

Pasco County Utilities

Remaining Disposal Capacity and Site Life Calculations Pasco County Resource Recovery Facility

Reporting Year 2015

February 2016

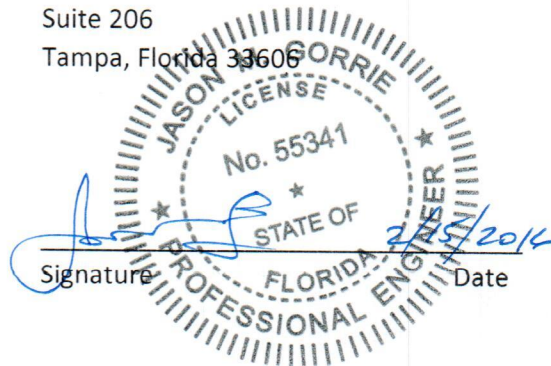


Prepared For:

Pasco County Utilities

Prepared By:

Jason Gorrie, P.E.
JMG Engineering, Inc.
238 East Davis Blvd.
Suite 206
Tampa, Florida 33606



Purpose of Report

Rule 62-701.500(13)(c) of the Florida Administrative Code (FAC) requires landfill owners and operators to annually prepare an estimate of the remaining life and capacity (in cubic yards) of the existing, constructed landfill and an annual estimate of the life and capacity of other permitted areas not yet constructed. For the purposes of this report, the “existing, constructed landfill” is considered to be the currently active portions of the site designated as A-4 (subcells 1, 2, and 3 of 6) and SW-2 (for unprocessed municipal solid waste.) Other portions of the West Pasco Resource Recovery Facility Landfill (Ash Cells A-1, A-2, A-3 and Solid Waste Cell SW-1) are currently inactive and temporarily capped and are not included in this Report.

Procedure

Ash Disposal Cell A-4

The currently permitted capacity of Ash Disposal Cell A-4 is considered to be 1,254,269 cubic yards. At present, subcells 1, 2, and 3 of Ash Disposal Cell A-4 have received waste and are considered to be “active”. In order to estimate the current volume of waste in place in subcells 1, 2, and 3, the Pasco County Engineering Services Department conducted a topographic survey of A-4 in January 2016. A copy of the topographic survey is included as Attachment 1.

Using the elevations reported on the topographic survey in conjunction with the known elevations of the liner system, it is possible to estimate the volume of ash in place in cell A-4. Mathematically, the volume under a function is defined by the double integral:

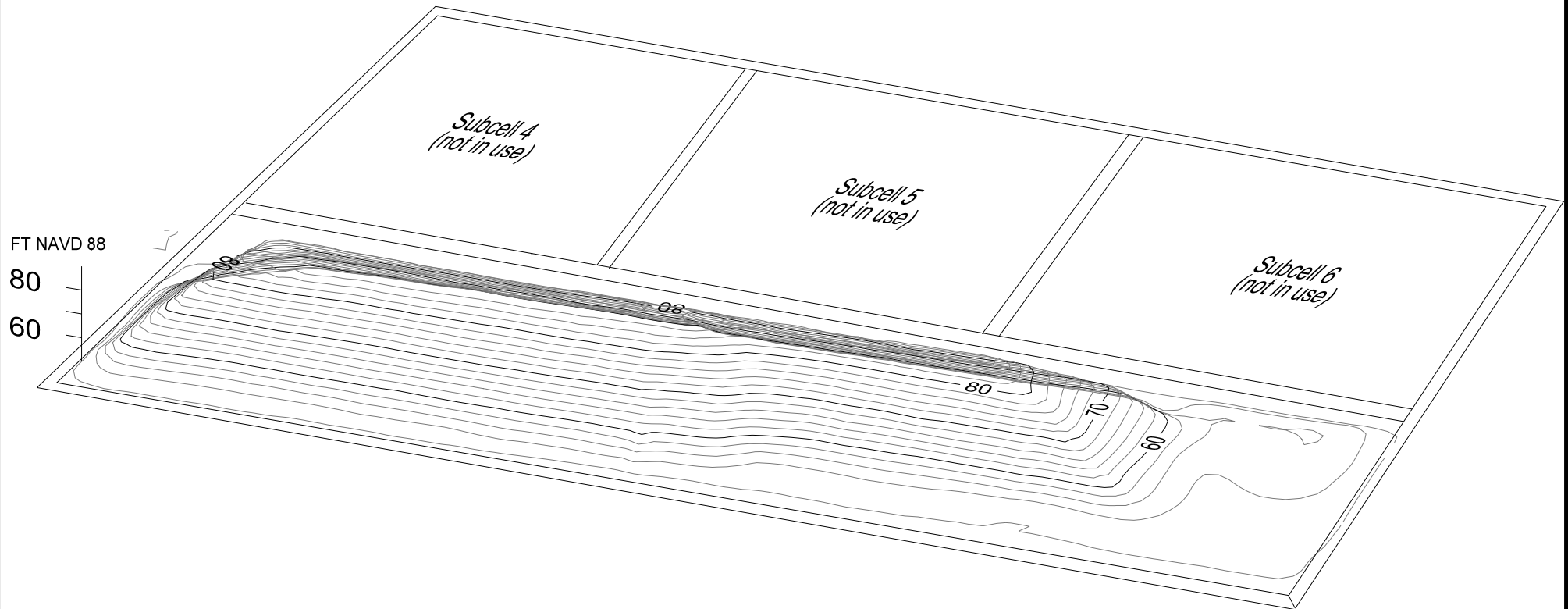
$$\int_{x-\min}^{x-\max} \int_{y-\min}^{y-\max} f(x, y) dx dy$$

To determine the function $f(x, y)$ defining the shape of the landfill surfaces, JMG Engineering relied upon the volume calculation algorithms of the surface mapping software program Surfer® 13. The total volume of ash calculated to be currently in place in A-4 is approximately 296,000 cubic yards. **Figure 1** graphically depicts the placement of the ash in relation to the permitted subcell areas.

The permitted volumetric capacity of A-4 is assumed to be 1,254,269 cubic yards. Subtracting the 296,000 cubic yards calculated to be currently in place, approximately 958,000 cubic yards of airspace remains available for disposal. Municipal waste combustor ash has an approximate density of 2,200 pounds per cubic yard. Using the assumed density, the 958,000 remaining cubic yards can accommodate approximately 1,053,800 tons of ash.

Table 1 below shows the current ash generation rate as measured by the facility scales. Because the waste-to-energy facility is currently operating at its maximum capacity, no changes in the ash generation rate are expected in the immediate future. By dividing the calculated remaining capacity of A-4 (1,053,800 tons) by the anticipated annual ash generation rate of 77,736 tons per year, **the estimated remaining useful life of Cell A-4 (as currently designed and permitted) is 13.6 years.**

Ash Disposal Cell A-4 West Pasco Resource Recovery Facility



SURVEY CONDUCTED BY PASCO COUNTY ENGINEERING SERVICES DEPARTMENT ON JANUARY 25, 2016

Municipal Solid Waste Cell SW-2

The calculation procedures used to estimate the remaining useful life for disposal cell SW-2 are identical to those described above for disposal cell A-4. Utilizing the surveyed elevations provided by Pasco County Engineering Services Department (see Attachment 2), the Surfer 13® algorithms determined that the volume of solid waste present in SW-2 is approximately 197,000 cubic yards. **Figure 2** graphically depicts the placement of the solid waste in relation to the permitted footprint of the disposal cell.

The permitted volumetric capacity of SW-2 is assumed to be 364,354 cubic yards. Subtracting the 197,000 cubic yards calculated to be currently in place, approximately 167,354 cubic yards of airspace remains available for disposal.

