Surveyor's Report

Hydrology – Polk County Monitoring Wells

NMI Project No. 1078.026

Report Date: April 6, 2007

Submittal: Final

Prepared for:

South Florida Water Management District

NICK MILLER, INC.

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OVERVIEW OF THE PROJECT

PURPOSE

The purpose of the Polk County Monitoring Wells Project is to establish a vertical control mark near the monitoring well. The project tests the application of Federal Geodetic Control Subcommittee (FGCS) Second-Order, Class II leveling procedures with Third-Order equipment. The goal of this hybrid pairing of procedures and equipment is to produce leveling measurements that will be acceptable to the National Geodetic Survey (NGS) and used in future vertical adjustments throughout the District.

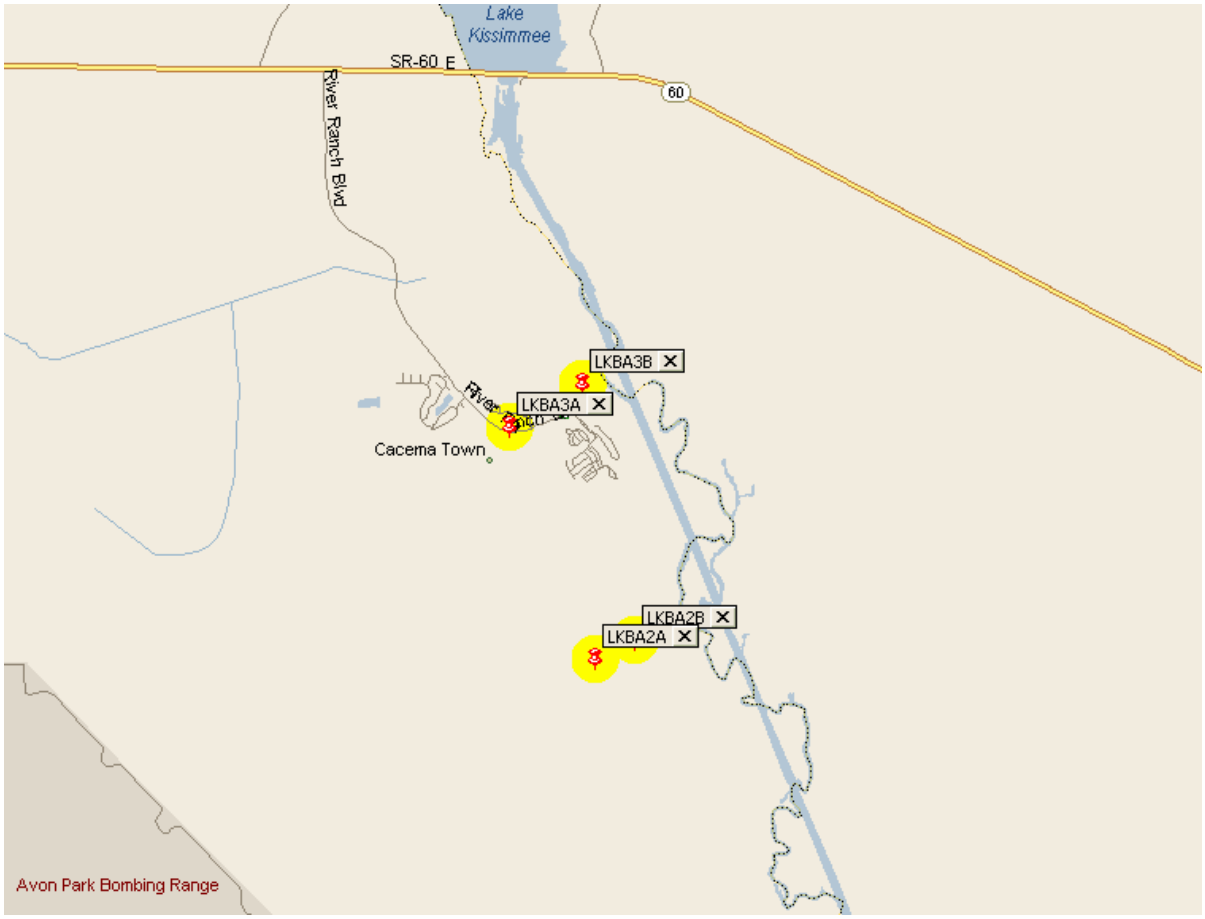
This project utilizes uncalibrated "off-the-shelf" fiberglass level rods. Such rods are not currently approved by NGS for precise leveling (Second-Order Class II and above) for three primary reasons:

1. The fiberglass material used to construct the rods is less dimensionally stable than rods constructed of Invar metal.
2. The fiberglass rods are not individually calibrated by the manufacturer to identify scale errors across the length of the rod.
3. The fiberglass rods are a three-section snap-together style that will, over time, wear at the connection points creating error in measurements on the top two sections.

While these limitations make the rods unsuitable for the extreme precision required in First-Order and Second-Order, Class I leveling, it is the hypothesis of this project that such rods can deliver Second-Order, Class II precisions. Fiberglass rods are commonly used by surveyors today. In contrast, Invar level rods are expensive and specialized equipment only used by surveyors working on the highest precision vertical control surveys. By demonstrating that fiberglass level rods such as those used in this project are suitable for Second-Order, Class II leveling the District will benefit from the increased number of consultants using these rods. As a result, more level lines run within the District should meet NGS's requirements for inclusion in future vertical adjustments, further refining the elevation models used for water control.

LOCATION OF PROJECT

This project is located in Polk County, Florida. Following is a vicinity map.



ITEMS DELIVERED TO THE CLIENT

The following items are delivered to the client with this report. Neither the report nor the items listed below are complete without the other.

1. Paper and electronic copy of field notes
2. Paper and electronic copy of all computation sheets
3. CORPSMET file for well site
4. Paper and electronic copy of site photographs
5. Paper copy of South Florida Water Management District Benchmark Description
6. Paper and electronic copy of NGS Blue Book submittal

VERTICAL DATUM FOR THE PROJECT

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

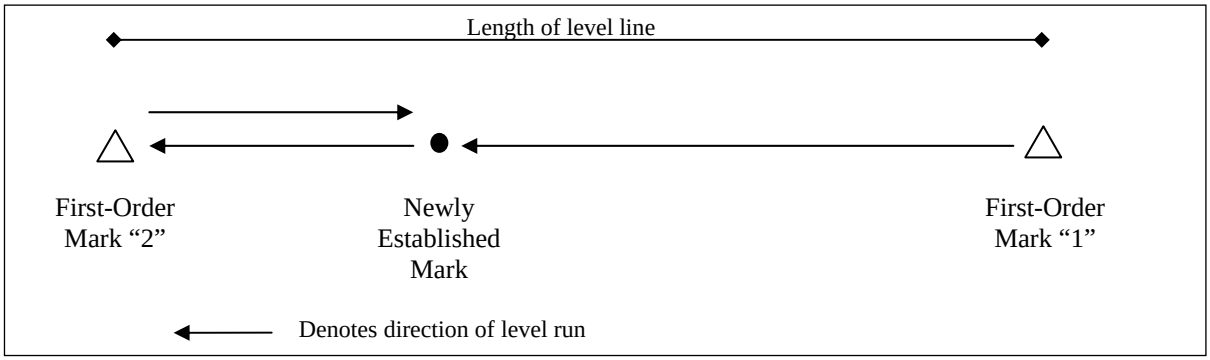
Leveling Methods

CONFIGURATION OF LEVEL RUNS

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

For each level line, two existing First or Second Order vertical marks were used. The run was started at one of the First or Second Order marks and continued through the newly established mark near the structure and closed on the second First or Second Order vertical mark. The run was then looped back from the second First or Second Order mark to the newly established mark (see Figure 1 below).

Figure 1 Typical Level Run Pattern



The FGCS maximum allowable misclosure for this type of run is eight millimeters multiplied by the length of the line in kilometers.

EQUIPMENT USED

All leveling during the project was performed with a Leica DNA03 digital level and Leica three-section, fiberglass bar-code level rods. Information and technical specification for the Leica DNA03 digital level are available at http://www.leica-geosystems.com.

PROJECT RESULTS

The following table lists the elevations established for the new mark, the level run misclosure, "to-reach" description for the mark and a photo of the mark. All elevations are in US Survey Feet.

LKBA2A	Elevation:	**55.91 ft**	(NAVD 88)	57.09 ft	(NGVD 29)
Bench Mark 1:	A 461	52.20 ft	(NAVD 88)	N/A ft	(NGVD 29)
Bench Mark 2:	KR 1560	54.43 ft	(NAVD 88)	N/A ft	(NGVD 29)
Bench Mark 3:	Z 460	53.93 ft	(NAVD 88)	N/A ft	(NGVD 29)
Monitoring Well:	LKBA2A	59.36 ft	(NAVD 88)	60.54 ft	(NGVD 29)
Concrete Pad:	LKBA2A	56.48 ft	(NAVD 88)	57.66 ft	(NGVD 29)
Ground Elevation:	LKBA2A	56.21 ft	(NAVD 88)	57.39 ft	(NGVD 29)

Length of Run:	0.99 km
Max Allowable Misclosure:	8 mm
Actual Misclosure:	1 mm

To Reach LKBA2A:

TO REACH THE MARK FROM THE INTERSECTION OF STATE ROAD 27 UNDERPASS AND STATE ROAD 60 IN LAKE WALES, GO EAST-SOUTHEAST ON STATE ROAD 60 FOR 25.7 MILES TO THE JUNCTION OF RIVER RANCH BOULEVARD ON THE RIGHT, TURN RIGHT ON RIVER RANCH BOULEVARD AND GO SOUTHEAST FOR 2.55 MILES TO THE GUARD HOUSE AT THE ENTRANCE TO RIVER RANCH, CONTINUE SOUTH ON RIVER RANCH BOULEVARD FOR 0.3 MILE TO THE JUNCTION OF KICCO ROAD ON THE RIGHT, TURN RIGHT ON KICCO ROAD (NEED SFWMD L KEY) AND GO SOUTHEAST FOR 0.2 MILE TO FOUR SETS OF DOUBLE UNLOCKED GATES, CONTINUE SOUTH ON KICCO ROAD
FOR 0.5 MILES TO ANOTHER UNLOCKED METAL GATE, CONTINUE SOUTHEAST ON KICCO ROAD FOR 0.2 MILE TO THE JUNCTION OF ROAD ON THE LEFT, CONTINUE SOUTH-SOUTHEAST ON KICCO ROAD FOR 1.4 MILES TO AN ENTRANCE OF A BRIDGE. +/- 200 FEET BEFORE BRIDGE MAKE RIGHT AND HEAD WESTERLY THROUGH GRASSY AREA TO DIRT ROAD ON EAST SIDE OF BARBED WIRE FENCE. MAKE RIGHT AND HEAD NORTH ON DIRT ROAD FOR 0.3 MILE TO BEND. MAKE LEFT AND HEAD WEST ON DIRT ROAD FOR 0.1 MILE TO MARK ON RIGHT. MONUMENT IS +/- 150 FEET NORTH OF DIRT ROAD ON SOUTH SIDE OF MONITORING WELL LKBA2A. SET IN THE TOP OF A ROUND CONCRETE MONUMENT FLUSH WITH THE GROUND. LOCATED 7.2 FEET SOUTH OF CENTERLINE OF 1 FOOT DIAMETER WHITE PVC PIPE FOR MONITORING WELL, 5.2 FEET SOUTHEAST OF SOUTHWEST BALLARD POST, 5.2 FEET SOUTHWEST OF SOUTHEAST BALLARD POST. MAGNET SET 1 FOOT NORTH OF MONUMENT.

LKBA2B (USED NGS BM Z 460)	Elevation:	**53.93 ft**	(NAVD 88)	N/A ft	(NGVD 29)
Bench Mark 1:	A 461	52.20 ft	(NAVD 88)	N/A ft	(NGVD 29)
Bench Mark 2:	KR 1560	54.43 ft	(NAVD 88)	N/A ft	(NGVD 29)
Bench Mark 3:	Z 460	53.93 ft	(NAVD 88)	N/A ft	(NGVD 29)
Monitoring Well:	LKBA2B	58.22 ft	(NAVD 88)	59.41 ft	(NGVD 29)
Concrete Pad:	LKBA2B	54.70 ft	(NAVD 88)	55.89 ft	(NGVD 29)
Ground Elevation:	LKBA2B	54.35 ft	(NAVD 88)	55.54 ft	(NGVD 29)
Monitoring Well:	Well West of LKBA2B	56.87 ft	(NAVD 88)	58.06 ft	(NGVD 29)
Concrete Pad:	Well West of LKBA2B	54.81 ft	(NAVD 88)	56.00 ft	(NGVD 29)
Ground Elevation:	Well West of LKBA2B	54.28 ft	(NAVD 88)	55.47 ft	(NGVD 29)
Monitoring Well:	Well South of LKBA2B	55.41 ft	(NAVD 88)	56.60 ft	(NGVD 29)
Concrete Pad:	Well South of LKBA2B	54.94 ft	(NAVD 88)	56.13 ft	(NGVD 29)
Ground Elevation:	Well South of LKBA2B	54.34 ft	(NAVD 88)	55.53 ft	(NGVD 29)

Length of Run:	0.99 km
Max Allowable Misclosure:	8 mm
Actual Misclosure:	1 mm

To Reach Z 460:

DESCRIBED BY FL DEPT OF ENV PRO 1997 (JLM) THE MARK IS ABOUT 30.0 MI (48.3 KM) SOUTHEAST OF LAKE WALES, 0.6 MI (1.0 KM) WEST OF THE KISSIMMEE RIVER ON KICCO ROAD IN SECTION 25, TOWNSHIP 31 SOUTH, RANGE 31 EAST. TO REACH THE MARK FROM THE INTERSECTION OF STATE ROAD 27 UNDERPASS AND STATE ROAD 60 IN LAKE WALES, GO EAST-SOUTHEAST ON STATE ROAD 60 FOR 25.7 MI (41.4 KM) TO THE JUNCTION OF RIVER RANCH BOULEVARD ON THE RIGHT, TURN RIGHT ON RIVER RANCH BOULEVARD AND GO SOUTHEAST FOR 2.55 MI (4.10 KM) TO THE GUARD HOUSE AT THE ENTRANCE TO RIVER RANCH, CONTINUE SOUTH ON RIVER RANCH BOULEVARD FOR 0.3 MI (0.5 KM) TO THE JUNCTION OF KICCO ROAD ON THE RIGHT, TURN RIGHT ON KICCO ROAD AND GO SOUTHEAST FOR 0.2 MI (0.3 KM) TO FOUR SETS OF DOUBLE UNLOCKED GATES, CONTINUE SOUTH ON KICCO ROAD FOR 0.5 MI (0.8 KM) TO ANOTHER UNLOCKED METAL GATE, CONTINUE SOUTHEAST ON KICCO ROAD FOR 0.2 MI (0.3 KM) TO THE JUNCTION OF ROAD ON THE LEFT, CONTINUE SOUTH-SOUTHEAST ON KICCO ROAD FOR 0.8 MI (1.3 KM) TO THE MARK ON THE RIGHT, A STAINLESS STEEL ROD DRIVEN TO REFUSAL AT A DEPTH OF 40.3 FT (12.3 M) WITH A LOGO CAP FLUSH WITH THE GROUND AND LEVEL WITH KICCO ROAD, THE DATUM POINT IS RECESSED 0.4 FT (12.2 CM) BELOW THE LEVEL OF THE LOGO CAP. LOCATED 37.5 FT (11.4 M) SOUTHWEST OF THE APPROXIMATE CENTERLINE OF KICCO ROAD AND 1.0 FT (0.3 M) NORTHWEST OF A CARSONITE WITNESS POST. NOTE ACCESS TO DATUM POINT IS HAD THROUGH A 5-INCH LOGO CAP. FOR KEY CONTACT SOUTH FLORIDA WATER MANAGEMENT DISTRICT AT 561-686-8800.

LKBA3A (USED NGS BM Y 460)	Elevation:	**55.00 ft**	(NAVD 88)	N/A ft	(NGVD 29)
Bench Mark 1:	X 460	55.47 ft	(NAVD 88)	N/A ft	(NGVD 29)
Bench Mark 2:	Y 460	55.00 ft	(NAVD 88)	N/A ft	(NGVD 29)
Monitoring Well:	LKBA3A	58.86 ft	(NAVD 88)	60.07 ft	(NGVD 29)
Concrete Pad:	LKBA3A	55.45 ft	(NAVD 88)	56.65 ft	(NGVD 29)
Ground Elevation:	LKBA3A	55.30 ft	(NAVD 88)	56.50 ft	(NGVD 29)
Length of Run:	1.37 km				
Max Allowable Misclosure:	9 mm				
Actual Misclosure:	1 mm				

To Reach Y 460:

DESCRIBED BY FL DEPT OF ENV PRO 1997 (JLM)
THE MARK IS ABOUT 29.0 MI (46.7 KM) SOUTHEAST OF LAKE WALES, 1.0 MI (1.6 KM) WEST OF THE KISSIMMEE RIVER ON RIVER RANCH BOULEVARD IN SECTION 23, TOWNSHIP 31 SOUTH, RANGE 31 EAST. TO REACH THE MARK FROM THE INTERSECTION OF STATE ROAD 27 UNDERPASS AND STATE ROAD 60 IN LAKE WALES, GO EAST-SOUTHEAST ON STATE ROAD 60 FOR 25.7 MI (41.4 KM) TO THE JUNCTION OF RIVER RANCH BOULEVARD ON THE RIGHT, TURN RIGHT ON RIVER RANCH BOULEVARD AND GO SOUTH FOR 2.55 MI (4.10 KM) TO THE GUARD HOUSE AT THE ENTRANCE TO RIVER RANCH, CONTINUE SOUTH ON RIVER RANCH BOULEVARD FOR 0.3 MI (0.5 KM) TO THE JUNCTION OF KICCO ROAD (A DIRT ROAD) LEADING SOUTHEAST ON THE RIGHT AND THE MARK ON THE RIGHT, SET IN THE TOP OF A ROUND CONCRETE MONUMENT FLUSH WITH THE GROUND AND LEVEL WITH RIVER RANCH BOULEVARD. LOCATED 85.4 FT (26.0 M) EAST-SOUTHEAST OF THE APPROXIMATE CENTERLINE OF TRACTOR TRAIL (A DIRT ROAD LEADING SOUTH), 55.9 FT (17.0 M) SOUTH OF THE APPROXIMATE CENTERLINE OF RIVER RANCH BOULEVARD, 50.8 FT (15.5 M) WEST-SOUTHWEST OF POWER POLE NUMBER 3717-1, 20.1 FT (6.1 M) EAST OF KICCO ROAD (A DIRT ROAD LEADING SOUTHEAST), 1.0 FT (0.3 M) WEST OF A BARBWIRE FENCE LINE AND 0.8 FT (24.4 CM) WEST OF A CARSONITE WITNESS POST.

LKBA3B	Elevation:	**46.03 ft**	(NAVD 88)	47.23 ft	(NGVD 29)
Bench Mark 1:	X 460	55.47 ft	(NAVD 88)	N/A ft	(NGVD 29)
Bench Mark 2:	Y 460	55.00 ft	(NAVD 88)	N/A ft	(NGVD 29)
Monitoring Well:	LKBA3B	50.59 ft	(NAVD 88)	51.80 ft	(NGVD 29)
Concrete Pad:	LKBA3B	46.61 ft	(NAVD 88)	47.82 ft	(NGVD 29)
Ground Elevation:	LKBA3B	46.32 ft	(NAVD 88)	47.52 ft	(NGVD 29)
Length of Run:	1.37 km				
Max Allowable Misclosure:	9 mm				
Actual Misclosure:	1 mm				

To Reach LKBA3B:

TO REACH THE MARK FROM THE INTERSECTION OF STATE ROAD 27 UNDERPASS AND STATE ROAD 60 IN LAKE WALES, GO EAST-SOUTHEAST ON STATE ROAD 60 FOR 25.7 MILES TO THE JUNCTION OF RIVER RANCH BOULEVARD ON THE RIGHT, TURN RIGHT ON RIVER RANCH BOULEVARD AND GO SOUTH FOR 2.55 MI TO THE GUARD HOUSE AT THE ENTRANCE TO RIVER RANCH, CONTINUE SOUTHERLY AND WESTERLY ON RIVER RANCH BOULEVARD FOR 0.8 MI (0.5 KM) TO WHERE THE ROAD TEES (MARINA PARKING). MAKE LEFT AND HEAD NORTH FOR +/- 200 FEET TO GATE. CONTINUE THROUGH GATE AND HEAD NORTHEASTERLY FOR 0.15 MILE TO THE MARK ON NORTH SIDE OF MONITORING WELL LKBA3B, SET IN THE TOP OF A ROUND CONCRETE MONUMENT FLUSH WITH THE GROUND. LOCATED 12.0 FEET NORTH OF CENTERLINE OF 1 FOOT DIAMETER GREY PVC PIPE FOR MONITORING WELL, 163.60 FEET NORTHEAST OF PK NAIL AND DISK ON NORTH SIDE OF 1 FOOT DIAMETER PALM TREE, 9.7 FEET NORTHEAST OF NORTHWEST YELLOW BALLARD POST. MAGNET SET 1 FOOT NORTH OF MONUMENT.

The combination of Second-Order, Class II methods and Third-Order fiberglass level rods produced errors of closure within the FGCS standard for Second-Order, Class II geodetic leveling. The data gathered during this project has been submitted to Mr. Ronnie Taylor, NGS Advisor for the State of Florida for further analysis and recommendations.

SURVEYOR'S CERTIFICATION

In my professional opinion, this report of survey meets applicable portions of the Minimum Technical Standards set forth by the Florida Board of Professional Surveyors and Mappers in Chapter 61-G17, Florida Administrative Code. This report is prepared for the sole and specific use of the South Florida Water Management District and is not assignable.

