Surveyor's Report

Well Sites: Holeyland, Rotenberger, TCEYDC, 3ANE, & 3ANW
Well Site Surveys
Broward, Okeechobee and Palm Beach Counties, Florida

SFWMD Work Order Number: 2

Contractors Project No. 4600000947

Report Date: 12/11/08

Submittal: Final

Prepared for:

South Florida Water Management District

Prepared By:

Calvin, Giordano & Associates, Inc.
EXCEPTIONAL SOLUTIONS
560 Village Blvd., Suite 340, West Palm Beach, Florida 33409
Phone: 561.684.6161 • Fax: 561.684.6360

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Purpose

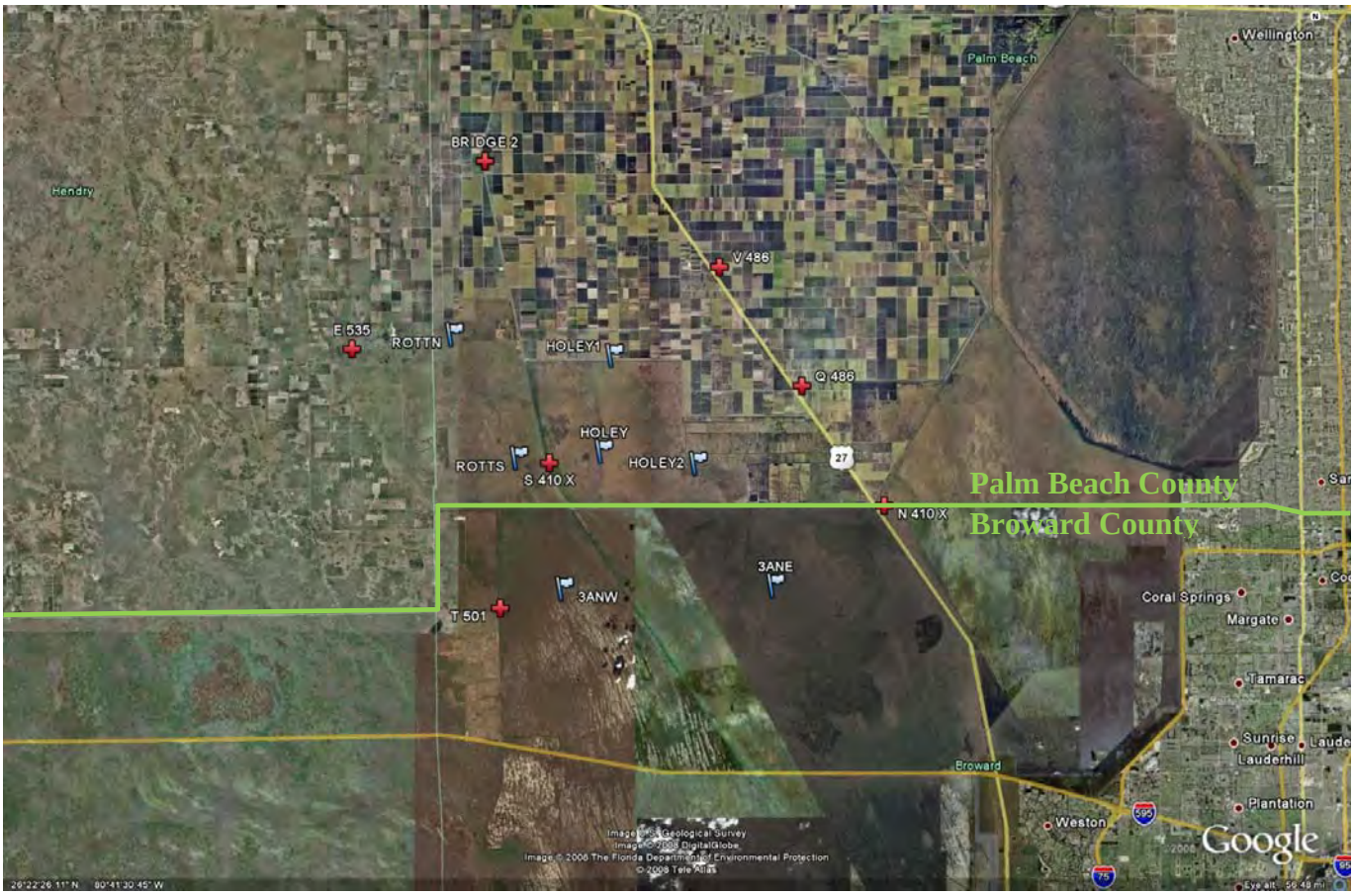
The purpose of this project is to establish site benchmarks with North American Vertical Datum of 1988 (NAVD 1988) and National Geodetic Vertical Datum of 1929 (NGVD 1929) at six well sites. Five are located within the Holeyland and Rotenberger Wild Life Management Areas in Palm Beach County and one is located in Okeechobee County at the Eckerd Youth Center. Additional benchmarks shall also be established on the well platforms and the measured distance to water shall also be recorded. Site photographs shall also be taken with close-ups of the recorder and the inside of the well casing. Existing well sites 3ANW and 3ANE are located in Broward County and have established benchmarks. New photographs and distance to water measurements for these wells are a part of this final report.

All services performed for this project were in accordance with Chapter 472 of the Florida Statutes, and under the direction of a Professional Surveyor and Mapper (PSM) registered in the State of Florida.

Project Location-1:

Project Location-1 is located within the northern portion of Broward County and the southern portion of Palm Beach County as represented on the following aerial map showing the approximate location of the well sites and NGS survey control used for this survey.

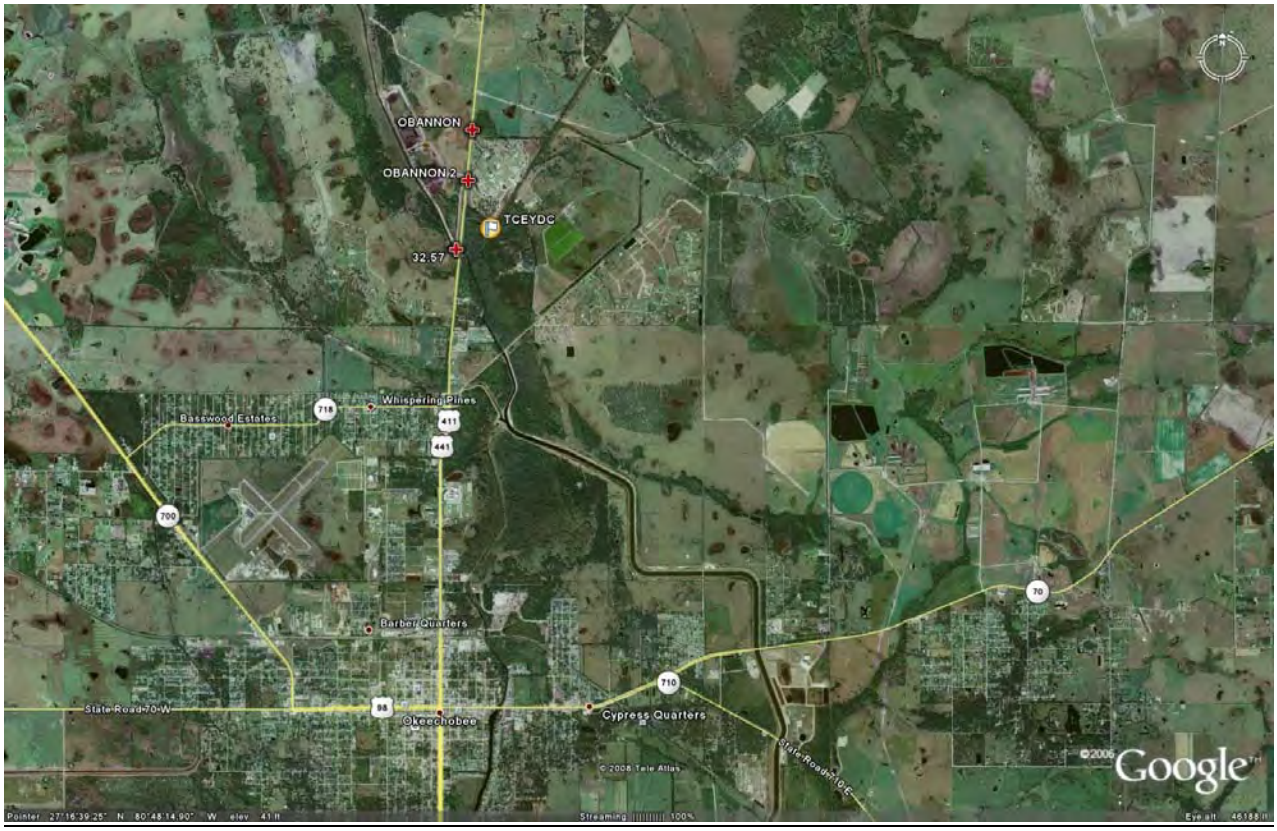
Figure 1: Project Locations – North Broward County and South Palm Beach County



Project Location-2:

Project Location-2 is located within Okeechobee County as represented on the following aerial map showing the approximate location of the well site and NGS survey control used for this survey.

Figure 2: Project Locations - Okeechobee County



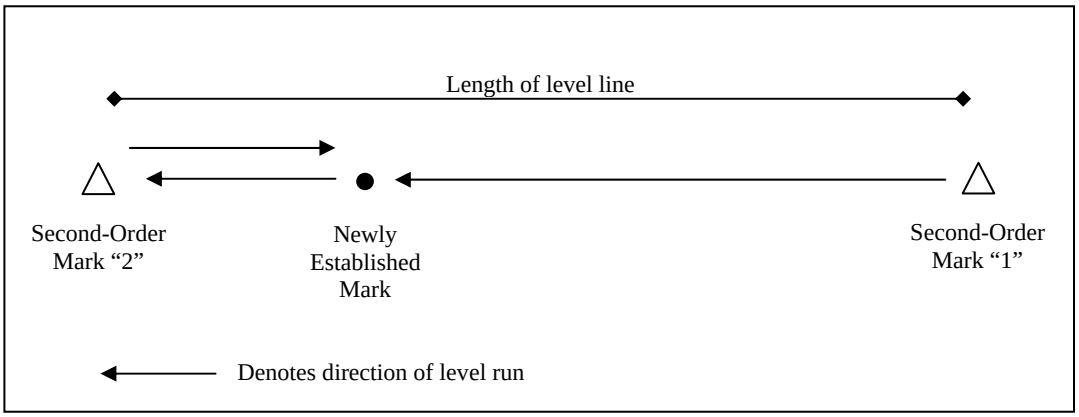
Items Delivered to the Client:

1. A CD containing the following:
    - Two copies of the survey report and one digital version in Microsoft Word format.
    - SFWMD survey control data sheets.
    - Digital photos (named the photo files with the benchmark designations).
    - Scanned copies of field notes.
    - Any other digital files associated with the survey.
    - Completed District benchmark description sheets for all set marks.
2. Bi-weekly contract status reports were delivered previously to Howard Ehmke PSM, Project Manager at hehmke@sfwmd.gov; and Ronnie Hudson, District Field Representative at rhudson@sfwmd.gov during the course of the project. Said contract status reports are not included in this report.

Configuration of Level Runs:

The leveling for the project was performed in accordance with the Federal Geodetic Control Subcommittee standard for Third-Order, Class II geodetic leveling. A brief description of the procedures used follows.

For each level run, two existing NGS First-Order, Class II vertical benchmarks were used. The run was started at one of the benchmarks and closed to a second benchmark. Level loops to the contract control points were then performed, both starting and ending at verified benchmarks.



Equipment Used:

All leveling during this project was performed with a Leica NA2 level and a Philadelphia rod. Information and technical specification for the Leica NA2 level are available at http://www.leica-geosystems.com.

Expected Accuracy:

The expected accuracy for all level runs for this project is Third-Order-Class II. This accuracy standard was verified by applying the following formula for checking all level runs: 0.03' times the square root of the length of the level run in miles. All level runs for this project met or exceeded the expected accuracy standard.

Vertical Datum for the Project:

The vertical datum for the project is the NAVD 88. Elevations of the benchmarks are also shown in the NGVD 29. The NGVD 29 elevations shown within this report were established by using the superseded survey control values as depicted on the NSG data sheets for the survey control used to determine the vertical values of the site benchmarks. The all elevation datum is expressed in the U.S. foot unless otherwise stated.

Horizontal Datum for the Project:

The horizontal datum for the project is the North American Datum of 1983, NSRS2007 adjustment (83/07) East Zone.

HORIZONTAL/GPS METHODS

GPS Equipment and Software Used:

Three Trimble 4800 receiver/antenna and one Trimble R8 receiver/antenna (without ground plane) were used for all static sessions.

The GPS baselines were processed and adjusted using (TGO) Trimble Geomatics Office version 1.62.

GPS METHOD:

Due to the remote location within the Holeyland and Rotenberger Wildlife Management Areas and wet conditions due to tropical storm Fay and seasonal rains the sites retained from one foot to four feet of water. Therefore it was determined that a GPS static survey were the only way to efficiently obtain elevations on the proposed new site benchmarks. All sites within the Holeyland and Rotenberger Wildlife Management Areas had to be accessed by airboat. GPS observations for this project were preformed in accordance with guidelines for Establishing GPS-Derived Ellipsoid Heights (National Geodetic Survey Technical Memorandum NOS NGS-58)

Mr. Ronnie Taylor the NOAA advisor for the state of Florida was contacted and supplied a mission plan for the GPS static survey to produce final coordinates. Mr. Taylor required two session's per site using two NGS control monuments with occupation time of 1.5 hours and a time separation of 4.0 hours between observations. Calvin, Giordano and Associates occupied three NGS control monuments for each site and observation sessions lasted for 2.0 hours with 4.0 hours between occupation times. These procedures exceeded Mr. Taylor's minimum allowable occupation time.

GPS observations were conducted over six days:

September 19th, 2008
September 24th, 2008
September 25th, 2008
September 29th, 2008
October 1st, 2008
October 6th, 2008

The two observed adjusted values were averaged to check the average closure of the two sessions then compared to the total processed observations to obtain the final elevations of all static surveyed benchmarks. The expected accuracy for the final elevation of site benchmarks at HOLEY, HOLEY1, HOLEY2, ROTTN AND ROTTS is +/-0.10'.

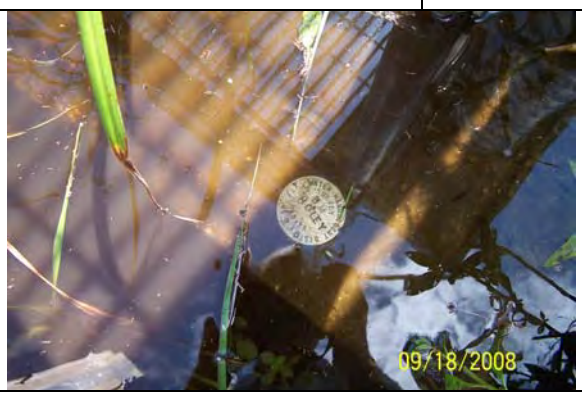
GPS BASELINE PROCESSING AND ADJUSTMENT

Baselines were processed using TGO. Cycle slips within baselines were disabled before processing. For each session, (n-1) baselines were selected that produced fixed integer solutions with the lowest possible RMS values. Baselines were selected to ensure that all set benchmarks had multiple vectors from multiple NGS control stations. NGS control stations S 410 X, V 486, Q 486, N 410 X, T 501, R 535 and BRIDGE2 were used for horizontal and vertical constrained adjustment.
For final coordinates, baseline were processed independently for each session to check redundant measurements and then combined to compute final coordinates. NAD 83 (NSRS2007) NGS Adjustment and NAVD 88 as vertical datum and GEOID03 for geoid were used for final coordinate adjustment.

