

CD0205\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
 CD0205+SATELLITE: SATELLITE OBSERVATIONS - February 14, 1989

CD0205

CD0205	HISTORY	- Date	Condition	Report By
CD0205	HISTORY	- 1956	MONUMENTED	CGS
CD0205	HISTORY	- 1981	GOOD	NGS
CD0205	HISTORY	- 19890214	GOOD	NGS

CD0205

CD0205 STATION DESCRIPTION

CD0205

CD0205'DESCRIBED BY COAST AND GEODETIC SURVEY 1956

CD0205'3.05 MI NE FROM VAN HORN.

CD0205'0.15 MILE EAST ALONG THE TEXAS AND PACIFIC RAILROAD FROM THE STATION  
 CD0205'AT VAN HORN, THENCE 0.5 MILE NORTH ALONG STATE HIGHWAY 54, THENCE 2.4  
 CD0205'MILES NORTHEAST ALONG FARM ROAD 2185, 230 FEET SOUTHEAST OF THE CENTER  
 CD0205'LINE OF THE FARM ROAD, AT THE ENTRANCE TO THE CULBERSON COUNTY  
 CD0205'AIRPORT, 40 FEET SOUTH OF THE CENTER LINE OF AN OILED ROAD LEADING TO  
 CD0205'THE AIRPORT, 21.5 FEET SOUTHEAST OF A POWER POLE, 49.5 FEET EAST OF A  
 CD0205'FENCE CORNER, 3.9 FEET NORTH OF A FENCE, 2.9 FEET WEST OF A WITNESS  
 CD0205'POST, SET IN THE TOP OF A CONCRETE POST WHICH PROJECTS 1.0 FOOT ABOVE  
 CD0205'THE GROUND.

CD0205

CD0205 STATION RECOVERY (1981)

CD0205

CD0205'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1981

CD0205'1.4 KM (0.85 MI) NORTH ALONG U.S. HIGHWAY 90 AND STATE HIGHWAY 54  
 CD0205'FROM ITS JUNCTION WITH INTERSTATE HIGHWAY 10 IN VAN HORN, THENCE  
 CD0205'3.9 KM (2.4 MI) NORTHEAST ALONG FARM ROAD 2185, THENCE 0.2 KM  
 CD0205'(0.1 MI) EAST ALONG A PAVED ROAD LEADING TO THE CULBERSON COUNTY  
 CD0205'AIRPORT, 0.6 KM (0.35 MI) WEST OF THE AIRPORT BEACON, 70.1 METERS  
 CD0205'(230.0 FT) SOUTHEAST OF THE CENTERLINE OF THE FARM ROAD, 14.9 METERS  
 CD0205'(48.9 FT) EAST OF A FENCE CORNER, 13.1 METERS (43.0 FT) SOUTH OF THE  
 CD0205'CENTER OF THE ROAD, AND 1.1 METERS (3.5 FT) NORTH OF A FENCE.  
 CD0205'THE MARK IS 0.5 METERS E FROM A WITNESS POST.  
 CD0205'THE MARK IS ABOVE LEVEL WITH THE ROAD.

CD0205

CD0205 STATION RECOVERY (1989)

CD0205

CD0205'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1989

CD0205'THE STATION IS LOCATED ABOUT 4.3 KM (2.65 MI) EAST-NORTHEAST OF VAN  
 CD0205'HORN, 0.7 KM (0.45 MI) WEST OF A PAVED ROAD END AT THE CULBERSON  
 CD0205'COUNTY AIRPORT, ALONG THE RIGHT OF WAY OF A PAVED ROAD.  
 CD0205'OWNERSHIP--STATE DEPARTMENT OF TRANSPORTATION.  
 CD0205'TO REACH THE STATION FROM THE JUNCTION OF U.S. HIGHWAY 80 AND STATE  
 CD0205'HIGHWAY 54 IN VAN HORN, GO NORTH ON HIGHWAY 54 FOR 1.04 KM (0.65 MI)  
 CD0205'TO A CROSS STREET. TURN RIGHT AND GO EAST ON FARM ROAD 2185 FOR 3.89  
 CD0205'KM (2.40 MI) TO A FORK. BEAR RIGHT AND GO EAST ON A PAVED ROAD FOR  
 CD0205'0.12 KM (0.05 MI) TO THE STATION ON THE RIGHT, JUST BEFORE REACHING A  
 CD0205'HUMP IN THE ROAD.  
 CD0205'THE STATION IS 20.1 M (65.9 FT) SOUTH OF A UTILITY POLE, 17.5 M  
 CD0205'(57.4 FT) EAST OF CABLE WARNING POST NUMBER 39R/2, 13.1 M (43.0 FT)  
 CD0205'SOUTH OF THE ROAD CENTER, 1.1 M (3.6 FT) NORTH OF A WIRE FENCE, 0.4 M  
 CD0205'(1.3 FT) EAST OF A METAL WITNESS POST, AND SET IN THE TOP OF A 30 CM  
 CD0205'ROUND CONCRETE POST THAT PROJECTS 5 CM ABOVE THE GROUND SURFACE AND IS  
 CD0205'ABOUT LEVEL WITH THE ROAD SURFACE.  
 CD0205'DESCRIBED BY R.D.B.

\*\*\* retrieval complete.

Elapsed Time = 00:00:04

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
CC0554 *****
CC0554 FBN          -  This is a Federal Base Network Control Station.
CC0554 DESIGNATION -  P 1391
CC0554 PID          -  CC0554
CC0554 STATE/COUNTY-  TX/REEVES
CC0554 COUNTRY      -  US
CC0554 USGS QUAD    -  NARROW BOW DRAW (1961)
CC0554
CC0554                      *CURRENT SURVEY CONTROL
CC0554
CC0554* NAD 83(2011) POSITION- 31 43 21.85539(N) 103 49 14.83427(W) ADJUSTED
CC0554* NAD 83(2011) ELLIP HT- 843.685 (meters) (06/27/12) ADJUSTED
CC0554* NAD 83(2011) EPOCH  - 2010.00
CC0554* NAVD 88 ORTHO HEIGHT - 869.284 (meters) 2851.98 (feet) ADJUSTED
CC0554
CC0554 GEOID HEIGHT  -      -25.594 (meters) GEOID12B
CC0554 NAD 83(2011) X  - -1,297,389.745 (meters) COMP
CC0554 NAD 83(2011) Y  - -5,273,764.375 (meters) COMP
CC0554 NAD 83(2011) Z  - 3,334,763.284 (meters) COMP
CC0554 LAPLACE CORR   -      -0.45 (seconds) DEFLEC12B
CC0554 DYNAMIC HEIGHT -      867.993 (meters) 2847.74 (feet) COMP
CC0554 MODELED GRAVITY - 979,127.0 (mgal) NAVD 88
CC0554
CC0554 VERT ORDER      -  FIRST      CLASS II
CC0554
CC0554 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
CC0554 Standards:
CC0554      FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
CC0554      Horiz Ellip              SD_N   SD_E   SD_h      (unitless)
CC0554 -----
CC0554 NETWORK      0.60   1.57              0.26   0.23   0.80      -0.10890617
CC0554 -----
CC0554 Click here for local accuracies and other accuracy information.
CC0554
CC0554
CC0554.The horizontal coordinates were established by GPS observations
CC0554.and adjusted by the National Geodetic Survey in June 2012.
CC0554
CC0554.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
CC0554.been affixed to the stable North American tectonic plate. See
CC0554.NA2011 for more information.
CC0554
CC0554.The horizontal coordinates are valid at the epoch date displayed above
CC0554.which is a decimal equivalence of Year/Month/Day.
CC0554
CC0554.The orthometric height was determined by differential leveling and
CC0554.adjusted by the NATIONAL GEODETIC SURVEY
CC0554.in June 1991.
CC0554

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CC0554 HISTORY - 19930222 GOOD NGS  
 CC0554 HISTORY - 19980223 GOOD NGS  
 CC0554 HISTORY - 19990408 GOOD NGS  
 CC0554 HISTORY - 19991215 GOOD NGS  
 CC0554 HISTORY - 20050702 GOOD USPSQD

CC0554

CC0554 STATION DESCRIPTION

CC0554

CC0554'DESCRIBED BY NATIONAL GEODETIC SURVEY 1981

CC0554'13.7 KM (8.5 MI) SE FROM ORLA.

CC0554'THE MARK IS 0.3 M BELOW THE HIGHWAY.

CC0554'13.7 KM (8.5 MI) SOUTHEAST ALONG U.S. HIGHWAY 285 FROM ITS JUNCTION

CC0554'WITH FARM ROAD 652 IN ORLA, 0.5 KM (0.3 MI) NORTHWEST OF A GRAVELED

CC0554'ROAD LEADING SOUTHWEST, AND 27.1 METERS (88.8 FT) SOUTHWEST OF THE

CC0554'CENTERLINE OF THE HIGHWAY. NOTE=REFUSAL WAS REACHED AT 2.1 METERS

CC0554'(7.0 FT). ACCESS TO THE DATUM POINT IS THROUGH A 5-INCH LOGO CAP.

CC0554'THE MARK IS 0.4 METERS NE FROM A WITNESS POST AND FENCE

CC0554

CC0554 STATION RECOVERY (1993)

CC0554

CC0554'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1993

CC0554'STATION IS LOCATED ABOUT 45 KM (27.95 MI) NORTHWEST OF PECOS, 15 KM

CC0554'(9.30 MI) SOUTHEAST OF ORLA, ALONG U.S. HIGHWAY 285, AT MILE 339.85,

CC0554'ON THE RIGHT-OF-WAY, ON THE SOUTHEAST SIDE OF GRADED ROAD LEADING TO

CC0554'THE KINLAW OIL CORPORATION LEASE RRC 32450 AND ACROSS FENCE FROM AN

CC0554'OIL JACK. OWNERSHIP--TEXAS DEPARTMENT OF TRANSPORTATION.

CC0554'TO REACH FROM THE OVERPASS AT THE JUNCTION OF INTERSTATE HIGHWAY 20

CC0554'AND U.S. HIGHWAY 285 (EXIT 42) ON THE SOUTHEAST SIDE OF PECOS, GO

CC0554'NORTHWEST ON HIGHWAY 285 THROUGH TOWN FOR 30.77 KM (19.10 MI) TO

CC0554'STATE HIGHWAY 302 ON THE RIGHT. CONTINUE AHEAD FOR 19.48 KM

CC0554'(12.10 MI) TO A GRADED ROAD LEFT AT TOP OF A RISE. CONTINUE AHEAD

CC0554'FOR 0.45 KM (0.25 MI) TO THE STATION ON THE LEFT.

CC0554'STATION IS A PUNCH MARK ON TOP OF A STAINLESS STEEL ROD ENCASED IN PVC

CC0554'PIPE WITH LOGO CAP SURROUNDED BY CONCRETE FLUSH WITH THE GROUND. IT

CC0554'IS 27.1 M (88.9 FT) SOUTHWEST OF AND SLIGHTLY LOWER THAN THE HIGHWAY

CC0554'CENTER, 0.3 M (1.0 FT) NORTHEAST OF A METAL WITNESS POST IN THE

CC0554'RIGHT-OF-WAY FENCE, 45.5 M (149.3 FT) SOUTHEAST OF THE CENTER OF THE

CC0554'GRADED ROAD AND 133.0 M (436.4 FT) NORTHWEST OF A UTILITY LINE ACROSS

CC0554'THE HIGHWAY.

CC0554

CC0554 STATION RECOVERY (1998)

CC0554

CC0554'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1998 (CSM)

CC0554'RECOVERED AS DESCRIBED WITH THIS NOTE. BY R.G. HAYES NOTE--THE DATUM

CC0554'POINT IS A PUNCH MARK ON THE TOP CENTER OF A STAINLESS STEEL ROD CAP

CC0554'CRIMPED TO THE TOP OF A STAINLESS STEEL ROD WITHOUT SLEEVE, RECESSED

CC0554'ABOUT 15-CM BELOW THE GROUND SURFACE AND DRIVEN TO A DEPTH OF 2.1 M,

CC0554'(6.9 FT) ENCASED IN A 5-INCH PVC PIPE WITH NGS LOGO CAP SURROUNDED BY

CC0554'CONCRETE, FLUSH WITH THE GROUND SURFACE.

CC0554

CC0554 STATION RECOVERY (1999)

CC0554

CC0554'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1999 (CSM)

CC0554'RECOVERED AS DESCRIBED.

CC0554

CC0554 STATION RECOVERY (1999)

CC0554

CC0554'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1999 (WEH)

CC0554'GOOD.

CC0554

CC0554 STATION RECOVERY (2005)  
CC0554  
CC0554'RECOVERY NOTE BY US POWER SQUADRON 2005 (BJK)  
CC0554'RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.  
Elapsed Time = 00:00:05

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
BB0019 *****
BB0019 FBN          -  This is a Federal Base Network Control Station.
BB0019 DESIGNATION -  PRESIDIO S BASE
BB0019 PID          -  BB0019
BB0019 STATE/COUNTY-  TX/PRESIDIO
BB0019 COUNTRY     -  US
BB0019 USGS QUAD   -  LA BOQUILLA (1978)
BB0019
BB0019                      *CURRENT SURVEY CONTROL
BB0019
BB0019* NAD 83(2011) POSITION- 29 39 53.01199(N) 104 21 40.38879(W) ADJUSTED
BB0019* NAD 83(2011) ELLIP HT- 920.326 (meters) (06/27/12) ADJUSTED
BB0019* NAD 83(2011) EPOCH  - 2010.00
BB0019* NAVD 88 ORTHO HEIGHT - 943.215 (meters) 3094.53 (feet) ADJUSTED
BB0019
BB0019 GEOID HEIGHT - -22.925 (meters) GEOID12B
BB0019 NAD 83(2011) X - -1,375,981.010 (meters) COMP
BB0019 NAD 83(2011) Y - -5,374,190.847 (meters) COMP
BB0019 NAD 83(2011) Z - 3,138,589.167 (meters) COMP
BB0019 LAPLACE CORR - 3.63 (seconds) DEFLEC12B
BB0019 DYNAMIC HEIGHT - 941.674 (meters) 3089.48 (feet) COMP
BB0019 MODELED GRAVITY - 978,978.3 (mgal) NAVD 88
BB0019
BB0019 VERT ORDER - FIRST CLASS II
BB0019
BB0019 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
BB0019 Standards:
BB0019      FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
BB0019      Horiz Ellip              SD_N   SD_E   SD_h      (unitless)
BB0019 -----
BB0019 NETWORK      0.64   1.63              0.25   0.27   0.83      -0.02033396
BB0019 -----
BB0019 Click here for local accuracies and other accuracy information.
BB0019
BB0019
BB0019.The horizontal coordinates were established by GPS observations
BB0019.and adjusted by the National Geodetic Survey in June 2012.
BB0019
BB0019.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
BB0019.been affixed to the stable North American tectonic plate. See
BB0019.NA2011 for more information.
BB0019
BB0019.The horizontal coordinates are valid at the epoch date displayed above
BB0019.which is a decimal equivalence of Year/Month/Day.
BB0019
BB0019.The orthometric height was determined by differential leveling and
BB0019.adjusted by the NATIONAL GEODETIC SURVEY
BB0019.in June 1991.
BB0019

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BB0019.Significant digits in the geoid height do not necessarily reflect accuracy.  
 BB0019.GEOID12B height accuracy estimate available [here](#).

BB0019

BB0019.The X, Y, and Z were computed from the position and the ellipsoidal ht.

BB0019

BB0019.The Laplace correction was computed from DEFLEC12B derived deflections.

BB0019

BB0019.The ellipsoidal height was determined by GPS observations

BB0019.and is referenced to NAD 83.

BB0019

BB0019.The dynamic height is computed by dividing the NAVD 88

BB0019.geopotential number by the normal gravity value computed on the

BB0019.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

BB0019.degrees latitude (g = 980.6199 gals.).

BB0019

BB0019.The modeled gravity was interpolated from observed gravity values.

BB0019

BB0019. The following values were computed from the NAD 83(2011) position.

BB0019

BB0019;	North	East	Units	Scale	Factor	Converg.
BB0019;SPC TXSC	- 4,214,860.309	81,230.099	MT	0.99987975	-2 37 35.5	
BB0019;SPC TXSC	-13,828,254.20	266,502.42	sFT	0.99987975	-2 37 35.5	
BB0019;UTM 13	- 3,281,805.721	561,815.637	MT	0.99964715	+0 18 58.2	

BB0019

BB0019! - Elev Factor x Scale Factor = Combined Factor

BB0019!SPC TXSC - 0.99985548 x 0.99987975 = 0.99973525

BB0019!UTM 13 - 0.99985548 x 0.99964715 = 0.99950268

BB0019

BB0019:	Primary Azimuth Mark	Grid Az
BB0019:SPC TXSC	- PRESIDIO BASE A 2	003 00 15.5
BB0019:UTM 13	- PRESIDIO BASE A 2	000 03 41.8

BB0019

BB0019\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13REN6181581805(NAD 83)

BB0019

BB0019	PID	Reference Object	Distance	Geod. Az
BB0019				dddmmss.s
BB0019	BB0018	PRESIDIO BASE A 2	APPROX. 2.5 KM	0002240.0
BB0019	BB0021	PRESIDIO S BASE RM 2	22.641 METERS	27110
BB0019	BB0020	PRESIDIO S BASE RM 1	21.931 METERS	35904

BB0019

SUPERSEDED SURVEY CONTROL

BB0019

BB0019	NAD 83(2007)-	29 39 53.01184(N)	104 21 40.38933(W)	AD(2002.00)	0
BB0019	ELLIP H (02/10/07)	920.332 (m)		GP(2002.00)	
BB0019	ELLIP H (05/01/00)	920.357 (m)		GP( )	3 1
BB0019	NAD 83(1993)-	29 39 53.01129(N)	104 21 40.38825(W)	AD( )	B
BB0019	ELLIP H (05/09/94)	920.399 (m)		GP( )	4 2
BB0019	NAD 83(1986)-	29 39 53.00280(N)	104 21 40.38447(W)	AD( )	1
BB0019	NAD 27	- 29 39 52.35900(N)	104 21 38.65300(W)	AD( )	1
BB0019	NAVD 88	943.21 (m)	3094.5 (f)	LEVELING	3
BB0019	NGVD 29 (??/??/92)	942.814 (m)	3093.22 (f)	ADJ UNCH	1 2
BB0019	NGVD 29	942.81 (m)	3093.2 (f)	LEVELING	3

BB0019

BB0019.Superseded values are not recommended for survey control.

BB0019

BB0019.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

BB0019.See file [dsdata.pdf](#) to determine how the superseded data were derived.