NICK MILLER, INC.
DBPR Authorization No. 4318

March 7th, 2007
Date of Survey

By: _____
Stephen M. Gordon, PSM
Professional Surveyor and Mapper
State of Florida
Certificate No. 5974

1078.026 LKBA3B SFWMD

~~1076~~ MONITORING WELL

- SET POURED-IN-PLACE CONCRETE MONUMENT W/ SFWMD BRASS DISK
- SET MARKER 1' NORTH OF MONUMENT

STAMPED LKBA3B 2007

IDS

- SET MONUMENT 12.0' NORTH OF 8" DIA. GREY PVC PIPE FOR MONITORING WELL LKBA3B.
- SET MONUMENT 163.60'NE OF PENCIL PINE ON NORTH SIDE OF 1' DIA. PALM TREE.
- SET MONUMENT 9.7' NE OF NEW YELLOW BALLARD POST.

COORDINATES

MONITORING WELL

N. 27° 46' 24" N. 1250346.016 ft

W. 81° 11' 23" E. 594817.529 ft

MONUMENT

N. 27° 46' 24" N. "

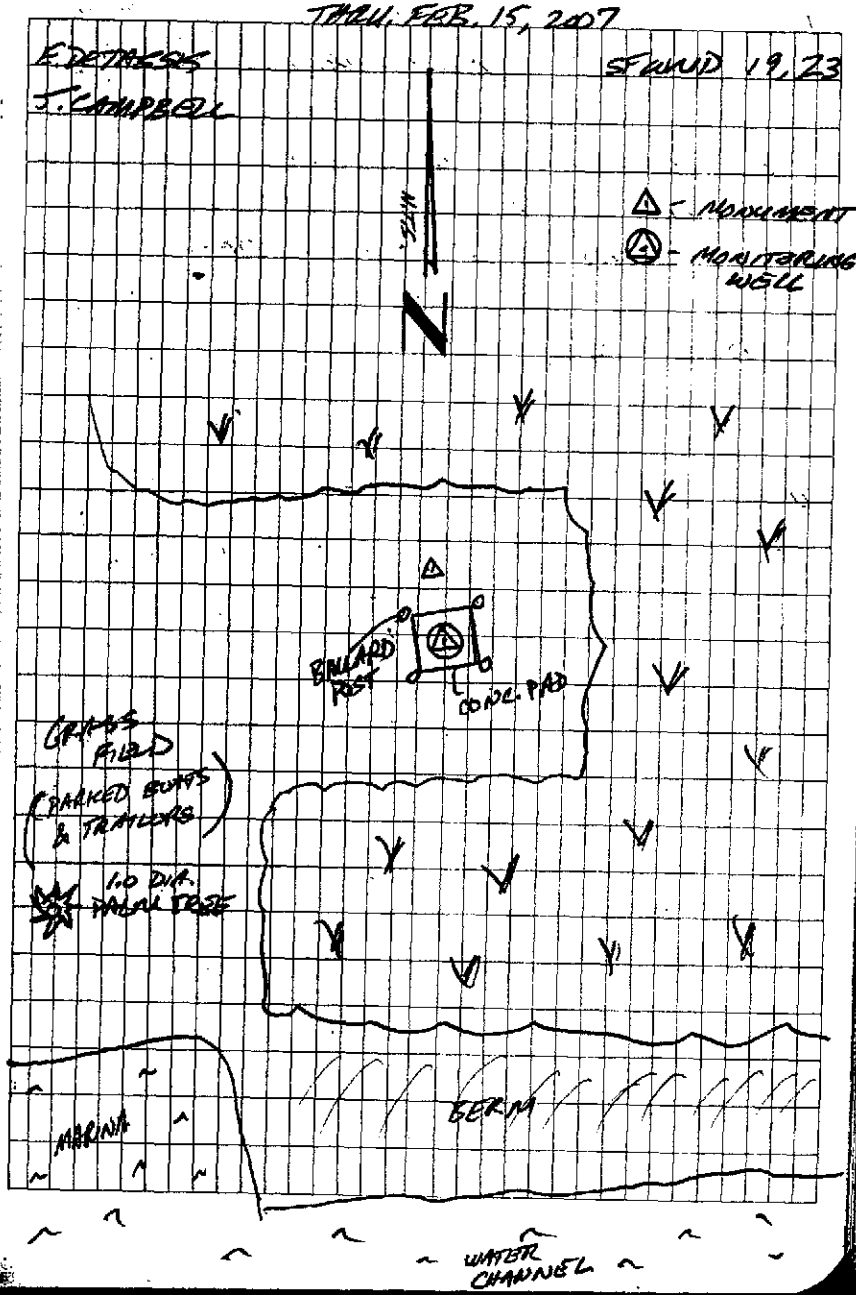
W. 81° 11' 23" E. "

THRU FEB. 15, 2007

E. DETMERS

J. CAMPBELL

SFWMD 19, 23



1078.026 LKBA3A STUMD

MONITORING WELL

- NGS BENCHMARK Y 460 USED FOR MONITORING WELL.

REF: NGS DATA SHEET FOR TO REACH DESCRIPTION AND COORDINATES

LKBA3A Well site

COORDINATES:

MONITORING WELL

N. 27° 46' 09" X. 1248835.337 ft

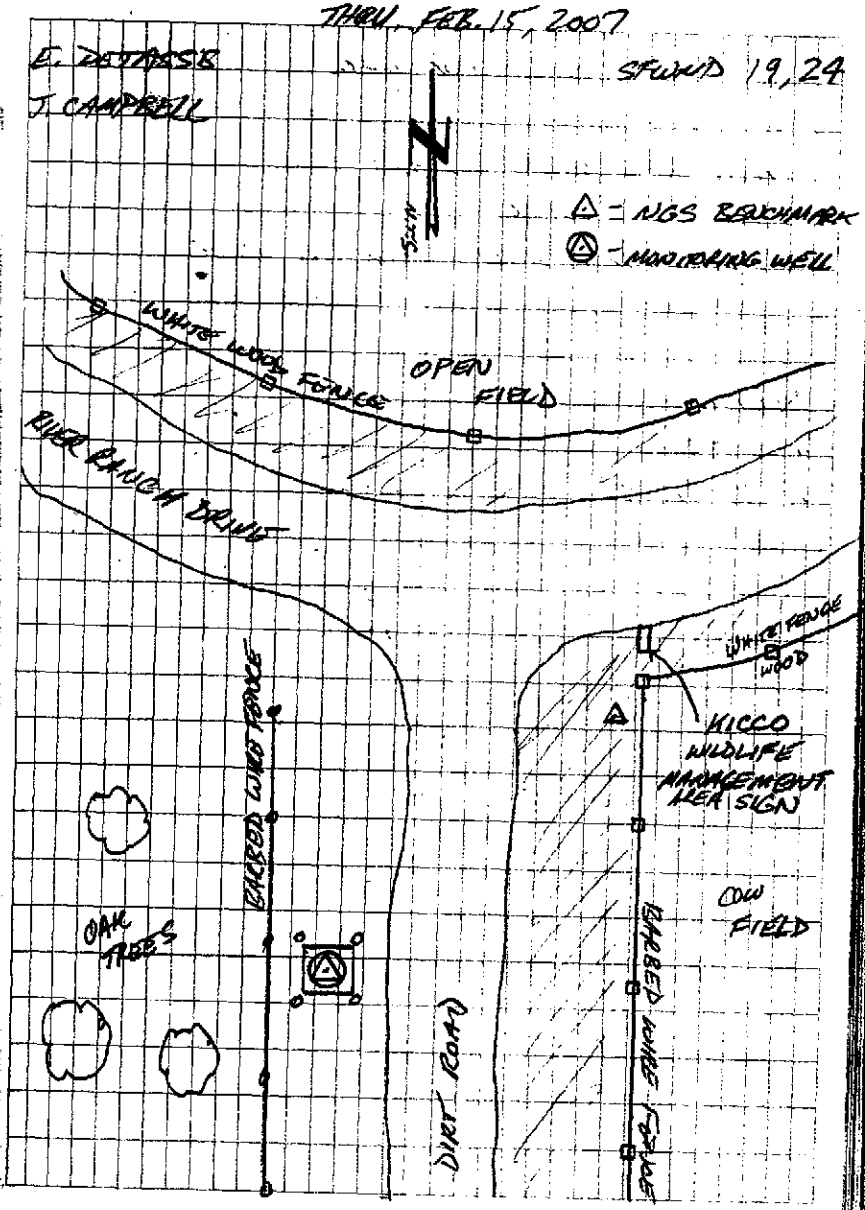
W. 81° 11' 52" E. 592210.29 ft

THRU FEB. 15, 2007

E. DETTASIS

J. CAMPBELL

STUMD 19, 24



1078.026 LKBA2B SFWMD

MONITORING WELL

- NGS BENCHMARK Z 460 USED FOR MONITORING WELL

REF: NGS DATA SHEET FOR TO REACH DESCRIPTION AND COORDINATES.

LKBA2B Well site

COORDINATES

MONITORING WELL

N. 27° 44' 57" N. 1241254.47 ft

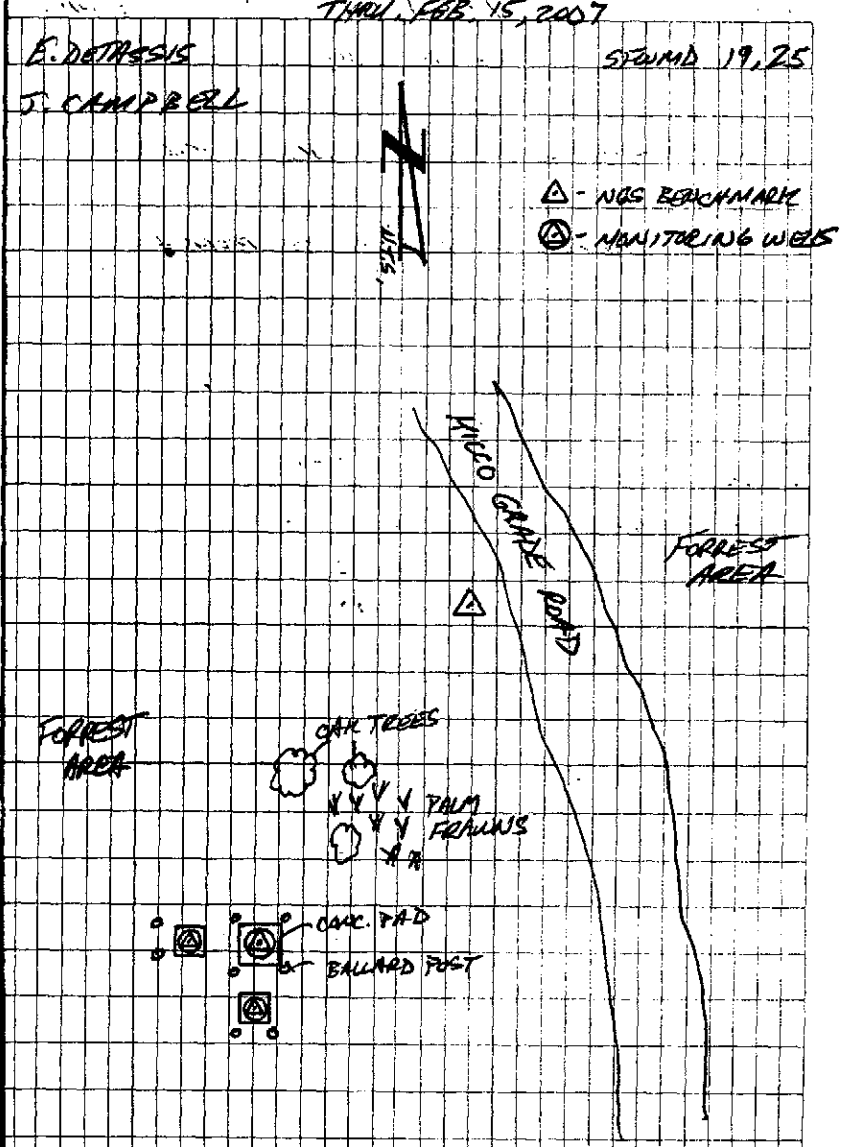
W. 81° 11' 02" E. 596690.23 ft

THUR. FEB. 15, 2007

E. DEMESIS

J. CAMPBELL

SFWMD 19, 25



1078.026 LKBA2A SFWMD

MONITORING WELL

- SET POURED-IN-PLACE CONCRETE MONUMENT W/ BRASS DISK.
- SET MAGNET 1' NORTH OF MONUMENT

STAMPED LKBA2A

2007

TIES

- SET MONUMENT 7.2' SOUTH OF 1' DIA. ~~GREY~~ WHITE PVC PIPE FOR MONITORING WELL.
- SET MONUMENT 5.2' SE OF SW BOLLARD POST
- " " 5.2' SW OF SE " "

COORDINATES

MONITORING WELL

N 27° 44' 47" N. 1240549.747 ft
W 81° 11' 18" E 595251.648 ft

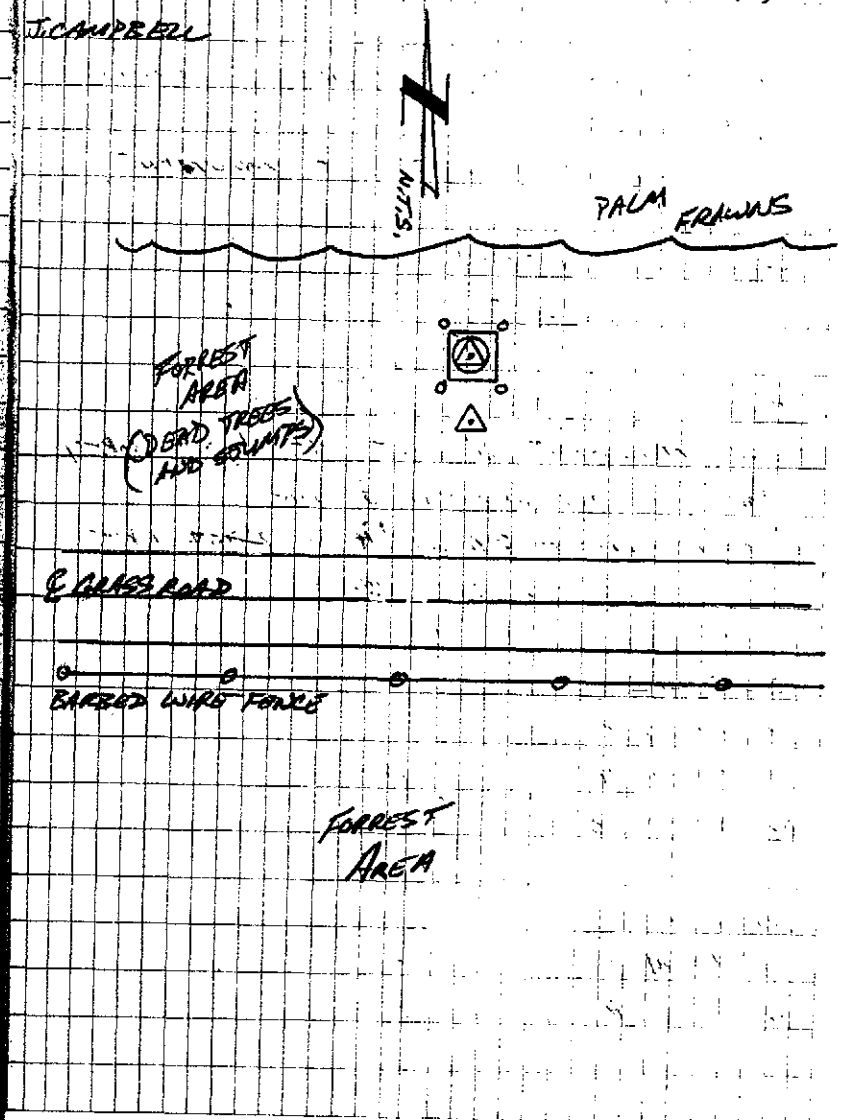
MONUMENT

N. 27° 44' 47" N. "
W. 81° 11' 18" E. "

THRU FEB. 15, 2007

SFWMD 19, 26

E. DETASSIS
J. CAMPBELL



1078

LEVEL RUN

SFWMD

A 461 → KR 1560

	+	H.I.	−	ELEV.	DESC.
				15.910M	A 461 BM
					60 D NAIL SET ON WEST SIDE OF KICCO RD.
1	1.5342 [67.7]				
			1.1720 [67.92]		
					" " "
2	1.8670 [69.15]				
			1.4504 [69.20]		
					" " "
3	1.3673 [69.71]				
			1.6113 [69.52]		
					" " "
4	1.6283 [56.83]				
			1.4823 [59.34]		KR 1560 BM
				16.5908M	

J. CAMPBELL TUE. MAR. 6, 2007

G. RAGER III SFWMD-19,52

N. KHAN

TOTAL DIST: 0.52937 KM

0.2MM ✓

1078.

LEVEL RUN

SFWMD

KR1560 → Z 460

	+	H.I.	−	ELEV.
				16.591M
1	1.6629 69.03		1.5044 68.83	
2	1.3848 69.84		1.4060 69.74	
3	1.4908 67.92		1.6081 68.32	
4	1.6104 23.66		1.7824 26.11	
				16.4391M

J. CAMPBELL TUE. MAR. 6, 2007

G. RAGER III SFWMD-19,53

N. KHAN

DISC

KR 1560 BM

60 D. NAIL SET ON WESTSIDE OF KICCO RD.

" " "

" " "

" " "

" " "

" "

Z 460 BM

TOTAL DIST: 0.46344 KM

1.1MM ✓

1078. LEVEL RUN — J. CAMPBELL TUE. MAR. 6, 2007

SFWMD — G. RAGER III — SFWMD-19,54

N. KHAN

MONITORING WELL LKBA2B

+	H.I.	−	ELEV.	DESC.
5.54'	105.54		100'	Z 460 BM
		5.12'	100.42'	GROUND
		4.77'	100.77'	CONC. PAD
		1.25'	104.29'	CONTRACTORS MARK LKBA2B
		5.13'	100.41'	GROUND
		4.53'	101.01'	CONC. PAD
		4.06'	101.48'	CONTRACTORS MARK LKBA2B (SOUTH)
		5.19'	100.35'	GROUND
		4.66'	100.88'	CONC. PAD
		2.60'	102.94'	CONTRACTORS MARK LKBA2B (WEST)
2.44'	105.38'		102.94'	CONTRACTORS MARK LKBA2B (WEST)
		3.90'	101.48'	CONTRACTORS MARK (SOUTH)
		1.09'	104.29'	CONTRACTORS MARK
		5.38'	100'	Z 460 BM
				0.00' ✓

1078. LEVEL RUN

KR1560 → LKBA2A

J. CAMPBELL TUE. MAR. 6, 2007

SFWMD G. RAGER III

N. KHAN

SFWMD-19,55

	+	H.I.	−	ELEV.	DESC.
					KR1560 BM
1	1.7063 [62.41]				I.R. SET IN WOODED AREA.
			1.4816 [62.72]		
2	1.5290 [61.72]				〃 〃
			1.4804 [60.66]		〃 〃
3	1.5804 [68.70]				〃 〃
			1.5752 [68.67]		〃 〃
4	1.7731 [50.27]				〃 〃
			1.5746 [47.52]		〃 〃
5	1.6816 [19.70]				〃 〃
			1.7320 [21.98]		〃 〃
6	1.6804 [9.79]				〃 〃
			1.6565 [8.07]	17.0415M	LKBA2A BM

TOTAL DIST: 0.54221 KM

1078. LEVEL RUN

SFWMD

J. CAMPBELL TUE. MAR. 6, 2007

G. RAGER III

N. KHAN

SFWMD-19,56

MONITORING WELL LKBA2A

+	H.I.	−	ELEV.	DESC.
5.100'	105.100'		100'	LKBA2A BM
		4.800'	100.300'	GROUND
		4.530'	100.570'	CONC. PAD
		1.655'	103.445'	CONTRACTORS MARK LKBA2A
1.270'	104.715'			CONTRACTORS MARK LKBA2A
		4.150'	100.565'	CONC. PAD.
		4.715'	100'	LKBA2A BM

0.00 ✓

1078. LEVEL RUN

J. CAMPBELL TUE. MAR. 6, 2007

SFWMD G. RAGER III

N. KHAN

SFWMD-19,57

LKBA2A → KR 1560

	+	H.I.	−	ELEV.	DESC.
	1.6147			17.0485M	LKBA2A BM
1	[47.54]		1.6739		I.R. SET IN WOODED AREA.
			[47.79]		
	1.5926				〃 〃
2	[67.30]		1.7636		〃 〃
			[67.68]		
	1.3272				〃 〃
3	[68.73]		1.2981		〃 〃
			[68.96]		
	1.5812				〃 〃
4	[65.29]		1.8304	16.5912	KR1560 BM
			[61.38]		
5	[ ]		[ ]		
6	[ ]		[ ]		

VOID

TOTAL DIST: 0.49467KM

0.2MM ✓

1078. LEVEL RUN

J. CAMPBELL TUE. MAR. 6, 2007

SFWMD G. RAGER III SFWMD-19,58

N. KHAN

MONITORING WELL LKB A3B

+	H.I.	−	ELEV.	DESC.
5.095'	105.095'		100'	LKB A3B BM
		4.805'	100.290'	GROUND
		4.510'	100.585'	CONC. PAD
		0.530'	104.565'	CONTRACTORS MARK LKB A3B
0.820'	105.385'			CONTRACTORS MARK LKB A3B
		4.800'	100.585'	CONC. PAD
		5.375'	100.01'	LKB A3B BM
				0.01' ✓

MONITORING WELL LKBA3A

4.225'	104.225'		100'	LKBA3A BM.
		3.940'	100.285'	GROUND
		3.765'	100.460'	CONC. PAD
		0.380'	103.845'	CONTRACTORS MARK LKBA3A
	VOID			
0.780'	104.625'			CONTRACTORS MARK LKBA3A
		4.185'	100.440'	CONC. PAD
		4.640'	99.985'	LKBA3A BM

1078. LEVEL RUN

J. CAMPBELL TUE. MAR. 6, 2007

SFWMD G. RAGER III SFWMD - 19,59

MONITORING WELL LKBA3A

N. KHAN

+	H.I.	−	ELEV.	DESC.
4.750'	104.750'		100'	LKBA3A BM
		4.450'	100.300'	GROUND
		4.300'	100.450'	CONC. PAD
		0.885'	103.865	CONTRACTORS MARK LKBA3A
0.760'	104.625'			CONTRACTORS MARK LKBA3A
		4.180'	100.445'	CONC. PAD
		4.630	99.995'	LKBA3A BM
				0.005' ✓

1078.

