SURVEYOR'S REPORT

Specific Purpose Survey of the
United Stated Geological Survey
Recorder Wells L-731, L-1138 and L-2313
in
Lee County, Florida

Prepared for:

South Florida Water Management District

Prepared by:
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Field Date: August 25, 2016
Report Date: September 13, 2016

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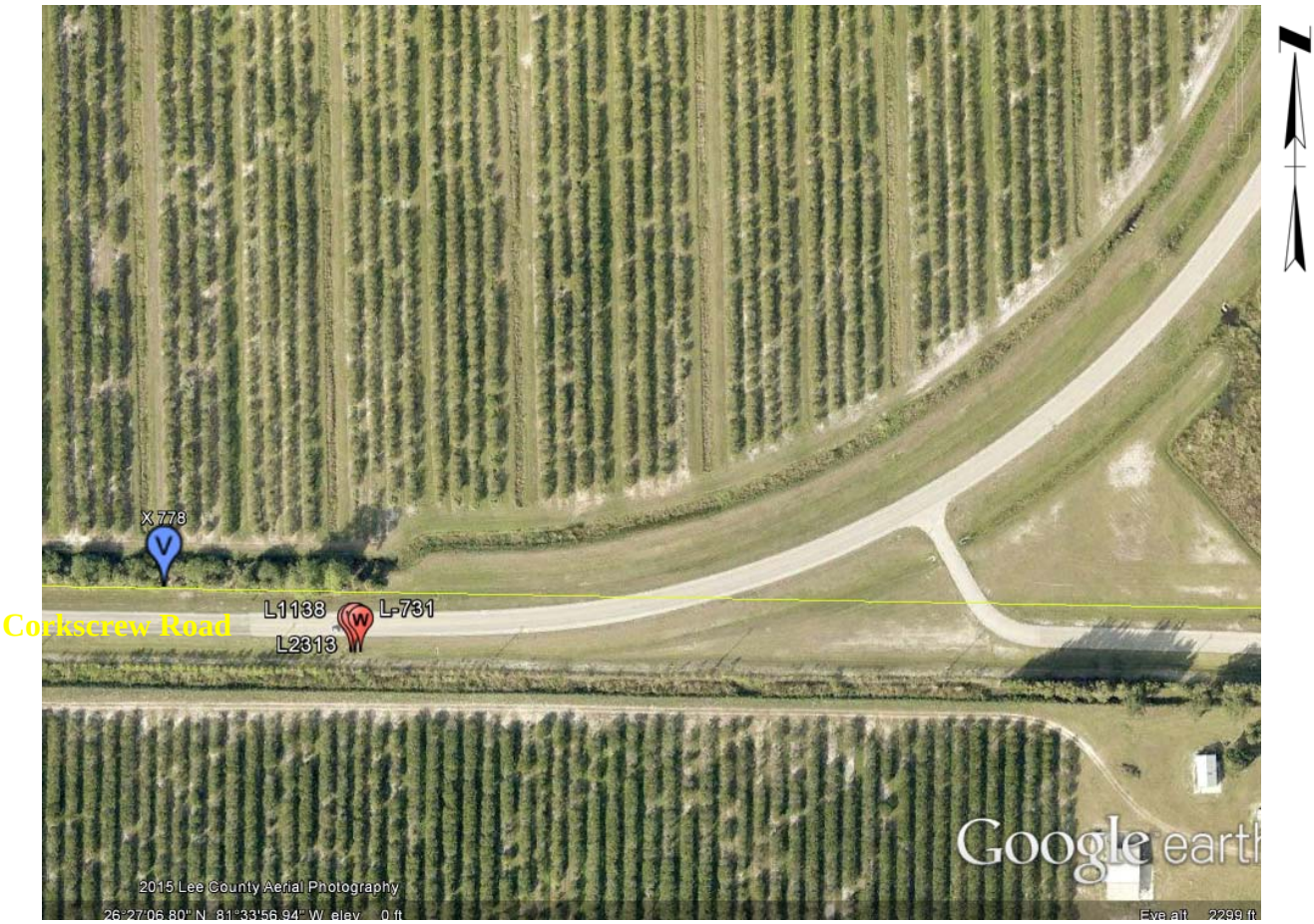
PURPOSE

The purpose of this survey is to establish a North American Vertical Datum of 1988 (NAVD 88) elevation on the reference point for three (3) recorder wells L-731, L-1138 and L-2313.

