

# **SURVEYOR'S REPORT**

**Specific Purpose Survey of the Monitoring Wells**

**BRNTMW**

**Charlotte County, Florida**

**South Florida Water Management District's**

**Purchase Order number PC P602020**

**Keith and Schnars project number 16434.07,**

**Task 22001**

**Report Date: August 31, 2006**

**Submittal: First**

**Prepared for:**

**South Florida Water Management District**

**Prepared by:**



**KEITH and SCHNARS, P.A.**  
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**Licensed Business (L.B.) 1337**

**SURVEYOR'S REPORT**

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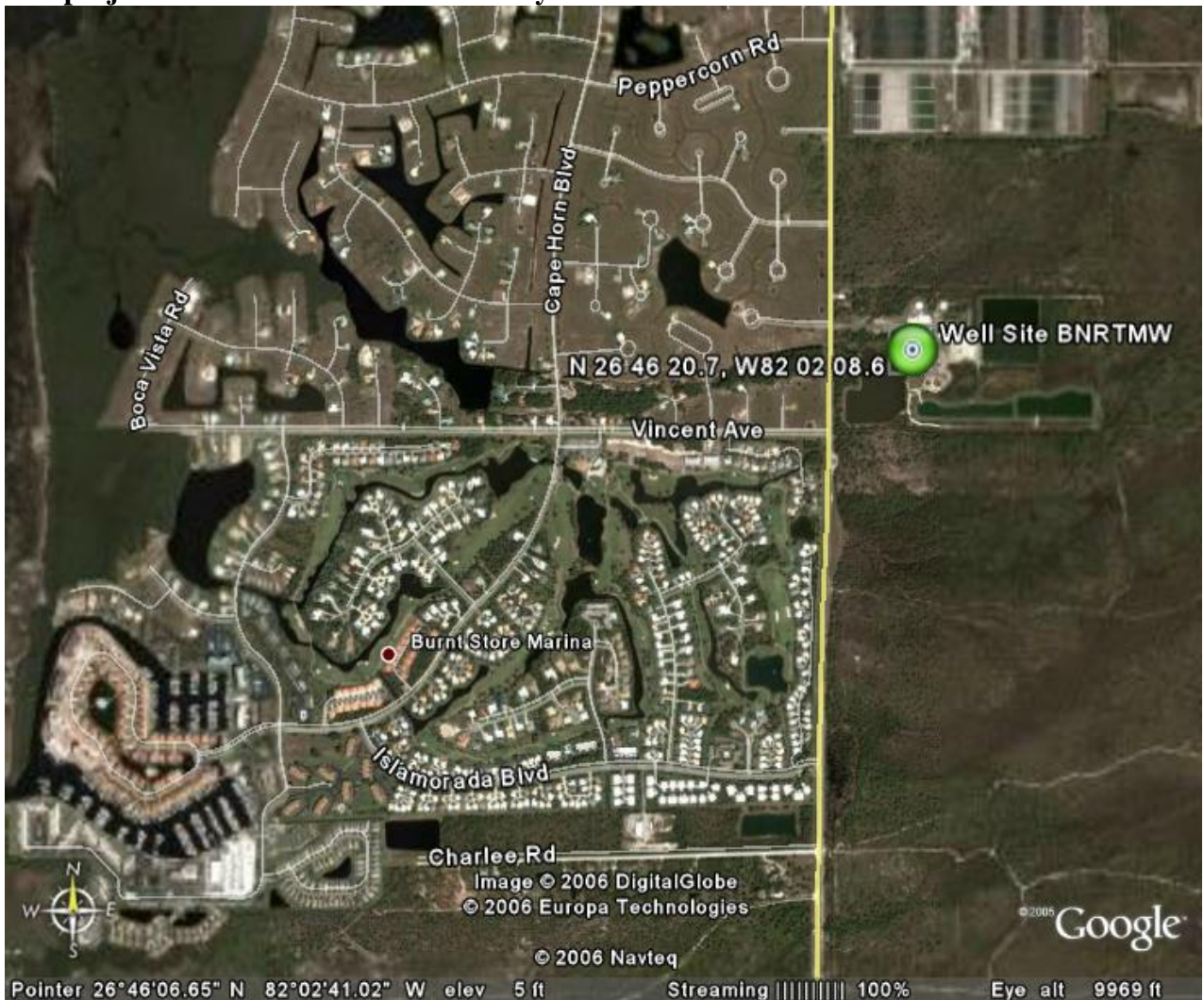
# SURVEYOR'S REPORT

## PURPOSE

To establish vertical data (NAVD 1988 and NGVD 1929) on the Monitoring Wells at the structure.

## LOCATION OF PROJECT

The project is located in Charlotte County.



## **SURVEYOR'S REPORT**

### **ITEMS DELIVERED TO THE DISTRICT**

1. Electronic copy of field notes.
2. Electronic copy of all computation sheets.
3. CORPSMET 95 file.
4. Site photographs.
5. Surveyor's Report.

### **DATUM FOR THE PROJECT**


The vertical datum for the project is North American Datum of 1988 (NAVD '88). National Geodetic Survey vertical control monuments with published NAVD '88 elevations were used as the basis for this survey. The National Geodetic Vertical Datum of 1929 (NGVD '29) shown were computed using CORPSCON version 6.0 program.

### **LEVELING METHODS**

Benchmark BRNTMW was constructed at the site. The elevations were established from Benchmark CHARLOTTE RM 1 using a Topcon DL-102C Digital Level and adjusted using Tripod Data Systems Survey Link DC with Geodetic and Digital Level modules 7.5.5.