LEVEL RUN

X 460 → Y 460

	+	H.I.	−	ELEV.	DESC.
				16.907 m	X460 B.M.
					60D. NAIL SET ON EAST SIDE OF RIVER RANCH RD.
1	1.7030 [69.60]		1.3559 [69.43]		
2	1.4320 [69.48]		1.4648 [69.39]		
3	1.4826 [69.66]		1.4690 [69.51]		
4	1.5124 [68.51]		1.5537 [68.86]		
5	1.3927 [69.23]		1.4757 [69.05]		
6	1.5054 [68.50]		1.5995 [68.85]		
7	1.4543 [67.91]		1.5773 [67.96]		

J. CAMPBELL WED. MAR. 7, 2007

SFWMD G. RAGER III SFWMD-1960

N. KHAN

" " " "

" " " "

" " " "

" " " "

" " " "

" " " "

" " " "

" " " "

" " " "

" " " "

1078. LEVEL RUN

X 460 → Y460 (CONT'D)

J. CAMPBELL WED. MAR. 7, 2007

SFWMD G. RAGER III SFWMD-19,61

N. KHAN

	+	H.I.	−	ELEV.	DESC.
					60D NAIL SET ON EAST SIDE OF RIVER RANCH RD.
					〃 〃 〃 〃
					〃 〃
					〃 〃 〃
					〃 〃 〃 〃
8	1.4835 [69.61]		1.5379 [69.65]		
9	1.5351 [69.84]		1.7604 [69.63]		
10	1.4887 [59.68]		1.3326 [61.88]		
				16.7628	Y460 BM

TOTAL DIST: 1.36623 KM

1.2 MM ✓

1078. LEVEL RUN

J. CAMPBELL WED. MAR. 7, 2007

SFWMD G. RAGER III SFWMD-19,62

N. KHAN

Y460 → LKBA3B

	+	H.I.	−	ELEV.	DESC.
				16.764M	Y 460 BM
					60D. NAIL SET ON SOUTH SIDE OF RIVER RANCH RD.
1	1.7446 [43.88]		1.6292 [43.74]		
2	1.5297 [69.30]		1.5461 [69.37]		
3	1.3402 [69.61]		1.6815 [69.53]		
4	1.6664 [69.52]		1.5770 [69.37]		
5	1.5501 [69.59]		1.9478 [69.50]		
6	1.0310 [69.19]		2.4582 [69.19]		
7	1.2093 [69.68]		1.8991 [69.70]		

1078. LEVEL RUN

J. CAMPBELL WED. MAR. 7, 2007
G. RAGER
N. KHAN

SFWMD

SFWMD -19, 63

Y460 → LKBA3B (CONT'D)

	+	HI.	−	ELEV.	DESC.
					I.R. SET IN COW PASTURE
8	1.4291 6.25				
			1.4953 6.53	14.0301M	LKBA3B BM

TOTAL DIST: 0.93397 KM

LKBA3B → Y460

	+	HI.	−	ELEV.	DESC.
				14.0301M	LKBA3B BM.
1	1.9311 68.85				60D. NAIL SET ON NORTH SIDE OF RIVER RANCH RD.
			1.1466 69.46		〃 〃 〃
2	1.7648 68.71				〃 〃 〃
			1.4014 68.55		〃 〃 〃
3	1.7311 69.91				〃 〃 〃
			1.5304 69.40		〃 〃 〃
4	1.6391 69.26				〃 〃 〃
			1.4825 69.13		〃 〃 〃
5	1.5417 69.49				〃 〃 〃
			1.4259 69.19		

1078. LEVEL RUN

J. CAMPBELL WED. MAR. 7, 2007

SFWMD G. RAGER III SFWMD-19,64

N. KHAN

LKBA3B → Y460 (CONT'D)

+	H.I.	−	ELEV.	DESC.
	1.5961			60D NAIL SET ON SOUTH SIDE OF RIVER RANCH RD.
6	69.49	1.6556		〃 〃 〃
		69.75		
	1.9464			〃 〃 〃
7	52.47	1.6211		〃 〃 〃
		54.35		
	1.5206			〃 〃 〃
8	9.75	1.6735		Y 460 BM
		8.46	16.7639M	TOTAL DIST: 0.95622 KM
				0.1 MM ✓

U.S DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL GEODETIC SURVEY

Charles W. Challstrom
Director

PROJECT REPORT
Second Order Class II Leveling and Mark Setting

March 2007

Ronnie L. Taylor
National Geodetic Survey, NOAA
National Ocean Service Advisor, Florida

PROJECT TITLE

Polk County Monitoring Wells

LINE TITLE FOR **L10785**

ESTABLISH BENCH MARK NEAR MONITORING WELLS IN POLK COUNTY, FLORIDA

STARTING HEIGHT IS BASED ON NAVD 88 HEIGHTS.
NOTE: COLLIMATION STORED IN ELECTRONIC INSTRUMENT.
NOTE: LATITUDE AND LONGITUDE WAS OBTAINED FROM SUB-METER GPS OBSERVATIONS.

JOB CODE **AA**

2560 rca boulevard, suite 105 • palm beach gardens, florida 33410-3335 • ph: 561.627.5200 • fax: 561.627.0983
1933 commonwealth lane • tallahassee, florida 32303-3196 • ph: 850.222.0599 • fax: 850.222.4255
email: info@nickmillerinc.com • web: www.nickmillerinc.com

NICK MILLER, INC.

PROJECT REPORT

I. INTRODUCTION

A. Authority

Bench Mark Setting and Leveling along this level route was authorized by a contract between the South Florida Water Management District and Nick Miller Incorporated.

B. Purpose

The purpose of this leveling project was to establish precise NAVD 88 heights near an existing Ground Water Monitoring Well for use by the South Florida Water Management District and the citizens of the State of Florida.

II. PROJECT AREA

A. Locality

This project is located in Polk County, Florida.

B. Terrain

The terrain is flat to rolling.

C. Specifications

FGCS Specifications and Procedures to Incorporate Electronic Digital/Bar-Code Leveling Systems were followed.

D. Monumentation

Monuments are set in concrete with a South Florida Water Management survey disk. A Magnetic device was either placed in or near the monuments. Please see descriptions for magnetic placements.

E. Instrumentation

One LEICA DNA03 Electronic Digital Level Instrument was used along with one set of LEICA Digital/Bar-Code Leveling Rods.

III. COMMENTS

A. Reconnaissance

See the To-Reach Descriptions included, for a clear access to all L10785 Stations.

B. Specifications

There were no deviations from the FGCS Specifications and Procedures to Incorporate Electronic Digital/Bar-Code Leveling Systems.

C. Route

The leveling route varied for each leveling part.

STARTING ELEVATION BASED ON NAVD 88 HEIGHTS PUBLISHED FROM THE NGS DATABASE. NOTE: COLLIMATION STORED IN ELECTRONIC INSTRUMENT. NOTE: LATITUDE AND LONGITUDE WAS DERIVED FROM NGS DATA SHEETS AND GPS SUB-METER OBSERVATIONS

This is a new second order, class 2 level run by Nick Miller, Inc.

D. Problems

No problems occurred during this project.

IV. Closures

Loop closures were computed and are included in the package for L10785.

A. Status

All records will be kept at Nick Miller, Inc. For information on these records please contact Stephen M. Gordon at (561)627-5200.

For question concerning the collection or processing of this data please call Ronnie L. Taylor or Randy Wegner at (850)245-2606.

B. Attachments

The following are included in this package:

Hardcopy of the ABS & BOK files and Quad Maps

Disk containing the following data files is attached to the front of the folder containing the ABS and BOK Files:

- DSC
- BLU
- HGZ
- ABS
- BOK
- LST RAW
- BACKUP.GSI
- BACKUP.RAW (RAW DATA UNTOUCHED)
- PHOTO'S
- LST

Windows Abstra Version 2.3 -- Jan 1, 2004 Mon Apr 09 11:04:04 2007

-*- FIELD ABSTRACT -*-

070306-070306 HGZ L10785 8.0 MM ORDER 2 CLASS 2 PAGE 1

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
ESTABLISH BENCH MARK NEAR MONITORING WELL LKBA2A AND LKBA2B
LOCATED IN POLK COUNTY, FLORIDA

FROM / TO	START	F/B	DIST TOTAL (KM)	ELEV DIFF (MT)		-(F+B) TOTAL (MM)	MEAN DIFF FLD ELEV (MT)	I C
0149 KR 1560							16.59100	
0149 KR 1560	3061305	F	0.54	0.45052	*	-0.10	0.45047	1
0151 LKBA2A	3061430	B	0.50	-0.45042	*			1
	SL 1		0.50			-0.10	17.04147	
0149 KR 1560	3061020	B	0.53	0.68102	*	0.00	-0.68102	1
0148 A 461								
	SL 1		0.53			0.00	15.90998	
0149 KR 1560	3061120	F	0.46	-0.15198	*	0.00	-0.15198	1
0150 Z 460								
			0.46			0.00	16.43902♀	

ELEVATION REJECTION AND ERROR CODES

C - section elevation difference was rejected for cause
    ie. *43* record rejection code set to "F"
R - section elevation difference was rejected by Halperin rejection algorithm
@ - section elevation difference does not include refraction correction
* - section elevation difference does not include rod correction

♀

INSTRUMENT CODE	INSTRUMENT	RODS	
1	243 - 331132	396 - 555	396 - 666

♀

LEVEL LINE SECTION RUNNING TREE

0149 (0151
      0148)
0150♀

FROM	TO	N. LATITUDE	W. LONGITUDE	FIELD DISTANCE	VS. COMPUTED
	0149	274442	0811102	0.00	0.00
0149	0151	274447	0811118	0.50	0.46
0149	0148	274427	0811107	0.53	0.48
0149	0150	274456	0811101	0.46	0.43♀

Windows Abstra Version 2.3 -- Jan 1, 2004 -- Mon Apr 09 11:04:04 2007

SECTION
FROM TO E R R O R M E S S A G E S

Y 460

LKBA2A

KR 1560

A 461

Long

Hammock

SUMMIT

RIVER

POLK CO

OSCEOLA CO

Stough

BM 58

BM 56

BR59

BR60

23

24

25

26

35

36

1

2

Legend

- New Benchmark
- 1st Order Control
- 2nd Order Control

0 650 1,300 2,600 3,900 Feet

1 inch equals 1,320 feet

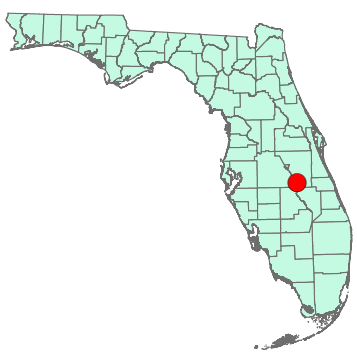
N

LKBA2A

South Florida Water Management District

NICK MILLER, INC.

Location Sketch



Windows Abstra Version 2.3 -- Jan 1, 2004 Mon Apr 09 11:04:51 2007

-*- FIELD ABSTRACT -*-

070307-070307 HGZ L10785 8.0 MM ORDER 2 CLASS 2 PAGE 1

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
ESTABLISH BENCH MARK NEAR MONITORING WELL LKBA3A AND LKBA3B
LOCATED IN POLK COUNTY, FLORIDA

FROM / TO		START	F/B	DIST TOTAL (KM)	ELEV DIFF (MT)		-(F+B) TOTAL (MM)	MEAN DIFF FLD ELEV (MT)	I C
0153	Y 460							16.76400	
0153	Y 460	3071120	F	0.93	-2.73446	*	-0.05	-2.73449	1
0154	LKBA3B	3071235	B	0.96	2.73451	*			1
		SL 1		0.93			-0.05	14.02951	
0153	Y 460	3071005	B	1.37	-0.14409	*	0.00	0.14409	1
0152	X 460								
				1.37			0.00	16.90809♀	

ELEVATION REJECTION AND ERROR CODES

C - section elevation difference was rejected for cause
ie. *43* record rejection code set to "F"
R - section elevation difference was rejected by Halperin rejection algorithm
@ - section elevation difference does not include refraction correction
* - section elevation difference does not include rod correction

♀

INSTRUMENT CODE	INSTRUMENT	RODS
1	243 - 331132	396 - 555 396 - 666

♀

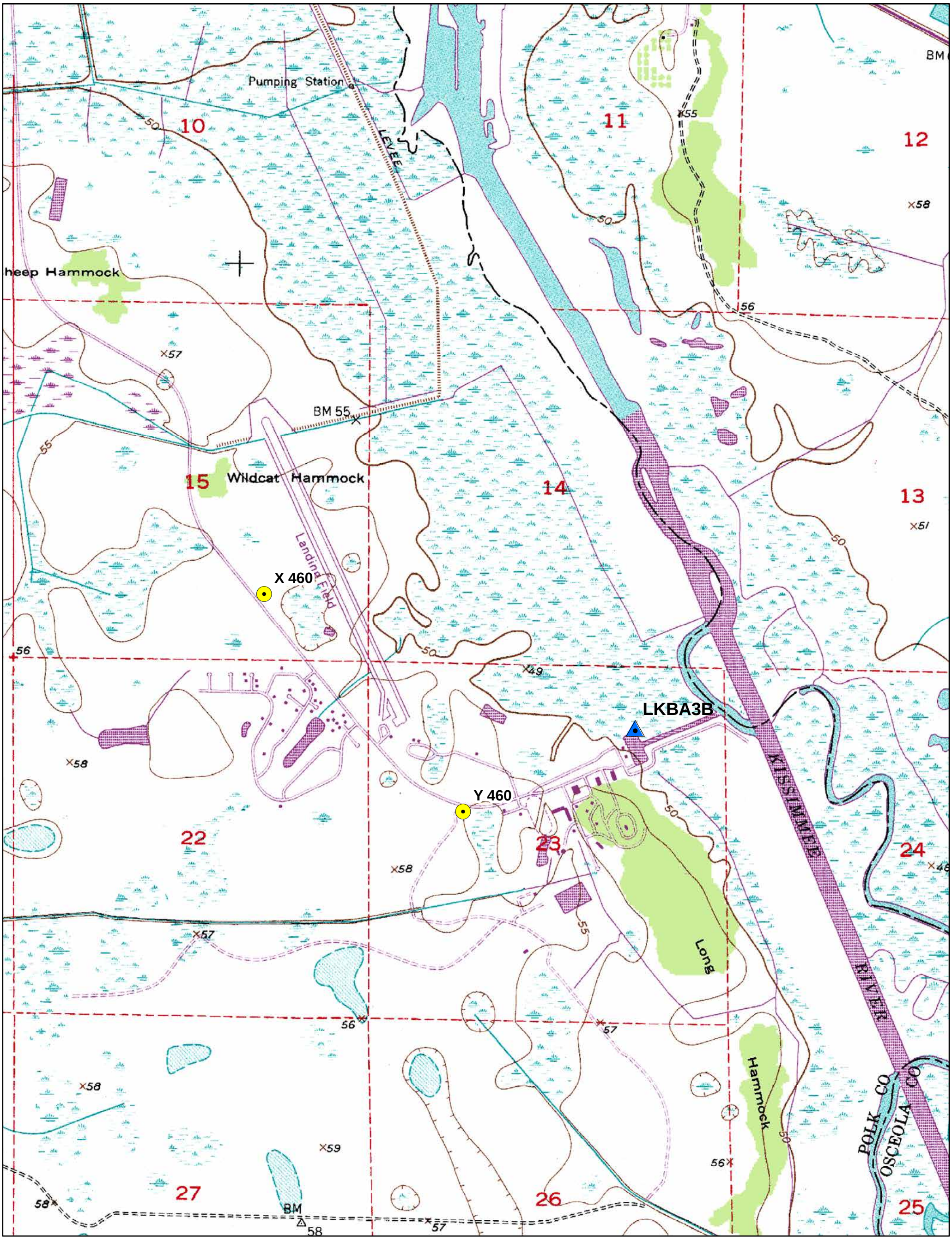
LEVEL LINE SECTION RUNNING TREE

0153 (0154)
0152♀

FROM	TO	N. LATITUDE	W. LONGITUDE	FIELD DISTANCE	VS. COMPUTED
	0153	274610	0811152	0.00	0.00
0153	0154	274624	0811123	0.93	0.90
0153	0152	274642	0811225	1.37	1.34♀

Windows Abstra Version 2.3 -- Jan 1, 2004 -- Mon Apr 09 11:04:51 2007

SECTION
FROM TO E R R O R M E S S A G E S



Legend

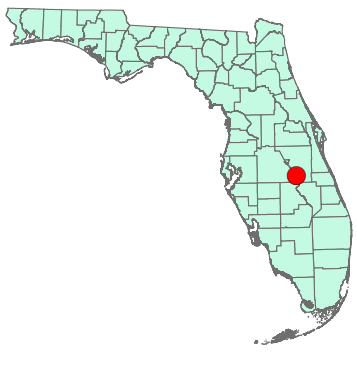
- New Benchmark
- 1st Order Control
- 2nd Order Control

0 650 1,300 2,600 3,900 Feet

1 inch equals 1,320 feet

N

Location Sketch



LKBA3B

South Florida Water Management District

NICK MILLER, INC.

LKBA2A

Nick Miller, Inc.
Date of Photo: February 15, 2007
View: Looking at the well facing east

LKBA2A

Nick Miller, Inc.
Date of Photo: February 15, 2007
View: Close-up of the showing the contractor's markings

LKBA2A

Nick Miller, Inc.
Date of Photo: February 15, 2007
View: Looking at the benchmark facing south

LKBA2A

Nick Miller, Inc.
Date of Photo: February 15, 2007
View: A top view of the benchmark

```
Identification_Information:
        Citation:
                Citation_Information:
                        Originator: Nick Miller, Inc.(comp.)
                        Originator: Stephen M. Gordon, PSM(ed.)
                        Publication_Date: 20070315
                        Publication_Time: Unknown
                        Title: S.F.W.M.D. Monitoring Well LKBA2A
                        Edition: 1
                        Series_Information:
                        Publication_Information:
                                Publication_Place: West Palm Beach, FL
                                Publisher: South Florida Water Management District
                        Larger_Work_Citation:
                                Citation_Information:
                                        Originator: Stephen M. Gordon, PSM
                                        Series_Information:
                                        Publication_Information:
        Description:
                Abstract:
                        South Florida Water Management District Monitoring Well
                        LKBA2A.
                Purpose:
                        To determine as built dimensions relative to NAVD 88 and
                        NGVD 29 vertical datum
        Time_Period_of_Content:
                Time_Period_Information:
                        Single_Date/Time:
                                Calendar_Date: 20070315
                        Range_of_Dates/Times:
                        Multiple_Dates/Times:
                Currentness_Reference: Publication Date
        Status:
                Progress: Complete
                Maintenance_and_Update_Frequency: Unknown
        Spatial_Domain:
                Bounding_Coordinates:
                        West_Bounding_Coordinate: -081D 11M 18.0S
                        East_Bounding_Coordinate: -081D 11M 01.0S
                        North_Bounding_Coordinate: +27D 44M 56.0S
                        South_Bounding_Coordinate: +27D 44M 27.0S
        Keywords:
                Theme:
                        Theme_Keyword_Thesaurus: Tri - Service Spatial Data Standard
                        Theme_Keyword: Improvement
                        Theme_Keyword: Geodedic/Cadastral
                Place:
                        Place_Keyword_Thesaurus: None
                        Place_Keyword: S.F.W.M.D. Monitoring Well LKBA2A
                        Place_Keyword: Sec. 35, Twp. 31 S., Rge. 31 E
                        Place_Keyword: Polk County, Florida
                        Place_Keyword_Thesaurus: Geographic Names Information System
                        Place_Keyword: Florida
                        Place_Keyword: Polk County
                        Place_Keyword: FORT KISSIMMEE NW
                Stratum:
                Temporal:
        Access_Constraints: None
        Use_Constraints: None
        Point_of_Contact:
                Contact_Information:
                        Contact_Person_Primary:
                                Contact_Person: Horward Ehmke
                                Contact_Organization: South Florida Water Management
District
                        Contact_Organization_Primary:
                        Contact_Position: Project Manager
                        Contact_Address:
                                Address_Type: mailing and physical address
                                Address: 3301 Gun Club Road
```

