

REFERENCE DOCUMENT 4

PPS-B SETTLEMENT PLATE DATA



11012 N. Ridgedale Road
Temple Terrace, Florida 33617
(813) 629-1965 office
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September 11, 2015

Project No. 15-01-025.03

Ms. Kimberly A. Byer

Solid Waste Management Division Director

Hillsborough County – Public Works Department

Solid Waste Management Division

332 N. Falkenburg Road

Tampa, Florida 33619

Subject: Review and Recommendations for PS-B Settlement Plate Survey Data Collection
Hillsborough County – Southeast County Landfill
WACS Facility ID No. 41193

Dear Mr. Curtis,

Civil Design Services, Inc. (CDS) is submitting this review and our recommendations for the collection of survey data at Permanent Pump Station B (PS-B) in the Phase VI disposal area at the Southeast County Landfill (Facility) located in Hillsborough County, Florida. Currently, the Leachate Management Plan (LMP) for the Facility requires the collection of survey data to be collected annually on the four (4) settlement plates that are connected to PS-B. As the waste phosphatic lays consolidate, the survey data is collected from the settlement plates to collect elevation data on PS-B.

It is our understanding, that the Hillsborough County Solid Waste Management Division (SWMD) has requested an evaluation for the survey data and also requested a reduction in the number of survey events that data is collected on the settlement plates.

Background Information on the Settlement Plates on PS-B

During construction of the PS-B, four (4) settlement plates, with adjustable measurement rods, were connected to the four corners of PS-B. As waste was added to the Phase VI area, the waste phosphatic clays underlying PS-B would settle/consolidate and the elevation of PS-B would be determined from survey data collected on the four settlement plates.

In the Facility's LMP, the collection of survey data is currently collected on an annual basis and the collected survey data sent to the FDEP. The survey data is used to monitor the PS-B evaluations and to confirm that overall drainage is toward the pump station.

Review of Survey Data Collected

A review of the survey data collected since installation is consistent with the predicted high initial settlement/consolidation of the waste phosphatic clays (refer to the measurement from March 1999 through October

2005) as predicted in Ardaman and Associates, Inc (Ardaman) 1983 design settlement curves. The initial magnitude of the settlement measurements (March 1999 through October 2005) is followed by a slower secondary consolidation of the clays from October 2005 through April of 2011.

From April 2011 through April of 2013, there are minor elevation changes, with variances of less than 0.2 feet, as the clays achieve long-term stability. From April 2013, the survey data has indicated the all primary and secondary settlement/consolidation has been completed (The survey data shows that the settlement plates have only settled approximately 0.1 feet since April 2013). Refer to Attachment A for a summary of survey data from March 1999 through October 2014.

Findings and Recommendations

Based upon the survey data collected to-date on the settlement plates at PS-B, it appears that the waste phosphatic clays have reached a level where the primary settlement/consolidation have been achieved and future settlement/consolidation at PS-B will be minimal and will not affect the overall Facility LMP. Additional collection of survey data will not provide any significant information since the clay elevations have stabilized and have been consistent. Upon additional loading, the clays will again settle/consolidate and PS-B elevation will continue to decrease as predicted in Ardaman's report.

Recommendation: We agreed with the County's request and recommend that the collection of survey data be suspended until placement of additional waste occurs in the Phase VI disposal area. The collection of survey data is important so the County has real elevation data for PS-B and can document the condition of the flow in leachate collection system toward PS-B. Upon placement of waste in Phase VI, the collection of survey data should be resumed annually until settlement changes have been recorded within 0.2 feet of prior readings for a least one-year and then can be suspended after two to three years of consistent (variance of 0.1 feet or less) elevation data has been collected.

Please call the undersigned if you have any questions.


Sincerely,

Civil Design Services, Inc.

Joseph H. O'Neill, P.E.

Vice President

Cc Mr. Robert Curtis, P.E. HDR


Joseph H. O'Neill, P.E.
P.E. No. 52049
Civil Design Services, Inc.
11012 N. Ridgedale Road
Temple Terrace, Florida 33617
Certificate of Authorization 28923