Project Results:

The following tables list the elevations established for each new mark, "to-reach" description for each mark and a photograph of the mark. All elevations are in US Survey Feet.

HOLEY		Elevation:	**10.72 ft**	(NAVD 88)	12.15 ft	(NGVD 29)
Bench Mark 1:	S 410 X		18.36 ft	(NAVD 88)	19.79 ft	(NGVD 29)
Bench Mark 2:	T 501		25.08 ft	(NAVD 88)	26.51 ft	(NGVD 29)
Benchmark 3:	V 486		19.26 ft	(NAVD 88)	20.69 ft	(NGVD 88)
Monitoring Well:	HOLEY		18.20 ft	(NAVD 88)	19.63 ft	(NGVD 29)
ESTABLISHED BY GPS						



To Reach HOLEY:

From the intersection of US Route 27 and the Palm Beach / Broward County Line proceed north on US 27 for 0.15 MI to a paved road on the left on the north side of the L-4 canal. Turn left and proceed west for 6 MI where the road turns to rock continue 6.9 MI to a clearing near an FPL Transmission Tower 1Z145 and an airboat trail; then proceed north along the airboat trail +/- 2.0 MI to the HOLEY well site. The benchmark is a South Florida Water Management District (SFWMD) Aluminum Cap set in the northwest concrete footer of well structure.

Well Site HOLEY

Benchmark Information. NGVD29

NAVD88 to NGVD29 offset +1.43' from NGS Data sheet Superseded Control

Established benchmark by GPS method: see above

Found existing benchmark stamped HOLEY H.L. 12 1996, El. 15.25'
CGA measured El. 15.22' on this survey.

Reference mark: Found existing ink marker mark on well deck.

Existing elevation of ink marker mark 19.66'

CGA established elevation and set brass tag at El. 19.64'

Average Ground Elevation: = 11.4'

Distance to Water (DTW): From brass tag reference mark 19.63'-7.35' DTW: El. 12.28'
9/9/2008 at 10:42 AM

Staff Gauge: El. 12.37'

HOLEY1		Elevation:	**9.70 ft**	(NAVD 88)	11.13 ft	(NGVD 29)
Bench Mark 1:	S 410 X		18.36 ft	(NAVD 88)	19.79 ft	(NGVD 29)
Bench Mark 2:	BRIDGE 2		19.16 ft	(NAVD 88)	20.59 ft	(NGVD 29)
Benchmark 3:	V 486		19.26 ft	(NAVD 88)	20.69 ft	(NGVD 88)
Monitoring Well:	HOLEY1		17.85 ft	(NAVD 88)	19.28 ft	(NGVD 29)
ESTABLISHED BY GPS						

To Reach HOLEY1:

From the intersection of US Route 27 and the Palm Beach / Broward County Line proceed north on US 27 for 0.15 MI to a paved road on the left on the north side of the L-4 canal. Turn left and proceed west for 6 MI where the road turns to rock continue 6.9 MI to a clearing near an FPL Transmission Tower 1Z145 and an airboat trail; then proceed north along the airboat trail +/- 6.7 MI to the HOLEY1 well site. The benchmark is a mag nail set in the northwest concrete footer of well structure.

Well Site HOLEY1

Benchmark Information. NGVD29

NAVD88 to NGVD29 offset +1.43' from NGS Data sheet Superseded Control

Established benchmark by GPS method: see above

Found existing benchmark stamped HOLEY-1 1994 broken.

CGA did not measure the elevation during this survey due to the broken monument.

Reference mark: Found ink marker mark on well deck.

Existing elevation of ink marker mark 20.12'

CGA established elevation and set brass tag at El. 19.28'

Average Ground Elevation: = 11.0'

Distance to Water (DTW): from brass tag reference mark 19.28'-7.05' DTW: El.=12.73' 10/16/2008 at 10:23 AM

Staff Gauge: El. 12.98'

HOLEY2	Elevation:	**9.57 ft**	(NAVD 88)	11.02 ft	(NGVD 29)	
Bench Mark 1:	S 410 X	18.36 ft	(NAVD 88)	19.79 ft	(NGVD 29)	
Bench Mark 2:	Q 486	10.46 ft	(NAVD 88)	11.91 ft	(NGVD 29)	
Benchmark 3:	N 410 X	12.70 ft	(NAVD 88)	14.15 ft	(NGVD 88)	
Monitoring Well:	HOLEY2	17.75 ft	(NAVD 88)	19.20 ft	(NGVD 29)	
ESTABLISHED BY GPS		To Reach HOLEY2:				

From the intersection of US Route 27 and the Palm Beach / Broward County Line proceed north on US 27 for 0.15 MI to a paved road on the left on the north side of the L-4 canal. Turn left and proceed west fo+/- 6 MI where the road turns to rock, continue 2.7 MI to an airboat trail; then proceed north along the airboat trail +/- 1.5 MI to the HOLEY2 well site. The benchmark is a mag nail set in the northwest concrete footer of well structure.

Well Site HOLEY2

Benchmark Information. NGVD29

NAVD88 to NGVD29 offset +1.45’ from NGS Data sheet Superseded Control

Established benchmark by GPS method: see above

Found existing benchmark stamped HOLEY-2 1994, El. 12.67’

CGA measured elevation at 12.61’ on this survey.

Reference mark: Found ink marker mark on well deck.

Existing elevation of ink marker mark El. 20.21’

CGA established elevation and set brass tag at El. 19.20’

Average Ground Elevation: = 12.4’

Distance to Water (DTW): from brass tag reference mark: 19.20’-7.02’ DTW: El. 12.18’ 10/16/2008 at 11:30 AM

Staff Gauge: EL=13.25’ CGA measured EL= 12.25’

SURVEYOR'S CERTIFICATION

I hereby certify that this Specific Purpose Survey meets applicable portions of the Minimum Technical Standards set forth by the Florida Board of Professional Surveyors and Mappers in Chapter 61G17, Florida Administrative Code. This report is prepared for the sole and specific use of the South Florida Water Management District and is not assignable.

Calvin, Giordano & Associates, Inc.
L.B. Number 6791

12/09/2008
Last Date of Field Survey

By: _____
Jon P. Weber, PSM
Professional Surveyor and Mapper
State of Florida Certificate No. 4323


09/09/2008


09/09/2008

19.66

09/09/2008


HOLEY W
ELEV. 19.64
DATE 09/24/08
BY C G A
NAVD NGVD 29
10/16/2008


WATER MANAGEMENT
SURVEY
B M
HOLEY
DISTRICT
09/18/2008


09/09/2008


09/09/2008


09/09/2008

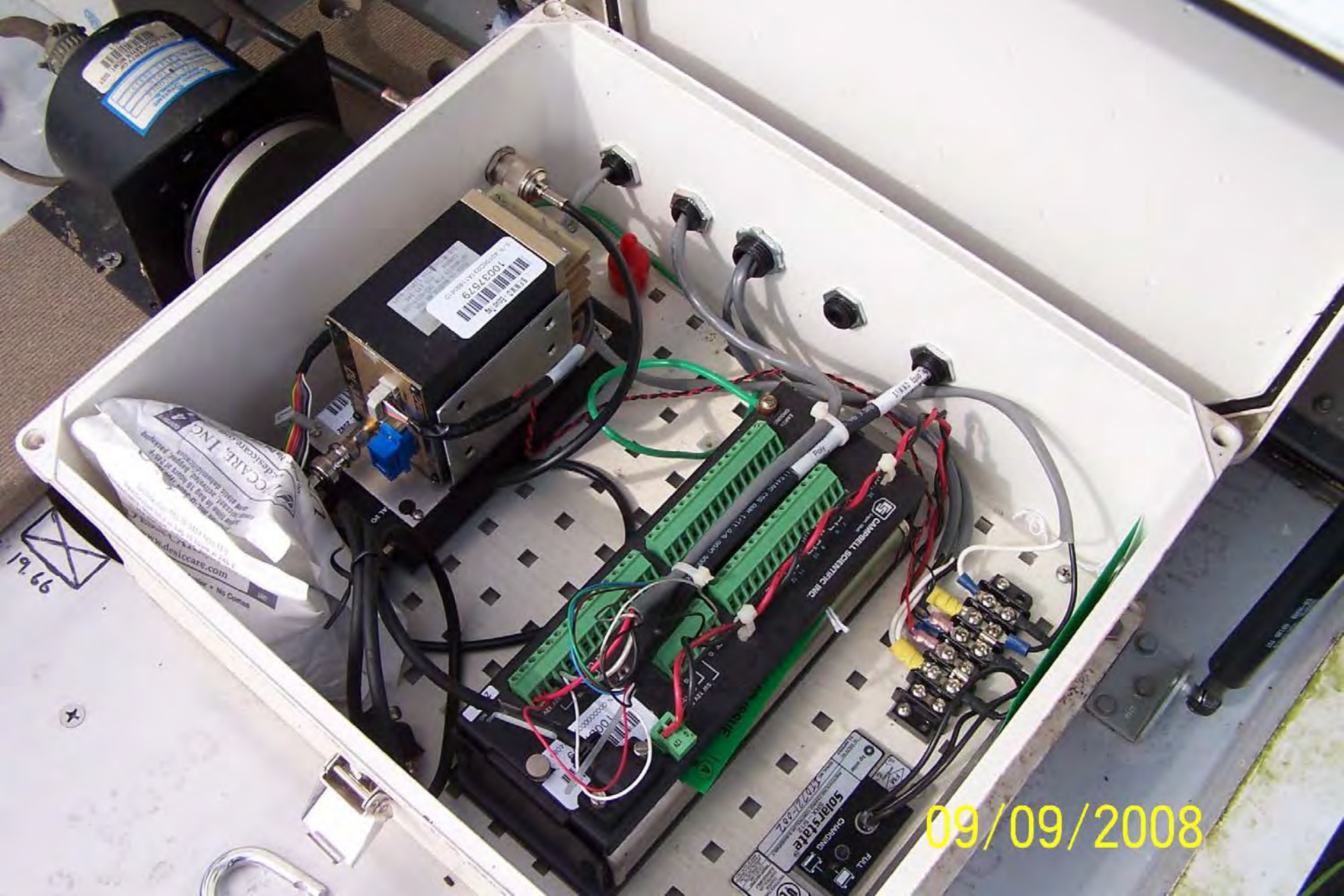

09/09/2008


09/09/2008


09/09/2008


09/09/2008


09/09/2008


09/09/2008


DL-340
Specification MIL-D-3464 Type I&II
Reactivation time in bag 16 hours at 245°F
Nomenclature: Desiccant, activated, bagged, packaging
09/09/2008


HOLEY G
09/09/2008


HOLEY G
09/09/2008

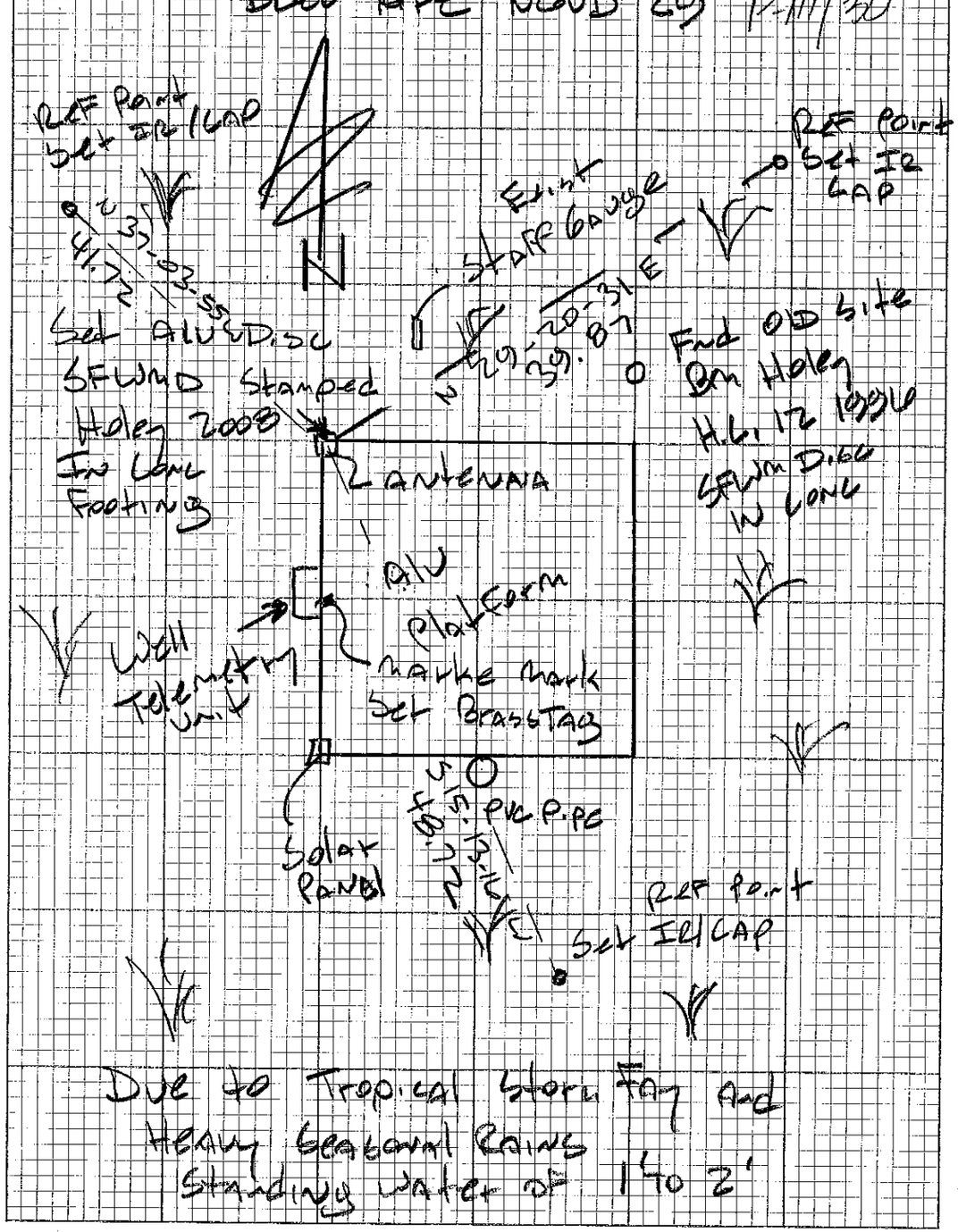
T. McLemore SFWMD Holey Land 9/9/08
H. Darville Rotenberger Hot 90s
R. Luke Monitoring Well Hole 7

Sta	+	HI	-	EL	Desc
Site Bm	8.33	20.48		12.15	Set Bm Holey 2008
Fnd old Bm H.L. 12 1996 EL=15.25			5.20	15.22	
Marker mark Set Brass Tag Marker mark EL 19.160 By others			0.85	19.63	Set Brass Tag
	0.71	20.34			
AVG Ground Shot			8.0	11.4	AVG Ground
Closed to CGA Site Bm			8.19	12.15	Site Bm

Measure Down to water

Water In Well	19.63	7.35	= 12.28
		10.42 am	

ELEV are NGVD 29 1-11-10



Due to Tropical Storm Fay and Heavy Seasonal Rains Standing water of 1' to 2'

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/08

COUNTY Palm Beach	**PROJECT** Holeyland Rotenberger Well Site Survey	**DESIGNATION** HOLEY
SECTION 28/33	**TOWNSHIP** 47 SOUTH	**RANGE** 36 EAST
NAME OF QUADRANGLE West Deem City		
Established by Calvin, Giordano & Associates, Inc.	**Recovered by** _____ *(Surveyor / Firm Name)*	
DATE 09/24/2008	**FIELD BOOK** P-111 **PAGE** 30	
HORIZONTAL DATUM: 1927 (1983) ADJ ____ Other___ (circle one)	ZONE (E) or W	
STATE PLANE COORDINATES	N 737598.1 ft	E 738431.0 ft
LATITUDE: N 26° 21' 45.70870"	**LONGITUDE:** W 80° 44' 55.54250"	
VERTICAL DATUM: MSL 1929 (1988) Other _____ (circle one)		EL. 10.72 ft
VERTICAL DATUM: MSL (1929) 1988 Other _____ (circle one)		EL. 12.15 ft
CONTROL ACCURACY: HORIZONTAL 1 2 3 (SUB-METER) (circle one) VERTICAL 1 2 (3)		

DESCRIPTION

To Reach: From the intersection of US Route 27 and the Palm Beach / Broward County Line proceed north on US 27 for 0.15 MI to a paved road on the left on the north side of the L-4 canal. Turn left and proceed west for 6 MI where the road turns to rock continue 6.9 MI to a clearing near an FPL Transmission Tower 1Z145 and an airboat trail then go north along the airboat trail +/- 2.0 MI to the HOLEY well site. The benchmark is a South Florida Water Management District (SFWMD) Aluminum Cap set in the northwest concrete footer of well structure.

