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SURVEYOR'S REPORT

Specific Purpose Survey of the United States
Geological Survey Well **STL 175**
in
St Lucie County, Florida

Prepared for:

South Florida Water Management District

3301 Gun Club Road
West Palm Beach, Florida 33406

Prepared by:

Peter Andersen, PSM, Vice President

Florida Professional Surveyor and Mapper
License Number 5199
State of Florida

GCY, Inc. LB 4108
PO Box 1469/1505 SW Martin Highway
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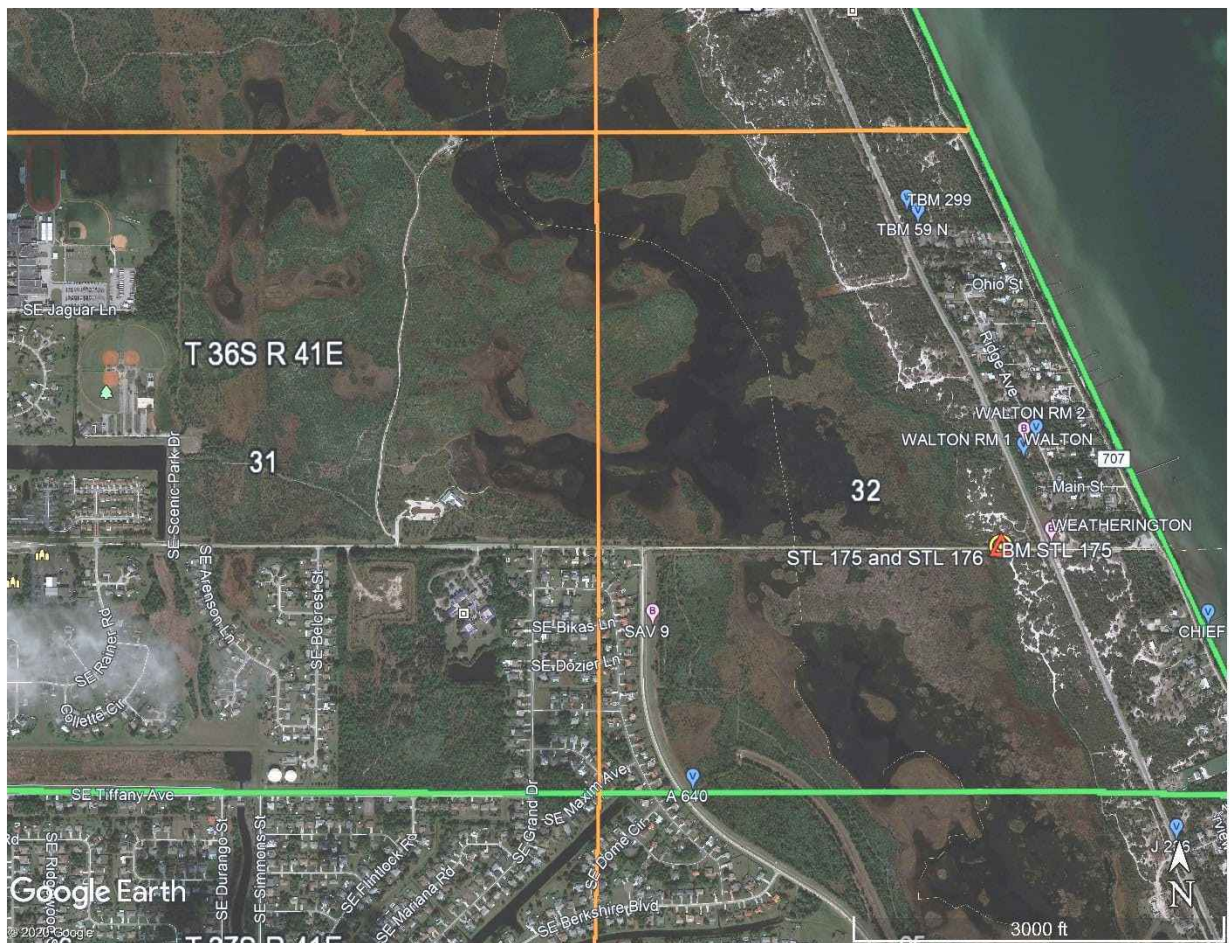
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PURPOSE

The Purpose of this survey is to set an Elevation Referenced Mark (Benchmark) using the guidelines for a National Geodetic Survey (NGS), Class "C" concrete monument and to establish a North American Vertical Datum of 1988 (NAVD 88) on said Benchmark and on an additional Reference Point with a Brass Plate, both at United States Geological Survey Well "STL 175".

LOCATION OF PROJECT

The United States Geological Survey Well "STL 175" is located in the Section 32, Township 36 South, Range 41 East, St Lucie County, Florida.



General Location (Not to Scale)



PROJECT VERTICAL DATUM

The project vertical datum is the North American Vertical Datum (NAVD) of 1988.

To convert the NAVD 88 elevation to the National Geodetic Vertical Datum (NGVD) of 1929 at **Station STL 175 add 1.483**. These values are based on Corpscon 6.0.1, a U.S. Army Corps of Engineers, Engineering Research and Development Center Windows based program to convert coordinates and elevations between datums using the updated vertcon05.txt and the vertcone.05 files supplied by the U.S Army Corps of Engineers. South Atlantic Division, Jacksonville, Florida.

PROJECT HORIZONTAL DATUM

The project horizontal datum is the State Plane Coordinate System, Florida East Zone, North American Datum 83, adjustment of 2011.

LEVELING METHODS

The leveling for this project was performed in accordance with standard survey practice using conventional third order methods, techniques and equipment.

The allowable error on this project meets or exceeds closures as required by SFWMD (.02 v miles) per executed SOW for 4600003703 WO07. Leveling was run from National Geodetic Survey (NGS) monument "WEATHERINGTON" (NGS PID AA5069) through the site benchmark and closing on the National Geodetic Survey (NGS) monument "WALTON RM2" (NGS PID AF3194). Leveling was done using a Leica DNA 10 digital level S/N 331745

GPS METHODS

Latitude and longitude for the New Benchmark "STL 175" were established by observing a 4.5-hour Static Sessions on February 26, 2020 using a Trimble 5700 dual frequency receiver S/N 0220381397. The data from these sessions was sent to the NGS "OPUS" site for post processing on April 28, 2020 and the reports were received from the "OPUS" site the same day.