Table 1 shows the current municipal solid waste disposal rate into SW-2 as measured by the facility scales. The 2015 annual disposal rate of 1,563 tons per year is roughly consistent with the disposal rate from previous years because Pasco County remains committed to preserving the permitted capacity of SW-2. Using an assumed density of 1,400 pounds per cubic yard for municipal solid waste compacted in-place, and further assuming that approximately 400 cubic yards of daily cover per year will be utilized, it is calculated that approximately 2,700 cubic yards of airspace will be consumed annually at the 2015 disposal rate. Accordingly, **the estimated remaining useful life of cell SW-2 (as currently designed and permitted) is approximately 60 years.**



Figure 2
Elevation of Existing Waste Placement
January 2016

Table 1
Monthly Tonnage Summary for 2015

Month	West Pasco A-4 (tons)	West Pasco SW-2 (tons)
January	6,548.92	499.28
February	6,337.37	12.96
March	4,654.86	74.65
April	6,528.72	173.87
May	7,091.90	50.01
June	6,338.58	92.81
July	7,085.65	80.06
August	7,039.96	71.91
September	7,259.31	72.84
October	5,722.23	315.55
November	6,211.75	54.05
December	6,816.88	64.69
Total	77,636.13	1,562.68

Historical Tonnage Summaries
2012 – 2015 (tons)

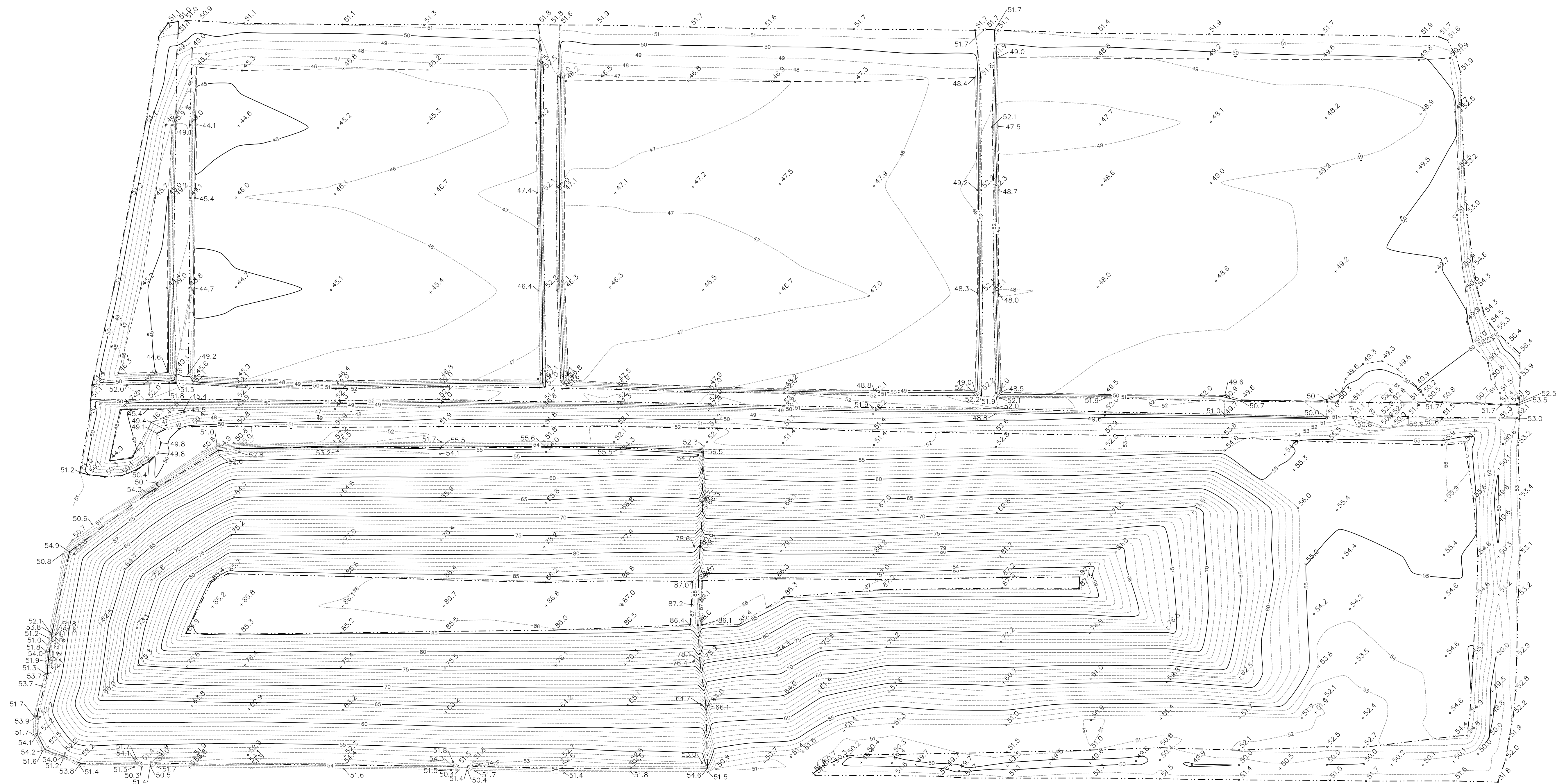
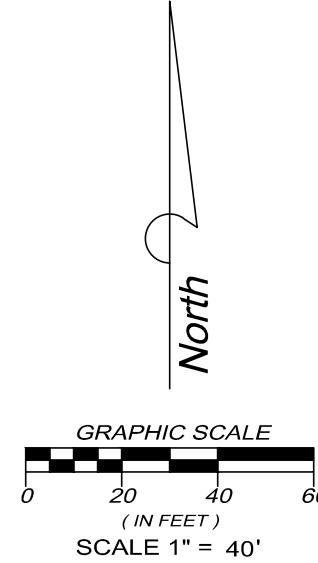
2012	76,643	2,822
2013	76,867	3,206
2014	74,284	4,433
2015	77,636	1,563