City: West Palm Beach
State_or_Province: Florida
Postal_Code: 33406
Country: USA
Contact_Voice_Telephone: 561-682-6672
Contact_Electronic_Mail_Address: hehmke@sfwmd.gov
Security_Information:
Cross_Reference:
Citation_Information:
Series_Information:
Publication_Information:
Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report: N/A
Logical_Consistency_Report:
Horizontal data was established using mapping grade GPS equipment. Vertical data was established using NGS control points A 461, KR 1560 & Z 460. Coordinates are in the Florida State Plane Coordinate System, East Zone, NAD 83/90. Elevations are in the NAVD 88 and the NGVD 29.
Completeness_Report:
Horizontal location taken at site benchmark
Lat. +27D 44M 47.0S
Long. -081D 11M 18.0S
N 1,240,549 ft
E 595,251 ft
Site Benchmark.
"LKBA2A" is a SFWMD brass disk set concrete at LKBA2A site.
TO REACH THE MARK FROM THE INTERSECTION OF STATE ROAD 27 UNDERPASS AND STATE ROAD 60 IN LAKE WALES, GO EAST-SOUTHEAST ON STATE ROAD 60 FOR 25.7 MILES TO THE JUNCTION OF RIVER RANCH BOULEVARD ON THE RIGHT, TURN RIGHT ON RIVER RANCH BOULEVARD AND GO SOUTHEAST FOR 2.55 MILES TO THE GUARD HOUSE AT THE ENTRANCE TO RIVER RANCH, CONTINUE SOUTH ON RIVER RANCH BOULEVARD FOR 0.3 MILE TO THE JUNCTION OF KICCO ROAD ON THE RIGHT, TURN RIGHT ON KICCO ROAD (NEED SFWMD L KEY) AND GO SOUTHEAST FOR 0.2 MILE TO FOUR SETS OF DOUBLE UNLOCKED GATES, CONTINUE SOUTH ON KICCO ROAD FOR 0.5 MILES TO ANOTHER UNLOCKED METAL GATE, CONTINUE SOUTHEAST ON KICCO ROAD FOR 0.2 MILE TO THE JUNCTION OF ROAD ON THE LEFT, CONTINUE SOUTH-SOUTHEAST ON KICCO ROAD FOR 1.4 MILES TO AN ENTRANCE OF A BRIDGE.
+/- 200 FEET BEFORE BRIDGE MAKE RIGHT AND HEAD WESTERLY THROUGH GRASSY AREA TO DIRT ROAD ON EAST SIDE OF BARBED WIRE FENCE. MAKE RIGHT AND HEAD NORTH ON DIRT ROAD FOR 0.3 MILE TO BEND. MAKE LEFT AND HEAD WEST ON DIRT ROAD FOR 0.1 MILE TO MARK ON RIGHT.
MONUMENT IS +/- 150 FEET NORTH OF DIRT ROAD ON SOUTH SIDE OF MONITORING WELL LKBA2A. SET IN THE TOP OF A ROUND CONCRETE MONUMENT FLUSH WITH THE GROUND.
LOCATED 7.2 FEET SOUTH OF CENTERLINE OF 1 FOOT DIAMETER WHITE PVC PIPE FOR MONITORING WELL, 5.2 FEET SOUTHEAST OF SOUTHWEST BALLARD POST, 5.2 FEET SOUTHWEST OF SOUTHEAST BALLARD POST.
MAGNET SET 1 FOOT NORTH OF MONUMENT.
Benchmark Elevation is 55.91 feet (NAVD 88).
Ground Elevation is 56.21 feet (NAVD 88).

```
                Concrete Pad Elevation is 56.48 feet (NAVD 88).
                Well Elevation for LKBA2A is 59.36 feet (NAVD 88)
                as observed at the existing reference mark for the well
                which is a red mark at the top of a PVC pipe at the
                center of the well.
                NGVD 29 minus NAVD 88 equals 1.181 feet.
                The NGVD 1929 value was taken from the NGS
                VERTCON conversion program.
                Vertical Control used A 461 El. 15.91 (m) (NAVD 88),
                KR 1560 El. 16.591 (m) (NAVD 88), Z 460 El. 16.438 (m)
                (NAVD 88).
        Positional_Accuracy:
                Horizontal_Positional_Accuracy:
                        Horizontal_Positional_Accuracy_Report:
                                The horizontal position of Site Benchmark "LKBA2A"
                                was established using a mapping grade GPS receiver
                                (Trimble Pro XR in accordance with the Florida Minimum
                                Technical Standards (Chapter 61G17-6, Florida
                                Administrative Code).
                        Quantitative_Horizontal_Positional_Accuracy_Assessment:
                                Horizontal_Positional_Accuracy_Value: 3 to 5 meters
                                Horizontal_Positional_Accuracy_Explanation: The intended
positional accuracy for this survey is 3 to 5 meters more or less.
                Vertical_Positional_Accuracy:
                        Vertical_Positional_Accuracy_Report:
                                A level line was run originating on benchmark A 461
                                and terminating at benchmark Z 460 with an allowable
                                error of 8mm times the square root of the distance
                                leveled (in kilometers).
                        Quantitative_Vertical_Positional_Accuracy_Assessment:
                                Vertical_Positional_Accuracy_Value: 0.001 m
                                Vertical_Positional_Accuracy_Explanation: NAVD 88 level
loop, 0.001 m closure in 0.615 km, max. allowed 0.006m.
        Lineage:
                Source_Information:
                        Source_Citation:
                                Citation_Information:
                                        Series_Information:
                                        Publication_Information:
                                        Larger_Work_Citation:
                                                Citation_Information:
                                                        Series_Information:
                                                        Publication_Information:
                        Source_Time_Period_of_Content:
                                Time_Period_Information:
                                        Single_Date/Time:
                                        Range_of_Dates/Times:
                                        Multiple_Dates/Times:
                Process_Step:
                        Process_Description:
                                The horizontal work was performed using a Trimble
                                Pro XR GPS receiver (mapping grade). The level
                                loop was run with a Leica DNA03 digital level.
                        Process_Date: 20070315
                        Process_Contact:
                                Contact_Information:
                                        Contact_Person_Primary:
                                        Contact_Organization_Primary:
                                        Contact_Address:
Spatial_Data_Organization_Information:
        Spatial_Reference_Information:
                Horizontal_Coordinate_System_Definition:
                        Geographic:
                        Planar:
                                Map_Projection:
                                        Albers_Conical_Equal_Area:
                                        Azimuthal_Equidistant:
                                        Equidistant_Conic:
                                        Equirectangular:
                                        General_Vertical_Near-sided_Perspective:
```

```
                                        LKBA2A.gen
                                        Gnomonic:
                                        Lambert_Azimuthal_Equal_Area:
                                        Lambert_Conformal_Conic:
                                        Mercator:
                                        Modified_Stereographic_for_Alaska:
                                        Miller_Cylindrical:
                                        Oblique_Mercator:
                                                Oblique_Line_Point:
                                        Orthographic:
                                        Polar_Stereographic:
                                        Polyconic:
                                        Robinson:
                                        Sinusoidal:
                                        van_der_Grinten:
                                        Space_Oblique_Mercator_(Landsat):
                                        Stereographic:
                                        Transverse_Mercator:
                                        van_der_Grinten:
                                Grid_Coordinate_System:
                                        Universal_Transverse_Mercator:
                                                Transverse_Mercator:
                                        Universal_Polar_Stereographic:
                                                Polar_Stereographic:
                                        State_Plane_Coordinate_System:
                                                Lambert_Conformal_Conic:
                                                Transverse_Mercator:
                                                Oblique_Mercator:
                                                        Oblique_Line_Point:
                                                Polyconic:
                                        ARC_Coordinate_System:
                                                Equirectangular:
                                                Azimuthal_Equidistant:
                                Local_Planar:
                                Planar_Coordinate_Information:
                                        Coordinate_Representation:
                                        Distance_and_Bearing_Representation:
                        Local:
                        Geodetic_Model:
                Vertical_Coordinate_System_Definition:
                        Altitude_System_Definition:
                        Depth_System_Definition:
Entity_and_Attribute_Information:
        Detailed_Description:
                Entity_Type:
                Attribute:
                        Attribute_Domain_Values:
                        Attribute_Value_Accuracy_Information:
        Overview_Description:
Distribution_Information:
        Distributor:
                Contact_Information:
                        Contact_Person_Primary:
                        Contact_Organization_Primary:
                        Contact_Address:
        Standard_Order_Process:
                Digital_Form:
                        Digital_Transfer_Information:
                        Digital_Transfer_Option:
                                Online_Option:
                                        Computer_Contact_Information:
                                                Network_Address:
                                                Dialup_Instructions:
                                OffLine_Option:
                                        Recording_Capacity:
        Available_Time_Period:
                Time_Period_Information:
                        Single_Date/Time:
                        Range_of_Dates/Times:
                        Multiple_Dates/Times:
Metadata_Reference_Information:
```

```
        Metadata_Date: 20070315
        Metadata_Contact:
                Contact_Information:
                        Contact_Person_Primary:
                                Contact_Person: Stephen M. Gordon
                                Contact_Organization: Nick Miller, Inc.
                        Contact_Organization_Primary:
                        Contact_Position: Project Surveyor
                        Contact_Address:
                                Address_Type: mailing and physical address
                                Address: 2560 RCA Blvd., Suite 105
                                City: Palm Beach Gardens
                                State_or_Province: Florida
                                Postal_Code: 33410
                                Country: USA
                        Contact_Voice_Telephone: 561-627-5200
                        Contact_Facsimile_Telephone: 561-627-0983
                        Contact_Electronic_Mail_Address: sgordon@nickmillerinc.com
        Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
        Metadata_Standard_Version: 2.0
        Metadata_Time_Convention: Local time
        Metadata_Access_Constraints: South Florida Water Management District controls
access.
        Metadata_Use_Constraints: Per South Florida Water Management District
        Metadata_Security_Information:
                Metadata_Security_Handling_Description: None
                Metadata_Security_Classification: Unclassified
                Metadata_Security_Classification_System: Structure
```

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/01

COUNTY POLK	**PROJECT Hydrology – Polk County Wells**	**DESIGNATION LKBA2A**
SECTION 35	**TOWNSHIP 31 SOUTH**	**RANGE 31 EAST**

GEOGRAPHIC INDEX OF QUAD

Established by Nick Miller Inc. **Recovered by**	**NAME OF QUADRANGLE** **FORT KISSIMMEE NW**
SURVEYOR Stephen M. Gordon **DATE** 3/07/2007	**FIELD BOOK** 19 **PAGE** 26

HORIZONTAL DATUM: **1927** (**1983**) **Other**_____ (circle one) ZONE (**E**) or **W**

STATE PLANE COORDINATES	**E 595,252 ft**	**N 1,240,550 ft**
LATITUDE: N 27.74639°	**LONGITUDE: W 81.18833°**	
VERTICAL DATUM: MSL **1929** (**1988**) **Other** _____ (circle one)		**EL. 55.91 ft**
VERTICAL DATUM: MSL (**1929**) **1988 Other** _____ (circle one)		**EL. 57.09 ft**

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

DESCRIPTION

To Reach:

TO REACH THE MARK FROM THE INTERSECTION OF STATE ROAD 27 UNDERPASS AND STATE ROAD 60 IN LAKE WALES, GO EAST-SOUTHEAST ON STATE ROAD 60 FOR 25.7 MILES TO THE JUNCTION OF RIVER RANCH BOULEVARD ON THE RIGHT, TURN RIGHT ON RIVER RANCH BOULEVARD AND GO SOUTHEAST FOR 2.55 MILES TO THE GUARD HOUSE AT THE ENTRANCE TO RIVER RANCH, CONTINUE SOUTH ON RIVER RANCH BOULEVARD FOR 0.3 MILE TO THE JUNCTION OF KICCO ROAD ON THE RIGHT, TURN RIGHT ON KICCO ROAD (NEED SFWMD L KEY) AND GO SOUTHEAST FOR 0.2 MILE TO FOUR SETS OF DOUBLE UNLOCKED GATES, CONTINUE SOUTH ON KICCO ROAD FOR 0.5 MILES TO ANOTHER UNLOCKED METAL GATE, CONTINUE SOUTHEAST ON KICCO ROAD FOR 0.2 MILE TO THE JUNCTION OF ROAD ON THE LEFT, CONTINUE SOUTH-SOUTHEAST ON KICCO ROAD FOR 1.4 MILES TO AN ENTRANCE OF A BRIDGE. +/- 200 FEET BEFORE BRIDGE MAKE RIGHT AND HEAD WESTERLY THROUGH GRASSY AREA TO DIRT ROAD ON EAST SIDE OF BARBED WIRE FENCE. MAKE RIGHT AND HEAD NORTH ON DIRT ROAD FOR 0.3 MILE TO BEND. MAKE LEFT AND HEAD WEST ON DIRT ROAD FOR 0.1 MILE TO MARK ON RIGHT. MONUMENT IS +/- 150 FEET NORTH OF DIRT ROAD ON SOUTH SIDE OF MONITORING WELL LKBA2A. SET IN THE TOP OF A ROUND CONCRETE MONUMENT FLUSH WITH THE GROUND. LOCATED 7.2 FEET SOUTH OF CENTERLINE OF 1 FOOT DIAMETER WHITE PVC PIPE FOR MONITORING WELL, 5.2 FEET SOUTHEAST OF SOUTHWEST BALLARD POST, 5.2 FEET SOUTHWEST OF SOUTHEAST BALLARD POST. MAGNET SET 1 FOOT NORTH OF MONUMENT.

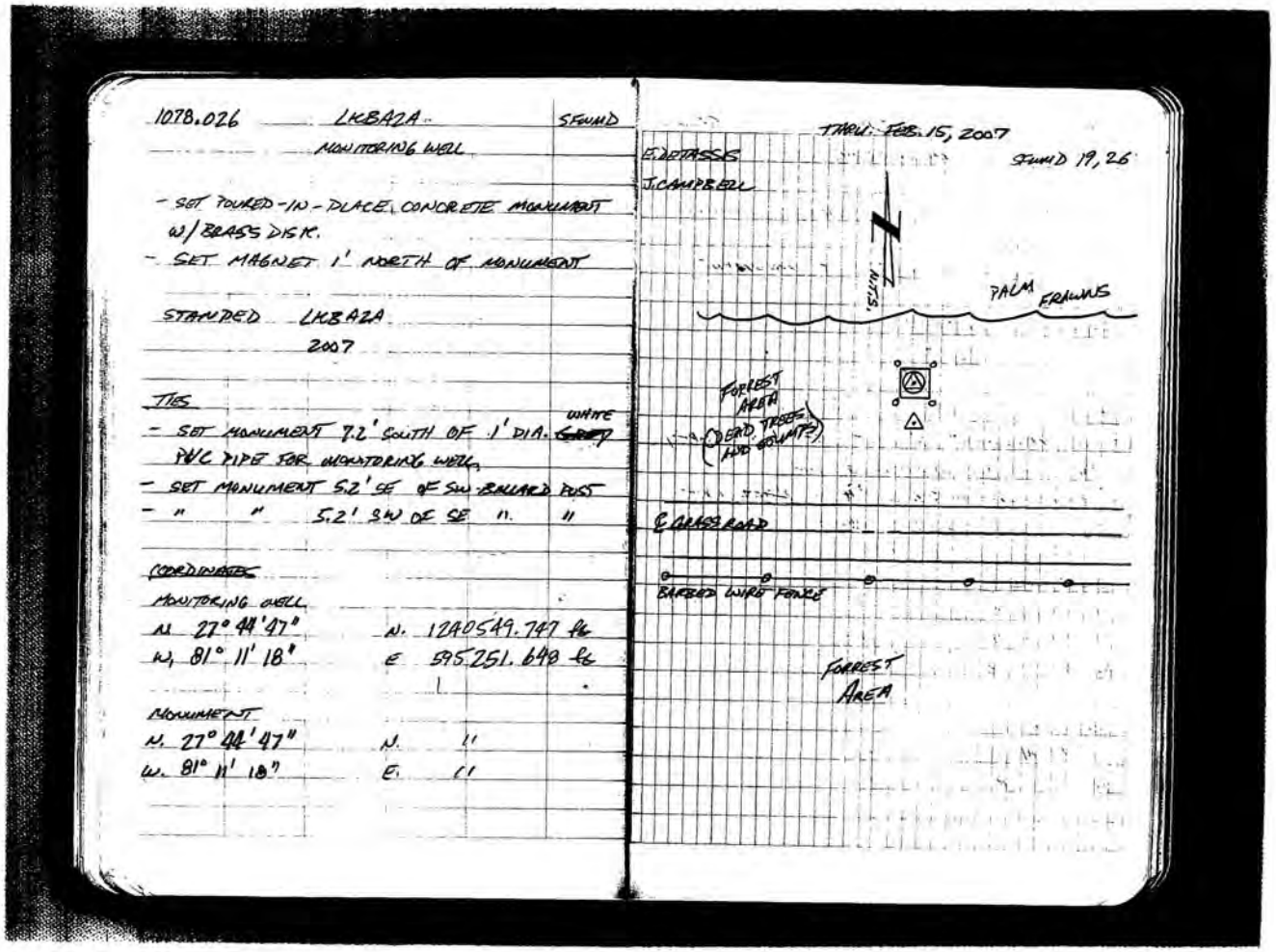
Benchmarks Used: A 461, KR 1560, Z 460

Notable Land marks:

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/01

SKETCH



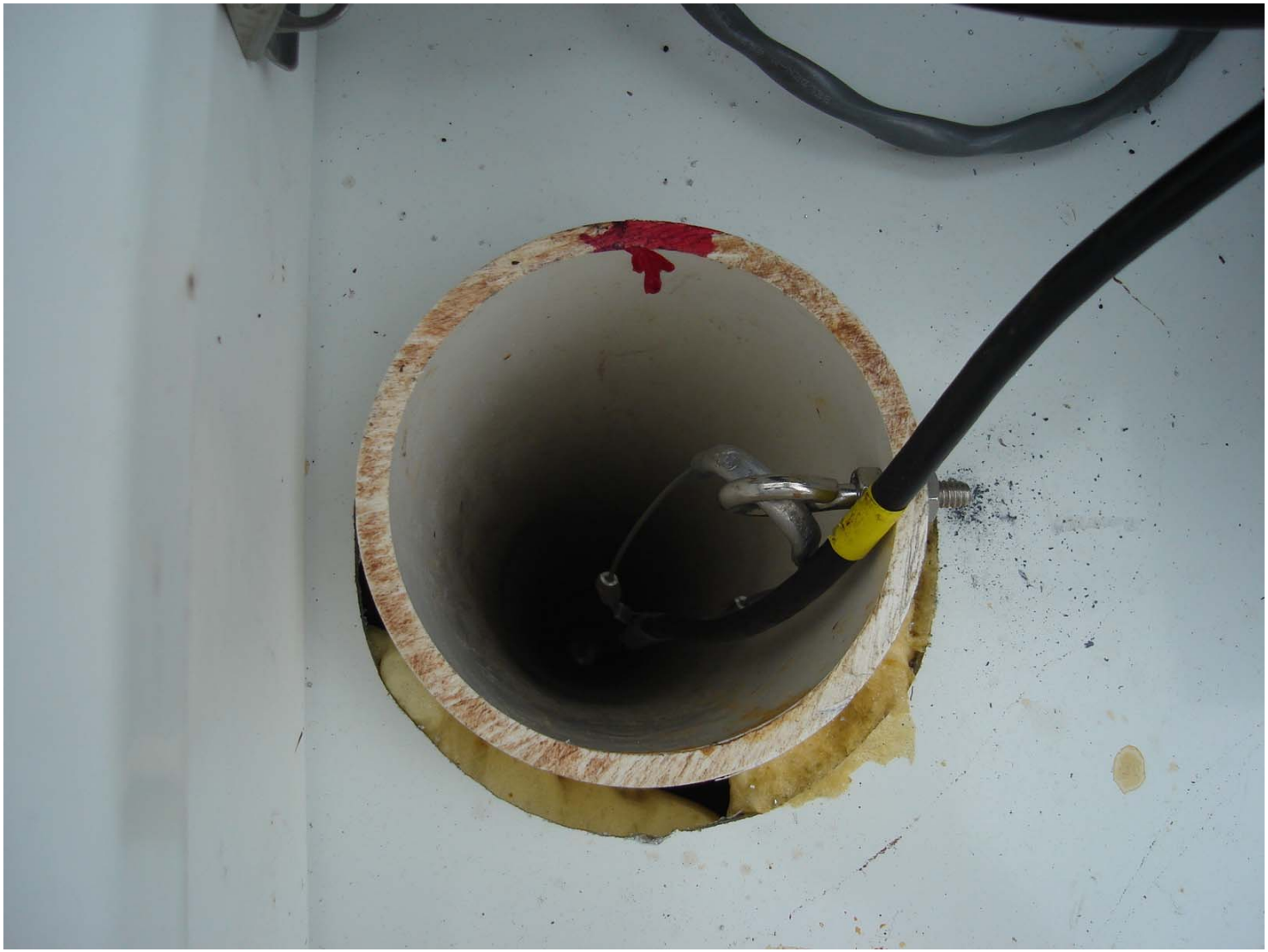
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/01

LKBA2B

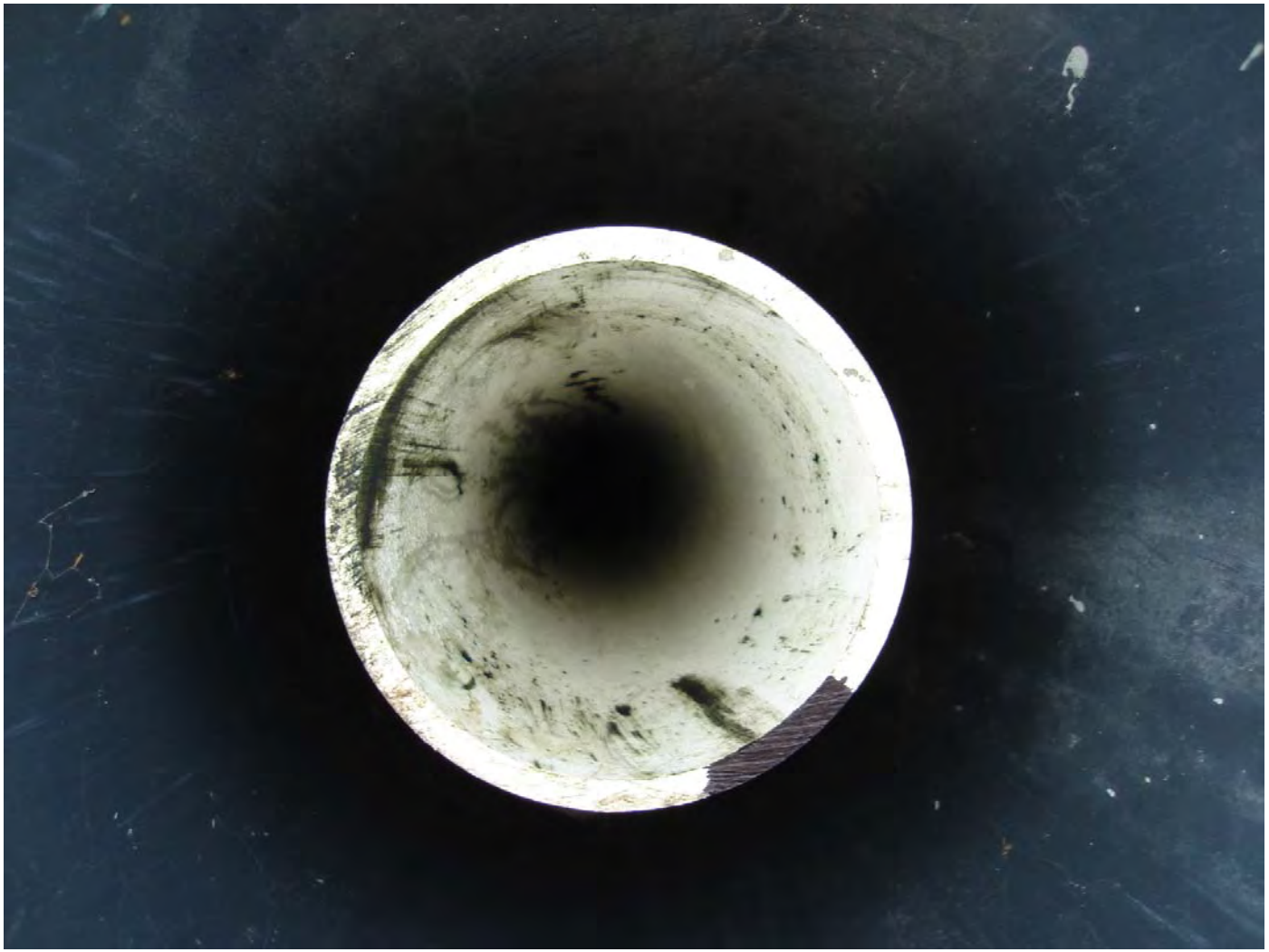
Nick Miller, Inc.
Date of Photo: February 15, 2007
View: Looking at the wells facing north

