



Contract # CN60744/3600000504  
Work Order #5



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## **VERTICAL CONTROL SURVEY REPORT**

**SOUTH FLORIDA WATER  
MANAGEMENT DISTRICT**

**FINAL**

February, 2008

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# VERTICAL CONTROL SURVEY REPORT

## Monitoring Well Reference Elevations

for:

**South Florida Water Management District**  
3301 Gun Club Road  
West Palm Beach, FL 33406

by:

**WOOLPERT, INC.**  
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## Overview of the Project

This survey consisted of establishing or verifying elevations to third-order National Geodetic Survey (NGS) Standards at District Recorder Well Sites. This survey request is associated with the District's Vertical Datum Upgrade Project (VDUP).

There were two main tasks to this survey.

1. Set reference elevations and tags at each well using a local site benchmark (BM) referenced to the National Geodetic Vertical Datum of 1929 (NGVD29).
2. For those sites that did not have a local benchmark, set a concrete monument and establish elevations referencing the North American Vertical Datum of 1988 (NAVD88), and then compute a conversion NGVD29 elevation.

The following list of 25 well sites were included within this Work-Order #5.

BOGAFB	LCYP19	LKISSP	S65A-SCA	TIGER
KENAN	LHAT11	MARIC	S-65GW	TURLAK
KUB009	LHATCH3	ORF61	SEBRING	WR11
KUB012	LJACK	RATHAM	SKYLAK	WR15
LAKWEO	LKIS5B	S63A-SCA	SNIVLY	WR16

Also a part of this report, and the delivery of Work-Order #5 are the following sites: BFARM, KISSFS, WRLGTE. These sites could not be completed during Work-Order #4 for various reasons, so their information is being delivered along with Work-Order #5.

## List of Project Deliverables

In addition to four signed and sealed hard copies of this survey report, the following deliverables were also a part of this project.

1. The survey report in Adobe Acrobat format.
2. Digital photos named by sites.
3. Scanned copies of field notes.
4. Any other digital files associated with the survey.
5. Completed District benchmark description sheet for all set marks.

These digital deliverables will be delivered on CD along with the final signed and sealed copy of this report.

## Date of Survey

All site field operations took place between December 3, 2007 and January 22, 2008.