Surveyors' Notes:

1. All measurements herein are in United States Survey feet and decimal thereof, unless otherwise specified.
2. Underground utilities were not located as part of this survey.
3. This survey report or copies thereof are not valid without the original signature and seal of a Florida licensed Surveyor and Mapper.
4. Additions or deletions to this survey report by other than the signing party (or parties) is prohibited without written consent of the signing party (or parties).
5. To convert from NAVD 88 to NGVD 29 add 1.483 feet. This value is based on Corpscon 6.0.1 a U.S. Army Corps of Engineers Engineering Research and Development Center Topographic Engineering Center Alexandria, Virginia Windows-based program to convert coordinates and elevations between datum's using vertcon05.txt and vertcon05.05 files supplied by the U.S. Army Corps of Engineers South Atlantic Division, Jacksonville Fl.
6. Date of last field work: February 26, 2020, GCY job No. 18-1020-07.
7. SFWMD Data records (on file at the District's headquarters):
 - A. Electronic Data files:
Miscellaneous picture files
Digital level run
File names: XXXXXX.DAT
 - B. Conventional reporting
Field Book: 1862 pages 56-61

SURVEYOR'S CERTIFICATION

In my professional opinion this Specific Purpose Survey meets applicable portions of the Standards of Practice set forth by the Florida Board of Professional Surveyors and Mappers in Chapter 5J-17, Florida Administrative Code. This report is prepared for the sole and specific use of the South Florida Water Management District and is not assignable.

February 26, 2020

Last date of Survey



Peter Andersen, PSM, Vice President
Florida Professional Surveyor and Mapper
License Number 5199
State of Florida
GCY, Inc. LB No 4108

NOTE:

This is an electronically signed and sealed document pursuant to Chapter 5J-17.062, Florida Administrative Code. The printed survey map or report or copies thereof are not valid without the original signature and seal of a Florida licensed surveyor or mapper.





SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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U.S.G.S. Station Name: STL 175	U.S.G.S. Station Number: UNKOWN	Agency: GCY, INC.	Date of Field Work: 2/26/2020
Party Chief: LAPOLLA	Field Book: GCY 1862	Page(s): 56-61	Report Prepared by: ANDERSEN

SITE SPECIFIC DATA

Site Benchmark: STL 175	Benchmark Elevation(s) (NAVD88): 17.759	Corpscon 6.0.1 Conversion Factor (NAVD88 to NGVD29) + 1.483	
Well Reference Elevation (NAVD88): 17.094	DTW: 9.70 (02/ 26/ 2020 at 2:31 PM)	Ground Elevation (NAVD88): 17.7	Pad Elevation (NAVD88): N/A

GEOGRAPHIC DATA

Section 32	Township 36 S	Range 41 E
Well Latitude: 27° 17' 55.4893" N	Well Longitude: 80° 15' 28.4499" W	Location Source: RTK GPS
State Plane Coordinates:	Northing (Y) = 1078486.136	Easting (X) = 897170.171

Notes: NAVD88 – North American Vertical Datum of 1988; NGVD29- National Geodetic Vertical Datum of 1929; **Corpscon 6.0.1** - A U.S. Army Corps of Engineers Engineering Research and Development Center Topographic Engineering Center Alexandria, Virginia Windows-based program to convert coordinates and elevations between datum's using vertcon05.txt and vertcon05.05 files supplied by the U.S. Army Corps of Engineers South Atlantic Division, Jacksonville FL.

PICTURES

Aerial of Overall Well Site

Benchmark "STL 175"
 Latitude: **27° 17' 55.63936" N**
 Longitude: **80° 15' 28.57158" W**
 El. =**17.759 feet NAVD88**

Not to scale (GoogleEarth product)



Well Site and Well Head



Well: "STL 175"
Reference Point: CHISEL MARK SE
SIDE 4" PIPE

Reference Point El. =**17.094**
feet NAVD88

Distance to Water =**9.70**
feet from reference point
(02/ 26/ 2020 at 2:41 PM)





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New Aluminum Tag





SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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USGS RMs



Site BM RM-3:



NAVD88 EL = 18.988



Site BM RM-2:



NAVD88 EL = 17.747



Site BM RM-1:



NAVD88 EL = 17.360



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Site Benchmark

Site Benchmark Overall Photo



Site BM:



Latitude: 27° 17' 55.63936" N
Longitude: 80° 15' 28.57158" W
NAVD88 EL = 17.759





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Source Benchmarks



WEATHERINGTON, AA5069, 3, 20060817

Source BM – “WEATHERINGTON”



Latitude: 27° 17' 55.62811" N
Longitude: 80° 15' 24.14800" W
NAVD88 EL = 28.783



WALTON RM 2, AF3194, 2, 20060817

Source BM – “WALTON RM 2”



Latitude: 27° 17' 54.7" N
Longitude: 80° 15' 24.6" W
NAVD88 EL = 40.095



“WEATHERINGTON” Benchmark Datasheet (1 OF 3)

5/11/2020

DATASHEETS

The NGS Data Sheet

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

PROGRAM = datasheet95, VERSION = 8.12.5.7

Starting Datasheet Retrieval...

1 National Geodetic Survey, Retrieval Date = MAY 11, 2020

AA5069 *****

AA5069 DESIGNATION - WEATHERINGTON

AA5069 PID - AA5069

AA5069 STATE/COUNTY- FL/ST LUCIE

AA5069 COUNTRY - US

AA5069 USGS QUAD - ANKONA (2018)

AA5069

*CURRENT SURVEY CONTROL

AA5069

AA5069* NAD 83(2011) POSITION- 27 17 55.62811(N) 080 15 24.14800(W) ADJUSTED

AA5069* NAD 83(2011) ELLIP HT- -18.773 (meters) (06/27/12) ADJUSTED

AA5069* NAD 83(2011) EPOCH - 2010.00

AA5069* NAVD 88 ORTHO HEIGHT - 8.773 (meters) 28.78 (feet) ADJUSTED

AA5069

AA5069 GEOID HEIGHT - -27.568 (meters) GEOID18

AA5069 NAD 83(2011) X - 959,855.727 (meters) COMP

AA5069 NAD 83(2011) Y - -5,589,952.232 (meters) COMP

AA5069 NAD 83(2011) Z - 2,907,666.373 (meters) COMP

AA5069 LAPLACE CORR - -2.66 (seconds) DEFLEC18

AA5069 DYNAMIC HEIGHT - 8.759 (meters) 28.74 (feet) COMP

AA5069 MODELED GRAVITY - 979,131.5 (mgal) NAVD 88

AA5069

AA5069 VERT ORDER - FIRST CLASS II

AA5069

AA5069 Network accuracy estimates per FGDC Geospatial Positioning Accuracy

Standards:

AA5069 FGDC (95% conf, cm) Standard deviation (cm) CorrNE

AA5069 Horiz Ellip SD_N SD_E SD_h (unitless)

AA5069 NETWORK 0.80 0.84 0.34 0.31 0.43 0.06971765

AA5069

AA5069 Click [here](#) for local accuracies and other accuracy information.