LKBA2B



Nick Miller, Inc.
Date of Photo: February 15, 2007
View: Close-up of the showing the contractor's markings on well LKBA2B

LKBA2B



Nick Miller, Inc.
Date of Photo: February 15, 2007
View: Close-up of the showing the contractor's markings on well west of well LKBA2B

LKBA2B

Nick Miller, Inc.
Date of Photo: February 15, 2007
View: Close-up of the showing the contractor's markings on well south of well LKBA2B

LKBA2B

Nick Miller, Inc.
Date of Photo: February 15, 2007
View: Looking at the NGS benchmark Z 460 facing west

LKBA2B

Nick Miller, Inc.
Date of Photo: February 15, 2007
View: A top view of the NGS benchmark Z 460

```
Identification_Information:
        Citation:
                Citation_Information:
                        Originator: Nick Miller, Inc.(comp.)
                        Originator: Stephen M. Gordon, PSM(ed.)
                        Publication_Date: 20070315
                        Publication_Time: Unknown
                        Title: S.F.W.M.D. Monitoring Well LKBA2B
                        Edition: 1
                        Series_Information:
                        Publication_Information:
                                Publication_Place: West Palm Beach, FL
                                Publisher: South Florida Water Management District
                        Larger_Work_Citation:
                                Citation_Information:
                                        Originator: Stephen M. Gordon, PSM
                                        Series_Information:
                                        Publication_Information:
        Description:
                Abstract:
                        South Florida Water Management District Monitoring Well
                        LKBA2B.
                Purpose:
                        To determine as built dimensions relative to NAVD 88 and
                        NGVD 29 vertical datum
        Time_Period_of_Content:
                Time_Period_Information:
                        Single_Date/Time:
                                Calendar_Date: 20070315
                        Range_of_Dates/Times:
                        Multiple_Dates/Times:
                Currentness_Reference: Publication Date
        Status:
                Progress: Complete
                Maintenance_and_Update_Frequency: Unknown
        Spatial_Domain:
                Bounding_Coordinates:
                        West_Bounding_Coordinate: -081D 11M 07.0S
                        East_Bounding_Coordinate: -081D 11M 01.0S
                        North_Bounding_Coordinate: +27D 44M 56.0S
                        South_Bounding_Coordinate: +27D 44M 27.0S
        Keywords:
                Theme:
                        Theme_Keyword_Thesaurus: Tri - Service Spatial Data Standard
                        Theme_Keyword: Improvement
                        Theme_Keyword: Geodedic/Cadastral
                Place:
                        Place_Keyword_Thesaurus: None
                        Place_Keyword: S.F.W.M.D. Monitoring Well LKBA2B
                        Place_Keyword: Sec. 25, Twp. 31 S., Rge. 31 E
                        Place_Keyword: Polk County, Florida
                        Place_Keyword_Thesaurus: Geographic Names Information System
                        Place_Keyword: Florida
                        Place_Keyword: Polk County
                        Place_Keyword: FORT KISSIMMEE NW
                Stratum:
                Temporal:
        Access_Constraints: None
        Use_Constraints: None
        Point_of_Contact:
                Contact_Information:
                        Contact_Person_Primary:
                                Contact_Person: Horward Ehmke
                                Contact_Organization: South Florida Water Management
District
                        Contact_Organization_Primary:
                        Contact_Position: Project Manager
                        Contact_Address:
                                Address_Type: mailing and physical address
                                Address: 3301 Gun Club Road
```

City: West Palm Beach
State_or_Province: Florida
Postal_Code: 33406
Country: USA
Contact_Voice_Telephone: 561-682-6672
Contact_Electronic_Mail_Address: hehmke@sfwmd.gov
Security_Information:
Cross_Reference:
Citation_Information:
Series_Information:
Publication_Information:
Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report: N/A
Logical_Consistency_Report:
Horizontal data was established using mapping grade GPS equipment. Vertical data was established using NGS control points A 461, KR 1560 & Z 460. Coordinates are in the Florida State Plane Coordinate System, East Zone, NAD 83/90. Elevations are in the NAVD 88 and the NGVD 29.
Completeness_Report:
Horizontal location taken at site benchmark
Lat. +27D 44M 56.0S
Long. -081D 11M 01.0S
N 1,241,456 ft
E 596,780 ft
Site Benchmark.
"Z 460" is a NGS flange-encased stainless steel rod at LKBA2B site.
DESCRIBED BY FL DEPT OF ENV PRO 1997 (JLM)
THE MARK IS ABOUT 30.0 MI (48.3 KM) SOUTHEAST OF LAKE WALES, 0.6 MI
(1.0 KM) WEST OF THE KISSIMMEE RIVER ON KICCO ROAD IN SECTION 25,
TOWNSHIP 31 SOUTH, RANGE 31 EAST. TO REACH THE MARK FROM THE
INTERSECTION OF STATE ROAD 27 UNDERPASS AND STATE ROAD 60 IN LAKE
WALES, GO EAST-SOUTHEAST ON STATE ROAD 60 FOR 25.7 MI (41.4 KM) TO THE
JUNCTION OF RIVER RANCH BOULEVARD ON THE RIGHT, TURN RIGHT ON RIVER
RANCH BOULEVARD AND GO SOUTHEAST FOR 2.55 MI (4.10 KM) TO THE GUARD
HOUSE AT THE ENTRANCE TO RIVER RANCH, CONTINUE SOUTH ON RIVER RANCH
BOULEVARD FOR 0.3 MI (0.5 KM) TO THE JUNCTION OF KICCO ROAD ON THE
RIGHT, TURN RIGHT ON KICCO ROAD AND GO SOUTHEAST FOR 0.2 MI (0.3 KM)
TO FOUR SETS OF DOUBLE UNLOCKED GATES, CONTINUE SOUTH ON KICCO ROAD
FOR 0.5 MI (0.8 KM) TO ANOTHER UNLOCKED METAL GATE, CONTINUE SOUTHEAST
ON KICCO ROAD FOR 0.2 MI (0.3 KM) TO THE JUNCTION OF ROAD ON THE LEFT,
CONTINUE SOUTH-SOUTHEAST ON KICCO ROAD FOR 0.8 MI (1.3 KM) TO THE MARK
ON THE RIGHT, A STAINLESS STEEL ROD DRIVEN TO REFUSAL AT A DEPTH OF
40.3 FT (12.3 M) WITH A LOGO CAP FLUSH WITH THE GROUND AND LEVEL WITH
KICCO ROAD, THE DATUM POINT IS RECESSED 0.4 FT (12.2 CM) BELOW THE
LEVEL OF THE LOGO CAP. LOCATED 37.5 FT (11.4 M) SOUTHWEST OF THE
APPROXIMATE CENTERLINE OF KICCO ROAD AND 1.0 FT (0.3 M) NORTHWEST OF A
CARSONITE WITNESS POST. NOTE ACCESS TO DATUM POINT IS HAD THROUGH A

5-INCH LOGO CAP. FOR KEY CONTACT SOUTH
FLORIDA WATER MANAGEMENT
DISTRICT AT 561-686-8800.
Benchmark Elevation is 53.93 feet (NAVD 88).
Ground Elevation is 54.35 feet (NAVD 88).
Concrete Pad Elevation is 54.70 feet (NAVD 88).
Well Elevation for LKBA2B is 58.22 feet (NAVD 88)
as observed at the existing reference mark for the well
which is a red mark at the top of a PVC pipe at the
center of the well.
Ground Elevation is 54.28 feet (NAVD 88).
Concrete Pad Elevation is 54.81 feet (NAVD 88).
Well Elevation for well west of well LKBA2B is 56.87 feet
(NAVD 88)
as observed at the existing reference mark for the well
which is a black mark at the top of a PVC pipe at the
center of the well.
Ground Elevation is 54.34 feet (NAVD 88).
Concrete Pad Elevation is 54.94 feet (NAVD 88).
Well Elevation for well south of well LKBA2B is 55.41 feet
(NAVD 88)
as observed a newly established reference mark for the
well
which is a white mark at the top of a metal pipe at the
center of the well.
NGVD 29 minus NAVD 88 equals 1.184 feet.
The NGVD 1929 value was taken from the NGS
VERTCON conversion program.
Vertical Control used A 461 El. 15.91 (m) (NAVD 88),
KR 1560 El. 16.591 (m) (NAVD 88), Z 460 El. 16.438 (m)
(NAVD 88).

Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:
The horizontal position of Site Benchmark "LKBA2B"
was established using a mapping grade GPS receiver
(Trimble Pro XR in accordance with the Florida Minimum
Technical Standards (Chapter 61G17-6, Florida
Administrative Code).
Quantitative_Horizontal_Positional_Accuracy_Assessment:
Horizontal_Positional_Accuracy_Value: 3 to 5 meters
Horizontal_Positional_Accuracy_Explanation: The intended
positional accuracy for this survey is 3 to 5 meters more or less.
Vertical_Positional_Accuracy:
Vertical_Positional_Accuracy_Report:
A level line was run originating on benchmark A 461
and terminating at benchmark Z 460 with an allowable
error of 8mm times the square root of the distance
leveled (in kilometers).
Quantitative_Vertical_Positional_Accuracy_Assessment:
Vertical_Positional_Accuracy_Value: 0.001 m
Vertical_Positional_Accuracy_Explanation: NAVD 88 level
loop, 0.001 m closure in 0.99 km, max. allowed 0.008m.

Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Series_Information:
Publication_Information:
Larger_Work_Citation:
Citation_Information:
Series_Information:
Publication_Information:
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Range_of_Dates/Times:
Multiple_Dates/Times:
Process_Step:
Process_Description:

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                                        LKBA2B.gen
                                The horizontal work was performed using a Trimble
                                Pro XR GPS receiver (mapping grade). The level
                                loop was run with a Leica DNA03 digital level.
                        Process_Date: 20070315
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                                        Equirectangular:
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                                        Gnomonic:
                                        Lambert_Azimuthal_Equal_Area:
                                        Lambert_Conformal_Conic:
                                        Mercator:
                                        Modified_Stereographic_for_Alaska:
                                        Miller_Cylindrical:
                                        Oblique_Mercator:
                                                Oblique_Line_Point:
                                        Orthographic:
                                        Polar_Stereographic:
                                        Polyconic:
                                        Robinson:
                                        Sinusoidal:
                                        van_der_Grinten:
                                        Space_Oblique_Mercator_(Landsat):
                                        Stereographic:
                                        Transverse_Mercator:
                                        van_der_Grinten:
                                Grid_Coordinate_System:
                                        Universal_Transverse_Mercator:
                                                Transverse_Mercator:
                                        Universal_Polar_Stereographic:
                                                Polar_Stereographic:
                                        State_Plane_Coordinate_System:
                                                Lambert_Conformal_Conic:
                                                Transverse_Mercator:
                                                Oblique_Mercator:
                                                        Oblique_Line_Point:
                                                Polyconic:
                                        ARC_Coordinate_System:
                                                Equirectangular:
                                                Azimuthal_Equidistant:
                                Local_Planar:
                                Planar_Coordinate_Information:
                                        Coordinate_Representation:
                                        Distance_and_Bearing_Representation:
                        Local:
                        Geodetic_Model:
                Vertical_Coordinate_System_Definition:
                        Altitude_System_Definition:
                        Depth_System_Definition:
Entity_and_Attribute_Information:
        Detailed_Description:
                Entity_Type:
                Attribute:
                        Attribute_Domain_Values:
                        Attribute_Value_Accuracy_Information:
        Overview_Description:
Distribution_Information:
        Distributor:
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                Contact_Information:
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                        Contact_Organization_Primary:
                        Contact_Address:
        Standard_Order_Process:
                Digital_Form:
                        Digital_Transfer_Information:
                        Digital_Transfer_Option:
                                Online_Option:
                                        Computer_Contact_Information:
                                                Network_Address:
                                                Dialup_Instructions:
                                OffLine_Option:
                                        Recording_Capacity:
        Available_Time_Period:
                Time_Period_Information:
                        Single_Date/Time:
                        Range_of_Dates/Times:
                        Multiple_Dates/Times:
Metadata_Reference_Information:
        Metadata_Date: 20070315
        Metadata_Contact:
                Contact_Information:
                        Contact_Person_Primary:
                                Contact_Person: Stephen M. Gordon
                                Contact_Organization: Nick Miller, Inc.
                        Contact_Organization_Primary:
                        Contact_Position: Project Surveyor
                        Contact_Address:
                                Address_Type: mailing and physical address
                                Address: 2560 RCA Blvd., Suite 105
                                City: Palm Beach Gardens
                                State_or_Province: Florida
                                Postal_Code: 33410
                                Country: USA
                        Contact_Voice_Telephone: 561-627-5200
                        Contact_Facsimile_Telephone: 561-627-0983
                        Contact_Electronic_Mail_Address: sgordon@nickmillerinc.com
        Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
        Metadata_Standard_Version: 2.0
        Metadata_Time_Convention: Local time
        Metadata_Access_Constraints: South Florida Water Management District controls
access.
        Metadata_Use_Constraints: Per South Florida Water Management District
        Metadata_Security_Information:
                Metadata_Security_Handling_Description: None
                Metadata_Security_Classification: Unclassified
                Metadata_Security_Classification_System: Structure
```

LKBA3A

Nick Miller, Inc.
Date of Photo: February 15, 2007
View: Looking at the well facing south

LKBA3A

Nick Miller, Inc.
Date of Photo: February 15, 2007
View: Close-up of the showing the contractor's markings

LKBA3A

Nick Miller, Inc.
Date of Photo: February 15, 2007
View: Looking at the NGS benchmark Y 460 facing east

LKBA3A

Nick Miller, Inc.
Date of Photo: February 15, 2007
View: A top view of the NGS benchmark Y 460

```
Identification_Information:
        Citation:
                Citation_Information:
                        Originator: Nick Miller, Inc.(comp.)
                        Originator: Stephen M. Gordon, PSM(ed.)
                        Publication_Date: 20070315
                        Publication_Time: Unknown
                        Title: S.F.W.M.D. Monitoring Well LKBA3A
                        Edition: 1
                        Series_Information:
                        Publication_Information:
                                Publication_Place: West Palm Beach, FL
                                Publisher: South Florida Water Management District
                        Larger_Work_Citation:
                                Citation_Information:
                                        Originator: Stephen M. Gordon, PSM
                                        Series_Information:
                                        Publication_Information:
        Description:
                Abstract:
                        South Florida Water Management District Monitoring Well
                        LKBA3A.
                Purpose:
                        To determine as built dimensions relative to NAVD 88 and
                        NGVD 29 vertical datum
        Time_Period_of_Content:
                Time_Period_Information:
                        Single_Date/Time:
                                Calendar_Date: 20070315
                        Range_of_Dates/Times:
                        Multiple_Dates/Times:
                Currentness_Reference: Publication Date
        Status:
                Progress: Complete
                Maintenance_and_Update_Frequency: Unknown
        Spatial_Domain:
                Bounding_Coordinates:
                        West_Bounding_Coordinate: -081D 12M 25.0S
                        East_Bounding_Coordinate: -081D 11M 52.0S
                        North_Bounding_Coordinate: +27D 46M 42.0S
                        South_Bounding_Coordinate: +27D 46M 10.0S
        Keywords:
                Theme:
                        Theme_Keyword_Thesaurus: Tri - Service Spatial Data Standard
                        Theme_Keyword: Improvement
                        Theme_Keyword: Geodedic/Cadastral
                Place:
                        Place_Keyword_Thesaurus: None
                        Place_Keyword: S.F.W.M.D. Monitoring Well LKBA3A
                        Place_Keyword: Sec. 23, Twp. 31 S., Rge. 31 E
                        Place_Keyword: Polk County, Florida
                        Place_Keyword_Thesaurus: Geographic Names Information System
                        Place_Keyword: Florida
                        Place_Keyword: Polk County
                        Place_Keyword: LAKE MARIAN SW
                Stratum:
                Temporal:
        Access_Constraints: None
        Use_Constraints: None
        Point_of_Contact:
                Contact_Information:
                        Contact_Person_Primary:
                                Contact_Person: Horward Ehmke
                                Contact_Organization: South Florida Water Management
District
                        Contact_Organization_Primary:
                        Contact_Position: Project Manager
                        Contact_Address:
                                Address_Type: mailing and physical address
                                Address: 3301 Gun Club Road
```

City: West Palm Beach
State_or_Province: Florida
Postal_Code: 33406
Country: USA
Contact_Voice_Telephone: 561-682-6672
Contact_Electronic_Mail_Address: hehmke@sfwmd.gov
Security_Information:
Cross_Reference:
Citation_Information:
Series_Information:
Publication_Information:
Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report: N/A
Logical_Consistency_Report:
Horizontal data was established using mapping grade GPS equipment. Vertical data was established using NGS control points X 460 & Y 460. Coordinates are in the Florida State Plane Coordinate System, East Zone, NAD 83/90. Elevations are in the NAVD 88 and the NGVD 29.
Completeness_Report:
Horizontal location taken at site benchmark
Lat. +27D 46M 10.0S
Long. -081D 11M 52.0S
N 1,248,936 ft
E 592,210 ft
Site Benchmark.
"Y 460" is a NGS brass disk set in concrete at LKBA3A site.
DESCRIBED BY FL DEPT OF ENV PRO 1997 (JLM)
THE MARK IS ABOUT 29.0 MI (46.7 KM) SOUTHEAST OF LAKE WALES, 1.0 MI
(1.6 KM) WEST OF THE KISSIMMEE RIVER ON RIVER RANCH BOULEVARD IN
SECTION 23, TOWNSHIP 31 SOUTH, RANGE 31 EAST.
TO REACH THE MARK FROM
THE INTERSECTION OF STATE ROAD 27 UNDERPASS AND STATE ROAD 60 IN LAKE
WALES, GO EAST-SOUTHEAST ON STATE ROAD 60 FOR 25.7 MI (41.4 KM) TO THE
JUNCTION OF RIVER RANCH BOULEVARD ON THE RIGHT, TURN RIGHT ON RIVER
RANCH BOULEVARD AND GO SOUTH FOR 2.55 MI
(4.10 KM) TO THE GUARD HOUSE
AT THE ENTRANCE TO RIVER RANCH, CONTINUE SOUTH ON RIVER RANCH
BOULEVARD FOR 0.3 MI (0.5 KM) TO THE JUNCTION OF KICCO ROAD (A DIRT
ROAD) LEADING SOUTHEAST ON THE RIGHT AND
THE MARK ON THE RIGHT, SET IN
THE TOP OF A ROUND CONCRETE MONUMENT
FLUSH WITH THE GROUND AND LEVEL
WITH RIVER RANCH BOULEVARD. LOCATED 85.4 FT
(26.0 M) EAST-SOUTHEAST OF
THE APPROXIMATE CENTERLINE OF TRACTOR TRAIL (A DIRT ROAD LEADING
SOUTH), 55.9 FT (17.0 M) SOUTH OF THE
APPROXIMATE CENTERLINE OF RIVER RANCH BOULEVARD, 50.8 FT (15.5 M)
WEST-SOUTHWEST OF POWER POLE NUMBER
3717-1, 20.1 FT (6.1 M) EAST OF KICCO ROAD (A DIRT ROAD LEADING
SOUTHEAST), 1.0 FT (0.3 M) WEST OF A BARBWIRE FENCE LINE AND 0.8 FT
(24.4 CM)WEST OF A CARSONITE WITNESS POST.
"Y 460" Benchmark Elevation is 55.00 feet (NAVD 88).
Ground Elevation is 55.30 feet (NAVD 88).
Concrete Pad Elevation is 55.45 feet (NAVD 88).
Well Elevation for LKBA3B is 58.86 feet (NAVD 88)
as observed at the existing reference mark for the well

Red

which is a ~~black~~ mark at the top of a PVC pipe at the
center of the well.
NGVD 29 minus NAVD 88 equals 1.204 feet.
The NGVD 1929 value was taken from the published NGS
superseded value for benchmark F 63.
Vertical Control used Y 460 El. 16.764 (m) (NAVD 88),
X 460 El. 16.907 (m) (NAVD 88)

Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:
The horizontal position of Site Benchmark "LKBA3A"
was established using a mapping grade GPS receiver
(Trimble Pro XR in accordance with the Florida Minimum
Technical Standards (Chapter 61G17-6, Florida
Administrative Code).
Quantitative_Horizontal_Positional_Accuracy_Assessment:
Horizontal_Positional_Accuracy_Value: 3 to 5 meters
Horizontal_Positional_Accuracy_Explanation: The intended
positional accuracy for this survey is 3 to 5 meters more or less.
Vertical_Positional_Accuracy:
Vertical_Positional_Accuracy_Report:
A level line was run originating on benchmark X 460
and terminating at benchmark Y 460 with an allowable
error of 8mm times the square root of the distance
leveled (in kilometers).
Quantitative_Vertical_Positional_Accuracy_Assessment:
Vertical_Positional_Accuracy_Value: 0.001 m
Vertical_Positional_Accuracy_Explanation: NAVD 88 level
loop, 0.001 m closure in 1.37 km, max. allowed 0.009m.

Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Series_Information:
Publication_Information:
Larger_Work_Citation:
Citation_Information:
Series_Information:
Publication_Information:
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Range_of_Dates/Times:
Multiple_Dates/Times:
Process_Step:
Process_Description:
The horizontal work was performed using a Trimble
Pro XR GPS receiver (mapping grade). The level
loop was run with a Leica DNA03 digital level.
Process_Date: 20070315
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Organization_Primary:
Contact_Address:
Spatial_Data_Organization_Information:

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Geographic:
Planar:
Map_Projection:
Albers_Conical_Equal_Area:
Azimuthal_Equidistant:
Equidistant_Conic:
Equirectangular:
General_Vertical_Near-sided_Perspective:
Gnomonic:
Lambert_Azimuthal_Equal_Area:
Lambert_Conformal_Conic:
Mercator:

```
                                        LKBA3A.gen
                                        Modified_Stereographic_for_Alaska:
                                        Miller_Cylindrical:
                                        Oblique_Mercator:
                                                Oblique_Line_Point:
                                        Orthographic:
                                        Polar_Stereographic:
                                        Polyconic:
                                        Robinson:
                                        Sinusoidal:
                                        van_der_Grinten:
                                        Space_Oblique_Mercator_(Landsat):
                                        Stereographic:
                                        Transverse_Mercator:
                                        van_der_Grinten:
                                Grid_Coordinate_System:
                                        Universal_Transverse_Mercator:
                                                Transverse_Mercator:
                                        Universal_Polar_Stereographic:
                                                Polar_Stereographic:
                                        State_Plane_Coordinate_System:
                                                Lambert_Conformal_Conic:
                                                Transverse_Mercator:
                                                Oblique_Mercator:
                                                        Oblique_Line_Point:
                                                Polyconic:
                                        ARC_Coordinate_System:
                                                Equirectangular:
                                                Azimuthal_Equidistant:
                                Local_Planar:
                                Planar_Coordinate_Information:
                                        Coordinate_Representation:
                                        Distance_and_Bearing_Representation:
                        Local:
                        Geodetic_Model:
                Vertical_Coordinate_System_Definition:
                        Altitude_System_Definition:
                        Depth_System_Definition:
Entity_and_Attribute_Information:
        Detailed_Description:
                Entity_Type:
                Attribute:
                        Attribute_Domain_Values:
                        Attribute_Value_Accuracy_Information:
        Overview_Description:
Distribution_Information:
        Distributor:
                Contact_Information:
                        Contact_Person_Primary:
                        Contact_Organization_Primary:
                        Contact_Address:
        Standard_Order_Process:
                Digital_Form:
                        Digital_Transfer_Information:
                        Digital_Transfer_Option:
                                Online_Option:
                                        Computer_Contact_Information:
                                                Network_Address:
                                                Dialup_Instructions:
                                OffLine_Option:
                                        Recording_Capacity:
        Available_Time_Period:
                Time_Period_Information:
                        Single_Date/Time:
                        Range_of_Dates/Times:
                        Multiple_Dates/Times:
Metadata_Reference_Information:
        Metadata_Date: 20070315
        Metadata_Contact:
                Contact_Information:
                        Contact_Person_Primary:
```

```
                Contact_Person: Stephen M. Gordon
                Contact_Organization: Nick Miller, Inc.
            Contact_Organization_Primary:
            Contact_Position: Project Surveyor
            Contact_Address:
                Address_Type: mailing and physical address
                Address: 2560 RCA Blvd., Suite 105
                City: Palm Beach Gardens
                State_or_Province: Florida
                Postal_Code: 33410
                Country: USA
            Contact_Voice_Telephone: 561-627-5200
            Contact_Facsimile_Telephone: 561-627-0983
            Contact_Electronic_Mail_Address: sgordon@nickmillerinc.com
    Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
    Metadata_Standard_Version: 2.0
    Metadata_Time_Convention: Local time
    Metadata_Access_Constraints: South Florida Water Management District controls
access.
    Metadata_Use_Constraints: Per South Florida Water Management District
    Metadata_Security_Information:
        Metadata_Security_Handling_Description: None
        Metadata_Security_Classification: Unclassified
        Metadata_Security_Classification_System: Structure
```

LKBA3B

Nick Miller, Inc.
Date of Photo: February 15, 2007
View: Looking at the well facing east

LKBA3B

Nick Miller, Inc.
Date of Photo: February 15, 2007
View: Close-up of the showing the contractor's markings

LKBA3B

Nick Miller, Inc.
Date of Photo: February 15, 2007
View: Looking at the benchmark facing south

LKBA3B

Nick Miller, Inc.
Date of Photo: February 15, 2007
View: A top view of the benchmark

```
Identification_Information:
        Citation:
                Citation_Information:
                        Originator: Nick Miller, Inc.(comp.)
                        Originator: Stephen M. Gordon, PSM(ed.)
                        Publication_Date: 20070315
                        Publication_Time: Unknown
                        Title: S.F.W.M.D. Monitoring Well LKBA3B
                        Edition: 1
                        Series_Information:
                        Publication_Information:
                                Publication_Place: West Palm Beach, FL
                                Publisher: South Florida Water Management District
                        Larger_Work_Citation:
                                Citation_Information:
                                        Originator: Stephen M. Gordon, PSM
                                        Series_Information:
                                        Publication_Information:
        Description:
                Abstract:
                        South Florida Water Management District Monitoring Well
                        LKBA3B.
                Purpose:
                        To determine as built dimensions relative to NAVD 88 and
                        NGVD 29 vertical datum
        Time_Period_of_Content:
                Time_Period_Information:
                        Single_Date/Time:
                                Calendar_Date: 20070315
                        Range_of_Dates/Times:
                        Multiple_Dates/Times:
                Currentness_Reference: Publication Date
        Status:
                Progress: Complete
                Maintenance_and_Update_Frequency: Unknown
        Spatial_Domain:
                Bounding_Coordinates:
                        West_Bounding_Coordinate: -081D 12M 25.0S
                        East_Bounding_Coordinate: -081D 11M 23.0S
                        North_Bounding_Coordinate: +27D 46M 42.0S
                        South_Bounding_Coordinate: +27D 46M 10.0S
        Keywords:
                Theme:
                        Theme_Keyword_Thesaurus: Tri - Service Spatial Data Standard
                        Theme_Keyword: Improvement
                        Theme_Keyword: Geodedic/Cadastral
                Place:
                        Place_Keyword_Thesaurus: None
                        Place_Keyword: S.F.W.M.D. Monitoring Well LKBA3B
                        Place_Keyword: Sec. 23, Twp. 31 S., Rge. 31 E
                        Place_Keyword: Polk County, Florida
                        Place_Keyword_Thesaurus: Geographic Names Information System
                        Place_Keyword: Florida
                        Place_Keyword: Polk County
                        Place_Keyword: LAKE MARIAN SW
                Stratum:
                Temporal:
        Access_Constraints: None
        Use_Constraints: None
        Point_of_Contact:
                Contact_Information:
                        Contact_Person_Primary:
                                Contact_Person: Horward Ehmke
                                Contact_Organization: South Florida Water Management
District
                        Contact_Organization_Primary:
                        Contact_Position: Project Manager
                        Contact_Address:
                                Address_Type: mailing and physical address
                                Address: 3301 Gun Club Road
```

City: West Palm Beach
State_or_Province: Florida
Postal_Code: 33406
Country: USA
Contact_Voice_Telephone: 561-682-6672
Contact_Electronic_Mail_Address: hehmke@sfwmd.gov
Security_Information:
Cross_Reference:
Citation_Information:
Series_Information:
Publication_Information:
Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report: N/A
Logical_Consistency_Report:
Horizontal data was established using mapping grade GPS equipment. Vertical data was established using NGS control points X 460 & Y 460. Coordinates are in the Florida State Plane Coordinate System, East Zone, NAD 83/90. Elevations are in the NAVD 88 and the NGVD 29.
Completeness_Report:
Horizontal location taken at site benchmark
Lat. +27D 46M 24.0S
Long. -081D 11M 23.0S
N 1,250,346 ft
E 594,818 ft
Site Benchmark.
"LKBA3B" is a South Florida Water Management District (SFWMD) brass disk set in concrete at LKBA3B site.
TO REACH THE MARK FROM THE INTERSECTION OF STATE ROAD
27 UNDERPASS AND STATE ROAD 60 IN LAKE WALES, GO EAST-SOUTHEAST
ON STATE ROAD 60 FOR 25.7 MILES TO THE JUNCTION OF RIVER RANCH
BOULEVARD ON THE RIGHT, TURN RIGHT ON RIVER RANCH BOULEVARD AND
GO SOUTH FOR 2.55 MI TO THE GUARD HOUSE AT THE ENTRANCE TO RIVER
RANCH, CONTINUE SOUTHERLY AND WESTERLY ON RIVER RANCH BOULEVARD
FOR 0.8 MI (0.5 KM) TO WHERE THE ROAD TEES (MARINA PARKING). MAKE
LEFT AND HEAD NORTH FOR +/- 200 FEET TO GATE. CONTINUE THROUGH GATE
AND HEAD NORTHEASTERLY FOR 0.15 MILE TO THE MARK ON NORTH SIDE OF
MONITORING WELL LKBA3B, SET IN THE TOP OF A ROUND CONCRETE MONUMENT
FLUSH WITH THE GROUND. LOCATED 12.0 FEET NORTH OF CENTERLINE OF 1 FOOT
DIAMETER GREY PVC PIPE FOR MONITORING WELL, 163.60 FEET NORTHEAST OF
PK NAIL AND DISK ON NORTH SIDE OF 1 FOOT DIAMETER PALM TREE, 9.7 FEET
NORTHEAST OF NORTHWEST YELLOW BALLARD POST. MAGNET SET 1 FOOT NORTH OF MONUMENT.
Benchmark Elevation is 46.03 feet (NAVD 88).
Ground Elevation is 46.32 feet (NAVD 88).
Concrete Pad Elevation is 46.61 feet (NAVD 88).
Well Elevation for LKBA3B is 50.59 feet (NAVD 88) as observed at the existing reference mark for the well which is a black mark at the top of a PVC pipe at the center of the well.
NGVD 29 minus NAVD 88 equals 1.204 feet.
The NGVD 1929 value was taken from the published NGS superseded value for benchmark F 63.
Vertical Control used Y 460 El. 16.764 (m) (NAVD 88), X 460 El. 16.907 (m) (NAVD 88)
Positional_Accuracy:

Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:
The horizontal position of Site Benchmark "LKBA3B" was established using a mapping grade GPS receiver (Trimble Pro XR in accordance with the Florida Minimum Technical Standards (Chapter 61G17-6, Florida Administrative Code).
Quantitative_Horizontal_Positional_Accuracy_Assessment:
Horizontal_Positional_Accuracy_Value: 3 to 5 meters
Horizontal_Positional_Accuracy_Explanation: The intended positional accuracy for this survey is 3 to 5 meters more or less.
Vertical_Positional_Accuracy:
Vertical_Positional_Accuracy_Report:
A level line was run originating on benchmark X 460 and terminating at benchmark Y 460 with an allowable error of 8mm times the square root of the distance leveled (in kilometers).
Quantitative_Vertical_Positional_Accuracy_Assessment:
Vertical_Positional_Accuracy_Value: 0.001 m
Vertical_Positional_Accuracy_Explanation: NAVD 88 level loop, 0.001 m closure in 1.37 km, max. allowed 0.009m.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Series_Information:
Publication_Information:
Larger_Work_Citation:
Citation_Information:
Series_Information:
Publication_Information:
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Range_of_Dates/Times:
Multiple_Dates/Times:
Process_Step:
Process_Description:
The horizontal work was performed using a Trimble Pro XR GPS receiver (mapping grade). The level loop was run with a Leica DNA03 digital level.
Process_Date: 20070315
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Organization_Primary:
Contact_Address:
Spatial_Data_Organization_Information:
Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Geographic:
Planar:
Map_Projection:
Albers_Conical_Equal_Area:
Azimuthal_Equidistant:
Equidistant_Conic:
Equirectangular:
General_Vertical_Near-sided_Perspective:
Gnomonic:
Lambert_Azimuthal_Equal_Area:
Lambert_Conformal_Conic:
Mercator:
Modified_Stereographic_for_Alaska:
Miller_Cylindrical:
Oblique_Mercator:
Oblique_Line_Point:
Orthographic:
Polar_Stereographic:
Polyconic:
Robinson:

```
                                        LKBA3B.gen
                                        Sinusoidal:
                                        van_der_Grinten:
                                        Space_Oblique_Mercator_(Landsat):
                                        Stereographic:
                                        Transverse_Mercator:
                                        van_der_Grinten:
                                Grid_Coordinate_System:
                                        Universal_Transverse_Mercator:
                                                Transverse_Mercator:
                                        Universal_Polar_Stereographic:
                                                Polar_Stereographic:
                                        State_Plane_Coordinate_System:
                                                Lambert_Conformal_Conic:
                                                Transverse_Mercator:
                                                Oblique_Mercator:
                                                        Oblique_Line_Point:
                                                Polyconic:
                                        ARC_Coordinate_System:
                                                Equirectangular:
                                                Azimuthal_Equidistant:
                                Local_Planar:
                                Planar_Coordinate_Information:
                                        Coordinate_Representation:
                                        Distance_and_Bearing_Representation:
                        Local:
                        Geodetic_Model:
                Vertical_Coordinate_System_Definition:
                        Altitude_System_Definition:
                        Depth_System_Definition:
Entity_and_Attribute_Information:
        Detailed_Description:
                Entity_Type:
                Attribute:
                        Attribute_Domain_Values:
                        Attribute_Value_Accuracy_Information:
        Overview_Description:
Distribution_Information:
        Distributor:
                Contact_Information:
                        Contact_Person_Primary:
                        Contact_Organization_Primary:
                        Contact_Address:
        Standard_Order_Process:
                Digital_Form:
                        Digital_Transfer_Information:
                        Digital_Transfer_Option:
                                Online_Option:
                                        Computer_Contact_Information:
                                                Network_Address:
                                                Dialup_Instructions:
                                OffLine_Option:
                                        Recording_Capacity:
        Available_Time_Period:
                Time_Period_Information:
                        Single_Date/Time:
                        Range_of_Dates/Times:
                        Multiple_Dates/Times:
Metadata_Reference_Information:
        Metadata_Date: 20070315
        Metadata_Contact:
                Contact_Information:
                        Contact_Person_Primary:
                                Contact_Person: Stephen M. Gordon
                                Contact_Organization: Nick Miller, Inc.
                        Contact_Organization_Primary:
                        Contact_Position: Project Surveyor
                        Contact_Address:
                                Address_Type: mailing and physical address
                                Address: 2560 RCA Blvd., Suite 105
                                City: Palm Beach Gardens
```

State_or_Province: Florida
Postal_Code: 33410
Country: USA
Contact_Voice_Telephone: 561-627-5200
Contact_Facsimile_Telephone: 561-627-0983
Contact_Electronic_Mail_Address: sgordon@nickmillerinc.com
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: 2.0
Metadata_Time_Convention: Local time
Metadata_Access_Constraints: South Florida Water Management District controls access.
Metadata_Use_Constraints: Per South Florida Water Management District
Metadata_Security_Information:
Metadata_Security_Handling_Description: None
Metadata_Security_Classification: Unclassified
Metadata_Security_Classification_System: Structure

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/01

COUNTY POLK	**PROJECT Hydrology – Polk County Wells**	**DESIGNATION LKBA3B**
SECTION 23	**TOWNSHIP 31 SOUTH**	**RANGE 31 EAST**

GEOGRAPHIC INDEX OF QUAD

Established by Nick Miller Inc. **Recovered by**	**NAME OF QUADRANGLE** **LAKE MARIAN SW**
SURVEYOR Stephen M. Gordon **DATE** 3/07/2007	**FIELD BOOK** 19 **PAGE** 23

HORIZONTAL DATUM: **1927** (**1983**) **Other**_____ (circle one) ZONE (**E**) or **W**

STATE PLANE COORDINATES	**E 594,818 ft**	**N 1,250,346 ft**
LATITUDE: N 27.77333°	**LONGITUDE: W 81.18972°**	
VERTICAL DATUM: MSL **1929** (**1988**) **Other** _____ (circle one)		**EL. 46.03 ft**
VERTICAL DATUM: MSL (**1929**) **1988 Other** _____ (circle one)		**EL. 47.23 ft**

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

DESCRIPTION

To Reach:

TO REACH THE MARK FROM THE INTERSECTION OF STATE ROAD 27 UNDERPASS AND STATE ROAD 60 IN LAKE WALES, GO EAST-SOUTHEAST ON STATE ROAD 60 FOR 25.7 MILES TO THE JUNCTION OF RIVER RANCH BOULEVARD ON THE RIGHT, TURN RIGHT ON RIVER RANCH BOULEVARD AND GO SOUTH FOR 2.55 MI TO THE GUARD HOUSE AT THE ENTRANCE TO RIVER RANCH, CONTINUE SOUTHERLY AND WESTERLY ON RIVER RANCH BOULEVARD FOR 0.8 MI (0.5 KM) TO WHERE THE ROAD TEES (MARINA PARKING). MAKE LEFT AND HEAD NORTH FOR +/- 200 FEET TO GATE. CONTINUE THROUGH GATE AND HEAD NORTHEASTERLY FOR 0.15 MILE TO THE MARK ON NORTH SIDE OF MONITORING WELL LKBA3B, SET IN THE TOP OF A ROUND CONCRETE MONUMENT FLUSH WITH THE GROUND. LOCATED 12.0 FEET NORTH OF CENTERLINE OF 1 FOOT DIAMETER GREY PVC PIPE FOR MONITORING WELL, 163.60 FEET NORTHEAST OF PK NAIL AND DISK ON NORTH SIDE OF 1 FOOT DIAMETER PALM TREE, 9.7 FEET NORTHEAST OF NORTHWEST YELLOW BALLARD POST. MAGNET SET 1 FOOT NORTH OF MONUMENT.

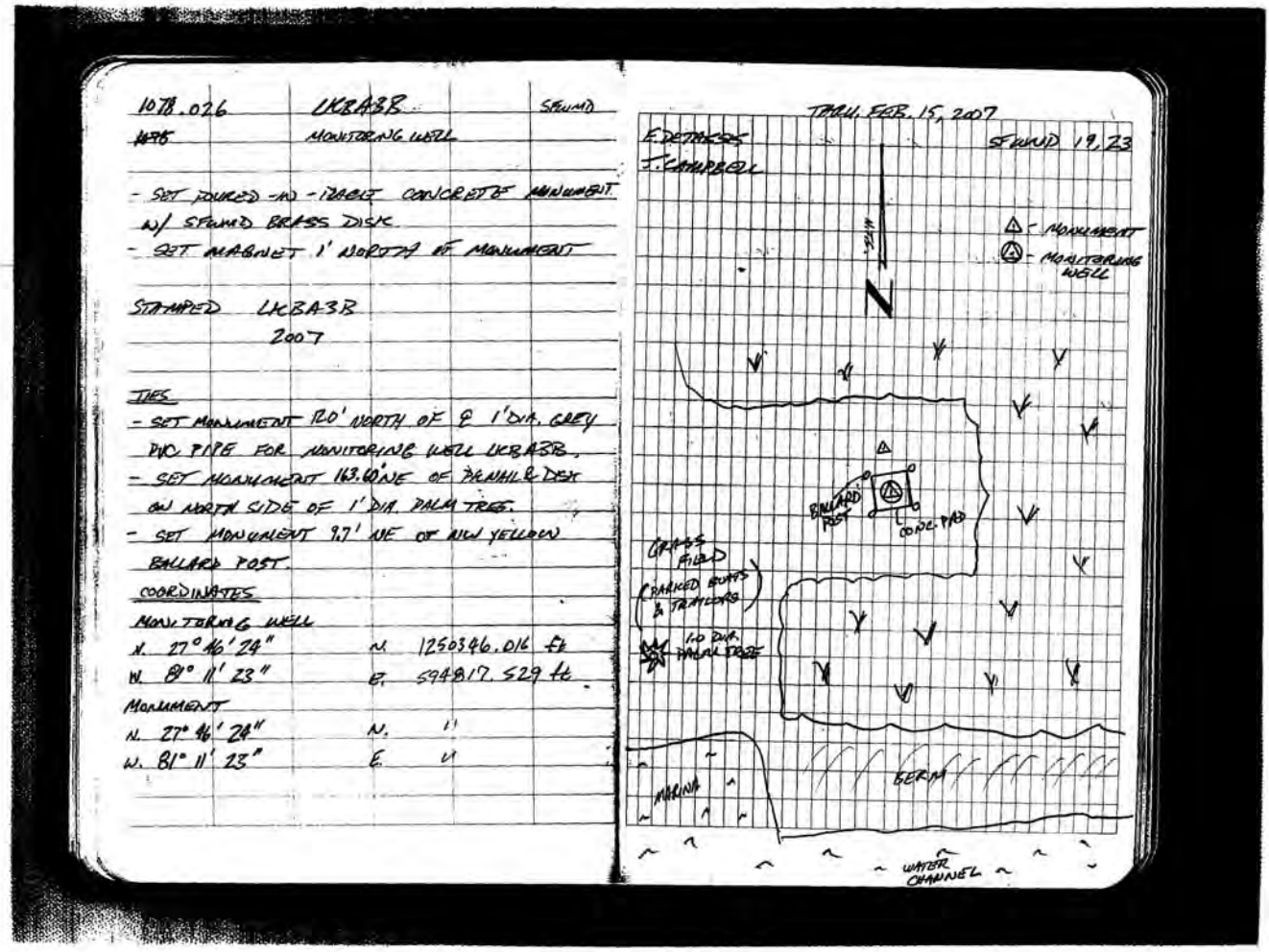
Benchmarks Used: X 460, Y 460

Notable Land marks:

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/01

SKETCH



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/01

Looking South

Looking East

The NGS Data Shee

See file dsdata.txt for more