NGS Benchmarks Used: S 410 X, T 501 AND Q 486

Notable Land marks:

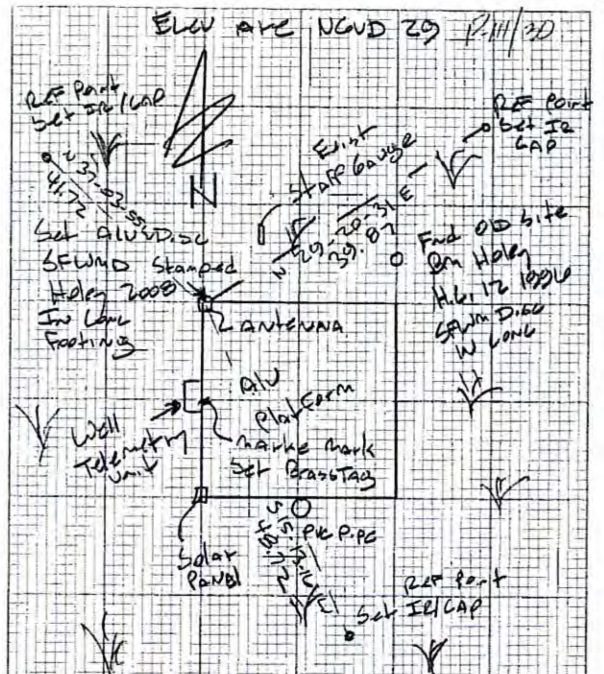
SKETCH

T. McLemore SFWMD Haley Land 9/9/08
H. Darville Rotenberger Hot 90°
R. Luke Monitoring Well
Haley

Sta	+	HI	−	EL	Desc
Site BM	8.33	20.48		12.15	Set BM Haley 2008
Fnd old BM H.L. 12 1996 EL=15.25			5.26	15.22	
Marker mark Set Brass Tag Marker mark EL 19.66 By others			0.85	19.63	Set Brass Tag
	0.71	20.34			
AVG Ground Shot			8.9	11.4	avg Ground
Closed to Site BM			8.19	12.15	Site BM

Measure Down to water

Water In Well		19.63	7.35 10:42 AM	= 12.28	



Due to Tropical Storm Fay and Heavy Seasonal Rains Standing water of 1' to 2'

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/08

PICTURE


10/16/2008


09/18/2008


09/18/2008


09/18/2008


09/18/2008


09/18/2008


09/18/2008


09/18/2008


09/18/2008

09/18/2008

09/18/2008


19.0
18.0
17.0
09/18/2008


LEUPOLD & STEVENS INC. BEAVERTON, OREGON
7
6
5
4
3
2
1
13
0
9
09/18/2008


POWERSONIC
09/18/2008

A.P. Elev.
20.12

09/18/2008


READY FOR ISSUE
DL-340
09/18/2008

HOLEY 1 W
ELEV. 19.28
DATE 09/24/08
BY CGA
NAVD NGVD29

10/16/2008

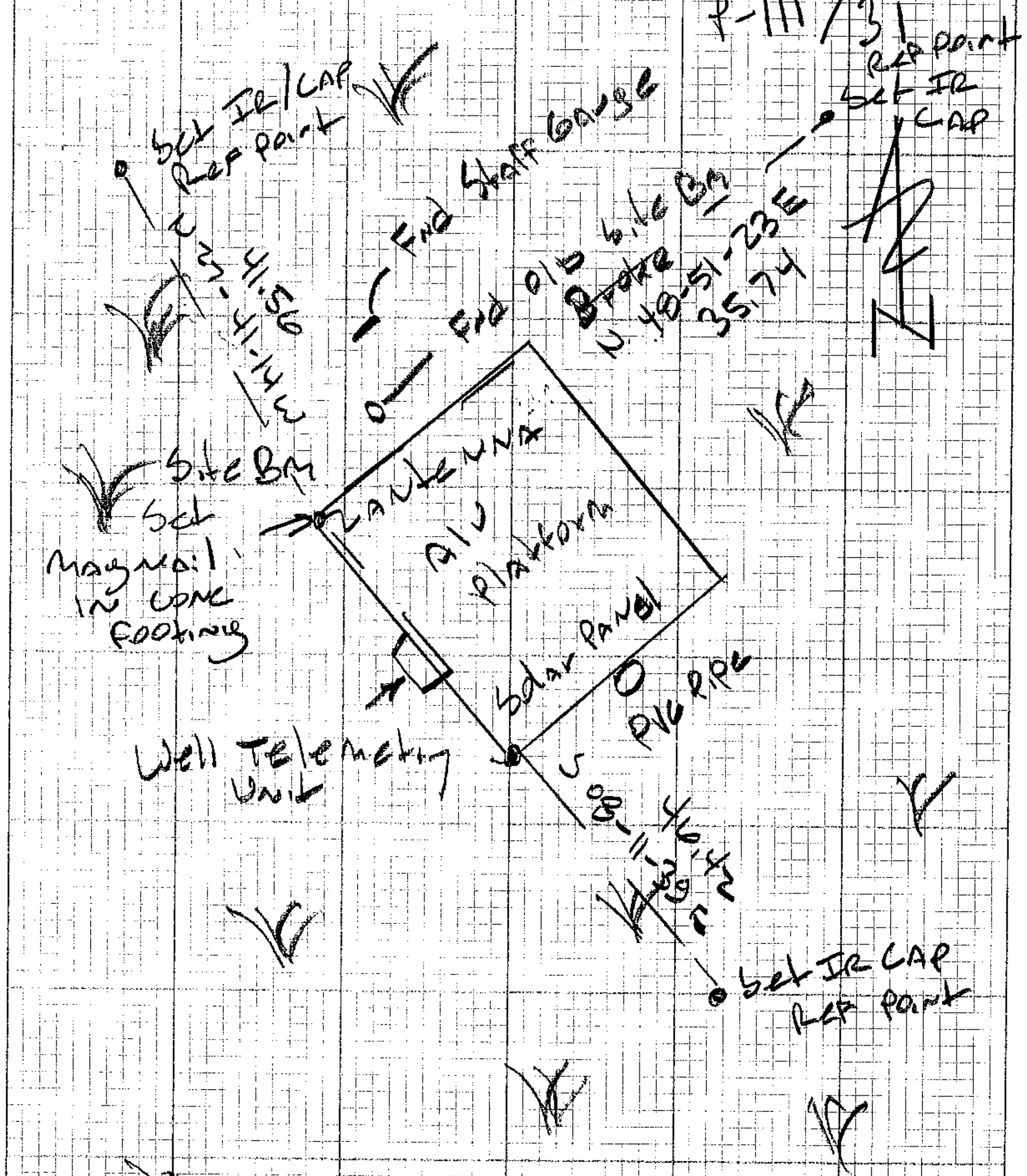
T McLemore   SFWMD   10/16/08
H Daville   Holey Land / Rotenberger   P-Cloudy 90°±
R Luke   Monitoring well

Holey-1

Sta	+	HI	-	EL	Desc
	9.05	20.18		11.13	Mag Nail Site BM
Well			0.96	19.22	marker mark Set Brass Tag
Brass Tag	0.72	19.94			
GS			8.9	11.0	Avg Ground
Close to Site BM			8.81	11.13	Mag Nail Site BM

Measure Down to Water   19.22 − 6.99 = 12.23   10-16-08 10:23 AM

f-111/31



Due to Heavy Rains From Tropical Storm Fay and Seasonal Rainy Site 1 to 2' of Water over Site

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/08

COUNTY Palm Beach	**PROJECT** Holeyland Rotenberger Well Site Survey	**DESIGNATION** HOLEY1
SECTION 4	**TOWNSHIP** 47 SOUTH	**RANGE** 36 EAST

NAME OF QUADRANGLE South of Okeeklanta

Established by Calvin, Giordano & Associates, Inc.	**Recovered by** _____ *(Surveyor / Firm Name)*
DATE 09/19/2008	**FIELD BOOK** P-111 **PAGE** 31

HORIZONTAL DATUM: 1927 (1983) ADJ ____ Other___ (circle one) ZONE (E) or W

STATE PLANE COORDINATES	N 761944.3 ft	E 741096.4 ft
LATITUDE: N *26° 25' 46.78803"*	**LONGITUDE:** W *80° 44' 25.69897"*	

VERTICAL DATUM: MSL 1929 (1988) Other _____ (circle one)	EL. 9.70 ft
VERTICAL DATUM: MSL (1929) 1988 Other _____ (circle one)	EL. 11.13 ft

CONTROL ACCURACY: HORIZONTAL 1 2 3 (SUB-METER) (circle one) **VERTICAL** 1 2 (3)

DESCRIPTION

To Reach: From the intersection of US Route 27 and the Palm Beach / Broward County Line proceed north on US 27 for 0.15 MI to a paved road on the left on the north side of the L-4 canal. Turn left and proceed west for 6 MI where the road turns to rock continue 6.9 MI to a clearing near an FPL Transmission Tower 1Z145 and an airboat trail then proceed north along the airboat trail +/- 6.7 MI to the HOLEY1 well site. The benchmark is a mag nail set in the northwest concrete footer of well structure.

NGS Benchmarks Used: S 410 X, BRIDGE2 AND V 486

Notable Land marks:

SKETCH

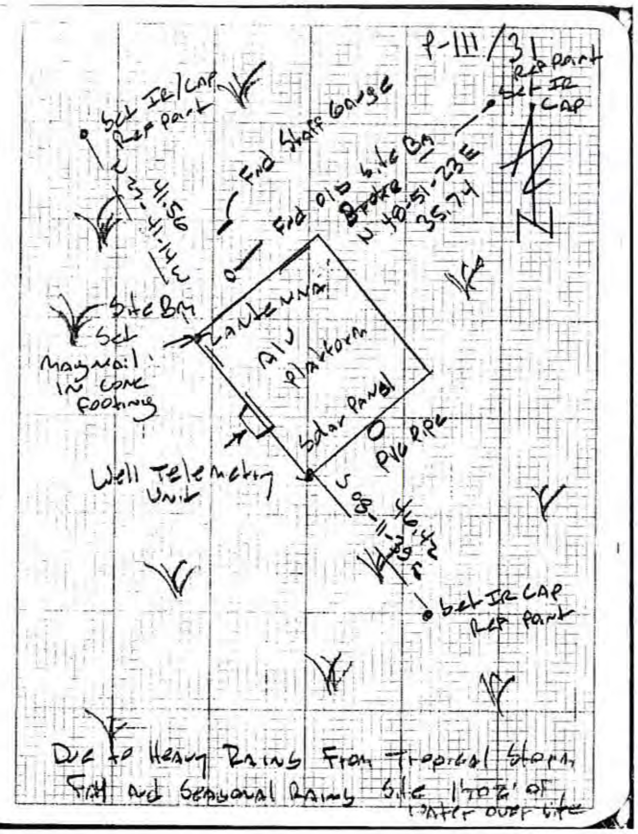
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

T McLemore | SFWMD | 10/16/08
H Dowlle | Holey Land / Rotenberger | P. Cloudy
R Luke | Monitoring well | 90°+

Holey - 1

Sta	+	HI	–	EL	Desc
	9.05	20.18		11.13	Mag Nail Site BM
Well			0.96	19.22	marker mark
Brass Tag	0.72	19.94			Set Brass Tag
SS			8.9	11.0	Avg Ground
Close to Site BM			8.81	11.13	Mag Nail Site BM