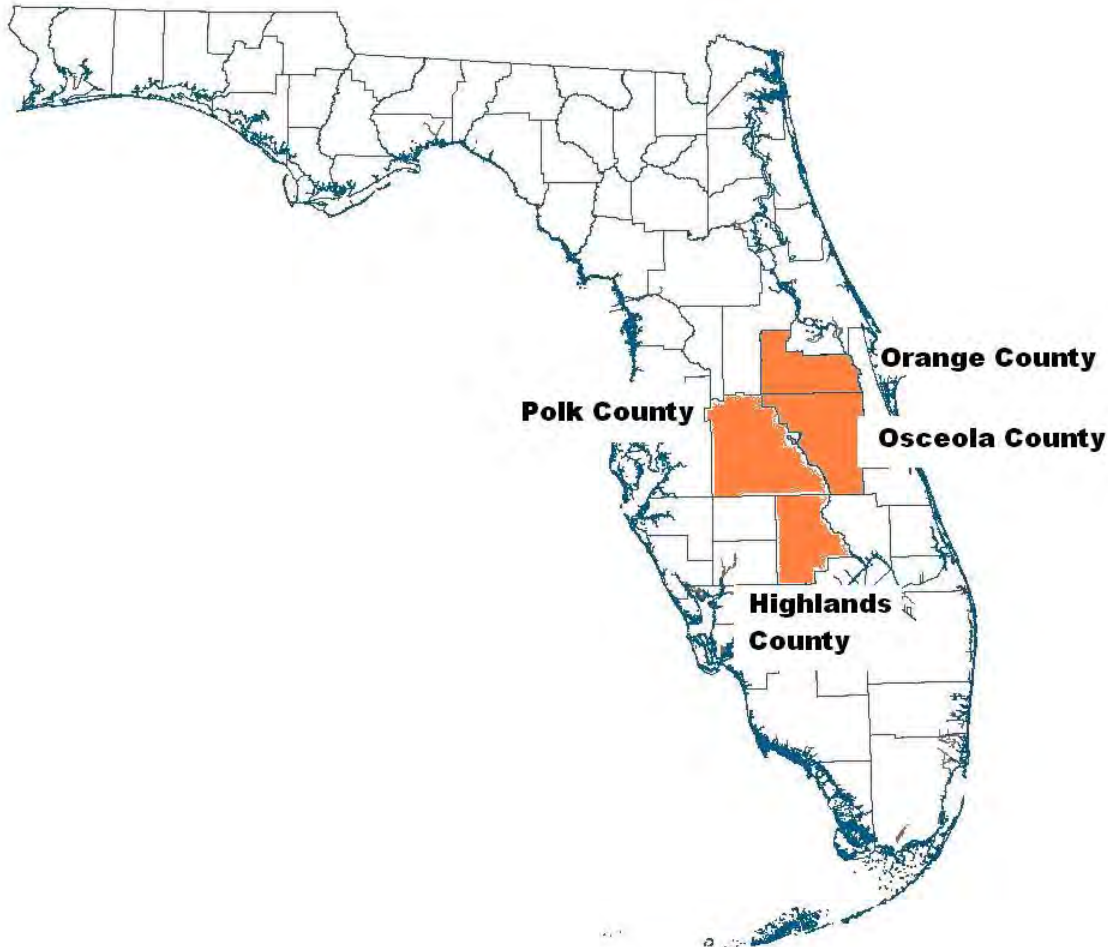
## Equipment Used

Wild NA2002 digital levels were used for all leveling. Latitude and Longitudes were determined for each site using Trimble Pro-XR sub-meter GPS equipment. These Latitudes and Longitudes were then converted to Florida State Plane Coordinates, East Zone, using the United States Army Corps of Engineers software CORPSCON version 6.0.1.

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## Project Location

All well site locations were in Orange, Osceola, Highlands and Polk Counties, Florida.



## Survey Methodology

Woolpert began by setting concrete monuments at each of the locations that did not have a benchmark on site. Monuments consisted of an 8 inch PVC pipe, 40 inches long, filled with poured concrete with an aluminum South Florida Water Management District survey cap.

Following building the concrete monuments, reconnaissance was done to find existing NGS control stations. Once found, elevation were established by using two NGS stations, performing closed level loops ensuring that NGS monument published elevations matched.

At each site, Woolpert used the local site benchmark to set reference elevations for each found well. Woolpert used the local benchmark to perform a closed loop level run from the benchmark to the reference mark to establish a NGVD29 elevation on the well reference point. If the local benchmark did not have a published NGVD29 elevation, Woolpert used the latitude, longitude, and NAVD88 elevation to find a NGVD29 elevation using the United States Army Corps of

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Engineers software CORPSCON version 6.0.1. To determine the sites benchmark latitude and longitude, Woolpert used a Trimble Pro-XR GPS receiver. This GPS receiver obtains differential GPS corrections from Coast Guard stations, resulting in horizontal accuracies of approximately 1 meter, at one sigma.

If a staff gauge existed at the site, Woolpert obtained the water level, the staff gauge reading, and recorded the time and date of those measurements.

Following all leveling and positioning, Woolpert then attached metal tags to each found well. Each tag was stamped with: Site name, well designation, elevation, date, firm name, and reference datum (NGVD29 in all cases).

## Summary of Leveling Results

BFARM was set using NGS station G354, a First-Order Class II benchmark with published elevation of 66.85 feet (NAVD88), and NGS station OSF WELLS BM1, a South Florida Water Management District benchmark with published elevation of 67.514 feet (NAVD88). Leveling began at station G354, passed through BFARM, and ended on OSF WELLS BM1 with a leveled elevation of 67.472. Total leveling distance was 6.63 miles resulting in a closure of 0.042 (0.077 allowable). Resulting elevation for BFARM was 64.09 feet NAVD88. This was converted using the United States Army Corps of Engineers software CORPSCON version 6.0.1 to derive a NGVD29 elevation of 65.02 feet.