## SURVEYOR'S REPORT

### VERTICAL CONTROL

|  |            |  |               |                  |  |
|--|------------|--|---------------|------------------|--|
| <b>BM CHARLOTTE RM 1</b>   | Elevation: | <b>NAVD 1988</b>   | <b>23.36'</b> | <b>NGVD 1929</b> |  |
| Found in National Geodetic Survey Database   | Latitude   | 26°50'27.4"<br>(Scaled)  |               |                  |  |
| State/County<br>FL/Charlotte   | Longitude  | 81°58'33.6"<br>(Scaled)  |               |                  |  |
| USGS QUAD<br>GILCHRIST (1987)  |            |  |               |                  |  |
| Horiz. Order (Preliminary)<br>Class (Preliminary)                                  |            | DESCRIBED BY NATIONAL GEODETIC SURVEY 1966 8 MI SE FROM PUNTA GORDA. ABOUT 7.65 MILES SOUTHEAST ALONG THE ATLANTIC COAST LINE RAILROAD FROM THE STATION AT PUNTA GORDA, THENCE 0.4 MILE <b>SOUTHWEST</b> ALONG A TRAIL, ALONG U.S. HIGHWAY 41 ABOUT 8.1 MILES SOUTHEAST OF THE JUNCTION OF U.S. HIGHWAY 17 AT PUNTA GORDA, 0.4 MILE NORTHWEST OF THE CHARLOTTE COUNTY LOOKOUT TOWER, 195 FEET NORTHEAST OF THE CENTER LINE OF THE HIGHWAY, 91 FEET NORTHEAST OF A FENCE CORNER, 30 FEET SOUTHEAST OF THE CENTER LINE OF THE TRAIL, 0.9 FOOT SOUTHEAST OF A FENCE LINE, 0.9 FOOT NORTHEAST OF A METAL WITNESS POST, ABOUT 1 FOOT BELOW THE LEVEL OF THE HIGHWAY AND SET IN THE TOP OF A CONCRETE POST PROJECTING 0.2 FOOT. IN SECTION 11, R 23 E, T 42 S. |               |                  |  |
|  |            |  |               |                  |  |

**SURVEYOR'S REPORT**

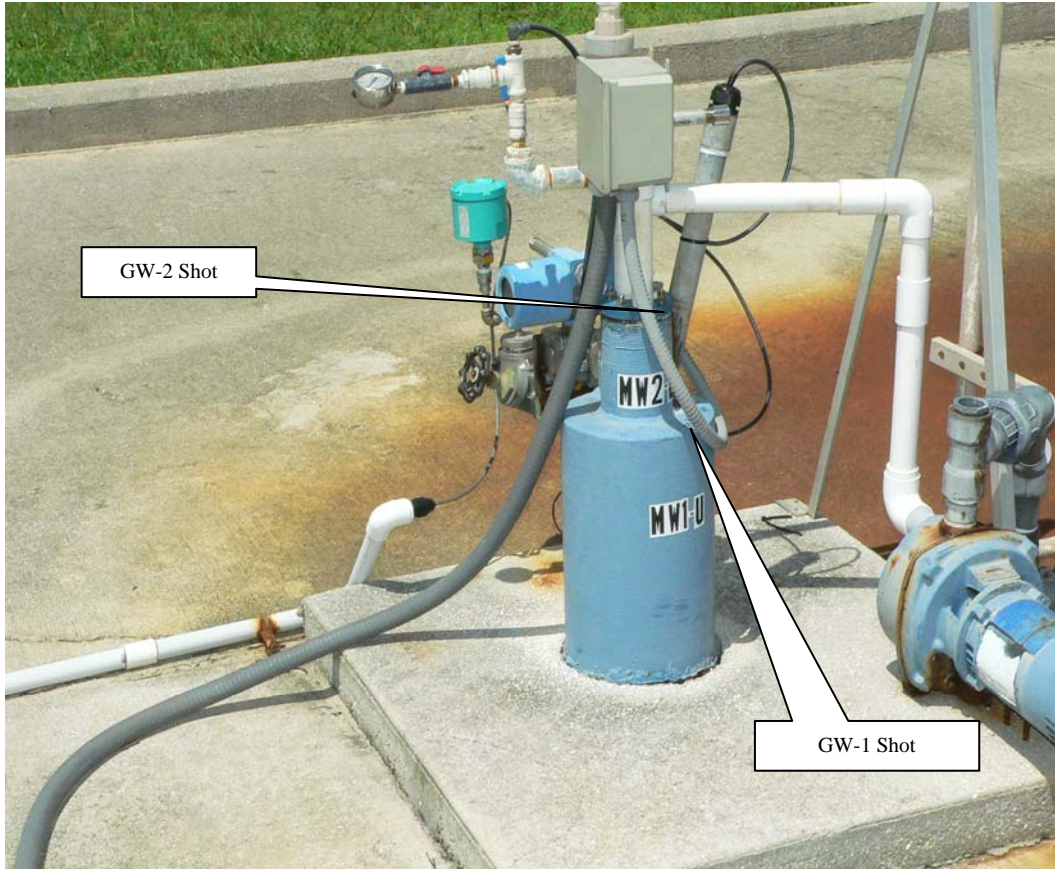
**PROJECT RESULTS**

| <b>Monitoring Well (GW-1)</b>  | <b>Monitoring Well (GW-2)</b>  |
|--|--|
| <p>Monitoring Well BRNTMW:<br/>Reference mark:<br/><b><u>Set mark on S. side 8" metal pipe<br/>With initials K&amp;S.</u></b></p> <p>New Reference<br/>Mark El. <b><u>15.636'</u></b><br/>(NGVD '29)<br/><b><u>(Wrote -1.140' to NAVD 1988).</u></b></p> <p>Initials:<br/><br/><b><u>K&amp;S</u></b><br/><b><u>B.M., R.F.</u></b></p> <p>Date:<br/><b><u>8/09/06</u></b></p> <p><b>written at the mark:</b><br/>El. <b><u>NONE</u></b><br/>Date: <b><u>NONE</u></b><br/>By: <b><u>None</u></b></p> <p>Reference Mark location:</p> | <p>Monitoring Well BRNTMW:<br/>Reference mark:<br/><b><u>Set mark on S. side 4" metal pipe<br/>With initials K&amp;S.</u></b></p> <p>New Reference<br/>Mark El. <b><u>16.182'</u></b><br/>(NGVD '29)<br/><b><u>(Wrote -1.140' to NAVD 1988).</u></b></p> <p>Initials:<br/><br/><b><u>K&amp;S</u></b><br/><b><u>B.M., R.F.</u></b></p> <p>Date:<br/><b><u>8/09/06</u></b></p> <p><b>written at the mark:</b><br/>El. <b><u>NONE</u></b><br/>Date: <b><u>NONE</u></b><br/>By: <b><u>None</u></b></p> <p>Reference Mark location:</p> |

