
# SURVEY REPORT

## Digital Aerial Solutions
## Suwannee, FL

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# 1 Introduction

## 1.1 Narrative

The purpose of this project was to provide ground truth data which will be used to validate LiDAR data of the Suwannee River, FL project located in North Central FL. The ground surveys were conducted utilizing the eGPS real time network to collect checkpoints of 10% of the predominant vegetation within the AOI. The vertical accuracy requirements meet or exceed the required RMSEz of 12.5cm and the vertical accuracy of 24.5cm at the 95% confidence level as specified by the SOW using NDEP guidelines.

### Datum & Coordinate System

Survey data and coordinate values presented in this report are referenced to the Universal Transverse Mercator (UTM) Zone 17 North, units of Meters. The vertical datum is North American Vertical Datum of 1988 (NAVD88), units of Meters. The Geoid09 model was used to determine the NAVD88 heights.

# 2 Ground Control Survey

## 2.1 Survey Methodology

All LiDAR check points were collected between Feb 26th thru and March 8th by a Magnolia River field crew with a Topcon GR-3 rover and Tesla data collector and a Trimble 3600 Total Station with TSC2 data collector. Corrections were received from the eGPS Continually Operating Reference Station (CORS) network, via the internet using NTRIP protocol and MiFi cellular connection. eGPS provides multi-base corrections from a network of continuously operating GPS reference stations. This service allows corrections to be applied to the points as they are collected, eliminating the need for further adjustments in post-processing.

LiDAR check points were collected in the categories of Bare Ground, High Grass, Brushland and Trees. In addition, a sampling of vertical LiDAR control points was collected in areas of Bare Ground. The LiDAR check points (excluding Tree check points) were collected using real-time CORS corrections for duration of at least 3 minutes. Tree check points were collected using the Trimble total station from previously collected Bare Ground points.

## 2.2 Accuracy Assessment

In order to assess the accuracy of the eGPS CORS corrections, the survey crew occupied a local published NGS each day. The results from the eGPS corrections were then compared to the published position of the marker.

### 2.2.1 NGS Points Used:

A175 (PID: AR1798), H0-V~
STEINRIED (PID: BD1035), H2-V2

*NGS Datasheets can be found in Appendix A.*

**Table 2.2.1: NGS Position Comparison (UTM17N, NAD83, Meters; Ellipsoidal Ht., Meters)**

| | A175 Pub. NGS Coordinates | | | Measured | | | Difference Δ | | |
|---|---|---|---|---|---|---|---|---|---|
| Pt. | Easting | Northing | Ell. Ht. | Easting | Northing | Ell. Ht. | Easting Δ | Northing Δ | Height Δ |
| 133 | 354133.71 | 3296342.202 | 12.324 | 354133.690 | 3296342.228 | 12.305 | 0.022 | -0.026 | 0.019 |
| 134 | 354133.71 | 3296342.202 | 12.324 | 354133.692 | 3296342.221 | 12.326 | 0.020 | -0.019 | -0.002 |
| 191 | 354133.71 | 3296342.202 | 12.324 | 354133.700 | 3296342.209 | 12.335 | 0.012 | -0.007 | -0.011 |

| | STEINRIED AZ MK Pub. NGS Coordinates | | | Measured | | | Difference Δ | | |
|---|---|---|---|---|---|---|---|---|---|
| Pt. | Easting | Northing | Ell. Ht. | Easting | Northing | Ell. Ht. | Easting Δ | Northing Δ | Height Δ |
| 297 | 337318.48 | 3337363.252 | 14.856 | 337318.524 | 3337363.243 | 14.875 | -0.045 | 0.009 | -0.019 |
| 298 | 337318.48 | 3337363.252 | 14.856 | 337318.535 | 3337363.264 | 14.828 | -0.056 | -0.012 | 0.028 |
| 467 | 337318.48 | 3337363.252 | 14.856 | 337318.526 | 3337363.243 | 14.867 | -0.047 | 0.009 | -0.011 |
| 509 | 337318.48 | 3337363.252 | 14.856 | 337318.518 | 3337363.246 | 14.857 | -0.039 | 0.006 | -0.001 |
| 527 | 337318.48 | 3337363.252 | 14.856 | 337318.524 | 3337363.240 | 14.876 | -0.045 | 0.012 | -0.020 |
| 528 | 337318.48 | 3337363.252 | 14.856 | 337318.524 | 3337363.252 | 14.860 | -0.045 | 0.000 | -0.004 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 371 | 337318.48 | 3337363.252 | 14.856 | 337318.532 | 3337363.249 | 14.854 | -0.053 | 0.003 | 0.002 |

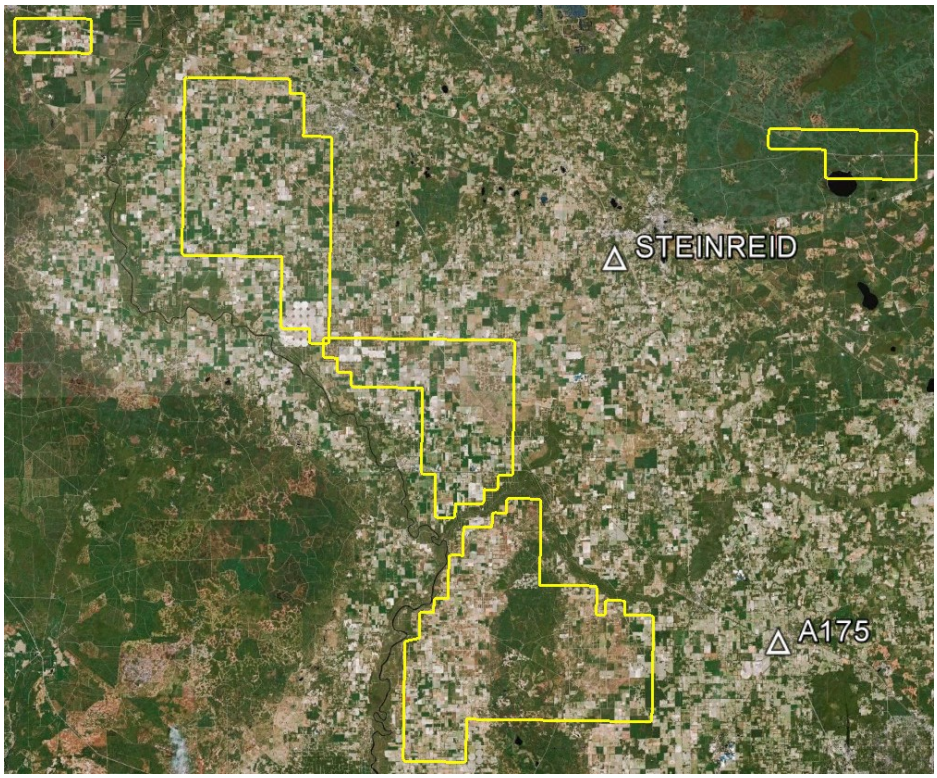


***Figure 2.2.1: NGS Control Points***

## 2.3 Vertical Test Point Collection

In order to validate the LIDAR DEM, test points were collected throughout the LiDAR collection area on the four most predominant ground cover classifications: Bare Ground (BG), High Grass (HG), Brushland (BL) and Forested areas (TREE).