WR11 was set using NGS station OS134, a Second-Order Class I benchmark with published elevation of 70.65 feet (NAVD88), and NGS station OS135, a Second-Order Class I benchmark with published elevation of 64.75 feet (NAVD88). Leveling began at station OS134, passed through WR11, and ended on OS135 with a leveled elevation of 64.65. Total leveling distance was 18.99 miles resulting in a closure of 0.10 (0.13 allowable). Resulting elevation for WR11 was 67.59 feet NAVD88. This was converted using the United States Army Corps of Engineers software CORPSCON version 6.0.1 to derive a NGVD29 elevation of 68.66 feet.

WR15 was set using NGS station OS134, a Second-Order Class I benchmark with published elevation of 70.65 feet (NAVD88), and NGS station OS135, a Second-Order Class I benchmark with published elevation of 64.75 feet (NAVD88). Leveling began at station OS134, passed through WR15, and ended on OS135 with a leveled elevation of 64.65. Total leveling distance was 18.99 miles resulting in a closure of 0.10 (0.13 allowable). Resulting elevation for WR15 was 62.01 feet NAVD88. This was converted using the United States Army Corps of Engineers software CORPSCON version 6.0.1 to derive a NGVD29 elevation of 63.09 feet.

For Well Site WR16, there existed a BM “WR11 1996” but it only had a published NGVD29 elevation of 66.19 feet. It did not have a published NAVD88 elevation. To establish an NAVD88 elevation, Woolpert used NGS station OS134, a Second-Order Class I benchmark with published elevation of 70.65 feet (NAVD88), and NGS station OS135, a Second-Order Class I benchmark with published elevation of 64.75 feet (NAVD88). Leveling began at station OS134, passed through “WR11 1996”, and ended on OS135 with a leveled elevation of 64.65. Total leveling distance was 18.99 miles resulting in a closure of 0.10 (0.13 allowable). Resulting elevation for “WR11 1996” was 65.14 feet NAVD88. As a check, the NAVD88 elevation was converted to NGVD29 using CORPSCON which yielded a value of 66.23 feet.

WRLGTE was set using NGS station L-715-003, a Second-Order Class I benchmark with published elevation of 91.44 feet (NAVD88), and NGS station L-659-024, a Second-Order Class I benchmark with published elevation of 102.44 feet (NAVD88). Leveling began at station L-715-003, passed through WRLGTE, and ended on L-659-024 with a leveled elevation of 102.43. Total leveling distance was 3.91 miles resulting in a closure of 0.01 (0.06 allowable). Resulting elevation for WRLGTE was 93.14 feet NAVD88. This was converted using the United States Army Corps of Engineers software CORPSCON version 6.0.1 to derive a NGVD29 elevation of 94.03 feet.

TURLAK was set using NGS station GOTHA RESET, a Second-Order Class I benchmark with published elevation of 136.56 feet (NAVD88), and NGS station ORA30, a Second-Order Class I benchmark with published elevation of 110.95 feet (NAVD88). Leveling began at station GOTHA RESET, passed through TURLAK, and ended on ORA30 with a leveled elevation of 111.030. Total leveling distance was 10.0 miles resulting in a closure of 0.08 (0.09 allowable). Resulting elevation for TURLAK was 123.39 feet NAVD88. This was converted using the United States Army Corps of Engineers software CORPSCON version 6.0.1 to derive a NGVD29 elevation of 124.28 feet.

## Well Site Notes and Changes

On January 9<sup>th</sup>, 2008 the District removed the following sites from the project. However, since four of the sites were already completed, Woolpert has included them within this report.

Well Designation	Notes
SKYLAK	
MARIC	~ had already been completed.
LHATCH3	~ had already been completed.
LHAT11	~ decommissioned.
SNIVLY	~ visited but not complete due to BM.
KUB009	~ visited but not complete. Tag existed, and BM was not at site.
KUB012	
LKISSP	~ visited to find BM, but not completed.
TIGER	~ had already been completed.
LKIS5B	
KENAN	~ had already been completed.