**SURVEYOR'S REPORT**

**PROJECT PHOTO**

**BRNTMW WELL SITE**



**SURVEYOR'S REPORT**

**PROJECT PHOTO**

**BRNTMW WELL SITE (GW-1)**





SURVEYOR'S REPORT

PROJECT PHOTO

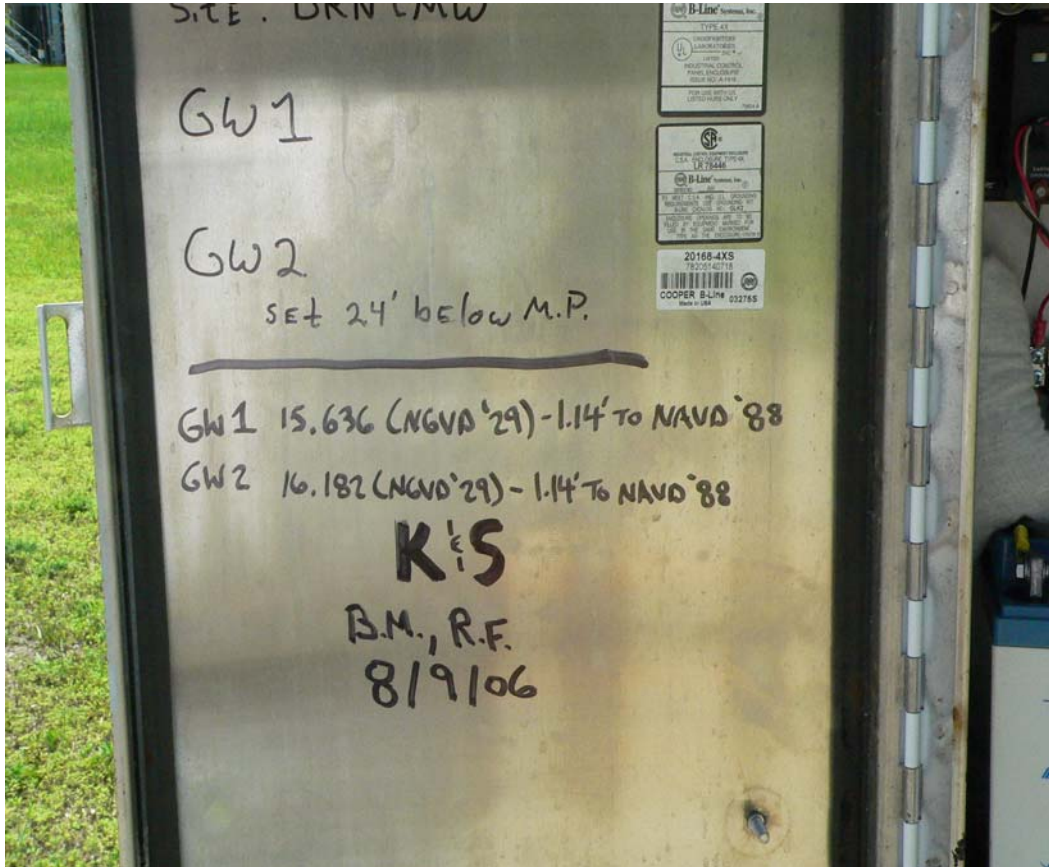
BRNTMW WELL SITE (GW-2)



SURVEYOR'S REPORT

PROJECT PHOTO

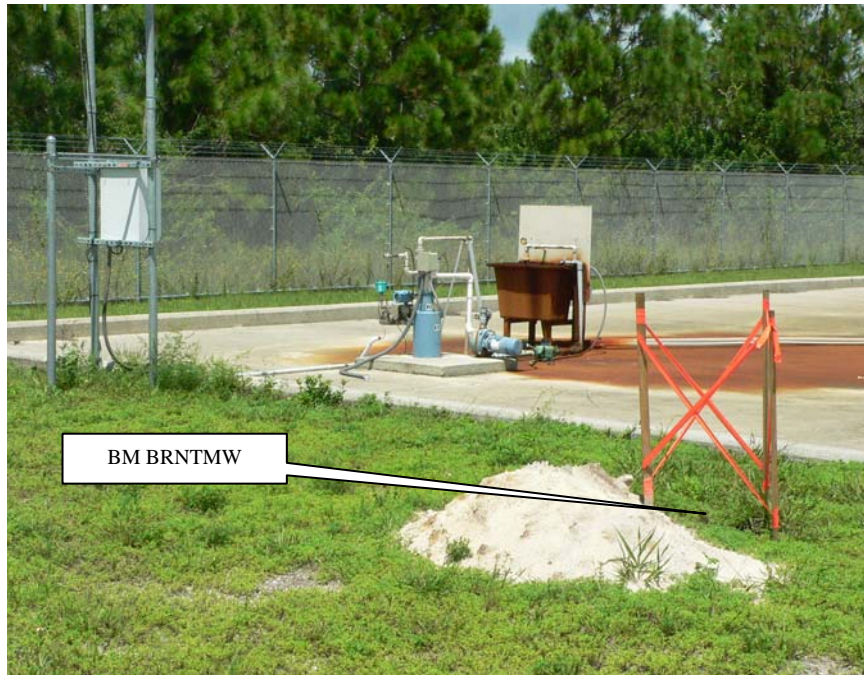
BRNTMW WELL SITE



**SURVEYOR'S REPORT**

**PROJECT PHOTO**

**BRNTMW WELL SITE**



## SURVEYOR'S REPORT

Comments:

Party Chief: B. Miller Field Book: 1168 Pages 11-15  
Bench Mark: "BRNTMW" El. 12.129', Vertical Datum: NAVD1988  
Offset: 1.14' SFWMD VALUE (add this value to convert to NGVD 1929)  
Offset: 1.14' NGS VALUE (add this value to convert to NGVD 1929)  
NAVD 88 - North American Vertical Datum of 1988  
NGVD29 -National Geodetic Vertical Datum of 1929  
NAD 83-99 (Horizontal Datum) North American Datum  
NGS- National Geodetic Survey  
SFWMD- South Florida Water Management District  
PVC- Polyvinyl Chloride

## SURVEYOR'S CERTIFICATION

I hereby certify that this Specific Purpose 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.