Measure Down to Water 19.22 − 6.99 = 12.23 10-16-08 10:23 am



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/08

PICTURE


10/16/2008


08/14/2008


08/14/2008


HOLEY2
08/14/2008


HOLEY2
08/14/2008


HOLEY2
08/14/2008


HOLEY2
08/14/2008


08/14/2008


08/14/2008


WATER MANAGEMENT DIST. FLA.
S.W.M. HOLEY — 2
SURVEY MARKER
1994
08/14/2008


HOLEY 2
10/06/2008


10/06/2008


10/06/2008


10/06/2008


10/06/2008


10/06/2008


10/06/2008


10/06/2008


31117160
P.T. Cable S/N
211594
Equip. Tag #
10035685
10030342
10/06/2008


10/06/2008
R.P. 20.21

R.P.
Elev. 20.21
6-19-08

10/06/2008


HOLEY 2
R.P.
Elev. 20.21
6-19-08
10/06/2008


POWERSONIC
HOLEY 2
10/06/2008


10/06/2008


HOLEY 2
10/06/2008


10/06/2008


09/18/2008


09/18/2008


09/18/2008


09/18/2008


09/18/2008


09/18/2008

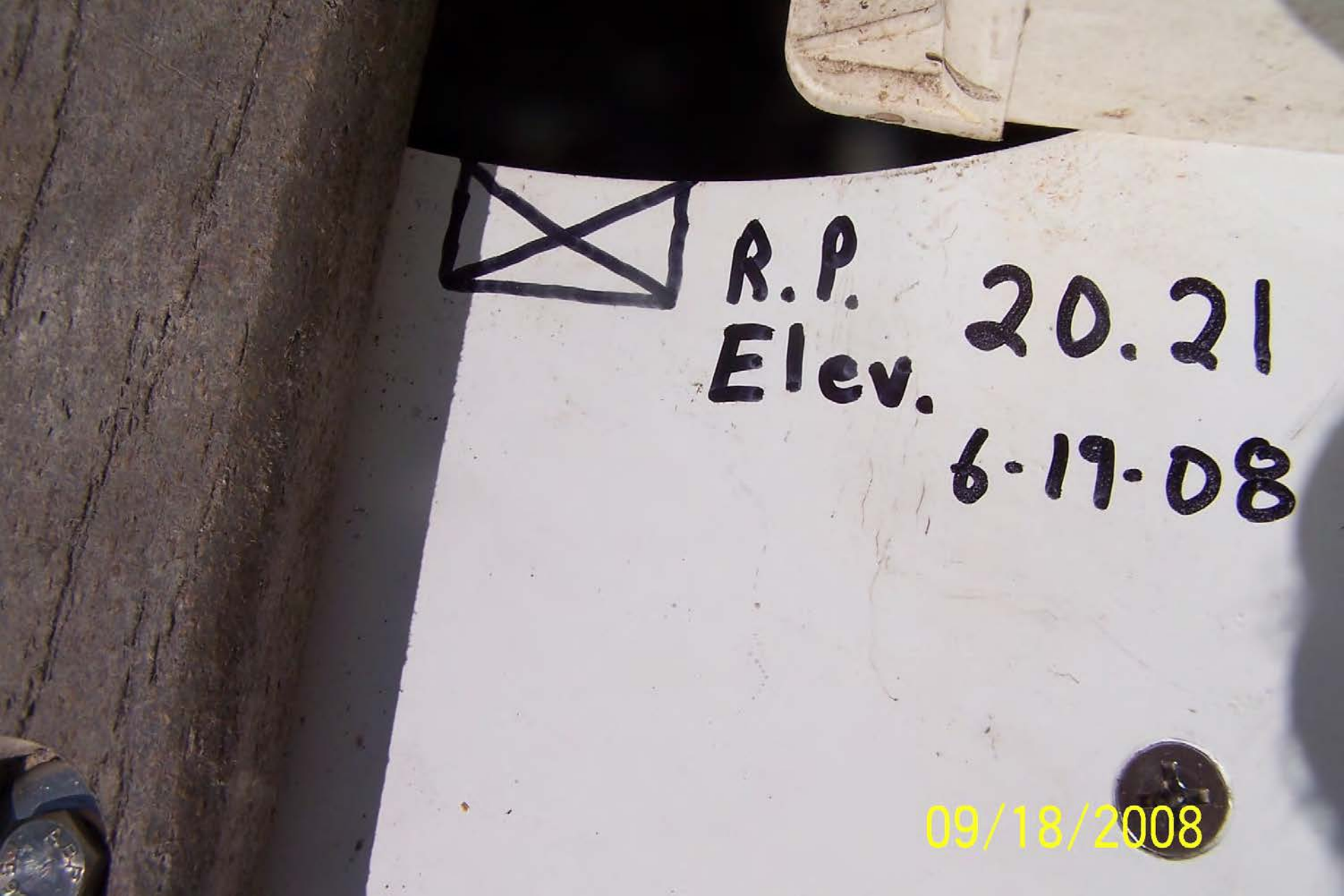

09/18/2008


1
17.0
9
8
7
6
5
4
3
2
1
16.0
09/18/2008

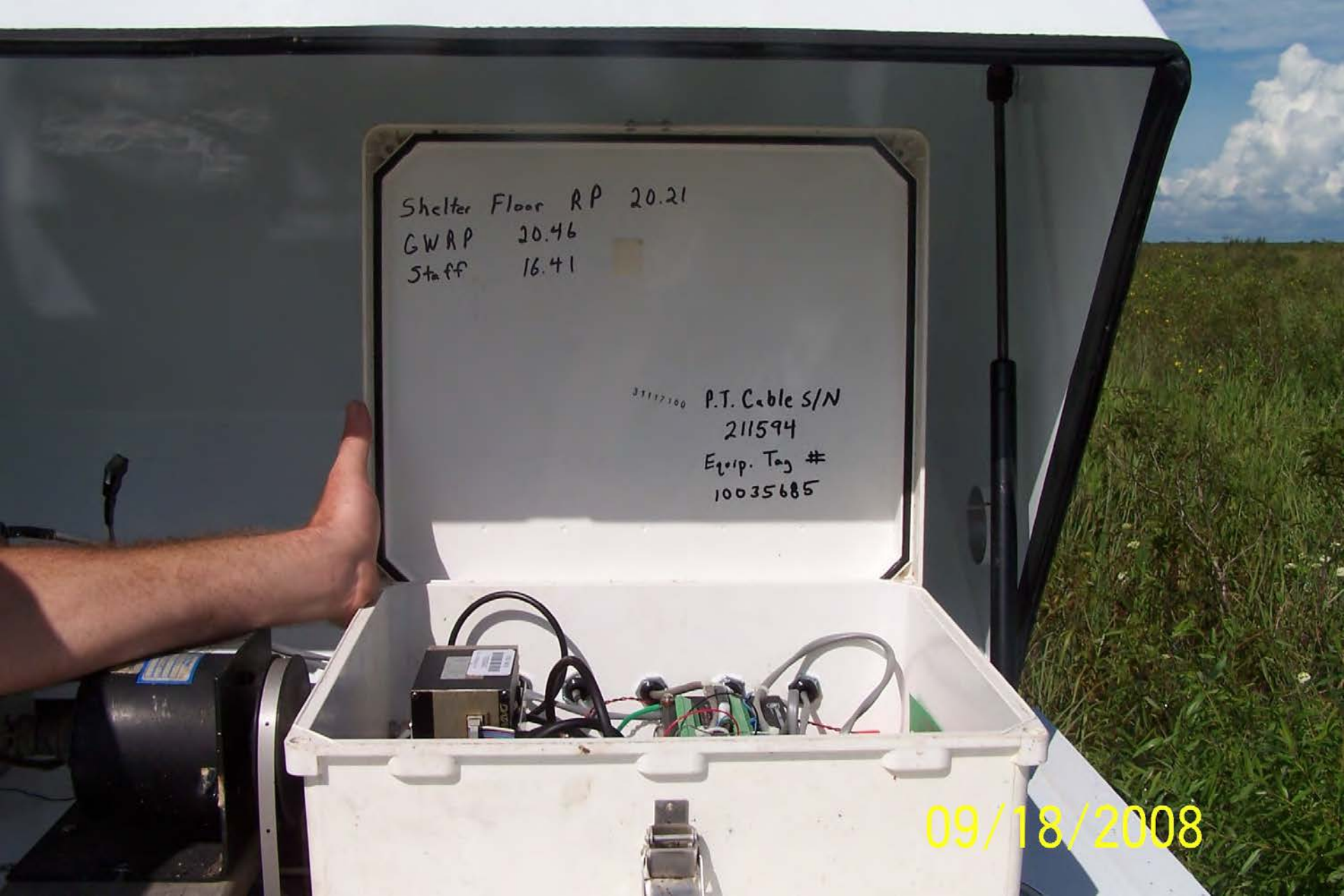

14.0
09/18/2008


09/18/2008


HOLEY 2
09/18/2008


R.P.
Elev. 20.21
6-17-08
09/18/2008


DL-3400
CAMPBELL SCIENTIFIC INC.
READY FOR ISSUE
09/18/2008


Shelter Floor RP 20.21
GWRP 20.46
Staff 16.41
P.T. Cable S/N
211594
Equip. Tag #
10035685
09/18/2008


POWERSONIC
HOLEY 2
09/18/2008


Trimble
09/18/2008

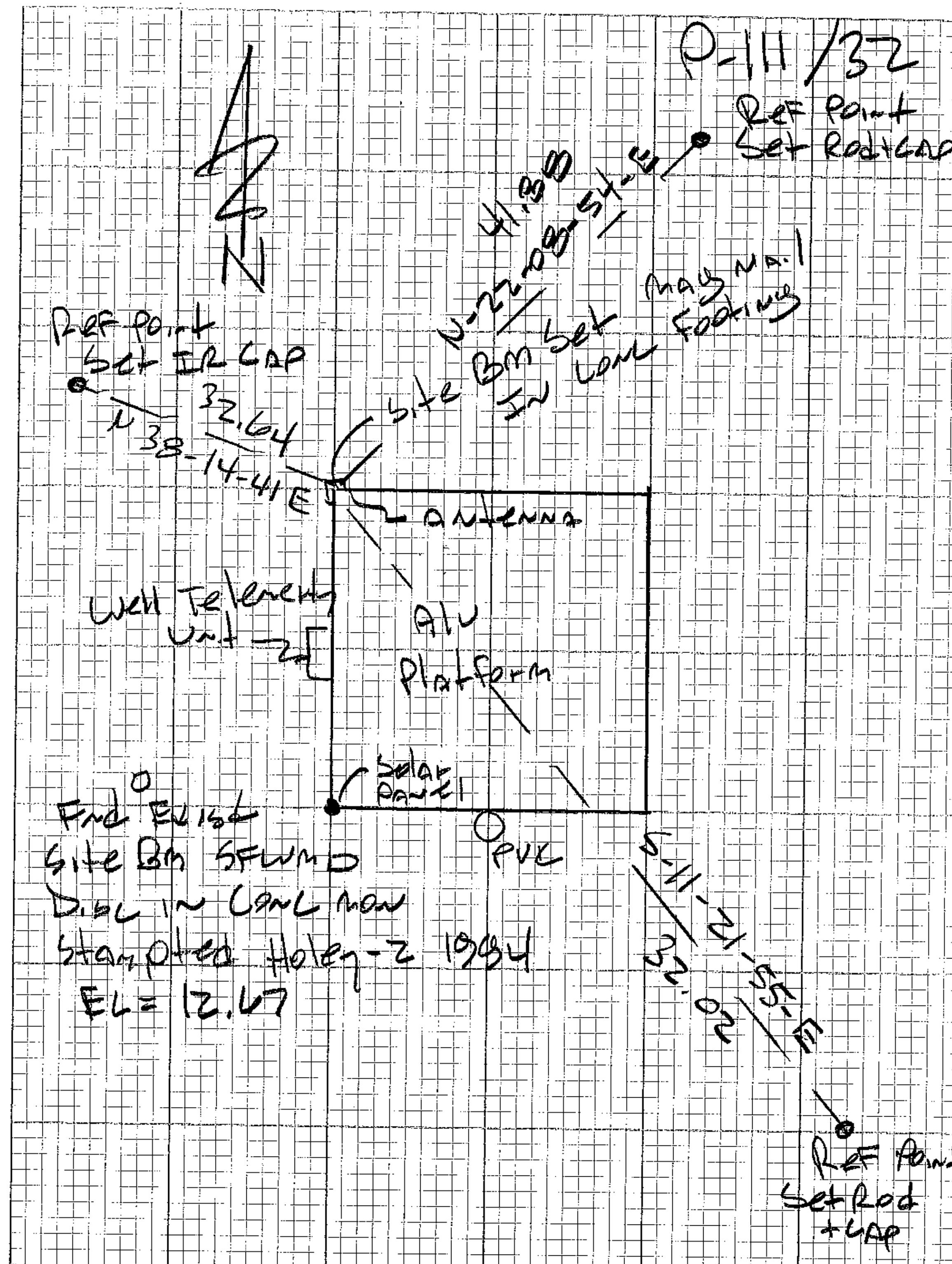

R.P
El
HOLEY 2 W
ELEV. 19.20
DATE 09/25/08
BY C G A
NAVD
NGVD 29
10/16/2008

T McLemore SFWMD 10/6/08
H Parville Holeyland Rotenberger
R Luke Monitoring well
Holey-2

Sta	+	T	-	Elz	Desc
BM	9.62	20.64		11.02	Site BM mag nail
Exist marker mark Set Brass Tag			1.44	19.20	Set Brass Tag
Fnd Exist Site BM			8.03	12.61	Conc mon with alum disk
	7.97	20.58			
Avg Ground Shot			9.9	10.7	
Closed			9.56	11.02	Site BM

Mea to water Brass Tag EL= 19.20
\- 7.02

11:30 AM
10/16/08 Water EL= 12.18



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/08

COUNTY Palm Beach	**PROJECT** Holeyland Rotenberger Well Site Survey	**DESIGNATION** HOLEY2
SECTION 18	**TOWNSHIP** 47 SOUTH	**RANGE** 37 EAST
NAME OF QUADRANGLE West of Deem City		
Established by Calvin, Giordano & Associates, Inc.	**Recovered by** _____ *(Surveyor / Firm Name)*	
DATE 09/25/2008	**FIELD BOOK** P-111 **PAGE** 32	
HORIZONTAL DATUM: 1927 (1983) ADJ ____ Other___ (circle one)	ZONE (E) or W	
STATE PLANE COORDINATES	N 734482.9 ft	E 762585.9 ft
LATITUDE: N 26° 21' 14.32079"	**LONGITUDE:** W 80° 40' 30.06001"	
VERTICAL DATUM: MSL 1929 (1988) Other _____ (circle one)		EL. 9.57 ft
VERTICAL DATUM: MSL (1929) 1988 Other _____ (circle one)		EL. 11.02 ft
CONTROL ACCURACY: HORIZONTAL 1 2 3 (SUB-METER) (circle one) **VERTICAL** 1 2 (3)		

DESCRIPTION

To Reach: From the intersection of US Route 27 and the Palm Beach / Broward County Line proceed north on US 27 for 0.15 MI to a paved road on the left on the north side of the L-4 canal. Turn left and proceed west for 6 MI where the road turns to rock continue 2.7 MI to an airboat trail then proceed north along the airboat trail +/- 1.5 MI to the HOLEY2 well site. The benchmark is a mag nail set in the northwest concrete footer of well structure.

NGS Benchmarks Used: S 410 X, N 410 X AND Q 486

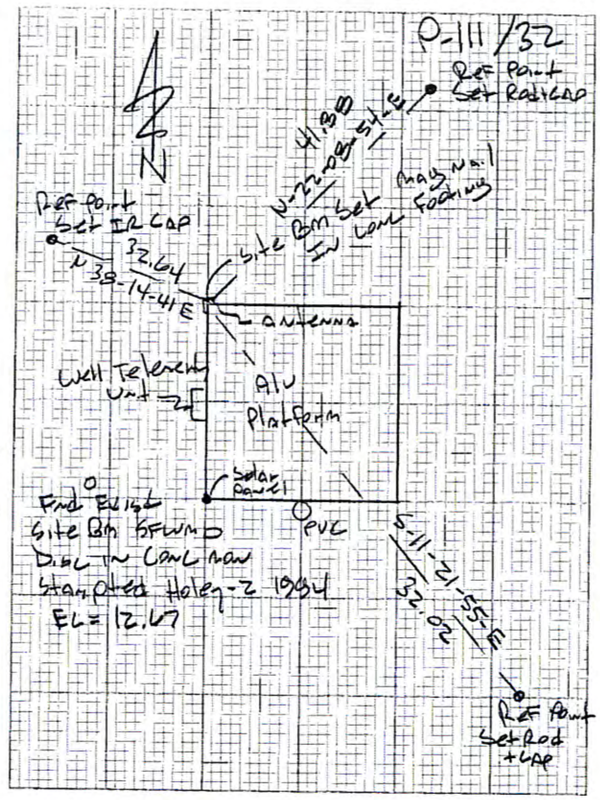
Notable Land marks:

SKETCH

T McLemore SFWMD 10/6/08
H Dorville Holey Land Rotenberger
R Luke — Monitoring Well
Holey-2

Sta	+	HI	-	EL=	Desc
BM	9.62	20.64		11.02	Site BM Mag Nail
Exist marker mark Set Brass Tag			1.44	19.20	Set Brass Tag
Fnd Exist Site BM			8.03	12.61	Conc mon with alum disk
	7.97	20.58			
AVG Ground Shot			9.9	10.7	
Closed			9.56	11.02	Site BM