AA5069

AA5069

AA5069.The horizontal coordinates were established by GPS observations

AA5069.and adjusted by the National Geodetic Survey in June 2012.

AA5069

AA5069.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has

AA5069.been affixed to the stable North American tectonic plate. See

AA5069.[NA2011](#) for more information.

AA5069

AA5069.The horizontal coordinates are valid at the epoch date displayed above

AA5069.which is a decimal equivalence of Year/Month/Day.

AA5069

AA5069.The orthometric height was determined by differential leveling and

AA5069.adjusted by the NATIONAL GEODETIC SURVEY

AA5069.in November 2008.

AA5069

AA5069.No vertical observational check was made to the station.

AA5069

AA5069.Significant digits in the geoid height do not necessarily reflect accuracy.

AA5069.GEOID18 height accuracy estimate available [here](#).

AA5069



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"WEATHERINGTON" Benchmark Datasheet (2 OF 3)

5/11/2020

DATASHEETS

AA5069.Click [photographs](#) - Photos may exist for this station.
AA5069
AA5069.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AA5069
AA5069.The Laplace correction was computed from DEFLEC18 derived deflections.
AA5069
AA5069.The ellipsoidal height was determined by GPS observations
AA5069.and is referenced to NAD 83.
AA5069
AA5069.The dynamic height is computed by dividing the NAVD 88
AA5069.geopotential number by the normal gravity value computed on the
AA5069.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AA5069.degrees latitude ($g = 980.6199$ gals.).
AA5069
AA5069.The modeled gravity was interpolated from observed gravity values.
AA5069
AA5069. The following values were computed from the NAD 83(2011) position.
AA5069
AA5069;
North East Units Scale Factor Converg.
AA5069;SPC FL E - 328,728.192 273,576.280 MT 1.00000798 +0 20 27.3
AA5069;SPC FL E - 1,078,502.41 897,558.18 sFT 1.00000798 +0 20 27.3
AA5069;UTM 17 - 3,019,748.013 573,551.176 MT 0.99966678 +0 20 27.3
AA5069
AA5069!
- Elev Factor x Scale Factor = Combined Factor
AA5069!SPC FL E - 1.00000295 x 1.00000798 = 1.00001093
AA5069!UTM 17 - 1.00000295 x 0.99966678 = 0.99966973
AA5069
AA5069_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNL7355119748(NAD 83)
AA5069
AA5069
SUPERSEDED SURVEY CONTROL
AA5069
AA5069 NAD 83(2007)- 27 17 55.62816(W) 080 15 24.14863(W) AD(2002.00) 0
AA5069 ELLIP H (02/10/07) -18.751 (m) GP(2002.00)
AA5069 NAD 83(1999)- 27 17 55.62840(W) 080 15 24.14886(W) AD() 1
AA5069 ELLIP H (06/19/01) -18.740 (m) GP() 4 1
AA5069 NAD 83(1990)- 27 17 55.62712(W) 080 15 24.14784(W) AD() 1
AA5069 ELLIP H (03/31/95) -18.689 (m) GP() 4 1
AA5069 NAVD 88 (03/31/95) 8.8 (m) GEOID93 model used GPS OBS
AA5069
AA5069.Superseded values are not recommended for survey control.
AA5069
AA5069.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AA5069.See file [dsdata.pdf](#) to determine how the superseded data were derived.
AA5069
AA5069_MARKER: DD = SURVEY DISK
AA5069_SETTING: 9 = SET IN PREFABRICATED CONCRETE POST IMBEDDED IN GROUND
AA5069_STAMPING: GCY INC GPS WEATHERINGTON
AA5069_MARK LOGO: GCYI
AA5069_PROJECTION: RECESSED 8 CENTIMETERS
AA5069_MAGNETIC: R = STEEL ROD IMBEDDED IN MONUMENT
AA5069_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY
AA5069_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AA5069+SATELLITE: SATELLITE OBSERVATIONS - January 17, 2008
AA5069
AA5069 HISTORY - Date Condition Report By
AA5069 HISTORY - 1991 MONUMENTED GCYI
AA5069 HISTORY - 19930913 GOOD GENGRP
AA5069 HISTORY - 20050604 GOOD GCYI
AA5069 HISTORY - 20060829 GOOD FLDEP
AA5069 HISTORY - 20080117 GOOD GCYI
AA5069
AA5069
STATION DESCRIPTION
AA5069
AA5069'DESCRIBED BY G.C.Y., INCORPORATED 1991 (GCY)
AA5069'IN ST. LUCIE COUNTY, SOUTH ON MIDPORT RD. FROM THE U.S. POST OFFICE

https://www.ngs.noaa.gov/cgi-bin/ds_mark.prl?PidBox=AA5069

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"WEATHERINGTON" Benchmark Datasheet (3 OF 3)