KEITH and SCHNARS, PA.  
L.B. number 1337

By:

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Date of Survey  
August 09, 2006

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Kenneth T. Glass, PSM  
Professional Surveyor and Mapper  
State of Florida  
Certificate No. 5713

Job No. / Task No. : 1643407 / 22001 BRNTMW BENCHRUN  
 Benchmark No. : CHARLOTTE RM 1  
 Starting BM Elev. : 23.360  
 Ending BM Elev. : 23.490  
 Unadjusted Ending Elev.: 23.494  
 Closure Error : 0.004  
 Length of Level Run : 112,169.320  
 Allowable Error : 0.138  
 Units : Feet

Closure is within allowable tolerances

Adjustment proportional to total distance

| Pt.#  | Unadj. Elev. | Adj. Elev. | Description      |
|-------|--------------|------------|------------------|
| RM 1  | 23.360       |            | (CHARLOTTE RM 1) |
| TBM3  | 23.275       | 23.275     |                  |
| TBM4  | 24.805       | 24.805     |                  |
| TBM5  | 25.021       | 25.021     |                  |
| TBM6  | 24.952       | 24.952     |                  |
| TBM7  | 24.756       | 24.756     |                  |
| TBM8  | 25.255       | 25.255     |                  |
| TBM9  | 25.387       | 25.387     |                  |
| TBM10 | 25.444       | 25.444     |                  |
| TBM11 | 25.340       | 25.340     |                  |
| TBM12 | 25.237       | 25.237     |                  |
| TBM13 | 25.402       | 25.402     |                  |
| TBM14 | 25.273       | 25.273     |                  |
| TBM15 | 24.794       | 24.794     |                  |
| TBM16 | 25.034       | 25.034     |                  |
| TBM17 | 25.197       | 25.197     |                  |
| TBM18 | 25.060       | 25.060     |                  |
| TBM19 | 25.500       | 25.500     |                  |
| TBM20 | 25.117       | 25.117     |                  |
| TBM21 | 25.293       | 25.293     |                  |
| TBM22 | 25.400       | 25.400     |                  |
| TBM23 | 25.376       | 25.376     |                  |
| TBM24 | 25.726       | 25.726     |                  |
| TBM25 | 25.493       | 25.493     |                  |
| TBM26 | 25.313       | 25.313     |                  |
| TBM27 | 25.390       | 25.390     |                  |
| TBM28 | 25.360       | 25.360     |                  |
| TBM29 | 25.027       | 25.027     |                  |
| TBM30 | 24.987       | 24.987     |                  |
| TBM31 | 24.890       | 24.890     |                  |
| TBM32 | 24.880       | 24.879     |                  |
| TBM33 | 25.037       | 25.036     |                  |
| TBM34 | 24.837       | 24.836     |                  |
| TBM35 | 24.777       | 24.776     |                  |
| TBM36 | 24.373       | 24.372     |                  |
| TBM37 | 24.273       | 24.272     |                  |
| TBM38 | 23.963       | 23.962     |                  |
| TBM39 | 23.276       | 23.275     |                  |
| TBM40 | 23.356       | 23.355     |                  |
| TBM41 | 23.323       | 23.322     |                  |
| TBM42 | 23.093       | 23.092     |                  |
| TBM43 | 22.910       | 22.909     |                  |
| TBM44 | 22.693       | 22.692     |                  |
| TBM45 | 22.560       | 22.559     |                  |
| TBM46 | 22.520       | 22.519     |                  |
| TBM47 | 22.233       | 22.232     |                  |
| TBM48 | 22.123       | 22.122     |                  |
| TBM49 | 22.806       | 22.805     |                  |
| TBM50 | 21.839       | 21.838     |                  |
| TBM51 | 21.639       | 21.638     |                  |
| TBM52 | 21.359       | 21.358     |                  |
| TBM53 | 21.269       | 21.268     |                  |
| TBM54 | 20.798       | 20.797     |                  |

|           |        |        |
|-----------|--------|--------|
| TBM55     | 20.743 | 20.742 |
| TBM56     | 20.686 | 20.685 |
| TBM57     | 20.512 | 20.511 |
| TBM58     | 20.433 | 20.432 |
| TBM59     | 20.464 | 20.463 |
| TBM60     | 20.509 | 20.508 |
| TBM61     | 20.403 | 20.402 |
| TBM62     | 20.251 | 20.250 |
| TBM63     | 19.967 | 19.966 |
| TBM64     | 19.980 | 19.979 |
| TBM65     | 19.520 | 19.519 |
| TBM66     | 19.923 | 19.922 |
| TBM67     | 19.654 | 19.653 |
| TBM68     | 19.625 | 19.624 |
| TBM69     | 19.161 | 19.160 |
| TBM70     | 19.014 | 19.013 |
| TBM71     | 19.172 | 19.171 |
| TBM72     | 19.038 | 19.037 |
| TBM73     | 19.082 | 19.081 |
| TBM74     | 18.923 | 18.922 |
| TBM75     | 19.205 | 19.204 |
| TBM76     | 18.923 | 18.922 |
| TBM77     | 18.272 | 18.271 |
| TBM78     | 17.529 | 17.528 |
| TBM79     | 17.453 | 17.452 |
| TBM80     | 17.270 | 17.269 |
| TBM81     | 17.347 | 17.346 |
| TBM82     | 16.492 | 16.491 |
| TBM83     | 16.213 | 16.212 |
| TBM84     | 15.570 | 15.569 |
| TBM85     | 15.863 | 15.861 |
| TBM86     | 13.886 | 13.884 |
| TBM87     | 14.406 | 14.404 |
| TBM88     | 14.259 | 14.257 |
| TBM89     | 13.765 | 13.763 |
| TBM90     | 14.928 | 14.926 |
| TBM91     | 13.528 | 13.526 |
| TBM92     | 12.682 | 12.680 |
| TBM93     | 12.752 | 12.750 |
| TBM94     | 12.332 | 12.330 |
| TBM95     | 11.792 | 11.790 |
| TBM96     | 11.075 | 11.073 |
| TBM97     | 11.522 | 11.520 |
| TBM98     | 12.053 | 12.051 |
| TBM99     | 11.584 | 11.582 |
| TBM100    | 11.162 | 11.160 |
| TBM101    | 11.008 | 11.006 |
| TBM102    | 11.369 | 11.367 |
| TBM103    | 11.720 | 11.718 |
| TBM104    | 12.232 | 12.230 |
| TBM105    | 12.589 | 12.587 |
| TBM106    | 12.835 | 12.833 |
| TBM107    | 13.290 | 13.288 |
| TBM108    | 12.988 | 12.986 |
| TBM109    | 11.694 | 11.692 |
| TBM110    | 12.814 | 12.812 |
| TBM111    | 12.384 | 12.382 |
| BM BRNTMW | 12.131 | 12.129 |
| TBM113    | 11.811 | 11.809 |
| TBM114    | 12.982 | 12.980 |
| TBM115    | 13.096 | 13.094 |
| TBM116    | 12.978 | 12.976 |
| TBM117    | 12.526 | 12.524 |
| TBM118    | 12.102 | 12.100 |
| TBM119    | 11.660 | 11.658 |
| TBM120    | 11.350 | 11.348 |
| TBM121    | 11.114 | 11.112 |
| TBM122    | 11.169 | 11.167 |
| TBM123    | 11.725 | 11.723 |
| TBM124    | 12.096 | 12.094 |
| TBM125    | 11.962 | 11.960 |
| TBM126    | 11.374 | 11.372 |