BB0019



BB0019\_MARKER: DS = TRIANGULATION STATION DISK  
 BB0019\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
 BB0019\_STAMPING: PRESIDIO S. B. 1934  
 BB0019\_MARK LOGO: CGS  
 BB0019\_MAGNETIC: N = NO MAGNETIC MATERIAL  
 BB0019\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
 BB0019+STABILITY: SURFACE MOTION  
 BB0019\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
 BB0019+SATELLITE: SATELLITE OBSERVATIONS - March 12, 2008

BB0019

BB0019	HISTORY	- Date	Condition	Report By
BB0019	HISTORY	- 1934	MONUMENTED	CGS
BB0019	HISTORY	- 1934	GOOD	CGS
BB0019	HISTORY	- 1958	GOOD	CGS
BB0019	HISTORY	- 1973	GOOD	LOCENG
BB0019	HISTORY	- 1975	GOOD	NGS
BB0019	HISTORY	- 1981	GOOD	NGS
BB0019	HISTORY	- 1982	GOOD	NGS
BB0019	HISTORY	- 1986	GOOD	
BB0019	HISTORY	- 19930222	GOOD	NGS
BB0019	HISTORY	- 19980224	GOOD	NGS
BB0019	HISTORY	- 20020905	GOOD	JCLS
BB0019	HISTORY	- 20080312	GOOD	IBWC

BB0019

BB0019

STATION DESCRIPTION

BB0019

BB0019'DESCRIBED BY COAST AND GEODETIC SURVEY 1934 (WRP)  
 BB0019'PRESIDIO S.B. 1934, A 0.9 FOOT SQUARE CONCRETE POST PROJECTING ABOUT  
 BB0019'3 INCHES. MARK IS ABOUT 101 FEET WEST OF CENTER LINE OF U.S.  
 BB0019'HIGHWAY 67.  
 BB0019'  
 BB0019'PRESIDIO S. BASE NO. 1 1934, A 0.9 FOOT SQUARE CONCRETE POST  
 BB0019'PROJECTING 2-1/2 INCHES. MARK IS 102 FEET WEST OF CENTER LINE  
 BB0019'OF U.S. HIGHWAY 67.  
 BB0019'  
 BB0019'PRESIDIO S. BASE NO. 2 1934, A 0.9 FOOT SQUARE CONCRETE POST  
 BB0019'PROJECTING 3 INCHES. MARK IS 175 FEET WEST OF CENTER LINE  
 BB0019'OF U.S. HIGHWAY 67.  
 BB0019'  
 BB0019'ALL MARKS FOUND TO BE IN EXCELLENT CONDITION.

BB0019

BB0019

STATION RECOVERY (1934)

BB0019

BB0019'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1934 (WRP)  
 BB0019'ABOUT 7 MILES NORTH OF PRESIDIO ON THE WEST SIDE OF U.S. HIGHWAY  
 BB0019'67, 50 FEET WEST OF CENTER LINE, 50 FEET NORTH OF CONCRETE  
 BB0019'RIGHT-OF-WAY MARKER 2772+00.  
 BB0019'  
 BB0019'TO REACH FROM PRESIDIO, FOLLOW U.S. HIGHWAY 67 NORTH FOR 7.0  
 BB0019'MILES TO TOP OF SMALL RISE ONTO A FLAT, AND STATION.  
 BB0019'  
 BB0019'SURFACE, UNDERGROUND, REFERENCE AND AZIMUTH MARKS ARE STANDARD  
 BB0019'BRONZE DISKS SET IN CONCRETE.  
 BB0019'  
 BB0019'AZIMUTH MARK IS PRESIDIO BASE-A2, WHICH IS AN A STATION ON THE  
 BB0019'PRESIDIO BASE. IT IS NORTH OF THE STATION ON U.S. HIGHWAY  
 BB0019'67.

BB0019

BB0019

STATION RECOVERY (1958)

BB0019

BB0019'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1958  
BB0019'7.45 MI N FROM PRESIDIO.  
BB0019'ABOUT 7.45 MILES NORTH ALONG U. S. HIGHWAY 67 FROM ITS SOUTH JUNCTION  
BB0019'WITH FARM ROAD 170 AT PRESIDIO, 100 FEET WEST OF THE CENTER LINE OF  
BB0019'THE HIGHWAY, 74.3 FEET EAST OF R.M. 2, 72.0 FEET SOUTH OF R.M. 1, AT  
BB0019'THE TOP OF A HILL SLOPING SOUTH, ABOUT 4 FEET ABOVE THE LEVEL OF THE  
BB0019'HIGHWAY, AND IN THE TOP OF A CONCRETE POST PROJECTING 5 INCHES.  
BB0019'  
BB0019' STATION RECOVERY (1973)  
BB0019'  
BB0019'RECOVERY NOTE BY LOCAL ENGINEER (INDIVIDUAL OR FIRM) 1973 (RJM)  
BB0019'RECOVERED BY BELL AEROSPACE CO.  
BB0019'  
BB0019'PRESIDIO S.B. 1934-GOOD  
BB0019'  
BB0019'PRESIDIO S. BASE NO. 1 1934-GOOD  
BB0019'  
BB0019'PRESIDIO S. BASE NO. 2 1934-GOOD  
BB0019'  
BB0019'STATION AND REFERENCE MARKS WERE RECOVERED AND ARE IN GOOD  
BB0019'CONDITION.  
BB0019'  
BB0019' STATION RECOVERY (1975)  
BB0019'  
BB0019'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1975 (AJ)  
BB0019'PRESIDIO S.B. 1934, RM 1, RM 2 AND THE AZIMUTH MARK WERE FOUND IN  
BB0019'GOOD CONDITION AS DESCRIBED.  
BB0019'  
BB0019'HOWEVER, IT COULD BE SAID THAT PRESIDIO BASE A2 IS 1.55 MILES NORTH  
BB0019'OF PRESIDIO S.B. 1934 ALONG ROUTE 67.  
BB0019'  
BB0019'THE STATION WAS USED AS THE ANTENNA SITE FOR GEOCEIVER STATION  
BB0019'51053.  
BB0019'  
BB0019' STATION RECOVERY (1981)  
BB0019'  
BB0019'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1981  
BB0019'RECOVERED IN GOOD CONDITION, THE 1958 DESCRIPTION (TX LINE 165) IS  
BB0019'ADEQUATE, EXCEPT ADD 0.9 METER (3.0 FT) NORTH OF A WITNESS POST.  
BB0019'  
BB0019' STATION RECOVERY (1982)  
BB0019'  
BB0019'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1982 (DCF)  
BB0019'THE STATION MARK, REFERENCE MARKS 1 AND 2 AND PRESIDIO BASE A2  
BB0019'1934 WERE RECOVERED AND FOUND IN GOOD CONDITION. THE DIRECTION  
BB0019'BETWEEN REFERENCE MARKS 1 AND 2 COMPARED FAVORABLY WITH THE 1934  
BB0019'DATA BY H.E.B. HOWEVER, THE DISTANCE TO REFERENCE MARK 1 WAS  
BB0019'FOUND TO BE SHORTER BY 0.014 METER AND THE DISTANCE TO REFERENCE  
BB0019'MARK 2 WAS FOUND TO BE SHORTER BY 0.012. A NEW AND COMPLETE  
BB0019'DESCRIPTION FOLLOWS.  
BB0019'THE STATION IS LOCATED ABOUT 16.1 KM (10 MI) NORTH OF PRESIDIO,  
BB0019'16.1 KM (10 MI) SOUTH OF SHAFTER AND ALONG U.S. HIGHWAY 67  
BB0019'RIGHT-OF-WAY.  
BB0019'OWNERSHIP--STATE OF TEXAS,  
BB0019'DISTRICT ENGINEER PRESIDIO COUNTY,  
BB0019'MARFA TX 79843.  
BB0019'  
BB0019'TO REACH THE STATION FROM THE JUNCTION OF U.S. HIGHWAY 67 AND  
BB0019'FARM ROAD 170, ON THE EAST SIDE OF PRESIDIO, GO NORTH ON U.S.  
BB0019'HIGHWAY 67 AND FARM ROAD 170 FOR 1.0 KM (0.6 MI) TO A FORK AND



BB0019'TRANSPORTATION.

BB0019'TO REACH FROM THE JUNCTION OF U.S. HIGHWAYS 67 AND 67 BUSINESS NEAR  
BB0019'THE SOUTH END OF THE BRIDGE OVER CIBOLO CREEK (2 KM NORTHWEST OF  
BB0019'PRESIDIO), GO NORTH ON HIGHWAY 67 FOR 7.50 KM (4.65 MI) TO THE  
BB0019'ENTRANCE TO THE PRESIDIO-LELY INTERNATIONAL AIRPORT ON THE LEFT.  
BB0019'CONTINUE AHEAD FOR 3.65 KM (2.25 MI) TO NORTH END OF ROAD CUT. TURN  
BB0019'DOUBLE LEFT AND RETURN ON TOP OF THE CUTBANK ALONG THE WEST SIDE OF  
BB0019'THE CUT FOR 0.14 KM (0.10 MI) TO THE STATION.

BB0019'STATION MARK IS SET IN THE TOP OF A 30 CM SQUARE CONCRETE POST  
BB0019'PROJECTING 10 CM ABOVE GROUND. IT IS ABOUT 80.0 M (262.5 FT) NORTH  
BB0019'OF THE SOUTH END OF THE BENCH, 30.4 M (99.7 FT) WEST OF AND 2.0 M  
BB0019'(6.6 FT) HIGHER THAN THE HIGHWAY CENTER, 13.7 M (44.9 FT) WEST OF THE  
BB0019'CUTBANK EDGE, 35.2 M (115.5 FT) SOUTH OF A UTILITY POLE, 24.9 M  
BB0019'(81.7 FT) NORTH OF A CONCRETE RIGHT-OF-WAY POST AND 0.9 M (3.0 FT)  
BB0019'NORTH OF A METAL WITNESS POST.

BB0019

STATION RECOVERY (1998)

BB0019

BB0019

BB0019'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1998 (CSM)  
BB0019'RECOVERED AS DESCRIBED WITH 3 ADDITIONS. BY R.G. HAYES 22.7 M (74.5  
BB0019'FT) EAST OF REFERENCE MARK -PRESIDIO S.B. NO. 2 1934, 21.9 M (71.9 FT)  
BB0019'SOUTH OF REFERENCE MARK -PRESIDIO S.B. NO. 1 1934, 6.0 M (19.7 FT)  
BB0019'NORTH-NORTHEAST OF A METAL FENCE POST.

BB0019

BB0019

STATION RECOVERY (2002)

BB0019

BB0019'RECOVERY NOTE BY JOHN CHANCE LAND SURVEYS INC 2002  
BB0019'RECOVERED IN GOOD CONDITION.

BB0019

BB0019

STATION RECOVERY (2008)

BB0019

BB0019'RECOVERY NOTE BY INT BDRY WTR COMM 2008 (JBB)  
BB0019'RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.

