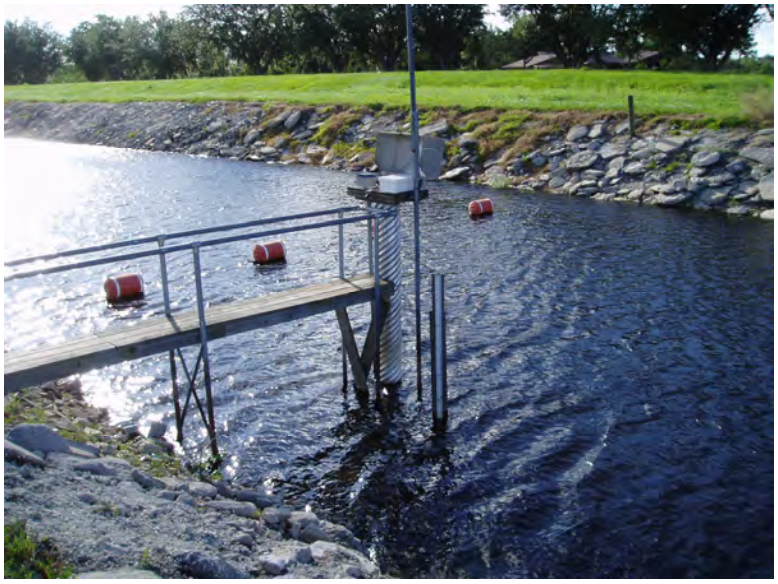
Contract # CN60744/3600000504



VERTICAL CONTROL SURVEY REPORT

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

FINAL

December, 2007

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.
Florida Certificate of Authorization # 6777
2121 Ponce de León Blvd., Suite 200
Coral Gables, Florida 33134
(305) 567-9900/fax: (305) 567-9009

Prepared by:
John A. Cestnick, PSM
Florida Professional Surveyor and Mapper # 5994

Summary of Contents

Section 1: Vertical Control Survey Report 8 Pages
- Summary of Contents 1
- Overview of the Project 2
- List of Project Deliverables 3
- Date of Survey 3
- Equipment Used 3
- Project Location 4
- Survey Methodology 4
- Summary of Leveling Results 5
- Monitoring Well Site Information Summary 7
- Surveyor's Notes: 8

Section 2: Monitoring Well Site Information Pages 9-85

Section 3: Monitoring Well Site Information in Table Format Pages 86-88

Section 4: New Benchmark Data Sheets Pages 89-98

Overview of the Project

This survey request 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 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 project began requiring a total of six sites that needed a new local benchmark, and a total of 59 separate sites requiring tags to be placed on wells. As the project was being completed, changes to the scope of services was required due to situation found in the field. For example, some sites were identified to have missing or destroyed benchmarks, additional leveling was required, and some sites were found to have additional wells than were identified.

To address these changes, a second work-order has been assigned for these additional tasks, as well as to perform similar services at additional site locations. The original list of sites to complete include the following.

1. AIR19	15. MOSSPK *	29. S63-SCA	43. TOHO4	57. WR8 *
2. ALL1	16. OAKISL *	30. SCBR	44. TOHO5	58. WR9 *
3. ALL2	17. OS181 **	31. SCPE	45. TOHO6	59. WRLGTE *
4. BFARM *	18. OSF53	32. SCPN	46. TOHO7	
5. BLACK **	19. REDYCK	33. SCPS	47. TOHO8	
6. BOG527 *	20. REEDC	34. SCSS	48. TOHO10	
7. C31SW	21. S57-SCA	35. SW15	49. TOHO12	
8. CAST *	22. S58-SCA	36. TAFTOR **	50. TOHO13	
9. EXOTFI *	23. S59-SCA	37. TMRNCH	51. TOHO14	
10. INRCTY	24. S59W	38. TB1	52. TOHO15	
11. KIRCOF	25. S60-SCA	39. TB2	53. TOHO16	
12. KISSD *	26. S61-SCA	40. TB3	54. TOHOE	
13. KISSFS	27. S61W	41. TOHO1	55. TOHOW	
14. MAKO	28. S62-SCA	42. TOHO2	56. WR6 *	

* *Benchmark was set at site (11 total).*

** *Site was decommissioned / destroyed (3 total).*

Not part of this report are the following sites for the following reasons.

Site	Notes:
BFARM	• Incorrect elevation was set on tag. This site will be included with the second work-order deliverable.
BLACK	• Site was decommissioned.
KISSFS	• Incorrect elevation was set on tag. This site will be included with the second work-order deliverable.
OS181	• Site was decommissioned.
REEDC	• REEDC was removed from the project after the District was informed that it was completed under a different contract.
S61W	• Site was overlooked. This site will be included with the second work-order deliverable.
TAFTOR	• Site was decommissioned.
TMRNCH	• Site was found to have existing tag, and tag elevations were verified. Tags were set by "EE &

Site	Notes:
	COON". GW1 was set on 5-18-05 with a verified reference elevation of 72.17, and GW2 was set on 1-6-06 with a verified reference elevation of 71.89 feet.
TB1	• Site was found to have existing tag, and tag elevations were verified. Tags were set by "K&S" dated "8-8-06". The east well was verified at 104.35 feet. The west well was verified at 104.02 feet.
TB2	• Site was found to have existing tag, and tag elevations were verified. Tags were set by "K&S" dated "8-9-06". GW1 well was verified at 104.09 feet. GW2 well was verified at 105.24 feet.
TB3	• TB3 was inaccessible due to high water. After discussing this with the District, it was assumed to also be completed by "K&S" as were TB1 and TB2.
TOHO13	• Site was found to have existing tag, and tag elevations were verified. Tag was set by "K&S" dated "8-9-07". Stamped elevation was 65.099 feet.
WRLGTE	• Incorrect elevation was set on tag. This site will be included with the second work-order deliverable.

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 August 28 and October 19, 2007.

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.

Project Location

All well site locations were in Osceola and Orange 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. Rebar rods were also added to the mixture for durability.

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. All well sites had a previously marked reference point on the 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 sites latitude, longitude, and NAVD88 elevation to find a NGVD29 elevation using the United States Army Corps of 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

BOG527 was set using NGS station L715017, a Second-Order Class I benchmark with published elevation of 92.90 feet (NAVD88), and NGS station L715018, a Second-Order Class I benchmark with published elevation of 91.84 feet (NAVD88). Leveling began at station L715017, passed through BOG527, and ended on L715018 with a leveled elevation of 91.88. Total leveling distance was 5.8 miles resulting in a closure of 0.04 (0.07 allowable). Resulting elevation for BOG527 was 80.95 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 81.88 feet.

CAST was set using NGS station Q507, a Second-Order Class I benchmark with published elevation of 73.65 feet (NAVD88), and NGS station P507, a Second-Order Class I benchmark with published elevation of 76.01 feet (NAVD88). Leveling began at station Q507, passed through CAST, and ended on P507 with a leveled elevation of 76.01. Total leveling distance was 1.65 miles resulting in a closure of 0.04 (0.04 allowable). Resulting elevation for CAST was 70.65 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 71.85 feet.

EXOFTI was set using NGS station S507, a Second-Order Class I benchmark with published elevation of 73.08 feet (NAVD88), and NGS station R507, a Second-Order Class I benchmark with published elevation of 70.67 feet (NAVD88). Leveling began at station S507, passed through EXOFTI, and ended on R507 with a leveled elevation of 70.65. Total leveling distance was 1.54 miles resulting in a closure of 0.02 (0.04 allowable). Resulting elevation for EXOFTI was 70.92 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 72.14 feet.

KISSD was set using NGS station F514, a Second-Order Class I benchmark with published elevation of 74.41 feet (NAVD88), and NGS station N512, a Second-Order Class I benchmark with published elevation of 65.69 feet (NAVD88). Leveling began at station F514, passed through KISSD, and ended on N512 with a leveled elevation of 65.69. Total leveling distance was 1.46 miles resulting in a closure of 0.00 (0.04 allowable). Resulting elevation for KISSD was 60.48 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 61.42 feet.

MOSSPK was set using NGS station R575, a Second-Order Class I benchmark with published elevation of 66.29 feet (NAVD88), and NGS station C802-008, a Second-Order Class I benchmark with published elevation of 66.88 feet (NAVD88). Leveling began at station R575, passed through MOSSPK, and ended on C802-008 with a leveled elevation of 66.91. Total leveling distance was 0.98 miles resulting in a closure of 0.03 (0.03 allowable). Resulting elevation for MOSSPK was 67.49 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 68.53 feet.

OAKISL was set using NGS station D466, a Second-Order Class I benchmark with published elevation of 155.80 feet (NAVD88), and NGS station I4-72A42E RM2, a Second-Order Class I benchmark with

published elevation of 189.29 feet (NAVD88). Leveling began at station D466, passed through OAKISL, and ended on I4-72A42E RM2 with a leveled elevation of 189.33. Total leveling distance was 6.7 miles resulting in a closure of 0.04 (0.08 allowable). Resulting elevation for OAKISL was 108.24 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 109.10 feet.

WR6 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 WR6, and ended on OS135 with a leveled elevation of 64.71. Total leveling distance was 12.8 miles resulting in a closure of 0.06 (0.11 allowable). Resulting elevation for WR6 was 63.78 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 64.82 feet.

WR8 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 WR8, and ended on OS135 with a leveled elevation of 64.71. Total leveling distance was 11.6 miles resulting in a closure of 0.06 (0.10 allowable). Resulting elevation for WR8 was 69.79 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 70.83 feet.

WR9 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 WR9, and ended on OS135 with a leveled elevation of 64.71. Total leveling distance was 11.6 miles resulting in a closure of 0.06 (0.10 allowable). Resulting elevation for WR9 was 69.32 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 70.36 feet.

Monitoring Well Site Information Summary

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

EXAMPLE:

Site Name	Sensor
Example	GW1

Latitude	Longitude	Northing	Easting
28° 23' 31.937"	81° 22' 31.937"	1472251	538267

Section	Township	Range	County	Quad
13	24	29	Orange	Lake Jessamine

Benchmark Information:

Name	Existing / Set	NAVD88	NGVD29
BOG527	Set	80.851	81.876

Reference Point Information:

Stamped Elevation (NGVD29)	Stamped Date	By Firm
87.50	9-21-07	Woolpert, Inc.

Note: Reference mark at edge of wood as marked.

Staff Gauge Information:

Water Elevation (NGVD29)	Gauge Reading	Time of Reading	Date of Reading
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. NGVD29 elevations were calculated using CORPSCON to convert the stated NAVD88 elevation. In some cases the local benchmark only had a NGVD29 elevation, so it was used and no NAVD88 elevation is stated.

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: _____ Seal:
(For, and on behalf of the firm Woolpert, Inc.)

Section 2: Monitoring Well Site Information

Site Name	Sensor
OSF53	GW1

Latitude	Longitude	Northing	Easting
28° 08’ 23.9”	81° 21’ 04.3”	1383756	542986

Section	Township	Range	County	Quad
18	27	30	Osceola	St Cloud South

Benchmark Information:

Name	Existing / Set	NAVD88	NGVD29
OSF 53	Existing	60.365	61.408

Reference Point Information:

Stamped Elevation (NGVD29)	Stamped Date	By Firm
62.77	9-24-07	Woolpert, Inc.

Note: Reference point at top of PVC pipe as marked.

Staff Gauge Information:

Water Elevation (NGVD29)	Gauge Reading	Time of Reading	Date of Reading
NA	NA	NA	NA

To Reach Description:
Located at the south side of Lake Tohopekaliga. From intersection of US 192 and US Hwy 17 in Kissimmee, go south on US HWY 17 for 3.5 miles to the junction of Pleasant Hill Road (CR 531).Go south on Pleasant Hill Road for 7.55 miles to Southport Road. Turn left onto Southport Road and go east for 5.3 miles to an access road for Structure S61. Continue east along the access road a distance of 0.6 miles to the site.

Sensor Well Area:

Sensor Well:

Tag Close-up:

Bench Mark:

Bench Mark:

Site Name	Sensor
OSF53	GW2

Latitude	Longitude	Northing	Easting
28° 08’ 23.9”	81° 21’ 04.3”	1383756	542986

Section	Township	Range	County	Quad
18	27	30	Osceola	St Cloud South

Benchmark Information:

Name	Existing / Set	NAVD88	NGVD29
OSF 53	Existing	60.365	61.408

Reference Point Information:

Stamped Elevation (NGVD29)	Stamped Date	By Firm
63.68	9-24-07	Woolpert, Inc.

Note: Reference point at top of PVC pipe as marked.

Staff Gauge Information:

Water Elevation (NGVD29)	Gauge Reading	Time of Reading	Date of Reading
NA	NA	NA	NA

To Reach Description:
Located at the south side of Lake Tohopekaliga. From intersection of US 192 and US Hwy 17 in Kissimmee, go south on US HWY 17 for 3.5 miles to the junction of Pleasant Hill Road (CR 531).Go south on Pleasant Hill Road for 7.55 miles to Southport Road. Turn left onto Southport Road and go east for 5.3 miles to an access road for Structure S61. Continue east along the access road a distance of 0.6 miles to the site.

Sensor Well Area:

Sensor Well:

Tag Close-up:

Bench Mark:

Bench Mark:

Site Name	Sensor
OSF53	GW3

Latitude	Longitude	Northing	Easting
28° 08’ 23.9”	81° 21’ 04.3”	1383756	542986

Section	Township	Range	County	Quad
18	27	30	Osceola	St Cloud South

Benchmark Information:

Name	Existing / Set	NAVD88	NGVD29
OSF 53	Existing	60.365	61.408

Reference Point Information:

Stamped Elevation (NGVD29)	Stamped Date	By Firm
63.69	9-24-07	Woolpert, Inc.

Note: Reference point at top of PVC pipe as marked.

Staff Gauge Information:

Water Elevation (NGVD29)	Gauge Reading	Time of Reading	Date of Reading
NA	NA	NA	NA

To Reach Description:
Located at the south side of Lake Tohopekaliga. From intersection of US 192 and US Hwy 17 in Kissimmee, go south on US HWY 17 for 3.5 miles to the junction of Pleasant Hill Road (CR 531).Go south on Pleasant Hill Road for 7.55 miles to Southport Road. Turn left onto Southport Road and go east for 5.3 miles to an access road for Structure S61. Continue east along the access road a distance of 0.6 miles to the site.

Sensor Well Area:

Sensor Well:

Tag Close-up:

Bench Mark:

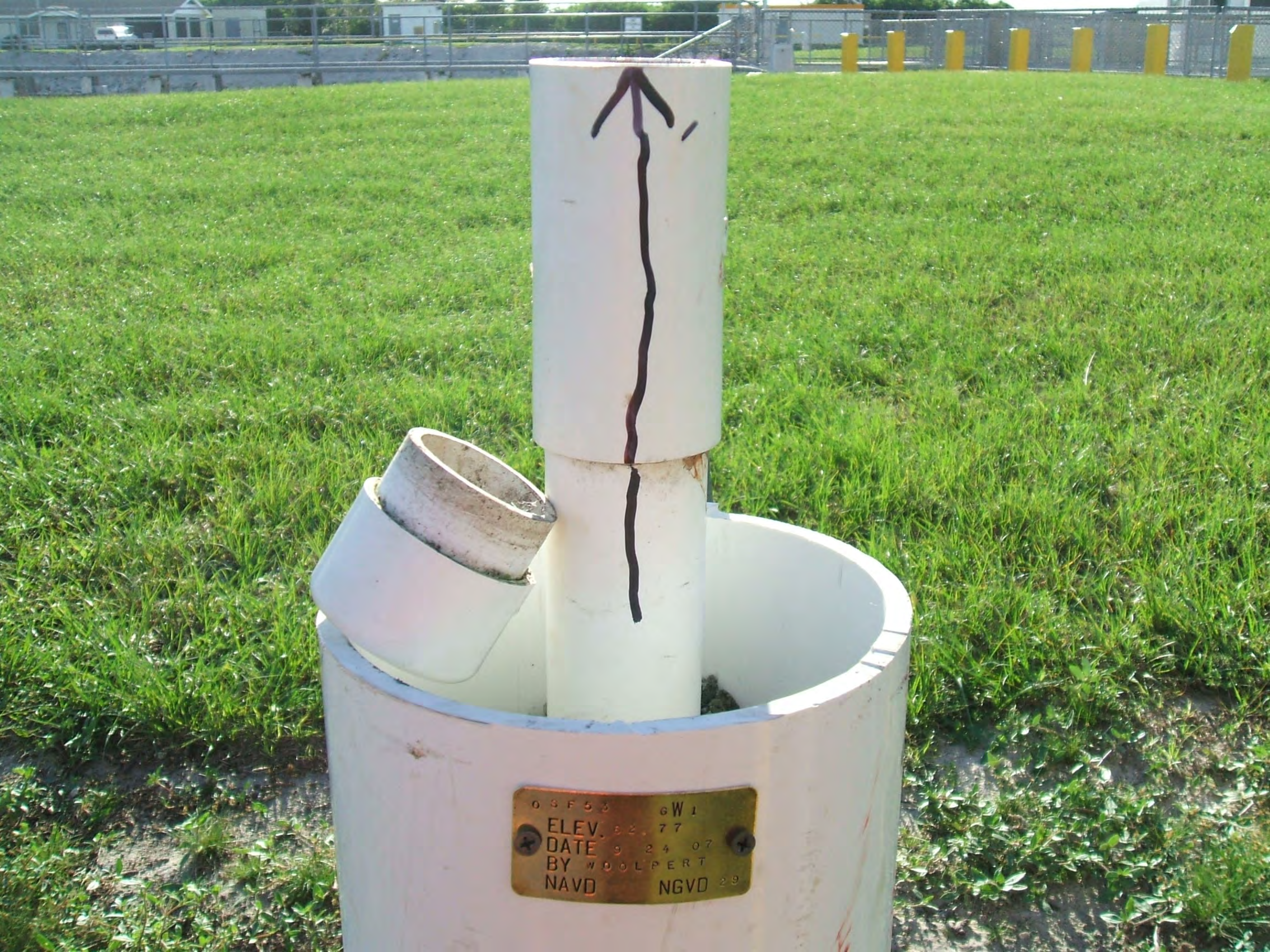
Bench Mark:


ELEV
DATE
BY
NAVD
NGVD


2
OSF 53 GW 2
ELEV. 63.68
DATE 9 24 07
BY WOOLPERT
NAVD NGVD 29


OSF 53 GW3
ELEV. 63.69
DATE 9 24 07
BY WOOLPERT
NAVD NGVD 29


ELEV
DATE
BY
NAVD


OSF53 GW1
ELEV. 82.77
DATE 9 24 07
BY WOOLPERT
NAVD NGVD 29


STATION
YEAR
2006

Monitoring Well Field Data Sheet
SFWMD #067411

Site/Station Designation: OSF 53 - G-W1 Date: 9 24 07

Crew: M.R / Y.N

Bench Mark Used:

Name stamp	Date stamp	EL NAVD 88	EL NGVD 29	Sign Present
OSF 53	2006	60.365	61.408	NO

Level Setup:

STA	BS	HI	FS	NGVD29 EL	DIST & REM
BM - MON				61.408	
	5.462	66.87			26 26
GW1			4.102	62.768	31.73
	3.419	66.188			36.97
BM - MON			5.777	60.411	30.08

Tag Check List:

- Stamp Site/Station Designation — OSF 53
- Stamp Elevation in NGVD 29 — 62.76
- Stamp Date — 9/24/07
- Stamp By Woolpert — WOOLPERT
- Stamp Datum (NGVD 29) — ✓
- Scratch Old Tag ✓

Photo Check List:

- Bench Mark close
- Bench Mark standing
- M. Well tag close
- M. Well standing
- M. Well Area

Photo#	1554
Photo#	1555
Photo#	1548
Photo#	1549
Photo#	1547

Staff Gauge:

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

Latitude and Longitude:

N 28° 08' 23.9"	W 081° 21' 04.3"

Site Description, Comments, or Remarks:

DID NOT MATCH OLD REFERANCE EL. CHECK BM. PROVIDED THEY BOTH HAVE THE SAME EL?

Monitoring Well Field Data Sheet
SFWMD #067411

Site/Station Designation: OSF 53. GW2 Date: 9/24/07

Crew: M.R/Y.N

Bench Mark Used: OSF 53

Name stamp	Date stamp	EL NAVD 88	EL NGVD 29	Sign Present
OSF 53	2006	60.365	61.408	NO

Level Setup:

STA	BS	HI	FS	NGVD29 EL	DIST & REM
BM				61.408	
	5.778	67.186			30.09
GW2			3.509	63.677	
	3.248	66.925			36.44
BM			5.518	61.407	29.81

Tag Check List:

- Stamp Site/Station Designation — OSF 53
- Stamp Elevation in NGVD 29 — 63.68
- Stamp Date — 9/24/07
- Stamp By Woolpert — WOOLPERT
- Stamp Datum (NGVD 29) — ✓
- Scratch Old Tag — ✓

Photo Check List:

- Bench Mark close
- Bench Mark standing
- M. Well tag close
- M. Well standing
- M. Well Area

Photo#	1554
Photo#	1555
Photo#	1552
Photo#	1553
Photo#	1547

Staff Gauge:

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

Latitude and Longitude:

N 28° 08' 23.7"	W 081° 21' 04.3"

Site Description, Comments, or Remarks:

SEE GW1

Monitoring Well Field Data Sheet
SFWMD #067411

Site/Station Designation: OSF 53 - GW3 Date: 9/24/07

Crew: M.R/Y.N

Bench Mark Used: OSF 53

Name stamp	Date stamp	EL NAVD 88	EL NGVD 29	Sign Present
OSF 53	2006	60.365	61.408	NO

Level Setup:

STA	BS	HI	FS	NGVD29 EL	DIST & REM
BM				61.408	
	5.518	66.926			29.86
GW3			3.234	63.692	36.17
	3.641	67.333			36.67
BM			5.924	61.409	

Tag Check List:

- Stamp Site/Station Designation
- Stamp Elevation in NGVD 29
- Stamp Date
- Stamp By Woolpert
- Stamp Datum (NGVD 29)
- Scratch Old Tag

Photo Check List:

OSF 53	Bench Mark close ✓
63.69	Bench Mark standing ✓
9/24/07	M. Well tag close
WOOLPERT	M. Well standing
YES	M. Well Area

Photo#	1554
Photo#	1555
Photo#	1550
Photo#	1551
Photo#	1547

Staff Gauge:

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

Latitude and Longitude:

N 28° 08' 23.8"	W 081° 21' 04.3"

Site Description, Comments, or Remarks:

SEE GW 1

South Florida Water Management District
Benchmark Database

Report run on: May 15, 2008 3:22 PM

Designation: OSF53
County: OSCEOLA
USGS Quad: ST. CLOUD SOUTH
Project: S-61
Sec: 18 Twp: 27 Rge: 30
Status:

NAD 1927 Coordinates:
N =
E =
Adjustment:

NAD 1983 Coordinates:
X = 542949.000
Y = 1383747.000
Adjustment:
Order:
Class:

Latitude: 280822.000
Longitude: 812100.000
Monument By: SFWMD
Year: 1982
Type: V
Stamping: NONE
Party Chief: JIM COTTON
Field Book: HIGHCO 6
Page: 7

NGVD 1929
Elevation: 61.408
Order: 3
Class:

NAVD 1988
Elevation: 60.365
Order: 3
Class:

Scaled values only

Description:

TO REACH: FROM THE INTERSECTION OF US RT 192 AND COUNTY RT C-531 PLEASANT HILL ROAD WEST OF KISSIMMEE, GO SOUTH ALONG C-531 7.2 MILES TO SOUTHPORT ROAD THEN GO EASTERLY ALONG SOUTHPORT ROAD 5.65 MILES TO SFWMD CANAL C-35 THEN GO NORTHERLY 0.10 MILES TO SFWMD WATER CONTROL STRUCTURE S-61 AND THE STATION LOCATION. STATION IS 75.0 FEET EAST OF THE LIGHPOLE BASE AT THE SOUTHWEST CORNER OF S-61 AND 34.0 FEET WEST OF A NORTH/SOUTH FENCE LINE ON THE EAST SIDE OF S-61
STATION IS A "V" CUT ON THE NORTHWEST SIDE OF THE WELL CASING.

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)
AIR19	GW1	Orange	Pine Castle	18	24	30	1479505	542444	28 24 11.94	81 21 13.49	89.41	88.48	AIR19	84.80	83.87
AIR19	GW2	Orange	Pine Castle	18	24	30	1479505	542444	28 24 11.94	81 21 13.49	90.05	89.12	AIR19	84.80	83.87
ALL1	GW1	Osceola	Ashton	29	26	31	1404991	577718	28 11 55	81 14 36.8	76.52	75.59	ALLIGATOR WELL #2	71.77	70.85
ALL1	GW2	Osceola	Ashton	29	26	31	1404991	577718	28 11 55	81 14 36.8	76.27	75.35	ALLIGATOR WELL #2	71.77	70.85
ALL2	GW1	Osceola	Ashton	29	26	31	1404988	578899	28 11 55	81 14 23.6	74.16	73.24	ALLIGATOR WELL #2	71.77	70.85
ALL2	GW2	Osceola	Ashton	29	26	31	1404988	578899	28 11 55	81 14 23.6	73.80	72.88	ALLIGATOR WELL #2	71.77	70.85
BOG527	STG1	Orange	Lake Jessamine	13	24	29	1475481	535428	28 23 31.94	81 22 31.9	87.50	86.58	BOG 527	81.88	80.95
C31SW	STG1	Osceola	St Cloud South	8	26	30	1418598	547434	28 14 09.02	81 20 15.7	62.77	61.83	C31 GFS	57.70	56.76
CAST	GW1	Osceola	Ashton	5	27	32	1395463	612548	28 10 21.4	81 08 07.4	74.54	73.34	CAST	71.85	70.65
CAST	GW2	Osceola	Ashton	5	27	32	1395463	612548	28 10 21.4	81 08 07.4	74.07	72.87	CAST	71.85	70.65
EXOTFI	GW1	Osceola	Holopaw	9	27	32	1389346	619075	28 09 20.7	81 06 54.4	75.39	74.17	EXOTFI	72.14	70.92
INRCTY	GW1	Osceola	Intercession City	3	26	28	1426088	493978	28 15 21.34	81 30 13.70	71.17	70.21	OSFWELLS BM1	68.47	67.51
INRCTY	GW2	Osceola	Intercession City	3	26	28	1426088	493978	28 15 21.34	81 30 13.70	71.14	70.18	OSFWELLS BM1	68.47	67.51
INRCTY	GW3	Osceola	Intercession City	3	26	28	1426088	493978	28 15 21.34	81 30 13.70	71.98	71.02	OSFWELLS BM1	68.47	67.51
INRCTY	GW4	Osceola	Intercession City	3	26	28	1426088	493978	28 15 21.34	81 30 13.70	72.53	71.57	OSFWELLS BM1	68.47	67.51
INRCTY	GW5	Osceola	Intercession City	3	26	28	1426088	493978	28 15 21.34	81 30 13.70	72.10	71.14	OSFWELLS BM1	68.47	67.51
INRCTY	GW6	Osceola	Intercession City	3	26	28	1426088	493978	28 15 21.34	81 30 13.70	71.23	70.27	OSFWELLS BM1	68.47	67.51
KIRCOF	GW1	Osceola	Lake Tohopekaliga	9	27	29	1389279	519428	28 09 17.84	81 25 27.67	74.83	73.82	OS 134	71.66	70.65
KIRCOF	GW2	Osceola	Lake Tohopekaliga	9	27	29	1389279	519428	28 09 17.84	81 25 27.67	73.93	72.92	OS 134	71.66	70.65
KISSD	STG1	Osceola	Kissimmee	28	25	29	1436371	521494	28 17 04.2	81 25 06.4	65.19	64.25	KISSD	61.42	60.48
MAKO	GW1	Osceola	Narcoossee	32	25	31	1432570	582808	28 16 28.18	81 13 40.49	80.19		MAKO 3	76.39	
MOSSPK	GW1	Orange	Narcoossee NW	23	24	31	1470369	594673	28 22 42.65	81 11 28.46	72.64	71.60	MOSSPK	68.53	67.49
MOSSPK	GW2	Orange	Narcoossee NW	23	24	31	1470369	594673	28 22 42.65	81 11 28.46	72.30	71.26	MOSSPK	68.53	67.49
OAKISL	GW1	Osceola	Lake Louisa SW	5	25	27	1454680	452311	28 20 02.49	81 38 01.31	111.46	110.60	OAKISL	109.10	108.24
OAKISL	GW2	Osceola	Lake Louisa SW	5	25	27	1454680	452311	28 20 02.49	81 38 01.31	111.60	110.74	OAKISL	109.10	108.24
OAKISL	GW3	Osceola	Lake Louisa SW	5	25	27	1454680	452311	28 20 02.49	81 38 01.31	111.55	110.69	OAKISL	109.10	108.24
OAKISL	GW4	Osceola	Lake Louisa SW	5	25	27	1454680	452311	28 20 02.49	81 38 01.31	110.01	109.15	OAKISL	109.10	108.24
OSF53	GW1	Osceola	St Cloud South	18	27	30	1383756	542986	28 08 23.9	81 21 04.3	62.77	61.73	OSF 53	61.41	60.37
OSF53	GW2	Osceola	St Cloud South	18	27	30	1383756	542986	28 08 23.9	81 21 04.3	63.68	62.63	OSF 53	61.41	60.37
OSF53	GW3	Osceola	St Cloud South	18	27	30	1383756	542986	28 08 23.9	81 21 04.3	63.69	62.65	OSF 53	61.41	60.37
REDYCK	GW1	Orange	Intercession City	23	24	27	1470874	467168	28 22 43.57	81 35 15.94	101.54	100.60	REDYCK	99.09	98.15
REDYCK	GW2	Orange	Intercession City	23	24	27	1470874	467168	28 22 43.57	81 35 15.94	103.64	102.70	REDYCK	99.09	98.15
S57-SCA	STG1	Osceola	Narcoossee	1	25	31	1455933	600071	28 20 19.8	81 10 27.79	71.38	70.33	Y 577	68.78	67.73
S57-SCA	STG2	Osceola	Narcoossee	1	25	31	1455933	600071	28 20 19.8	81 10 27.79	71.37	70.32	Y 577	68.78	67.73
S58-SCA	STG1	Osceola	Narcoossee	36	25	31	1431567	604364	28 16 18.59	81 09 39.38	72.40	71.35	OS 100	70.17	69.12
S58-SCA	STG2	Osceola	Narcoossee	36	25	31	1431567	604364	28 16 18.59	81 09 39.38	72.41	71.36	OS 100	70.17	69.12
S59-SCA	HW	Osceola	St Cloud North	33	25	30	1429037	555707	28 15 52.6	81 18 43.5	66.83	65.83	KR 908	61.69	60.69
S59-SCA	TW	Osceola	St Cloud North	33	25	30	1429037	555707	28 15 52.6	81 18 43.5	66.80	65.81	KR 908	61.69	60.69
S59W	GW1	Osceola	St Cloud North	33	25	30	1429076	555692	28 15 52.99	81 18 43.67	62.52	61.63	OS 81 1980	65.02	64.13
S60-SCA	HW	Osceola	Ashton	32	26	31	1397057	580727	28 10 36.5	81 14 03	75.57	74.48	KR 1066	71.01	70.14
S60-SCA	TW	Osceola	Ashton	32	26	31	1397057	580727	28 10 36.5	81 14 03	74.58	73.49	KR 1066	71.01	70.14
S61-SCA	HW	Osceola	St Cloud South	18	27	30	1383797	542852	28 08 24.3	81 21 05.8	65.58	64.54	OSF 53	61.40	60.37
S61-SCA	TW	Osceola	St Cloud South	18	27	30	1382797	542852	28 08 24.3	81 21 05.8	65.56	64.53	OSF 53	61.40	60.37
S62-SCA	HW	Orange	Narcoossee	33	24	31	1464776	586085	28 21 47.13	81 13 04.49	72.51	71.48	OR 91	68.60	67.57
S62-SCA	TW	Orange	Narcoossee	33	24	31	1464776	586085	28 21 47.13	81 13 04.49	72.53	71.50	OR 91	68.60	67.57
S63-SCA	HW	Osceola	Cypress Lake	19	27	31	1376003	574258	28 07 07.9	81 15 14.8	71.75	70.85	KR 1067	68.33	67.43
S63-SCA	TW	Osceola	Cypress Lake	19	27	31	1376003	574258	28 07 07.9	81 15 14.8	71.78	70.88	KR 1067	68.33	67.43
SCBR	GW1	Orange	Lake Jessamine	8	24	29	1478382	516853	28 24 36.17	81 26 01.71	86.28	85.37	C 1286 036	87.57	86.66
SCPE	GW1	Orange	Kissimmee	29	24	29	1468791	514892	28 22 24.96	81 26 21.57	81.44	80.53	SCPE	78.19	77.28
SCPN	HW	Orange	Lake Jessamine	19	24	29	1474814	510500	28 23 24.27	81 27 11.51	83.15	82.24	SCPN	78.53	77.62
SCPN	TW	Orange	Lake Jessamine	19	24	29	1474814	510500	28 23 24.27	81 27 11.51	83.04	82.13	SCPN	78.53	77.62
SCPS	HW	Orange	Kissimmee	30	24	29	1468563	510520	28 22 22.55	81 27 10.50	82.64	81.73	L 715 008	79.23	78.32
SCPS	TW	Orange	Kissimmee	30	24	29	1468563	510520	28 22 22.55	81 27 10.50	82.47	81.56	L 715 008	79.23	78.32
SCSS	STG1	Orange	Lake Jessamine	13	24	28	1477281	508089	28 23 48.78	81 27 38.09	85.09	84.20	SCSS	80.72	79.83
SW15	GW1	Orange	Lake Louisa SW	16	24	27	1475682	456994	28 23 30.67	81 37 10.11	111.05	110.11	SW15-9	108.93	107.99
SW15	GW2	Orange	Lake Louisa SW	16	24	27	1475682	456994	28 23 30.67	81 37 10.11	112.34	111.40	SW15-9	108.93	107.99
TOHO 1	GW1	Osceola	St Cloud South	33	26	30	1396053	555533	28 10 26	81 18 44.5	68.01		TOHO 1	64.46	
TOHO 1	GW2	Osceola	St Cloud South	33	26	30	1396053	555533	28 10 26	81 18 44.5	67.81		TOHO 1	64.46	
TOHO 2	GW1	Osceola	St Cloud South	3	27	30	1395292	557196	28 10 18.5	81 18 25.9	69.40	68.37	TOHO 2	65.66	64.63

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)
TOHO 4	GW1	Osceola	Lake Tohopekaliga	10	27	29	1386180	530170	28 08 47.51	81 23 27.55	63.71	62.68	TOHO 4	59.62	58.59
TOHO 5	GW1	Osceola	Lake Tohopekaliga	29	26	29	1405464	514584	28 11 57.92	81 26 22.44	74.36	73.38	TOHO 5	70.33	69.35
TOHO 5	GW2	Osceola	Lake Tohopekaliga	29	26	29	1405464	514584	28 11 57.92	81 26 22.44	74.10	73.12	TOHO 5	70.33	69.35
TOHO 6	GW1	Osceola	St Cloud South	29	26	29	1403532	540917	28 11 39.66	81 21 28.06	70.44	69.45	TOHO 6	67.01	66.02
TOHO 7	GW1	Osceola	Kissimmee	21	25	29	1440606	519669	28 17 46.06	81 25 26.98	74.21	73.25	BMWELL 7	70.84	69.88
TOHO 8	GW1	Osceola	Kissimmee	21	25	29	1440342	523931	28 17 43.6	81 24 39.3	68.95	67.99	BMWELL 8	65.40	64.44
TOHO 10	GW1	Osceola	St Cloud South	19	26	30	1406499	543294	28 12 09.1	81 21 01.6	74.67	73.67	TOHO 10	70.58	69.58
TOHO 12	GW1	Osceola	St Cloud North	10	25	30	1453807	561663	28 19 58.01	81 17 37.57	77.82	76.62	BMWELL12	73.92	72.72
TOHO 14	GW1	Osceola	St Cloud South	13	27	30	1385263	569855	28 08 39.5	81 16 04.2	72.84		WELL 14	69.09	
TOHO 15	GW1	Osceola	St Cloud South	30	26	31	1401062	572717	28 11 16	81 15 32.6	78.40	77.38	TOHO 15	75.05	74.02
TOHO 16	GW1	Osceola	St Cloud South	1	27	30	1393537	568710	28 10 01.4	81 16 17.2	72.77	71.73	TOHO 16A	69.12	68.08
TOHO 16	GW2	Osceola	St Cloud South	1	27	30	1393537	568710	28 10 01.4	81 16 17.2	72.60	71.56	TOHO 16A	69.12	68.08
TOHO E	STG1	Osceola	St Cloud North	2	26	30	1427170	565475	28 15 34.35	81 16 54.22	61.93	60.94	TOHOE	61.63	60.64
TOHO W	STG1	Osceola	Kissimmee	32	25	29	1438045	525426	28 17 20.9	81 24 22.49	62.07	61.13	TOHOW	57.93	56.98
WR6	GW1	Osceola	Lake Hatchineha	28	27	29	1374487	523000	28 06 51.5	81 24 47.2	69.05	68.01	WR 6	64.82	63.78
WR8	GW1	Osceola	Lake Hatchineha	28	27	29	13711644	521486	28 06 23.3	81 25 04.0	72.89	71.85	WR 8	70.83	69.79
WR9	GW1	Osceola	Lake Hatchineha	28	27	29	1372605	520934	28 06 32.8	81 25 10.2	70.65	69.61	WR 9	70.36	69.32

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.
5. In a few cases a Benchmark did not have superseded NGVD29 values so CORPSCON was used to derive a NGVD29 elevation.