|        |        |        |
|--------|--------|--------|
| TBM127 | 11.049 | 11.047 |
| TBM128 | 10.903 | 10.901 |
| TBM129 | 9.988  | 9.986  |
| TBM130 | 9.003  | 9.001  |
| TBM131 | 9.696  | 9.694  |
| TBM132 | 10.061 | 10.059 |
| TBM133 | 8.285  | 8.283  |
| TBM134 | 10.232 | 10.230 |
| TBM135 | 12.964 | 12.962 |
| TBM136 | 14.556 | 14.554 |
| TBM137 | 15.269 | 15.267 |
| TBM138 | 15.579 | 15.577 |
| TBM139 | 16.069 | 16.066 |
| TBM140 | 16.584 | 16.581 |
| TBM141 | 16.405 | 16.402 |
| TBM142 | 16.883 | 16.880 |
| TBM143 | 17.545 | 17.542 |
| TBM144 | 17.324 | 17.321 |
| TBM145 | 17.601 | 17.598 |
| TBM146 | 17.768 | 17.765 |
| TBM147 | 18.266 | 18.263 |
| TBM148 | 18.978 | 18.975 |
| TBM149 | 19.388 | 19.385 |
| TBM150 | 19.026 | 19.023 |
| TBM151 | 19.216 | 19.213 |
| TBM152 | 19.172 | 19.169 |
| TBM153 | 19.128 | 19.125 |
| TBM154 | 19.207 | 19.204 |
| TBM155 | 19.267 | 19.264 |
| TBM156 | 19.648 | 19.645 |
| TBM157 | 19.708 | 19.705 |
| TBM158 | 19.511 | 19.508 |
| TBM159 | 19.865 | 19.862 |
| TBM160 | 19.972 | 19.969 |
| TBM161 | 20.096 | 20.093 |
| TBM162 | 20.801 | 20.798 |
| TBM163 | 20.596 | 20.593 |
| TBM164 | 20.866 | 20.863 |
| TBM165 | 20.833 | 20.830 |
| TBM166 | 20.660 | 20.657 |
| TBM167 | 20.787 | 20.784 |
| TBM168 | 20.910 | 20.907 |
| TBM169 | 21.051 | 21.048 |
| TBM170 | 21.238 | 21.235 |
| TBM171 | 21.507 | 21.504 |
| TBM172 | 21.659 | 21.656 |
| TBM173 | 21.712 | 21.709 |
| TBM174 | 22.548 | 22.545 |
| TBM175 | 22.159 | 22.156 |
| TBM176 | 22.465 | 22.462 |
| TBM177 | 22.499 | 22.496 |
| TBM178 | 22.681 | 22.678 |
| TBM179 | 22.676 | 22.673 |
| TBM180 | 23.003 | 23.000 |
| TBM181 | 22.984 | 22.981 |
| TBM182 | 23.141 | 23.138 |
| TBM183 | 23.277 | 23.274 |
| TBM184 | 23.561 | 23.558 |
| TBM185 | 26.084 | 26.081 |
| TBM186 | 26.430 | 26.427 |
| TBM187 | 26.505 | 26.502 |
| TBM188 | 26.450 | 26.447 |
| TBM189 | 26.521 | 26.518 |
| TBM190 | 26.531 | 26.528 |
| TBM191 | 26.454 | 26.450 |
| TBM192 | 26.510 | 26.506 |
| TBM193 | 26.553 | 26.549 |
| TBM194 | 26.500 | 26.496 |
| TBM195 | 26.510 | 26.506 |
| TBM196 | 26.179 | 26.175 |
| TBM197 | 26.345 | 26.341 |
| TBM198 | 26.068 | 26.064 |

|        |        |        |
|--------|--------|--------|
| TBM199 | 26.125 | 26.121 |
| TBM200 | 26.049 | 26.045 |
| TBM201 | 26.139 | 26.135 |
| TBM202 | 26.160 | 26.156 |
| TBM203 | 26.171 | 26.167 |
| TBM204 | 26.207 | 26.203 |
| TBM205 | 26.229 | 26.225 |
| TBM206 | 26.287 | 26.283 |
| TBM207 | 26.504 | 26.500 |
| TBM208 | 26.504 | 26.500 |
| TBM209 | 26.542 | 26.538 |
| TBM210 | 26.526 | 26.522 |
| TBM211 | 26.572 | 26.568 |
| TBM212 | 26.225 | 26.221 |
| TBM213 | 26.080 | 26.076 |
| TBM214 | 26.058 | 26.054 |
| TBM215 | 26.012 | 26.008 |
| TBM216 | 25.740 | 25.736 |
| TBM217 | 24.833 | 24.829 |
| RM 2   | 23.494 | 23.490 |

(CHARLOTTE RM 2)



# BRNTMW Well SITE

1168/16

SAME CREW  
8/9/2006

| BM                   | BS            | MEAN  | HI     | FS           | MEAN  |
|----------------------|---------------|-------|--------|--------------|-------|
| BM BRNTMW            | 6.09          |       |        |              |       |
| <del>BM BRNTMW</del> | 5.99          | 5.987 | 18.116 |              |       |
|                      | 5.88 N        |       |        |              |       |
|                      | <u>17.96</u>  |       |        |              |       |
| WELL PIPE 1          |               |       |        | 3.73         |       |
|                      |               |       |        | 3.62         | 3.620 |
|                      |               |       |        | 3.51         |       |
|                      |               |       |        | 10.68        |       |
| WELL PIPE 2          | 2.44          |       |        | 3.19         |       |
|                      | 2.33 N        | 2.330 |        | 3.07         | 3.073 |
|                      | <u>2.22</u> N |       |        | 2.96         |       |
|                      | 6.99          |       |        | 9.22         |       |
| BM BRNTMW            |               |       |        | 5.35         |       |
| <del>BM BRNTMW</del> |               |       |        | 5.24         | 5.243 |
|                      |               |       |        | 5.14 N       |       |
|                      |               |       |        | <u>15.73</u> |       |

| ELEV   | ADJ. ELEV | REMARKS                                    |
|--------|-----------|--|
|        | 12.129    | POURED CONC. MON. W/ S.F.W.M.D. BRASS DISK |
|        | NAND 88   | EL. = 13.269 NGVD '29                      |
| 14.496 |           | 3" METAL PIPE 50' +/- N OF CONTROL BOX     |
|        |           | NGVD '29 = 15.636                          |
|        |           | -1.140 TO NAND '88                         |
| 15.043 | 15.042    | 4" METAL PIPE 50' +/- N OF CONTROL BOX     |
|        |           | 44   |
|        |           | NGVD '29 = 16.182                          |
|        |           | -1.140 TO NAND '88                         |
| 12.130 | 12.129    | POURED CONC. MON. W/ S.F.W.M.D. BRASS DISK |
| 40.001 | NAND 88   | 87'  |