Elapsed Time = 00:00:05

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
BQ0022 *****
BQ0022 FBN          -  This is a Federal Base Network Control Station.
BQ0022 DESIGNATION -  QUEBEC RESET
BQ0022 PID          -  BQ0022
BQ0022 STATE/COUNTY-  TX/JEFF DAVIS
BQ0022 COUNTRY     -  US
BQ0022 USGS QUAD   -  VALENTINE EAST (1978)
BQ0022
BQ0022                      *CURRENT SURVEY CONTROL
BQ0022
BQ0022 * NAD 83(2011) POSITION- 30 30 52.09269(N) 104 24 18.84456(W) ADJUSTED
BQ0022 * NAD 83(2011) ELLIP HT- 1384.786 (meters) (06/27/12) ADJUSTED
BQ0022 * NAD 83(2011) EPOCH   - 2010.00
BQ0022 * NAVD 88 ORTHO HEIGHT - 1407.138 (meters) 4616.59 (feet) ADJUSTED
BQ0022
BQ0022 GEOID HEIGHT   -      -22.346 (meters) GEOID12B
BQ0022 NAD 83(2011) X - -1,368,458.205 (meters) COMP
BQ0022 NAD 83(2011) Y - -5,327,772.025 (meters) COMP
BQ0022 NAD 83(2011) Z -  3,220,339.785 (meters) COMP
BQ0022 LAPLACE CORR   -           4.25 (seconds) DEFLEC12B
BQ0022 DYNAMIC HEIGHT -      1404.798 (meters) 4608.91 (feet) COMP
BQ0022 MODELED GRAVITY -      978,929.5 (mgal) NAVD 88
BQ0022
BQ0022 VERT ORDER     -  FIRST      CLASS II
BQ0022
BQ0022 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
BQ0022 Standards:
BQ0022      FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
BQ0022      Horiz Ellip              SD_N   SD_E   SD_h      (unitless)
BQ0022 -----
BQ0022 NETWORK      0.59   1.41              0.23   0.25   0.72      -0.02865947
BQ0022 -----
BQ0022 Click here for local accuracies and other accuracy information.
BQ0022
BQ0022
BQ0022 The horizontal coordinates were established by GPS observations
BQ0022 and adjusted by the National Geodetic Survey in June 2012.
BQ0022
BQ0022 NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
BQ0022 been affixed to the stable North American tectonic plate. See
BQ0022 NA2011 for more information.
BQ0022
BQ0022 The horizontal coordinates are valid at the epoch date displayed above
BQ0022 which is a decimal equivalence of Year/Month/Day.
BQ0022
BQ0022 The orthometric height was determined by differential leveling and
BQ0022 adjusted by the NATIONAL GEODETIC SURVEY
BQ0022 in June 1991.
BQ0022

```

BQ0022.Significant digits in the geoid height do not necessarily reflect accuracy.  
BQ0022.GEOID12B height accuracy estimate available [here](#).

BQ0022

BQ0022.The X, Y, and Z were computed from the position and the ellipsoidal ht.

BQ0022

BQ0022.The Laplace correction was computed from DEFLEC12B derived deflections.

BQ0022

BQ0022.The ellipsoidal height was determined by GPS observations

BQ0022.and is referenced to NAD 83.

BQ0022

BQ0022.The dynamic height is computed by dividing the NAVD 88

BQ0022.geopotential number by the normal gravity value computed on the

BQ0022.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

BQ0022.degrees latitude (g = 980.6199 gals.).

BQ0022

BQ0022.The modeled gravity was interpolated from observed gravity values.

BQ0022

BQ0022. The following values were computed from the NAD 83(2011) position.

BQ0022

BQ0022;	North	East	Units	Scale Factor	Converg.
BQ0022;SPC TX C	- 3,101,135.724	309,279.188	MT	0.99991761	-2 05 50.2
BQ0022;SPC TX C	-10,174,309.45	1,014,693.47	sFT	0.99991761	-2 05 50.2
BQ0022;SPC TXSC	- 4,309,149.465	81,325.918	MT	1.00007495	-2 38 53.1
BQ0022;SPC TXSC	-14,137,601.20	266,816.78	sFT	1.00007495	-2 38 53.1
BQ0022;UTM 13	- 3,375,945.451	557,066.052	MT	0.99964017	+0 18 07.2

BQ0022

BQ0022! Elev Factor x Scale Factor = Combined Factor

BQ0022!SPC TX C - 0.99978258 x 0.99991761 = 0.99970021

BQ0022!SPC TXSC - 0.99978258 x 1.00007495 = 0.99985751

BQ0022!UTM 13 - 0.99978258 x 0.99964017 = 0.99942283

BQ0022

BQ0022:	Primary Azimuth Mark	Grid Az
BQ0022:SPC TX C	- QUEBEC AZ MK	312 44 39.0
BQ0022:SPC TXSC	- QUEBEC AZ MK	313 17 41.9
BQ0022:UTM 13	- QUEBEC AZ MK	310 20 41.6

BQ0022

BQ0022\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13REP5706675945(NAD 83)

BQ0022

BQ0022	PID	Reference Object	Distance	Geod. Az
BQ0022				dddmmss.s
BQ0022	BQ0020	QUEBEC RM 1	20.757 METERS	04404
BQ0022	BQ0021	QUEBEC RM 2	13.242 METERS	14909
BQ0022	BQ0023	QUEBEC RM 3	65.157 METERS	29525
BQ0022	BQ0017	QUEBEC AZ MK		3103848.8
BQ0022	BQ0018	D 1118		3131418.5

BQ0022

BQ0022

BQ0022 SUPERSEDED SURVEY CONTROL

BQ0022

BQ0022	NAD 83(2007)-	30 30 52.09256(N)	104 24 18.84520(W)	AD(2002.00)	0
BQ0022	ELLIP H (02/10/07)	1384.800 (m)		GP(2002.00)	
BQ0022	ELLIP H (05/01/00)	1384.823 (m)		GP( )	3 1
BQ0022	NAD 83(1993)-	30 30 52.09192(N)	104 24 18.84442(W)	AD( )	A
BQ0022	ELLIP H (05/12/97)	1384.918 (m)		GP( )	1 1
BQ0022	ELLIP H (05/09/94)	1384.915 (m)		GP( )	4 2
BQ0022	NAD 83(1993)-	30 30 52.09194(N)	104 24 18.84437(W)	AD( )	A
BQ0022	ELLIP H (01/13/94)	1384.915 (m)		GP( )	1 1
BQ0022	ELLIP H (12/21/93)	1385.041 (m)		GP( )	4 1
BQ0022	NAD 83(1986)-	30 30 52.08529(N)	104 24 18.84812(W)	AD( )	2

BQ0022 NAD 27 - 30 30 51.55800(N) 104 24 17.13200(W) AD( ) 2  
 BQ0022 NAVD 88 1407.14 (m) 4616.6 (f) LEVELING 3  
 BQ0022 NGVD 29 1406.54 (m) 4614.6 (f) LEVELING 3  
 BQ0022 NGVD 29 1406.68 (m) 4615.1 (f) LEVELING 3

BQ0022

BQ0022.Superseded values are not recommended for survey control.

BQ0022

BQ0022.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

BQ0022.See file [dsdata.pdf](#) to determine how the superseded data were derived.

BQ0022

BQ0022\_MARKER: DH = HORIZONTAL CONTROL DISK

BQ0022\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

BQ0022\_STAMPING: QUEBEC 1942 1975

BQ0022\_MARK LOGO: NGS

BQ0022\_PROJECTION: FLUSH

BQ0022\_MAGNETIC: N = NO MAGNETIC MATERIAL

BQ0022\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

BQ0022+STABILITY: SURFACE MOTION

BQ0022\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

BQ0022+SATELLITE: SATELLITE OBSERVATIONS - October 17, 2006

BQ0022

BQ0022	HISTORY	- Date	Condition	Report By
BQ0022	HISTORY	- 1942	MONUMENTED	CGS
BQ0022	HISTORY	- 1958	GOOD	AMS
BQ0022	HISTORY	- 1973	SEE DESCRIPTION	USGS
BQ0022	HISTORY	- 1975	SEE DESCRIPTION	NGS
BQ0022	HISTORY	- 1975	GOOD	NGS
BQ0022	HISTORY	- 1981	GOOD	NGS
BQ0022	HISTORY	- 19890214	GOOD	NGS
BQ0022	HISTORY	- 19930222	GOOD	NGS
BQ0022	HISTORY	- 19961009	GOOD	USPSQD
BQ0022	HISTORY	- 19980224	GOOD	NGS
BQ0022	HISTORY	- 20061017	GOOD	CDSMS

BQ0022

#### STATION DESCRIPTION

BQ0022

BQ0022'DESCRIBED BY COAST AND GEODETIC SURVEY 1942 (JCS)

BQ0022'STATION IS LOCATED ABOUT 27.0 MILES NW OF MARFA, 6-1/2 MILES

BQ0022'SE OF VALENTINE, AND 1/4 MILE NW OF QUEBEC FLAG STOP ON SOUTHERN

BQ0022'PACIFIC RAILROAD, BETWEEN THE RAILROAD AND U.S. HIGHWAY 90.

BQ0022'

BQ0022'SURFACE MARK IS A STANDARD BRONZE DISK SET IN CONCRETE BLOCK

BQ0022'WHICH PROJECTS ABOUT 3 INCHES ABOVE THE GROUND. IT IS STAMPED

BQ0022'QUEBEC 1942.

BQ0022'

BQ0022'UNDERGROUND MARK IS A STANDARD DISK SET IN CONCRETE, AS

BQ0022'DESCRIBED.

BQ0022'

BQ0022'REFERENCE MARK NO. 1 IS A STANDARD BRONZE DISK SET FLUSH IN

BQ0022'CONCRETE BASE OF RAILROAD SIGNAL ARM AND IS STAMPED QUEBEC 1942

BQ0022'NO. 1.

BQ0022'

BQ0022'REFERENCE MARK NO. 2 IS A STANDARD BRONZE DISK SET IN CONCRETE

BQ0022'BLOCK PROJECTING ABOUT 4 INCHES ABOVE THE GROUND AND IS STAMPED

BQ0022'QUEBEC 1942 NO. 2.

BQ0022'

BQ0022'THE AZIMUTH MARK IS A STANDARD BRONZE DISK SET FLUSH IN NE

BQ0022'HEADWALL OF BOX CULVERT UNDER HIGHWAY. IT IS STAMPED QUEBEC

BQ0022'1942.

BQ0022'

BQ0022'TO REACH FROM MARFA GO NW ON U.S. HIGHWAY 90, TOWARD VALENTINE,  
BQ0022'27.3 MILES TO QUEBEC FLAG STOP. CONTINUE NW 0.25 MILE TO A  
BQ0022'DOUBLE SEMAPHORE, JUST ACROSS THE COUNTY LINE AND STATION ON  
BQ0022'RIGHT. STATION IS 100.0 FEET NW OF COUNTY LINE MARKER, 81.0  
BQ0022'FEET E OF CENTER LINE OF HIGHWAY, AND 76.1 FEET E OF NEAREST  
BQ0022'TRACK OF RAILROAD.  
BQ0022  
BQ0022 STATION RECOVERY (1958)  
BQ0022  
BQ0022'RECOVERY NOTE BY US ARMY MAP SERVICE (NOW DMA) 1958  
BQ0022'STATION, REFERENCE MARKS 1 AND 2, AND THE AZIMUTH MARK WERE  
BQ0022'RECOVERED AS DESCRIBED.  
BQ0022'  
BQ0022'THE STATION IS LOCATED 81 FEET NE OF CENTERLINE OF U.S. HIGHWAY  
BQ0022'90. 79 FEET SW OF CENTERLINE OF THE MAIN RAILROAD TRACK. 217  
BQ0022'FEET SE OF THE CENTER OF CUT DITCH THAT CROSSES RAILROAD AND  
BQ0022'HIGHWAY. 220 FEET NW OF THE EXTENDED NORTHWESTERN END OF  
BQ0022'BUILDING.  
BQ0022  
BQ0022 STATION RECOVERY (1973)  
BQ0022  
BQ0022'RECOVERY NOTE BY US GEOLOGICAL SURVEY 1973  
BQ0022'STATION WAS APPARENTLY DESTROYED BY THE HIGHWAY DEPARTMENT DUE TO  
BQ0022'WIDENING OF HIGHWAY, PIECES OF BROKEN POST WERE FOUND IN VICINITY.  
BQ0022'R. M. 1 SEARCHED FOR BUT NOT FOUND, APPARENTLY DESTROYED.  
BQ0022  
BQ0022 STATION RECOVERY (1975)  
BQ0022  
BQ0022'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1975 (CLN)  
BQ0022'THE STATION SUB-SURFACE MARK, REFERENCE MARK NO.2, AND THE AZIMUTH  
BQ0022'MARK WERE RECOVERED AND FOUND IN GOOD CONDITION. THE STATION  
BQ0022'SURFACE MARK AND REFERENCE MARK NO. 1 WERE FOUND TO HAVE BEEN  
BQ0022'DESTROYED.  
BQ0022'  
BQ0022'THE DISTANCE AND DIRECTION TO REFERENCE MARK NO. 2 WAS VERIFIED.  
BQ0022'  
BQ0022'A NEW STATION SURFACE MARK AND REFERENCE MARK NO. 3 WERE SET AT THIS  
BQ0022'TIME.  
BQ0022'  
BQ0022'A NEW AND COMPLETE DESCRIPTION FOLLOWS--  
BQ0022'  
BQ0022'THE STATION IS LOCATED ABOUT 14 MILES NORTHWEST OF MARFA, 4 MILES  
BQ0022'SOUTHEAST OF VALENTINE, BETWEEN U. S. HIGHWAY 90 AND RAILROAD  
BQ0022'TRACKS, AND JUST WEST OF THE PRESIDIO-JEFF DAVIS COUNTY LINE.  
BQ0022'  
BQ0022'TO REACH THE STATION FROM THE POST OFFICE IN VALENTINE, GO SOUTHEAST  
BQ0022'ON U. S. HIGHWAY 90 FOR 3.4 MILES TO THE JUNCTION OF FARM ROAD 505  
BQ0022'ON THE LEFT AND BENCH MARK D 1118 1958 ON THE LEFT. CONTINUE  
BQ0022'SOUTHEAST ON U. S. HWY. 90 FOR ABOUT 0.05 MILE TO CULVERT AND  
BQ0022'AZIMUTH MARK ON THE LEFT, IN HEAD-WALL OF CULVERT. CONTINUE  
BQ0022'SOUTHEAST ON U. S. HWY. 90 FOR 0.3 MILE TO STATION ON THE LEFT, THIS  
BQ0022'IS JUST BEFORE REACHING THE PRESIDIO-JEFF DAVIS COUNTY-LINE.  
BQ0022'  
BQ0022'THE STATION MARK IS A STANDARD DISK, SET IN THE TOP OF A ROUND  
BQ0022'CONCRETE POST, THAT IS ABOUT 6-INCHES BELOW THE SURFACE OF THE  
BQ0022'GROUND AND IS STAMPED QUEBEC 1942 1975. IT IS 100 FEET NORTHWEST  
BQ0022'OF THE PRESIDIO-JEFF DAVIS COUNTY-LINE MARKER, 88 FEET NORTHEAST OF  
BQ0022'THE CENTER-LINE OF U. S. HWY. 90, 76 FEET SOUTH-SOUTHWEST OF THE  
BQ0022'SOUTH RAIL OF TRACKS, 38 FEET SOUTH OF A TELEPHONE POLE AND 1.6  
BQ0022'FEET WEST OF A METAL WITNESS POST.



BQ0022'

BQ0022'REFERENCE MARK NO. 2 IS A STANDARD DISK, SET IN THE TOP OF A SQUARE  
BQ0022'CONCRETE POST, THAT PROJECTS ABOUT 6-INCHES AND IS STAMPED QUEBEC  
BQ0022'NO 2 1942. IT IS 88 FEET SOUTH OF THE SOUTH RAIL OF TRACKS, 75  
BQ0022'FEET NORTH-NORTHEAST OF THE CENTER-LINE OF U. S. HWY. 90, 56 FEET  
BQ0022'WEST NORTHWEST OF THE COUNTY-LINE MARKER, AND 40 FEET SOUTHWEST  
BQ0022'OF A TELEPHONE POLE.

BQ0022'

BQ0022'REFERENCE MARK NO. 3 IS A STANDARD DISK, SET IN A DRILL HOLE, IN THE  
BQ0022'LOWER PORTION OF THE SOUTHEAST END OF THE NORTH HEADWALL ABUTMENT OF  
BQ0022'CULVERT AND IS STAMPED QUEBEC 1942 NO 3 1975. IT IS 24 FEET  
BQ0022'NORTH-NORTHEAST OF THE CENTER-LINE OF HIGHWAY AND IS ABOUT THE  
BQ0022'SAME ELEVATION AS ROAD-BED OF HIGHWAY.

BQ0022'

BQ0022'AZIMUTH MARK IS A STANDARD DISK, SET IN A DRILL HOLE, AT THE  
BQ0022'APPROXIMATE CENTER OF THE NORTHEAST HEADWALL OF CULVERT AND IS  
BQ0022'STAMPED QUEBEC 1942. IT IS 25 FEET NORTH-NORTHEAST OF THE CENTER  
BQ0022'LINE OF HIGHWAY AND IS ABOUT THE SAME ELEVATION AS THE ROAD-BED OF  
BQ0022'HIGHWAY.

BQ0022'

BQ0022'BENCH MARK D 1118 IS A STANDARD BENCH MARK DISK, SET IN THE TOP OF  
BQ0022'A ROUND CONCRETE POST, THAT PROJECTS ABOUT 8-INCHES AND IS STAMPED  
BQ0022'D 1118 1958. IT IS 115 FEET NORTH-NORTHEAST OF THE CENTER-LINE OF  
BQ0022'U. S. HWY. 90, 115 FEET EAST-SOUTHEAST OF THE CENTER-LINE OF FARM  
BQ0022'ROAD 505, 47 FEET SOUTHWEST OF THE SOUTH RAIL OF TRACKS, 5 FEET  
BQ0022'SOUTHWEST OF A TELEPHONE POLE AND 1.6 FEET WEST OF A METAL  
BQ0022'WITNESS POST.

BQ0022'

BQ0022'AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN--VALENTINE SE  
BQ0022'4-MILES.

BQ0022

BQ0022

STATION RECOVERY (1975)

BQ0022

BQ0022'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1975

BQ0022'4 MI SE FROM VALENTINE.

BQ0022'FROM THE POST OFFICE IN VALENTINE, GO SOUTHEAST ON U.S. HIGHWAY 90 FOR  
BQ0022'3.75 MILES TO MARK ON THE LEFT, THIS IS JUST BEFORE REACHING THE JEFF  
BQ0022'DAVIS-PRESIDIO COUNTY-LINE. STANDARD TRIANGULATION STATION MARK DISK,  
BQ0022'SET IN THE TOP OF A ROUND CONCRETE POST, THAT IS ABOUT 6-INCHES BELOW  
BQ0022'THE SURFACE OF THE GROUND AND IS STAMPED QUEBEC 1942 1975. IT IS 100  
BQ0022'FEET NORTHWEST OF THE PRESIDIO-JEFF DAVIS COUNTY-LINE MARKER, 88 FEET  
BQ0022'NORTHEAST OF THE CENTERLINE OF U.S. HWY. 90, 76 FEET SOUTH-SOUTHWEST  
BQ0022'OF THE SOUTH RAIL OF TRACKS, 38 FEET SOUTH OF A TELEPHONE POLE AND 1.6  
BQ0022'FEET WEST OF A METAL WITNESS POST.

BQ0022

BQ0022

STATION RECOVERY (1981)

BQ0022

BQ0022'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1981

BQ0022'THE MARK IS ABOVE LEVEL WITH THE HIGHWAY.

BQ0022'12.2 KM (7.6 MI) SOUTHEAST ALONG U.S. HIGHWAY 90 FROM THE POST OFFICE  
BQ0022'IN VALENTINE, 0.6 KM (0.4 MI) SOUTHEAST OF THE JUNCTION OF RANCH ROAD  
BQ0022'505, AT A POWERLINE CROSSING, 30.5 METERS (100.0 FT) NORTH-NORTHEAST  
BQ0022'OF THE JEFF DAVIS-PRESIDIO COUNTY LINE MARKER, 24.7 METERS (81.0 FT)  
BQ0022'NORTHEAST OF THE CENTERLINE OF THE HIGHWAY, 23.2 METERS (76.0 FT)  
BQ0022'SOUTHWEST OF THE NEAR RAIL OF THE SOUTHERN PACIFIC RAILROAD, AND 15.9  
BQ0022'METERS (52.0 FT) WEST-NORTHWEST OF A UTILITY POLE WITH A GUY WIRE.  
BQ0022'THE MARK IS 0.5 METERS WNW FROM A WITNESS POST.

BQ0022

BQ0022

STATION RECOVERY (1989)

BQ0022

BQ0022'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1989  
BQ0022'THE STATION IS LOCATED ABOUT 12.45 KM (7.75 MI) SOUTHEAST OF  
BQ0022'VALENTINE, 0.72 KM (0.45 MI) EAST OF FARM ROAD 505, BETWEEN THE  
BQ0022'HIGHWAY AND RAILROAD TRACK AT THE JEFF DAVIS-PRESIDIO COUNTY LINE.  
BQ0022'OWNERSHIP--TEXAS AND NEW ORLEANS RAILROAD.  
BQ0022'TO REACH THE STATION FROM THE JUNCTION OF U.S. HIGHWAY 90 AND A  
BQ0022'CROSSROAD (PAVED TO THE NORTHEAST AND GRAVEL TO THE SOUTHWEST) JUST  
BQ0022'SOUTHEAST OF A SMALL POST OFFICE IN VALENTINE, GO SOUTHEAST ON HIGHWAY  
BQ0022'90 FOR 11.73 KM (7.30 MI) TO FARM ROAD 505 ON THE LEFT. CONTINUE  
BQ0022'AHHEAD FOR 0.72 KM (0.45 MI) TO THE COUNTY LINE POLE ON THE RIGHT AND  
BQ0022'THE STATION ON THE LEFT.  
BQ0022'THE STATION IS 65.2 M (213.9 FT) EAST-SOUTHEAST OF REFERENCE MARK 3  
BQ0022'(IN THE SOUTHEAST END OF A STEPPED CULVERT HEADWALL), 52.8 M  
BQ0022'(173.2 FT) NORTH OF THE COUNTY LINE POST, 37.2 M (122.0 FT)  
BQ0022'WEST-NORTHWEST OF A UTILITY POLE WITH LINE CROSSING THE HIGHWAY, 26.6  
BQ0022'M (87.3 FT) NORTHEAST OF THE HIGHWAY CENTERLINE, 23.1 M (75.8 FT)  
BQ0022'SOUTHWEST OF THE SOUTHWEST RAIL OF THE MAIN TRACK OF THE TEXAS AND NEW  
BQ0022'ORLEANS RAILROAD, 13.2 M (43.3 FT) NORTH-NORTHWEST OF REFERENCE MARK  
BQ0022'2, 0.6 M (2.0 FT) SOUTHEAST OF A WITNESS POST, 0.5 M (1.6 FT)  
BQ0022'NORTHWEST OF A WITNESS POST, AND IS RECESSED 5 CM BELOW THE GROUND  
BQ0022'SURFACE.  
BQ0022'DESCRIBED BY R.D.B.

BQ0022

BQ0022

STATION RECOVERY (1993)

BQ0022

BQ0022'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1993  
BQ0022'STATION IS LOCATED ABOUT 45 KM (27.95 MI) NORTHWEST OF MARFA, 12 KM  
BQ0022'(7.45 MI) SOUTHEAST OF VALENTINE, 0.7 KM (0.45 MI) SOUTHEAST OF FARM  
BQ0022'ROAD 505 JUNCTION WITH U.S. HIGHWAY 90, IN THE WEED STRIP BETWEEN  
BQ0022'HIGHWAY 90 AND THE SOUTHERN PACIFIC RAILROAD TRACKS, AT THE JEFF  