### Table 2.3.1: Bare Ground Points

| POINT NAME | EASTING (M) | NORTHING (M) | ORTHOMETRIC HT. (M) | CODE |
|---|---|---|---|---|
| 175 | 320993.402 | 3308120.244 | 13.030 | BG-04-01A |
| 187 | 326112.489 | 3307737.304 | 22.822 | BG-04-02A |
| 158 | 319598.638 | 3301873.914 | 14.950 | BG-04-03A |
| 111 | 331746.987 | 3298942.721 | 18.167 | BG-04-04A |
| 122 | 326762.438 | 3296630.256 | 21.784 | BG-04-05A |
| 140 | 319373.398 | 3292850.449 | 19.861 | BG-04-06A |
| 100 | 331649.435 | 3292979.483 | 23.697 | BG-04-07A |
| 147 | 316501.554 | 3286297.515 | 15.665 | BG-04-08A |
| 192 | 320398.005 | 3313009.436 | 15.822 | BG-056-17A |
| 444 | 356703.948 | 3349342.186 | 47.641 | BG-07-01A |

| | | | | |
|---|---|---|---|---|
| 431 | 365296.264 | 3347887.832 | 49.445 | BG-07-02A |
| 423 | 362502.757 | 3347039.533 | 49.260 | BG-07-03A |
| 406 | 274322.615 | 3363749.746 | 29.174 | BG-08-01A |
| 397 | 279498.109 | 3362716.074 | 27.383 | BG-08-02A |
| 456 | 274990.107 | 3360823.940 | 28.979 | BG-08-03A |
| 384 | 279700.656 | 3360392.983 | 25.849 | BG-08-04A |
| 361 | 295022.348 | 3354464.900 | 25.797 | BG-56-01A |
| 373 | 301056.241 | 3355203.216 | 28.704 | BG-56-02A |
| 350 | 294563.603 | 3349618.604 | 27.028 | BG-56-03A |
| 339 | 303754.509 | 3349447.934 | 29.527 | BG-56-04A |
| 328 | 299830.702 | 3344616.115 | 27.097 | BG-56-05A |
| 317 | 294833.867 | 3339933.683 | 23.077 | BG-56-06A |
| 306 | 303535.782 | 3339801.927 | 27.272 | BG-56-07A |
| 294 | 306068.795 | 3331792.168 | 24.309 | BG-56-08A |
| 283 | 309058.124 | 3328422.201 | 17.863 | BG-56-09A |
| 274 | 311683.270 | 3324743.117 | 15.182 | BG-56-10A |
| 263 | 320146.765 | 3326725.893 | 23.598 | BG-56-11A |
| 252 | 325381.503 | 3326773.108 | 29.216 | BG-56-12A |
| 238 | 321863.617 | 3323589.869 | 21.354 | BG-56-13A |
| 227 | 321309.716 | 3318668.632 | 17.651 | BG-56-14A |
| 215 | 316291.332 | 3317017.925 | 12.270 | BG-56-15A |
| 205 | 323706.448 | 3316592.427 | 17.613 | BG-56-16A |
| 481 | 306221.658 | 3337173.753 | 27.423 | BG-56-18A |