Meas to water Brass Tag EL= 19.20
- 7.02
11:30 AM
10/16/08 Water El= 12.18



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/08

PICTURE

The NGS Data Sheet

See file _dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.64
1        National Geodetic Survey,   Retrieval Date = DECEMBER  1, 2008
 AD7409 ***********************************************************************
 AD7409  DESIGNATION -  BRIDGE 2
 AD7409  PID         -  AD7409
 AD7409  STATE/COUNTY-  FL/PALM BEACH
 AD7409  USGS QUAD   -  LAKE HARBOR SE (1970)
 AD7409
 AD7409                        *CURRENT SURVEY CONTROL
 AD7409  ______________________________________________________________________
 AD7409* NAD 83(1990)-  26 33 57.48801(N)     080 50 31.94665(W)      ADJUSTED
 AD7409* NAVD 88     -         5.841  (meters)       19.16   (feet)  ADJUSTED
 AD7409  ______________________________________________________________________
 AD7409  LAPLACE CORR-          -0.96  (seconds)                      DEFLEC99
 AD7409  GEOID HEIGHT-         -24.82  (meters)                       GEOID03
 AD7409  DYNAMIC HT  -           5.832 (meters)       19.13   (feet)  COMP
 AD7409  MODELED GRAV-     979,087.1   (mgal)                         NAVD 88
 AD7409
 AD7409  HORZ ORDER  -  FIRST
 AD7409  VERT ORDER  -  SECOND    CLASS I
 AD7409
 AD7409.The horizontal coordinates were established by classical geodetic methods
 AD7409.and adjusted by the National Geodetic Survey in May 1991.
 AD7409
 AD7409.The orthometric height was determined by differential leveling
 AD7409.and adjusted in May 2003.
 AD7409.No vertical observational check was made to the station.
 AD7409.WARNING-Repeat measurements at this control monument indicate possible
 AD7409.vertical movement.
 AD7409
 AD7409.The Laplace correction was computed from DEFLEC99 derived deflections.
 AD7409
 AD7409.The geoid height was determined by GEOID03.
 AD7409
 AD7409.The dynamic height is computed by dividing the NAVD 88
 AD7409.geopotential number by the normal gravity value computed on the
 AD7409.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 AD7409.degrees latitude (g = 980.6199 gals.).
 AD7409
 AD7409.The modeled gravity was interpolated from observed gravity values.
 AD7409
 AD7409;                    North         East     Units Scale Factor Converg.
 AD7409;SPC FL E     -   247,325.863   215,720.454   MT  0.99994423   +0 04 14.0
 AD7409;SPC FL E     -   811,434.94    707,742.86   sFT  0.99994423   +0 04 14.0
 AD7409;UTM  17      - 2,938,373.458   515,715.090   MT  0.99960305   +0 04 14.0
 AD7409
 AD7409!             -  Elev Factor  x  Scale Factor =   Combined Factor
 AD7409!SPC FL E     -   1.00000298  x   0.99994423  =   0.99994721
 AD7409!UTM  17      -   1.00000298  x   0.99960305  =   0.99960603
 AD7409
 AD7409:                Primary Azimuth Mark                     Grid Az
 AD7409:SPC FL E     -  OKEELANTA SUGAR REFINING CO TK           081 47 16.0
 AD7409:UTM  17      -  OKEELANTA SUGAR REFINING CO TK           081 47 16.0
 AD7409
 AD7409|----------------------------------------------------------------------|
 AD7409| PID    Reference Object                    Distance      Geod. Az   |
 AD7409|                                                          dddmmss.s  |
 AD7409| AD7346 OKEELANTA SUGAR REFINING CO TK     APPROX. 9.3 KM 0815130.0  |
 AD7409| AD8164 BRIDGE 2 RM 3                       22.013 METERS 11341      |
```

```
AD7409| CW9345 BRIDGE 2 RM 4                          14.244 METERS 25852     |
AD7409| AD7413 CLEWISTON ATT MICROWAVE              APPROX.10.3 KM 3114850.3 |
AD7409| CW9344 BRIDGE 2 AZ MK                                      3485427.0 |
AD7409|-------------------------------------------------------------------|
AD7409
AD7409                          SUPERSEDED SURVEY CONTROL
AD7409
AD7409  NAD 83(1986)-  26 33 57.48982(N)    080 50 31.95552(W) AD(       ) 1
AD7409  NAD 27      -  26 33 56.23244(N)    080 50 32.72985(W) AD(       ) 1
AD7409  NAVD 88 (10/26/99)    5.877  (m)           19.28   (f) UNKNOWN     1 2
AD7409  NAVD 88 (09/04/92)    5.882  (m)           19.30   (f) UNKNOWN     1 2
AD7409  NGVD 29 (09/01/92)    6.312  (m)           20.71   (f) ADJUSTED    1 2
AD7409
AD7409.Superseded values are not recommended for survey control.
AD7409.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AD7409.See file dsdata.txt to determine how the superseded data were derived.
AD7409
AD7409_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNK1571538373(NAD 83)
AD7409_MARKER: DS = TRIANGULATION STATION DISK
AD7409_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
AD7409_SP_SET: CONCRETE POST
AD7409_STAMPING: BRIDGE 2 1970
AD7409_MARK LOGO: NGS
AD7409_MAGNETIC: N = NO MAGNETIC MATERIAL
AD7409_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
AD7409+STABILITY: SURFACE MOTION
AD7409_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AD7409+SATELLITE: SATELLITE OBSERVATIONS - November 01, 2007
AD7409
AD7409  HISTORY     - Date     Condition        Report By
AD7409  HISTORY     - 1970     MONUMENTED       NGS
AD7409  HISTORY     - 1970     GOOD             NGS
AD7409  HISTORY     - 1973     GOOD             LOCSUR
AD7409  HISTORY     - 19920317 GOOD             NGS
AD7409  HISTORY     - 20000301 GOOD             FLDEP
AD7409  HISTORY     - 20021111 GOOD             NGS
AD7409  HISTORY     - 20071101 GOOD             GCT
AD7409
AD7409                          STATION DESCRIPTION
AD7409
AD7409'DESCRIBED BY NATIONAL GEODETIC SURVEY 1970 (NCA)
AD7409'STATION IS ABOUT 14 MILES SOUTHWEST OF BELLE GLADE, 14 MILES
AD7409'SOUTHEAST OF CLEWISTON, 9 MILES SOUTH OF LAKE HARBOR, AT THE
AD7409'JUNCTION OF THE SEABOARD COAST LINE RAILROAD AND MIAMI CANAL
AD7409'AND ON THE RAILROAD RIGHT-OF-WAY.
AD7409'
AD7409'TO REACH THE STATION FROM THE POST OFFICE IN SOUTH BAY, GO WEST
AD7409'ON STATE HIGHWAY 80 FOR 0.2 MILE TO THE JUNCTION OF U.S. HIGHWAY
AD7409'27.  TURN LEFT AND GO SOUTHERLY ON HIGHWAY 27 FOR 3.90 MILES TO
AD7409'A CROSSROAD (S-832).  CONTINUE SOUTH ON HIGHWAY 27 FOR 2.05 MILES
AD7409'TO A SIDE ROAD RIGHT.  TURN RIGHT AND GO WEST ON THE NORTH SIDE
AD7409'OF A CANAL FOR 2.45 MILES TO WHERE THE MAIN ROAD TURNS AND
AD7409'CROSSES THE CANAL AT THE ENTRANCE TO A SUGAR PLANT.  CROSS THE
AD7409'CANAL AND TURN RIGHT AND GO WEST ON OILED ROAD ALONG THE
AD7409'SOUTH SIDE OF THE CANAL FOR 1.5 MILES TO A CROSSROAD AND CANAL.
AD7409'TURN LEFT AND GO SOUTH ALONG THE EAST SIDE OF THE CANAL FOR
AD7409'1.0 MILE TO A T JUNCTION JUST AFTER CROSSING A RAILROAD TRACK.
AD7409'TURN RIGHT AND GO WEST ON OILED ROAD FOR 4.55 MILES TO A
AD7409'CROSSROAD JUST BEFORE REACHING A BRIDGE CROSSING THE MIAMI
AD7409'CANAL.  TURN RIGHT AND GO NORTH FOR 0.05 MILE TO A RAILROAD
AD7409'CROSSING AND STATION ON LEFT AS DESCRIBED.
AD7409'
AD7409'ALL MARKS ARE STANDARD DISKS.
AD7409'
AD7409'STATION MARK, STAMPED BRIDGE 2 1970, IS SET IN A ROUND CONCRETE
AD7409'POST FLUSH WITH THE GROUND.  IT IS 44 FEET NORTHWEST OF CENTER
```

AD7409'OF THE RAILROAD CROSSING, 38 FEET WEST OF CENTER OF THE
AD7409'GRAVELED ROAD, 17.5 FEET WEST OF A RAILROAD CROSSING SIGN, 14
AD7409'FEET NORTHEAST OF THE NORTHEAST CORNER OF THE RAILROAD BRIDGE
AD7409'AND 12.6 FEET NORTH OF THE NORTH RAIL OF THE TRACKS.
AD7409'
AD7409'REFERENCE MARK 3, STAMPED BRIDGE 2 NO 3 1970, IS SET IN A
AD7409'ROUND CONCRETE POST FLUSH WITH THE GROUND. IT IS 28 FEET
AD7409'SOUTHEAST OF CENTER OF THE RAILROAD CROSSING, 21.5 FEET EAST OF
AD7409'CENTER OF THE ROAD, 11.8 FEET SOUTH OF THE SOUTH RAIL AND 1.3
AD7409'FEET WEST OF A RAILROAD CROSSING SIGN.
AD7409'
AD7409'REFERENCE MARK 4, STAMPED BRIDGE 2 NO 4 1970, IS CEMENTED IN A
AD7409'DRILL HOLE IN THE NORTH END OF THE EAST BRIDGE SUPPORT OF THE
AD7409'RAILROAD BRIDGE. IT IS 85 FEET WEST OF CENTER OF THE ROAD, 37
AD7409'FEET WEST OF THE NORTHEAST CORNER OF THE RAILROAD BRIDGE AND
AD7409'4 FEET NORTH AND ABOUT 3 FEET LOWER THAN THE NORTH RAIL.
AD7409'
AD7409'AZIMUTH MARK, STAMPED BRIDGE 2 1970, IS SET IN A ROUND
AD7409'CONCRETE POST FLUSH WITH THE GROUND. IT IS 81 FEET EAST OF THE
AD7409'EAST EDGE OF THE MIAMI CANAL, 47 FEET WEST OF A DITCH, 15 FEET
AD7409'EAST OF CENTER OF THE ROAD AND 2 FEET WEST OF A METAL WITNESS
AD7409'POST.
AD7409'
AD7409'TO REACH THE AZIMUTH MARK FROM THE STATION GO NORTH ON THE
AD7409'GRAVELED ROAD FOR 0.55 MILE TO THE MARK ON THE RIGHT AS DESCRIBED.
AD7409'
AD7409'HEIGHT OF LIGHT ABOVE STATION MARK 3 METERS.
AD7409
AD7409 STATION RECOVERY (1970)
AD7409
AD7409'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1970
AD7409'RECOVERED IN GOOD CONDITION.
AD7409
AD7409 STATION RECOVERY (1973)
AD7409
AD7409'RECOVERY NOTE BY LOCAL SURVEYOR (INDIVIDUAL OR FIRM) 1973
AD7409'STATION AND AZIMUTH MARK RECOVERED IN GOOD CONDITION.
AD7409
AD7409 STATION RECOVERY (1992)
AD7409
AD7409'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1992
AD7409'14.8 KM (9.20 MI) SOUTHERLY ALONG MIAMI CANAL ROAD AND THE WEST LEVEE
AD7409'ROAD OF THE MIAMI CANAL FROM THE POST OFFICE IN LAKE HARBOR, 49.4 M
AD7409'(162.1 FT) EAST OF THE CENTER OF THE ROAD, 22.0 M (72.2 FT) NORTHWEST
AD7409'OF REFERENCE MARK 3, 5.6 M (18.4 FT) WEST OF A SIGN (RAILROAD
AD7409'CROSSING), 4.8 M (15.7 FT) NORTHEAST OF THE NORTHEAST CORNER OF A
AD7409'FLORIDA EAST COAST RAILROAD BRIDGE SPANNING THE MIAMI CANAL, 3.8 M
AD7409'(12.5 FT) NORTH OF THE NEAR RAIL, 0.3 M (1.0 FT) SOUTH OF A WITNESS
AD7409'POST, AND THE MONUMENT PROJECTS 0.1 M (0.3 FT) ABOVE THE GROUND
AD7409'SURFACE.
AD7409
AD7409 STATION RECOVERY (2000)
AD7409
AD7409'RECOVERY NOTE BY FL DEPT OF ENV PRO 2000 (JLM)
AD7409'THE MARK IS ABOUT 13.6 MI (21.9 KM) SOUTHWEST OF SOUTHBAY, 9.2 MI
AD7409'(14.8 KM) SOUTH OF LAKE HARBOR (ON THE EAST LEVEE ROAD OF THE MIAMI
AD7409'CANAL), IN SECTION 21, TOWNSHIP 45 SOUTH, RANGE 35 EAST. TO REACH THE
AD7409'MARK FROM THE JUNCTION OF U.S. HIGHWAY 27 AND STATE ROAD 80 IN SOUTH
AD7409'BAY, GO SOUTH ON U.S. HIGHWAY 27 FOR 3.8 MI (6.1 KM) TO THE JUNCTION
AD7409'OF COUNTY ROAD 827 ON THE RIGHT, TURN RIGHT ON COUNTY ROAD 827 AND GO
AD7409'WEST FOR 4.8 MI (7.7 KM) TO THE END OF THE PAVEMENT, CONTINUE WEST ON
AD7409'COUNTY ROAD 827 FOR 2.95 MI (4.75 KM) TO THE JUNCTION OF MIAMI CANAL
AD7409'(EAST SIDE), TURN LEFT ON THE LEVEE ROAD AND GO SOUTH FOR 3.1 MI (5.0
AD7409'KM) TO THE RAILROAD TRACKS AND THE MARK ON THE RIGHT, SET IN THE TOP
AD7409'OF A ROUND CONCRETE MONUMENT, PROJECTING 0.2 FT (6.1 CM) ABOVE THE
AD7409'LEVEL OF THE GROUND AND THE LEVEE ROAD. LOCATED 238.0 FT (72.5 M)

```
AD7409'NORTH OF THE APPROXIMATE CENTERLINE OF A EAST-WEST PAVED ROAD, 18.0 FT
AD7409'(5.5 M) WEST OF A RAILROAD CROSSING POLE WITH A PALM BEACH COUNTY
AD7409'WITNESS SIGN, 15.5 FT (4.7 M) NORTH OF THE CENTER OF THE RAILROAD
AD7409'TRACKS AND 1.0 FT (0.3 M) SOUTH OF A CARSONITE WITNESS POST.
AD7409
AD7409                          STATION RECOVERY (2002)
AD7409
AD7409'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2002
AD7409'RECOVERED IN GOOD CONDITION.
AD7409
AD7409                          STATION RECOVERY (2007)
AD7409
AD7409'RECOVERY NOTE BY GUSTIN, COTHERN, AND TUCKER, I 2007 (HWW)
AD7409'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:01
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The NGS Data Sheet

See file _dsdata.txt for more information about the datasheet.

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DATABASE =  ,PROGRAM = datasheet, VERSION = 7.64
1        National Geodetic Survey,   Retrieval Date = DECEMBER  1, 2008
 AD8147 ***********************************************************************
 AD8147  DESIGNATION -  S 410 X
 AD8147  PID         -  AD8147
 AD8147  STATE/COUNTY-  FL/PALM BEACH
 AD8147  USGS QUAD   -  NORTH OF LONE PALM (1979)
 AD8147
 AD8147                        *CURRENT SURVEY CONTROL
 AD8147  ______________________________________________________________________
 AD8147* NAD 83(2007)-  26 21 16.72080(N)     080 47 29.55225(W)      ADJUSTED
 AD8147* NAVD 88     -         5.595  (meters)      18.36   (feet)   ADJUSTED
 AD8147  ______________________________________________________________________
 AD8147  EPOCH DATE  -        2002.00
 AD8147  X           -     915,189.358 (meters)                      COMP
 AD8147  Y           -  -5,645,269.542 (meters)                      COMP
 AD8147  Z           -   2,814,314.704 (meters)                      COMP
 AD8147  LAPLACE CORR-          -0.22  (seconds)                     DEFLEC99
 AD8147  ELLIP HEIGHT-         -19.216 (meters)          (02/10/07) ADJUSTED
 AD8147  GEOID HEIGHT-         -24.80  (meters)                      GEOID03
 AD8147  DYNAMIC HT  -           5.586 (meters)      18.33  (feet)  COMP
 AD8147
 AD8147  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 AD8147  Type    PID    Designation                       North   East  Ellip
 AD8147  ----------------------------------------------------------------------
 AD8147  NETWORK AD8147 S 410 X                             0.45   0.51   0.92
 AD8147  ----------------------------------------------------------------------
 AD8147  MODELED GRAV-     979,063.2   (mgal)                        NAVD 88
 AD8147
 AD8147  VERT ORDER  -  FIRST     CLASS II
 AD8147
 AD8147.The horizontal coordinates were established by GPS observations
 AD8147.and adjusted by the National Geodetic Survey in February 2007.
 AD8147
 AD8147.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 AD8147.See National Readjustment for more information.
 AD8147.The horizontal coordinates are valid at the epoch date displayed above.
 AD8147.The epoch date for horizontal control is a decimal equivalence
 AD8147.of Year/Month/Day.
 AD8147
 AD8147.The orthometric height was determined by differential leveling
 AD8147.and adjusted in September 1992.
 AD8147
 AD8147.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 AD8147
 AD8147.The Laplace correction was computed from DEFLEC99 derived deflections.
 AD8147
 AD8147.The ellipsoidal height was determined by GPS observations
 AD8147.and is referenced to NAD 83.
 AD8147
 AD8147.The geoid height was determined by GEOID03.
 AD8147
 AD8147.The dynamic height is computed by dividing the NAVD 88
 AD8147.geopotential number by the normal gravity value computed on the
 AD8147.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 AD8147.degrees latitude (g = 980.6199 gals.).
 AD8147
 AD8147.The modeled gravity was interpolated from observed gravity values.
 AD8147
```

```
AD8147;                    North         East     Units Scale Factor Converg.
AD8147;SPC FL E     -   223,920.675   220,806.050   MT  0.99994652   +0 05 33.1
AD8147;SPC FL E     -   734,646.41    724,427.85   sFT  0.99994652   +0 05 33.1
AD8147;UTM  17      - 2,914,976.256   520,798.951   MT  0.99960534   +0 05 33.1
AD8147
AD8147!             -  Elev Factor  x  Scale Factor =   Combined Factor
AD8147!SPC FL E     -   1.00000302  x   0.99994652  =   0.99994954
AD8147!UTM  17      -   1.00000302  x   0.99960534  =   0.99960836
AD8147
AD8147                          SUPERSEDED SURVEY CONTROL
AD8147
AD8147  NAD 83(1999)-  26 21 16.72086(N)    080 47 29.55230(W) AD(       ) A
AD8147  ELLIP H (12/09/02)  -19.226  (m)                       GP(       ) 4 1
AD8147  NAVD 88 (12/09/02)    5.59   (m)           18.3    (f) LEVELING    3
AD8147  NGVD 29 (09/01/92)    6.033  (m)           19.79   (f) ADJUSTED    1 2
AD8147
AD8147.Superseded values are not recommended for survey control.
AD8147.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AD8147.See file dsdata.txt to determine how the superseded data were derived.
AD8147
AD8147_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNK2079914976(NAD 83)
AD8147_MARKER: F = FLANGE-ENCASED ROD
AD8147_SETTING: 15 = METAL ROD DRIVEN INTO GROUND. SEE TEXT FOR ADDITIONAL
AD8147+WITH SETTING: INFORMATION.
AD8147_SP_SET: STAINLESS STEEL ROD
AD8147_STAMPING: S 410 X 1992
AD8147_MARK LOGO: NGS
AD8147_PROJECTION: RECESSED 150 CENTIMETERS
AD8147_MAGNETIC: N = NO MAGNETIC MATERIAL
AD8147_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY
AD8147_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AD8147+SATELLITE: SATELLITE OBSERVATIONS - November 01, 2007
AD8147_ROD/PIPE-DEPTH:  1.5 meters
AD8147
AD8147  HISTORY     - Date     Condition        Report By
AD8147  HISTORY     - 1992     MONUMENTED       NGS
AD8147  HISTORY     - 20020227 GOOD             MAPTEC
AD8147  HISTORY     - 20030930 GOOD             FLDEP
AD8147  HISTORY     - 20041005 GOOD             MCKIM
AD8147  HISTORY     - 20051010 GOOD             NGS
AD8147  HISTORY     - 20070618 GOOD             GCT
AD8147  HISTORY     - 20071101 GOOD             GCT
AD8147
AD8147                          STATION DESCRIPTION
AD8147
AD8147'DESCRIBED BY NATIONAL GEODETIC SURVEY 1992
AD8147'14.9 KM (9.25 MI) SOUTHERLY ALONG MIAMI CANAL ROAD AND THE WEST LEVEE
AD8147'ROAD OF THE MIAMI CANAL FROM THE POST OFFICE IN LAKE HARBOR, THENCE
AD8147'0.1 KM (0.05 MI) EASTERLY ALONG A PAVED ROAD, THENCE 23.9 KM (14.85
AD8147'MI) SOUTHERLY ALONG THE EAST LEVEE ROAD OF THE MIAMI CANAL, 7.4 M
AD8147'(24.3 FT) NORTHEAST OF AND LEVEL WITH THE CENTER OF THE ROAD, 1.8 M
AD8147'(5.9 FT) SOUTHEAST OF A UTILITY POLE, AND 0.5 M (1.6 FT) NORTHWEST OF
AD8147'A WITNESS POST.  NOTE--ACCESS TO THE DATUM POINT IS THROUGH A 5-INCH
AD8147'LOGO CAP.  THE ROAD WAS DRIVEN TO REFUSAL AND ANCHORED.
AD8147
AD8147                          STATION RECOVERY (2002)
AD8147
AD8147'RECOVERY NOTE BY MAPTECH INCORPORATED 2002 (RLT)
AD8147'RECOVERED AS DESCRIBED
AD8147'
AD8147'
AD8147'
AD8147'
AD8147
AD8147                          STATION RECOVERY (2003)
AD8147
```

```
AD8147'RECOVERY NOTE BY FL DEPT OF ENV PRO 2003 (RWH)
AD8147'RECOVERY IN GOOD CONDITION EXCEPT, THE ROD WAS DRIVEN TO REFUSAL AND
AD8147'ANCHORED.  NOT--THE ROAD WAS DRIVEN TO REFUSAL AND ANCHORED.
AD8147
AD8147                          STATION RECOVERY (2004)
AD8147
AD8147'RECOVERY NOTE BY MCKIM AND CREED 2004 (BRH)
AD8147'RECOVERED IN GOOD CONDITION.
AD8147
AD8147                          STATION RECOVERY (2005)
AD8147
AD8147'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2005 (ECD)
AD8147'RECOVERED AS DESCRIBED.
AD8147
AD8147                          STATION RECOVERY (2007)
AD8147
AD8147'RECOVERY NOTE BY GUSTIN, COTHERN, AND TUCKER, I 2007 (WBM)
AD8147'RECOVERED IN GOOD CONDITION.
AD8147
AD8147                          STATION RECOVERY (2007)
AD8147
AD8147'RECOVERY NOTE BY GUSTIN, COTHERN, AND TUCKER, I 2007 (HWW)
AD8147'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:00
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The NGS Data Sheet

See file _dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.64
1        National Geodetic Survey,   Retrieval Date = DECEMBER  1, 2008
 AJ3482 ***********************************************************************
 AJ3482  DESIGNATION -  V 486
 AJ3482  PID         -  AJ3482
 AJ3482  STATE/COUNTY-  FL/PALM BEACH
 AJ3482  USGS QUAD   -  SOUTH OF OKEELANTA (1974)
 AJ3482
 AJ3482                        *CURRENT SURVEY CONTROL
 AJ3482  ______________________________________________________________________
 AJ3482* NAD 83(2007)-  26 29 31.27303(N)    080 39 31.00954(W)     ADJUSTED
 AJ3482* NAVD 88     -         5.870  (meters)      19.26   (feet)  ADJUSTED
 AJ3482  ______________________________________________________________________
 AJ3482  EPOCH DATE  -        2002.00
 AJ3482  X           -     927,184.770 (meters)                     COMP
 AJ3482  Y           -  -5,636,447.913 (meters)                     COMP
 AJ3482  Z           -   2,827,945.103 (meters)                     COMP
 AJ3482  LAPLACE CORR-          -0.65  (seconds)                    DEFLEC99
 AJ3482  ELLIP HEIGHT-         -19.100 (meters)          (02/10/07) ADJUSTED
 AJ3482  GEOID HEIGHT-         -24.94  (meters)                     GEOID03
 AJ3482  DYNAMIC HT  -           5.861 (meters)      19.23  (feet)  COMP
 AJ3482
 AJ3482  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 AJ3482  Type    PID    Designation                       North   East  Ellip
 AJ3482  ----------------------------------------------------------------------
 AJ3482  NETWORK AJ3482 V 486                               1.74   1.72   3.12
 AJ3482  ----------------------------------------------------------------------
 AJ3482  MODELED GRAV-     979,083.8   (mgal)                       NAVD 88
 AJ3482
 AJ3482  VERT ORDER  -  SECOND    CLASS I
 AJ3482
 AJ3482.The horizontal coordinates were established by GPS observations
 AJ3482.and adjusted by the National Geodetic Survey in February 2007.
 AJ3482
 AJ3482.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 AJ3482.See National Readjustment for more information.
 AJ3482.The horizontal coordinates are valid at the epoch date displayed above.
 AJ3482.The epoch date for horizontal control is a decimal equivalence
 AJ3482.of Year/Month/Day.
 AJ3482
 AJ3482.The orthometric height was determined by differential leveling
 AJ3482.and adjusted in September 2001.
 AJ3482
 AJ3482.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 AJ3482
 AJ3482.The Laplace correction was computed from DEFLEC99 derived deflections.
 AJ3482
 AJ3482.The ellipsoidal height was determined by GPS observations
 AJ3482.and is referenced to NAD 83.
 AJ3482
 AJ3482.The geoid height was determined by GEOID03.
 AJ3482
 AJ3482.The dynamic height is computed by dividing the NAVD 88
 AJ3482.geopotential number by the normal gravity value computed on the
 AJ3482.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 AJ3482.degrees latitude (g = 980.6199 gals.).
 AJ3482
 AJ3482.The modeled gravity was interpolated from observed gravity values.
 AJ3482
```

```
AJ3482;                    North         East     Units Scale Factor Converg.
AJ3482;SPC FL E     -   239,168.671   234,033.296   MT  0.99995547   +0 09 08.2
AJ3482;SPC FL E     -   784,672.55    767,824.24   sFT  0.99995547   +0 09 08.2
AJ3482;UTM  17      - 2,930,219.049   534,021.684   MT  0.99961429   +0 09 08.2
AJ3482
AJ3482!             -  Elev Factor  x  Scale Factor =   Combined Factor
AJ3482!SPC FL E     -   1.00000300  x   0.99995547  =   0.99995847
AJ3482!UTM  17      -   1.00000300  x   0.99961429  =   0.99961729
AJ3482
AJ3482                          SUPERSEDED SURVEY CONTROL
AJ3482
AJ3482  NAD 83(1999)-  26 29 31.27309(N)    080 39 31.00979(W) AD(       ) 1
AJ3482  ELLIP H (12/12/02)  -19.107  (m)                       GP(       ) 4 1
AJ3482  NAVD 88 (12/12/02)    5.87   (m)           19.3    (f) LEVELING    3
AJ3482
AJ3482.Superseded values are not recommended for survey control.
AJ3482.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AJ3482.See file dsdata.txt to determine how the superseded data were derived.
AJ3482
AJ3482_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNK3402230219(NAD 83)
AJ3482_MARKER: F = FLANGE-ENCASED ROD
AJ3482_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AJ3482_STAMPING: V 486 2000
AJ3482_MARK LOGO: NGS
AJ3482_PROJECTION: FLUSH
AJ3482_MAGNETIC: N = NO MAGNETIC MATERIAL
AJ3482_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AJ3482_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AJ3482+SATELLITE: SATELLITE OBSERVATIONS - November 01, 2007
AJ3482_ROD/PIPE-DEPTH:  3.7 meters
AJ3482
AJ3482  HISTORY     - Date     Condition        Report By
AJ3482  HISTORY     - 2000     MONUMENTED       FLDEP
AJ3482  HISTORY     - 20020528 GOOD             MAPTEC
AJ3482  HISTORY     - 20041122 GOOD             WEIDEN
AJ3482  HISTORY     - 20071101 GOOD             GCT
AJ3482
AJ3482                          STATION DESCRIPTION
AJ3482
AJ3482'DESCRIBED BY FL DEPT OF ENV PRO 2000 (JLM)
AJ3482'THE MARK IS ABOUT 26.0 MI (41.8 KM) SOUTHWEST OF SOUTH BAY ON LEVEE
AJ3482'19, IN SECTION 5, TOWNSHIP 46 SOUTH, RANGE 37 EAST. TO REACH THE MARK
AJ3482'FROM THE JUNCTION OF U.S. HIGHWAY 27 AND STATE ROAD 80 IN SOUTH BAY,
AJ3482'GO SOUTH ON U.S. HIGHWAY 27 FOR 3.8 MI (6.1 KM) TO THE JUNCTION OF
AJ3482'COUNTY ROAD 827, CONTINUE SOUTH ON U.S. HIGHWAY 27 FOR 1.05 MI (1.69
AJ3482'KM) TO A CONCRETE BRIDGE ON THE LEFT OVER THE NORTH NEW RIVER CANAL,
AJ3482'TURN LEFT CROSSING OVER THE BRIDGE TO THE EAST END AND THE JUNCTION OF
AJ3482'LEVEE 19 PARALELLING THE NORTH NEW RIVER CANAL, TURN RIGHT ON LEVEE 19
AJ3482'AND GO SOUTH FOR 8.1 MI (13.0 KM) TO THE MARK ON THE RIGHT, A
AJ3482'STAINLESS STEEL ROD DRIVEN TO REFUSAL AT A DEPTH OF 12.0 FT (3.7 M)
AJ3482'WITH A NGS LOGO CAP FLUSH WITH THE GROUND AND LEVEL WITH THE LEVEE
AJ3482'ROAD, THE DATUM POINT IS RECESSED 0.5 FT (15.2 CM) BELOW THE LEVEL OF
AJ3482'THE NGS LOGO CAP. LOCATED 25.0 FT (7.6 M) SOUTHWEST OF THE APPROXIMATE
AJ3482'CENTERLINE OF THE LEVEE ROAD, 2.3 FT (0.7 M) NORTHWEST OF A 3-INCH PVC
AJ3482'PIPE AND 1.0 FT (0.3 M) NORTHEAST OF A CARSONITE WITNESS POST. NOTE
AJ3482'ACCESS TO THE DATUM POINT IS HAD THROUGH A 5-INCH NGS LOGO CAP.
AJ3482
AJ3482                          STATION RECOVERY (2002)
AJ3482
AJ3482'RECOVERY NOTE BY MAPTECH INCORPORATED 2002 (CDP)
AJ3482'STATION RECOVERY (2002)
AJ3482'RECOVERY NOTE BY MAPTECH, INCORPORATED 2002 (CDP)
AJ3482'RECOVERED AS DESCRIBED.
AJ3482'
AJ3482'
AJ3482
```

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AJ3482                          STATION RECOVERY (2004)
AJ3482
AJ3482'RECOVERY NOTE BY WEIDENER SURVEYING AND MAPPING 2004
AJ3482'RECOVERED AS DESCRIBED
AJ3482
AJ3482                          STATION RECOVERY (2007)
AJ3482
AJ3482'RECOVERY NOTE BY GUSTIN, COTHERN, AND TUCKER, I 2007 (HWW)
AJ3482'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:00
```
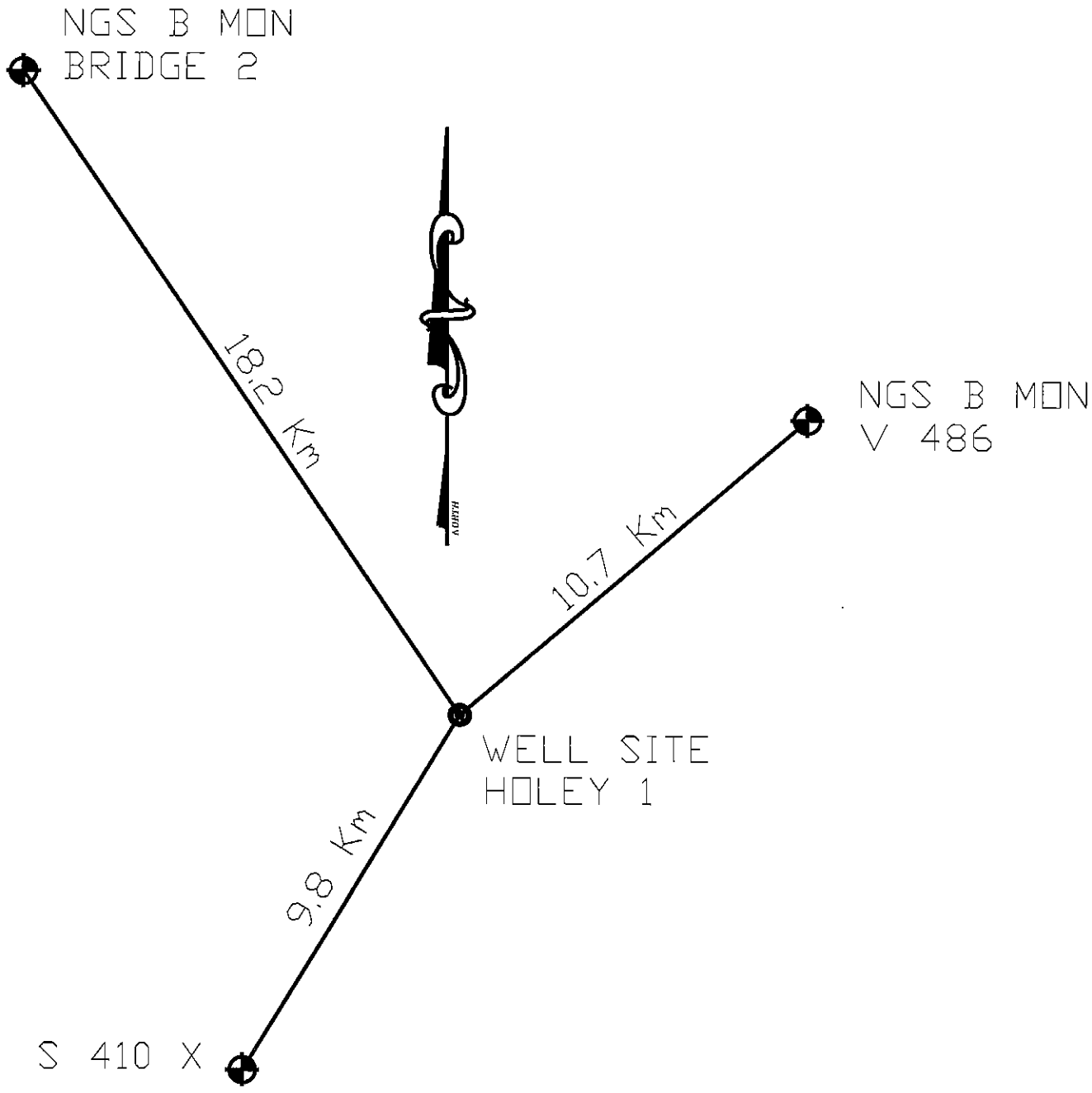

Calvin, Goirdano
GPS Observation Sessions Plan

Station	Session	DAY	Start Time	End Time	R8	4800	4800	4800
ROTTN	1	Tuesday	7:00 AM	9:00 AM	ROTTN	BRIDGE 2	S 410 X	G 406
ROTTN	2	Tuesday	1:15 PM	3:15 PM	ROTTN	BRIDGE 2	S 410 X	G 406
ROTTS	1	Tuesday	7:00 AM	9:00 AM	ROTTS	T 501	S 410 X	G 406
ROTTS	2	Tuesday	1:15 PM	3:15 PM	ROTTS	T 501	S 410 X	G 406
HOLEY	1	Wed	7:00 AM	9:00 AM	HOLEY	T 501	S 410	Q 486
HOLEY	2	Wed	1:15 PM	3:15 PM	HOLEY	T 501	S 410	Q 486
HOLEY1	1	Wed	7:00 AM	9:00 AM	HOLEY1	BRIDGE2	S 410 X	V 486
HOLEY1	2	Wed	1:15 PM	3:15 PM	HOLEY1	BRIDGE2	S 410 X	V 486
HOLEY2	1	Thursday	7:00 AM	9:00 AM	HOLEY2	N 410 X	S 410 X	V 486
HOLEY2	2	Thursday	1:15 PM	3:15 PM	HOLEY2	N 410 X	S 410 X	V 486

Calvin, Giordano
Actual GPS Observation Sessions
In the Field

Station	Session	Day	Start Time	End Time	R8	4800	4800	4800
ROTTN	1	10/1/2008	8:45 AM	11:20 AM	E 535	BRIDGE2	S 410 X	ROTTN
ROTTN	2	10/1/2008	3:30 PM	5:45 PM	E 535	BRIDGE2	S 410 X	ROTTN
ROTTS	1	9/29/2008	8:45 AM	11:00 AM	E 535	T 501	S 410 X	ROTTS
ROTTS	2	10/6/2008	3:30 PM	5:50 PM	E 535	T 510	S 410 X	ROTTS
HOLEY	1	9/24/2008	9:03 AM	11:15 AM	V 486	S 410 X	T 501	HOLEY
HOLEY	2	9/24/2008	15:20 PM	17:40 PM	V 486	S 410 X	T 501	HOLEY
HOLEY1	1	10/10/2008	9:02 AM	11:15 AM	S 410 X	BRIDGE 2	V 486	HOLEY1
HOLEY1	2	10/10/2008	3:40 PM	5:55 PM	S 410 X	BRIDGE 2	V 486	HOLEY1
HOLEY2	1	9/25/2008	8:05 AM	10:20 AM	N 410 X	Q 486	S 410 X	HOLEY2
HOLEY2	2	9/25/2008	2:35 PM	4:50 PM	N 410 X	Q 486	S 410 X	HOLEY2


NGS B MON
BRIDGE 2
18.2 Km
NGS B MON
V 486
10.7 Km
WELL SITE
HOLEY 1
9.8 Km
S 410 X

Calvin, Giordano & Associates, Inc.
Engineers Surveyors Planners

560 Village Blvd., Suite 340
West Palm Beach, Florida 33409
Phone: 561.684.6161 Fax 561.684.6360

GPS STATION ASSIGNMENT

PROJECT NAME: HOLEY1   PROJECT NUMBER: 065994.3   OPERATOR: ~~NICOLAS~~ McLEMORE   DATE: 09/19/08

RECEIVER SERIAL No.: [illegible] 2040   RECEIVER TYPE: [illegible]   FILE NAME:

OPERATOR	SESSION No. 1	SESSION No. 2	SESSION No. 3	SESSION No. 4	SESSION No. 5	SESSION No. 6	SESSION No. 7	SESSION No. 8	SESSION No. 9	SESSION No. 10
UNIT # 1 MCLMORE	HOLEY1	HOLEY1								
UNIT # 2 DARVILLE	S 410 X	S 410 X								
UNIT # 3 SCHNEIDER	BRIDGE2	BRIDGE2								
UNIT # 4 NICOLAS	V 486	V 486								
HI MEASURE & RECORD 3 SIDES	FT/MT 10.10/3.079	10.10/3.079								
	FT/MT 10.10/3.079	10.10/3.079								
	FT/MT 10.10/3.079	10.10/3.079								
ESTIMATED START TIME	[illegible]	3:40 PM								
END TIME	[illegible]	5:45 PM								
ACTUAL START TIME	[illegible] AM	3:40PM								
END TIME	[illegible]:35AM	5:55PM								

NOTES:

NOTE ACTUAL ROD MEAS FROM TRIMBLE TO POINT OF ROD @ 10.35/3.154mts [illegible]

MAG NAIL IN [illegible] COL [illegible] FOUNDATION HOLEY 1

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GPS STATION ASSIGNMENT

PROJECT NAME: HOLEY1 PROJECT NUMBER: 065994.3 OPERATOR: DARVILLE DATE: 9-19-08

RECEIVER SERIAL No.: 7019 S410X RECEIVER TYPE: R8 FILE NAME: S410X/S410X-A

OPERATOR	SESSION No. 1	SESSION No. 2	SESSION No. 3	SESSION No. 4	SESSION No. 5	SESSION No. 6	SESSION No. 7	SESSION No. 8	SESSION No. 9	SESSION No. 10
UNIT # 1 MCLMORE	HOLEY2	HOLEY2								
UNIT # 4 DARVILLE	S 410 X	S 410 X								
UNIT # 3 SCHNEIDER	BRIDGE2	BRIDGE2								
UNIT # 4 NICOLAS	V 486	V 486								
HI MEASURE & RECORD 3 SIDES	FT/MT 6.562 FT	6.562 M								
	FT/MT "	Rod								
	FT/MT "	Rod								
ESTIMATED START TIME	9.02 am	~~8:05 am~~ 5:40 pm								
END TIME	~~3:00~~ 11:35 am	~~6~~ 5:55 pm								
ACTUAL START TIME										
END TIME										

Fixed Height 2 meter Rod

NOTES: Sunny

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GPS STATION ASSIGNMENT

PROJECT NAME: HOLEY1 PROJECT NUMBER: 065994.3 OPERATOR: ~~MCLEMORE~~ KEROL DATE: 9-19-08

RECEIVER SERIAL No.: 9590 RECEIVER TYPE: Trimble 4800 FILE NAME: V- 486 2000

OPERATOR	SESSION No. 1	SESSION No. 2	SESSION No. 3	SESSION No. 4	SESSION No. 5	SESSION No. 6	SESSION No. 7	SESSION No. 8	SESSION No. 9	SESSION No. 10
UNIT # 1 MCLMORE	HOLEY2	HOLEY2								
UNIT # 2 DARVILLE	S 410 X	S 410 X								
UNIT # 3 SCHNEIDER	BRIDGE2	BRIDGE2								
UNIT # ~~4~~ 3 NICOLAS	V 486	V 486								
HI MEASURE & RECORD 3 SIDES	FT/MT 5.735/1.75	5.55/1.69								
	FT/MT 5.735/1.75	5.55/1.69								
	FT/MT 5.735/1.75	5.55/1.69								
ESTIMATED START TIME	9:00	15:35								
END TIME	11:00	17:35								
ACTUAL START TIME	9:02	15:40								
END TIME	11:35	17:55								

NOTES: Area of observation Clear. (See SKETCH ON BACK)

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GPS STATION ASSIGNMENT

PROJECT NAME: HOLEY1 PROJECT NUMBER: 065994.3 OPERATOR: SCHNEIDER DATE: 9/19/08

RECEIVER SERIAL No.: 8341 RECEIVER TYPE: TRIMBLE 4800 FILE NAME: _____

OPERATOR	SESSION No. 1	SESSION No. 2	SESSION No. 3	SESSION No. 4	SESSION No. 5	SESSION No. 6	SESSION No. 7	SESSION No. 8	SESSION No. 9	SESSION No. 10
UNIT # 1 MCLMORE	HOLEY2	HOLEY2								
UNIT # 2 DARVILLE	S 410 X	S 410 X								
UNIT # 3 SCHNEIDER	BRIDGE2	BRIDGE2								
UNIT # 4 NICOLAS	V 486	V 486								
HI MEASURE & RECORD 3 SIDES	FT/MT 4.565/1.392	4.905/1.495								
	FT/MT 4.56/1.39	4.905/1.495								
	FT/MT 4.56/1.39	4.90/1.495								
ESTIMATED START TIME	9:02	3:40								
END TIME	~~11:35~~ 11:35	5:55								
ACTUAL START TIME	9:02	3:40								
END TIME	11:35	5:55								

NOTES: CANAL 25% N.W. [illegible] AT SESSION 1 [illegible], WIRE PULLED OUT @ 10:10 AM RESTART @ 10:20 AM ADD 20 MIN TO OBSERVATION TIME, SESSION # 2 TRAIN PAST SLOW @ 4:09 PM – 4:10 PM

Network Adjustment Report

Project : Holey1

User name	RFurniss	**Date & Time**	3:14:50 PM 9/22/2008
Coordinate System	US State Plane 1983	**Zone**	Florida East 0901
Project Datum	(WGS 84)		
Vertical Datum		**Geoid Model**	GEOID99 (Conus)
Coordinate Units	US survey feet		
Distance Units	US survey feet		
Height Units	US survey feet		

Adjustment Style Settings - 95% Confidence Limits

Residual Tolerances

To End Iterations : 0.000033sft
Final Convergence Cutoff : 0.016404sft

Covariance Display

Horizontal
Propagated Linear Error [E] : U.S.
Constant Term [C] : 0.00000000sft
Scale on Linear Error [S] : 1.96

Three-Dimensional
Propagated Linear Error [E] : U.S.
Constant Term [C] : 0.00000000sft
Scale on Linear Error [S] : 1.96
Elevation Errors were used in the calculations.

Adjustment Controls

Compute Correlations for Geoid : False
Horizontal and Vertical adjustment performed

Set-up Errors

GPS
Error in Height of Antenna : 0.000sft
Centering Error : 0.000sft

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Statistical Summary

Successful Adjustment in 1 iteration(s)

Network Reference Factor : 4.94
Chi Square Test (α=95%) : FAIL
Degrees of Freedom : 30.00

GPS Observation Statistics

Reference Factor : 4.94
Redundancy Number (r) : 30.00

Individual GPS Observation Statistics

Observation ID	Reference Factor	Redundancy Number
B6192	3.97	2.06
B6193	3.95	2.06
B6194	8.27	2.62
B6196	3.28	2.13
B6197	3.46	2.23
B6198	3.36	1.93
B6199	7.59	2.74
B6200	5.70	2.69
B6202	5.51	2.41
B6203	4.02	1.94
B6204	0.79	2.14
B6205	1.22	2.16
B6206	4.70	1.67
B6207	4.66	1.22

Weighting Strategies

GPS Observations

Default Scalar Applied to All Observations
Scalar : 1.00

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Adjusted Coordinates

Adjustment performed in WGS-84

Number of Points : 5
Number of Constrained Points : 0

Adjusted Grid Coordinates

Errors are reported using 1.96σ.

Point Name	Northing	N error	Easting	E error	Elevation	e error	Fix
BRIDGE2	811434.938sft	0.011sft	707742.861sft	0.012sft	N/A	N/A	
V486	784672.222sft	0.011sft	767824.369sft	0.012sft	N/A	N/A	
S410X	734646.245sft	0.013sft	724427.934sft	0.015sft	N/A	N/A	
HOLLEY1	761944.183sft	0.020sft	741096.493sft	0.021sft	N/A	N/A	
HOLEY1	761944.171sft	0.025sft	741096.465sft	0.030sft	N/A	N/A	

Adjusted Geodetic Coordinates

Errors are reported using 1.96σ.

Point Name	Latitude	N error	Longitude	E error	Height	h error	Fix
BRIDGE2	26°33'57.48802"N	0.011sft	80°50'31.94659"W	0.012sft	-62.220sft	0.061sft	
V486	26°29'31.26980"N	0.011sft	80°39'31.00812"W	0.012sft	-62.537sft	0.066sft	
S410X	26°21'16.71911"N	0.013sft	80°47'29.55131"W	0.015sft	-62.992sft	0.075sft	
HOLLEY1	26°25'46.78642"N	0.020sft	80°44'25.69811"W	0.021sft	-71.750sft	0.099sft	
HOLEY1	26°25'46.78630"N	0.025sft	80°44'25.69842"W	0.030sft	-71.580sft	0.209sft	

Coordinate Deltas

Point Name	ΔNorthing	ΔEasting	ΔElevation	ΔHeight	ΔGeoid Separation
BRIDGE2	0.000sft	0.000sft	N/A	0.000sft	N/A
V486	0.000sft	0.000sft	N/A	0.000sft	N/A
S410X	0.000sft	0.000sft	N/A	0.000sft	N/A
HOLLEY1	0.000sft	0.000sft	N/A	0.000sft	N/A
HOLEY1	0.000sft	0.000sft	N/A	0.000sft	N/A

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Control Coordinate Comparisons

Values shown are control coord minus adjusted coord.

Point Name	ΔNorthing	ΔEasting	ΔElevation	ΔHeight
BRIDGE2	0.002sft	-0.001sft	N/A	40.885sft

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Adjusted Observations

Adjustment performed in WGS-84

GPS Observations

Number of Observations : 14
Number of Outliers : 0

Observation Adjustment (Critical Tau = 3.03). Any outliers are in red.

Obs. ID	From Pt.	To Pt.		Observation	A-posteriori Error (1.96σ)	Residual	Stand. Residual
B6199	BRIDGE2	S410X	Az.	167°48'40.6571"	0°00'00.0475"	0°00'00.1807"	2.55
			ΔHt.	-0.772sft	0.064sft	0.034sft	0.19
			Dist.	78584.797sft	0.016sft	0.013sft	0.54
B6194	BRIDGE2	V486	Az.	114°04'49.9946"	0°00'00.0477"	0°00'00.0414"	0.87
				-0.317sft	0.052sft	-0.214sft	-1.58

			ΔHt.				
			Dist.	65775.910sft	0.014sft	-0.033sft	-1.81
B6200	V486	S410X	**Az.**	221°05'34.3855"	0°00'00.0471"	-0°00'00.0098"	-0.13
			ΔHt.	-0.455sft	0.077sft	0.200sft	1.12
			Dist.	66229.012sft	0.018sft	0.038sft	1.72
B6202	BRIDGE2	HOLLEY1	**Az.**	146°05'34.4149"	0°00'00.0973"	-0°00'00.1483"	-1.04
			ΔHt.	-9.530sft	0.104sft	-0.107sft	-1.44
			Dist.	59683.999sft	0.022sft	0.014sft	0.49
B6203	BRIDGE2	HOLLEY1	**Az.**	146°05'34.4149"	0°00'00.0973"	0°00'00.0415"	0.54
			ΔHt.	-9.530sft	0.104sft	0.072sft	1.30
			Dist.	59683.999sft	0.022sft	-0.010sft	-0.51
B6192	BRIDGE2	V486	**Az.**	114°04'49.9946"	0°00'00.0477"	-0°00'00.0388"	-0.74
			ΔHt.	-0.317sft	0.052sft	0.017sft	0.60
			Dist.	65775.910sft	0.014sft	0.013sft	1.16
B6197	BRIDGE2	S410X	**Az.**	167°48'40.6571"	0°00'00.0475"	-0°00'00.0527"	-1.15
			ΔHt.	-0.772sft	0.064sft	-0.008sft	-0.18
			Dist.	78584.797sft	0.016sft	-0.006sft	-0.42
B6198	V486	S410X	**Az.**	221°05'34.3855"	0°00'00.0471"	0°00'00.0146"	0.57
			ΔHt.	-0.455sft	0.077sft	0.032sft	0.35
			Dist.	66229.012sft	0.018sft	-0.011sft	-1.07
B6196	BRIDGE2	S410X	**Az.**	167°48'40.6571"	0°00'00.0475"	-0°00'00.0525"	-1.03
			ΔHt.	-0.772sft	0.064sft	-0.014sft	-0.39
			Dist.	78584.797sft	0.016sft	-0.007sft	-0.39
B6206	BRIDGE2	HOLEY1	**Az.**	146°05'34.5170"	0°00'00.1253"	0°00'00.0632"	0.90
			ΔHt.	-9.360sft	0.261sft	-0.147sft	-0.96
			Dist.	59683.994sft	0.033sft	-0.012sft	-0.61
B6207	V486	HOLEY1	**Az.**	229°46'33.5364"	0°00'00.1984"	-0°00'00.0574"	-0.69
			ΔHt.	-9.043sft	0.260sft	0.106sft	0.93
			Dist.	35086.501sft	0.035sft	-0.012sft	-0.83
B6193	BRIDGE2	V486	**Az.**	114°04'49.9946"	0°00'00.0477"	-0°00'00.0163"	-0.43
			ΔHt.	-0.317sft	0.052sft	0.032sft	0.92
			Dist.	65775.910sft	0.014sft	0.011sft	0.93
B6205	S410X	HOLLEY1	**Az.**	31°30'05.6887"	0°00'00.1509"	-0°00'00.0004"	0.00
			ΔHt.	-8.757sft	0.118sft	0.018sft	0.10
			Dist.	31986.322sft	0.029sft	-0.008sft	-0.42
B6204	V486	HOLLEY1	**Az.**	229°46'33.4853"	0°00'00.1307"	0°00'00.0225"	0.26
			ΔHt.	-9.213sft	0.113sft	0.019sft	0.12
			Dist.	35086.472sft	0.028sft	0.000sft	0.01

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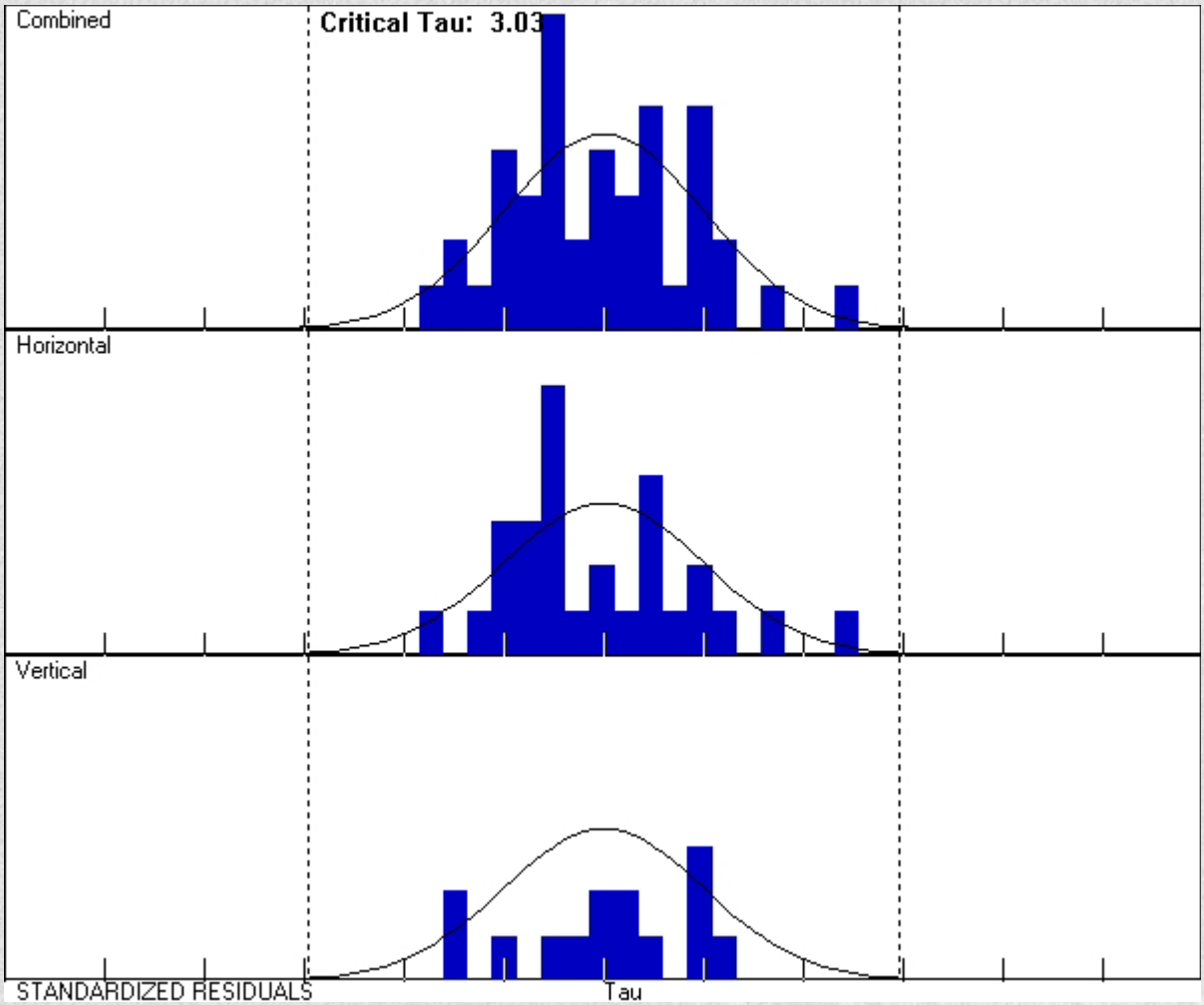
Histograms of Standardized Residuals



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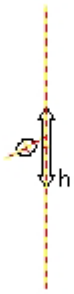
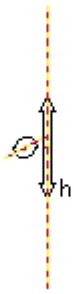
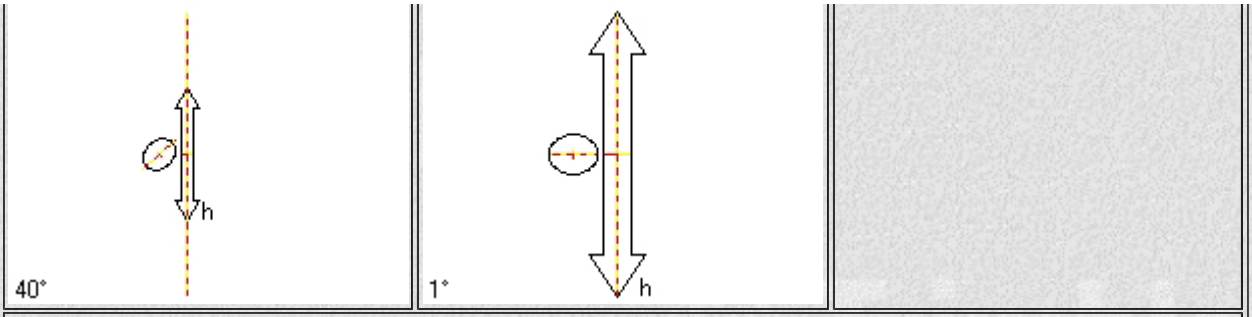
Point Error Ellipses

BRIDGE2	V486	S410X
 28°	 27°	 31°
Tick Size: 0.0100sft Horizontal Bivariate Scalar: 2.45σ Vertical Univariate Scalar: 1.96σ		
HOLLEY1	HOLEY1	



Tick Size: 0.0100sft Horizontal Bivariate Scalar: 2.45σ Vertical Univariate Scalar: 1.96σ

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Covariant Terms

Adjustment performed in WGS-84

From Point	To Point		Components	A-posteriori Error (1.96σ)	Horiz. Precision (Ratio)	3D Precision (Ratio)
BRIDGE2	V486	**Az.**	114°04'49.9946"	0°00'00.0477"	1:4820764	1:4820764
		ΔHt.	-0.317sft	0.052sft		
		ΔElev.	?	?		
		Dist.	65775.910sft	0.014sft		
BRIDGE2	S410X	**Az.**	167°48'40.6571"	0°00'00.0475"	1:4904460	1:4904460
		ΔHt.	-0.772sft	0.064sft		
		ΔElev.	?	?		
		Dist.	78584.797sft	0.016sft		
BRIDGE2	HOLLEY1	**Az.**	146°05'34.4149"	0°00'00.0973"	1:2671177	1:2671177
		ΔHt.	-9.530sft	0.104sft		
		ΔElev.	?	?		
		Dist.	59683.999sft	0.022sft		
BRIDGE2	HOLEY1	**Az.**	146°05'34.5170"	0°00'00.1253"	1:1787561	1:1787561
		ΔHt.	-9.360sft	0.261sft		
		ΔElev.	?	?		
		Dist.	59683.994sft	0.033sft		
V486	S410X	**Az.**	221°05'34.3855"	0°00'00.0471"	1:3654301	1:3654301
		ΔHt.	-0.455sft	0.077sft		
		ΔElev.	?	?		
		Dist.	66229.012sft	0.018sft		
V486	HOLLEY1	**Az.**	229°46'33.4853"	0°00'00.1307"	1:1238117	1:1238117
		ΔHt.	-9.213sft	0.113sft		
		ΔElev.	?	?		
		Dist.	35086.472sft	0.028sft		

V486	HOLEY1	**Az.**	229°46'33.5364"	0°00'00.1984"	1:1002660	1:1002660
		ΔHt.	-9.043sft	0.260sft		
		ΔElev.	?	?		
		Dist.	35086.501sft	0.035sft		
S410X	HOLLEY1	**Az.**	31°30'05.6887"	0°00'00.1509"	1:1115344	1:1115344
		ΔHt.	-8.757sft	0.118sft		
		ΔElev.	?	?		
		Dist.	31986.322sft	0.029sft		

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Calvin, Goirdano
GPS Observation Sessions Plan

Station	Session	DAY	Start Time	End Time	R8	4800	4800	4800
ROTTN	1	Tuesday	7:00 AM	9:00 AM	ROTTN	BRIDGE 2	S 410 X	G 406
ROTTN	2	Tuesday	1:15 PM	3:15 PM	ROTTN	BRIDGE 2	S 410 X	G 406
ROTTS	1	Tuesday	7:00 AM	9:00 AM	ROTTS	T 501	S 410 X	G 406
ROTTS	2	Tuesday	1:15 PM	3:15 PM	ROTTS	T 501	S 410 X	G 406
HOLEY	1	Wed	7:00 AM	9:00 AM	HOLEY	T 501	S 410	Q 486
HOLEY	2	Wed	1:15 PM	3:15 PM	HOLEY	T 501	S 410	Q 486
HOLEY1	1	Wed	7:00 AM	9:00 AM	HOLEY1	BRIDGE2	S 410 X	V 486
HOLEY1	2	Wed	1:15 PM	3:15 PM	HOLEY1	BRIDGE2	S 410 X	V 486
HOLEY2	1	Thursday	7:00 AM	9:00 AM	HOLEY2	N 410 X	S 410 X	V 486
HOLEY2	2	Thursday	1:15 PM	3:15 PM	HOLEY2	N 410 X	S 410 X	V 486

Calvin, Giordano
Actual GPS Observation Sessions
In the Field

Station	Session	Day	Start Time	End Time	R8	4800	4800	4800
ROTTN	1	10/1/2008	8:45 AM	11:20 AM	E 535	BRIDGE2	S 410 X	ROTTN
ROTTN	2	10/1/2008	3:30 PM	5:45 PM	E 535	BRIDGE2	S 410 X	ROTTN
ROTTS	1	9/29/2008	8:45 AM	11:00 AM	E 535	T 501	S 410 X	ROTTS
ROTTS	2	10/6/2008	3:30 PM	5:50 PM	E 535	T 510	S 410 X	ROTTS
HOLEY	1	9/24/2008	9:03 AM	11:15 AM	V 486	S 410 X	T 501	HOLEY
HOLEY	2	9/24/2008	15:20 PM	17:40 PM	V 486	S 410 X	T 501	HOLEY
HOLEY1	1	10/10/2008	9:02 AM	11:15 AM	S 410 X	BRIDGE 2	V 486	HOLEY1
HOLEY1	2	10/10/2008	3:40 PM	5:55 PM	S 410 X	BRIDGE 2	V 486	HOLEY1
HOLEY2	1	9/25/2008	8:05 AM	10:20 AM	N 410 X	Q 486	S 410 X	HOLEY2
HOLEY2	2	9/25/2008	2:35 PM	4:50 PM	N 410 X	Q 486	S 410 X	HOLEY2