## Identification\_Information:

## Citation:

## Citation\_Information:

Originator: Kenneth T. Glass, P. S. M. (ed.)

Publication\_Date: 20060809

Publication\_Time: Unknown

Title: S. F. W. M. D. Monitoring Well

Edition: BRNTMW

Series\_Information:

Publication\_Information:

Publication\_Place: Not Published

Publisher: None

Online\_Linkage: kglass@keithandschnars.com

Larger\_Work\_Citation:

Citation\_Information:

Series\_Information:

Publication\_Information:

## Description:

## Abstract:

South Florida Water Management District  
Well Site BRNTMW.

## Purpose:

To establish reference elevations in NAVD 1988 and  
NGVD 1929 datum at the Monitoring Well(s).

## Time\_Period\_of\_Content:

## Time\_Period\_Information:

Single\_Date/Time:

Calendar\_Date: 20060809

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: 82°02'08.6"

East\_Bounding\_Coordinate: 82°02'08.6"

North\_Bounding\_Coordinate: 26°46'20.7"

South\_Bounding\_Coordinate: 26°46'20.7"

## Keywords:

## Theme:

Theme\_Keyword\_Thesaurus: Specific Purpose Survey

Theme\_Keyword: Monitoring Well(s)

## Place:

Place\_Keyword\_Thesaurus: Charlotte County

Place\_Keyword: S. F. W. M. D. Monitoring Well BRNTMW

Place\_Keyword: SEC. 32 - T42S - R23E

## Stratum:

## Temporal:

Access\_Constraints: Key needed to gain access to Monitoring Wells.

Use\_Constraints: Call South Florida Water Management District for key.

## Point\_of\_Contact:

## Contact\_Information:

Contact\_Person\_Primary:

Contact\_Person: Howard J. Ehmke

Contact\_Organization: South Florida Water Management District

Contact\_Organization\_Primary:

Contact\_Position: P. S. M.

Contact\_Address:

Address\_Type: mailing and physical address

Address:

Acceler 8

Suite 150

2301 Centerpark West Drive

City: West Palm Beach

State\_or\_Province: Florida

Postal\_Code: 33409

Country: USA

Contact\_Voice\_Telephone: (561) 242-5520 ext 4064

Contact\_Electronic\_Mail\_Address: hehmke@sfwmd.gov

Hours\_of\_Service: 8:00 am to 5:00 pm EST

Security\_Information:

Cross\_Reference:

Citation\_Information:

Series\_Information:

Publication\_Information:

Data\_Quality\_Information:

Attribute\_Accuracy:

Attribute\_Accuracy\_Report:

The horizontal location of the benchmark was taken from a hand held G.P.S. unit. The vertical data was collected using a Wild NA-2 Level. Coordinates are based on the Florida State Plane Coordinate System, East Zone, NAD 83/90. Elevations are based on NAVD 1988 with an offset supplied to convert to NGVD 1929.

Logical\_Consistency\_Report:

Vertical data on the monitoring wells were established using the site benchmark.

Completeness\_Report:

15.636' (NGVD 1929) BRNTMW Well.  
Offset written at wells (-) 1.140' to NAVD 1988.  
16.182' (NGVD 1929) BRNTMW Well.  
Offset written at wells (-) 1.140' to NAVD 1988.  
BRNTMW was the site benchmark used for this survey. NAVD 1988 elevation 12.129'

Positional\_Accuracy:

Horizontal\_Positional\_Accuracy:

Horizontal\_Positional\_Accuracy\_Report:

The horizontal position of the benchmark was established using a hand held GPS.

Quantitative\_Horizontal\_Positional\_Accuracy\_Assessment:

Horizontal\_Positional\_Accuracy\_Value: Lat. 26° 46' 20.7" Long.

82° 02' 08.6"

Horizontal\_Positional\_Accuracy\_Explanation: Value derived by

hand-held GPS unit.

Vertical\_Positional\_Accuracy:

Vertical\_Positional\_Accuracy\_Report:

The onsite benchmark was used to establish the elevations on the monitoring well(s) in this report.

Quantitative\_Vertical\_Positional\_Accuracy\_Assessment:

Vertical\_Positional\_Accuracy\_Value: 0.004ft. NAVD88

Vertical\_Positional\_Accuracy\_Explanation: Better than 0.03ft. x

sq. root of miles of the level loop.

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:

Differential leveling was performed using a Wild NA-2 conventional level. The onsite benchmark BRNTMW was used to determine the monitoring well elevation. Elevations were written at the wells in NGVD 1929 with an offset provided to convert the elevations to NAVD 1988.

Process\_Date: 20060809

Process\_Contact:

Contact\_Information:

Contact\_Person\_Primary:

Contact\_Organization\_Primary:

Contact\_Address:

Spatial\_Data\_Organization\_Information:

BRNTMW. gen

Spatial\_Reference\_Information:

Horizontal\_Coordinate\_System\_Definition:

Geographic:

Latitude\_Resolution: 26° 46' 20. 7"

Longitude\_Resolution: 82° 02' 08. 6"

Geographic\_Coordinate\_Units: Degrees, minutes, and decimal seconds

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\_Organization: Keith and Schnars, P. A.

Contact\_Person: Kenneth T. Glass, P. S. M.

Contact\_Position: Director of Surveying and Mapping Lakeland

Contact\_Address:

Address\_Type: mailing and physical address

Address: 2525 Drane Field Rd., Suite 7

City: Lakeland

State\_or\_Province: Florida

Postal\_Code: 33811

Country: Polk

Contact\_Voice\_Telephone: (863)-646-4771

Contact\_Facsimile\_Telephone: (863)-646-3378

Contact\_Electronic\_Mail\_Address: kglass@keithandschnars.com

Hours\_of\_Service: 8:00-5:00 est.