The following are project notes pertaining to specific well sites:

### BOGAFB:

This site was completed however the well box was empty at the time of measurements.

### LAKWEO:

The supplied BM from the District (P-13) did not have a published NAVD88 elevation, and could not be found in the field. According to a NGS BM search, the two nearest BM's with NAVD88 elevations would require approximately 20 miles of levels if they were found (BM's L64 and KR122 RESET). It would also require the construction of another concrete monument close to the LAKWEO site. These services could not be performed under this work-order since it would exceed the maximum fee allowed.

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ORF61:

The BM provided by the District for this site was R627, and was not on-site. It required approximately 1.2 miles of leveling.

SEBRING:

Two NGS BM's with NAVD88 elevations could not be found within 5 miles of the SEBRING well site. Woolpert used the on-site BM (SEBRING MW2004) to verify the existing tag in NGVD29.

KISSFS:

Woolpert used the on-site BM (KISSFS 1983) supplied by the District to set a reference tag in NGVD29. Using the two nearest NGS BM's with NAVD88, if found (Q512 and P512), would require approximately six miles of levels and could not be completed under this work-order since it would exceed the maximum fee allowed.

WR11:

Only GW1 was measured at this site, not GW2. GW2 was missed because both wells share the same box and the field crews did not notice the second well.

WR15:

Only GW1 was measured at this site, not GW2. GW2 was missed because both wells share the same box and the field crews did not notice the second well.

WR16:

Only GW1 was measured at this site, not GW2. GW2 was missed because both wells share the same box and the field crews did not notice the second well.

Therefore, a final list of the Well Sites included within this report are:

BOGAFB	MARIC	S-65GW	WR15
KENAN1	ORF61	SEBRING (no NAVD88)	WR16
LCYP19	RATHAM	TIGER	BFARM
LHATCH3	S63A-SCA	TURLAK	KISSFS (no NAVD88)
LJACK	S65A-SCA	WR11	WRLGTE

# Monitoring Well Site Information Summary

In Section 2, all well site information is presented in the same format.

**EXAMPLE:**

Site Name		Sensor		
Example		GW1		
<b>Latitude</b>	<b>Longitude</b>	<b>Northing</b>	<b>Easting</b>	
28° 23' 31.937"	81° 22' 31.937"	1472251	538267	
<b>Section</b>	<b>Township</b>	<b>Range</b>	<b>County</b>	<b>Quad</b>
13	24	29	Orange	Lake Jessamine
<b>Benchmark Information:</b>				
<b>Name</b>	<b>Existing / Set</b>	<b>NAVD88</b>	<b>NGVD29</b>	
BOG527	Set	80.851	81.876	
<b>Reference Point Information:</b>				
<b>Stamped Elevation (NGVD29)</b>		<b>Stamped Date</b>	<b>By Firm</b>	
87.50		9-21-07	Woolpert, Inc.	
Note: Reference mark at edge of wood as marked.				
<b>Staff Gauge Information:</b>				
<b>Water Elevation (NGVD29)</b>	<b>Gauge Reading</b>	<b>Time of Reading</b>	<b>Date of Reading</b>	
79.928	80.05	09:25	9-21-07	

**NOTES:**

1. Latitude and longitude were derived at the benchmark location, and is given to assist in locating the site. It is not meant to accurately locate each well.
2. The Northing and Easting were obtained by using CORPSCON to convert the latitude and longitude to Florida State Plane Coordinates, East Zone, Adjustment of 1990 (NAD83/90) HARN.
3. All measurements and elevations are in feet unless otherwise noted.
4. Reference point elevations were determined by using the stated NGVD29 elevation.
5. The site bench mark NGVD29 elevations were calculated using CORPSCON to convert the published NAVD88 elevation if a published NGVD29 elevation was not available.
6. In some cases the local benchmark only had a NGVD29 elevation, so it was used and no NAVD88 elevation is stated.
7. For some well sites an existing tag was found with a stamped elevation from another source. For these sites, Woolpert verified the tag elevation by leveling from the local site bench mark to the reference point. If the stamped tag elevation was accurate based on the leveling, the tag was left alone.