BQ0022'DAVIS-PRESIDIO COUNTY LINE. OWNERSHIP--SOUTHERN PACIFIC RAILROAD.  
BQ0022'TO REACH FROM THE JUNCTION OF U.S. HIGHWAY 90 AND FARM ROAD 505  
BQ0022'(TURN-OFF TO MCDONALD OBSERVATORY), GO SOUTHEAST ON HIGHWAY 90 FOR  
BQ0022'0.08 KM (0.05 MI) TO THE AZIMUTH MARK ON THE LEFT IN A STEPPED  
BQ0022'CULVERT HEADWALL. CONTINUE AHEAD FOR 0.61 KM (0.35 MI) TO THE  
BQ0022'STATION ON THE LEFT JUST BEFORE REACHING THE COUNTY LINE.  
BQ0022'STATION MARK IS SET IN THE TOP OF A 25 CM ROUND CONCRETE POST 2 CM  
BQ0022'BELOW GROUND. IT IS 26.5 M (86.9 FT) NORTHEAST OF AND SLIGHTLY LOWER  
BQ0022'THAN THE HIGHWAY CENTER, 23.1 M (75.8 FT) SOUTHWEST OF THE SOUTHWEST  
BQ0022'RAIL OF THE TRACK, 52.8 M (173.2 FT) NORTH OF A TALL COUNTY LINE POST  
BQ0022'ACROSS THE HIGHWAY, 64.9 M (212.9 FT) EAST OF THE SOUTHEAST END OF A  
BQ0022'STEPPED CULVERT HEADWALL, 37.1 M (121.7 FT) WEST-NORTHWEST OF A  
BQ0022'UTILITY POLE WITH LINE ACROSS THE HIGHWAY, 0.6 M (2.0 FT) SOUTHEAST  
BQ0022'OF A FIBERGLASS WITNESS POST AND 0.5 M (1.6 FT) NORTHWEST OF A METAL  
BQ0022'WITNESS POST.

BQ0022

BQ0022

STATION RECOVERY (1996)

BQ0022

BQ0022'RECOVERY NOTE BY US POWER SQUADRON 1996

BQ0022'RECOVERED IN GOOD CONDITION.

BQ0022

BQ0022

STATION RECOVERY (1998)

BQ0022

BQ0022'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1998 (CSM)  
BQ0022'RECOVERED AS DESCRIBED WITH THIS NOTE AND 1 ADDITION. BY R.G. HAYES  
BQ0022'NOTE--THE PREVIOUS DESCRIPTIONS STATE TRIANGULATION STATION DISK, THIS  
BQ0022'IS INCORRECT. IT IS A HORIZONTAL CONTROL DISK. 13.2 M (43.3 FT)  
BQ0022'NORTHWEST OF REFERENCE MARK -QUEBEC NO 2 1942.

BQ0022

BQ0022

STATION RECOVERY (2006)

BQ0022

BQ0022'RECOVERY NOTE BY CDS/MUERY SERVICES 2006 (MDM)

BQ0022'RECOVERED IN GOOD CONDITION AS DESCRIBED.

\*\*\* retrieval complete.

Elapsed Time = 00:00:05

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
BQ0021 *****
BQ0021 DESIGNATION -  QUEBEC RM 2
BQ0021 PID          -  BQ0021
BQ0021 STATE/COUNTY-  TX/JEFF DAVIS
BQ0021 COUNTRY      -  US
BQ0021 USGS QUAD    -  VALENTINE EAST (1978)
BQ0021
BQ0021                      *CURRENT SURVEY CONTROL
BQ0021
BQ0021* NAD 83(1986) POSITION- 30 30 51.72 (N) 104 24 18.59 (W) HD_HELD1
BQ0021* NAVD 88 ORTHO HEIGHT - 1407.446 (meters)      4617.60 (feet) ADJUSTED
BQ0021
BQ0021 GEOID HEIGHT   -      -22.346 (meters)          GEOID12B
BQ0021 DYNAMIC HEIGHT -      1405.105 (meters)      4609.92 (feet) COMP
BQ0021 MODELED GRAVITY -      978,929.5 (mgal)          NAVD 88
BQ0021
BQ0021 VERT ORDER    -  FIRST      CLASS II
BQ0021
BQ0021.The horizontal coordinates were determined by differentially corrected
BQ0021.hand held GPS observations or other comparable positioning techniques
BQ0021.and have an estimated accuracy of +/- 3 meters.
BQ0021.
BQ0021.The orthometric height was determined by differential leveling and
BQ0021.adjusted by the NATIONAL GEODETTIC SURVEY
BQ0021.in June 1991.
BQ0021
BQ0021.Significant digits in the geoid height do not necessarily reflect accuracy.
BQ0021.GEOID12B height accuracy estimate available here.
BQ0021
BQ0021.The dynamic height is computed by dividing the NAVD 88
BQ0021.geopotential number by the normal gravity value computed on the
BQ0021.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
BQ0021.degrees latitude (g = 980.6199 gals.).
BQ0021
BQ0021.The modeled gravity was interpolated from observed gravity values.
BQ0021
BQ0021;
BQ0021;          North          East          Units  Estimated Accuracy
BQ0021;SPC TX C    - 3,101,124.0    309,285.5    MT    (+/- 3 meters HH1 GPS)
BQ0021
BQ0021_U.S. NATIONAL GRID SPATIAL ADDRESS: 13REP5707275934(NAD 83)
BQ0021
BQ0021                      SUPERSEDED SURVEY CONTROL
BQ0021
BQ0021 NGVD 29 (??/??/92) 1406.843 (m)          4615.62 (f) ADJ UNCH    1 2
BQ0021
BQ0021.Superseded values are not recommended for survey control.
BQ0021
BQ0021.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
BQ0021.See file dsdata.pdf to determine how the superseded data were derived.

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BQ0021

BQ0021\_MARKER: DR = REFERENCE MARK DISK

BQ0021\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

BQ0021\_STAMPING: QUEBEC NO 2 1942

BQ0021\_MARK LOGO: CGS

BQ0021\_PROJECTION: PROJECTING 10 CENTIMETERS

BQ0021\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

BQ0021+STABILITY: SURFACE MOTION

BQ0021

BQ0021	HISTORY	- Date	Condition	Report By
BQ0021	HISTORY	- 1942	MONUMENTED	CGS
BQ0021	HISTORY	- 1957	GOOD	CGS
BQ0021	HISTORY	- 1981	GOOD	NGS
BQ0021	HISTORY	- 19961009	GOOD	USPSQD

BQ0021

BQ0021 STATION DESCRIPTION

BQ0021

BQ0021'DESCRIBED BY COAST AND GEODETIC SURVEY 1957

BQ0021'7.2 MI SE FROM VALENTINE.

BQ0021'ABOUT 7.2 MILES SOUTHEAST ALONG THE TEXAS AND NEW ORLEANS RAILROAD

BQ0021'FROM THE STATION AT VALENTINE, 12 POLES SOUTHEAST OF MILEPOST 661, 89

BQ0021'FEET SOUTHWEST OF THE SOUTHWEST RAIL OF THE MAIN TRACK, AT THE JEFF

BQ0021'DAVIS-PRESIDIO COUNTY LINE, 7 RAILS SOUTHEAST OF A TRESTLE, 9 POLES

BQ0021'NORTHWEST OF THE QUEBEC SIDING SIGN, 43 1/2 FEET SOUTH-SOUTHEAST OF

BQ0021'QUEBEC 1942, 69 FEET NORTHEAST OF THE CENTER LINE OF U.S. HIGHWAY 90,

BQ0021'ABOUT 4 FEET BELOW THE LEVEL OF THE TRACK, AND IN THE TOP OF A

BQ0021'CONCRETE POST PROJECTING 2 INCHES.

BQ0021

BQ0021 STATION RECOVERY (1981)

BQ0021

BQ0021'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1981

BQ0021'12.2 KM (7.6 MI) SOUTHEAST ALONG U.S. HIGHWAY 90 FROM THE POST OFFICE

BQ0021'IN VALENTINE, 0.6 KM (0.4 MI) SOUTHEAST OF THE JUNCTION OF RANCH ROAD

BQ0021'505, AT A POWERLINE CROSSING, 27.4 METERS (90.0 FT) NORTHEAST OF THE

BQ0021'JEFF DAVIS-PRESIDIO COUNTY LINE MARKER, 26.8 METERS (88.0 FT)

BQ0021'SOUTHWEST OF THE NEAR RAIL OF THE SOUTHERN PACIFIC RAILROAD, 22.9

BQ0021'METERS (75.0 FT) NORTHEAST OF THE CENTERLINE OF THE HIGHWAY, 13.3

BQ0021'METERS (43.5 FT) SOUTHEAST OF QUEBEC RESET 1975, AND 12.2 METERS (40.0

BQ0021'FT) WEST-SOUTHWEST OF A UTILITY POLE WITH A GUY WIRE.

BQ0021'THE MARK IS 12.8 METERS SE FROM A WITNESS POST.

BQ0021'THE MARK IS ABOVE LEVEL WITH THE HIGHWAY.

BQ0021

BQ0021 STATION RECOVERY (1996)

BQ0021

BQ0021'RECOVERY NOTE BY US POWER SQUADRON 1996

BQ0021'RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.

Elapsed Time = 00:00:04

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
AJ1065 *****
AJ1065 DESIGNATION - R 1404
AJ1065 PID - AJ1065
AJ1065 STATE/COUNTY- TX/ZAPATA
AJ1065 COUNTRY - US
AJ1065 USGS QUAD - SAN YGNACIO (1979)
AJ1065
AJ1065 *CURRENT SURVEY CONTROL
AJ1065
AJ1065* NAD 83(1986) POSITION- 27 02 04. (N) 099 25 45. (W) SCALED
AJ1065* NAVD 88 ORTHO HEIGHT - 101.086 (meters) 331.65 (feet) ADJUSTED
AJ1065
AJ1065 GEOID HEIGHT - -23.074 (meters) GEOID12B
AJ1065 DYNAMIC HEIGHT - 100.924 (meters) 331.11 (feet) COMP
AJ1065 MODELED GRAVITY - 979,043.3 (mgal) NAVD 88
AJ1065
AJ1065 VERT ORDER - FIRST CLASS II
AJ1065
AJ1065.The horizontal coordinates were scaled from a topographic map and have
AJ1065.an estimated accuracy of +/- 6 seconds.
AJ1065.
AJ1065.The orthometric height was determined by differential leveling and
AJ1065.adjusted by the NATIONAL GEODETIC SURVEY
AJ1065.in June 1991.
AJ1065
AJ1065.Significant digits in the geoid height do not necessarily reflect accuracy.
AJ1065.GEOID12B height accuracy estimate available here.
AJ1065
AJ1065.The dynamic height is computed by dividing the NAVD 88
AJ1065.geopotential number by the normal gravity value computed on the
AJ1065.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AJ1065.degrees latitude (g = 980.6199 gals.).
AJ1065
AJ1065.The modeled gravity was interpolated from observed gravity values.
AJ1065
AJ1065;
AJ1065;          North      East      Units  Estimated Accuracy
AJ1065;SPC TX S - 5,151,880. 207,810. MT (+/- 180 meters Scaled)
AJ1065
AJ1065_U.S. NATIONAL GRID SPATIAL ADDRESS: 14RMQ574903(NAD 83)
AJ1065
AJ1065 SUPERSEDED SURVEY CONTROL
AJ1065
AJ1065.No superseded survey control is available for this station.
AJ1065
AJ1065_MARKER: I = METAL ROD
AJ1065_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AJ1065_STAMPING: R 1404 1981
AJ1065_MARK LOGO: NGS
AJ1065_PROJECTION: FLUSH

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AJ1065\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

AJ1065\_ROD/PIPE-DEPTH: 4.9 meters

AJ1065

AJ1065	HISTORY	- Date	Condition	Report By
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AJ1065	HISTORY	- 1981	MONUMENTED	NGS
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AJ1065

AJ1065 STATION DESCRIPTION

AJ1065

AJ1065'DESCRIBED BY NATIONAL GEODETIC SURVEY 1981

AJ1065'1.4 KM (0.85 MI) SE FROM SAN YGNACIO.

AJ1065'1.4 KM (0.85 MI) SOUTHEAST ALONG U.S. HIGHWAY 83 FROM THE JUNCTION OF

AJ1065'FARM ROAD 3169 IN SAN YGNACIO, AT AN IRON GATE AND FIELD ROAD LEADING

AJ1065'SOUTHWEST, ACROSS HIGHWAY FROM A SINGLE GRAVE HEADSTONE, 15.3 METERS

AJ1065'(50.10 FT) SOUTHWEST OF CENTER OF HIGHWAY, 3.7 METERS (12.0 FT)

AJ1065'SOUTHEAST OF CENTER OF AN IRON GATE AND FIELD ROAD, 31.4 METERS

AJ1065'(103.0 FT) SOUTHWEST OF AN IRRIGATION WATER VALVE, 29.6 METERS

AJ1065'(97.0 FT) NORTHWEST OF A POWERLINE POLE, 41.2 METERS (135.0 FT) SOUTH

AJ1065'SOUTHWEST OF AND ACROSS HIGHWAY FROM A HEADSTONE WITH, MARCOS,

AJ1065'INSCRIBED, AND 0.30 METERS (1.0 FT) NORTHEAST OF A FENCE LINE.

AJ1065'THE MARK IS 0.15 M ABOVE HIGHWAY..

\*\*\* retrieval complete.

Elapsed Time = 00:00:04

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
AP0139 *****
AP0139 DESIGNATION - R 1439
AP0139 PID - AP0139
AP0139 STATE/COUNTY- TX/MAVERICK
AP0139 COUNTRY - US
AP0139 USGS QUAD - EAGLE PASS NE (1982)
AP0139
AP0139 *CURRENT SURVEY CONTROL
AP0139
AP0139* NAD 83(1986) POSITION- 28 41 26. (N) 100 22 22. (W) SCALED
AP0139* NAVD 88 ORTHO HEIGHT - 252.360 (meters) 827.95 (feet) ADJUSTED
AP0139
AP0139 GEOID HEIGHT - -23.046 (meters) GEOID12B
AP0139 DYNAMIC HEIGHT - 251.983 (meters) 826.71 (feet) COMP
AP0139 MODELED GRAVITY - 979,144.0 (mgal) NAVD 88
AP0139
AP0139 VERT ORDER - FIRST CLASS II
AP0139
AP0139.The horizontal coordinates were scaled from a topographic map and have
AP0139.an estimated accuracy of +/- 6 seconds.
AP0139.
AP0139.The orthometric height was determined by differential leveling and
AP0139.adjusted by the NATIONAL GEODETIC SURVEY
AP0139.in June 1991.
AP0139
AP0139.Significant digits in the geoid height do not necessarily reflect accuracy.
AP0139.GEOID12B height accuracy estimate available here.
AP0139
AP0139.The dynamic height is computed by dividing the NAVD 88
AP0139.geopotential number by the normal gravity value computed on the
AP0139.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AP0139.degrees latitude (g = 980.6199 gals.).
AP0139
AP0139.The modeled gravity was interpolated from observed gravity values.
AP0139
AP0139; North East Units Estimated Accuracy
AP0139;SPC TXSC - 4,095,790. 465,860. MT (+/- 180 meters Scaled)
AP0139
AP0139_U.S. NATIONAL GRID SPATIAL ADDRESS: 14RLS658744(NAD 83)
AP0139
AP0139 SUPERSEDED SURVEY CONTROL
AP0139
AP0139.No superseded survey control is available for this station.
AP0139
AP0139_MARKER: I = METAL ROD
AP0139_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AP0139_STAMPING: R 1439 1982
AP0139_MARK LOGO: NGS
AP0139_PROJECTION: FLUSH

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AP0139\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

AP0139

AP0139	HISTORY	- Date	Condition	Report By
AP0139	HISTORY	- 1982	MONUMENTED	NGS

AP0139

AP0139

STATION DESCRIPTION

AP0139

AP0139'DESCRIBED BY NATIONAL GEODETIC SURVEY 1982

AP0139'13.3 KM (8.25 MI) EAST FROM EAGLE PASS.

AP0139'13.3 KM (8.25 MI) EAST ALONG MAIN STREET AND U.S. HIGHWAY 277 FROM THE

AP0139'OLD COURTHOUSE IN EAGLE PASS THAT IS LOCATED AT THE JUNCTION OF MAIN

AP0139'STREET AND MADISON STREET, NEAR A SMALL CONCRETE CULVERT, 46.0 METERS

AP0139'(151.0 FT) SOUTH OF A TELEPHONE JUNCTION BOX NUMBER 23 1/2, 24.0

AP0139'METERS (79.0 FT) SOUTHEAST OF THE CENTER OF THE SOUTH HEADWALL OF A

AP0139'SMALL CONCRETE CULVERT, 22.4 METERS (74.0 FT) SOUTH OF CENTERLINE OF

AP0139'THE HIGHWAY, 0.4 METER (1.4 FT) NORTH OF RIGHT OF WAY FENCE.

AP0139'THE MARK IS 0.2 METERS E FROM A WITNESS POST.

AP0139'THE MARK IS 1.2 M BELOW HIGHWAY.

\*\*\* retrieval complete.

Elapsed Time = 00:00:04

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
AJ1068 *****
AJ1068 DESIGNATION -  S 1405
AJ1068 PID          -  AJ1068
AJ1068 STATE/COUNTY-  TX/ZAPATA
AJ1068 COUNTRY      -  US
AJ1068 USGS QUAD    -  SAN YGNACIO (1979)
AJ1068
AJ1068                                *CURRENT SURVEY CONTROL
AJ1068
AJ1068* NAD 83(1986) POSITION- 27 05 38.      (N) 099 25 33.      (W) SCALED
AJ1068* NAVD 88 ORTHO HEIGHT - 116.766 (meters)      383.09 (feet) ADJUSTED
AJ1068
AJ1068 GEOID HEIGHT   -      -23.275 (meters)                                GEOID12B
AJ1068 DYNAMIC HEIGHT -      116.578 (meters)      382.47 (feet) COMP
AJ1068 MODELED GRAVITY -      979,040.5 (mgal)                                NAVD 88
AJ1068
AJ1068 VERT ORDER    -  FIRST      CLASS II
AJ1068
AJ1068.The horizontal coordinates were scaled from a topographic map and have
AJ1068.an estimated accuracy of +/- 6 seconds.
AJ1068.
AJ1068.The orthometric height was determined by differential leveling and
AJ1068.adjusted by the NATIONAL GEODETIC SURVEY
AJ1068.in June 1991.
AJ1068
AJ1068.Significant digits in the geoid height do not necessarily reflect accuracy.
AJ1068.GEOID12B height accuracy estimate available here.
AJ1068
AJ1068.The dynamic height is computed by dividing the NAVD 88
AJ1068.geopotential number by the normal gravity value computed on the
AJ1068.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AJ1068.degrees latitude (g = 980.6199 gals.).
AJ1068
AJ1068.The modeled gravity was interpolated from observed gravity values.
AJ1068
AJ1068;
AJ1068;          North      East      Units  Estimated Accuracy
AJ1068;SPC TX S   - 5,158,460.    208,190.    MT  (+/- 180 meters Scaled)
AJ1068
AJ1068_U.S. NATIONAL GRID SPATIAL ADDRESS: 14RMQ577969(NAD 83)
AJ1068
AJ1068                                SUPERSEDED SURVEY CONTROL
AJ1068
AJ1068.No superseded survey control is available for this station.
AJ1068
AJ1068_MARKER: I = METAL ROD
AJ1068_SETTING: 15 = METAL ROD DRIVEN INTO GROUND. SEE TEXT FOR ADDITIONAL
AJ1068+WITH SETTING: INFORMATION.
AJ1068_STAMPING: S 1405 1981
AJ1068_MARK LOGO: NGS

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AJ1068\_PROJECTION: FLUSH

AJ1068\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

AJ1068\_ROD/PIPE-DEPTH: 0.61 meters

AJ1068

AJ1068	HISTORY	- Date	Condition	Report By
AJ1068	HISTORY	- 1981	MONUMENTED	NGS
AJ1068	HISTORY	- 1988	GOOD	USPSQD

AJ1068

AJ1068 STATION DESCRIPTION

AJ1068

AJ1068'DESCRIBED BY NATIONAL GEODETIC SURVEY 1981

AJ1068'6.0 KM (3.7 MI) NORTH FROM SAN YGNACIO.

AJ1068'6.0 KM (3.7 MI) NORTH ALONG U.S. HIGHWAY 83 FROM THE JUNCTION OF FARM

AJ1068'ROAD 3169 AT SAN YGNACIO, AT THE TOP OF A HIGH HILL, AT A

AJ1068'REST AREA, SET IN LINE WITH THE EXTENDED CENTERLINE OF THE NORTH MOST

AJ1068'ACCESS ROAD TO THE REST AREA, AT A ROAD LEADING NORTHEAST TO A GULF

AJ1068'OIL LEASE PROPERTY, 26.8 METERS (87.8 FT) EAST OF THE CENTERLINE OF

AJ1068'THE HIGHWAY, 14.4 METERS (47.2 FT) NORTH OF THE CENTER OF THE ROAD,

AJ1068'3.5 METERS (11.6 FT) SOUTH OF THE CENTER OF AN ABANDONED ROAD AND

AJ1068'GATE, 0.91 METERS (3.0 FT) NORTH OF A METAL CORNER FENCE POST, AND

AJ1068'0.31 METERS (1.0 FT) WEST OF A METAL RAIL FENCE. NOTE, ROD DRIVEN TO

AJ1068'REFUSAL.

AJ1068'THE MARK IS 0.31 METERS W FROM A WITNESS POST.

AJ1068'THE MARK IS 0.31 M ABOVE HIGHWAY.

AJ1068

AJ1068 STATION RECOVERY (1988)