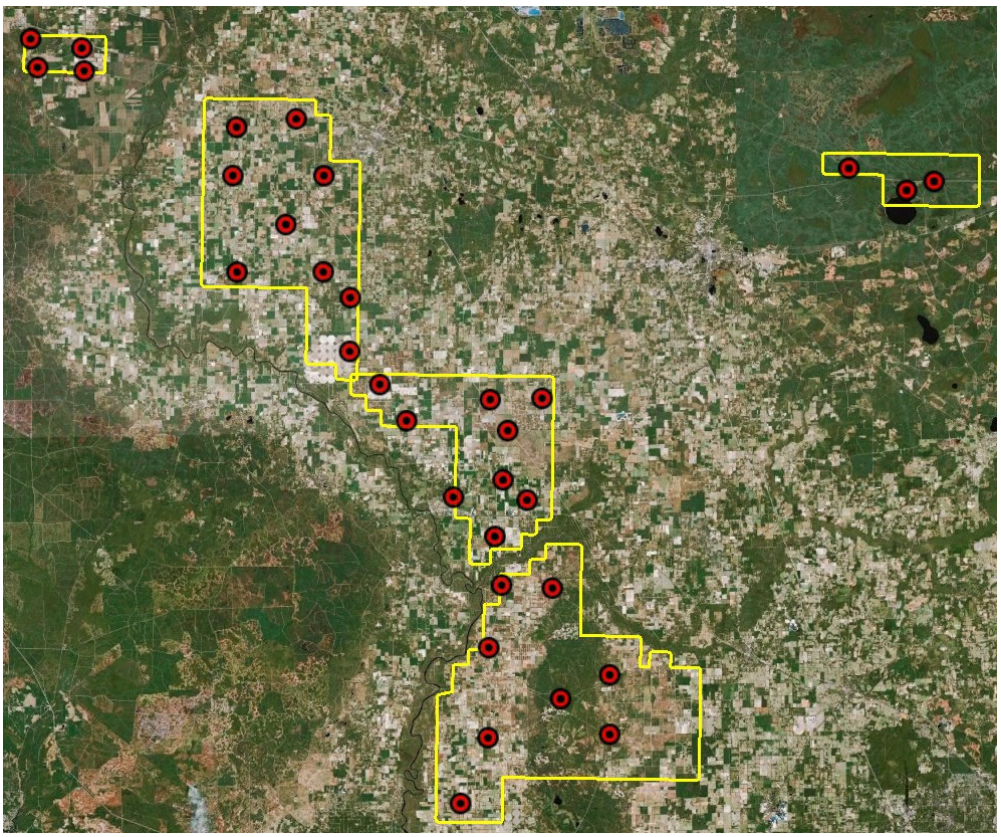

***Figure 2.3.1: Bare Ground Point Distribution***

**Table 2.3.2: Brushland Points**

| POINT NAME | EASTING (M) | NORTHING (M) | ORTHOMETRIC HT. (M) | CODE |
|---|---|---|---|---|
| 171 | 321268.104 | 3308118.825 | 13.418 | BL-04-01A |
| 184 | 326045.258 | 3307786.927 | 22.765 | BL-04-02A |
| 162 | 319566.794 | 3301689.817 | 15.474 | BL-04-03A |
| 117 | 331665.182 | 3298925.25 | 18.021 | BL-04-04A |
| 128 | 326756.168 | 3296592.381 | 22.297 | BL-04-05A |
| 143 | 319356.166 | 3292869.402 | 19.531 | BL-04-06A |
| 108 | 331655.842 | 3292559.226 | 18.639 | BL-04-07A |
| 151 | 316650.663 | 3286256.856 | 14.781 | BL-04-08A |
| 450 | 356698.055 | 3349361.219 | 47.404 | BL-07-01A |
| 434 | 365341.710 | 3347820.913 | 49.025 | BL-07-02A |
| 420 | 362467.387 | 3347042.105 | 48.238 | BL-07-03A |
| 412 | 274473.424 | 3363276.822 | 27.650 | BL-08-01A |
| 394 | 279527.314 | 3362719.478 | 27.215 | BL-08-02A |
| 462 | 275003.080 | 3360932.012 | 28.655 | BL-08-03A |
| 390 | 279904.017 | 3360396.973 | 25.508 | BL-08-04A |
| 367 | 295020.837 | 3354508.385 | 26.128 | BL-56-01A |
| 379 | 301000.571 | 3355215.637 | 28.400 | BL-56-02A |
| 356 | 294584.682 | 3349665.327 | 26.761 | BL-56-03A |
| 345 | 303747.543 | 3349460.247 | 29.264 | BL-56-04A |
| 334 | 299922.742 | 3344561.332 | 25.848 | BL-56-05A |
| 323 | 294858.485 | 3339917.320 | 23.449 | BL-56-06A |
| 312 | 303578.522 | 3339779.762 | 26.981 | BL-56-07A |
| 302 | 306053.405 | 3331729.931 | 24.422 | BL-56-08A |
| 286 | 309221.875 | 3328356.670 | 17.731 | BL-56-09A |
| 248 | 311660.620 | 3324771.410 | 15.473 | BL-56-10A |
| 269 | 320180.570 | 3326718.122 | 23.998 | BL-56-11A |
| 256 | 325381.258 | 3326794.151 | 29.442 | BL-56-12A |
| 244 | 321834.059 | 3323562.886 | 22.268 | BL-56-13A |
| 230 | 321292.289 | 3318688.949 | 17.795 | BL-56-14A |
| 218 | 316278.222 | 3316976.859 | 12.648 | BL-56-15A |
| 211 | 323699.501 | 3316593.797 | 17.571 | BL-56-16A |
| 198 | 320334.247 | 3312897.778 | 15.875 | BL-56-17A |
| 487 | 306134.950 | 3337427.833 | 25.420 | BL-56-18A |

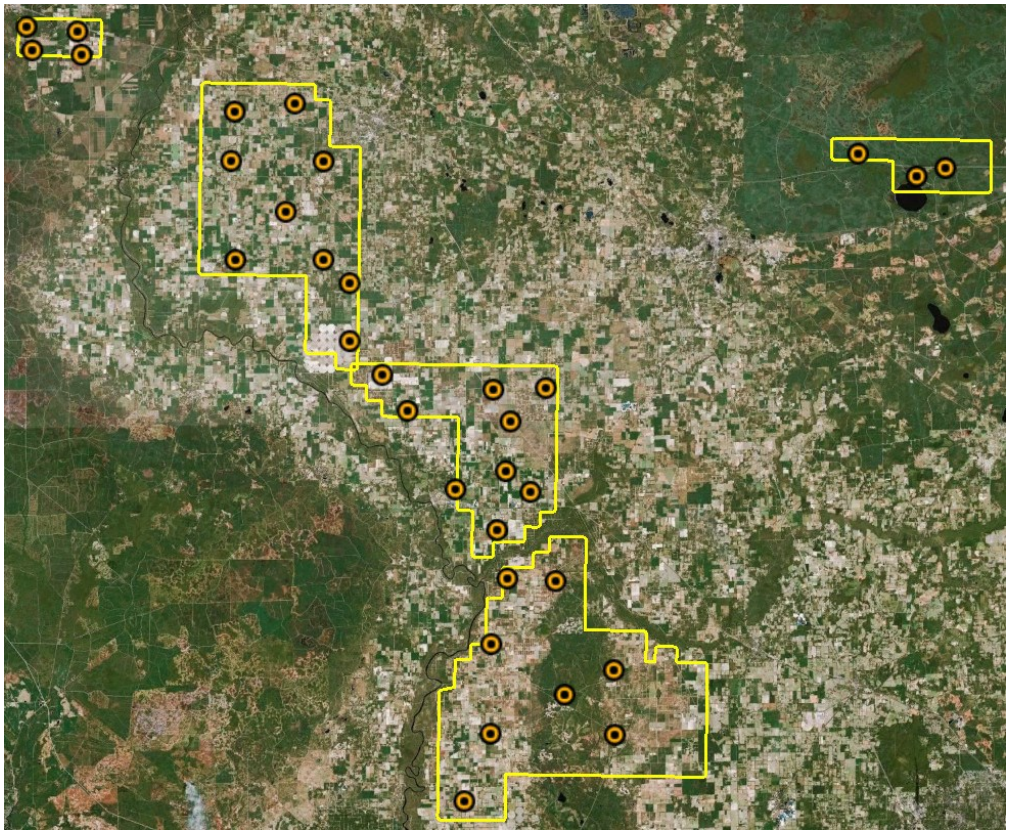

***Figure 2.3.2: Brushland Point Distribution***

**Table 2.3.3: High Grass Points**

| POINT NAME | EASTING (M) | NORTHING (M) | ORTHOMETRIC HT. (M) | CODE |
|---|---|---|---|---|
| 174 | 321302.129 | 3308095.609 | 12.895 | HG-04-01A |
| 181 | 326067.328 | 3307780.207 | 22.848 | HG-04-02A |
| 165 | 319564.101 | 3301758.559 | 14.539 | HG-04-03A |
| 114 | 331698.541 | 3298925.439 | 17.551 | HG-04-04A |
| 125 | 326784.175 | 3296622.373 | 21.706 | HG-04-05A |
| 137 | 319241.742 | 3292767.558 | 20.104 | HG-04-06A |
| 105 | 331674.361 | 3292593.780 | 19.132 | HG-04-07A |
| 154 | 316650.731 | 3286243.955 | 14.726 | HG-04-08A |
| 195 | 320358.415 | 3312911.405 | 16.091 | HG-056-17A |
| 447 | 356742.548 | 3349381.272 | 47.245 | HG-07-01A |
| 426 | 362542.035 | 3347034.615 | 48.441 | HG-07-03A |
| 409 | 274331.628 | 3363782.638 | 28.966 | HG-08-01A |
| 402 | 279061.215 | 3363350.395 | 28.068 | HG-08-02A |
| 415 | 274700.878 | 3362593.656 | 27.277 | HG-08-03A |
| 387 | 279713.992 | 3360331.652 | 24.734 | HG-08-04A |
| 364 | 294999.608 | 3354471.136 | 25.542 | HG-56-01A |

| | | | | |
|---|---|---|---|---|
| 376 | 301090.131 | 3355186.128 | 28.821 | HG-56-02A |
| 353 | 294578.844 | 3349639.254 | 26.691 | HG-56-03A |
| 342 | 303761.701 | 3349456.096 | 28.977 | HG-56-04A |
| 331 | 299867.131 | 3344592.967 | 25.585 | HG-56-05A |
| 320 | 294814.383 | 3339921.770 | 23.280 | HG-56-06A |
| 309 | 303562.233 | 3339777.740 | 27.263 | HG-56-07A |
| 299 | 306055.458 | 3331716.211 | 24.023 | HG-56-08A |
| 289 | 309204.541 | 3328351.267 | 17.903 | HG-56-09A |
| 259 | 325403.237 | 3326777.697 | 29.824 | HG-56-10A |
| 266 | 320148.649 | 3326738.926 | 23.425 | HG-56-11A |
| 277 | 311784.899 | 3324755.165 | 14.921 | HG-56-12A |
| 241 | 321882.055 | 3323582.476 | 21.281 | HG-56-13A |
| 233 | 321237.911 | 3318617.864 | 17.899 | HG-56-14A |
| 221 | 316314.986 | 3316881.520 | 13.494 | HG-56-15A |
| 208 | 323711.643 | 3316588.307 | 17.668 | HG-56-16A |
| 484 | 306194.523 | 3337193.260 | 27.557 | HG-56-18A |