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Surveyor's Notes:

**THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.**

**THIS REPORT OF SURVEY CONSISTS OF FOUR SECTIONS AS OUTLINED WITHIN THE SUMMARY OF CONTENTS AND IS NOT VALID UNLESS ATTACHED TO THE OTHERS IN THEIR ENTIRETY.**

**ADDITIONS OR DELETIONS TO SURVEY MAPS AND REPORTS BY OTHER THAN THE SIGNING PARTY OR PARTIES IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF THE SIGNING PARTY OR PARTIES.**

**Surveyor and Mapper in Responsible Charge:**

**John A. Cestnick**

Professional Surveyor and Mapper,

License Number: 5994

Signed: \_\_\_\_\_  
(For, and on behalf of the firm Woolpert, Inc.)

Seal:

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## **Section 2: Monitoring Well Site Information**

Site Name		Sensor		
WRLGTE		GW1		

<b>Latitude</b> 28° 21' 12.55"	<b>Longitude</b> 81° 30' 14.08"	<b>Northing</b> 1461558	<b>Easting</b> 494092	
<b>Section</b> 34	<b>Township</b> 24	<b>Range</b> 28	<b>County</b> Orange	<b>Quad</b> Intercession City

**Benchmark Information:**

<b>Name</b> WRLGTE 2007	<b>Existing / Set</b> Set	<b>NAVD88</b> 93.14	<b>NGVD29</b> 94.03
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**Reference Point Information:**

<b>Stamped Elevation (NGVD29)</b> 97.20	<b>Stamped Date</b> 9-21-07	<b>By Firm</b> Woolpert, Inc.
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Note: Reference point at top of PVC pipe as marked.

**Staff Gauge Information:**

<b>Water Elevation (NGVD29)</b> NA	<b>Gauge Reading</b> NA	<b>Time of Reading</b> NA	<b>Date of Reading</b> NA
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**To Reach Description:**

From the intersection of SR535 & HWY192 in the town of Kissimmee Florida, go north on SR535 for 1.8 miles to International Drive South. Then proceed west on International Drive South for 0.7 mile to a dirt maintenance entrance to the south past Gateway entry. Follow Dirt road south then east and south again around lake for approximately 0.2miles to the site on the left (east) side of road.

Sensor Well Area:



Sensor Well:



Tag Close-up:



Bench Mark:



Bench Mark:



Bench Mark:



Site Name		Sensor	
WRLGTE		GW2	

<b>Latitude</b> 28° 21' 12.55"	<b>Longitude</b> 81° 30' 14.08"	<b>Northing</b> 1461558	<b>Easting</b> 494092
<b>Section</b> 34	<b>Township</b> 24	<b>Range</b> 28	<b>County</b> Orange
			<b>Quad</b> Intercession City

**Benchmark Information:**

<b>Name</b> WRLGTE 2007	<b>Existing / Set</b> Set	<b>NAVD88</b> 93.14	<b>NGVD29</b> 94.03
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**Reference Point Information:**

<b>Stamped Elevation (NGVD29)</b> 97.18	<b>Stamped Date</b> 9-21-07	<b>By Firm</b> Woolpert, Inc.
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Note: Reference point at top of PVC pipe as marked.

**Staff Gauge Information:**

<b>Water Elevation (NGVD29)</b> NA	<b>Gauge Reading</b> NA	<b>Time of Reading</b> NA	<b>Date of Reading</b> NA
---------------------------------------	----------------------------	------------------------------	------------------------------

**To Reach Description:**

From the intersection of SR535 & HWY192 in the town of Kissimmee Florida, go north on SR535 for 1.8 miles to International Drive South. Then proceed west on International Drive South for 0.7 mile to a dirt maintenance entrance to the south past Gateway entry. Follow Dirt road south then east and south again around lake for approximately 0.2miles to the site on the left (east) side of road.