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DATASHEETS

AA5069' 0.15 MI (0.24 KM) TO PORT ST. LUCIE BLVD. EAST ON PORT ST. LUCIE
 AA5069' BLVD. 1.65 MI (2.66 KM) TO U.S. HIGHWAY NO. 1, NORTH ON U.S. HIGHWAY
 AA5069' NO. 1, 2.0 MI (3.2 KM) TO WALTON RD., EAST ON WALTON RD. 2.9 MI (4.7
 AA5069' KM) TO THE F.E.C. RAILROAD AND GPS MARK WEATHERINGTON. THE MARK IS
 AA5069' LOCATED 28.0 FT (8.5 M) NORTH OF THE NORTH EDGE OF PAVEMENT OF WALTON
 AA5069' RD., 25.0 FT (7.6 M) EAST OF THE EAST RAIL OF THE TRACKS, 2.0 FT (0.6
 AA5069' M) EAST OF A METAL GUARDRAIL, 186.90 FT (56.97 M) NORTHWESTERLY OF A
 AA5069' REFERENCE MARK SET IN A WOOD POWER POLE (NO NUMBER) LOCATED EAST OF
 AA5069' THE TRACKS ON THE NORTH SIDE OF WALTON RD., 108.45 FT (33.06 M)
 AA5069' NORTHERLY OF A REFERENCE MARK SET IN A SECOND WOOD POWER POLE (NO
 AA5069' NUMBER) LOCATED EAST OF THE TRACKS ON THE SOUTH SIDE OF WALTON RD.,
 AA5069' 115.01 FT (35.06 M) NORTHEASTERLY OF A REFERENCE MARK SET IN A THIRD
 AA5069' WOOD POWER POLE (NO NUMBER) LOCATED WEST OF THE TRACKS ON THE SOUTH
 AA5069' SIDE OF WALTON RD. AND NEAR A 2 1/2" DIAMETER GALVANIZED METAL WITNESS
 AA5069' POST. ALL REFERENCE MARKS ARE P.K. NAIL AND DISKS STAMPED W.E.S.
 AA5069' TRAVERSE PT. THERE IS A SECONDARY MARK LOCATED APPROXIMATELY 3.0 FT
 AA5069' (0.9 M) BELOW SAID MARK, SAID MARK BEING A 1/2" IRON ROD WITH CAP
 AA5069' MARKED GCY, INC. TRAVERSE PT.

AA5069

STATION RECOVERY (1993)

AA5069

AA5069

AA5069' RECOVERY NOTE BY GENESIS GROUP INCORPORATED SE 1993 (JEK)

AA5069' RECOVERED AS DESCRIBED.

AA5069

AA5069

STATION RECOVERY (2005)

AA5069

AA5069' RECOVERY NOTE BY G.C.Y., INCORPORATED 2005 (PA)

AA5069' RECOVERED AS DESCRIBED.

AA5069

AA5069

STATION RECOVERY (2006)

AA5069

AA5069' RECOVERY NOTE BY FL DEPT OF ENV PRO 2006 (BPJ)

AA5069' RECOVERED AS DESCRIBED.

AA5069

AA5069

STATION RECOVERY (2008)

AA5069

AA5069' RECOVERY NOTE BY G.C.Y., INCORPORATED 2008 (MEL)

AA5069' RECOVERED IN GOOD CONDITION.

*** retrieval complete.

Elapsed Time = 00:00:02



“WALTON RM 2” Benchmark Datasheet (1 OF 3)

5/11/2020

DATASHEETS

The NGS Data Sheet

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

PROGRAM = datasheet95, VERSION = 8.12.5.7

Starting Datasheet Retrieval...

1 National Geodetic Survey, Retrieval Date = MAY 11, 2020

AF3194 *****

AF3194 DESIGNATION - WALTON RM 2

AF3194 PID - AF3194

AF3194 STATE/COUNTY- FL/ST LUCIE

AF3194 COUNTRY - US

AF3194 USGS QUAD - ANKONA (2018)

AF3194

AF3194 *CURRENT SURVEY CONTROL

AF3194

AF3194* NAD 83(1986) POSITION- 27 18 03.74 (N) 080 15 25.50 (W) HD_HELD1

AF3194* [NAVD 88](#) ORTHO HEIGHT - 12.221 (meters) 40.10 (feet) ADJUSTED

AF3194

AF3194 GEOID HEIGHT - -27.568 (meters) GEOID18

AF3194 DYNAMIC HEIGHT - 12.203 (meters) 40.04 (feet) COMP

AF3194 MODELED GRAVITY - 979,131.8 (mgal) NAVD 88

AF3194

AF3194 VERT ORDER - FIRST CLASS II

AF3194

AF3194.The horizontal coordinates were determined by differentially corrected

AF3194.hand held GPS observations or other comparable positioning techniques

AF3194.and have an estimated accuracy of +/- 3 meters.

AF3194.

AF3194.The orthometric height was determined by differential leveling and

AF3194.adjusted by the NATIONAL GEODETIC SURVEY

AF3194.in November 2008.

AF3194

AF3194.Significant digits in the geoid height do not necessarily reflect accuracy.

AF3194.GEOID18 height accuracy estimate available [here](#).

AF3194

AF3194.Click [photographs](#) - Photos may exist for this station.

AF3194

AF3194.The dynamic height is computed by dividing the NAVD 88

AF3194.geopotential number by the normal gravity value computed on the

AF3194.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

AF3194.degrees latitude (g = 980.6199 gals.).

AF3194

AF3194.The modeled gravity was interpolated from observed gravity values.

AF3194

AF3194; North East Units Estimated Accuracy

AF3194;SPC FL E - 328,977.7 273,537.6 MT (+/- 3 meters HH1 GPS)

AF3194

AF3194 U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNL7351219997(NAD 83)

AF3194

AF3194 SUPERSEDED SURVEY CONTROL

AF3194

AF3194 NAVD 88 (06/15/91) 12.231 (m) 40.13 (f) SUPERSEDED 1 1

AF3194 NGVD 29 (??/??/92) 12.682 (m) 41.61 (f) ADJ UNCH 1 1

AF3194

AF3194.Superseded values are not recommended for survey control.

AF3194

AF3194.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

AF3194.See file [dsdata.pdf](#) to determine how the superseded data were derived.