Distribution\_Liability: None

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: 20060831

Metadata\_Contact:

Contact\_Information:

Contact\_Person\_Primary:

Contact\_Person: Kenneth T. Glass, P. S. M.

Contact\_Organization: Keith and Schnars, P. A.

Contact\_Organization\_Primary:

Contact\_Position: Director of Surveying and Mapping Lakeland

Contact\_Address:

Address\_Type: mailing and physical address

Address: 2525 Drane Field Rd., Suite 7

City: Lakeland

State\_or\_Province: FL

Postal\_Code: 33811

Country: USA

Contact\_Voice\_Telephone: (863) 646-4771

Contact\_Facsimile\_Telephone: (863) 646-3378

Contact\_Electronic\_Mail\_Address: kglass@keithandschnars.com

Hours\_of\_Service: 8:00 am to 5:00 pm EST

BRNTMW.gen

Metadata\_Standard\_Name: FGDC Content Standards for Digital Geospatial Metadata

Metadata\_Standard\_Version: 19940608

Metadata\_Security\_Information:



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/01

|  |  |                                 |   |  |  |
|--|--|---------------------------------|---|--|--|
| <b>COUNTY</b><br>Charlotte   |  | <b>PROJECT</b>                  |   | <b>DESIGNATION</b><br>Structure BRNTMW     |  |
| <b>SECTION <u>32</u></b>   |  | <b>TOWNSHIP <u>42</u> SOUTH</b> |   | <b>RANGE <u>23</u> EAST</b>                |  |
| <b>GEOGRAPHIC INDEX OF QUAD</b>  |  |                                 |   |  |  |
| Established by <u>KEITH AND SCHNARS</u>  |  |                                 | NAME OF QUADRANGLE<br><u>PUNTA GORDA SE</u> |  |  |
| Recovered by<br><u>SET CLASS "C" MONUMENT WITH SFWMD BRASS DISK.</u>   |  |                                 |   |  |  |
| SURVEYOR <u>B. MILLER (Keith and Schnars)</u><br>DATE <u>08/09/2006</u>  |  |                                 | FIELD BOOK, 1168, pgs. 11-15                |  |  |
| HORIZONTAL DATUM: 1983 with 1999 correction, ZONE East   |  |                                 |   |  |  |
| VERTICAL DATUM: NGVD 1929 and NAVD 1988  |  |                                 |   |  |  |
| CONTROL ACCURACY: HORIZONTAL HAND-HELD GPS, 3 <sup>rd</sup> Order VERTICAL   |  |                                 |   |  |  |
| STATE PLANE COORDINATES  |  | X = <del>644510</del>           | Y = <del>886446</del>                       | EL. (NGVD 1929)<br>13.284' <i>Corpscon</i> |  |
| <i>Corpscon +1.155</i><br><i>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.</i> |  |                                 |   | EL. (NAVD 1988)<br>12.129'                 |  |
| <div style="border: 1px solid red; padding: 2px; display: inline-block; color: red;">             12.129 (NAVD 88)<br/>             + 1.145 (Diff. at Source BM)<br/>             13.274 Actual           </div>   |  |                                 |   |  |  |
| LATITUDE <u>26° 46' 20.7"</u>  |  | LONGITUDE <u>82° 02' 08.6"</u>  |   |  |  |
| <b>DESCRIPTION</b>   |  |                                 |   |  |  |
| South Florida Water Management District brass disk set in concrete stamped "BRNTMW / 2006".  |  |                                 |   |  |  |
| The benchmark is located 11 miles south of Punta Gorda.  |  |                                 |   |  |  |
| From the intersection of I-75 and S.R. 762 (Tuckers Grade Rd.) travel west along S.R.762 for a distance of 1.0 miles to the intersection of U.S. 41, then travel south along U.S. 41 a distance of 4.6 miles to Zemel Rd.,   |  |                                 |   |  |  |
| Then travel west along Zemel Rd. a distance of 5.3 miles to the intersection of Burnt Store Rd., Then travel   |  |                                 |   |  |  |
| South along Burnt Store Rd a distance of 1.8 miles to the Charlotte County Utilities Burnt Store Water and   |  |                                 |   |  |  |
| Wastewater Treatment Facilities on the left, then travel east 0.15 miles to the well on the right. 4' +- south of  |  |                                 |   |  |  |
| A 100' +- x 100' +- concrete pad and 268' +- south from the north edge of pavement of access Rd.   |  |                                 |   |  |  |
|  |  |                                 |   |  |  |
|  |  |                                 |   |  |  |
|  |  |                                 |   |  |  |
|  |  |                                 |   |  |  |
|  |  |                                 |   |  |  |
| Notable Land marks:  |  |                                 |   |  |  |
|  |  |                                 |   |  |  |
|  |  |                                 |   |  |  |

SKETCH

# Office

## Project

29 December 2016

### INPUT

Geographic, flhpgn - Florida HPGN  
Vertical - NAVD88, U.S. Feet

### OUTPUT

State Plane, flhpgn - Florida HPGN  
0901 - Florida East, U.S. Feet  
Vertical - NGVD29 (Custom), U.S. Feet

---

## BRNTMW

1/1

**Latitude:** 26 46 20.7  
**Longitude:** 82 02 08.6  
**Elevation/Z:** 0

**Northing/Y:** 887820.727  
**Easting/X:** 318227.936  
**Elevation/Z:** 1.155  
**Convergence:** -0 27 59.68778  
**Scale Factor:** 1.000072113  
**Combined Factor:** 1.000075811

---

Remark:

Corpscon v6.0.1, U.S. Army Corps of Engineers

## The NGS Data Sheet

See file [dsdata.txt](#) for more information about the datasheet.