Sensor Well Area:



Sensor Well:



Tag Close-up:



Bench Mark:



Bench Mark:



Bench Mark:



# Monitoring Well Field Data Sheet

## SFWMD #067411

Site/Station Designation: WRLGTE GW1

Date: 9 21 07

Crew: RODRIGUEZ/M-CARTNEY

Bench Mark Used:

Name stamp	Date stamp	EL NAVD 88	EL NGVD 29	Sign Present
WRLGTE	2007	93.14	94.03 <i>CORPSCON</i>	Yes

Level Setup:

STA	BS	HI	FS	EL	DIST & REM
WRLGTE				94.03	
	6.117				28.00
GW1			2.944	97.20	51.84
	2.581				52.43
WRLGTE			6.054	94.03	28.72

Tag Check List:

Photo Check List:

- Stamp Site/Station Designation WRLGTE W1 Bench Mark close
- Stamp Elevation in NGVD 29 97.20 Bench Mark standing
- Stamp Date 9 21 07 M. Well tag close
- Stamp By Woolpert ✓ M. Well standing
- Stamp Datum (NGVD 29) ✓ M. Well Area
- Scratch Old Tag /

Photo#	1521
Photo#	1522
Photo#	1523
Photo#	1524
Photo#	1527

Staff Gauge:

Site Name	Water Elev.	Gauge Reading	Time Meas.	Date Meas.
-	-	-	-	-

Site Description, Comments, or Remarks:

$\frac{N}{1461558.76}$                        $\frac{E}{494092.02}$   
 28° 21' 12.5501 N                      81° 30' 14.0819 W

# Monitoring Well Field Data Sheet

## SFWMD #067411

Site/Station Designation: WRLGTE GWZ

Date: 9-21-07

Crew: RODRIGUEZ/McCARTNEY

Bench Mark Used:

Name stamp	Date stamp	EL NAVD 88	EL NGVD 29	Sign Present
WRLGTE	2007	93.14	94.03	Yes

CORPSCON

Level Setup:

STA	BS	HI	FS	NGVD29 EL	DIST & REM
WRLGTE				94.03	
	6.054				28.72
GWZ			2.900	97.18	52.76
	2.706				54.56
WRLGTE			5.860	94.03	31.59

Tag Check List:

Photo Check List:

- |                                  |                  |                     |
|----------------------------------|------------------|---------------------|
| • Stamp Site/Station Designation | <u>WRLGTE:WZ</u> | Bench Mark close    |
| • Stamp Elevation in NGVD 29     | <u>97.18</u>     | Bench Mark standing |
| • Stamp Date                     | <u>9 21 07</u>   | M. Well tag close   |
| • Stamp By Woolpert              | <u>✓</u>         | M. Well standing    |
| • Stamp Datum (NGVD 29)          | <u>✓</u>         | M. Well Area        |
| • Scratch Old Tag                | <u>✓</u>         |                     |

Photo#	1521
Photo#	1522
Photo#	1525
Photo#	1526
Photo#	1527

Staff Gauge:

Site Name	Water Elev.	Gauge Reading	Time Meas.	Date Meas.
_____	_____	_____	_____	_____

Latitude and Longitude:

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1461 548.76

494 092.02

Site Description, Comments, or Remarks:

28° 21' 12.5501 N

81° 20' 14.0819 W

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# **Section 3: Monitoring Well Site Information in Table Format**