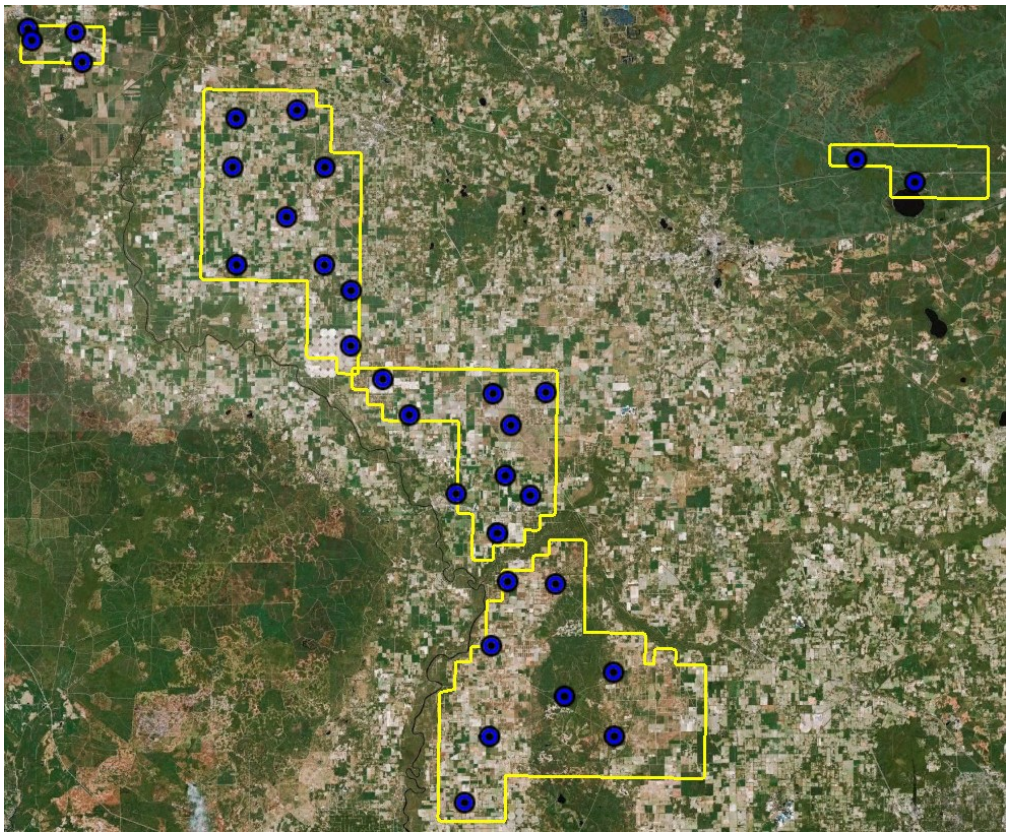

***Figure 2.3.3: High Grass Point Distribution***

**Table 2.3.4: Tree Points**

| POINT NAME | EASTING (M) | NORTHING (M) | ORTHOMETRIC HT. (M) | CODE |
|---|---|---|---|---|
| 1000 | 275047.477 | 3360860.985 | 28.558 | TREE A |
| 1004 | 274371.469 | 3363719.669 | 29.308 | TREE A |
| 1007 | 278932.595 | 3363398.622 | 27.092 | TREE A |
| 1010 | 279667.303 | 3360329.709 | 23.961 | TREE A |
| 1013 | 279760.130 | 3360415.698 | 24.479 | TREE A |
| 1016 | 295060.371 | 3354428.026 | 25.249 | TREE A |
| 1018 | 295056.474 | 3354503.817 | 25.887 | TREE A |
| 1020 | 300865.976 | 3355233.447 | 26.808 | TREE A |
| 1022 | 300930.161 | 3355239.822 | 27.528 | TREE A |
| 1024 | 294528.966 | 3349592.635 | 26.547 | TREE A |
| 1027 | 303760.719 | 3349414.860 | 29.572 | TREE A |
| 1030 | 299829.688 | 3344681.747 | 26.613 | TREE A |
| 1033 | 294787.150 | 3339962.200 | 23.289 | TREE A |
| 1036 | 294860.965 | 3339961.801 | 24.018 | TREE A |
| 1039 | 303402.718 | 3339781.002 | 26.462 | TREE A |
| 1042 | 306037.152 | 3331809.711 | 24.371 | TREE A |
| 1046 | 306137.674 | 3337135.289 | 29.154 | TREE A |
| 1049 | 309001.752 | 3328453.249 | 17.642 | TREE A |
| 1051 | 309091.219 | 3328464.164 | 17.697 | TREE A |
| 1053 | 311631.193 | 3324715.189 | 15.048 | TREE A |
| 1056 | 320124.930 | 3326695.793 | 23.575 | TREE A |
| 1059 | 325293.717 | 3326694.561 | 29.658 | TREE A |
| 1063 | 321846.400 | 3323632.302 | 22.580 | TREE A |
| 1068 | 321353.789 | 3318581.283 | 17.411 | TREE A |
| 1073 | 321348.728 | 3318719.839 | 17.694 | TREE A |
| 1076 | 316267.515 | 3317068.598 | 13.047 | TREE A |
| 1079 | 316207.125 | 3317023.610 | 13.276 | TREE A |
| 1081 | 323643.259 | 3316617.971 | 17.528 | TREE A |
| 1085 | 323728.951 | 3316629.957 | 17.381 | TREE A |
| 1087 | 320480.305 | 3312209.341 | 15.342 | TREE A |
| 1092 | 321386.857 | 3308186.622 | 16.045 | TREE A |
| 1096 | 321343.788 | 3308094.186 | 14.667 | TREE A |
| 1099 | 326078.417 | 3307842.510 | 22.142 | TREE A |
| 1103 | 326034.735 | 3307772.992 | 22.735 | TREE A |
| 1105 | 326067.135 | 3307733.696 | 22.691 | TREE A |
| 1106 | 362443.943 | 3347030.771 | 48.275 | TREE A |
| 1109 | 362408.737 | 3347105.904 | 48.328 | TREE A |
| 1112 | 356705.580 | 3349309.161 | 47.734 | TREE A |
| 1115 | 356632.429 | 3349335.750 | 47.844 | TREE A |
| 1117 | 365296.886 | 3347931.712 | 47.903 | TREE A |
| 1121 | 331678.689 | 3299017.844 | 16.483 | TREE A |
| 1124 | 331692.815 | 3299083.072 | 17.932 | TREE A |
| 1125 | 326805.348 | 3296563.303 | 21.910 | TREE A |
| 1128 | 326754.238 | 3296578.907 | 22.061 | TREE A |
| 1132 | 319510.689 | 3301756.155 | 14.217 | TREE A |
| 1135 | 319609.869 | 3301765.695 | 14.977 | TREE A |
| 1138 | 318686.214 | 3292491.310 | 19.859 | TREE A |

| | | | | |
|---|---|---|---|---|
| 1141 | 318752.723 | 3292538.561 | 20.050 | TREE A |
| 1143 | 316688.011 | 3286350.000 | 15.642 | TREE A |
| 1147 | 331740.023 | 3293515.728 | 21.018 | TREE A |