LOCATION OF PROJECT

The United Stated Geological Survey's Recorder Wells "L-731, L-1138 and L-2313" are located in Section 25 Township 46 South, Range 27 East, Lee County Florida.

General Location (Intended Display scale is "Not to Scale")



PROJECT VERTICAL DATUM

The project vertical datum is the North American Vertical Datum (NAVD) of 1988.

To convert the NAVD 88 elevation to the National Geodetic Vertical Datum of 1929 add **1.250 feet**. This value is based on Corpscon 6.0.1 a U.S. Army Corps of Engineers Engineering Research and Development Center Topographic Engineering Center Alexandria, Virginia Windows-based program to convert coordinates and elevations between datum's using vertcon05.txt and vertcon05.05 files supplied by the U.S. Army Corps of Engineers South Atlantic Division, Jacksonville Fl.

LEVELING METHODS

The leveling for this project was performed in accordance with standard survey practice using conventional third order methods, techniques and equipment.

The allowable error on this project meets or exceeds third order closures (.05√miles) as required by law for this type of work.

A level loop was run from the National Geodetic Survey (NGS) monument "X778 (PID DP9848) to the site and back. The measurements were hand written in South Florida Water Management District Field Book Misc 6Z page 45 dated 25-aug-16, reduced and adjusted. Additional data was manually recorded in the field book.

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EQUIPMENT USED

The instrument for this project was a Zeiss NI2 Level Serial Number 163109 (SFWMD E14973) and a standard survey rod.