ATTACHMENT A

PPS-B Survey Data – Settlement Plates

**TABLE 1. APPROXIMATE TOP OF CLAY ELEVATIONS
PUMP STATION B SUMP
SOUTHEAST COUNTY LANDFILL**

DATE	NW	NE	SE	SW
March 3, 1999	115.65	115.63	115.66	115.62
May 4, 1999	115.63	115.59	115.63	115.58
July 28, 1999	115.49	115.46	115.49	115.45
September 17, 1999 ²	115.59	115.55	115.65	115.56
November 11, 1999	115.44	115.40	115.50	115.31
January 3, 2000	115.31	115.26	115.36	115.17
March 30, 2000	115.39	115.35	115.45	115.26
July 5, 2000 ³	114.85	114.82	114.90	114.71
October 5, 2000	114.83	114.78	114.87	114.67
April 6, 2001	114.35	115.33	114.33	114.29
April 18, 2001 ²	114.15	114.59	114.17	114.07
August 8, 2001	114.34	115.31	114.32	114.28
September 19, 2001 ²	113.78	114.20	113.79	113.69
December 18, 2001	113.63	114.02	113.62	113.52
March 29, 2002	113.22	113.58	113.21	113.10
August 15, 2002 ²	112.67	113.04	112.64	112.58
February 1, 2003	112.08	112.46	112.04	111.99
May 1, 2003	111.78	112.19	111.80	111.71
September 2, 2003	111.56	111.92	111.54	111.46
December 1, 2003	111.44	111.80	111.42	111.34
April 1, 2004	111.30	111.66	111.29	111.20
July 31, 2004	111.04	111.41	111.04	110.94
December 1, 2004	111.09	111.45	111.10	111.00
March 1, 2005	111.01	111.38	111.02	110.92
June 2, 2005	110.93	111.30	110.95	110.85
October 1, 2005	110.65	111.01	110.65	110.55
February 1, 2006	110.67	111.03	110.69	110.58
June 6, 2006	110.60	110.96	110.63	110.52
October 2, 2006	110.53	110.91	110.59	110.47
February 1, 2007	110.40	110.76	110.43	110.32
June 1, 2007	110.37	110.74	110.41	110.29
September 1, 2007 ²	110.37	110.74	110.41	110.29
January 2, 2008	110.31	110.72	110.39	110.27
April 1, 2008	110.21	110.63	110.29	110.17
May 8, 2008 ²	110.33	110.69	110.37	110.25
July 1, 2008	110.13	110.50	110.19	110.06
October 1, 2008	110.01	110.41	110.10	109.97
January 2, 2009	109.84	110.25	109.94	109.82
April 1, 2009	109.79	110.20	109.90	109.77
July 2, 2009	109.71	110.12	109.82	109.69
October 8, 2009	109.68	110.10	109.79	109.67
January 4, 2010	109.63	110.04	109.74	109.61
April 1, 2010	109.59	110.00	109.70	109.58
July 1, 2010	109.56	109.97	109.68	109.55
October 4, 2010	109.50	109.91	109.62	109.49
December 20, 2010	109.51	109.92	109.63	109.50
January 3, 2011	109.49	109.90	109.61	109.47
April 1, 2011	109.46	109.87	109.58	109.45
July 1, 2011	109.45	109.86	109.58	109.44
October 1, 2011	109.44	109.86	109.57	109.44
January 3, 2012	109.44	109.86	109.57	109.44

leachate/calcs/ClayTop.xls; updated 01/23/12 by ler

Notes:

1. Vertical Datum based on feet NGVD 1929.
2. WMI extended the rods of the settling plates.
3. Benchmarks used in March 30, 2000 survey were found to have settled; elevations shown for July 5, 2000 were tied into new benchmarks.



Public Works

MEMORANDUM

Board of County Commissioners

Kevin Beckner
Victor D. Crist
Ken Hagan
Al Higginbotham
Lesley "Les" Miller Jr.
Sandra L. Murman
Stacy R. White

County Administrator

Michael S. Merrill

County Administrator

Executive Team

Lucia E. Garsys
Carl S. Harness
Gregory S. Horwedel
Ramin Kouzehkanani
Liana Lopez
Bonnie M. Wise

County Internal Auditor

Michelle Leonhardt

County Attorney

Chip Fletcher

Public Works

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DATE: February 20, 2015

TO: Kimberly A. Byer, Division Director, Solid Waste Management Division

FROM: *Larry E. Ruiz*
Larry E. Ruiz, Manager Landfill Operations, Solid Waste Management Division

SUBJECT: Top of Phosphatic Clay Liner Elevations, Southeast County Landfill

The Solid Waste Management Division staff has received and reviewed the field Survey Report from Pickett & Associates, Inc. (Pickett) dated January 2, 2015. The elevations provided by Pickett were used to calculate the approximate elevations of the top of the phosphatic clay liner at the Pump Station B Sump location. As shown on Table 1, the Pump Station B sump showed a slight change in elevation this quarter. Overall the top of clay at this location has reached consolidation as projected by Ardaman and Associates 1983. As such, no significant change is anticipated until additional load is applied over Phase VI. Since no significant data is expected, the SWMD will request that the monitoring of the staff gages be discontinued from the Florida Department of Environmental Protection.

Please advise should you have any questions concerning the information provided.