## Monitoring Well Site Information in Table Format

Well Designation	Well Type	County	Quadrangle	Section	Township	Range	Northing	Easting	Latitude of BM	Longitude of BM	Ref. Point Elev. (NGVD29)	Ref. Point Elev. (NAVD88)	Benchmark Name Used to Set Ref. Elev.	Benchmark Elev. (NGVD29)	Benchmark Elev. (NAVD88)
BOGAFB	NONE	ORANGE	PINE CASTLE	33	23	30	1497078	556344	28 27 05.30	81 18 36.09	92.14	91.17	GODWIN1	89.45	88.48
KENAN1	GW1	OSCEOLA	LAKE MARIN NE	10	30	33	1292324	650320	27 53 19.06	81 01 05.93	79.32	78.09	KEEN5	75.83	74.61
LCYPR19	GW1	OSCEOLA	CYPRESS LAKE	4	28	30	1360051	549721	28 04 28.30	81 19 49.10	57.51	56.39	LCYP19	54.53	53.41
LHATCH3	STG1	POLK	HESPERIDES	1	29	29	1327143	534579	27 59 02	81 22 37	59.27	58.06	LHATCH3	54.50	53.29
LJACK	STG1	OSCEOLA	LAKE MARIAN NW	31	29	32	1326984	607824	27 54 36	81 09 00	58.88	57.68	TLWMA3	60.80	59.60
MARIC	STG1	POLK	LAKE HATCHINEHA	18	28	29	1352657	507088	28 03 07.77	81 27 44.68	57.85	56.84	POT 28518	54.34	53.33
ORF 61	GW1	ORANGE	WINDERMERE	10	23	28	1503773	482382	28 28 09	81 32 28	108.40	107.45	R 627	108.71	107.77
ORF 61	GW2	ORANGE	WINDERMERE	10	23	28	1503773	482382	28 28 09	81 32 28	108.49	107.55	R 627	108.71	107.77
ORF 61	GW3	ORANGE	WINDERMERE	10	23	28	1503773	482382	28 28 09	81 32 28	108.49	107.55	R 627	108.71	107.77
RATHAM	GW1	POLK	FORT KISSIMMEE NW	6	32	32	1231938	602118	27 43 20.72	81 10 02.20	53.17	51.94	F 461	53.68	52.45
S63A-SCA	HW	OSCEOLA	CYPRESS LAKE	6	28	31	1361858	572373	28 04 47.8	81 15 35.5	67.95	67.05	KR 1068	63.86	62.96
S63A-SCA	TW	OSCEOLA	CYPRESS LAKE	6	28	31	1361858	572373	28 04 47.8	81 15 35.5	67.96	67.06	KR 1068	63.86	62.96
S-65GW	GW1	OSCEOLA	LAKE MARIAN SW	11	31	31	1261327	592302	27 48 12.7	81 11 51.2	57.88	56.69	KR 1013	63.00	61.81
S-65GW	GW2	OSCEOLA	LAKE MARIAN SW	11	31	31	1261327	592302	27 48 12.7	81 11 51.2	57.98	56.79	KR 1013	63.00	61.81
S-65GW	GW3	OSCEOLA	LAKE MARIAN SW	11	31	31	1261327	592302	27 48 12.7	81 11 51.2	57.87	56.68	KR 1013	63.00	61.81
S 65A SCA	STG1	OSCEOLA	FORT KISSIMMEE NW	28	32	32	1363587	525045	27 39 33.2	81 08 07.2	57.57	56.38	MACK 5-23-84	53.95	52.76
SEBRING	GW1	HIGHLANDS	LORIDA	5	35	30	1136116	541350	27 27 30.54	81 21 15.34	66.35	NA	SEBRING MW2004	63.04	NA
TIGER	STG1	POLK	LAKE WEOHYAKAPKA	17	30	30	1286486	545269	27 52 19.72	81 20 36.48	58.12	56.92	Z 504	56.24	55.04
TURLAK	GW1	ORANGE	LANDO WEST	11	23	28	1515086	503067	28 30 02.9	81 28 36.00	127.13	126.24	TURLAK 2008	124.28	123.39
WR 11	GW1	OSCEOLA	LAKE HATCHINEHA	3	28	29	1363587	525045	28 05 03.64	81 24 23.95	71.97	70.93	WR11 2007	68.66	67.59
WR 15	GW1	OSCEOLA	LAKE HATCHINEHA	2	28	29	1363442	530369	28 05 02.38	81 23 24.51	67.86	66.82	WR15 2007	63.09	62.01
WR 16	GW1	OSCEOLA	LAKE HATCHINEHA	2	28	29	1361365	529754	28 04 41.79	81 23 31.30	70.68	69.64	WR11 1996	66.19	65.14
BFARM	STG1	OSCEOLA	KISSIMMEE	35	25	28	1432592	503001	28 16 26.10	81 28 33.08	64.13	63.17	BFARM 2007	65.02	64.09
KISSFS	GW1	OSCEOLA	KISSIMMEE	19	25	29	1438580	511848	28 17 25.73	81 26 54.39	74.95	NA	KISSFS 1983	75.84	NA
KISSFS	GW2	OSCEOLA	KISSIMMEE	19	25	29	1438580	511848	28 17 25.73	81 26 54.39	74.36	NA	KISSFS 1983	75.84	NA
KISSFS	GW3	OSCEOLA	KISSIMMEE	19	25	29	1438580	511848	28 17 25.73	81 26 54.39	74.46	NA	KISSFS 1983	75.84	NA
WRLGTE	GW1	ORANGE	INTERCESSION CITY	34	24	28	1461558	494092	28 21 12.55	81 30 14.08	97.20	96.31	WRLGTE 2007	94.03	93.14
WRLGTE	GW2	ORANGE	INTERCESSION CITY	34	24	28	1461558	494092	28 21 12.55	81 30 14.08	97.18	96.29	WRLGTE 2007	94.03	93.14