VERTICAL CONTROL POINT

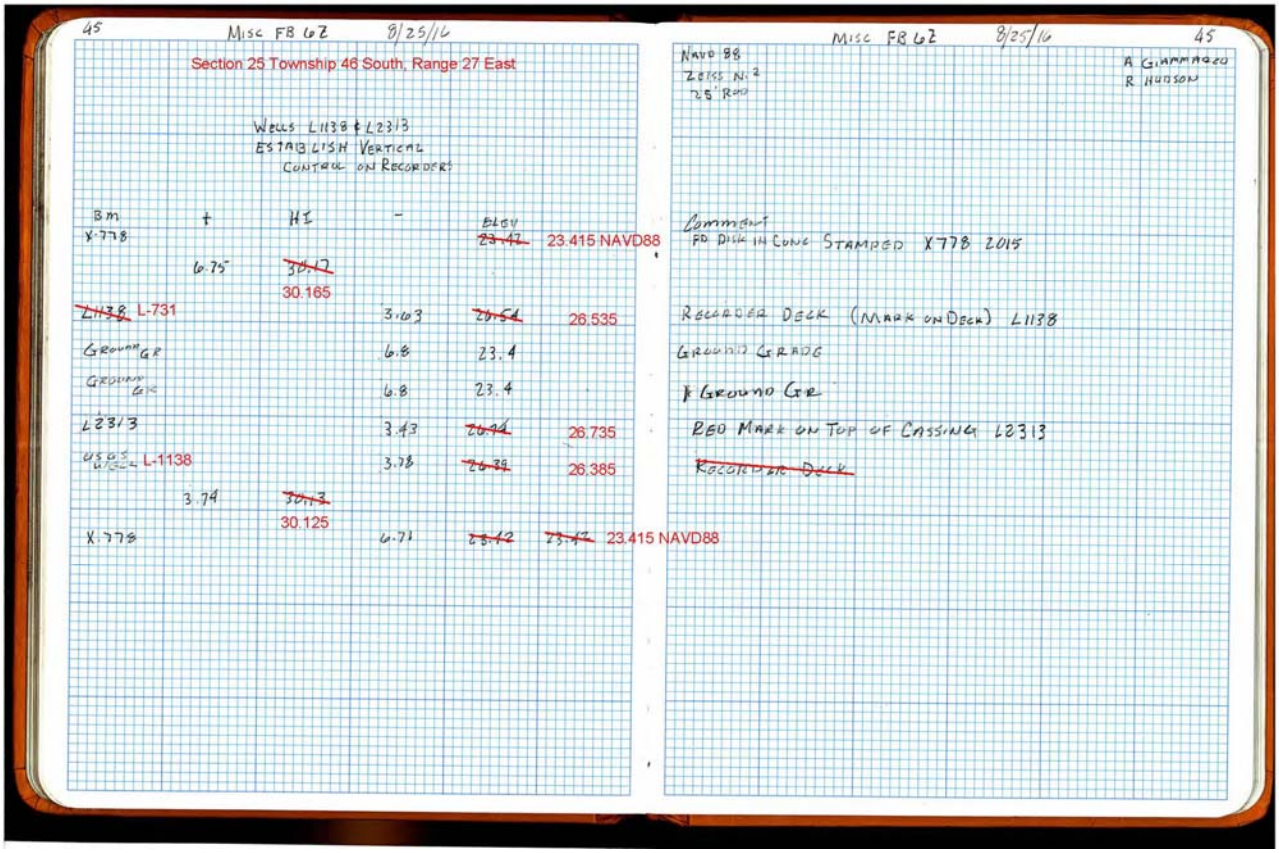
The Vertical Control point used for this survey is the:
National Geodetic Survey (NGS) "X778" (PID DP9848)

BM: X778 (PID DP9848)					
26°27'05.0" (N)	081°34'03.4"(W):	23.415 ft.	(NAVD 88)	7.137m	Published
		24.665 ft.	(NAVD 29)		Corpscon 6.0.1

The mark is about 10.2 miles Southwest of Felda, 9.6 miles West-Northwest of Immokalee, 1.5 miles South-Southwest of Corkscrew, in estimated Section 24, Township 46 South, Range 27 East.
To reach the mark from the junction of State Road 29 and State Road 82 about 5.0 miles North of Immokalee, go Northwesterly on State Road 82 for 5.4 miles to the junction of County Road 850 (Corkscrew Road) on the left. Turn left on County Road 850 (Corkscrew Road) and go Southwest for 5.4 miles to the mark on the right.
The mark can also be reached from the intersection of Interstate 75 and County Road 850 (Corkscrew Road) in Estero, go East on County Road 850 (Corkscrew Road) for 5.0 miles to the junction of Alico Road on the left. Continue East on County Road 850 (Corkscrew Road) for 8.6 miles to the mark on the left, set flush in the top of the concrete monument recessed 0.3 feet below the level of the ground and level with County Road 850 (Corkscrew Road). Located 80.3 feet Northwest of a 10.0 feet tall speed limit sign, 43.7 feet North of the approximate centerline of County Road 850 (Corkscrew Road), 29.6 feet North of the edge of the pavement and 1.5 feet South of a carsonite witness post. Note a magnet was buried on the South side of the mark.