Attachments

LER/ya

Attachment

TABLE 1. APPROXIMATE TOP OF CLAY ELEVATIONS
PUMP STATION B SUMP
SOUTHEAST COUNTY LANDFILL

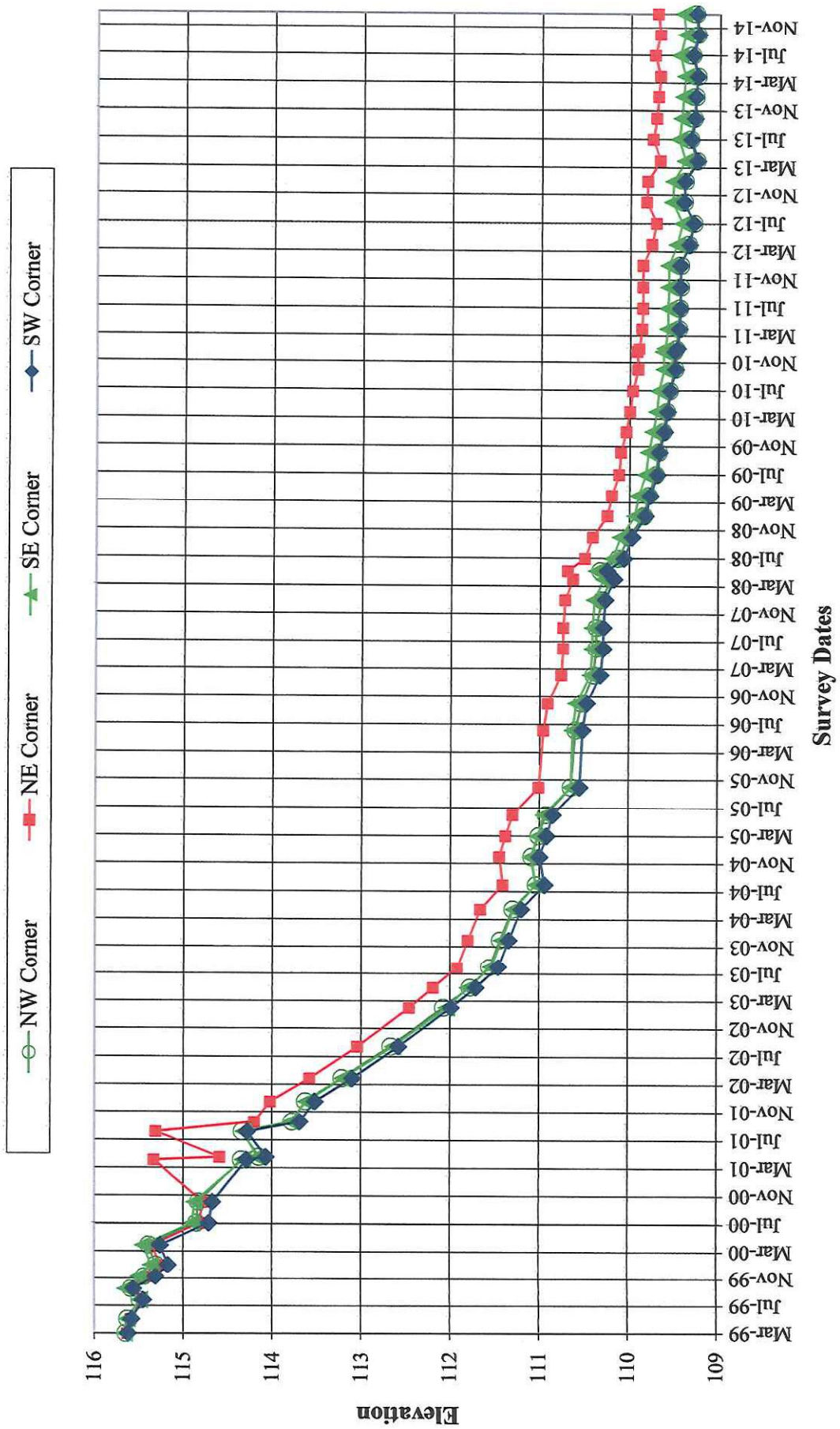
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September 2, 2003	111.56	111.92	111.54	111.46
December 1, 2003	111.44	111.80	111.42	111.34
April 1, 2004	111.30	111.66	111.29	111.20
July 31, 2004	111.04	111.41	111.04	110.94
December 1, 2004	111.09	111.45	111.10	111.00
March 1, 2005	111.01	111.38	111.02	110.92
June 2, 2005	110.93	111.30	110.95	110.85
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February 1, 2007	110.40	110.76	110.43	110.32
June 1, 2007	110.37	110.74	110.41	110.29
September 1, 2007 ²	110.37	110.74	110.41	110.29
January 2, 2008	110.31	110.72	110.39	110.27
April 1, 2008	110.21	110.63	110.29	110.17
May 8, 2008 ²	110.33	110.69	110.37	110.25
July 1, 2008	110.13	110.50	110.19	110.06
October 1, 2008	110.01	110.41	110.10	109.97
January 2, 2009	109.84	110.25	109.94	109.82
April 1, 2009	109.79	110.20	109.90	109.77
July 2, 2009	109.71	110.12	109.82	109.69
October 8, 2009	109.68	110.10	109.79	109.67
January 4, 2010	109.63	110.04	109.74	109.61
April 1, 2010	109.59	110.00	109.70	109.58
July 1, 2010	109.56	109.97	109.68	109.55
October 4, 2010	109.50	109.91	109.62	109.49
December 20, 2010	109.51	109.92	109.63	109.50
January 3, 2011	109.49	109.90	109.61	109.47
April 1, 2011	109.46	109.87	109.58	109.45
July 1, 2011	109.45	109.86	109.58	109.44
October 1, 2011	109.44	109.86	109.57	109.44
January 3, 2012	109.44	109.86	109.57	109.44
April 2, 2012	109.35	109.76	109.48	109.34
July 2, 2012	109.29	109.71	109.42	109.29
October 2, 2012	109.40	109.82	109.53	109.40
January 2, 2013	109.39	109.81	109.52	109.39
April 1, 2013	109.26	109.67	109.39	109.25
July 2, 2013	109.33	109.75	109.46	109.32
October 1, 2013	109.29	109.71	109.43	109.28
January 2, 2014	109.27	109.69	109.41	109.27
April 1, 2014	109.25	109.67	109.39	109.25
July 1, 2014	109.31	109.73	109.45	109.30
October 1, 2014	109.25	109.67	109.39	109.24
January 2, 2015	109.27	109.70	109.41	109.26