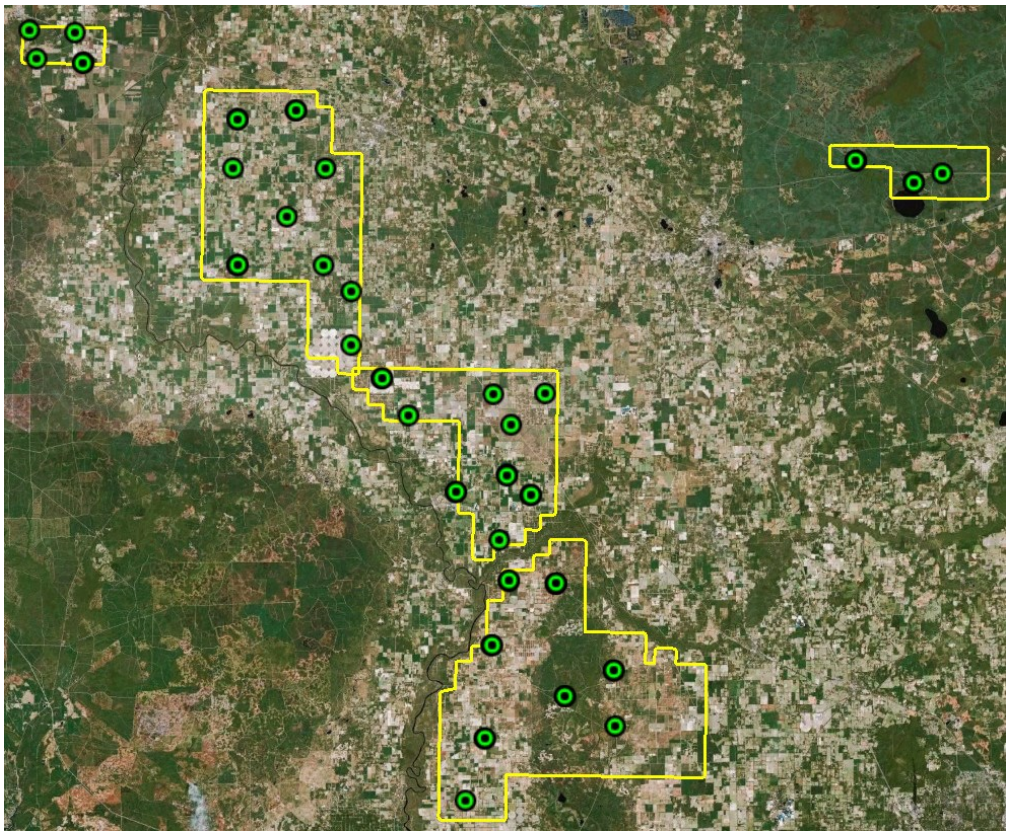

***Figure 2.3.4: Tree Point Distribution***

## 2.4 Vertical Control Point Collection

In addition to the ground classification sampling requirements, points were collected on Bare Ground (BG) in order to adjust the LiDAR data vertically.

### Table 2.4: Vertical Control Points

| POINT NAME | EASTING (M) | NORTHING (M) | ORTHO. HT. (M) | CODE |
|---|---|---|---|---|
| 169 | 321296.214 | 3308144.044 | 14.615 | BG-CONTROL-04-01-01 |
| 180 | 326062.663 | 3307791.939 | 22.866 | BG-CONTROL-04-02-01 |
| 157 | 319568.321 | 3301756.520 | 14.559 | BG-CONTROL-04-03-01 |
| 120 | 331708.913 | 3298962.259 | 17.881 | BG-CONTROL-04-04-01 |
| 131 | 326781.658 | 3296620.340 | 21.681 | BG-CONTROL-04-05-01 |
| 135 | 318745.396 | 3292482.134 | 19.847 | BG-CONTROL-04-06-01 |
| 103 | 331706.363 | 3293016.059 | 23.965 | BG-CONTROL-04-07-01 |
| 146 | 316499.541 | 3286314.997 | 15.244 | BG-CONTROL-04-08-01 |
| 442 | 356710.895 | 3349338.924 | 47.644 | BG-CONTROL-07-01-01 |
| 429 | 365308.871 | 3347877.537 | 49.364 | BG-CONTROL-07-02-01 |
| 418 | 362486.405 | 3347041.493 | 48.731 | BG-CONTROL-07-03-01 |
| 405 | 274326.027 | 3363784.710 | 29.057 | BG-CONTROL-08-01-01 |
| 400 | 279007.525 | 3363391.236 | 28.284 | BG-CONTROL-08-02-01 |
| 454 | 274986.385 | 3360914.652 | 28.809 | BG-CONTROL-08-03-01 |
| 383 | 279686.123 | 3360403.335 | 25.638 | BG-CONTROL-08-04-01 |
| 360 | 295028.798 | 3354477.996 | 26.104 | BG-CONTROL-56-01-01 |
| 372 | 301082.652 | 3355198.508 | 28.762 | BG-CONTROL-56-02-01 |
| 349 | 294561.505 | 3349627.059 | 27.163 | BG-CONTROL-56-03-01 |
| 338 | 303753.510 | 3349453.068 | 29.290 | BG-CONTROL-56-04-01 |
| 327 | 299841.981 | 3344625.941 | 26.660 | BG-CONTROL-56-05-01 |
| 316 | 294828.831 | 3339927.407 | 23.086 | BG-CONTROL-56-06-01 |
| 305 | 303532.639 | 3339810.826 | 27.408 | BG-CONTROL-56-07-01 |
| 292 | 306076.734 | 3331724.937 | 24.085 | BG-CONTROL-56-08-01 |
| 280 | 309193.422 | 3328416.251 | 17.933 | BG-CONTROL-56-09-01 |
| 247 | 311641.269 | 3324751.250 | 15.370 | BG-CONTROL-56-10-01 |
| 262 | 320122.249 | 3326737.629 | 23.091 | BG-CONTROL-56-11-01 |
| 251 | 325392.589 | 3326775.174 | 29.609 | BG-CONTROL-56-12-01 |
| 236 | 321786.627 | 3323598.833 | 24.256 | BG-CONTROL-56-13-01 |
| 225 | 321238.975 | 3318634.434 | 18.168 | BG-CONTROL-56-14-01 |
| 214 | 316287.201 | 3317028.926 | 12.622 | BG-CONTROL-56-15-01 |
| 203 | 323714.537 | 3316595.393 | 17.715 | BG-CONTROL-56-16-01 |
| 201 | 320427.193 | 3312335.833 | 14.330 | BG-CONTROL-56-17-01 |
| 479 | 306172.125 | 3337185.111 | 28.364 | BG-CONTROL-56-18-01 |