FIELD NOTES

Field Book Misc 6Z page 45



PROJECT RESULTS

Reference Elevations:

Well	Reference Elevation	Comments
L731	**26.535**	**Recorder Deck**
L1138	**26.385**	
L2313	**26.735**	

Source & Site Benchmark:
NGS X778 El. 23.415 (NAVD 88) El. 7.491 (NGVD 29) (Corpscon)

USGS L-731 El. 27.5 **(NGVD 29) supplied by the Ft. Myers Office of the USGS**

Surveyor's Notes

1. All measurements herein are in United States Survey feet and decimal thereof, unless otherwise specified.
2. Underground utilities were not located as part of this survey.
3. This survey report or copies thereof are not valid without the signature and the original raised seal of a Florida licensed Surveyor and Mapper.
4. Additions or deletions to this survey report by other than the signing party (or parties) is prohibited without written consent of the signing party (or parties).
5. To convert from NAVD 88 to NGVD 29 add 1.250 feet. This value is based on Corpscon 6.0.1 a U.S. Army Corps of Engineers Engineering Research and Development Center Topographic Engineering Center Alexandria, Virginia Windows-based program to convert coordinates and elevations between datum's using vertcon05.txt and vertcon05.05 files supplied by the U.S. Army Corps of Engineers South Atlantic Division, Jacksonville Fl.
6. Date of last field work: **August 25, 2016**
7. SFWMD Data records (on file at the District's headquarters):
    A. Electronic Data files:
        Miscellaneous picture files
    B. Conventional reporting
        Field Book: Misc 6Z page 45

Abbreviations:

El. - Elevation
NAVD 88 - North American Vertical Datum of 1988
NGVD29 - National Geodetic Vertical Datum of 1929
NGS - National Geodetic Survey
PSM – Professional Surveyor & Mapper
PID - Permanent Identifiers
SFWMD - South Florida Water Management District
USGS United States Geological Survey

SURVEYOR'S CERTIFICATION

In my professional opinion this Specific Purpose Survey meets applicable portions of the Standards of Practice set forth by the Florida Board of Professional Surveyors and Mappers in Chapter 5J, Florida Administrative Code. This report is prepared for the sole and specific use of the South Florida Water Management District and is not assignable.

Last date of Survey
25-aug-16

Howard J. Ehmke II PSM
(Responsible Surveyor and Mapper)
Professional Surveyor and Mapper
State of Florida Certificate No. 4191
South Florida Water Management District

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/16

Site Name: **L-731, L-1138, L-2313**		Date of Field Work: **25-aug-16**
Party Chief:	Field Book: **Misc 6Z**	Page **45**
Site Benchmark: **X778 (DP9848)**	Benchmark Elevation (NAVD88) **23.415**	Corpscon 6.0.1 Conversion Factor (NAVD88 to NGVD29) **+1.250**

Reference Elevation(s) (NAVD88):		Existing Tag Elevation (Datum):			Calibration Port Elevation(s) (NAVD88):
Well	**Elevation**	Well	Elevation	Datum	**Not Applicable**
L-731	**26.535**	**L-731**	**27.5**	**NGVD29 (from USGS)**	
L-1138	**26.385**				
L-2313	**26.735**				

Ground Elevation (NAVD88): **23.4 Average**	Pad Elevation (NAVD88): **Not Applicable**

Latitude/Longitude

Designation	**Latitude**	**Longitude**
L-731	**26°27' 04.3"**	**81° 34' 00.64" ***
L-1138	**26°27' 04.2"**	**81° 34' 00.7" ***
L-2313	**26°27' 04.3"**	**81° 34' 00.56" * (* taken from Google Earth)**

Notes:

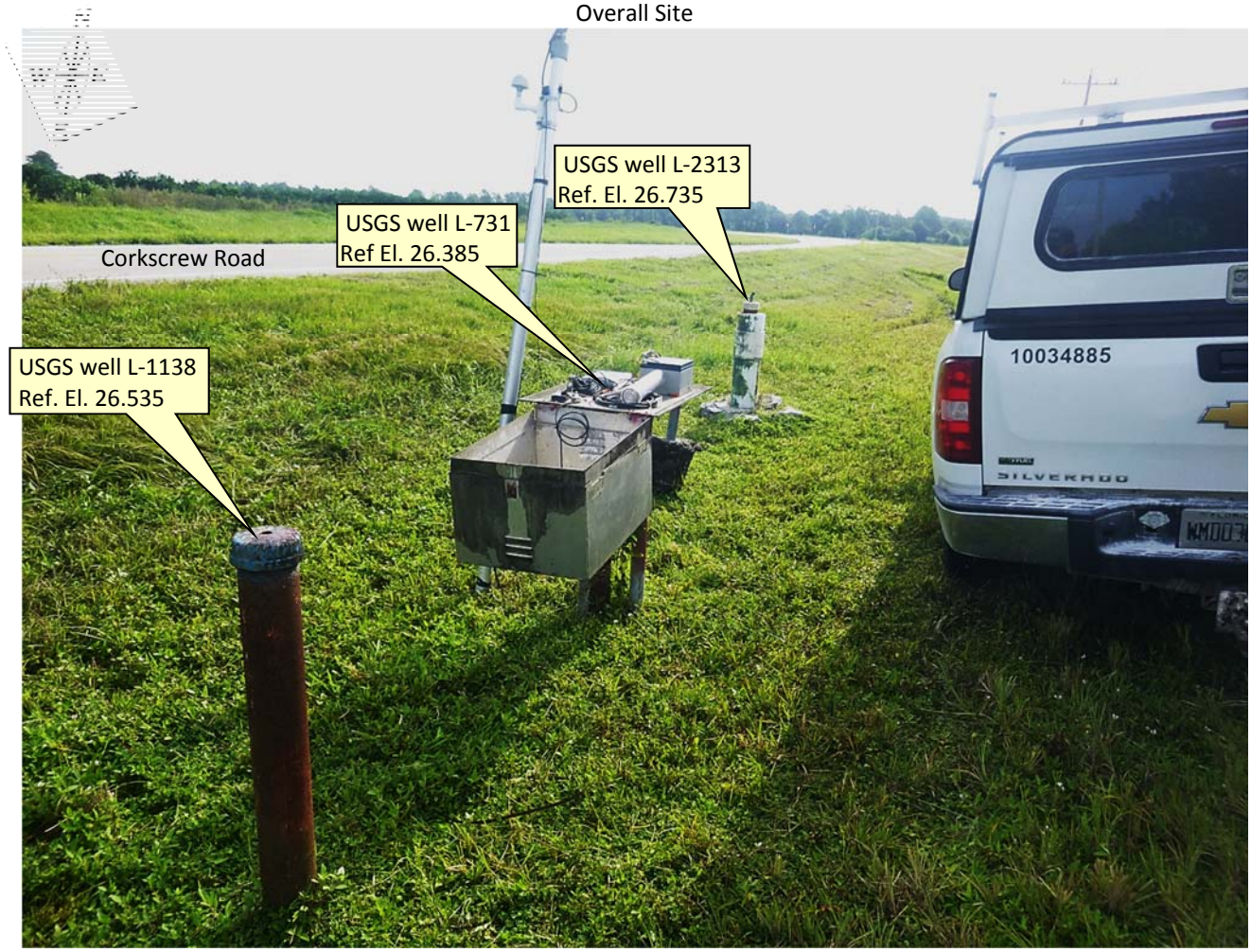
NAVD88 – North American Vertical Datum of 1988

NGVD29- National Geodetic Vertical Datum of 1929

Corpscon 6.0.1 - A U.S. Army Corps of Engineers Engineering Research and Development Center Topographic Engineering Center Alexandria, Virginia Windows-based program to convert coordinates and elevations between datum's using vertcon05.txt and vertcon05.05 files supplied by the U.S. Army Corps of Engineers South Atlantic Division, Jacksonville Fl.