```
DATABASE = Sybase ,PROGRAM
1        National Geodeti
 AH8768 ********************************************************
 AH8768  DESIGNATION -  Z 460
 AH8768  PID         -  AH8768
 AH8768  STATE/COUNTY-  FL/POLK
 AH8768  USGS QUAD   -  FORT KISSIMMEE NW (1972)
 AH8768
 AH8768                          *CURRENT SURVEY CONTROL
 AH8768
 AH8768* NAD 83(1986)-  27 44 56.      (N)    081 11 01.      (W)      SCALED
 AH8768* NAVD 88     -        16.438   (meters)      53.93    (feet)   ADJUSTED
 AH8768
 AH8768  GEOID HEIGHT-         -26.64  (meters)                         GEOID03
 AH8768  DYNAMIC HT  -          16.413 (meters)       53.85   (feet)   COMP
 AH8768  MODELED GRAV-     979,157.5   (mgal)                           NAVD 88
 AH8768
 AH8768  VERT ORDER  -  SECOND    CLASS I
 AH8768
 AH8768.The horizontal coordinates were scaled from a topographic map and have
 AH8768.an estimated accuracy of +/- 6 seconds.
 AH8768
 AH8768.The orthometric height was determined by differential leveling
 AH8768.and adjusted in July 1999.
 AH8768
 AH8768.The geoid height was determined by GEOID03.
 AH8768
 AH8768.The dynamic height is computed by dividing the NAVD 88
 AH8768.geopotential number by the normal gravity value computed on the
 AH8768.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 AH8768.degrees latitude (g = 980.6199 gals.).
 AH8768
 AH8768.The modeled gravity was interpolated from observed gravity values.
 AH8768
 AH8768;                     North         East     Units  Estimated Accuracy
 AH8768;SPC FL W     -   378,650.      280,480.      MT  (+/- 180 meters Scaled)
 AH8768
 AH8768                          SUPERSEDED SURVEY CONTROL
 AH8768
 AH8768 No superseded survey control is available for this station.
 AH8768
 AH8768_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RML819694(NAD 83)
 AH8768_MARKER: F = FLANGE-ENCASED ROD
 AH8768_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
 AH8768_STAMPING: Z 460 1997
 AH8768_MARK LOGO: NGS
 AH8768_PROJECTION: FLUSH
 AH8768_MAGNETIC: N = NO MAGNETIC MATERIAL
 AH8768_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
 AH8768_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 AH8768+SATELLITE: SATELLITE OBSERVATIONS - 1997
 AH8768_ROD/PIPE-DEPTH: 12.3 meters
 AH8768
 AH8768  HISTORY     - Date     Condition        Report By
 AH8768  HISTORY     - 1997     MONUMENTED       FLDEP
 AH8768
 AH8768                           STATION DESCRIPTION
 AH8768
 AH8768'DESCRIBED BY FL DEPT OF ENV PRO 1997 (JLM)
 AH8768'THE MARK IS ABOUT 30.0 MI (48.3 KM) SOUTHEAST OF LAKE WALES, 0.6 MI
 AH8768'(1.0 KM) WEST OF THE KISSIMMEE RIVER ON KICCO ROAD IN SECTION 25,
 AH8768'TOWNSHIP 31 SOUTH, RANGE 31 EAST. TO REACH THE MARK FROM THE
 AH8768'INTERSECTION OF STATE ROAD 27 UNDERPASS AND STATE ROAD 60 IN LAKE
 AH8768'WALES, GO EAST-SOUTHEAST ON STATE ROAD 60 FOR 25.7 MI (41.4 KM) TO THE
 AH8768'JUNCTION OF RIVER RANCH BOULEVARD ON THE RIGHT, TURN RIGHT ON RIVER
 AH8768'RANCH BOULEVARD AND GO SOUTHEAST FOR 2.55 MI (4.10 KM) TO THE GUARD
 AH8768'HOUSE AT THE ENTRANCE TO RIVER RANCH, CONTINUE SOUTH ON RIVER RANCH
 AH8768'BOULEVARD FOR 0.3 MI (0.5 KM) TO THE JUNCTION OF KICCO ROAD ON THE
 AH8768'RIGHT, TURN RIGHT ON KICCO ROAD AND GO SOUTHEAST FOR 0.2 MI (0.3 KM)
```

AH8768'TO FOUR SETS OF DOUBLE UNLOCKED GATES, CONTINUE SOUTH ON KICCO ROAD
AH8768'FOR 0.5 MI (0.8 KM) TO ANOTHER UNLOCKED METAL GATE, CONTINUE SOUTHEAST
AH8768'ON KICCO ROAD FOR 0.2 MI (0.3 KM) TO THE JUNCTION OF ROAD ON THE LEFT,
AH8768'CONTINUE SOUTH-SOUTHEAST ON KICCO ROAD FOR 0.8 MI (1.3 KM) TO THE MARK
AH8768'ON THE RIGHT, A STAINLESS STEEL ROD DRIVEN TO REFUSAL AT A DEPTH OF
AH8768'40.3 FT (12.3 M) WITH A LOGO CAP FLUSH WITH THE GROUND AND LEVEL WITH
AH8768'KICCO ROAD, THE DATUM POINT IS RECESSED 0.4 FT (12.2 CM) BELOW THE
AH8768'LEVEL OF THE LOGO CAP. LOCATED 37.5 FT (11.4 M) SOUTHWEST OF THE
AH8768'APPROXIMATE CENTERLINE OF KICCO ROAD AND 1.0 FT (0.3 M) NORTHWEST OF A
AH8768'CARSONITE WITNESS POST. NOTE ACCESS TO DATUM POINT IS HAD THROUGH A
AH8768'5-INCH LOGO CAP. FOR KEY CONTACT SOUTH FLORIDA WATER MANAGEMENT
AH8768'DISTRICT AT 561-686-8800.

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

South Florida Water Management District
Benchmark Database

Report run on: February 25, 2008 6:56 AM

Designation: Z460
County: POLK
USGS Quad: FT.KISSIMMEE NW
Project: LKBA2B WELL SITE

Sec: 25 Twp: 31 Rge: 31

Status: GOOD

NAD 1927 Coordinates:
N =
E =
Adjustment:

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

Latitude: 274456.000 Scaled values only
Longitude: 811101.000
Monument By: FL DEPT OF ENVIR PROT
Year: 1997
Type: V
Stamping: Z 460 1997
Party Chief:
Field Book
Page:

NGVD 1929
Elevation: 55.114
Order: 2
Class: I

NAVD 1988
Elevation: 53.930
Order: 2
Class: I

Description:

OLD NGVD 1929 ELEVATION = 55.15
********** RECOVERY NOTE **********
3/6/2007 RAGER NICK MILLER INC FIELDBOOK19 PAGE 53 BM Z460
5/6/1999 PURPERA OF 3001 INC., A CONTRACTOR FOR THE CORPS OF ENGINEERS,
FIELD BOOK #1 99-133, PAGE 16, Z 460 (1997) EL. 55.24 NGVD 29, A
STAINLESS STEEL ROD WITH ACCESS CAP STAMPED "Z 460 1997"
****

THE NGS DATA SHEET
DATABASE = SYBASE ,PROGRAM = DATASHEET, VERSION = 6.20
STARTING DATASHEET RETRIEVAL...
1 NATIONAL GEODETIC SURVEY, RETRIEVAL DATE = MAY 24, 2000
AH8768 **********
AH8768 DESIGNATION - Z 460
AH8768 PID - AH8768
AH8768 STATE/COUNTY- FL/POLK
AH8768 USGS QUAD - FORT KISSIMMEE NW (1973)
AH8768
AH8768 *CURRENT SURVEY CONTROL
AH8768 _____
AH8768* NAD 83(1986)- 27 44 56. (N) 081 11 01. (W) SCALED
AH8768* NAVD 88 - 16.438 (METERS) 53.93 (FEET) ADJUSTED
AH8768 _____
AH8768 GEOID HEIGHT- -26.67 (METERS) GEOID99
AH8768 DYNAMIC HT - 16.413 (METERS) 53.85 (FEET) COMP
AH8768 MODELED GRAV- 979,157.5 (MGAL) NAVD 88
AH8768
AH8768 VERT ORDER - SECOND CLASS I
AH8768
AH8768.THE HORIZONTAL COORDINATES WERE SCALED FROM A TOPOGRAPHIC MAP AND HAVE
AH8768.AN ESTIMATED ACCURACY OF +/- 6 SECONDS.
AH8768
AH8768.THE ORTHOMETRIC HEIGHT WAS DETERMINED BY DIFFERENTIAL LEVELING
AH8768.AND ADJUSTED BY THE NATIONAL GEODETIC SURVEY IN JULY 1999.

AH8768
AH8768.THE GEOID HEIGHT WAS DETERMINED BY GEOID99.
AH8768
AH8768.THE DYNAMIC HEIGHT IS COMPUTED BY DIVIDING THE NAVD 88
AH8768.GEOPOTENTIAL NUMBER BY THE NORMAL GRAVITY VALUE COMPUTED ON THE
AH8768.GEODETIC REFERENCE SYSTEM OF 1980 (GRS 80) ELLIPSOID AT 45
AH8768.DEGREES LATITUDE (G = 980.6199 GALS.).
AH8768
AH8768.THE MODELED GRAVITY WAS INTERPOLATED FROM OBSERVED GRAVITY VALUES.
AH8768
AH8768; NORTH EAST UNITS ESTIMATED ACCURACY
AH8768;SPC FL W - 378,650. 280,480. MT (+/- 180 METERS SCALED)
AH8768
AH8768 SUPERSEDED SURVEY CONTROL
AH8768
AH8768.NO SUPERSEDED SURVEY CONTROL IS AVAILABLE FOR THIS STATION.
AH8768
AH8768_MARKER: F = FLANGE-ENCASED ROD
AH8768_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AH8768_STAMPING: Z 460 1997
AH8768_PROJECTION: FLUSH
AH8768_MAGNETIC: N = NO MAGNETIC MATERIAL
AH8768_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AH8768_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AH8768+SATELLITE: SATELLITE OBSERVATIONS - 1997
AH8768_ROD/PIPE-DEPTH: 12.3 METERS
AH8768
AH8768 HISTORY - DATE CONDITION RECOV. BY
AH8768 HISTORY - 1997 MONUMENTED FLDEP
AH8768
AH8768 STATION DESCRIPTION
AH8768
AH8768'DESCRIBED BY FL DEPT OF ENV PRO 1997 (JLM)
AH8768'THE MARK IS ABOUT 30.0 MI (48.3 KM) SOUTHEAST OF LAKE WALES, 0.6 MI
AH8768'(1.0 KM) WEST OF THE KISSIMMEE RIVER ON KICCO ROAD IN SECTION 25,
AH8768'TOWNSHIP 31 SOUTH, RANGE 31 EAST. TO REACH THE MARK FROM THE
AH8768'INTERSECTION OF STATE ROAD 27 UNDERPASS AND STATE ROAD 60 IN LAKE
AH8768'WALES, GO EAST-SOUTHEAST ON STATE ROAD 60 FOR 25.7 MI (41.4 KM) TO THE
AH8768'JUNCTION OF RIVER RANCH BOULEVARD ON THE RIGHT, TURN RIGHT ON RIVER
AH8768'RANCH BOULEVARD AND GO SOUTHEAST FOR 2.55 MI (4.10 KM) TO THE GUARD
AH8768'HOUSE AT THE ENTRANCE TO RIVER RANCH, CONTINUE SOUTH ON RIVER RANCH
AH8768'BOULEVARD FOR 0.3 MI (0.5 KM) TO THE JUNCTION OF KICCO ROAD ON THE
AH8768'RIGHT, TURN RIGHT ON KICCO ROAD AND GO SOUTHEAST FOR 0.2 MI (0.3 KM)
AH8768'TO FOUR SETS OF DOUBLE UNLOCKED GATES, CONTINUE SOUTH ON KICCO ROAD
AH8768'FOR 0.5 MI (0.8 KM) TO ANOTHER UNLOCKED METAL GATE, CONTINUE SOUTHEAST
AH8768'ON KICCO ROAD FOR 0.2 MI (0.3 KM) TO THE JUNCTION OF ROAD ON THE LEFT,
AH8768'CONTINUE SOUTH-SOUTHEAST ON KICCO ROAD FOR 0.8 MI (1.3 KM) TO THE MARK
AH8768'ON THE RIGHT, A STAINLESS STEEL ROD DRIVEN TO REFUSAL AT A DEPTH OF
AH8768'40.3 FT (12.3 M) WITH A LOGO CAP FLUSH WITH THE GROUND AND LEVEL WITH
AH8768'KICCO ROAD, THE DATUM POINT IS RECESSED 0.4 FT (12.2 CM) BELOW THE
AH8768'LEVEL OF THE LOGO CAP. LOCATED 37.5 FT (11.4 M) SOUTHWEST OF THE
AH8768'APPROXIMATE CENTERLINE OF KICCO ROAD AND 1.0 FT (0.3 M) NORTHWEST OF A
AH8768'CARSONITE WITNESS POST. NOTE ACCESS TO DATUM POINT IS HAD THROUGH A
AH8768'5-INCH LOGO CAP. FOR KEY CONTACT SOUTH FLORIDA WATER MANAGEMENT
AH8768'DISTRICT AT 561-686-8800.
ELAPSED TIME = 00:00:02

The NGS Data Sheet

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