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Notes:

1. Vertical Datum based on feet NGVD 1929.
2. WMI extended the rods of the settling plates.
3. Benchmarks used in March 30, 2000 survey were found to have settled; elevations shown for July 5, 2000 were tied into new benchmarks.

Settlement of Pump Station B Sump



SURVEYOR'S REPORT

Quarterly Vault Survey Southeast Landfill Hillsborough County, Florida

Prepared for:



Prepared by:



PICKETT & ASSOCIATES PROJECT NO.: 12131
TITLE/TYPE OF SURVEY: SPECIFIC PURPOSE SURVEY
DATE OF SURVEY: 01/02/15
DATE OF THIS REPORT: 01/05/15

***NOTE: THIS REPORT IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL
RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.***

Pickett & Associates, Inc. • 475 South First Avenue • Bartow, FL 33830 • (863) 533-9095

PROJECT DESCRIPTION

The quarterly Specific Purpose Survey was prepared to show the existing conditions of the ground pipes coming from the vault located at the Hillsborough County Southeast Landfill.

PIPE	NORTHING	EASTING	ELEVATION	DESCRIPTION
SW	1251010.3	596333.8	191.61'	Top of 4" pipe
			191.38'	Top of 1" pipe
SE	1251004.7	596339.5	191.65'	Top of 4" pipe
			191.59'	Top of 1" pipe
NE	1251014.2	596344.4	191.61'	Top of 4" pipe
			191.53'	Top of 1" pipe
NW	1251014.5	596336.5	191.12'	Top of 4" pipe
			191.37'	Top of 1" pipe


METHODOLOGY AND ACCURACY STATEMENT: A set 60d nail near the vault was used as a benchmark and surveyed with Real Time Kinematic Global Positioning System (RTK GPS). RTK points were observed at least twice with a new initialization between each observation and the RTK shots were taken at intervals greater than 5 minutes. A level was used to measure the top of pipes. The benchmark has an estimated horizontal positional accuracy of 0.08' or less and a vertical positional accuracy of 0.10' or less.

Pickett & Associates, Inc. has been measuring the vault since 2006. During this period the elevations have trended lower each quarter. In the last few quarters this trend has changed up and down. These changes are within the tolerances of the equipment and procedures used to obtain these measurements.

DATUM:

HORIZONTAL: North and the Coordinates are based on the West Zone of the Florida State Plane Coordinate System, North American Datum of 1983, 1990 adjustment and are based upon provided control referenced to Hillsborough County Horizontal Control Monuments LW-H (PID AG8963) and BY-E (PID AG8747).

VERTICAL: Elevations are to National Geodetic Vertical Datum of 1929 and are based upon provided control referenced to Hillsborough County Horizontal Control Monument VR-B (PID AG9078), elevation is 103.08' from Hillsborough County's Vertical Control Network.


Sherry A. Grymko, P.S.M.
Florida Registration No. 6648
Pickett & Associates, Inc.
Florida Registration No. 364

01/02/15

Survey Date