AF3194



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"WALTON RM 2" Benchmark Datasheet (2 OF 3)

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DATASHEETS

AF3194_MARKER: DR = REFERENCE MARK DISK
 AF3194_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 AF3194_STAMPING: WALTON NO 2 1930
 AF3194_MARK LOGO: CGS
 AF3194_PROJECTION: FLUSH
 AF3194_MAGNETIC: N = NO MAGNETIC MATERIAL
 AF3194_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 AF3194+STABILITY: SURFACE MOTION
 AF3194_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 AF3194+SATELLITE: SATELLITE OBSERVATIONS - August 31, 2006

AF3194	HISTORY	- Date	Condition	Report By
AF3194	HISTORY	- 1930	MONUMENTED	CGS
AF3194	HISTORY	- 1965	GOOD	CGS
AF3194	HISTORY	- 1972	GOOD	NGS
AF3194	HISTORY	- 1988	GOOD	USPSQD
AF3194	HISTORY	- 1989	POOR	USPSQD
AF3194	HISTORY	- 1990	MARK NOT FOUND	USPSQD
AF3194	HISTORY	- 20000919	GOOD	FLDT
AF3194	HISTORY	- 20050604	GOOD	GCVI
AF3194	HISTORY	- 20050811	GOOD	GCVI
AF3194	HISTORY	- 20060831	GOOD	FLDEP

AF3194
 AF3194 STATION DESCRIPTION

AF3194'DESCRIBED BY COAST AND GEODETIC SURVEY 1965
 AF3194'10.8 MI S FROM FT PIERCE.
 AF3194'ABOUT 10.8 MILES SOUTH ALONG THE FLORIDA EAST COAST RAILWAY
 AF3194'FROM THE STATION AT FT PIERCE, ABOUT 0.5 MILE SOUTH OF MILEPOST
 AF3194'252, AT THE SMALL VILLAGE OF WALTON, ABOUT 130 YARDS NORTH OF
 AF3194'THE JUNCTION OF MAIN STREET AND RIDGE AVENUE, 243 1/2 FEET EAST
 AF3194'OF THE EAST RAIL OF THE EAST TRACK, 99.4 FEET EAST OF THE STATION,
 AF3194'90 FEET SOUTH OF THE APPROXIMATE CENTER OF THE JUNCTION OF RIDGE
 AF3194'AVENUE AND A DRIVEWAY LEADING WEST TO A FRAME HOUSE, 13 FEET
 AF3194'WEST OF THE CENTER LINE OF RIDGE AVENUE, 1.6 FEET SOUTH OF A
 AF3194'METAL WITNESS POST, ABOUT LEVEL WITH RIDGE AVENUE, SET IN THE
 AF3194'TOP OF A CONCRETE POST PROJECTING 1 INCH ABOVE THE LEVEL OF THE
 AF3194'GROUND. IN SECTION 32, R 41 E, T 36 S.

AF3194
 AF3194 STATION RECOVERY (1972)

AF3194'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1972
 AF3194'RECOVERED IN GOOD CONDITION.

AF3194
 AF3194 STATION RECOVERY (1988)

AF3194'RECOVERY NOTE BY US POWER SQUADRON 1988 (DHF)
 AF3194'RECOVERED IN GOOD CONDITION.

AF3194
 AF3194 STATION RECOVERY (1989)

AF3194'RECOVERY NOTE BY US POWER SQUADRON 1989 (DHF)
 AF3194'MARK RECOVERED IN POOR CONDITION.

AF3194
 AF3194 STATION RECOVERY (1990)

AF3194'RECOVERY NOTE BY US POWER SQUADRON 1990 (DHF)
 AF3194'MARK NOT FOUND.

AF3194
 AF3194 STATION RECOVERY (2000)

AF3194'RECOVERY NOTE BY FLORIDA DEPARTMENT OF TRANSPORTATION 2000 (MS)
 AF3194'THIS MARK WAS RECOVERED IN GOOD CONDITION BY THE FLDT.

AF3194
 AF3194 STATION RECOVERY (2005)



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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"WALTON RM 2" Benchmark Datasheet (3 OF 3)

5/11/2020

DATASHEETS

AF3194

AF3194'RECOVERY NOTE BY G.C.Y., INCORPORATED 2005 (PA)

AF3194'RECOVERED AS DESCRIBED.

AF3194

STATION RECOVERY (2005)

AF3194

AF3194'RECOVERY NOTE BY G.C.Y., INCORPORATED 2005 (JES)

AF3194'RECOVERED IN GOOD CONDITION.

AF3194

STATION RECOVERY (2006)

AF3194

AF3194'RECOVERY NOTE BY FL DEPT OF ENV PRO 2006 (BPJ)

AF3194'RECOVERED IN GOOD CONDITION WITH A NEW TO BEACH AS FOLLOWS, TO REACH

AF3194'THE MARK FROM THE INTERSECTION OF U.S. HIGHWAY 1 AND SOUTHEAST PORT

AF3194'ST. LUCIE BOULEVARD (STATE ROAD 710) IN PORT ST. LUCIE, GO NORTHWEST

AF3194'ON U.S. HIGHWAY 1 FOR 2.1 MI TO THE INTERSECTION OF MIDPORT ROAD ON

AF3194'THE LEFT AND WALTON ROAD ON THE RIGHT, TURN RIGHT ON WALTON ROAD AND

AF3194'GO EAST FOR 3.1 MI TO THE JUNCTION OF COUNTY ROAD 707 (SOUTH INDIAN

AF3194'RIVER ROAD) ON THE LEFT, TURN LEFT ON COUNTY ROAD 707 AND GO

AF3194'NORTHWEST FOR 0.1 MI TO THE JUNCTION OF MAIN STREET ON THE LEFT, TURN

AF3194'LEFT ON MAIN STREET AND GO WEST FOR 0.1 MI TO THE JUNCTION OF RIDGE

AF3194'AVENUE ON THE RIGHT, TURN RIGHT ON RIDGE AVENUE AND GO NORTHWEST FOR

AF3194'0.05 MI TO THE MARK ON THE LEFT, SET IN THE TOP OF A CONCRETE

AF3194'MONUMENT FLUSH WITH THE GROUND AND LEVEL WITH RIDGE AVENUE.

*** retrieval complete.

Elapsed Time = 00:00:02



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/19

Field Notes (1 of 6)

WALTON RD, PSL

SPWMS - USGS / PUB WELLS			
BENCH RUN FOR NEW BME WELLS			
STL 175		STL 176 (NOV 88)	
PEG TEST:			
Coll. Err. OLD =	1.5"	Coll. Err. NEW =	6.0"
DIFF =	4.5"	RETELL =	4.119'
STA USGS BM WENDELLWOOD	TOTAL DIST	ELEV	ADJ
	Ø	28.783'	
BM STL 175	434.50'	17.759'	
BM1	455.21'	17.760'	
BM2	467.02'	17.747'	
4	484.05'	17.094'	
(CONT. ON NEXT PG.)			