AJ1068

AJ1068'RECOVERY NOTE BY US POWER SQUADRON 1988 (HAK)

AJ1068'RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.

Elapsed Time = 00:00:04

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
AP0140 *****
AP0140 DESIGNATION -  S 1439
AP0140 PID          -  AP0140
AP0140 STATE/COUNTY-  TX/MAVERICK
AP0140 COUNTRY      -  US
AP0140 USGS QUAD    -  EAGLE PASS EAST (1983)
AP0140
AP0140                      *CURRENT SURVEY CONTROL
AP0140
AP0140* NAD 83(1986) POSITION- 28 41 41.5      (N) 100 23 27.4      (W)  HD_HELD2
AP0140* NAVD 88 ORTHO HEIGHT -   248.154 (meters)      814.15  (feet) ADJUSTED
AP0140
AP0140 GEOID HEIGHT   -      -23.042 (meters)                      GEOID12B
AP0140 DYNAMIC HEIGHT -      247.783 (meters)      812.93  (feet) COMP
AP0140 MODELED GRAVITY -   979,144.6  (mgal)                      NAVD 88
AP0140
AP0140 VERT ORDER     -  FIRST      CLASS II
AP0140
AP0140.The horizontal coordinates were established by autonomous hand held GPS
AP0140.observations and have an estimated accuracy of +/- 10 meters.
AP0140.
AP0140.The orthometric height was determined by differential leveling and
AP0140.adjusted by the NATIONAL GEODETIC SURVEY
AP0140.in June 1991.
AP0140
AP0140.Significant digits in the geoid height do not necessarily reflect accuracy.
AP0140.GEOID12B height accuracy estimate available here.
AP0140
AP0140.The dynamic height is computed by dividing the NAVD 88
AP0140.geopotential number by the normal gravity value computed on the
AP0140.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AP0140.degrees latitude (g = 980.6199 gals.).
AP0140
AP0140.The modeled gravity was interpolated from observed gravity values.
AP0140
AP0140;
AP0140;          North      East      Units  Estimated Accuracy
AP0140;SPC TXSC   - 4,096,290.    464,085.    MT  (+/- 10 meters HH2 GPS)
AP0140
AP0140_U.S. NATIONAL GRID SPATIAL ADDRESS: 14RLS6411874971(NAD 83)
AP0140
AP0140                      SUPERSEDED SURVEY CONTROL
AP0140
AP0140.No superseded survey control is available for this station.
AP0140
AP0140_MARKER: I = METAL ROD
AP0140_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AP0140_STAMPING: S 1439 1982
AP0140_MARK LOGO: NGS
AP0140_PROJECTION: FLUSH

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AP0140\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

AP0140\_ROD/PIPE-DEPTH: 1.8 meters

AP0140

AP0140	HISTORY	- Date	Condition	Report By
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AP0140	HISTORY	- 1982	MONUMENTED	NGS
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AP0140

AP0140 STATION DESCRIPTION

AP0140

AP0140'DESCRIBED BY NATIONAL GEODETIC SURVEY 1982

AP0140'11.4 KM (7.1 MI) EAST FROM EAGLE PASS.

AP0140'11.4 KM (7.1 MI) EAST ALONG MAIN STREET AND U.S. HIGHWAY 277 FROM THE

AP0140'OLD COURTHOUSE IN EAGLE PASS AND SET ON THE SOUTHSIDE OF HIGHWAY 277

AP0140'ACROSS FROM TWO TELEPHONE JUNCTION BOXES AND ON THE EAST SLOPE OF A

AP0140'GRADE, 23.1 METERS (76.0 FT) SOUTH SOUTHWEST OF THE CENTERLINE OF THE

AP0140'HIGHWAY 277, 47.5 METERS (156.0 FT) SOUTHWEST AND ACROSS HIGHWAY FROM

AP0140'THE TELEPHONE BOX NUMBER 20, 44.8 METERS (147.0 FT) SOUTHEAST AND

AP0140'ACROSS HIGHWAY FROM TELEPHONE JUNCTION BOX NUMBER 7-1912, AND

AP0140'0.4 METER (1.2 FT) NORTH OF THE FENCE.

AP0140'THE MARK IS 03 METERS N FROM A WITNESS POST.

AP0140'THE MARK IS 0.6 M ABOVE HIGHWAY.

\*\*\* retrieval complete.

Elapsed Time = 00:00:04

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
BA0033 *****
BA0033 FBN          -  This is a Federal Base Network Control Station.
BA0033 DESIGNATION -  T 747
BA0033 PID          -  BA0033
BA0033 STATE/COUNTY-  TX/BREWSTER
BA0033 COUNTRY      -  US
BA0033 USGS QUAD    -  DAGGER FLAT (1971)
BA0033
BA0033                      *CURRENT SURVEY CONTROL
BA0033
BA0033* NAD 83(2011) POSITION- 29 31 23.52609(N) 103 07 23.35861(W) ADJUSTED
BA0033* NAD 83(2011) ELLIP HT- 867.918 (meters) (06/27/12) ADJUSTED
BA0033* NAD 83(2011) EPOCH   - 2010.00
BA0033* NAVD 88 ORTHO HEIGHT - 889.502 (meters) 2918.31 (feet) ADJUSTED
BA0033
BA0033 GEOID HEIGHT   -      -21.591 (meters) GEOID12B
BA0033 NAD 83(2011) X   - -1,261,290.596 (meters) COMP
BA0033 NAD 83(2011) Y   - -5,410,168.062 (meters) COMP
BA0033 NAD 83(2011) Z   -  3,124,920.524 (meters) COMP
BA0033 LAPLACE CORR    -          1.54 (seconds) DEFLEC12B
BA0033 DYNAMIC HEIGHT  -          888.079 (meters) 2913.64 (feet) COMP
BA0033 MODELED GRAVITY -  979,012.9 (mgal) NAVD 88
BA0033
BA0033 VERT ORDER      -  FIRST      CLASS II
BA0033
BA0033 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
BA0033 Standards:
BA0033      FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
BA0033      Horiz Ellip              SD_N   SD_E   SD_h      (unitless)
BA0033 -----
BA0033 NETWORK    0.31   0.84              0.13   0.12   0.43      -0.02944437
BA0033 -----
BA0033 Click here for local accuracies and other accuracy information.
BA0033
BA0033
BA0033.The horizontal coordinates were established by GPS observations
BA0033.and adjusted by the National Geodetic Survey in June 2012.
BA0033
BA0033.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
BA0033.been affixed to the stable North American tectonic plate. See
BA0033.NA2011 for more information.
BA0033
BA0033.The horizontal coordinates are valid at the epoch date displayed above
BA0033.which is a decimal equivalence of Year/Month/Day.
BA0033
BA0033.The orthometric height was determined by differential leveling and
BA0033.adjusted by the NATIONAL GEODETIC SURVEY
BA0033.in June 1991.
BA0033

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BA0033	HISTORY	- 1967	GOOD	CGS
BA0033	HISTORY	- 19930222	GOOD	NGS
BA0033	HISTORY	- 19980219	GOOD	NGS
BA0033	HISTORY	- 20010331	GOOD	NGS
BA0033	HISTORY	- 20061023	GOOD	CDSMS
BA0033	HISTORY	- 20160509	GOOD	PROFLN

BA0033

BA0033

## STATION DESCRIPTION

BA0033

BA0033'DESCRIBED BY COAST AND GEODETIC SURVEY 1967

BA0033'10.85 MI S FROM PERSIMMON GAP.

BA0033'ABOUT 10.85 MILES SOUTH ALONG U.S. HIGHWAY 385 FROM THE TOP OF

BA0033'PERSIMMON GAP, 73 FEET EAST OF THE CENTERLINE OF THE HIGHWAY, 0.3

BA0033'MILES NORTH OF A GRAVEL WASH, ON THE NORTH SIDE OF A DRAW, 1 1/2 FEET

BA0033'WEST OF A WHITE WOODEN WITNESS POST, ABOUT LEVEL WITH THE HIGHWAY, AND

BA0033'IN THE TOP OF A CONCRETE POST PROJECTING 4 INCHES.

BA0033

BA0033

## STATION RECOVERY (1993)

BA0033

BA0033'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1993

BA0033'STATION IS LOCATED ABOUT 81.2 KM (50.45 MI) SOUTH OF MARATHON, IN BIG

BA0033'BEND NATIONAL PARK, 15.9 KM (9.85 MI) SOUTH OF THE VISITORS CENTER ON

BA0033'THE EXTENSION OF U.S. HIGHWAY 385, 21 KM (13.05 MI) NORTH OF PANTHER

BA0033'JUNCTION (ENTRANCE TO THE PARK HEADQUARTERS), ALONG THE PARK ROAD, AT

BA0033'MILE 15.9, AT THE SOUTH END OF A LONG STRAIGHT SECTION, IN A FLAT

BA0033'PEBBLED AREA. OWNERSHIP--U.S. GOVERNMENT, DEPARTMENT OF THE

BA0033'INTERIOR. CONTACT PARK SUPERINTENDENT ROBERT L. ARMBERGER, PHONE

BA0033'915-477-2251.

BA0033'TO REACH FROM THE PARK ENTRANCE AT THE END OF U.S. HIGHWAY 385 COMING

BA0033'FROM MARATHON, GO SOUTH ON THE PARK ROAD FOR 2.48 KM (1.55 MI) TO THE

BA0033'VISITORS CENTER ON THE RIGHT. CONTINUE AHEAD FOR 7.7 KM (4.80 MI) TO

BA0033'THE CONCRETE BRIDGE OVER NINE POINT DRAW. CONTINUE AHEAD FOR 8.18 KM

BA0033'(5.10 MI) TO THE STATION ON THE LEFT JUST BEFORE REACHING ROAD CURVE

BA0033'LEFT.

BA0033'STATION MARK IS SET IN THE TOP OF A 20 CM SQUARE CONCRETE POST

BA0033'PROJECTING 15 CM ABOVE GROUND. IT IS 25.0 M (82.0 FT) EAST OF AND

BA0033'SLIGHTLY HIGHER THAN THE ROAD CENTER, 22.5 M (73.8 FT) ALONG THE ROAD

BA0033'FROM THE NORTH END OF A CULVERT HEADWALL, 0.7 M (2.3 FT) NORTH OF A

BA0033'FIBERGLASS WITNESS POST AND 0.7 M (2.3 FT) WEST OF A WOODEN WITNESS

BA0033'POST.

BA0033

BA0033

## STATION RECOVERY (1998)

BA0033

BA0033'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1998 (CSM)

BA0033'THE STATION IS LOCATED ABOUT 81.2 KM (50.45 MI) SOUTH OF MARATHON, IN

BA0033'BIG BEND NATIONAL PARK, 15.9 KM (9.85 MI) SOUTH OF THE VISITORS CENTER

BA0033'ON THE EXTENSION OF U.S. HIGHWAY 385, 21 KM (13.05 MI) NORTH OF

BA0033'PANTHER JUNCTION (ENTRANCE TO THE PARK HEADQUARTERS) , ALONG THE EAST

BA0033'SIDE OF THE PARK ROAD AT MILE 15.9, 0.16 KM (0.10 MI) SOUTH OF

BA0033'MILEPOST 16. OWNERSHIP--U.S. GOVERNMENT, DEPARTMENT OF THE INTERIOR.

BA0033'CONTACT PARK SUPERINTENDENT ROBERT L. ARMBERGER, PHONE 915-477-2251.

BA0033'TO REACH THE STATION FROM THE NORTH PARK ENTRANCE AT THE SOUTH END OF

BA0033'U.S. HIGHWAY 385 AND THE BEGINING OF THE PARK ROAD ABOUT 62.7 KM

BA0033'(38.95 MI) SOUTH OF MARATHON, GO SOUTH, FOR 2.41 KM (1.50 MI) ALONG

BA0033'THE PARK ROAD TO THE VISITORS CENTER ON THE RIGHT. CONTINUE SOUTHERLY,

BA0033'FOR 7.96 KM (4.95 MI) TO THE CONCRETE BRIDGE OVER NINE POINT DRAW.

BA0033'CONTINUE SOUTHERLY, FOR 8.77 KM (5.45 MI) TO THE STATION ON THE LEFT,

BA0033'JUST BEFORE A CURVE TO THE LEFT. STATION IS 29.2 M (95.8 FT)

BA0033'NORTH-NORTHEAST OF THE NORTHEAST CORNER OF A CONCRETE TRIPLE CULVERT

BA0033'HEADWALL, 24.9 M (81.7 FT) EAST OF THE ROAD CENTER, 0.7 M (2.3 FT)



BA0033'WEST OF A 3X3-INCH WOODEN POST, 0.6 M (2.0 FT) NORTH OF A FIBERGLASS  
BA0033'WITNESS POST, AND THE MONUMENT IS ABOUT 0.2 M (0.7 FT) ABOVE THE ROAD  
BA0033'LEVEL AND PROJECTING ABOUT 15-CM ABOVE THE GROUND SURFACE. BY R.G.  
BA0033'HAYES

BA0033

BA0033

STATION RECOVERY (2001)

BA0033

BA0033'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2001 (DB)

BA0033'THIS REPORT WAS SUBMITTED BY THE US POWER SQUADRONS.

BA0033

BA0033

STATION RECOVERY (2006)

BA0033

BA0033'RECOVERY NOTE BY CDS/MUERY SERVICES 2006 (MDM)

BA0033'RECOVERED IN GOOD CONDITION AS DESCRIBED.

BA0033

BA0033

STATION RECOVERY (2016)

BA0033

BA0033'RECOVERY NOTE BY PROFESSIONAL LAND SURVEYOR 2016 (JRO)

BA0033'RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.

Elapsed Time = 00:00:05

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
AP0141 *****
AP0141 DESIGNATION -  T 1439
AP0141 PID          -  AP0141
AP0141 STATE/COUNTY-  TX/MAVERICK
AP0141 COUNTRY      -  US
AP0141 USGS QUAD    -  EAGLE PASS EAST (1983)
AP0141
AP0141                      *CURRENT SURVEY CONTROL
AP0141
AP0141* NAD 83(1986) POSITION- 28 42 02.1      (N) 100 24 30.3      (W)  HD_HELD2
AP0141* NAVD 88 ORTHO HEIGHT - 256.241 (meters)      840.68 (feet) ADJUSTED
AP0141
AP0141 GEOID HEIGHT   -      -23.032 (meters)                      GEOID12B
AP0141 DYNAMIC HEIGHT -      255.859 (meters)      839.43 (feet) COMP
AP0141 MODELED GRAVITY - 979,145.3 (mgal)                      NAVD 88
AP0141
AP0141 VERT ORDER    -  FIRST      CLASS II
AP0141
AP0141.The horizontal coordinates were established by autonomous hand held GPS
AP0141.observations and have an estimated accuracy of +/- 10 meters.
AP0141.
AP0141.The orthometric height was determined by differential leveling and
AP0141.adjusted by the NATIONAL GEODETIC SURVEY
AP0141.in June 1991.
AP0141
AP0141.Significant digits in the geoid height do not necessarily reflect accuracy.
AP0141.GEOID12B height accuracy estimate available here.
AP0141
AP0141.The dynamic height is computed by dividing the NAVD 88
AP0141.geopotential number by the normal gravity value computed on the
AP0141.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AP0141.degrees latitude (g = 980.6199 gals.).
AP0141
AP0141.The modeled gravity was interpolated from observed gravity values.
AP0141
AP0141;
AP0141;          North      East      Units  Estimated Accuracy
AP0141;SPC TXSC   - 4,096,945.    462,386.    MT  (+/- 10 meters HH2 GPS)
AP0141
AP0141_U.S. NATIONAL GRID SPATIAL ADDRESS: 14RLS6241975625(NAD 83)
AP0141
AP0141                      SUPERSEDED SURVEY CONTROL
AP0141
AP0141.No superseded survey control is available for this station.
AP0141
AP0141_MARKER: I = METAL ROD
AP0141_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AP0141_STAMPING: T 1439 1982
AP0141_MARK LOGO: NGS
AP0141_PROJECTION: FLUSH

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AP0141\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

AP0141\_ROD/PIPE-DEPTH: 1.8 meters

AP0141

AP0141	HISTORY	- Date	Condition	Report By
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AP0141	HISTORY	- 1982	MONUMENTED	NGS
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AP0141

AP0141 STATION DESCRIPTION

AP0141

AP0141'DESCRIBED BY NATIONAL GEODETIC SURVEY 1982

AP0141'9.55 KM (5.95 MI) EAST FROM EAGLE PASS.

AP0141'9.55 KM (5.95 MI) EAST ALONG MAIN STREET AND U.S. HIGHWAY 277 FROM THE

AP0141'OLD COURTHOUSE IN EAGLE PASS THAT IS LOCATED AT THE JUNCTION OF MAIN

AP0141'STREET AND MADISON STREET, SET AT TOP OF SMALL HILL ACROSS HIGHWAY

AP0141'FROM TWO TELEPHONE JUNCTION BOXES, 0.25 KM (0.15 MI) EAST OF UNDER

AP0141'GROUND HIGH PRESSURE PIPE LINE, 45.7 METERS (150.0 FT) SOUTH OF A

AP0141'TELEPHONE JUNCTION BOX, NUMBER 15 1/2, THE LARGER OF THE TWO,

AP0141'50.3 METERS (165.0 FT) SOUTH OF A TELEPHONE JUNCTION BOX NUMBER 16,

AP0141'22.8 METERS (75.0 FT) SOUTH OF THE CENTERLINE OF THE HIGHWAY, AND

AP0141'0.2 METER (0.8 FT) NORTH OF RIGHT OF WAY FENCE.

AP0141'THE MARK IS 0.2 METERS N FROM A WITNESS POST.

AP0141'THE MARK IS 0.3 M ABOVE HIGHWAY.

\*\*\* retrieval complete.

Elapsed Time = 00:00:08

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
BA0437 *****
BA0437 CBN          -  This is a Cooperative Base Network Control Station.
BA0437 DESIGNATION -  TERLINGUA
BA0437 PID          -  BA0437
BA0437 STATE/COUNTY-  TX/BREWSTER
BA0437 COUNTRY     -  US
BA0437 USGS QUAD   -  TERLINGUA (1971)
BA0437
BA0437                      *CURRENT SURVEY CONTROL
BA0437
BA0437* NAD 83(2011) POSITION- 29 18 53.23913(N) 103 36 37.98161(W) ADJUSTED
BA0437* NAD 83(2011) ELLIP HT-  846.213 (meters)          (06/27/12) ADJUSTED
BA0437* NAD 83(2011) EPOCH   - 2010.00
BA0437* NAVD 88 ORTHO HEIGHT -  868.1 (meters)          2848. (feet) GPS OBS
BA0437
BA0437 NAVD 88 orthometric height was determined with geoid model      GEOID96
BA0437 GEOID HEIGHT   -      -21.857 (meters)                        GEOID96
BA0437 GEOID HEIGHT   -      -22.004 (meters)                        GEOID12B
BA0437 NAD 83(2011) X - -1,309,932.940 (meters)                      COMP
BA0437 NAD 83(2011) Y - -5,410,254.611 (meters)                      COMP
BA0437 NAD 83(2011) Z -  3,104,784.950 (meters)                      COMP
BA0437 LAPLACE CORR   -           -1.32 (seconds)                    DEFLEC12B
BA0437
BA0437 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
BA0437 Standards:
BA0437      FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
BA0437      Horiz Ellip              SD_N   SD_E   SD_h      (unitless)
BA0437 -----
BA0437 NETWORK      1.97   4.45              0.84   0.77   2.27      -0.01847203
BA0437 -----
BA0437 Click here for local accuracies and other accuracy information.
BA0437
BA0437
BA0437.The horizontal coordinates were established by GPS observations
BA0437.and adjusted by the National Geodetic Survey in June 2012.
BA0437
BA0437.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
BA0437.been affixed to the stable North American tectonic plate. See
BA0437.NA2011 for more information.
BA0437
BA0437.The horizontal coordinates are valid at the epoch date displayed above
BA0437.which is a decimal equivalence of Year/Month/Day.
BA0437
BA0437.The orthometric height was determined by GPS observations and a
BA0437.high-resolution geoid model.
BA0437
BA0437.Significant digits in the geoid height do not necessarily reflect accuracy.
BA0437.GEOID12B height accuracy estimate available here.
BA0437