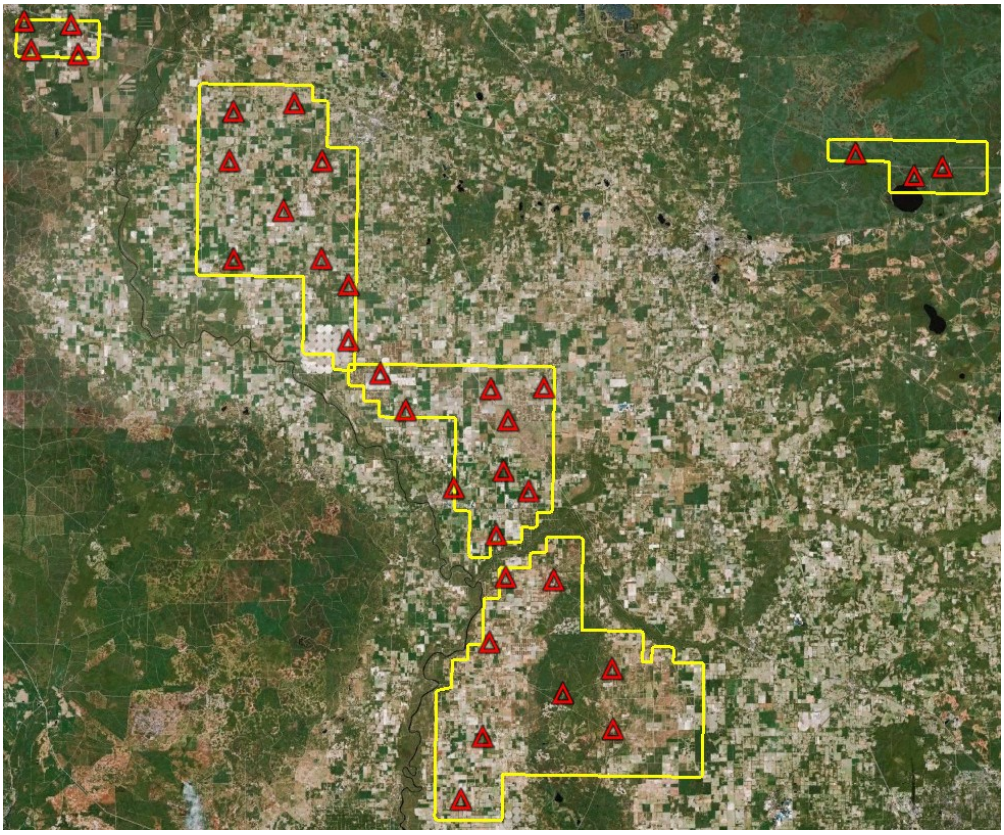

***Figure 2.4: Vertical Control Point Distribution***

## *Appendix A*

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**********************************************************************
AR1798  DESIGNATION -  A 175
AR1798  PID         -  AR1798
AR1798  STATE/COUNTY-  FL/ALACHUA
AR1798  COUNTRY     -  US
AR1798  USGS QUAD   -  HIGH SPRINGS (1993)
AR1798
AR1798                    *CURRENT SURVEY CONTROL
AR1798
_____________________________________________________________________________
AR1798* NAD 83(2011) POSITION- 29 47 19.83109(N) 082 30 32.80965(W)   ADJUSTED
AR1798* NAD 83(2011) ELLIP HT-    12.324 (meters)       (06/27/12)   ADJUSTED
AR1798* NAD 83(2011) EPOCH   -  2010.00
AR1798* NAVD 88 ORTHO HEIGHT -    40.4    (meters)     133.    (feet) VERTCON
AR1798
_____________________________________________________________________________
AR1798  GEOID HEIGHT    -       -27.94  (meters)                GEOID12A
AR1798  NAD 83(2011) X  -    722,232.736 (meters)                 COMP
AR1798  NAD 83(2011) Y  - -5,492,653.512 (meters)                 COMP
AR1798  NAD 83(2011) Z  -  3,150,087.274 (meters)                 COMP
AR1798  LAPLACE CORR    -         0.55  (seconds)               DEFLEC12A
AR1798
AR1798  FGDC Geospatial Positioning Accuracy Standards (95% confidence, cm)
AR1798  Type                              Horiz  Ellip  Dist(km)
AR1798  ----------------------------------------------------------------
AR1798  NETWORK                             2.11   2.96
AR1798  ----------------------------------------------------------------
AR1798  MEDIAN LOCAL ACCURACY AND DIST (008 points)   2.17   2.80      6.18
AR1798  ----------------------------------------------------------------
AR1798  NOTE: Click here for information on individual local accuracy
AR1798  values and other accuracy information.
AR1798
AR1798
AR1798.The horizontal coordinates were established by GPS observations
AR1798.and adjusted by the National Geodetic Survey in June 2012.
AR1798
AR1798.NAD 83(2011) refers to NAD 83 coordinates where the reference
AR1798.frame has been affixed to the stable North American tectonic plate. See
AR1798.NA2011 for more information.
AR1798
AR1798.The horizontal coordinates are valid at the epoch date displayed above
AR1798.which is a decimal equivalence of Year/Month/Day.
AR1798
AR1798.The NAVD 88 height was computed by applying the VERTCON shift value to
AR1798.the NGVD 29 height (displayed under SUPERSEDED SURVEY CONTROL.)
AR1798
AR1798.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AR1798
AR1798.The Laplace correction was computed from DEFLEC12A derived deflections.
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AR1798
AR1798.The ellipsoidal height was determined by GPS observations
AR1798.and is referenced to NAD 83.
AR1798
AR1798. The following values were computed from the NAD 83(2011) position.
AR1798
AR1798;  North  East  Units Scale Factor Converg.
AR1798;SPC FL N  -  89,121.699  792,483.037  MT  0.99997010  +1 00 01.7
AR1798;SPC FL N  -  292,393.44  2,600,004.76  sFT  0.99997010  +1 00 01.7
AR1798;UTM  17  - 3,296,342.202  354,133.712  MT  0.99986252  -0 44 59.5
AR1798
AR1798!  - Elev Factor  x  Scale Factor =  Combined Factor
AR1798!SPC FL N  -  0.99999806  x  0.99997010  =  0.99996816
AR1798!UTM  17  -  0.99999806  x  0.99986252  =  0.99986058
AR1798
AR1798  SUPERSEDED SURVEY CONTROL
AR1798
AR1798  NAD 83(2007)-  29 47 19.83104(N)  082 30 32.81036(W) AD(  ) 0
AR1798  ELLIP H (02/10/07)  12.350  (m)  GP(  )
AR1798  NAD 83(1999)-  29 47 19.83148(N)  082 30 32.81053(W) AD(  ) 2
AR1798  ELLIP H (06/12/02)  12.323  (m)  GP(  ) 4 1
AR1798  NAD 83(1990)-  29 47 19.82997(N)  082 30 32.80972(W) AD(  ) 2
AR1798  ELLIP H (05/01/91)  12.386  (m)  GP(  ) 4 1
AR1798  NAD 83(1986)-  29 47 19.83815(N)  082 30 32.81359(W) AD(  ) 2
AR1798  NGVD 29 (11/17/89)  40.7  (m)  RAPSU86 model used  GPS OBS
AR1798
AR1798.Superseded values are not recommended for survey control.
AR1798
AR1798.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AR1798.See file dsdata.txt to determine how the superseded data were derived.
AR1798
AR1798_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RLN5413396342(NAD 83)
AR1798
AR1798_MARKER: DD = SURVEY DISK
AR1798_SETTING: 2 = OBJECT DRIVEN INTO GROUND
AR1798_SP_SET: OBJECT DRIVEN INTO GROUND
AR1798_MAGNETIC: B = BAR MAGNET IMBEDDED IN MONUMENT
AR1798_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY
AR1798_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AR1798+SATELLITE: SATELLITE OBSERVATIONS - April 23, 2012
AR1798
AR1798  HISTORY  - Date  Condition  Report By
AR1798  HISTORY  - 1988  MONUMENTED  PMC
AR1798  HISTORY  - 20120423 GOOD  INDIV
AR1798
AR1798  STATION DESCRIPTION
AR1798
AR1798'DESCRIBED BY PERRY C MCGRIFF COMPANY 1988 (LC)
AR1798'THE STATION IS LOCATED ABOUT 22.5 KM (14.0 MI)
AR1798'NORTHWEST OF GAINESVILLE.
AR1798'OWNERSHIP--SW 1ST AVE R/W.
AR1798'
AR1798'TO REACH THE STATION FROM THE INTERSECTION OF U.S. 441 AND