```
PROGRAM = datasheet95, VERSION = 8.8
1        National Geodetic Survey,   Retrieval Date = DECEMBER  5, 2015
 AH8770 ***********************************************************************
 AH8770  DESIGNATION -  KR 1560
 AH8770  PID         -  AH8770
 AH8770  STATE/COUNTY-  FL/POLK
 AH8770  COUNTRY     -  US
 AH8770  USGS QUAD   -  FORT KISSIMMEE NW (1972)
 AH8770
 AH8770                        *CURRENT SURVEY CONTROL
 AH8770  ______________________________________________________________________
 AH8770* NAD 83(1986) POSITION- 27 44 42.     (N) 081 11 02.     (W)    SCALED
 AH8770* NAVD 88 ORTHO HEIGHT -    16.591 (meters)       54.43  (feet) ADJUSTED
 AH8770  ______________________________________________________________________
 AH8770  GEOID HEIGHT    -        -26.662 (meters)                     GEOID12B
 AH8770  DYNAMIC HEIGHT  -         16.566 (meters)       54.35  (feet) COMP
 AH8770  MODELED GRAVITY -    979,157.5   (mgal)                       NAVD 88
 AH8770
 AH8770  VERT ORDER      -  SECOND    CLASS I
 AH8770
 AH8770.The horizontal coordinates were scaled from a topographic map and have
 AH8770.an estimated accuracy of +/- 6 seconds.
 AH8770.
 AH8770.The orthometric height was determined by differential leveling and
 AH8770.adjusted by the NATIONAL GEODETIC SURVEY
 AH8770.in July 1999.
 AH8770
 AH8770.Significant digits in the geoid height do not necessarily reflect accuracy.
 AH8770.GEOID12B height accuracy estimate available here.
 AH8770
 AH8770.The dynamic height is computed by dividing the NAVD 88
 AH8770.geopotential number by the normal gravity value computed on the
 AH8770.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 AH8770.degrees latitude (g = 980.6199 gals.).
 AH8770
 AH8770.The modeled gravity was interpolated from observed gravity values.
 AH8770
 AH8770;                    North         East     Units  Estimated Accuracy
 AH8770;SPC FL W     -   378,220.      280,460.      MT  (+/- 180 meters Scaled)
 AH8770
 AH8770                          SUPERSEDED SURVEY CONTROL
 AH8770
 AH8770.No superseded survey control is available for this station.
 AH8770
 AH8770_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RML818689(NAD 83)
 AH8770
 AH8770_MARKER: DD = SURVEY DISK
 AH8770_SETTING: 9 = SET IN PREFABRICATED CONCRETE POST IMBEDDED IN GROUND
 AH8770_STAMPING: KR-1560 GPS 1994 JAX FLA
 AH8770_MARK LOGO: USE
 AH8770_MAGNETIC: N = NO MAGNETIC MATERIAL
 AH8770_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY
 AH8770_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 AH8770+SATELLITE: SATELLITE OBSERVATIONS - July 10, 1997
 AH8770
 AH8770  HISTORY     - Date     Condition        Report By
 AH8770  HISTORY     - 1994     MONUMENTED       USE
```

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AH8770  HISTORY     - 19970710 GOOD            FLDEP
AH8770
AH8770                          STATION DESCRIPTION
AH8770
AH8770'DESCRIBED BY FL DEPT OF ENV PRO 1997 (JLM)
AH8770'THE MARK IS ABOUT 30.0 MI (48.3 KM) SOUTHEAST OF LAKE WALES, 0.5 MI
AH8770'(0.8 KM) WEST OF THE KISSIMMEE RIVER ON KICCO ROAD IN SECTION 36,
AH8770'TOWNSHIP 31 SOUTH, RANGE 31 EAST. TO REACH THE MARK FROM THE
AH8770'INTERSECTION OF STATE ROAD 27 UNDERPASS AND STATE ROAD 60 IN LAKE
AH8770'WALES, GO EAST-SOUTHEAST ON STATE ROAD 60 FOR 25.7 MI (41.4 KM) TO THE
AH8770'JUNCTION OF RIVER RANCH BOULEVARD ON THE RIGHT, TURN RIGHT ON RIVER
AH8770'RANCH BOULEVARD AND GO SOUTHEAST FOR 2.55 MI (4.10 KM) TO THE GUARD
AH8770'HOUSE AT THE ENTRANCE TO RIVER RANCH, CONTINUE SOUTH ON RIVER RANCH
AH8770'BOULEVARD FOR 0.3 MI (0.5 KM) TO THE JUNCTION OF KICCO ROAD ON THE
AH8770'RIGHT, TURN RIGHT ON KICCO ROAD AND GO SOUTHEAST FOR 0.2 MI (0.3 KM)
AH8770'TO FOUR SETS OF DOUBLE UNLOCKED GATES, CONTINUE SOUTH ON KICCO ROAD
AH8770'FOR 0.5 MI (0.8 KM) TO ANOTHER UNLOCKED METAL GATE, CONTINUE SOUTHEAST
AH8770'ON KICCO ROAD FOR 0.05 MI (0.08 KM) TO A LOCKED GATE, THE ENTRANCE TO
AH8770'PROPERTY OWNED BY THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT,
AH8770'CONTINUE SOUTHEAST ON A SHELL ROAD (KICCO ROAD) FOR 0.2 MI (0.3 KM) TO
AH8770'THE JUNCTION OF A ROAD ON THE LEFT, CONTINUE SOUTH-SOUTHEAST ON THE
AH8770'SHELL ROAD FOR 1.1 MI (1.8 KM) TO THE MARK ON THE RIGHT, A STANDARD
AH8770'CORP OF ENGINEERS BRASS DISK SET IN CONCRETE INSIDE A 6-INCH PVC PIPE
AH8770'INBEDDED IN THE GROUND, FLUSH WITH THE GROUND AND 0.6 FT (18.3 CM)
AH8770'BELOW THE LEVEL OF THE SHELL ROAD. LOCATED 33.2 FT (10.1 M)
AH8770'WEST-NORTHWEST OF THE APPROXIMATE CENTERLINE OF THE SHELL ROAD (KICCO
AH8770'ROAD) , 32.7 FT (10.0 M) SOUTHWEST OF THE WEST END OF A GALVANIZED
AH8770'CULVERT UNDER THE SHELL ROAD (KICCO ROAD) , 2.1 FT (0.6 M) WEST OF A
AH8770'METAL WITNESS POST AND 0.8 FT (24.4 CM) WEST OF A CARSONITE WITNESS
AH8770'POST. NOTE FOR ACCESS AND KEY CONTACT SOUTH FLORIDA WATER MANAGEMENT
AH8770'DISTRICT AT 561-686-8800.

*** retrieval complete.
Elapsed Time = 00:00:02
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The NGS Data Sheet

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

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PROGRAM = datasheet95, VERSION = 8.8
1        National Geodetic Survey,   Retrieval Date = DECEMBER  5, 2015
 AH8771 ***********************************************************************
 AH8771  DESIGNATION -  A 461
 AH8771  PID         -  AH8771
 AH8771  STATE/COUNTY-  FL/POLK
 AH8771  COUNTRY     -  US
 AH8771  USGS QUAD   -  FORT KISSIMMEE NW (1972)
 AH8771
 AH8771                        *CURRENT SURVEY CONTROL
 AH8771  ______________________________________________________________________
 AH8771* NAD 83(1986) POSITION- 27 44 27.     (N) 081 11 07.     (W)    SCALED
 AH8771* NAVD 88 ORTHO HEIGHT -    15.910  (meters)       52.20  (feet) ADJUSTED
 AH8771  ______________________________________________________________________
 AH8771  GEOID HEIGHT    -       -26.648  (meters)                      GEOID12B
 AH8771  DYNAMIC HEIGHT  -        15.886  (meters)       52.12  (feet) COMP
 AH8771  MODELED GRAVITY -    979,157.4   (mgal)                        NAVD 88
 AH8771
 AH8771  VERT ORDER      -  SECOND    CLASS I
 AH8771
 AH8771.The horizontal coordinates were scaled from a topographic map and have
 AH8771.an estimated accuracy of +/- 6 seconds.
 AH8771.
 AH8771.The orthometric height was determined by differential leveling and
 AH8771.adjusted by the NATIONAL GEODETIC SURVEY
 AH8771.in July 1999.
 AH8771
 AH8771.Significant digits in the geoid height do not necessarily reflect accuracy.
 AH8771.GEOID12B height accuracy estimate available here.
 AH8771
 AH8771.The dynamic height is computed by dividing the NAVD 88
 AH8771.geopotential number by the normal gravity value computed on the
 AH8771.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 AH8771.degrees latitude (g = 980.6199 gals.).
 AH8771
 AH8771.The modeled gravity was interpolated from observed gravity values.
 AH8771
 AH8771;                    North         East     Units  Estimated Accuracy
 AH8771;SPC FL W     -   377,760.      280,330.      MT  (+/- 180 meters Scaled)
 AH8771
 AH8771                          SUPERSEDED SURVEY CONTROL
 AH8771
 AH8771.No superseded survey control is available for this station.
 AH8771
 AH8771_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RML817685(NAD 83)
 AH8771
 AH8771_MARKER: DD = SURVEY DISK
 AH8771_SETTING: 35 = SET IN A MAT FOUNDATION OR CONCRETE SLAB OTHER THAN
 AH8771+WITH SETTING: PAVEMENT
 AH8771_SP_SET: BRIDGE DECK
 AH8771_STAMPING: A 461 1997
 AH8771_MARK LOGO: FLDEP
 AH8771_MAGNETIC: N = NO MAGNETIC MATERIAL
 AH8771_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 AH8771+STABILITY: SURFACE MOTION
 AH8771_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 AH8771+SATELLITE: SATELLITE OBSERVATIONS - May 06, 2008
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AH8771
AH8771  HISTORY     - Date     Condition        Report By
AH8771  HISTORY     - 1997     MONUMENTED       FLDEP
AH8771  HISTORY     - 20080506 GOOD             PICKET
AH8771
AH8771                          STATION DESCRIPTION
AH8771
AH8771'DESCRIBED BY FL DEPT OF ENV PRO 1997 (JLM)
AH8771'THE MARK IS ABOUT 30.5 MI (49.1 KM) SOUTHEAST OF LAKE WALES, 0.5 MI
AH8771'(0.8 KM) WEST OF THE KISSIMMEE RIVER IN SECTION 35, TOWNSHIP 31 SOUTH,
AH8771'RANGE 31 EAST. TO REACH THE MARK FROM THE INTERSECTION OF STATE ROAD
AH8771'27 UNDERPASS AND STATE ROAD 60 IN LAKE WALES, GO EAST-SOUTHEAST ON
AH8771'STATE ROAD 60 FOR 25.7 MI (41.4 KM) TO THE JUNCTION OF RIVER RANCH
AH8771'BOULEVARD ON THE RIGHT, TURN RIGHT ON RIVER RANCH BOULEVARD AND GO
AH8771'SOUTHEAST FOR 2.55 MI (4.10 KM) TO THE GUARD HOUSE AT THE ENTRANCE TO
AH8771'RIVER RANCH, CONTINUE SOUTH ON RIVER RANCH BOULEVARD FOR 0.3 MI (0.5
AH8771'KM) TO THE JUNCTION OF KICCO ROAD ON THE RIGHT, TURN RIGHT ON KICCO
AH8771'ROAD AND GO SOUTHEAST FOR 0.2 MI (0.3 KM) TO FOUR SETS OF DOUBLE OF
AH8771'UNLOCKED GATES, CONTINUE SOUTH ON KICCO ROAD FOR 0.5 MI (0.8 KM) TO
AH8771'ANOTHER UNLOCKED METAL GATE, CONTINUE SOUTHEAST ON KICCO ROAD FOR 0.05
AH8771'MI (0.08 KM) TO A LOCKED METAL GATE, THE ENTRANCE TO PROPERTY OWNED BY
AH8771'THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT, CONTINUE SOUTHEAST ON A
AH8771'SHELL ROAD (KICCO ROAD) FOR 0.2 MI (0.3 KM) TO THE JUNCTION OF ROAD ON
AH8771'THE LEFT, CONTINUE SOUTH-SOUTHEAST ON THE SHELL ROAD (KICCO ROAD) FOR
AH8771'1.45 MI (2.33 KM) TO AN UNLOCKED METAL GATE NUMBER 8, PASSING THROUGH
AH8771'THE GATE GO SOUTHERLY FOR ABOUT 15.0 FT (4.6 M) TO THE NORTH END OF
AH8771'THE BRIDGE OVER ICE-CREAM SLOUGH AND THE MARK ON THE RIGHT. LOCATED
AH8771'28.4 FT (8.7 M) SOUTH-SOUTHWEST OF THE CENTERLINE OF THE METAL GATE,
AH8771'7.2 FT (2.2 M) WEST OF THE APPROXIMATE CENTERLINE OF THE SHELL ROAD
AH8771'(KICCO ROAD) AND 1.4 FT (0.4 M) SOUTH OF THE NORTH END OF THE BRIDGE
AH8771'GUARDRAIL. NOTE FOR ACCESS AND KEY CONTACT SOUTH FLORIDA WATER
AH8771'MANAGEMENT DISTRICT AT 561-686-8800.
AH8771
AH8771                          STATION RECOVERY (2008)
AH8771
AH8771'RECOVERY NOTE BY PICKETT AND ASSOCIATES 2008 (JS)
AH8771'RECOVERED IN GOOD CONDITION.

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

See file dsdata.txt for more inf

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PROGRAM = datasheet95,
1        National Geodetic Survey,   Retrieval Date =
 AH8765 ****************************************
 AH8765  DESIGNATION -  Y 460
 AH8765  PID         -  AH8765
 AH8765  STATE/COUNTY-  FL/POLK
 AH8765  COUNTRY     -  US
 AH8765  USGS QUAD   -  LAKE MARIAN SW (1972)
 AH8765
 AH8765                        *CURRENT SURVEY CONTROL
 AH8765
 AH8765* NAD 83(1986) POSITION- 27 46 10.      (N) 081 11 52.      (W)    SCALED
 AH8765* NAVD 88 ORTHO HEIGHT -    16.764  (meters)        55.00   (feet) ADJUSTED
 AH8765
 AH8765  GEOID HEIGHT    -        -26.764  (meters)                       GEOID12B
 AH8765  DYNAMIC HEIGHT  -         16.739  (meters)        54.92   (feet) COMP
 AH8765  MODELED GRAVITY -    979,154.1    (mgal)                         NAVD 88
 AH8765
 AH8765  VERT ORDER      -  SECOND    CLASS I
 AH8765
 AH8765.The horizontal coordinates were scaled from a topographic map and have
 AH8765.an estimated accuracy of +/- 6 seconds.
 AH8765.
 AH8765.The orthometric height was determined by differential leveling and
 AH8765.adjusted by the NATIONAL GEODETIC SURVEY
 AH8765.in July 1999.
 AH8765
 AH8765.Significant digits in the geoid height do not necessarily reflect accuracy.
 AH8765.GEOID12B height accuracy estimate available here.
 AH8765
 AH8765.The dynamic height is computed by dividing the NAVD 88
 AH8765.geopotential number by the normal gravity value computed on the
 AH8765.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 AH8765.degrees latitude (g = 980.6199 gals.).
 AH8765
 AH8765.The modeled gravity was interpolated from observed gravity values.
 AH8765
 AH8765;                    North         East     Units  Estimated Accuracy
 AH8765;SPC FL W     -   380,920.      279,070.      MT  (+/- 180 meters Scaled)
 AH8765
 AH8765                         SUPERSEDED SURVEY CONTROL
 AH8765
 AH8765.No superseded survey control is available for this station.
 AH8765
 AH8765_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RML805716(NAD 83)
 AH8765
 AH8765_MARKER: DD = SURVEY DISK
 AH8765_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 AH8765_STAMPING: Y 460 1997
 AH8765_MARK LOGO: FLDEP
 AH8765_MAGNETIC: N = NO MAGNETIC MATERIAL
 AH8765_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 AH8765+STABILITY: SURFACE MOTION
 AH8765_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 AH8765+SATELLITE: SATELLITE OBSERVATIONS - May 06, 2008
 AH8765
 AH8765  HISTORY     - Date     Condition        Report By
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AH8765  HISTORY     - 1997     MONUMENTED       FLDEP
AH8765  HISTORY     - 20080506 GOOD             PICKET
AH8765
AH8765                          STATION DESCRIPTION
AH8765
AH8765'DESCRIBED BY FL DEPT OF ENV PRO 1997 (JLM)
AH8765'THE MARK IS ABOUT 29.0 MI (46.7 KM) SOUTHEAST OF LAKE WALES, 1.0 MI
AH8765'(1.6 KM) WEST OF THE KISSIMMEE RIVER ON RIVER RANCH BOULEVARD IN
AH8765'SECTION 23, TOWNSHIP 31 SOUTH, RANGE 31 EAST. TO REACH THE MARK FROM
AH8765'THE INTERSECTION OF STATE ROAD 27 UNDERPASS AND STATE ROAD 60 IN LAKE
AH8765'WALES, GO EAST-SOUTHEAST ON STATE ROAD 60 FOR 25.7 MI (41.4 KM) TO THE
AH8765'JUNCTION OF RIVER RANCH BOULEVARD ON THE RIGHT, TURN RIGHT ON RIVER
AH8765'RANCH BOULEVARD AND GO SOUTH FOR 2.55 MI (4.10 KM) TO THE GUARD HOUSE
AH8765'AT THE ENTRANCE TO RIVER RANCH, CONTINUE SOUTH ON RIVER RANCH
AH8765'BOULEVARD FOR 0.3 MI (0.5 KM) TO THE JUNCTION OF KICCO ROAD (A DIRT
AH8765'ROAD) LEADING SOUTHEAST ON THE RIGHT AND THE MARK ON THE RIGHT, SET IN
AH8765'THE TOP OF A ROUND CONCRETE MONUMENT FLUSH WITH THE GROUND AND LEVEL
AH8765'WITH RIVER RANCH BOULEVARD. LOCATED 85.4 FT (26.0 M) EAST-SOUTHEAST OF
AH8765'THE APPROXIMATE CENTERLINE OF TRACTOR TRAIL (A DIRT ROAD LEADING
AH8765'SOUTH) , 55.9 FT (17.0 M) SOUTH OF THE APPROXIMATE CENTERLINE OF RIVER
AH8765'RANCH BOULEVARD, 50.8 FT (15.5 M) WEST-SOUTHWEST OF POWER POLE NUMBER
AH8765'3717-1, 20.1 FT (6.1 M) EAST OF KICCO ROAD (A DIRT ROAD LEADING
AH8765'SOUTHEAST) , 1.0 FT (0.3 M) WEST OF A BARBWIRE FENCE LINE AND 0.8 FT
AH8765'(24.4 CM) WEST OF A CARSONITE WITNESS POST.
AH8765
AH8765                          STATION RECOVERY (2008)
AH8765
AH8765'RECOVERY NOTE BY PICKETT AND ASSOCIATES 2008 (JS)
AH8765'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:02
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The NGS Data Sheet

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

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PROGRAM = datasheet95, VERSION = 8.8
1        National Geodetic Survey,   Retrieval Date = DECEMBER  5, 2015
 AH8764 ***********************************************************************
 AH8764  DESIGNATION -  X 460
 AH8764  PID         -  AH8764
 AH8764  STATE/COUNTY-  FL/POLK
 AH8764  COUNTRY     -  US
 AH8764  USGS QUAD   -  LAKE MARIAN SW (1972)
 AH8764
 AH8764                        *CURRENT SURVEY CONTROL
 AH8764 ______________________________________________________________________
 AH8764* NAD 83(1986) POSITION- 27 46 42.     (N) 081 12 25.     (W)    SCALED
 AH8764* NAVD 88 ORTHO HEIGHT -    16.907 (meters)       55.47  (feet) ADJUSTED
 AH8764 ______________________________________________________________________
 AH8764  GEOID HEIGHT    -        -26.805 (meters)                     GEOID12B
 AH8764  DYNAMIC HEIGHT  -         16.882 (meters)       55.39  (feet) COMP
 AH8764  MODELED GRAVITY -    979,152.1   (mgal)                       NAVD 88
 AH8764
 AH8764  VERT ORDER      -  SECOND    CLASS I
 AH8764
 AH8764.The horizontal coordinates were scaled from a topographic map and have
 AH8764.an estimated accuracy of +/- 6 seconds.
 AH8764.
 AH8764.The orthometric height was determined by differential leveling and
 AH8764.adjusted by the NATIONAL GEODETIC SURVEY
 AH8764.in July 1999.
 AH8764
 AH8764.Significant digits in the geoid height do not necessarily reflect accuracy.
 AH8764.GEOID12B height accuracy estimate available here.
 AH8764
 AH8764.The dynamic height is computed by dividing the NAVD 88
 AH8764.geopotential number by the normal gravity value computed on the
 AH8764.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 AH8764.degrees latitude (g = 980.6199 gals.).
 AH8764
 AH8764.The modeled gravity was interpolated from observed gravity values.
 AH8764
 AH8764;                    North         East     Units  Estimated Accuracy
 AH8764;SPC FL W     -   381,900.      278,160.      MT  (+/- 180 meters Scaled)
 AH8764
 AH8764                          SUPERSEDED SURVEY CONTROL
 AH8764
 AH8764.No superseded survey control is available for this station.
 AH8764
 AH8764_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RML796726(NAD 83)
 AH8764
 AH8764_MARKER: DD = SURVEY DISK
 AH8764_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 AH8764_STAMPING: X 460 1997
 AH8764_MARK LOGO: FLDEP
 AH8764_MAGNETIC: N = NO MAGNETIC MATERIAL
 AH8764_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 AH8764+STABILITY: SURFACE MOTION
 AH8764_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 AH8764+SATELLITE: SATELLITE OBSERVATIONS - May 06, 2008
 AH8764
 AH8764  HISTORY     - Date     Condition        Report By
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AH8764  HISTORY     - 1997     MONUMENTED       FLDEP
AH8764  HISTORY     - 20080506 GOOD             PICKET
AH8764
AH8764                          STATION DESCRIPTION
AH8764
AH8764'DESCRIBED BY FL DEPT OF ENV PRO 1997 (JLM)
AH8764'THE MARK IS ABOUT 28.0 MI (45.1 KM) SOUTHEAST OF LAKE WALES ON RIVER
AH8764'RANCH BOULEVARD IN SECTION 15, TOWNSHIP 31 SOUTH, RANGE 31 EAST. TO
AH8764'REACH THE MARK FROM THE INTERSECTION OF STATE ROAD 27 UNDERPASS AND
AH8764'STATE ROAD 60 IN LAKE WALES, GO EAST-SOUTHEAST ON STATE ROAD 60 FOR
AH8764'25.7 MI (41.4 KM) TO THE JUNCTION OF RIVER RANCH BOULEVARD ON THE
AH8764'RIGHT, TURN RIGHT ON RIVER RANCH BOULEVARD AND GO SOUTH FOR 2.15 MI
AH8764'(3.46 KM) TO THE MARK ON THE LEFT, SET IN THE TOP OF A ROUND CONCRETE
AH8764'MONUMENT FLUSH WITH THE GROUND AND LEVEL WITH RIVER RANCH BOULEVARD.
AH8764'LOCATED 206.0 FT (62.8 M) SOUTHEAST OF A METAL CABLE POLE AEF3-24-LP9,
AH8764'APPROXIMATELY 112.0 FT (34.1 M) NORTHEAST OF POWER POLE NUMBER 35,
AH8764'71.2 FT (21.7 M) NORTHEAST OF THE CENTERLINE OF RIVER RANCH BOULEVARD
AH8764'AND 1.6 FT (0.5 M) SOUTHWEST OF A CARSONITE WITNESS POST.
AH8764
AH8764                          STATION RECOVERY (2008)
AH8764
AH8764'RECOVERY NOTE BY PICKETT AND ASSOCIATES 2008 (JS)
AH8764'RECOVERED IN GOOD CONDITION.

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

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

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PROGRAM = datasheet95, VERSION = 8.8
1        National Geodetic Survey,   Retrieval Date = DECEMBER  5, 2015
 AF6116 ***********************************************************************
 AF6116  DESIGNATION -  F 63
 AF6116  PID         -  AF6116
 AF6116  STATE/COUNTY-  FL/POLK
 AF6116  COUNTRY     -  US
 AF6116  USGS QUAD   -  LAKE MARIAN SW (1972)
 AF6116
 AF6116                        *CURRENT SURVEY CONTROL
 AF6116  ______________________________________________________________________
 AF6116* NAD 83(1986) POSITION- 27 48 16.     (N) 081 12 38.      (W)    SCALED
 AF6116* NAVD 88 ORTHO HEIGHT -    15.829 (meters)        51.93   (feet) ADJUSTED
 AF6116  ______________________________________________________________________
 AF6116  GEOID HEIGHT    -        -26.909 (meters)                       GEOID12B
 AF6116  DYNAMIC HEIGHT  -         15.806 (meters)        51.86   (feet) COMP
 AF6116  MODELED GRAVITY -    979,150.6   (mgal)                         NAVD 88
 AF6116
 AF6116  VERT ORDER      -  FIRST     CLASS II
 AF6116
 AF6116.The horizontal coordinates were scaled from a topographic map and have
 AF6116.an estimated accuracy of +/- 6 seconds.
 AF6116.
 AF6116.The orthometric height was determined by differential leveling and
 AF6116.adjusted by the NATIONAL GEODETIC SURVEY
 AF6116.in May 2008.
 AF6116
 AF6116.Significant digits in the geoid height do not necessarily reflect accuracy.
 AF6116.GEOID12B height accuracy estimate available here.
 AF6116
 AF6116.The dynamic height is computed by dividing the NAVD 88
 AF6116.geopotential number by the normal gravity value computed on the
 AF6116.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 AF6116.degrees latitude (g = 980.6199 gals.).
 AF6116
 AF6116.The modeled gravity was interpolated from observed gravity values.
 AF6116
 AF6116;                    North         East     Units  Estimated Accuracy
 AF6116;SPC FL W     -   384,790.      277,790.      MT  (+/- 180 meters Scaled)
 AF6116
 AF6116                          SUPERSEDED SURVEY CONTROL
 AF6116
 AF6116  NAVD 88 (06/15/91)    15.827  (m)             51.93    (f) SUPERSEDED  2 0
 AF6116  NGVD 29 (??/??/92)    16.194  (m)             53.13    (f) SUPERSEDED  2 0
 AF6116  NGVD 29 (09/01/92)    16.194  (m)             53.13    (f) ADJUSTED    2 0
 AF6116
 AF6116.Superseded values are not recommended for survey control.
 AF6116
 AF6116.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 AF6116.See file dsdata.txt to determine how the superseded data were derived.
 AF6116
 AF6116_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RML792755(NAD 83)
 AF6116
 AF6116_MARKER: DB = BENCH MARK DISK
 AF6116_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 AF6116_STAMPING: F 63 1934
 AF6116_MARK LOGO: CGS
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AF6116_PROJECTION: FLUSH
AF6116_MAGNETIC: N = NO MAGNETIC MATERIAL
AF6116_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
AF6116+STABILITY: SURFACE MOTION
AF6116_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AF6116+SATELLITE: SATELLITE OBSERVATIONS - May 06, 2008
AF6116

AF6116	HISTORY	- Date	Condition	Report By
AF6116	HISTORY	- 1934	MONUMENTED	CGS
AF6116	HISTORY	- 1960	GOOD	CGS
AF6116	HISTORY	- 1973	GOOD	NGS
AF6116	HISTORY	- 1983	GOOD	FLDNR
AF6116	HISTORY	- 19970726	GOOD	FLDEP
AF6116	HISTORY	- 20070414	GOOD	FLDEP
AF6116	HISTORY	- 20080506	GOOD	PICKET

AF6116
AF6116 STATION DESCRIPTION
AF6116
AF6116'DESCRIBED BY COAST AND GEODETIC SURVEY 1960
AF6116'25.4 MI E FROM LAKE WALES.
AF6116'25.4 MILES EAST ALONG STATE HIGHWAY 60 FROM THE ATLANTIC COAST
AF6116'LINE RAILROAD STATION AT LAKE WALES, 0.7 MILE WEST OF THE WEST
AF6116'END OF THE CONCRETE HIGHWAY BRIDGE OVER KISSIMMEE RIVER, 0.3 MILE
AF6116'WEST OF A 30-FOOT BRIDGE OVER A SWAMP, BETWEEN THE 3RD. AND 4TH.
AF6116'TELEPHONE POLES WEST OF THE BRIDGE, 50 FEET SOUTH OF THE CENTER
AF6116'LINE OF HIGHWAY, 103 1/2 FEET WEST-NORTHWEST OF THE 4TH. POLE WEST
AF6116'OF THE BRIDGE, (POLE NO. 17-187), 14 FEET NORTH OF AN EAST-WEST
AF6116'FENCE LINE, 2 FEET WEST OF A CONCRETE WITNESS POST, ABOUT 4
AF6116'FEET BELOW THE LEVEL OF THE HIGHWAY, AND SET IN TOP OF A CONCRETE
AF6116'POST PROJECTING 1 INCH. STEEL WITNESS POST WAS SET NEARBY.
AF6116
AF6116 STATION RECOVERY (1973)
AF6116
AF6116'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1973
AF6116'RECOVERED IN GOOD CONDITION.
AF6116
AF6116 STATION RECOVERY (1983)
AF6116
AF6116'RECOVERY NOTE BY FL DEPT OF NAT RES 1983
AF6116'RECOVERED IN GOOD CONDITION.
AF6116
AF6116 STATION RECOVERY (1997)
AF6116
AF6116'RECOVERY NOTE BY FL DEPT OF ENV PRO 1997 (JLM)
AF6116'THE MARK IS ABOUT 25.0 MI (40.2 KM) EAST-SOUTHEAST OF LAKE WALES, 55.0
AF6116'MI (88.5 KM) NORTH-NORTHWEST OF VERO BEACH ON STATE ROAD 60 IN SECTION
AF6116'10, TOWNSHIP 31 SOUTH, RANGE 31 EAST. TO REACH THE MARK FROM THE
AF6116'INTERSECTION OF STATE ROAD 27 AND STATE ROAD 60 IN LAKE WALES, GO
AF6116'EAST-SOUTHEAST ON STATE ROAD 60 FOR 25.7 MI (41.4 KM) TO THE JUNCTION
AF6116'OF RIVER RANCH BOULEVARD ON THE RIGHT, CONTINUE EAST ON STATE ROAD 60
AF6116'FOR 0.5 MI (0.8 KM) TO THE MARK ON THE RIGHT, SET IN TOP OF A ROUND
AF6116'CONCRETE MONUMENT FLUSH WITH THE GROUND AND 4.0 FT (1.2 M) BELOW THE
AF6116'LEVEL OF THE ROAD. LOCATED 257.3 FT (78.4 M) WEST OF POWER POLE NUMBER
AF6116'17-187, 87.4 FT (26.6 M) EAST OF POWER POLE NUMBER 17-188, 50.0 FT
AF6116'(15.2 M) SOUTH OF THE CENTERLINE OF STATE ROAD 60 AND 1.0 FT (0.3 M)
AF6116'SOUTH OF A METAL WITNESS POST.
AF6116
AF6116 STATION RECOVERY (2007)
AF6116
AF6116'RECOVERY NOTE BY FL DEPT OF ENV PRO 2007 (BPJ)
AF6116'RECOVERED AS DESCRIBED.
AF6116
AF6116 STATION RECOVERY (2008)
AF6116
AF6116'RECOVERY NOTE BY PICKETT AND ASSOCIATES 2008 (JS)
AF6116'RECOVERED IN GOOD CONDITION.

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*** retrieval complete.
Elapsed Time = 00:00:02
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