```

BA0437.The X, Y, and Z were computed from the position and the ellipsoidal ht.

BA0437

BA0437.The Laplace correction was computed from DEFLEC12B derived deflections.

BA0437

BA0437.The ellipsoidal height was determined by GPS observations

BA0437.and is referenced to NAD 83.

BA0437

BA0437. The following values were computed from the NAD 83(2011) position.

BA0437

BA0437;	North	East	Units	Scale	Factor	Converg.
BA0437;SPC TXSC	- 4,173,010.347	152,298.113	MT	0.99986330	-2 15 31.6	
BA0437;SPC TXSC	-13,690,951.45	499,664.73	sFT	0.99986330	-2 15 31.6	
BA0437;UTM 13	- 3,243,663.429	634,927.158	MT	0.99982464	+0 40 49.4	

BA0437

BA0437! - Elev Factor x Scale Factor = Combined Factor

BA0437!SPC TXSC - 0.99986711 x 0.99986330 = 0.99973043

BA0437!UTM 13 - 0.99986711 x 0.99982464 = 0.99969177

BA0437

BA0437:	Primary Azimuth Mark	Grid Az
BA0437:SPC TXSC	- TERLINGUA AZ MK	029 44 09.9
BA0437:UTM 13	- TERLINGUA AZ MK	026 47 48.9

BA0437

BA0437\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13RFN3492743663(NAD 83)

BA0437

BA0437	PID	Reference Object	Distance	Geod. Az
BA0437			dddmmss.s	
BA0437	CI0601	TERLINGUA AZ MK		0272838.3
BA0437	CI0602	TERLINGUA RM 1	6.873 METERS	18759
BA0437	CI0603	TERLINGUA RM 2	7.273 METERS	30444

BA0437

BA0437 SUPERSEDED SURVEY CONTROL

BA0437

BA0437	NAD 83(2007)-	29 18 53.23895(N)	103 36 37.98224(W)	AD(2002.00)	0
BA0437	ELLIP H (02/10/07)	846.225 (m)		GP(2002.00)	
BA0437	ELLIP H (10/24/00)	846.243 (m)		GP( )	4 2
BA0437	NAD 83(1993)-	29 18 53.23841(N)	103 36 37.98146(W)	AD( )	B
BA0437	ELLIP H (05/09/94)	846.320 (m)		GP( )	4 2
BA0437	NAD 83(1986)-	29 18 53.22616(N)	103 36 37.96845(W)	AD( )	2
BA0437	NAD 27	- 29 18 52.51600(N)	103 36 36.29500(W)	AD( )	2
BA0437	NAVD 88 (01/13/95)	868.1 (m)	UNKNOWN model used	GPS OBS	
BA0437	NAVD 88 (05/09/94)	868.1 (m)	GEOID93 model used	GPS OBS	

BA0437

BA0437.Superseded values are not recommended for survey control.

BA0437

BA0437.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

BA0437.See file [dsdata.pdf](#) to determine how the superseded data were derived.

BA0437

BA0437\_MARKER: DS = TRIANGULATION STATION DISK

BA0437\_SETTING: 80 = SET IN A BOULDER

BA0437\_STAMPING: TERLINGUA 1934

BA0437\_MARK LOGO: CGS

BA0437\_MAGNETIC: N = NO MAGNETIC MATERIAL

BA0437\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

BA0437+STABILITY: SURFACE MOTION

BA0437\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

BA0437+SATELLITE: SATELLITE OBSERVATIONS - November 02, 2002

BA0437

BA0437	HISTORY	- Date	Condition	Report By
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BA0437	HISTORY	- 1934	MONUMENTED	CGS
BA0437	HISTORY	- 1934	GOOD	CGS
BA0437	HISTORY	- 1958	GOOD	AMS
BA0437	HISTORY	- 19930222	GOOD	NGS
BA0437	HISTORY	- 20021102	GOOD	INDIV

BA0437

BA0437

BA0437

## STATION DESCRIPTION

BA0437'DESCRIBED BY COAST AND GEODETIC SURVEY 1934 (WRP)

BA0437'ABOUT 0.7 MILE SOUTHEAST OF TERLINGUA POST OFFICE, 0.1 MILE

BA0437'EAST OF THE TERLINGUA-CASTOLON MAIN ROAD, ON THE SECOND AND

BA0437'HIGHEST KNOLL ON A LOW RIDGE THAT RUNS EAST FROM THE ROAD.

BA0437'

BA0437'TO REACH FROM TERLINGUA POST OFFICE, GO EAST 0.1 MILE, THEN

BA0437'TAKE RIGHT FORK 0.15 MILE, THEN AGAIN RIGHT FORK AT THE

BA0437'NORTHWEST CORNER OF A CEMETERY, AND GO EAST AND SOUTH ON MAIN

BA0437'ROAD FOR 0.3 MILE TO WHERE THE ROAD BEGINS TO DESCEND. LEAVE

BA0437'MAIN ROAD HERE AND GO TO THE LEFT, FOLLOWING A STOCK TRAIL EAST

BA0437'FOR 0.1 MILE TO THE NORTH SIDE OF THE SECOND KNOLL, THEN

BA0437'TURN RIGHT UP KNOLL AND GO 0.05 MILE TO THE TOP AND STATION.

BA0437'

BA0437'SURFACE, REFERENCE AND AZIMUT MARKS ARE STANDARD BRONZE DISKS

BA0437'SET IN BOULDERS.

BA0437'UNDERGROUND MARK IS A STANDARD BRONZE DISK SET IN CONCRETE.

BA0437'

BA0437'AZIMUTH MARK IS ABOUT 0.5 MILE NORTHEAST OF STATION ON SOUTH

BA0437'SIDE OF ROAD AND 100 YARDS EAST OF STONE HOUSE ON NORTH SIDE

BA0437'OF ROAD.

BA0437'

BA0437'MAIN SCHEME STATIONS WERE NOT OBSERVED UPON FROM THIS STATION.

BA0437'STATION WAS OCCUPIED ONLY TO CUT IN REFERENCE MARKS.

BA0437

BA0437

## STATION RECOVERY (1934)

BA0437

BA0437'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1934

BA0437'RECOVERED IN GOOD CONDITION.

BA0437

BA0437

## STATION RECOVERY (1958)

BA0437

BA0437'RECOVERY NOTE BY US ARMY MAP SERVICE (NOW DMA) 1958

BA0437'STATION AND REFERENCE MARKS 1 AND 2 RECOVERED AS DESCRIBED.

BA0437'

BA0437'THE STATION IS LOCATED ON THE HIGHEST POINT AND IN A LIGHT SPOT

BA0437'OF HILL. 229 FEET ESE OF CENTERLINE OF ROAD. 108 FEET NNW OF

BA0437'LONE DARK BUSH IN E-W DRAIN. 24 FEET S OF THE N EDGE OF SMALL

BA0437'HILL.

BA0437

BA0437

## STATION RECOVERY (1993)

BA0437

BA0437'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1993

BA0437'STATION IS LOCATED ABOUT 120 KM (74.55 MI) SOUTH OF ALPINE, 65 KM

BA0437'(40.40 MI) EAST-SOUTHEAST OF PRESIDIO, 15 KM (9.30 MI) WEST OF THE

BA0437'WEST ENTRANCE TO BIG BEND NATIONAL PARK, AT TERLINGUA, ON A LOW

BA0437'NORTHWEST-SOUTHEAST RIDGE, ABOUT 100 M (328.1 FT) SOUTHEAST OF FARM

BA0437'ROAD 170, AT MILE 228.5. OWNERSHIP--UNKNOWN.

BA0437'TO REACH FROM THE JUNCTION OF STATE HIGHWAY 118 AND FARM ROAD 170 AT

BA0437'STUDY BUTTE (5 KM WEST OF WEST ENTRANCE TO BIG BEND NATIONAL PARK),

BA0437'GO SOUTHWEST ON FARM ROAD 170 FOR 2.23 KM (1.40 MI) TO A BRIDGE OVER

BA0437'TERLINGUA CREEK. CONTINUE AHEAD FOR 5.35 KM (3.30 MI) TO A DIRT ROAD

BA0437'RIGHT LEADING NORTHWEST INTO TERLINGUA. CONTINUE AHEAD FOR 0.51 KM

BA0437' (0.30 MI) TO A GRADED DIRT CROSSROAD AT UTILITY LINE ACROSS THE ROAD.  
BA0437' CONTINUE AHEAD FOR ABOUT 50 M (164.0 FT) TO A NARROW GRADED ROAD  
BA0437' LEFT. TURN LEFT, SOUTHEAST, ALONG THE RIDGE FOR 0.13 KM (0.10 MI) TO  
BA0437' A UTILITY POLE ON THE LEFT AND STATION ON THE RIGHT. VEHICLE CAN  
BA0437' WORK WAY UP SIDE OF RIDGE ALMOST TO THE STATION.  
BA0437' STATION MARK IS SET IN A DRILL HOLE IN A SMALL BOULDER PROJECTING 1 CM  
BA0437' ABOVE GROUND. A SMALL CAIRN IS OVER THE STATION. IT IS 28 M  
BA0437' (91.9 FT) SOUTHEAST OF THE NORTHWEST END OF THE RIDGE, 7 M (23.0 FT)  
BA0437' SOUTHWEST OF THE NORTHEAST EDGE AND 43.5 M (142.7 FT) (SLOPE) WEST OF  
BA0437' THE UTILITY POLE WITH TRANSFORMER ALONG ROAD.

BA0437

BA0437

STATION RECOVERY (2002)

BA0437

BA0437' RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2002 (MBD)

BA0437' RECOVERED TERLINGUA AND REFERENCE MARKS, CARSONITE MARKER IS IN NEED  
BA0437' OF RESETTING. DUE TO THE LACK OF A PRECISE DISTANCE THE AZIMUTH MARK  
BA0437' WAS NOT FOUND AND MAY HAVE BEEN OBLITERATED OR DESTROYED.

\*\*\* retrieval complete.

Elapsed Time = 00:00:05

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST 11, 2019
BO0158 *****
BO0158 DESIGNATION - V 104
BO0158 PID - BO0158
BO0158 STATE/COUNTY- TX/CROCKETT
BO0158 COUNTRY - US
BO0158 USGS QUAD - OZONA (1979)
BO0158
BO0158 *CURRENT SURVEY CONTROL
BO0158
BO0158* NAD 83(1986) POSITION- 30 42 39.36 (N) 101 12 02.01 (W) HD_HELD1
BO0158* NAVD 88 ORTHO HEIGHT - 719.674 (meters) 2361.13 (feet) ADJUSTED
BO0158
BO0158 GEOID HEIGHT - -23.672 (meters) GEOID12B
BO0158 DYNAMIC HEIGHT - 718.615 (meters) 2357.66 (feet) COMP
BO0158 MODELED GRAVITY - 979,146.1 (mgal) NAVD 88
BO0158
BO0158 VERT ORDER - FIRST CLASS II
BO0158
BO0158.The horizontal coordinates were determined by differentially corrected
BO0158.hand held GPS observations or other comparable positioning techniques
BO0158.and have an estimated accuracy of +/- 3 meters.
BO0158.
BO0158.The orthometric height was determined by differential leveling and
BO0158.adjusted by the NATIONAL GEODETIC SURVEY
BO0158.in June 1991.
BO0158
BO0158.Significant digits in the geoid height do not necessarily reflect accuracy.
BO0158.GEOID12B height accuracy estimate available here.
BO0158
BO0158.Photographs are available for this station.
BO0158
BO0158.The dynamic height is computed by dividing the NAVD 88
BO0158.geopotential number by the normal gravity value computed on the
BO0158.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
BO0158.degrees latitude (g = 980.6199 gals.).
BO0158
BO0158.The modeled gravity was interpolated from observed gravity values.
BO0158
BO0158;
BO0158;          North          East          Units  Estimated Accuracy
BO0158;SPC TX C - 3,116,086.1  616,937.1    MT    (+/- 3 meters HH1 GPS)
BO0158
BO0158_U.S. NATIONAL GRID SPATIAL ADDRESS: 14RKU8926599634(NAD 83)
BO0158
BO0158 SUPERSEDED SURVEY CONTROL
BO0158
BO0158 NGVD 29 (??/??/92) 719.461 (m) 2360.43 (f) ADJ UNCH 1 2
BO0158
BO0158.Superseded values are not recommended for survey control.
BO0158

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BO0158.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
BO0158.See file [dsdata.pdf](#) to determine how the superseded data were derived.

BO0158

BO0158\_MARKER: DB = BENCH MARK DISK

BO0158\_SETTING: 31 = SET IN A PAVEMENT SUCH AS STREET, SIDEWALK, CURB, ETC.

BO0158\_SP\_SET: STEP

BO0158\_STAMPING: V 104 1933 2360.432

BO0158\_MARK LOGO: CGS

BO0158\_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY

BO0158

HISTORY	- Date	Condition	Report By
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HISTORY	- 1933	MONUMENTED	CGS
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HISTORY	- 1958	GOOD	CGS
---------	--------	------	-----

HISTORY	- 20180503	GOOD	USPSQD
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BO0158

BO0158 STATION DESCRIPTION

BO0158

BO0158'DESCRIBED BY COAST AND GEODETIC SURVEY 1958

BO0158'IN OZONA.

BO0158'AT OZONA, IN THE TOP OF THE NORTH END OF THE FIRST STONE STEP OF THE

BO0158'WEST ENTRANCE TO THE COURTHOUSE, AND ABOUT 3 INCHES ABOVE THE

BO0158'SIDEWALK.

BO0158

BO0158 STATION RECOVERY (2018)

BO0158

BO0158'RECOVERY NOTE BY US POWER SQUADRON 2018 (RBP)

BO0158'RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.

Elapsed Time = 00:00:04

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

```

PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
AJ1110 *****
AJ1110 DESIGNATION -  V 1422
AJ1110 PID          -  AJ1110
AJ1110 STATE/COUNTY-  TX/WEBB
AJ1110 COUNTRY      -  US
AJ1110 USGS QUAD    -  CALLAGHAN RANCH SOUTH (1980)
AJ1110
AJ1110                                *CURRENT SURVEY CONTROL
AJ1110
AJ1110* NAD 83(1986) POSITION- 27 47 14.4      (N) 099 27 19.4      (W)  HD_HELD2
AJ1110* NAVD 88 ORTHO HEIGHT - 213.859 (meters)      701.64 (feet) ADJUSTED
AJ1110
AJ1110 GEOID HEIGHT   -      -24.204 (meters)                                GEOID12B
AJ1110 DYNAMIC HEIGHT -      213.524 (meters)      700.54 (feet) COMP
AJ1110 MODELED GRAVITY - 979,075.0 (mgal)                                NAVD 88
AJ1110
AJ1110 VERT ORDER     -  FIRST      CLASS II
AJ1110
AJ1110.The horizontal coordinates were established by autonomous hand held GPS
AJ1110.observations and have an estimated accuracy of +/- 10 meters.
AJ1110.
AJ1110.The orthometric height was determined by differential leveling and
AJ1110.adjusted by the NATIONAL GEODETIC SURVEY
AJ1110.in June 1991.
AJ1110
AJ1110.Significant digits in the geoid height do not necessarily reflect accuracy.
AJ1110.GEOID12B height accuracy estimate available here.
AJ1110
AJ1110.The dynamic height is computed by dividing the NAVD 88
AJ1110.geopotential number by the normal gravity value computed on the
AJ1110.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AJ1110.degrees latitude (g = 980.6199 gals.).
AJ1110
AJ1110.The modeled gravity was interpolated from observed gravity values.
AJ1110
AJ1110;
AJ1110;          North      East      Units  Estimated Accuracy
AJ1110;SPC TX S   - 5,235,316.    205,844.    MT  (+/- 10 meters HH2 GPS)
AJ1110
AJ1110_U.S. NATIONAL GRID SPATIAL ADDRESS: 14RMR5513773727(NAD 83)
AJ1110
AJ1110                                SUPERSEDED SURVEY CONTROL
AJ1110
AJ1110.No superseded survey control is available for this station.
AJ1110
AJ1110_MARKER: I = METAL ROD
AJ1110_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AJ1110_STAMPING: V 1422 1982
AJ1110_MARK LOGO: NGS
AJ1110_PROJECTION: PROJECTING 5 CENTIMETERS

```

AJ1110\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL  
 AJ1110\_SATELLITE: THE SITE LOCATION WAS REPORTED AS NOT SUITABLE FOR  
 AJ1110+SATELLITE: SATELLITE OBSERVATIONS - April 09, 2002  
 AJ1110\_ROD/PIPE-DEPTH: 3.4 meters  
 AJ1110  

AJ1110	HISTORY	- Date	Condition	Report By
AJ1110	HISTORY	- 1982	MONUMENTED	NGS
AJ1110	HISTORY	- 20020409	GOOD	USPSQD

 AJ1110  
 AJ1110 STATION DESCRIPTION  
 AJ1110  
 AJ1110'DESCRIBED BY NATIONAL GEODETIC SURVEY 1982  
 AJ1110'3.6 KM (2.25 MI) NW FROM WEBB.  
 AJ1110'1.6 KM (2.25 MI) NORTHWEST ALONG U.S. HIGHWAY 83 FROM THE JUNCTION OF  
 AJ1110'INTERSTATE 35 OVERPASS BRIDGE IN WEBB, ABOUT 122 METERS (400.0 FT)  
 AJ1110'SOUTHWEST OF A BOX CULVERT UNDER HIGHWAY AND 0.08 KM (0.05 MI)  
 AJ1110'NORTHWEST OF A SMALL BOX CULVERT UNDER HIGHWAY. 61.0 METERS  
 AJ1110'(200.0 FT) SOUTHWEST OF CENTERLINE OF THE HIGHWAY, 3.3 METERS  
 AJ1110'(10.5 FT) SOUTH SOUTHEAST OF CENTER OF A METAL GATE, 0.91 METERS  
 AJ1110'(3.0 FT) SOUTH SOUTHEAST OF A METAL GATE POST, AND 0.30 METERS  
 AJ1110'(1.0 FT) NORTHEAST OF A FENCE LINE. NOTE, ROD DRIVEN TO REFUSAL.  
 AJ1110'THE MARK IS 0.30 METERS N FROM A WITNESS POST.  
 AJ1110'THE MARK IS 0.30 M ABOVE HIGHWAY.  
 AJ1110  
 AJ1110 STATION RECOVERY (2002)  
 AJ1110  
 AJ1110'RECOVERY NOTE BY US POWER SQUADRON 2002 (WHM)  
 AJ1110'RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.  
 Elapsed Time = 00:00:04

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
AP0159 *****
AP0159 DESIGNATION -  V 1439
AP0159 PID          -  AP0159
AP0159 STATE/COUNTY-  TX/MAVERICK
AP0159 COUNTRY      -  US
AP0159 USGS QUAD    -  QUEMADO SE (1974)
AP0159
AP0159                      *CURRENT SURVEY CONTROL
AP0159
AP0159* NAD 83(2011) POSITION- 28 52 18.94127(N) 100 31 25.67879(W) NO CHECK
AP0159* NAD 83(2011) ELLIP HT- 246.813 (meters) (06/27/12) NO CHECK
AP0159* NAD 83(2011) EPOCH   - 2010.00
AP0159* NAVD 88 ORTHO HEIGHT - 269.586 (meters) 884.47 (feet) ADJUSTED
AP0159
AP0159 GEOID HEIGHT   -      -22.822 (meters) GEOID12B
AP0159 NAD 83(2011) X - -1,020,965.402 (meters) COMP
AP0159 NAD 83(2011) Y - -5,495,894.853 (meters) COMP
AP0159 NAD 83(2011) Z -  3,061,597.635 (meters) COMP
AP0159 LAPLACE CORR   -           0.05 (seconds) DEFLEC12B
AP0159 DYNAMIC HEIGHT -           269.188 (meters) 883.16 (feet) COMP
AP0159 MODELED GRAVITY -           979,159.6 (mgal) NAVD 88
AP0159
AP0159 VERT ORDER      -  FIRST      CLASS II
AP0159
AP0159 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
AP0159 Standards:
AP0159      FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
AP0159      Horiz  Ellip              SD_N   SD_E   SD_h      (unitless)
AP0159 -----
AP0159 NETWORK    1.29   1.67              0.56   0.49   0.85      -0.01427193
AP0159 -----
AP0159 Click here for local accuracies and other accuracy information.
AP0159
AP0159
AP0159.The horizontal coordinates were established by GPS observations
AP0159.and adjusted by the National Geodetic Survey in June 2012.
AP0159
AP0159.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
AP0159.been affixed to the stable North American tectonic plate. See
AP0159.NA2011 for more information.
AP0159
AP0159.The horizontal coordinates are valid at the epoch date displayed above
AP0159.which is a decimal equivalence of Year/Month/Day.
AP0159
AP0159.No horizontal observational check was made to the station.
AP0159.
AP0159.The orthometric height was determined by differential leveling and
AP0159.adjusted by the NATIONAL GEODETIC SURVEY
AP0159.in June 1991.