PICTURES

Overall Site

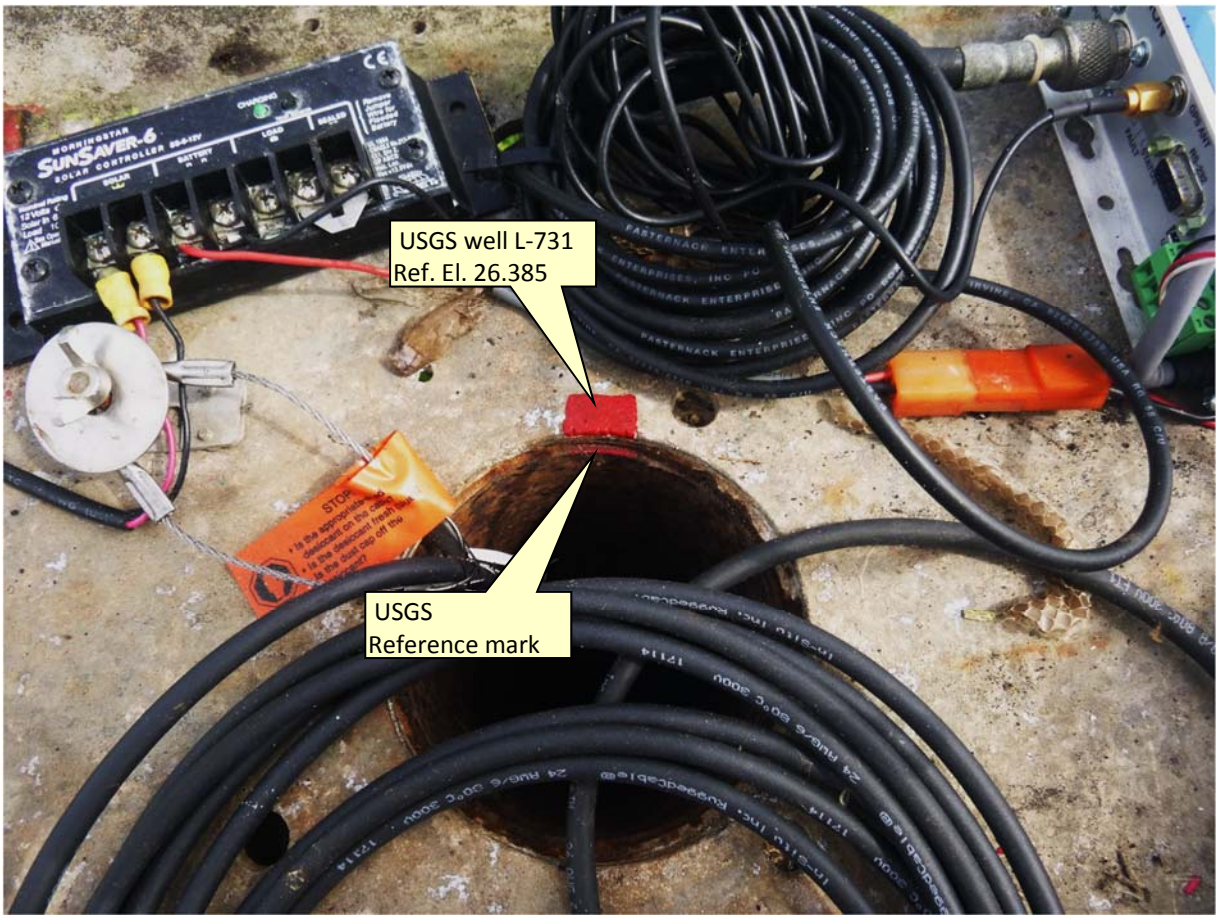


Looking Northeasterly (Not to Scale)

USGS Well L-731

Looking Southwesterly

Looking Northeasterly



Looking Southerly

USGS Well L-1138

Looking Northeasterly

USGS Well L-1138

Looking Southwesterly

Looking Southeasterly

Looking Southeasterly

Looking Southerly from Benchmark to USGS Wells (Not to Scale)

Source Benchmark
NGS X778 (DP9848)
El. 23.415 NAVD88