AR1798'ACR 241/235 (SE 1ST STREET) IN ALACHUA, GO SOUTH FOR
AR1798'0.3 KM (0.2 MI) ON ACR 241/235 TO SE 1ST AVE,
AR1798'TURN RIGHT AND GO WEST FOR 0.6 KM (0.4 MI) ON SE 1ST TO SW 4TH
AR1798'STREET, (SE 1ST AVE BECOMES SW 1ST AVE AT SOUTH MAIN STREET),
AR1798'CONTINUE WEST FOR 0.8 KM (0.5 MI) ON SW 1ST AVE TO COLONIAL HEIGHTS
AR1798'SUBDIVISION AND THE STATION. THE STATION IS AT THE NORTHEAST
AR1798'CORNER OF AN INTERSECTION, WEST 7.6 METERS (25 FT) OF THE
AR1798'CENTERLINE OF SE 1ST AVE, NORTHEAST 1.2 METERS (4 FT) OF A LIGHT
AR1798'POLE, SOUTHWEST 0.6 METERS (2 FT) OF A TELEPHONE PEDESTAL, AND
AR1798'WEST 0.9 METERS (3 FT) OF A CABLE TV BOX.
AR1798'
AR1798'THE STATION IS A STANDARD AC GIS DISK
AR1798'STAMPED---STATION A175---,
AR1798'SET INTO THE GROUND 18 FT TO REFUSAL (6 IN PVC SLEEVE)
AR1798'18.56 METERS (60.88 FT) NORTHWEST FROM A NAIL AND CAP (NO 3765) SET
AR1798'IN POWER POLE,
AR1798'47.37 METERS (155.41 FT) SOUTHWEST FROM A NAIL AND CAP (NO 3765)
AR1798'SET IN 10 IN PINE,
AR1798'16.96 METERS (55.65 FT) SOUTHEAST FROM A NAIL AND CAP (NO 3765) SET
AR1798'IN 8 IN PINE,
AR1798'4.86 METERS (15.95 FT) NORTHEAST FROM A NAIL AND CAP (NO 3765) SET
AR1798'IN ASPHALT DRIVEWAY,
AR1798'0.2 METERS (0.7 FT) NORTH FROM A CARSONITE WITNESS POST SET.
AR1798'
AR1798'AZIMUTH MARK NO. 1 IS A STANDARD AC GIS DISK
AR1798'STAMPED---AZIMUTH A176---,
AR1798'SET INTO THE GROUND 27 FT TO REFUSAL (6 IN PVC SLEEVE)
AR1798'28.61 METERS (93.85 FT) NORTH FROM A NAIL AND CAP (NO 3765) SET IN
AR1798'40 IN OAK,
AR1798'20.67 METERS (67.80 FT) NORTHEAST FROM A NAIL AND CAP (NO 3765) SET
AR1798'IN 6 IN DOGWOOD,
AR1798'21.30 METERS (69.87 FT) SOUTH FROM A NAIL AND CAP (NO 3765) SET IN
AR1798'36 IN OAK,
AR1798'14.20 METERS (46.57 FT) NORTHWEST FROM A NAIL AND CAP (NO 3765) SET
AR1798'IN 12 IN CEDAR,
AR1798'0.2 METERS (0.8 FT) EAST FROM A CARSONITE WITNESS POST SET.
AR1798'TO REACH THE AZIMUTH FROM THE STATION,
AR1798'GO NORTHEAST FOR 0.8 KM (0.5 MI) ON SW 1ST AVE TO SW 4TH STREET,
AR1798'TURN RIGHT AND GO SOUTHEAST TO SW 3RD AVE, THE AZIMUTH MARK IS
AR1798'46.0 METERS (151 FT) SOUTH OF THE CENTERLINE OF SW 3RD AVE,
AR1798'5.5 METERS (18 FT) WEST OF THE CENTERLINE OF SW 4TH STREET AT THE
AR1798'ALACHUA COUNTY COMMUNITY CENTER SITE.
AR1798
AR1798 STATION RECOVERY (2012)
AR1798
AR1798'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2012 (MLH)
AR1798'RECOVERED AS DUE TO NEW STREET NAMES. NEW TO REACH DESCRIPTION
IS AS
AR1798'FOLLOWS,
AR1798'TO REACH THE STATION FROM THE INTERSECTION OF U.S. HIGHWAY 441 AND
AR1798'STATE ROADS 241/235 (NW 140TH STREET) IN ALACHUA, GO SOUTH ON STATE
AR1798'ROAD 241/235 FOR 0.25 MILES TO NW 147TH AVENUE, TURN RIGHT (WEST) ON
AR1798'NW 147TH AVENUE FOR 0.85 MILES TO NW 154TH TERRACE,

AR1798'BEAR LEFT (SOUTHWEST) ONTO NW 154TH TERRACE FOR 0.10 MILES TO NW 145TH
AR1798'PLACE AND STATION ON THE RIGHT. STATION IS NORTHWEST OF NW 154TH
AR1798'TERRACE AND SOUTHWEST OF NW 145TH PLACE. REFERENCES FOUND AS DESCRIBED
AR1798'AND A NEW CARSONITE POST WAS SET 0.8 FEET SOUTHEAST FROM STATION.

