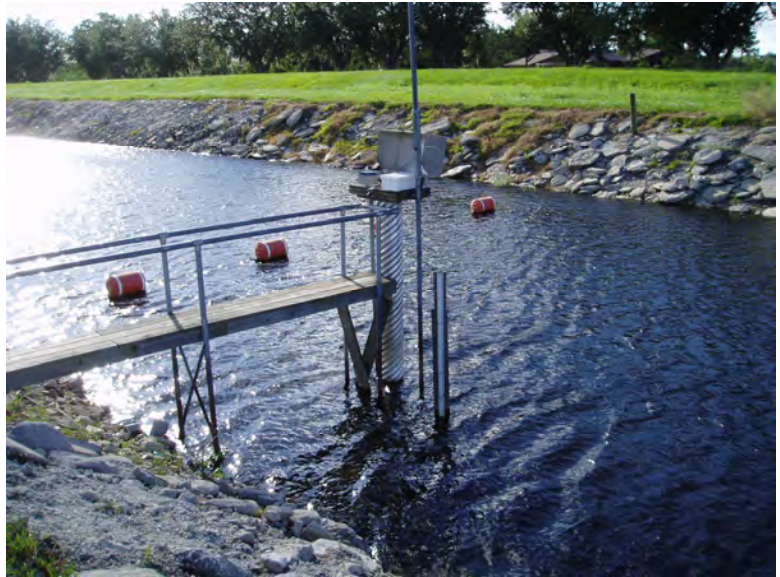




Contract # CN60744/3600000504



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

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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	<ul style="list-style-type: none">• Incorrect elevation was set on tag. This site will be included with the second work-order deliverable.
BLACK	<ul style="list-style-type: none">• Site was decommissioned.
KISSFS	<ul style="list-style-type: none">• Incorrect elevation was set on tag. This site will be included with the second work-order deliverable.
OS181	<ul style="list-style-type: none">• Site was decommissioned.
REEDC	<ul style="list-style-type: none">• REEDC was removed from the project after the District was informed that it was completed under a different contract.
S61W	<ul style="list-style-type: none">• Site was overlooked. This site will be included with the second work-order deliverable.
TAFTOR	<ul style="list-style-type: none">• Site was decommissioned.
TMRNCH	<ul style="list-style-type: none">• Site was found to have existing tag, and tag elevations were verified. Tags were set by "EE &

Site	Notes:
TB1	<p>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.</p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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

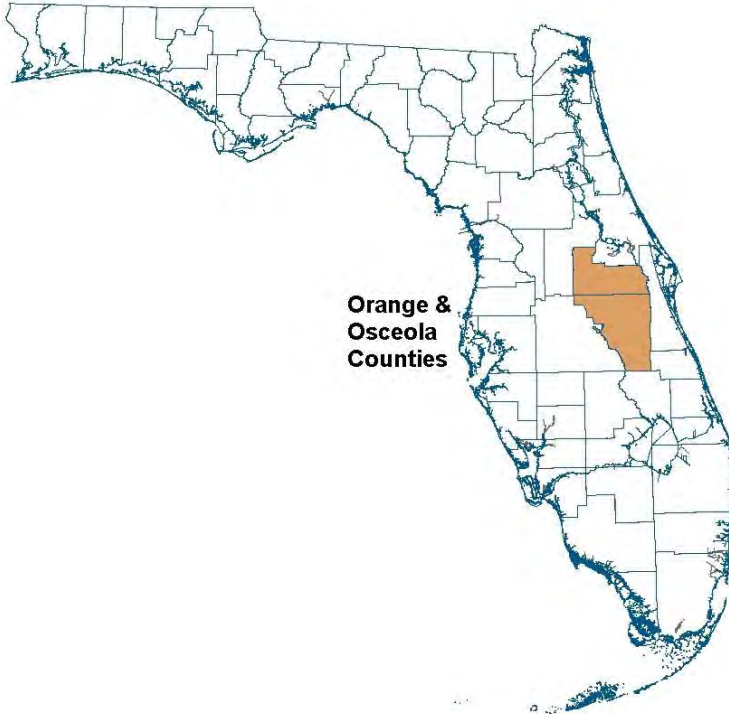
All site field operations took place between August 28 and October 19, 2007.