18-1020-07-02 1862 56

80° CLOUDY L.26.20 WED

WESA DND 10 M. LaPolla PC

FILE: WELL STL 175 176 B. Coonan H

LONG: STL 175 176

DESK

NGS BM WESTWENINGTON PID: AA5069

NOV 88 E = 28.783'

NEW BM "STL 175" (BM 1862-560A)

SET 1 1/2" (S.D.) IRON PIPE W/ ALUMI. CAP

"SPWMS STL 175 LB4108 2020" I.P. IS 3'

LONG W/ GRADES ALUMI. CAP. 3' S. OF A WIRE E

14.7' N. OF WELL STL 176.

USGS BM RM1 (BM 1862-563) 3/4" I.R.

USGS BM RM2 (BM 1862-560C) 1/2" I.R.

MEASURING POINT @ WELL STL 175

(BM 1862-560D) TOP OF 4" IRON PIPE BETWEEN

CHASSIS MARKS. SE SIDE OF I.P.

4



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/19

Field Notes (2 of 6)

SFWMCD-USGS / PWS WELLS			
Cont. BENCH FROM PG FILE			
Sta	TOTAL DIST	ELV	ADJ
5	504.95'	17.372'	
RM3	578.61'	18.988'	
15	2493.67'	25.016'	
BM NGS WACTON RM2	3277.50'	40.101'	

18-10-07-02 1862 57

8¹ CLOUDY 2.24.20 WED

M. LORILLA PC

B. GONNARD X

DECK

MEASURING POINT @ WELL STA 1716 (BM 1802-57A)

TOP OF 4" IRON PIPE BETWEEN CHISEL MARKS
ON SW SIDE OF I.P.

USGS BM RM3 (BM 1802-57B)

MAG. NAIL + ALUM. WASHER "USGS SURVEY MARKED"
ON TOP OF GUARD RAIL POST, S. SIDE OF WACTON RD.

BET MAG. NAIL + BRASS WASHER "GET TANG PT"
1' S. OF THE N. END OF MAG. ST. NEAR E. R
EXT. OF ADDRESS #105. (BM 1802-57C)

✓ TO NGS BM WACTON RM2 PID: AF3194

LISTED NAVD 83 ELV: 40.095'

FIELD: 40.101'

ERR: +.006

DIST IN MILES = 0.102

MTC @ .02 PER MILE = 0.015

★ END RUN ★

WACTON RM2
AF3194 40.095'



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/19

Field Notes (3 of 6)

SFWMD-USGS / PWS WELLS		18-1020-07-02	1862 58
4.5 hr OPUS SESSION		81° CLOUDY	L. L. LO WED
@ NEW BM STL 175 (BM 1862-56A)			M. LoPolo PC
			B. Dorman R
BASE:	TRIMBLE 5700		
HE:	4.92'		
START:	11:11 AM		
END:	15:51		
ANTENNA: ZEPHYR			
NOTE: @ 13:12 HEAVY DOWNPOUR			
ENDED @ 13:19			
RAIN SHOWERS IN AFTERNOON!			
	START	END	
	13:30	13:43	



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/19

Field Notes (4 of 6)

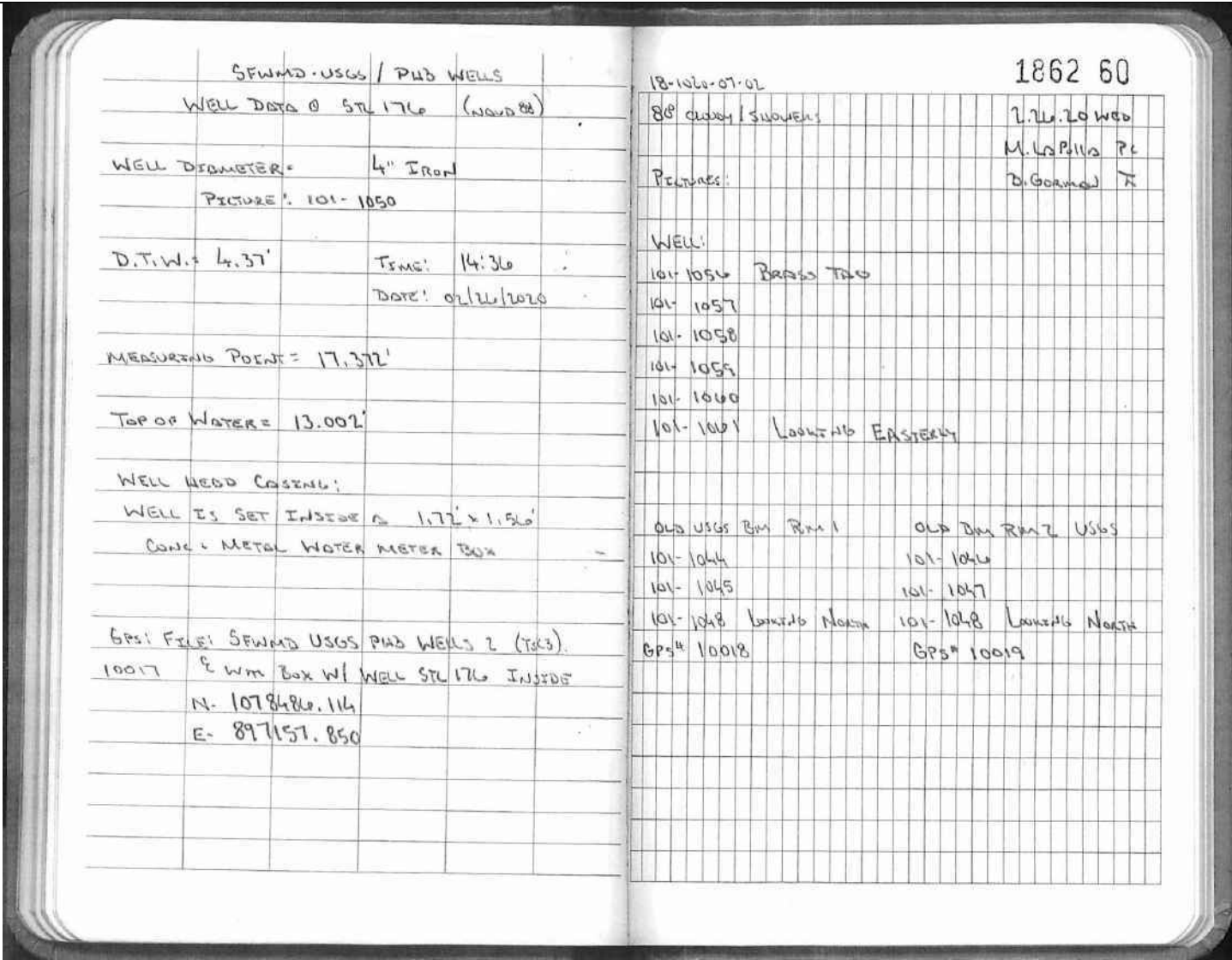
SFWMDC-USGS / PWS WELLS		18-1010-01-02		1862 59	
WELL DATA @ STA 175 (Nov 88)		81° Cassy		L. L. L. L. WED	
WELL DIAMETER 4" Iron		PICTURES:		M. LaFolia PC	
PICTURE 101-1049		WELL:		B. Garner Z	
D.T.W. = 9.70'		101-1051 Brass Tap			
TIME: 14:31		101-1052			
DATE: 02/26/2020		101-1053			
MEASURING POINT = 17.094'		101-1054			
TOP OF WATER = 7.394'		101-1055 Looking North			
WELL HEAD CASING:		NEW BM STA 175			
WELL IS SET INSIDE A 1.72' x 1.56'		101-1062			
CONC + METAL WATER METER BOX.		101-1063			
GPS FILE: SFWMDC USGS PWS WELLS 2 (TOL 3)		101-1064 Looking North			
10016 E WM Box W/ WELL STA 175 INSIDE		OLD USGS BM RM3 GPS# 10020			
N = 1078486.136		101-1041			
E = 897170.171		101-1042			
		101-1043 Looking South			