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AP0159

AP0159.Significant digits in the geoid height do not necessarily reflect accuracy.  
AP0159.GEOID12B height accuracy estimate available [here](#).

AP0159

AP0159.[Photographs](#) are available for this station.

AP0159

AP0159.The X, Y, and Z were computed from the position and the ellipsoidal ht.

AP0159

AP0159.The Laplace correction was computed from DEFLEC12B derived deflections.

AP0159

AP0159.The ellipsoidal height was determined by GPS observations

AP0159.and is referenced to NAD 83.

AP0159

AP0159.The dynamic height is computed by dividing the NAVD 88

AP0159.geopotential number by the normal gravity value computed on the

AP0159.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

AP0159.degrees latitude ( $g = 980.6199$  gals.).

AP0159

AP0159.The modeled gravity was interpolated from observed gravity values.

AP0159

AP0159. The following values were computed from the NAD 83(2011) position.

AP0159

AP0159;	North	East	Units	Scale	Factor	Converg.
AP0159;SPC TXSC	- 4,116,073.396	451,359.687	MT	0.99989566	-0 44	47.5
AP0159;SPC TXSC	-13,504,150.80	1,480,835.91	sFT	0.99989566	-0 44	47.5
AP0159;UTM 14	- 3,194,750.828	351,390.016	MT	0.99987254	-0 44	09.3

AP0159

AP0159!  
- Elev Factor x Scale Factor = Combined Factor

AP0159!SPC TXSC - 0.99996124 x 0.99989566 = 0.99985690

AP0159!UTM 14 - 0.99996124 x 0.99987254 = 0.99983378

AP0159

AP0159\_U.S. NATIONAL GRID SPATIAL ADDRESS: 14RLS5139094750(NAD 83)

AP0159

SUPERSEDED SURVEY CONTROL

AP0159

AP0159 NAD 83(2007)- 28 52 18.94122(N) 100 31 25.67914(W) AD(2002.00) 0

AP0159 ELLIP H (02/10/07) 246.812 (m) GP(2002.00)

AP0159 NAD 83(1993)- 28 52 18.94032(N) 100 31 25.67870(W) AD( ) 1

AP0159 ELLIP H (05/20/03) 246.837 (m) GP( ) 3 1

AP0159 NAVD 88 269.59 (m) 884.5 (f) LEVELING 3

AP0159

AP0159.Superseded values are not recommended for survey control.

AP0159

AP0159.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

AP0159.See file [dsdata.pdf](#) to determine how the superseded data were derived.

AP0159

AP0159\_MARKER: F = FLANGE-ENCASED ROD

AP0159\_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)

AP0159\_STAMPING: V 1439 1982

AP0159\_MARK LOGO: NGS

AP0159\_PROJECTION: FLUSH

AP0159\_MAGNETIC: I = MARKER IS A STEEL ROD

AP0159\_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD

AP0159+STABILITY: POSITION/ELEVATION WELL

AP0159\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

AP0159+SATELLITE: SATELLITE OBSERVATIONS - April 03, 2003

AP0159\_ROD/PIPE-DEPTH: 8.4 meters

AP0159\_SLEEVE-DEPTH : 6.9 meters

AP0159

AP0159 HISTORY - Date Condition Report By

AP0159 HISTORY - 1982 MONUMENTED NGS  
AP0159 HISTORY - 20030403 GOOD NGS

AP0159

AP0159

STATION DESCRIPTION

AP0159

AP0159'DESCRIBED BY NATIONAL GEODETIC SURVEY 1982

AP0159'21.8 KM (13.55 MI) NORT FROM EAGLE PASS.

AP0159'0.25 KM (0.15 MI) EAST ALONG QUARRY STREET FROM THE COURTHOUSE AT

AP0159'EAGLE PASS, THENCE 19.1 KM (11.85 MI) NORTH ALONG CEYLON STREET AND

AP0159'U.S. HIGHWAY 277, THENCE 2.5 KM (1.55 MI) WEST ALONG STATE HIGHWAY

AP0159'131, SET ACROSS THE STATE HIGHWAY FROM A 3.4 METERS (11.0 FT) BY

AP0159'4.0 METERS (13.0 FT) TELEPHONE SUBSTATION BUILDING ON THE PROPERTY OF

AP0159'ADOBE OIL AND GAS CORPORATION, BURR ESTATE LEASE, 16.8 METERS

AP0159'(55.0 FT) WEST OF THE CENTERLINE OF HIGHWAY 131, 49.7 METERS

AP0159'(163.0 FT) NORTHWEST OF THE NORTHWEST CORNER OF THE BUILDING,

AP0159'33.8 METERS (111.0 FT) NORTH OF THE CENTER OF A GATE AT A PASTURE, AND

AP0159'1.1 METERS (3.5 FT) EAST OF A NORTH SOUTH FENCE LINE.

AP0159'THE MARK IS 3.5 METERS E FROM A WITNESS POST.

AP0159'THE MARK IS 0.6 M BELOW HIGHWAY.

AP0159

AP0159

STATION RECOVERY (2003)

AP0159

AP0159'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2003 (DH)

AP0159'RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.

Elapsed Time = 00:00:05

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
BP0589 *****
BP0589 SACS          -  This is a Secondary Airport Control Station.
BP0589 DESIGNATION -  Y 1403
BP0589 PID          -  BP0589
BP0589 STATE/COUNTY-  TX/PECOS
BP0589 COUNTRY     -  US
BP0589 USGS QUAD   -  FORT STOCKTON WEST (1970)
BP0589
BP0589                      *CURRENT SURVEY CONTROL
BP0589
BP0589* NAD 83(2011) POSITION- 30 54 32.90474(N) 102 55 19.64068(W) ADJUSTED
BP0589* NAD 83(2011) ELLIP HT- 902.772 (meters) (06/27/12) ADJUSTED
BP0589* NAD 83(2011) EPOCH  - 2010.00
BP0589* NAVD 88 ORTHO HEIGHT - 926.298 (meters) 3039.03 (feet) ADJUSTED
BP0589
BP0589 GEOID HEIGHT  -  -23.551 (meters) GEOID12B
BP0589 NAD 83(2011) X  - -1,225,013.939 (meters) COMP
BP0589 NAD 83(2011) Y  - -5,339,217.679 (meters) COMP
BP0589 NAD 83(2011) Z  - 3,257,718.461 (meters) COMP
BP0589 LAPLACE CORR  -  -0.53 (seconds) DEFLEC12B
BP0589 DYNAMIC HEIGHT - 924.896 (meters) 3034.43 (feet) COMP
BP0589 MODELED GRAVITY - 979,095.8 (mgal) NAVD 88
BP0589
BP0589 VERT ORDER      -  FIRST      CLASS II
BP0589
BP0589 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
BP0589 Standards:
BP0589      FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
BP0589      Horiz Ellip              SD_N   SD_E   SD_h      (unitless)
BP0589 -----
BP0589 NETWORK      1.81   3.25              0.71   0.76   1.66      0.24500228
BP0589 -----
BP0589 Click here for local accuracies and other accuracy information.
BP0589
BP0589
BP0589.This mark is at Fort Stockton-Pecos Co (FST) Airport (FST)
BP0589
BP0589.The horizontal coordinates were established by GPS observations
BP0589.and adjusted by the National Geodetic Survey in June 2012.
BP0589
BP0589.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
BP0589.been affixed to the stable North American tectonic plate. See
BP0589.NA2011 for more information.
BP0589
BP0589.The horizontal coordinates are valid at the epoch date displayed above
BP0589.which is a decimal equivalence of Year/Month/Day.
BP0589
BP0589.The orthometric height was determined by differential leveling and
BP0589.adjusted by the NATIONAL GEODETIC SURVEY

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BP0589.in June 1991.

BP0589

BP0589.Significant digits in the geoid height do not necessarily reflect accuracy.  
BP0589.GEOID12B height accuracy estimate available [here](#).

BP0589

BP0589.[Photographs](#) are available for this station.

BP0589

BP0589.The X, Y, and Z were computed from the position and the ellipsoidal ht.

BP0589

BP0589.The Laplace correction was computed from DEFLEC12B derived deflections.

BP0589

BP0589.The ellipsoidal height was determined by GPS observations

BP0589.and is referenced to NAD 83.

BP0589

BP0589.The dynamic height is computed by dividing the NAVD 88

BP0589.geopotential number by the normal gravity value computed on the

BP0589.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

BP0589.degrees latitude (g = 980.6199 gals.).

BP0589

BP0589.The modeled gravity was interpolated from observed gravity values.

BP0589

BP0589. The following values were computed from the NAD 83(2011) position.

BP0589

BP0589;	North	East	Units	Scale	Factor	Converg.
BP0589;SPC TX C	- 3,140,613.404	452,576.779	MT	0.99988303	-1 20	00.2
BP0589;SPC TX C	-10,303,829.14	1,484,828.98	sFT	0.99988303	-1 20	00.2
BP0589;UTM 13	- 3,421,382.589	698,575.332	MT	1.00008643	+1 04	03.8

BP0589

BP0589!  
- Elev Factor x Scale Factor = Combined Factor

BP0589!SPC TX C - 0.99985825 x 0.99988303 = 0.99974130

BP0589!UTM 13 - 0.99985825 x 1.00008643 = 0.99994467

BP0589

BP0589\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13RFQ9857521382(NAD 83)

BP0589

#### SUPERSEDED SURVEY CONTROL

BP0589

BP0589 NAD 83(2007)- 30 54 32.90455(N) 102 55 19.64121(W) AD(2002.00) 0

BP0589 ELLIP H (02/10/07) 902.783 (m) GP(2002.00)

BP0589 ELLIP H (10/24/00) 902.790 (m) GP( ) 4 2

BP0589 ELLIP H (07/03/97) 902.416 (m) GP( ) 4 2

BP0589 NAD 83(1993)- 30 54 32.90395(N) 102 55 19.64101(W) AD( ) B

BP0589 ELLIP H (09/09/96) 902.833 (m) GP( ) 1 2

BP0589 NAVD 88 926.30 (m) 3039.0 (f) LEVELING 3

BP0589

BP0589.Superseded values are not recommended for survey control.

BP0589

BP0589.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

BP0589.See file [dsdata.pdf](#) to determine how the superseded data were derived.

BP0589

BP0589\_MARKER: F = FLANGE-ENCASED ROD

BP0589\_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)

BP0589\_STAMPING: Y 1403 1981

BP0589\_MARK LOGO: NGS

BP0589\_PROJECTION: RECESSED 4 CENTIMETERS

BP0589\_MAGNETIC: I = MARKER IS A STEEL ROD

BP0589\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

BP0589\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

BP0589+SATELLITE: SATELLITE OBSERVATIONS - October 23, 2006

BP0589\_ROD/PIPE-DEPTH: 4.6 meters

BP0589



BP0589	HISTORY	- Date	Condition	Report By
BP0589	HISTORY	- 1981	MONUMENTED	NGS
BP0589	HISTORY	- 1981	GOOD	NGS
BP0589	HISTORY	- 1981	GOOD	NGS
BP0589	HISTORY	- 19950509	GOOD	NGS
BP0589	HISTORY	- 19950705	GOOD	NGS
BP0589	HISTORY	- 19961005	GOOD	USPSQD
BP0589	HISTORY	- 20030827	GOOD	USPSQD
BP0589	HISTORY	- 20060815	GOOD	JCLS
BP0589	HISTORY	- 20061023	GOOD	CDSMS

BP0589

BP0589

BP0589

## STATION DESCRIPTION

BP0589'DESCRIBED BY NATIONAL GEODETIC SURVEY 1981

BP0589'4.2 KM (2.7 MI) NW FROM FORT STOCKTON.

BP0589'1.1 KM (0.75 MI) WEST ALONG U. S. HIGHWAYS 290, 285 AND 67 FROM ITS

BP0589'JUNCTION WITH STATE HIGHWAY 18 IN FORT STOCKTON, THENCE 3.1 KM

BP0589'(1.95 MI) NORTHWEST ALONG U. S. HIGHWAY 285, AT A GRAVELED ROAD

BP0589'LEADING NORTH TO THE PECOS COUNTY MOTO-CROSS TRACK, 19.4 METERS

BP0589'(63.7 FT) NORTHEAST OF THE CENTERLINE OF THE HIGHWAY, 13.3 METERS

BP0589'(43.6 FT) SOUTHEAST OF THE CENTERLINE OF THE ROAD AND 0.7 METERS

BP0589'(2.3 FT) SOUTHWEST OF A FENCE.

BP0589'THE MARK IS 0.4 METERS SE FROM A WITNESS POST.

BP0589'THE MARK IS ABOVE LEVEL WITH THE HIGHWAY.

BP0589

BP0589

## STATION RECOVERY (1981)

BP0589

BP0589'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1981

BP0589'RECOVERED IN GOOD CONDITION.

BP0589

BP0589

## STATION RECOVERY (1981)

BP0589

BP0589'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1981

BP0589'RECOVERED IN GOOD CONDITION.

BP0589

BP0589

## STATION RECOVERY (1995)

BP0589

BP0589'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (AJL)

BP0589'THE STATION IS LOCATED ABOUT 3.8 KM (2.35 MI) NORTHWEST OF FORT

BP0589'STOCKTON, ALONG U.S. HIGHWAY 285, SOUTHEAST OF THE ENTRANCE TO THE

BP0589'PECOS COUNTY GRAVEL AND FILL DIRT STOCK PILES. (26 M SOUTHEAST OF THE

BP0589'EXTENDED CENTER OF RUNWAY 3-12) OWNERSHIP--TEXAS HIGHWAY DEPARTMENT.

BP0589'TO REACH THE STATION FROM THE JUNCTION OF INTERSTATE HIGHWAY 10 AND

BP0589'U.S. HIGHWAY 285 (EXIT 257) IN FORT STOCKTON, GO NORTHWEST ON HIGHWAY

BP0589'285 FOR 1.49 KM (0.90 MI) TO THE STATION ON THE RIGHT. THE STATION IS

BP0589'19.4 M (63.6 FT) NORTHEAST OF THE HIGHWAY CENTERLINE, 13.3 M (43.6 FT)

BP0589'SOUTHEAST OF THE CENTER OF ENTRANCE GATE, 0.7 M (2.3 FT) SOUTHWEST OF

BP0589'A FENCE, 0.4 M (1.3 FT) SOUTHEAST OF A METAL WITNESS POST, AND 0.3 M

BP0589'(1.0 FT) BELOW THE LEVEL OF THE HIGHWAY. NOTE--ACCESS TO THE DATUM

BP0589'POINT IS THROUGH A 5-INCH LOGO CAP. BY DEB.

BP0589

BP0589

## STATION RECOVERY (1995)

BP0589

BP0589'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (WCW)

BP0589'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (WCW) . RECOVERED AS

BP0589'DESCRIBED WITH CHANGE. THIS IS A SECONDARY AIRPORT CONTROL STATION

BP0589'(SACS) .

BP0589

BP0589

## STATION RECOVERY (1996)

BP0589

BP0589'RECOVERY NOTE BY US POWER SQUADRON 1996  
BP0589'RECOVERED IN GOOD CONDITION.  
BP0589  
BP0589 STATION RECOVERY (2003)  
BP0589  
BP0589'RECOVERY NOTE BY US POWER SQUADRON 2003 (RLR)  
BP0589'WITNESS POST AND SIGN MISSING.  
BP0589  
BP0589 STATION RECOVERY (2006)  
BP0589  
BP0589'RECOVERY NOTE BY JOHN CHANCE LAND SURVEYS INC 2006  
BP0589'RECOVERED IN GOOD CONDITION.  
BP0589  
BP0589 STATION RECOVERY (2006)  
BP0589  
BP0589'RECOVERY NOTE BY CDS/MUERY SERVICES 2006 (MDM)  
BP0589'RECOVERED AS DESCRIBED.

\*\*\* retrieval complete.  
Elapsed Time = 00:00:05

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
BP0651 *****
BP0651 DESIGNATION -  Y 1417
BP0651 PID          -  BP0651
BP0651 STATE/COUNTY-  TX/TERRELL
BP0651 COUNTRY      -  US
BP0651 USGS QUAD    -  SANDERSON SE (1969)
BP0651
BP0651                                *CURRENT SURVEY CONTROL
BP0651
BP0651* NAVD 88 NAD 83(1986) POSITION- 30 06 38.      (N) 102 22 29.      (W) SCALED
BP0651* NAVD 88 ORTHO HEIGHT - 811.732 (meters)      2663.16 (feet) ADJUSTED
BP0651
BP0651 GEOID HEIGHT - -22.553 (meters) GEOID12B
BP0651 DYNAMIC HEIGHT - 810.489 (meters) 2659.08 (feet) COMP
BP0651 MODELED GRAVITY - 979,084.4 (mgal) NAVD 88
BP0651
BP0651 VERT ORDER - FIRST CLASS II
BP0651
BP0651.The horizontal coordinates were scaled from a topographic map and have
BP0651.an estimated accuracy of +/- 6 seconds.
BP0651.
BP0651.The orthometric height was determined by differential leveling and
BP0651.adjusted by the NATIONAL GEODETIC SURVEY
BP0651.in June 1991.
BP0651
BP0651.Significant digits in the geoid height do not necessarily reflect accuracy.
BP0651.GEOID12B height accuracy estimate available here.
BP0651
BP0651.The dynamic height is computed by dividing the NAVD 88
BP0651.geopotential number by the normal gravity value computed on the
BP0651.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
BP0651.degrees latitude (g = 980.6199 gals.).
BP0651
BP0651.The modeled gravity was interpolated from observed gravity values.
BP0651
BP0651;
BP0651;          North      East      Units  Estimated Accuracy
BP0651;SPC TXSC - 4,257,080.  274,810.  MT  (+/- 180 meters Scaled)
BP0651
BP0651_U.S. NATIONAL GRID SPATIAL ADDRESS: 13RGP529339(NAD 83)
BP0651
BP0651                                SUPERSEDED SURVEY CONTROL
BP0651
BP0651.No superseded survey control is available for this station.
BP0651
BP0651_MARKER: DB = BENCH MARK DISK
BP0651_SETTING: 66 = SET IN ROCK OUTCROP
BP0651_STAMPING: Y 1417 1981
BP0651_MARK LOGO: NGS
BP0651_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

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BP0651  
BP0651 HISTORY - Date Condition Report By  
BP0651 HISTORY - 1981 MONUMENTED NGS

BP0651

BP0651

BP0651

STATION DESCRIPTION

BP0651'DESCRIBED BY NATIONAL GEODETIC SURVEY 1981

BP0651'5.0 KM (3.1 MI) SE FROM SANDERSON.

BP0651'0.1 KM (0.05 MI) NORTH ALONG PERSIMMON AVENUE FROM THE SOUTHERN

BP0651'PACIFIC RAILROAD STATION IN SANDERSON, THENCE 4.9 KM (3.05 MI)

BP0651'SOUTHEAST ALONG U.S. HIGHWAY 90, IN A 5 BY 20 FT EXPOSED AREA OF

BP0651'OUTCROPPING BEDROCK, 19.8 METERS (65.0 FT) SOUTH OF A FENCE AND

BP0651'13.1 METERS (43.0 FT) NORTH OF THE CENTERLINE OF THE HIGHWAY.

BP0651'THE MARK IS 0.3 METERS SE FROM A WITNESS POST.

BP0651'THE MARK IS ABOVE LEVEL WITH THE HIGHWAY.

\*\*\* retrieval complete.