BD1035 **********
BD1035 DESIGNATION - STEINRIED AZ MK
BD1035 PID - BD1035
BD1035 STATE/COUNTY- FL/COLUMBIA
BD1035 COUNTRY - US
BD1035 USGS QUAD - LAKE CITY WEST (1993)
BD1035
BD1035 *CURRENT SURVEY CONTROL
BD1035

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BD1035* NAD 83(1990) POSITION- 30 09 24.41448(N) 082 41 21.38288(W) ADJUSTED
BD1035* NAVD 88 ORTHO HEIGHT - 42.956 (meters) 140.93 (feet) ADJUSTED
BD1035

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BD1035 LAPLACE CORR - -0.47 (seconds) DEFLEC12A
BD1035 GEOID HEIGHT - -28.10 (meters) GEOID12A
BD1035 DYNAMIC HEIGHT - 42.900 (meters) 140.75 (feet) COMP
BD1035 MODELED GRAVITY - 979,320.7 (mgal) NAVD 88
BD1035
BD1035 HORZ ORDER - SECOND
BD1035 VERT ORDER - SECOND CLASS 0
BD1035
BD1035.The horizontal coordinates were established by classical geodetic methods
BD1035.and adjusted by the National Geodetic Survey in May 1991.
BD1035.
BD1035.The orthometric height was determined by differential leveling and
BD1035.adjusted by the NATIONAL GEODETIC SURVEY
BD1035.in June 1991.
BD1035
BD1035.The Laplace correction was computed from DEFLEC12A derived deflections.
BD1035
BD1035.The dynamic height is computed by dividing the NAVD 88
BD1035.geopotential number by the normal gravity value computed on the
BD1035.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
BD1035.degrees latitude (g = 980.6199 gals.).
BD1035
BD1035.The modeled gravity was interpolated from observed gravity values.
BD1035
BD1035. The following values were computed from the NAD 83(1990) position.
BD1035
BD1035; North East Units Scale Factor Converg.
BD1035;SPC FL N - 129,611.229 774,418.707 MT 0.99994845 +0 54 35.8

BD1035;SPC FL N - 425,232.84 2,540,738.71 sFT 0.99994845 +0 54 35.8
BD1035;UTM 17 - 3,337,363.252 337,318.479 MT 0.99992652 -0 50 55.8
BD1035
BD1035! - Elev Factor x Scale Factor = Combined Factor
BD1035!SPC FL N - 0.99999767 x 0.99994845 = 0.99994612
BD1035!UTM 17 - 0.99999767 x 0.99992652 = 0.99992419
BD1035
BD1035|----------|
BD1035| PID Reference Object Distance Geod. Az |
BD1035| dddmmss.s |
BD1035| BD1031 I75 71 A14 334.145 METERS 04520 |
BD1035| BD1032 STEINRIED 339.440 METERS 04755 |
BD1035|----------|
BD1035
BD1035 SUPERSEDED SURVEY CONTROL
BD1035
BD1035 NAD 83(1986)- 30 09 24.42246(N) 082 41 21.38917(W) AD( ) 2
BD1035 NAD 27 - 30 09 23.58428(N) 082 41 21.94330(W) AD( ) 2
BD1035 NGVD 29 (??/??/92) 43.202 (m) 141.74 (f) ADJ UNCH 2 0
BD1035
BD1035.Superseded values are not recommended for survey control.
BD1035
BD1035.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
BD1035.See file dsdata.txt to determine how the superseded data were derived.
BD1035
BD1035_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RLP3731837363(NAD 83)
BD1035
BD1035_MARKER: DZ = AZIMUTH MARK DISK
BD1035_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
BD1035_SP_SET: SET IN TOP OF CONCRETE MONUMENT
BD1035_STAMPING: STEINRIED AZIMUTH 1932
BD1035_MARK LOGO: CGS
BD1035_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
BD1035+STABILITY: SURFACE MOTION
BD1035_SATELLITE: THE SITE LOCATION WAS REPORTED AS NOT SUITABLE FOR
BD1035+SATELLITE: SATELLITE OBSERVATIONS - January 13, 2005
BD1035
BD1035 HISTORY - Date Condition Report By
BD1035 HISTORY - 1932 MONUMENTED CGS
BD1035 HISTORY - 1972 GOOD FLDT
BD1035 HISTORY - 1975 GOOD FLDT
BD1035 HISTORY - 20050113 GOOD GEOCAC
BD1035
BD1035 STATION DESCRIPTION
BD1035
BD1035'DESCRIBED BY COAST AND GEODETIC SURVEY 1932
BD1035'AZIMUTH MARK IS A REFERENCE MARK DISK STAMPED STEINRIED AZIMUTH
1932
BD1035'SET IN THE TOP OF A 10-INCH SQUARE CONCRETE MONUMENT THAT
PROJECTS 8
BD1035'INCHES ABOVE THE GROUND SURFACE.
BD1035
BD1035 STATION RECOVERY (1972)

BD1035
BD1035'RECOVERY NOTE BY FLORIDA DEPARTMENT OF TRANSPORTATION 1972
BD1035'4.5 MI SW FROM LAKE CITY.
BD1035'ABOUT 0.8 MILE SOUTHWEST ALONG STATE ROUTE 247 FROM THE SR
BD1035'247 BRIDGE OVER INTERSTATE ROUTE 10, ON NORTHWEST SIDE OF
BD1035'HIGHWAY. 0.8 FEET EAST OF A METAL WITNESS POST AND 48.3 FEET
BD1035'NORTH OF CENTERLINE OF SR 247. A BRASS DISK, SET IN TOP OF
BD1035'A SQUARE CONCRETE MONUMENT THAT PROJECTS 6 INCHES ABOVE THE
BD1035'GROUND. THIS MONUMENT IS THE AZIMUTH MARK FOR TRIANGULATION
BD1035'STATION STEINRIED 1932. SECTION 11, T 4S, R 16E
BD1035
BD1035 STATION RECOVERY (1975)
BD1035
BD1035'RECOVERY NOTE BY FLORIDA DEPARTMENT OF TRANSPORTATION 1975
BD1035'RECOVERED IN GOOD CONDITION.
BD1035
BD1035 STATION RECOVERY (2005)
BD1035
BD1035'RECOVERY NOTE BY GEOCACHING 2005 (WD)
BD1035'THE CONCRETE MONUNMENT IN WHICH THE MARK IS SET NOW PROJECTS 1.0 FEET
BD1035'ABOVE THE SURFACE, THE MARK IS ABOUT 2.0 FEET ABOVE THE LEVEL OF STATE
BD1035'HIGHWAY, AND ACROSS THE HIGHWAY FROM AND ON THE EXTENDED CENTERLINE OF
BD1035'KIRBY AVE.