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/19

Field Notes (5 of 6)



SFWMD-USGS / PUB WELLS
WELL DATA @ STA 176 (NAVD 88)

WELL DIAMETER = 4" Iron
PICTURE #: 101-1050

D.T.W. = 4.37' TIME: 14:36
DATE: 02/26/2020

MEASURING POINT = 17.372'

TOP OF WATER = 13.002'

WELL HEAD CASING:
WELL IS SET INSIDE A 1.72' x 1.50'
CONC. METAL WATER METER BOX

GPS: FILE: SFWMD USGS PUB WELLS 2 (TICKS).
10017 Wm Box w/ WELL STA 176 INSIDE
N. 1078486.114
E. 897157.850

1862 60

18-1020-07-02
80° cloudy / SHOWERS

PELTURES:

WELL:
101-1050 BRASS TAP
101-1057
101-1058
101-1059
101-1060
101-1061 Looking EASTERN

OLD USGS BM RM 1	OLD BM RM 2 USGS
101-1044	101-1046
101-1045	101-1047
101-1048 Looking North	101-1048 Looking North
GPS# 10018	GPS# 10019

L.W. Zoweb
M. LaPina PC
D. Gorman JR



Field Notes (6 of 6)

WALTON RD, PCL

SFWMD-USGS		PIED WELLS		NO P WELLS			
BENCH RUN FOR							
STN 175 + 176				(NAVD 88)			
STA	+	HT	-	GL	ALT		
Bm RM2	5.032				17.747'		
	4.886						
	4.74						
	(4.886)	22.633'					
S.S. 1				4.96	17.733'		
S.S. 2				4.83	17.803'		
				5.43			
				5.272			
				5.118			
Rm 1				(5.273)	17.559'		

18-10-07-02

8:00 CLOUDY / RAIN SHOWERS

DESC

USGS Bm RM2 (Bm 1862-50C)
LISTED NAVD 88 EL: 17.747'

NO P WELL STN 175
NO P WELL STN 176

✓ TO OLD USGS Bm RM 1 (Bm 1862-50B)
LISTED NAVD 88 EL: 17.30'
ERR: -1.001

* END RUN *

1862 61

2:26:10 WED

M. Lapella PC

B. Gorman T



South Florida Water Management District Benchmark Datasheet

Designation: <u>STL 175</u>	Project Name: <u>USGS PHASE 3 WELLS</u>	Type: <u>V</u>	State Plane Zone: <u>FL East</u>
Stamping: <u>STL 175 LB4108 2020</u>	Field Book Name: <u>GCY 1862</u>	Field Book Page: <u>56-61</u>	
Established By: <u>GCY, INC.</u>	Recovered By: _____	Recovery Date: _____	
Surveyor: <u>ANDERSEN</u>	Established Date: <u>02/26/20</u>	Status: <u>New</u>	

GEOGRAPHIC POSITION INFORMATION

Section: <u>32</u>	Township: <u>36 SOUTH</u>	Range: <u>41 EAST</u>
County: <u>ST LUCIE</u>	Quadrangle: <u>ANKONA</u>	Quad Index: <u>1667</u>
NAD83 Adj. Year: <u>2011</u>	Vertical Datum: <u>NAVD1988</u>	Horizontal Datum: <u>NAD1983</u>
NAVD88 Elevation (feet): <u>17.759</u>	NGVD29 Elevation (feet): <u>19.242</u>	2022 Elevation: _____
NAVD88 Class: _____	NGVD29 Class: _____	Other Elevation: _____
NAVD88 Order: <u>3RD</u>	NGVD29 Order: <u>3RD</u>	Other Elevation Type: _____
		NGS Source BM(s): <u>WEATHERINGTON</u>
		NGS PID(s): <u>AA5069</u>
		NGS NAVD88 Elev (ft): <u>28.783</u>
		NGS NAVD88 Elev (m): <u>8.773</u>
		NGS 2022 Elev (ft): _____

CORPSCON 6.0.1 CONVERSION FACTOR (NAVD88 TO NGVD29): (A U.S. Army Corps of Engineers Engineering Research and Development Center Topographic Engineering Center Alexandria, Virginia Windows-based program to convert coordinates and elevations between datum's using vertcon05.txt and vertcon05.05 files supplied by the U.S. Army Corps of Engineers South Atlantic Division, Jacksonville FL)