**NOTES:**

1. Latitude and longitude were derived at the benchmark location, and is given to assist in locating the site. It is not meant to accurately locate each well.
2. Northing and Eastings were obtained by using CORPSCON to convert the latitude and longitude to Florida State Plane Coordinates, East Zone, Adjustment of 1990 (NAD83/90) HARN.
3. All measurements and elevations are in feet unless otherwise noted.
4. Some Benchmarks used did not have a published NAVD88 elevation, and therefore have been left blank.



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# Section 4: Benchmark Data Sheets

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SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/01

<b>COUNTY</b>	ORANGE	<b>PROJECT</b>	VDUP- Reference Elevation Audit Project # 1	<b>DESIGNATION</b>	WRLGTE
<b>SECTION</b>	34	<b>TOWNSHIP</b>	24S	<b>RANGE</b>	28E
<b>GEOGRAPHIC INDEX OF QUAD</b> 28081-C5					
<b>Established by</b> WOOLPERT			<b>NAME OF QUADRANGLE</b> INTERCESSION CITY		
<b>SURVEYOR</b> JOHN CESTNICK <b>DATE</b> 9 / 12 / 2007			<b>FIELD BOOK</b> W0104-28 <b>PAGE</b>		
<b>HORIZONTAL DATUM:</b> 1983 <b>ZONE</b> E					
<b>VERTICAL DATUM:</b> NGVD 1929 (CORPSCON) NAVD 1988					
<b>CONTROL ACCURACY:</b> HORIZONTAL GPS RTD			<b>VERTICAL</b> 3		
<b>STATE PLANE COORDINATES</b>	<b>X</b>	494092	<b>Y</b>	1461558	<b>EL. NGVD 29</b> 94.03 <b>NAVD 88</b> 93.14
<b>LATITUDE</b>	28° 21' 12.6"	<b>LONGITUDE</b>	81° 30' 14.1"		
<b>DESCRIPTION</b>					

To Reach:

From the intersection of SR535 & HWY192 in the town of Kissimmee Florida, go north on SR535 for 1.8 miles to International Drive South. Then proceed west on International Drive South for 0.7 mile to a dirt maintenance entrance to the south past Gateway entry. Follow Dirt road south then east and south again around lake for approximately 0.2miles to the BM on the left (east) side of road. BM is +/- 20 west of well, SE of high tension overhead wires, and east of lake. The BM is a SFWMD disc on an 8" diameter & 40" deep concrete monument incased by a PVC pipe.

SKETCH

References:

- 270 ° and 1' from carsonite sign
- 270° and 25' from antenna pole.
- 207° and 95' from power pole.
- 27° and 79' from 3" pine tree.