Elapsed Time = 00:00:04

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
CC0603 *****
CC0603 SACS          -  This is a Secondary Airport Control Station.
CC0603 DESIGNATION -  Z 1397
CC0603 PID          -  CC0603
CC0603 STATE/COUNTY-  TX/REEVES
CC0603 COUNTRY     -  US
CC0603 USGS QUAD   -  PECOS WEST (1981)
CC0603
CC0603                      *CURRENT SURVEY CONTROL
CC0603
CC0603* NAD 83(2011) POSITION- 31 23 23.83947(N) 103 30 40.59435(W) ADJUSTED
CC0603* NAD 83(2011) ELLIP HT- 769.269 (meters) (06/27/12) ADJUSTED
CC0603* NAD 83(2011) EPOCH  - 2010.00
CC0603* NAVD 88 ORTHO HEIGHT - 793.788 (meters) 2604.29 (feet) ADJUSTED
CC0603
CC0603 GEOID HEIGHT  -      -24.524 (meters) GEOID12B
CC0603 NAD 83(2011) X  - -1,273,379.512 (meters) COMP
CC0603 NAD 83(2011) Y  - -5,299,412.530 (meters) COMP
CC0603 NAD 83(2011) Z  -  3,303,278.154 (meters) COMP
CC0603 LAPLACE CORR  -      0.66 (seconds) DEFLEC12B
CC0603 DYNAMIC HEIGHT -      792.631 (meters) 2600.49 (feet) COMP
CC0603 MODELED GRAVITY -      979,156.8 (mgal) NAVD 88
CC0603
CC0603 VERT ORDER      -  FIRST      CLASS II
CC0603
CC0603 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
CC0603 Standards:
CC0603      FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
CC0603      Horiz Ellip              SD_N   SD_E   SD_h      (unitless)
CC0603 -----
CC0603 NETWORK      1.97   3.35              0.67   0.90   1.71      0.11002469
CC0603 -----
CC0603 Click here for local accuracies and other accuracy information.
CC0603
CC0603
CC0603.This mark is at Pecos Muni (PEQ) Airport (PEQ)
CC0603
CC0603.The horizontal coordinates were established by GPS observations
CC0603.and adjusted by the National Geodetic Survey in June 2012.
CC0603
CC0603.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
CC0603.been affixed to the stable North American tectonic plate. See
CC0603.NA2011 for more information.
CC0603
CC0603.The horizontal coordinates are valid at the epoch date displayed above
CC0603.which is a decimal equivalence of Year/Month/Day.
CC0603
CC0603.The orthometric height was determined by differential leveling and
CC0603.adjusted by the NATIONAL GEODETIC SURVEY

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CC0603.in June 1991.

CC0603

CC0603.Significant digits in the geoid height do not necessarily reflect accuracy.  
CC0603.GEOID12B height accuracy estimate available [here](#).

CC0603

CC0603.The X, Y, and Z were computed from the position and the ellipsoidal ht.  
CC0603

CC0603.The Laplace correction was computed from DEFLEC12B derived deflections.  
CC0603

CC0603.The ellipsoidal height was determined by GPS observations  
CC0603.and is referenced to NAD 83.

CC0603

CC0603.The dynamic height is computed by dividing the NAVD 88  
CC0603.geopotential number by the normal gravity value computed on the  
CC0603.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
CC0603.degrees latitude (g = 980.6199 gals.).

CC0603

CC0603.The modeled gravity was interpolated from observed gravity values.

CC0603

CC0603. The following values were computed from the NAD 83(2011) position.

CC0603

CC0603;	North	East	Units	Scale	Factor	Converg.
CC0603;SPC TX C	- 3,195,354.121	397,804.926	MT	0.99990466	-1 38	12.6
CC0603;SPC TX C	-10,483,424.31	1,305,131.66	sFT	0.99990466	-1 38	12.6
CC0603;UTM 13	- 3,473,778.058	641,548.308	MT	0.99984713	+0 46	32.0

CC0603

CC0603!	Elev Factor	x	Scale Factor	=	Combined Factor
CC0603!SPC TX C	- 0.99987922	x	0.99990466	=	0.99978389
CC0603!UTM 13	- 0.99987922	x	0.99984713	=	0.99972637

CC0603

CC0603:	Primary Azimuth Mark	Grid Az
CC0603:SPC TX C	- PECOSPORT	171 00 29.7
CC0603:UTM 13	- PECOSPORT	168 35 45.1

CC0603

CC0603\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13RFQ4154873778(NAD 83)

CC0603

CC0603	PID	Reference Object	Distance	Geod. Az
CC0603				dddmmss.s
CC0603	CC0857	PECOSPORT	407.417 METERS	1692217.1

CC0603

CC0603

#### SUPERSEDED SURVEY CONTROL

CC0603

CC0603	NAD 83(2007)-	31 23 23.83913(N)	103 30 40.59512(W)	AD(2002.00)	0
CC0603	ELLIP H (02/10/07)	769.280 (m)		GP(2002.00)	
CC0603	ELLIP H (10/24/00)	769.276 (m)		GP( )	4 2
CC0603	ELLIP H (07/08/97)	769.342 (m)		GP( )	4 2
CC0603	NAD 83(1993)-	31 23 23.83849(N)	103 30 40.59509(W)	AD( )	B
CC0603	ELLIP H (09/09/96)	769.321 (m)		GP( )	1 2
CC0603	NAVD 88	793.79 (m)	2604.3 (f)	LEVELING	3

CC0603

CC0603.Superseded values are not recommended for survey control.

CC0603

CC0603.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

CC0603.See file [dsdata.pdf](#) to determine how the superseded data were derived.

CC0603

CC0603\_MARKER: I = METAL ROD

CC0603\_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)

CC0603\_STAMPING: Z 1397 1981

CC0603\_MARK LOGO: NGS  
 CC0603\_PROJECTION: FLUSH  
 CC0603\_MAGNETIC: I = MARKER IS A STEEL ROD  
 CC0603\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL  
 CC0603\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
 CC0603+SATELLITE: SATELLITE OBSERVATIONS - May 10, 1995  
 CC0603\_ROD/PIPE-DEPTH: 1.5 meters

CC0603  
 CC0603 HISTORY - Date Condition Report By  
 CC0603 HISTORY - 1981 MONUMENTED NGS  
 CC0603 HISTORY - 19950509 GOOD NGS  
 CC0603 HISTORY - 19950510 GOOD NGS

CC0603  
 CC0603 STATION DESCRIPTION  
 CC0603

CC0603'DESCRIBED BY NATIONAL GEODETIC SURVEY 1981  
 CC0603'IN PECOS.

CC0603'IN PECOS, AT THE PECOS MUNICIPAL AIRPORT OFFICE, IN THE SOUTH  
 CC0603'CORNER OF A CHAIN LINK FENCE AROUND THE WEST SIDE OF THE OFFICE,  
 CC0603'14.8 METERS (48.6 FT) SOUTHWEST OF THE SOUTH CORNER OF THE  
 CC0603'OFFICE, 0.9 METER (3.0 FT) SOUTHWEST OF A STEEL UTILITY POLE AND  
 CC0603'STANDARD SIGN, 0.6 METER (2.0 FT) NORTH OF A FENCE CORNER, 0.4  
 CC0603'METER (1.4 FT) NORTHWEST OF A FENCE, AND 0.4 METER (1.2 FT)  
 CC0603'NORTHEAST OF A FENCE. NOTE=ACCESS TO THE DATUM POINT IS THROUGH A  
 CC0603'5-INCH LOGO CAP. REFUSAL WAS REACHED AT 5.0 FT.  
 CC0603'THE MARK IS ABOVE LEVEL WITH THE GROUND.

CC0603  
 CC0603 STATION RECOVERY (1995)  
 CC0603

CC0603'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (AJL)  
 CC0603'THE STATION IS LOCATED ABOUT 3 KM (1.85 MI) SOUTH OF PECOS, ON THE  
 CC0603'PECOS MUNICIPAL AIRPORT, IN THE SOUTH CORNER OF THE LAWN SOUTHWEST OF  
 CC0603'THE AIRPORT OFFICE.--CITY OF PECOS, BOX 929, PECOS TX 79772. THE  
 CC0603'AIRPORT MANAGER IS ISABELLE BLANCHARD, PHONE 915 447-2488. TO REACH  
 CC0603'THE STATION FROM THE JUNCTION OF INTERSTATE HIGHWAY 20 AND COUNTRY  
 CC0603'CLUB DRIVE (EXIT 40) IN PECOS, GO SOUTHERLY 1.02 KM (0.65 MI) ALONG A  
 CC0603'PAVED ROAD TO THE AIRPORT OFFICE AND AUTOMATIC GATE ON THE LEFT, PASS  
 CC0603'THROUGH THE GATE 30 METERS (98.4 FT) TO THE STATION ON THE RIGHT,  
 CC0603'INSIDE THE CHAIN-LINK FENCE CORNER. THE STATION IS 14.8 M (48.6 FT)  
 CC0603'SOUTHWEST OF THE SOUTH CORNER OF THE F OFFICE, 0.9 M (3.0 FT)  
 CC0603'SOUTHWEST OF A STEEL UTILITY LIGHT POLE, 0.6 M (2.0 FT) NORTH OF THE  
 CC0603'FENCE CORNER, 0.3 M (1.0 FT) NORTHEAST OF THE FENCE. NOTE--ACCESS TO  
 CC0603'THE DATUM POINT IS THROUGH A 5-INCH LOGO CAP. BY DEB.

CC0603  
 CC0603 STATION RECOVERY (1995)  
 CC0603

CC0603'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (AJL)  
 CC0603'THE STATION IS LOCATED ABOUT 3 KM (1.85 MI) SOUTH OF PECOS, ON THE  
 CC0603'PECOS MUNICIPAL AIRPORT, IN THE SOUTH CORNER OF THE LAWN SOUTHWEST OF  
 CC0603'THE AIRPORT OFFICE.--CITY OF PECOS, BOX 929, PECOS TX 79772. THE  
 CC0603'AIRPORT MANAGER IS ISABELLE BLANCHARD, PHONE 915 447-2488. TO REACH  
 CC0603'THE STATION FROM THE JUNCTION OF INTERSTATE HIGHWAY 20 AND COUNTRY  
 CC0603'CLUB DRIVE (EXIT 40) IN PECOS, GO SOUTHERLY 1.02 KM (0.65 MI) ALONG A  
 CC0603'PAVED ROAD TO THE AIRPORT OFFICE AND AUTOMATIC GATE ON THE LEFT, PASS  
 CC0603'THROUGH THE GATE 30 METERS (98.4 FT) TO THE STATION ON THE RIGHT,  
 CC0603'INSIDE THE CHAIN-LINK FENCE CORNER. THE STATION IS 14.8 M (48.6 FT)  
 CC0603'SOUTHWEST OF THE SOUTH CORNER OF THE F OFFICE, 0.9 M (3.0 FT)  
 CC0603'SOUTHWEST OF A STEEL UTILITY LIGHT POLE, 0.6 M (2.0 FT) NORTH OF THE  
 CC0603'FENCE CORNER, 0.3 M (1.0 FT) NORTHEAST OF THE FENCE. NOTE--ACCESS TO  
 CC0603'THE DATUM POINT IS THROUGH A 5-INCH LOGO CAP. THIS IS A SECONDARY

CC0603'AIRPORT CONTROL STATION (SACS) .

\*\*\* retrieval complete.  
Elapsed Time = 00:00:04



# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
BP0583 *****
BP0583 DESIGNATION -  Z 1410
BP0583 PID          -  BP0583
BP0583 STATE/COUNTY-  TX/PECOS
BP0583 COUNTRY      -  US
BP0583 USGS QUAD    -  FORT STOCKTON WEST (1970)
BP0583
BP0583                      *CURRENT SURVEY CONTROL
BP0583
BP0583* NAVD 88 NAD 83(1986) POSITION- 30 59 05.      (N) 102 53 04.      (W) SCALED
BP0583* NAVD 88 ORTHO HEIGHT - 868.834 (meters)      2850.50 (feet) ADJUSTED
BP0583
BP0583 GEOID HEIGHT - -23.562 (meters)                      GEOID12B
BP0583 DYNAMIC HEIGHT - 867.532 (meters)      2846.23 (feet) COMP
BP0583 MODELED GRAVITY - 979,114.4 (mgal)                      NAVD 88
BP0583
BP0583 VERT ORDER - FIRST CLASS II
BP0583
BP0583.The horizontal coordinates were scaled from a topographic map and have
BP0583.an estimated accuracy of +/- 6 seconds.
BP0583.
BP0583.The orthometric height was determined by differential leveling and
BP0583.adjusted by the NATIONAL GEODETIC SURVEY
BP0583.in June 1991.
BP0583
BP0583.Significant digits in the geoid height do not necessarily reflect accuracy.
BP0583.GEOID12B height accuracy estimate available here.
BP0583
BP0583.The dynamic height is computed by dividing the NAVD 88
BP0583.geopotential number by the normal gravity value computed on the
BP0583.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
BP0583.degrees latitude (g = 980.6199 gals.).
BP0583
BP0583.The modeled gravity was interpolated from observed gravity values.
BP0583
BP0583;
BP0583;          North          East          Units  Estimated Accuracy
BP0583;SPC TX C - 3,148,910.      456,370.      MT  (+/- 180 meters Scaled)
BP0583
BP0583_U.S. NATIONAL GRID SPATIAL ADDRESS: 13RGQ020298(NAD 83)
BP0583
BP0583                      SUPERSEDED SURVEY CONTROL
BP0583
BP0583.No superseded survey control is available for this station.
BP0583
BP0583_MARKER: I = METAL ROD
BP0583_SETTING: 15 = METAL ROD DRIVEN INTO GROUND. SEE TEXT FOR ADDITIONAL
BP0583+WITH SETTING: INFORMATION.
BP0583_STAMPING: Z 1410 1981
BP0583_MARK LOGO: NGS

```

BP0583\_PROJECTION: FLUSH

BP0583\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

BP0583\_ROD/PIPE-DEPTH: 1.5 meters

BP0583

BP0583	HISTORY	- Date	Condition	Report By
BP0583	HISTORY	- 1981	MONUMENTED	NGS
BP0583	HISTORY	- 19961005	GOOD	USPSQD

BP0583

BP0583 STATION DESCRIPTION

BP0583

BP0583'DESCRIBED BY NATIONAL GEODETIC SURVEY 1981

BP0583'10.0 KM (6.2 MI) NORTH FROM FORT STOCKTON.

BP0583'10.0 KM (6.2 MI) NORTHERLY ALONG STATE HIGHWAY 18 FROM ITS JUNCTION

BP0583'WITH U. S. HIGHWAYS 290, 285 AND 67 IN FORT STOCKTON, AT A PAVED

BP0583'ROAD LEADING WEST, 23.6 METERS (77.5 FT) WEST OF THE CENTERLINE OF THE

BP0583'HIGHWAY, 15.2 METERS (49.9 FT) NORTH OF THE CENTER OF THE ROAD, 2.2

BP0583'METERS (7.2 FT) WEST-SOUTHWEST OF A FENCE CORNER AND 1.8 METERS

BP0583'(5.9 FT) EAST OF THE EAST LEG OF A SIGN (NORTHERN NATURAL GAS

BP0583'COMPANY GOMEZ PLANT). NOTE=ACCESS TO THE DATUM POINT IS THROUGH

BP0583'A 5-INCH LOGO CAP.

BP0583'THE MARK IS 0.5 METERS S FROM A WITNESS POST AND FENCE

BP0583'THE MARK IS ABOVE LEVEL WITH THE HIGHWAY.

BP0583

BP0583 STATION RECOVERY (1996)

BP0583

BP0583'RECOVERY NOTE BY US POWER SQUADRON 1996

BP0583'RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.

Elapsed Time = 00:00:05

# The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.3
1      National Geodetic Survey,  Retrieval Date = AUGUST  6, 2019
BP0652 *****
BP0652 DESIGNATION -  Z 1417
BP0652 PID          -  BP0652
BP0652 STATE/COUNTY-  TX/TERRELL
BP0652 COUNTRY      -  US
BP0652 USGS QUAD    -  SANDERSON SE (1969)
BP0652
BP0652                                *CURRENT SURVEY CONTROL
BP0652
BP0652* NAVD 88 NAD 83(1986) POSITION- 30 05 12.      (N) 102 21 39.      (W)  SCALED
BP0652* NAVD 88 ORTHO HEIGHT - 787.837 (meters)      2584.76 (feet) ADJUSTED
BP0652
BP0652 GEOID HEIGHT - -22.551 (meters)                GEOID12B
BP0652 DYNAMIC HEIGHT - 786.634 (meters)      2580.82 (feet) COMP
BP0652 MODELED GRAVITY - 979,089.1 (mgal)                NAVD 88
BP0652
BP0652 VERT ORDER - FIRST CLASS II
BP0652
BP0652.The horizontal coordinates were scaled from a topographic map and have
BP0652.an estimated accuracy of +/- 6 seconds.
BP0652.
BP0652.The orthometric height was determined by differential leveling and
BP0652.adjusted by the NATIONAL GEODETIC SURVEY
BP0652.in June 1991.
BP0652
BP0652.Significant digits in the geoid height do not necessarily reflect accuracy.
BP0652.GEOID12B height accuracy estimate available here.
BP0652
BP0652.The dynamic height is computed by dividing the NAVD 88
BP0652.geopotential number by the normal gravity value computed on the
BP0652.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
BP0652.degrees latitude (g = 980.6199 gals.).
BP0652
BP0652.The modeled gravity was interpolated from observed gravity values.
BP0652
BP0652;
BP0652;          North      East      Units  Estimated Accuracy
BP0652;SPC TXSC - 4,254,390.    276,070.    MT  (+/- 180 meters Scaled)
BP0652
BP0652_U.S. NATIONAL GRID SPATIAL ADDRESS: 13RGP543313(NAD 83)
BP0652
BP0652                                SUPERSEDED SURVEY CONTROL
BP0652
BP0652.No superseded survey control is available for this station.
BP0652
BP0652_MARKER: DB = BENCH MARK DISK
BP0652_SETTING: 66 = SET IN ROCK OUTCROP
BP0652_STAMPING: Z 1417 1981
BP0652_MARK LOGO: NGS
BP0652_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD

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BP0652+STABILITY: POSITION/ELEVATION WELL

BP0652

BP0652	HISTORY	- Date	Condition	Report By
BP0652	HISTORY	- 1981	MONUMENTED	NGS

BP0652

BP0652

STATION DESCRIPTION

BP0652

BP0652'DESCRIBED BY NATIONAL GEODETIC SURVEY 1981

BP0652'8.3 KM (5.15 MI) SE FROM SANDERSON.

BP0652'0.1 KM (0.05 MI) NORTH ALONG PERSIMMON AVENUE FROM THE SOUTHERN

BP0652'PACIFIC RAILROAD STATION IN SANDERSON, THENCE 8.2 KM (5.1 MI)

BP0652'SOUTHEAST ALONG U.S. HIGHWAY 90, 0.2 KM (0.1 MI) NORTHWEST OF THE

BP0652'SOUTHEAST END OF A HIGHWAY CUT AND 13.4 METERS (44.0 FT) SOUTHWEST OF

BP0652'CENTERLINE OF THE HIGHWAY.

BP0652'THE MARK IS 0.3 METERS NW FROM A WITNESS POST.

BP0652'THE MARK IS ABOVE LEVEL WITH THE HIGHWAY.

\*\*\* retrieval complete.

Elapsed Time = 00:00:04