Vertical Datum Offset: + <u>1.483</u>	Actual NGS Elevation or ngvd29.txt file: _____	OPUS Ortho Height: <u>17.835</u>
Northing (Y) (feet): <u>1078501.173</u>	Easting (X) (feet): <u>897159.101</u>	Source of Latitude & Longitude: <u>OPUS SOLUTION</u>
Latitude: <u>27</u>	<u>17</u>	<u>55.63936</u>
DD°	MM'	SS"
Longitude (Decimal Degrees): <u>27.29878871</u>	Longitude (Decimal Degrees): <u>-80.25793655</u>	
	DD°	MM'
		SS"

RECOVERY DATA

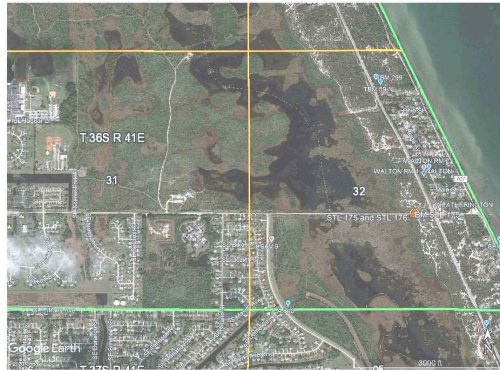
How to Reach: STATION IS LOCATED 0.24 MILES WEST OF THE INTERSECTION OF WALTON ROAD AND INDIAN RIVER DRIVE. STATION IS 25' +/- NORTH OF THE NORTH EDGE OF PAVEMENT OF WALTON ROAD, 375' +/- WEST OF CENTERLINE OF FEC RAILROAD. MARK IS A STANDARD SFWMD DISK SET IN A 1 1/2" IRON PIPE WITH A CONCRETE COLLAR AND IS RECESSED ABOUT 0.5 FEET BELOW GRADE.

Description/Notes:

Notable Landmarks:
Other Source Benchmarks:

PICTURES

Aerial View of Overall Site



PICTURES

Site Sketch



From: opus
To: Pete Andersen
Subject: OPUS solution : 13970570.t01 OP1588073593961
Date: Tuesday, April 28, 2020 7:38:11 AM

FILE: 13970570.t01 OP1588073593961

NGS OPUS SOLUTION REPORT
=====

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

USER: petea@gcyinc.com DATE: April 28, 2020
RINEX FILE: 1397057q.20o TIME: 11:37:55 UTC

SOFTWARE: page5 1801.18 master56.pl 160321 START: 2020/02/26 16:22:00
EPHEMERIS: igs20943.eph [precise] STOP: 2020/02/26 20:52:00
NAV FILE: brdc0570.20n OBS USED: 11439 / 13356 : 86%
ANT NAME: TRM39105.00 NONE # FIXED AMB: 103 / 157 : 66%
ARP HEIGHT: 1.500 OVERALL RMS: 0.029(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) ITRF2014 (EPOCH:2020.1551)

X: 959735.313(m) 0.120(m) 959734.480(m) 0.120(m)
Y: -5589969.721(m) 0.082(m) -5589968.143(m) 0.082(m)
Z: 2907665.141(m) 0.059(m) 2907664.981(m) 0.059(m)

LAT: 27 17 55.63936 0.017(m) 27 17 55.65998 0.017(m)
E LON: 279 44 31.42842 0.116(m) 279 44 31.40826 0.116(m)
W LON: 80 15 28.57158 0.116(m) 80 15 28.59174 0.116(m)
EL HGT: -22.129(m) 0.111(m) -23.709(m) 0.111(m)
ORTHO HGT: 5.436(m) 0.141(m) [NAVD88 (Computed using GEOID18)]

UTM COORDINATES STATE PLANE COORDINATES
UTM (Zone 17) SPC (0901 FL E)
Northing (Y) [meters] 3019747.636 328727.815
Easting (X) [meters] 573429.579 273454.641
Convergence [degrees] 0.34034722 0.34034722
Point Scale 0.99966656 1.00000776
Combined Factor 0.99967004 1.00001124

US NATIONAL GRID DESIGNATOR: 17RNL7342919747(NAD 83)

BASE STATIONS USED
PID DESIGNATION LATITUDE LONGITUDE DISTANCE(m)
DQ7965 FLWE WEDGEFIELD FL CORS ARP N282626.477 W0810533.176 150887.3
DE9138 OKCB OKEECHOBEE CORS ARP N271557.715 W0805119.181 59256.0
DH3834 LAUD LAUDERDALE CORS ARP N261146.341 W0801023.014 122454.8

NEAREST NGS PUBLISHED CONTROL POINT
AA5069 WEATHERINGTON N271755.628 W0801524.148 121.6

This position and the above vector components were computed without any knowledge by the National Geodetic Survey regarding the equipment or field operating procedures used.

*110001+00000000000000A1 32...1+0000000000050062 331.21+0000000000004331
390...+0000000000000005 391.21+0000000000000000
*110002+00000000000000B1 32...1+00000000000100028 332.21+0000000000004994
390...+0000000000000005 391.21+0000000000000001
*110003+00000000000000B2 32...1+00000000000050334 336.21+0000000000004783
390...+0000000000000005 391.21+0000000000000000
*110004+00000000000000A2 32...1+00000000000099718 335.21+0000000000004122
390...+0000000000000005 391.21+0000000000000000
*410005+00000000?.....1
*110006+000WEATHERINGTON 83..51+00000000000028783
*110007+000WEATHERINGTON 32...1+00000000000069334 331.21+00000000000003811
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*110018+000000BM STL 175 573..1+0000000000001038 574..1+0000000000434497
83..21+00000000000017759
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83..21+0000000000040101

Palm City

12 May 2020

INPUT

State Plane, fhpgn - Florida HPGN
0901 - Florida East, U.S. Feet
Vertical - NAVD88, U.S. Feet

OUTPUT

Geographic, fhpgn - Florida HPGN
Vertical - NGVD29 (Custom), U.S. Feet

STL 175

1/1

Northing/Y: 1078501.173

Easting/X: 897159.101

Elevation/Z: 0

Convergence: 0 20 25.25423

Scale Factor: 1.000007757

Combined Factor: 1.000012078

Latitude: 27 17 55.63936

Longitude: 80 15 28.57159

Elevation/Z: 1.483

Remark: