## SPECIFIC PURPOSE SURVEY C-24FAS GW WELL CLUSTER REFERENCE ELEVATION

## December 2016





## SOUTH FLORIDA WATER MANAGEMENT DISTRICT SURVEY SECTION

3301 Gun Club Road West Palm Beach, Florida 33406

Phone: 561.686.8800 Fax: 561.682.0066

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# **Surveyor's Report**

Report Date: 12/29/16 Submittal: Final

Prepared for: Hydrogeology

# South Florida Water Management District



South Florida Water Management District SURVEY SECTION 3301 Gun Club Road West Palm Beach, Florida 33406 Phone; 561.686.8800 Fax: 561.682.0066

#### **OVERVIEW OF THE PROJECT**

#### PURPOSE

The purpose of this Survey is to establish Reference Elevation for Groundwater wells monitored by the USGS and South Florida Water Management District (SFWMD). Third order elevations referring to both the North American Vertical Datum of 1988 (NAVD88) and the National Geodetic Vertical Datum of 1929 (NGVD29). NGVD 29 elevation shall be based on offset from NAVD 88 using USACE Corpscon 6.0.1.

#### **Location of Project**

The project is located in St. Lucie County, Florida. Following is a map of Location.



General Location (Not to Scale)

#### VERTICAL DATUM FOR THE PROJECT

The vertical datum for the project is the North American Vertical Datum of 1988. For correlation with older data sets, the elevations of the benchmarks are also shown in the National Geodetic Vertical Datum (NGVD) of 1929. The NGVD 29 elevations were derived using data from published NGS superseded values when applicable, otherwise values provided by the South Florida Water Management District in a file named "NGVD29.txt" were used. The linear unit for all elevations is the U.S. survey feet unless otherwise stated.

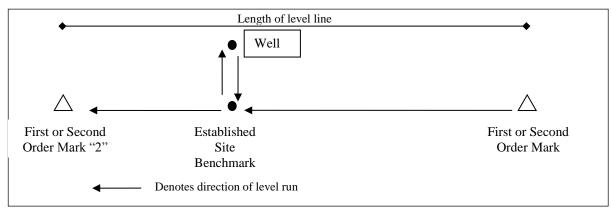
#### LEVELING METHODS

#### **CONFIGURATION OF LEVEL RUNS**

The leveling for the project was performed in accordance with the Federal Geodetic Control Subcommittee standard for Second-Order, Class II geodetic leveling. A brief description of the procedures used is as follows. The run was started at one of the First or Second Order marks and continued through the Site Benchmark (Found or Established) at the well and closed on the original or additional First or Second Order NGS vertical mark. (See Figure 1. below).

For each well site, a closed loop was run from an established Third Order vertical mark (Site Benchmark).

#### Figure 1 Typical Level Run Pattern



The FGCS maximum allowable misclosure for this type of run is 0.03' multiplied by the square root of the length of the line in miles.

#### EQUIPMENT USED

All leveling was performed with a Topcon Digital Level.

#### **BENCHMARKS USED**

#### INTRODUCTION

The following instrument was used for GPS observations: (1) Garmin GPS Map 78.

Description	X, (Easting) 83/86	Y, (Northing) 83/86	Latitude	Longitude
	Coordinates	Coordinates		
BM HAWK	827090.730	1092521.449	27 20 18	80 28 24.6
BM S-544	818217.449	1092383.991	27 20 17	80 30 03.0
BM C-24FAS	821748.20	1092269.39	27 20 15.72	80 29 23.85

#### **CONTROL BENCHMARKS**

## The NGS Data Sheet

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

```
PROGRAM = datasheet95, VERSION = 8.11
1 National Geodetic Survey, Retrieval Date = DECEMBER 21, 2016
AJ8590 DESIGNATION - HAWK
            - AJ8590
AJ8590 PID
AJ8590 STATE/COUNTY- FL/ST LUCIE
AJ8590 COUNTRY - US
AJ8590 USGS QUAD - FORT PIERCE SW (1953)
AJT8590
                             *CURRENT SURVEY CONTROL
AJ8590
AJ8590
AJ8590* NAD 83(1986) POSITION- 27 20 18. (N) 080 28 25.
                                                           (W)
                                                                 SCALED
AJ8590* NAVD 88 ORTHO HEIGHT - 8.695 (meters) 28.53 (feet) ADJUSTED
AJ8590
                               -27.209 (meters)
AJ8590 GEOID HEIGHT
                                                                 GEOID12B
                       _
AJ8590 DYNAMIC HEIGHT -
                               8.681 (meters)
                                                   28.48 (feet) COMP
AJ8590 MODELED GRAVITY - 979,126.4 (mgal)
                                                                 NAVD 88
AJ8590
AJ8590 VERT ORDER
                    - FIRST
                                 CLASS II
AJ8590
AJ8590. The horizontal coordinates were scaled from a topographic map and have
AJ8590.an estimated accuracy of +/- 6 seconds.
AJ8590.
AJ8590. The orthometric height was determined by differential leveling and
AJ8590.adjusted by the NATIONAL GEODETIC SURVEY
AJ8590.in August 2009.
AJ8590
AJ8590.Significant digits in the geoid height do not necessarily reflect accuracy.
AJ8590.GEOID12B height accuracy estimate available here.
AJ8590
AJ8590. The dynamic height is computed by dividing the NAVD 88
AJ8590.geopotential number by the normal gravity value computed on the
AJ8590.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AJ8590.degrees latitude (g = 980.6199 \text{ gals.}).
AJ8590
AJ8590. The modeled gravity was interpolated from observed gravity values.
AJ8590
                                            Units Estimated Accuracy
AJ8590;
                         North
                                     East
AJ8590;SPC FL E - 333,000.
                                  252,090. MT (+/- 180 meters Scaled)
AJ8590
AJ8590 U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNL520240 (NAD 83)
AJ8590
AJ8590
                              SUPERSEDED SURVEY CONTROL
AJ8590
AJ8590 NAVD 88 (05/02/02) 8.701 (m)
                                               28.55 (f) SUPERSEDED 1 2
AJ8590
AJ8590.Superseded values are not recommended for survey control.
AJ8590
```

AJ8590.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums. AJ8590.See file dsdata.txt to determine how the superseded data were derived. AJ8590 AJ8590 MARKER: DD = SURVEY DISKAJ8590 SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT AJ8590 STAMPING: HAWK 2001 AJ8590 MARK LOGO: FL-111 AJ8590 PROJECTION: RECESSED 5 CENTIMETERS AJ8590 MAGNETIC: O = OTHER; SEE DESCRIPTION AJ8590 STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO AJ8590+STABILITY: SURFACE MOTION AJ8590 SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR AJ8590+SATELLITE: SATELLITE OBSERVATIONS - August 17, 2006 AJT8590 AJ8590 HISTORY - Date Condition Report By AJ8590 HISTORY - 2001 MONUMENTED FL-111 AJ8590 HISTORY - 20010923 GOOD FOST AJ8590 HISTORY - 20050812 GOOD GCYI - 20060817 GOOD AJ8590 HISTORY FLDEP AJ8590 HISTORY - 20100204 GOOD CREEI AJ8590 AJ8590 STATION DESCRIPTION AJ8590 AJ8590'DESCRIBED BY CHARLEY FOSTER AND ASSOCIATES 2001 (JB) AJ8590'THE MONUMENT IS LOCATED 22.9 MILES (36.80 KM) NORTHEAST OF OKEECHOBEE, AJ8590'FL. AND 11.5 MILES (18.50 KM) AJ8590'SOUTHWEST OF FT. PIERCE, SECTION 19, TOWNSHIP 36 SOUTH, RANGE 39 EAST. AJ8590'OWNERSHIP IS SOUTH FLORIDA WATER MANAGEMENT DISTRICT. AJ8590' AJ8590'TO REACH THE MONUMENT FROM THE INTERSECTION OF STATE ROAD 70 AND AJ8590'COUNTY ROAD 609A (SHINN AJ8590'ROAD), 10.5 MILES (16.96 KM) WEST OF THE JUNCTION OF U.S. HIGHWAY 1 AJ8590'AND STATE ROAD 70 IN FT. PIERCE FL., AJ8590'GO SOUTH ON COUNTY ROAD 609A FOR 0.4 MILES (0.64 KM) TO THE AJ8590'INTERSECTION OF SHINN ROAD AND COUNTY AJ8590'ROAD 712 (MIDWAY ROAD), GO SOUTH (STRAIGHT) 2.5 MILES (4.02 KM) ON AJ8590'SCHINN ROAD TO THE MONUMENT AJ8590'LOCATION, ON THE NORTHWEST CORNER OF BRIDGE NO. 940018 (THE NORTH SIDE AJ8590'OF RIM DITCH). THE AJ8590'MONUMENT IS 0.05 MILES (0.08 KM) NORTH OF THE JUNCTION OF SCHINN ROAD AJ8590'AND C-24 CANAL ROAD AJ8590'(JUNCTION ON THE SOUTH SIDE OF RIM DITCH). AJ8590' AJ8590'THE MONUMENT IS 13.5 FEET (4.11 M) WEST OF THE CENTER OF BEND IN AJ8590'GUARDRAIL, 3.5 FEET (1.07 M) AJ8590'SOUTHEAST OF THE END OF GUARDRAIL, 9.0 FEET (2.74 M) NORTH OF THE WEST AJ8590'POST OF A SIGN READING C-24 AJ8590'RIM DITCH SFLWMD PROTECTING OUR WATER RESOURCES, 15.5 FEET (4.72 M) AJ8590'SOUTH OF THE CENTER OF A AJ8590'DIRT ROAD RUNNING PARALLEL TO RIM DITCH, 27.5 FEET (8.38 M) WEST OF AJ8590'THE CENTER OF SCHINN ROAD AND AJ8590'3.0 FEET (0.91 M) NORTH OF A CARSONITE WITNESS POST. NOTE A MAGNET WAS AJ8590'BURIED NEARBY AT AN AJ8590'UNSPECIFIED POSITION. AJ8590' AJ8590 AJ8590 STATION RECOVERY (2005) AJ8590 AJ8590'RECOVERY NOTE BY G.C.Y., INCORPORATED 2005 (JES)

AJ8590'RECOVERED AS DESCRIBED. AJ8590 AJ8590 AJ8590 AJ8590'RECOVERY NOTE BY FL DEPT OF ENV PRO 2006 (BPJ) AJ8590'RECOVERED AS DESCRIBED. AJ8590 AJ8590 AJ8590 AJ8590 AJ8590'RECOVERY NOTE BY CREECH ENGINEERS INC 2010 AJ8590'RECOVERED IN GOOD CONDITION.

### The NGS Data Sheet

See file <u>dsdata.txt</u> for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.11
1 National Geodetic Survey, Retrieval Date = DECEMBER 21, 2016
AJ8588 DESIGNATION - S 544
AJ8588 PID
            - AJ8588
AJ8588 STATE/COUNTY- FL/ST LUCIE
AJ8588 COUNTRY - US
AJ8588 USGS QUAD - NORTH OF BLUEFIELD (1970)
AJ8588
AJ8588
                            *CURRENT SURVEY CONTROL
AJ8588
AJ8588* NAD 83(1986) POSITION- 27 20 17. (N) 080 30 03. (W)
                                                                SCALED
AJ8588* NAVD 88 ORTHO HEIGHT - 7.352 (meters) 24.12 (feet) ADJUSTED
AJ78588
AJ8588 GEOID HEIGHT - -27.179 (meters)
                                                               GEOID12B
AJ8588 DYNAMIC HEIGHT -
                               7.341 (meters)
                                                  24.08 (feet) COMP
AJ8588 MODELED GRAVITY - 979,124.2 (mgal)
                                                                NAVD 88
AJ8588
AJ8588 VERT ORDER - FIRST CLASS II
AJ8588
AJ8588. The horizontal coordinates were scaled from a topographic map and have
AJ8588.an estimated accuracy of +/- 6 seconds.
AJ8588.
AJ8588. The orthometric height was determined by differential leveling and
AJ8588.adjusted by the NATIONAL GEODETIC SURVEY
AJ8588.in May 2002.
AJ8588
AJ8588.Significant digits in the geoid height do not necessarily reflect accuracy.
AJ8588.GEOID12B height accuracy estimate available here.
AJ8588
AJ8588. The dynamic height is computed by dividing the NAVD 88
AJ8588.geopotential number by the normal gravity value computed on the
AJ8588.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AJ8588.degrees latitude (g = 980.6199 \text{ gals.}).
AJ8588
AJ8588. The modeled gravity was interpolated from observed gravity values.
AJ8588
```

AJ8588; North East Units Estimated Accuracy AJ8588; SPC FL E - 332,960. 249,390. MT (+/- 180 meters Scaled) AJ8588 AJ8588 U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNL493239(NAD 83) AJ78588 SUPERSEDED SURVEY CONTROL AJ8588 AJ8588 AJ8588.No superseded survey control is available for this station. AJ8588 AJ8588 MARKER: DD = SURVEY DISK AJ8588 SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT AJ8588 STAMPING: S 544 2001 CERP AJ8588 MARK LOGO: USE AJ8588 PROJECTION: RECESSED 8 CENTIMETERS AJ8588 MAGNETIC: O = OTHER; SEE DESCRIPTION AJ8588 STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO AJ8588+STABILITY: SURFACE MOTION AJ8588 SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR AJ8588+SATELLITE: SATELLITE OBSERVATIONS - August 12, 2005 AJ8588 - Date AJ8588 HISTORY Condition Report By AJ8588 HISTORY - 20010923 MONUMENTED AJ8588 HISTORY - 20050812 GOOD FOST GCYI AJ8588 STATION DESCRIPTION AJ8588 AJ8588 AJ8588'DESCRIBED BY CHARLEY FOSTER AND ASSOCIATES 2001 (JB) AJ8588'THE MONUMENT IS LOCATED 21.4 MILES (34.46 KM) NORTHEAST OF OKEECHOBEE, AJ8588'FL. AND 12.9 MILES (20.83 KM) AJ8588'SOUTHWEST OF FT. PIERCE, SECTION 14, TOWNSHIP 36 SOUTH, RANGE 38 EAST. AJ8588'OWNERSHIP IS SOUTH FLORIDA WATER MANAGEMENT DISTRICT. AJ8588' AJ8588'TO REACH THE MONUMENT FROM THE INTERSECTION OF STATE ROAD 70 AND AJ8588'COUNTY ROAD 609A (SHINN AJ8588'ROAD), 10.5 MILES (16.96 KM) WEST OF THE JUNCTION OF U.S. HIGHWAY 1 AJ8588'AND STATE ROAD 70 IN FT. PIERCE FL., AJ8588'GO SOUTH ON COUNTY ROAD 609A FOR 0.4 MILES (0.64 KM) TO THE AJ8588'INTERSECTION OF SHINN ROAD AND COUNTY AJ8588'ROAD 712 (MIDWAY ROAD), GO SOUTH (STRAIGHT) 2.55 MILES (4.10 KM) ON AJ8588'SCHINN ROAD TO JUNCTION OF AJ8588'SCHINN ROAD AND C-24 CANAL ROAD, JUST SOUTH OF BRIDGE NO. 940018. AJ8588'CONTINUE WEST ALONG C-24 CANAL AJ8588'ROAD ON THE SOUTH SIDE OF RIM DITCH 1.65 MILES (2.66 KM) TO THE AJ8588'MONUMENT LOCATION. THE MONUMENT IS AJ8588'2.8 MILES (4.51 KM) EAST OF THE INTERSECTION OF CARLTON ROAD AND C-24 AJ8588'CANAL ROAD. AJ8588' AJ8588'THE MONUMENT IS 6.7 FEET (2.04 M) SOUTH OF THE SOUTH TOP OF BANK OF AJ8588'RIM DITCH, 17.0 FEET (5.18 M) AJ8588'NORTH OF THE CENTER OF C-24 CANAL ROAD, 28.5 FEET (8.69 M) NORTH OF AJ8588'THE TOE OF THE LEVEE AND 6.7 AJ8588'FEET (2.04 M) SOUTH OF A CARSONITE WITNESS POST. NOTE A MAGNET WAS AJ8588'BURIED NEARBY AT AN AJ8588'UNSPECIFIED POSITION. NOTE ACCESS TO THE DATUM POINT (TOP OF A AJ8588'STAINLESS STEEL ROD) IS HAD AJ8588'THROUGH A 5 INCH LOGO CAP. NOTE A MAGNET WAS PLACED INSIDE THE PVC AJ8588'PIPE. AJ8588' AJ8588

COUNTY ST LUCIE	PROJECT MIS	SC	DESIGN	ATION C24FAS
SECTION 24	TOWNSHIP	<u>36 SOUTH</u>	RANG	E 38 EAST
NAME OF QUADRANGLE FORT F	PIERCE SW	(1953)		
Established by SFWMD STRICKLAND Name) or	) (Surveyor / Firm	Recovered by		(Surveyor / Firm Name)
DATE <u>11/9/2016</u> (Established or Recover	red)	FIELD BOOK MI	SC 7B	<b>PAGE</b> 12 AND 13
HORIZONTAL DATUM: 1927 198	83) ADJ	_ Other (circle	one) Z	ZONE <b>E</b> or <b>W</b>
STATE PLANE COORDINATES		<u>N 1092269.39</u>	FT	<u>E 821748.20 FT</u>
LATITUDE: N 27 20 15.72		LONGITUDE: W8	0 29 23.8	5
VERTICAL DATUM: MSL 1929	1988) Other _	(circle	one)	EL. 26.611 ft
VERTICAL DATUM: MSL 1929	988 Other _	(circle	one)	EL. ft
CONTROL ACCURACY: HORIZONT	TAL 1 2 3	<u>SUB-METER</u> (cir	cle one) <b>\</b>	/ERTICAL 1 2 3
	DES	CRIPTION		
To Reach:				
FROM THE INTERSECTION OF STAT SHINN ROAD (CR 609A) 0.40 MILE TO THIS POINT) 2.55 MILES CROSSING ( CANAL ROAD. TURN RIGHT AND PRO LOCATION ON THE LEFT.	MIDWAY ROAD	). CONTINUE SOUTH CANAL TO THE SOU	I ON SHIN JTH BANK	NN ROAD (DIRT ROAD AT COF CANAL AND C 24
THE STATION IS LOCATED 58 FEET S WEST OF THE WEST EDGE OF CONC WELLS AT THIS LOCATION).				

THE STATION IS A FOUND 4" X 4" CONCRETE MONUMENT WITH A SFWMD ALUMINUM CAP STAMPED " S R/W C-24 LB 6969 BM C24FAS" 0.15 FEET BELOW GROUND.

NOTE: THE COORDINATES ARE FROM C24 GATES.PDF

NGS Benchmarks Used:

Notable Land marks: C24 FAS WELL SITE AKA SLF 74, 75, 76 AND C 24 PC 25 SKETCH

#### PROJECT RESULTS

The following tables list the elevations established for each existing or new mark, the level run misclosure, "to-reach" description for each mark and a photo of the mark. All elevations and coordinates are in US Survey Feet.

#### SURVEYOR'S REPORT VERTICAL CONTROL WELL SLF-74

BM HAWK (AJ8590)	Elev	ation:	28.53ft	(NAVD 88)	29.99 ft	(NGVD 29)
BM S-544 (AJ8588)	Elev	ation:	24.12ft	(NAVD 88)	25.58ft	(NGVD 29)
Site BM	C-24	1FAS	26.61 ft	(NAVD 88)	28.07ft	(NGVD 29)
Reference Elevation Top of Well Pad Elevation Ground Elevation			29.93ft 27.42ft 26.8ft	(NAVD 88) (NAVD 88) (NAVD 88)	31.39ft 28.88ft 28.3ft	(NGVD 29) (NGVD 29) (NGVD 29)
Length of Run:		.01 mi	To Reach WELL	_ C-24FAS:		
Max Allowable Misclosure:	0.00 ft					
Actual Misclosure: 0.00 ft		TO REACH the	ne Mark and Site	e from SR70 a	and SHINN	



**TO REACH** the Mark and Site from SR70 and SHINN RD. in FT. PIERCE. Go South on SHINN Rd. (CR609A) 0.4mls to MIDWAY Rd. Continue South on SHINN RD. (Shell Rock) for 2.55mls crossing over C-24 Canal to south bank and Shell Rock Rd. Turn Right and go 1.0ml to Station Location on Left. Located 58ft south of the centerline of the canal road and 75ft west of the west edge of the concrete pad for SLF 75 well pad. The Mark is a found 4" X 4" concrete monument with SFWMD Alum. Disk Stamped SR/W C-24 LB6969 BM C24FAS and is 0.15' below ground.



Benchmark Found at wellsite for wells SLF 74, SLF 75 and SLF 76

#### SURVEYOR'S REPORT VERTICAL CONTROL WELL SLF-75

below ground.

BM HAWK (AJ8590)	Elev	ation:	28.53ft	(NAVD 88)	29.99 ft	(NGVD 29)	
BM S-544 (AJ8588)	Elev	ation:	24.12ft	(NAVD 88)	25.58ft	(NGVD 29)	
Site BM	C-24	4FAS	26.61 ft	(NAVD 88)	28.07ft	(NGVD 29)	
Reference Elevation			29.50ft	(NAVD 88)	30.96ft	(NGVD 29)	
Top of Well Pad Elevation			27.03ft	(NAVD 88)	28.49ft	(NGVD 29)	
Ground Elevation			26.4ft	(NAVD 88)	27.9ft	(NGVD 29)	
Length of Run:	Length of Run:		To Reach WELL	_ C-24FAS:			
Max Allowable Misclosure:		0.00 ft					
Actual Misclosure:		0.00 ft	TO REACH the				
			RD. in FT. PIER	CE. Go South or	n SHINN Rd.	(CR609A)	





0.4mls to MIDWAY Rd. Continue South on SHINN RD. (Shell Rock) for 2.55mls crossing over C-24 Canal to south bank and Shell Rock Rd. Turn Right and go 1.0ml to Station Location on Left. Located 58ft south of the centerline of the canal road and 75ft west of the west edge of the concrete pad for SLF 75 well pad. The Mark is a found 4" X 4" concrete monument with SFWMD Alum. Disk Stamped SR/W C-24 LB6969 BM C24FAS and is 0.15'

Benchmark Found at wellsite for wells SLF 74, SLF 75 and SLF 76

#### SURVEYOR'S REPORT VERTICAL CONTROL WELL SLF-76

BM HAWK (AJ8590)	Elev	ation:	28.53ft	(NAVD 88)	29.99 ft	(NGVD 29)
BM S-544 (AJ8588)	Elev	ation:	24.12ft	(NAVD 88)	25.58ft	(NGVD 29)
Site BM	C-24	IFAS	26.61 ft	(NAVD 88)	28.07ft	(NGVD 29)
Reference Elevation			29.58ft	(NAVD 88)	31.04ft	(NGVD 29)
Top of Well Pad Elevation			27.18ft	(NAVD 88)	28.64ft	(NGVD 29)
Ground Elevation			26.6ft	(NAVD 88)	28.1ft	(NGVD 29)
Length of Run:		.01 mi	To Reach WELL	_ C-24FAS:		
Max Allowable Misclosure:		0.00 ft				
Actual Misclosure:		0.00 ft	TO REACH the			
			RD. in FT. PIFR	CE. Go South o	n SHINN Rd.	(CR609A)



**TO REACH** the Mark and Site from SR70 and SHINN RD. in FT. PIERCE. Go South on SHINN Rd. (CR609A) 0.4mls to MIDWAY Rd. Continue South on SHINN RD. (Shell Rock) for 2.55mls crossing over C-24 Canal to south bank and Shell Rock Rd. Turn Right and go 1.0ml to Station Location on Left. Located 58ft south of the centerline of the canal road and 75ft west of the west edge of the concrete pad for SLF 75 well pad. The Mark is a found 4" X 4" concrete monument with SFWMD Alum. Disk Stamped SR/W C-24 LB6969 BM C24FAS and is 0.15' below ground.



Benchmark Found at wellsite for wells SLF 74, SLF 75 and SLF 76

#### SURVEYOR'S REPORT PROJECT RESULTS WELL SLF-74

Site SLF-74 GW			Date of Field Work 11/9&14/16
Party Chief Strickland/Demonstranti	<b>Field Book Name/Number</b> Misc FB #7B		Page Number(s) Pg. 12&13
<b>Site Benchmark Name</b> C24FAS	Benchmark Elevation (NAVD88) 26.61ft	n	<b>Datum Offset to NGVD29</b> +1.46
<b>Reference Elevation (NAVD 88)</b> 29.93ft		Existing NA	g Tag Elevation (Datum)
Latitude 27° 20' 15.9"		Longitu 80° 29'	
	Photographs		
<b>Overall Site</b>	Benchmark Locati	on	Benchmark Close Up
Brass Tag Close Up		Brass	Tag + Reference Mark
STN SLF 74 0 W 3 ELEV, 29,93 DATE 11 14 18 BY JS DD NAVD SB NGVD DFFSET + 1,448			

#### SURVEYOR'S REPORT PROJECT RESULTS WELL SLF-75

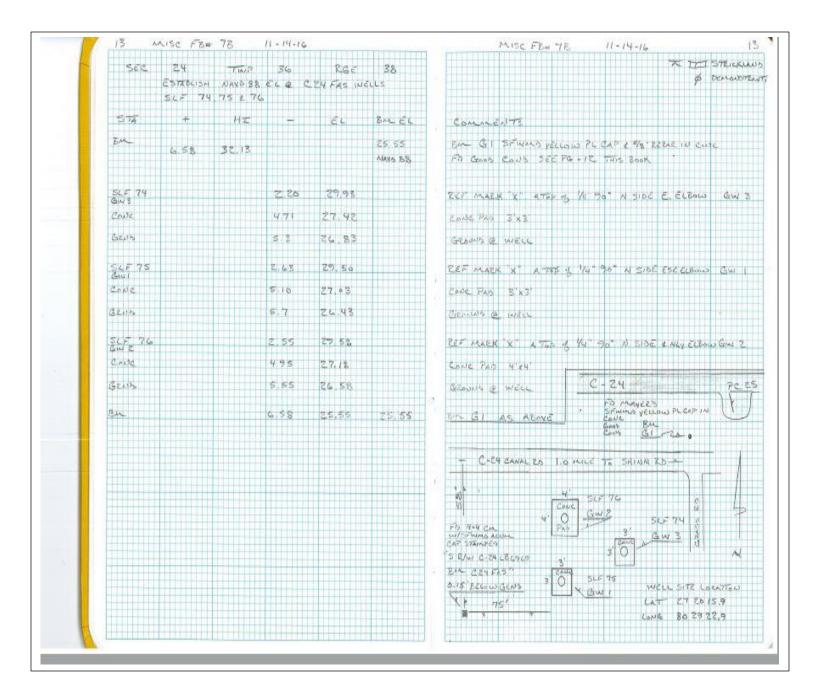
Site SLF-75 GW			Date of Field Work 11/9&14/16
Party Chief	Field Book Name/Nu	umber	Page Number(s)
Strickland/Demonstranti	Misc FB #7B		Pg. 12&13
Site Benchmark Name	Benchmark Elevatio	n	Datum Offset to NGVD29
C24FAS	( <b>NAVD88</b> ) 26.61ft		+1.46
<b>Reference Elevation (NAVD 88)</b> 29.50ft		Existing NA	g Tag Elevation (Datum)
Latitude		Longitu	ıde
27° 20' 15.8"		80° 29'	
			F
Overall Site	Photographs Benchmark Locati	ion	Benchmark Close Up
Brass Tag Close Up		Brass	Tag + Reference Mark
STN SLF 75 GW A ELEV. 29,60 DATE 11 14 18 BY JS DD NAVD 98 NBVD DFFSET + 1,46			

#### SURVEYOR'S REPORT PROJECT RESULTS WELL SLF-76

Site SLF-76 GW			Date of Field Work 11/9&14/16
Party Chief	Field Book Name/Nu	ımber	Page Number(s)
Strickland/Demonstranti	Misc FB #7B		Pg. 12&13
Site Benchmark Name	<b>Benchmark Elevatio</b>	n	Datum Offset to NGVD29
C24FAS	(NAVD88) 26.61ft		+1.46
<b>Reference Elevation (NAVD 88)</b> 29.58ft	20.0111	<b>Existin</b> NA	g Tag Elevation (Datum)
Latitude 27° 20' 15.9"		Longitu 80° 29'	
Overall Site	Photographs Benchmark Locati	ion	Benchmark Close Up
Overall Site	- Dencimark Locau		Benchmark Close Op
Brass Tag Close Up		Brass	Tag + Reference Mark
STN 31, 776 0 W 2 ELEV, 29, 59 DATE 11, 14, 16 BY J3 DD NAVD 38 NGVD DFFSET + 1, 46			

#### SURVEYOR'S REPORT PROJECT RESULTS Field Notes

522 24		Su EGE	28	CON USED DIAN LEVELA BALLESS EAD SERIAL TO TO TOS T
CHEEK	Ed Trained 17	EINS QUE GE		FILE MART + CERFAS TO CA
ris e	24 FAS SITE	RUT 79, 154 44 -	assa ter ta	ELF CIEN GATES
STA / 17.70		¢4	BASEL	Chrangett
<u>en</u> 1			14013.16 38.88	Ether Al Strang you and PL Cat & ME CORNE IN . To Gain Catto
CZYARS &		Z66,5615		ENC CERFAS IS A PO RIN CAN MAY INTO FINING A CAP STRANFES S. RIN CAN MAY INTO FINING A REAR MENTION AND FILM CENFAST
je s		21.429	22.44	EN GE STWINS VALLOW TO BAT I STREETING OF
	(ZREAR )	(140)		Guan Conth
しのとって				
6 <u>5</u> 5			23.44	544 G.C. AS ASAZ
CARL				
Carl 6 1779		24:304		CANAC CENC 1994 75 STRAKS LARE AND SIS Junt CONT OF BOARD GRADS 4 571 2541 4 14-15 30 8 72 26
GE 7		23,442	23:94	8m QT AS ARAC
	Látzet a			



#### Abbreviation:

NAVD 88 -	North American Vertical Datum of 1988
NGVD 29 -	National Geodetic Vertical Datum of 1929
NAD 83/99-	(Horizontal Datum) North American Datum
NGS –	National Geodetic Survey.
SFWMD –	South Florida Water Management District
PSM –	Professional Surveyor & Mapper

#### SURVEYOR'S CERTIFICATION

I hereby certify that this Specific Purpose Survey was made under my responsible charge and meets applicable portions of the Standards of Practice set forth by the Florida Board of Professional Surveyors and Mappers in Chapter 5J, Florida Administrative Code, pursuant to Section 472.027, Florida State Statutes.

This report is prepared for the sole and specific use of the South Florida Water Management District and is not assignable.

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Date of Survey November 14, 2016 Elvie D. Ebanks PSM Professional Surveyor and Mapper State of Florida Certificate No. 5765