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

Seal:

Section 2: Monitoring Well Site Information

Site Name		Sensor		
SW15		GW1		

Latitude	Longitude	Northing	Easting
28° 23' 30.67"	81° 37' 10.11"	1475682	456994

Section	Township	Range	County	Quad
16	24	27	Orange	Lake Louisa SW

Benchmark Information:

Name	Existing / Set	NAVD88	NGVD29
SW15-9	Existing	107.992	108.934

Reference Point Information:

Stamped Elevation (NGVD29)	Stamped Date	By Firm
111.05	9-13-07	Woolpert, Inc.

Note: Reference point at edge of wood as marked with black marker.

Staff Gauge Information:

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

To Reach Description: (as described)

Take Turnpike north to exit 242. take US 441 / US 192 west for 21.5 miles to SR 545 (Orange Blvd). Take SR 545, 1 mile north to Hartzog RD. Take Hartzog RD east and north, 4.5 miles. Wells can be seen on the side of the road.

Sensor Well Area:



Sensor Well:



Tag Close-up:



Bench Mark:



Bench Mark:



Site Name		Sensor		
SW15		GW2		

Latitude 28° 23' 30.67"	Longitude 81° 37' 10.11"	Northing 1475682	Easting 456994	
Section 16	Township 24	Range 27	County Orange	Quad Lake Louisa SW

Benchmark Information:

Name SW15-9	Existing / Set Existing	NAVD88 107.992	NGVD29 108.934
-----------------------	-----------------------------------	--------------------------	--------------------------

Reference Point Information:

Stamped Elevation (NGVD29) 112.34	Stamped Date 9-13-07	By Firm Woolpert, Inc.
---	--------------------------------	----------------------------------

Note: Reference point at edge of hole as marked with black marker.

Staff Gauge Information:

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

To Reach Description: (as described)

Take Turnpike north to exit 242. take US 441 / US 192 west for 21.5 miles to SR 545 (Orange Blvd). Take SR 545, 1 mile north to Hartzog RD. Take Hartzog RD east and north, 4.5 miles. Wells can be seen on the side of the road.

Sensor Well Area:



Sensor Well:



Tag Close-up:



Bench Mark:



Bench Mark:





S W I S *

G W 2

ELEV. 112.34

DATE 9 11 07

BY WOOLPERT

NAVD

NGVD 29

Sealed Rechargeable
Battery
POWERSONIC
MODEL 400 NB
12 V 40 Amp. Hr.

SW 19 6 W 2
ELEV. 112.34
DATE 9 11 07
BY WOOLPERT
NAVD NGVD 29

[Handwritten scribble]



S W 1 5

G W 1 1

ELEV.

1111.05

DATE

9 13 07

BY

W O O L P E R T

NAVD

NGVD 29

~~SW 15 GW 1~~

GW 1



SW 15 GW 1
ELEV. 1111.05
DATE 9 13 07
BY WOOLPERT
NAVD NGVD 29



FLA. FOREST SURVEY
B-1
SM 15-9
2003
MARKER
ISLAND



POWER
MODEL
12



Monitoring Well Field Data Sheet

SFWMD #067411

Site/Station Designation: SW 15 GW 1

Date: 9 13 07

Crew: M. RODRIGUEZ / N. MCCARTNEY

Bench Mark Used:

Name stamp	Date stamp	EL NAVD 88	EL NGVD 29	Sign Present
SW15-9	2003	107.992	108.934	YES.

Level Setup:

STA	BS	HI	FS	EL ^{NGVD 29}	DIST & REM
SW15-9				108.934	
	4.776	113.710			22.25
GW1			2.657	111.053	24.81
	2.615	113.668			25.35
SW15-GW2			4.731	108.934	22.76

Tag Check List:

Photo Check List:

- Stamp Site/Station Designation SW 15 Bench Mark close
- Stamp Elevation in NGVD 29 111.05 Bench Mark standing
- Stamp Date 9 13 07 M. Well tag close
- Stamp By Woolpert ✓ M. Well standing
- Stamp Datum (NGVD 29) ✓ M. Well Area
- Scratch Old Tag ✓

Photo#	1420
Photo#	1421
Photo#	1425
Photo#	1426
Photo#	1427

Staff Gauge: NONE

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

Site Description, Comments, or Remarks:

AS DESC.

LAT

28° 23' 30.67

LONG

81° 37' 10.11

Monitoring Well Field Data Sheet

SFWMD #067411

Site/Station Designation: SW15 GW2

Date: 9/13/07

Crew: M. RODRIGUEZ / N MCCARTNEY

Bench Mark Used:

Name stamp	Date stamp	EL NAVD 88	EL NGVD 29	Sign Present
SW15-GW2	2003	107.992	108.934	yes

Level Setup:

STA	BS	HI	FS	EL	DIST & REM
SW15 GW2				108.934	
	4.531	113.465			23.12
GW2			1.128	112.337	22.54
	1.026	113.363			22.53
			4.429	108.934	22.87

Tag Check List:

Photo Check List:

- | | | |
|----------------------------------|----------------|---------------------|
| • Stamp Site/Station Designation | <u>SW15</u> | Bench Mark close |
| • Stamp Elevation in NGVD 29 | <u>112.34</u> | Bench Mark standing |
| • Stamp Date | <u>9-11-07</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#	1420
Photo#	1421
Photo#	1422
Photo#	1423
Photo#	1424

Staff Gauge: NONE

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

Site Description, Comments, or Remarks:

AS DESC

LAT
28° 23' 30.67

LONG
81° 37' 10.11



South Florida Water Management District Benchmark Database

Report run on: October 20, 2005 8:22 AM

Designation: SW159	Latitude:	Scaled values only
County: ORANGE	Longitude:	
USGS Quad: WINDERMERE	Monument By: SFWMD	
Project: SW 15 WELL	Year: 2003	
Sec: 16 Twp: 24 Rge: 27	Type: V	
Status:	Stamping: SW 15-9 2003	
NAD 1927 Coordinates:	Party Chief: HOLLIN	
N =	Field Book OSCEOLA CO WELLS 17	
E =	Page: 76	
Adjustment:	NGVD 1929	
NAD 1983 Coordinates:	Elevation: 108.934	
X =	Order: 3	
Y =	Class:	
Adjustment:	NAVD 1988	
Order:	Elevation: 107.992	
Class:	Order:	
	Class:	

Description:

OLD SFWMD EL. 108.95 NGVD 1929

THE FLDEP PRELIMINARY DATA
WINDOWS ABSTRA VERSION 1.2 -- OCT. 2001 TUE SEP 06 10:49:04 2005
-*- FIELD ABSTRACT -*-

940601-940830 HGZ L26791 4.0 MM ORDER 1 CLASS 2 PAGE 1
LEVELING ALONG VARIOUS STATE AND COUNTY ROADS AROUND DISNEY WORLD,
ORANGE AND OSCEOLA COUNTIES, FLORIDA AREA. TIE TO L26723.
STARTING ELEVATION BASED ON NAVD 88 HEIGHTS.
NOTE COLLIMATION STORED IN ELECTRONIC INSTRUMENT.
NOTE LATITUDE AND LONGITUDE WAS SCALED FROM TOPOGRAPHIC MAP.

FROM TO	START	F/B	DIST TOTAL (KM)	ELEV DIFF (MT)	-(F+B) TOTAL (MM)	MEAN DIFF FLD ELEV (MT)	I C
0107 J 629	7120933 F	1.01	-6.30938 *	1.42	-6.30867	2	
0106 SW15 9	7191437 B	1.00	6.30797 *			2	
	SL 1	33.04		0.87	32.91600		

WINDOWS ABSTRA VERSION 1.2 -- OCT. 2001 TUE SEP 06 10:50:20 2005
-*- FIELD ABSTRACT -*-

940601-940830 HGZ L26791 4.0 MM ORDER 1 CLASS 2 PAGE 1
LEVELING ALONG VARIOUS STATE AND COUNTY ROADS AROUND DISNEY WORLD,
ORANGE AND OSCEOLA COUNTIES, FLORIDA AREA. TIE TO L26723.
STARTING ELEVATION BASED ON NGVD 29 HEIGHTS.
NOTE COLLIMATION STORED IN ELECTRONIC INSTRUMENT.
NOTE LATITUDE AND LONGITUDE WAS SCALED FROM TOPOGRAPHIC MAP.

FROM TO	START	F/B	DIST TOTAL (KM)	ELEV DIFF (MT)	-(F+B) TOTAL (MM)	MEAN DIFF FLD ELEV (MT)	I C



South Florida Water Management District Benchmark Database

Report run on: October 20, 2005 8:22 AM

0107 J 629 7120933 F 1.01 -6.30938 * 1.42 -6.30867 2
0106 SW15 9 7191437 B 1.00 6.30797 * 2
 SL 1 33.04 0.87 33.20300

KEYED-IN ORDER:0087 SSN:0106 CONDITION:G PID:
 DESIGNATION:SW15 9
 ALIAS:
 QUADNAME:WINDERMERE
 COUNTRY:US STATE:FL COUNTY:OSCEOLA 097

MONUMENT:DD SETTING:07 SPECIFIC:
MAGNETISM:M STABILITY:C SATELLITE:Y APPLICATIONS:
 FPR:F ROD/PIPE: SLEEVE:
STAMPING:SW15-9 BM 2003
ESTAB BY:SFLWMD SETTING DATE:2003
 LOGO:SFLWMD
REPORT BY:FLDEP REPORT DATE:20050506
TRANSPORT:P PACK TIME:00:00 COP:JLM

=== POSITION RECORDS =====

DATUM	EPOCH	LATITUDE	LONGITUDE	POSITION SOURCE	ADJUSTMENT ORDER	TECHNIQUE	DATE
27	N282329	W0813710	S	5			

=== DESCRIPTIVE TEXT RECORD =====

TEXT STATUS:
THE MARK IS ABOUT 17.0 MI NORTHWEST OF KISSIMMEE, 15.0 MI SOUTH OF WINTER GARDEN, IN SECTION 16, TOWNSHIP 24 SOUTH, RANGE 27 EAST.

TO REACH THE MARK FROM THE INTERSECTION OF U.S. HIGHWAY 27 OVERPASS AND U.S. HIGHWAY 192 ABOUT 15.0 MI SOUTH OF CLERMONT, GO EAST ON U.S. HIGHWAY 192 FOR 1.55 MI TO THE JUNCTION OF COUNTY ROAD 545 ON THE LEFT, TURN LEFT ON COUNTY ROAD 545 (AVALON ROAD) AND GO NORTH FOR 1.0 MI TO THE JUNCTION OF HARTZOG ROAD ON THE RIGHT, TURN RIGHT ON HARTZOG ROAD AND GO EAST AND NORTH FOR 4.0 MI TO THE MARK ON THE RIGHT, SET IN THE TOP OF A CONCRETE MONUMENT RECESSED 0.8 FT BELOW THE LEVEL OF THE GROUND AND ABOUT 1.0 FT ABOVE THE LEVEL OF HARTZOG ROAD.

LOCATED 24.4 FT EAST OF THE APPROXIMATE CENTERLINE OF HARTZOG ROAD, 23.0 FT NORTH-NORTHEAST OF THE SOUTHEAST END OF THE PAVEMENT, 6.0 FT NORTH OF A GAGE AND 5.0 FT SOUTH OF THE SOUTHWEST CORNER OF A GAGE WITH AN ANTENNA.

NOTE A MAGNET WAS IMBEDDED IN THE GROUND ON THE SOUTH SIDE OF THE MONUMENT.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT DESCRIPTION
TO REACH: FROM THE INTERSECTION OF UNITED STATES HIGHWAY 192 (US 192) AND COUNTY ROAD 545 WEST OF KISSIMMEE, GO NORTH ON COUNTY ROAD 545, 4.7 MILES TO HARTZOG ROAD ON THE RIGHT; THEN GO EAST AND SOUTH ON HARTZOG ROAD, 2.15 MILES TO A POLE BARN ON THE LEFT AND THE STATION LOCATION.
THE STATION IS:
6.3 FEET NORTH OF A SFWMD WELL WITH RECORDER PLATFORM AND
6.0 FEET SOUTH OF A SFWMD WELL WITH RECORDER PLATFORM,
24 FEET EAST OF THE CENTERLINE OF HARTZOG ROAD NAD
100 FEET MORE OR LESS SOUTH OF THE CENTERLINE OF THE ROAD TO THE POLE BARN.

THE BENCHMARK "SW15-9 2003" IS A SOUTH FLORIDA WATER MANAGEMENT DISTRICT (SFWMD) ALUMINUM DISK IN A 1 1/4-INCH X 18-INCH GALVANIZED IRON PIPE WITH A WITH A CONCRETE COLLAR.



South Florida Water Management District Benchmark Database

Report run on: October 20, 2005 8:22 AM



FLA. WATER MANAGEMENT DIST.
SURVEY
SW15-9
BM
2003
MARKER
05



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.