DATABASE = Sybase ,PROGRAM = datasheet, VERSION = 7.37

1 National Geodetic Survey, Retrieval Date = JULY 30, 2006

AD1473 \*\*\*\*\*

AD1473 DESIGNATION - CHARLOTTE RM 1

AD1473 PID - AD1473

AD1473 STATE/COUNTY- FL/CHARLOTTE

AD1473 USGS QUAD - GILCHRIST (1987)

AD1473

AD1473 \*CURRENT SURVEY CONTROL

AD1473

AD1473\* NAD 83(1990)- 26 50 27.44346(N) 081 58 33.59197(W) ADJUSTED

AD1473\* NAVD 88 - 7.119 (meters) 23.36 (feet) ADJUSTED

AD1473

AD1473 LAPLACE CORR- -1.66 (seconds) DEFLEC99

AD1473 GEOID HEIGHT- -24.04 (meters) GEOID03

AD1473 DYNAMIC HT - 7.108 (meters) 23.32 (feet) COMP

AD1473 MODELED GRAV- 979,101.1 (mgal) NAVD 88

AD1473

AD1473 HORZ ORDER - SECOND

AD1473 VERT ORDER - FIRST CLASS I

AD1473

AD1473.The horizontal coordinates were established by classical geodetic methods

AD1473.and adjusted by the National Geodetic Survey in May 1991..

AD1473.No horizontal observational check was made to the station.

AD1473

AD1473.The orthometric height was determined by differential leveling

AD1473.and adjusted by the National Geodetic Survey in June 1991..

AD1473

AD1473.The Laplace correction was computed from DEFLEC99 derived deflections.

AD1473

AD1473.The geoid height was determined by GEOID03.

AD1473

AD1473.The dynamic height is computed by dividing the NAVD 88

AD1473.geopotential number by the normal gravity value computed on the

AD1473.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

AD1473.degrees latitude (g = 980.6199 gals.).

AD1473

AD1473.The modeled gravity was interpolated from observed gravity values.

AD1473

AD1473; North East Units Scale Factor Converg.

AD1473;SPC FL W - 277,782.935 202,385.541 MT 0.99994125 +0 00 39.0

AD1473;SPC FL W - 911,359.51 663,993.23 sFT 0.99994125 +0 00 39.0

AD1473;UTM 17 - 2,969,192.857 403,027.544 MT 0.99971609 -0 26 26.6

AD1473

AD1473! Elev Factor x Scale Factor = Combined Factor

AD1473!SPC FL W - 1.00000266 x 0.99994125 = 0.99994391

AD1473!UTM 17 - 1.00000266 x 0.99971609 = 0.99971875

AD1473

AD1473 SUPERSEDED SURVEY CONTROL

AD1473

AD1473 NAD 83(1986)- 26 50 27.44351(N) 081 58 33.60673(W) AD( ) 2

AD1473 NGVD 29 (09/01/92) 7.468 (m) 24.50 (f) ADJUSTED 1 1

AD1473

AD1473.Superseded values are not recommended for survey control.

AD1473.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

AD1473. [See file dsdata.txt](#) to determine how the superseded data were derived.

AD1473

AD1473 U.S. NATIONAL GRID SPATIAL ADDRESS: 17RMK0302869193(NAD 83)

AD1473\_MARKER: DR = REFERENCE MARK DISK

AD1473\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

AD1473\_SP\_SET: CONCRETE POST

AD1473\_STAMPING: CHARLOTTE NO 1 1956

AD1473\_MARK LOGO: CGS

AD1473\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

AD1473+STABILITY: SURFACE MOTION

AD1473

AD1473 HISTORY - Date Condition Report By

AD1473 HISTORY - 1956 MONUMENTED CGS

AD1473 HISTORY - 1966 GOOD NGS

7.119M - 7.468M - 0.349M (1.1450108333')



## DATASHEETS

|        |         |        |      |        |
|--------|---------|--------|------|--------|
| AD1473 | HISTORY | - 1976 | GOOD | NGS    |
| AD1473 | HISTORY | - 1976 | GOOD | NGS    |
| AD1473 | HISTORY | - 1982 | GOOD | FLDT   |
| AD1473 | HISTORY | - 1988 | GOOD | USPSQD |

AD1473  
AD1473 STATION DESCRIPTION

AD1473 DESCRIBED BY NATIONAL GEODETIC SURVEY 1966  
AD1473 8 MI SE FROM PUNTA GORDA.  
AD1473 ABOUT 7.65 MILES SOUTHEAST ALONG THE ATLANTIC COAST LINE RAILROAD  
AD1473 FROM THE STATION AT PUNTA GORDA, THENCE 0.4 MILE SOUTHWEST ALONG  
AD1473 A TRAIL, ALONG U.S. HIGHWAY 41 ABOUT 8.1 MILES SOUTHEAST OF THE  
AD1473 JUNCTION OF U.S. HIGHWAY 17 AT PUNTA GORDA, 0.4 MILE NORTHWEST  
AD1473 OF THE CHARLOTTE COUNTY LOOKOUT TOWER, 195 FEET NORTHEAST OF THE  
AD1473 CENTER LINE OF THE HIGHWAY, 91 FEET NORTHEAST OF A FENCE CORNER,  
AD1473 30 FEET SOUTHEAST OF THE CENTER LINE OF THE TRAIL, 0.9 FOOT  
AD1473 SOUTHEAST OF A FENCE LINE, 0.9 FOOT NORTHEAST OF A METAL WITNESS  
AD1473 POST, ABOUT 1 FOOT BELOW THE LEVEL OF THE HIGHWAY AND SET IN  
AD1473 THE TOP OF A CONCRETE POST PROJECTING 0.2 FOOT. IN SECTION 11,  
AD1473 R 23 E, T 42 S.

AD1473  
AD1473 STATION RECOVERY (1976)

AD1473 RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1976  
AD1473 RECOVERED IN GOOD CONDITION.

AD1473  
AD1473 STATION RECOVERY (1976)

AD1473 RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1976  
AD1473 FROM THE JUNCTION OF U.S. HIGHWAY 41 AND STATE HIGHWAY 78 IN NORTH  
AD1473 FORT MEYERS, GO NORTHERLY ON U.S. HIGHWAY 41 FOR 12.1 MILES TO MARK  
AD1473 ON RIGHT. IS 30 FEET SOUTH OF CENTER OF TRACK ROAD, 1 FOOT SOUTH OF  
AD1473 FENCE AND 1.0 FEET EAST OF WITNESS POST.

AD1473  
AD1473 STATION RECOVERY (1982)

AD1473 RECOVERY NOTE BY FLORIDA DEPARTMENT OF TRANSPORTATION 1982  
AD1473 RECOVERED IN GOOD CONDITION.

AD1473  
AD1473 STATION RECOVERY (1988)

AD1473 RECOVERY NOTE BY US POWER SQUADRON 1988 (CFR)  
AD1473 RECOVERED IN GOOD CONDITION.

\*\*\* retrieval complete.  
Elapsed Time = 00:00:01