Attachments

- Attachment 1: A-4 Topographical Survey
- Attachment 2: SW-2 Topographical Survey
- Attachment 3: A-4 Grid Volume Computations
- Attachment 4: SW-2 Grid Volume Computations
- Attachment 5: 2015 Waste Placement Records

ATTACHMENT 1
A-4 Topographical Survey

SECTIONS 24 & 25, TOWNSHIP 24 SOUTH, RANGE 17 EAST
PASCO COUNTY, FLORIDA



BM #2
EL=48.82
FIRC 1/2" TRAV PT
N 146.7773.823
E 475271.762

\\BCHRES01\Survey\Projects\FY15\1516\069 West Pasco Landfill\Topo A-4 & SW-2\DWG\topo WP Landfill.dwg, February 2, 2016 3:08 PM, Bcsurvey08w

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DRAWN BY
S.S.

CHECKED BY
ELM

PASCO COUNTY
ENGINEERING SERVICES DEPARTMENT
8731 CITIZENS DRIVE
NEW PORT RICHEY, FLORIDA 34654-5507

COORDINATE FILE
1516_WP LANDFILL.CRD

DRAWING FILE
TOPO_WP LANDFILL.DWG

FIELD BOOK, PAGE(S)
834 02-04

January 25, 2016

SCALE
1" = 50'

DATE DRAWN
February 2, 2016



WEST PASCO LANDFILL A-4
TOPOGRAPHIC SURVEY

SHEET
2 OF 2

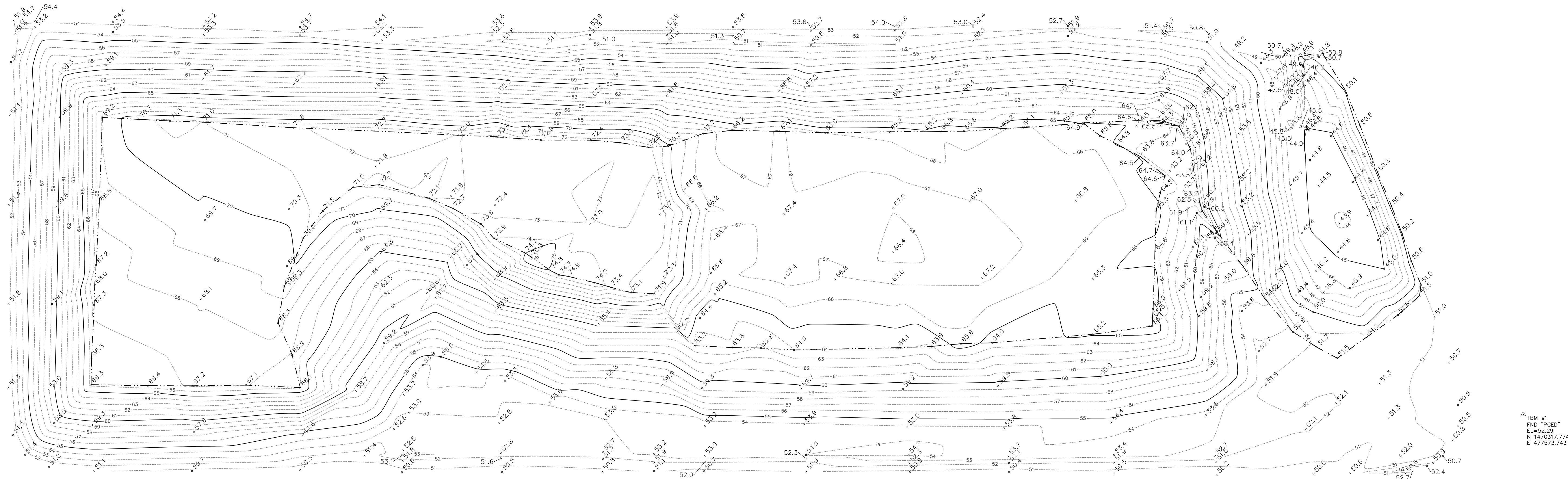
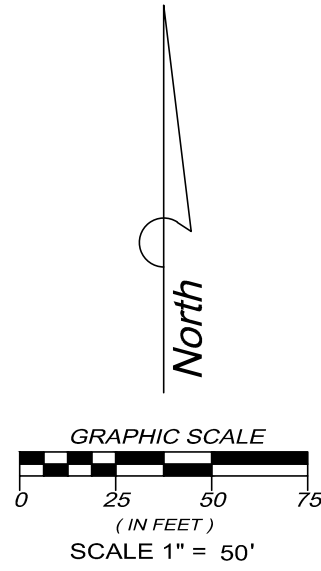
PROJECT NUMBER
X-9699.00

ATTACHMENT 2
SW-2 Topographical Survey

NOTES

1. The Topographic survey depicted here was prepared without the benefit of an attorney's title opinion or title search of the Public Records of Pasco County FL. There may be additional easements, takings, right of ways and other matters of record not shown on this survey.
2. The parcel identification numbers shown hereon were taken from the Property Appraiser's web site at www.appraiser.pascogov.com
3. Horizontal control measurements were made with a transit and steel tape, or devices with equivalent or higher degrees of accuracy.
4. No subsurface investigations were made nor subsurface improvements shown hereon.
5. Additions or deletions to this survey map by anyone other than the signing party is prohibited without written consent of the signing party.
6. Last date of field survey: January 28, 2016.
7. Coordinates show hereon are based on the Florida state plane coordinate system, West Zone, NAD 83 (90).

SECTIONS 24 & 25, TOWNSHIP 24 SOUTH, RANGE 17 EAST
PASCO COUNTY, FLORIDA



BENCH MARKS

Elevations are based on the North American Vertical Datum of 1988 (NAVD88). National Geodetic Survey (NGS) benchmark C-675, a survey disk set on top of concrete monument, the published elevation 46.77 was used for this survey.

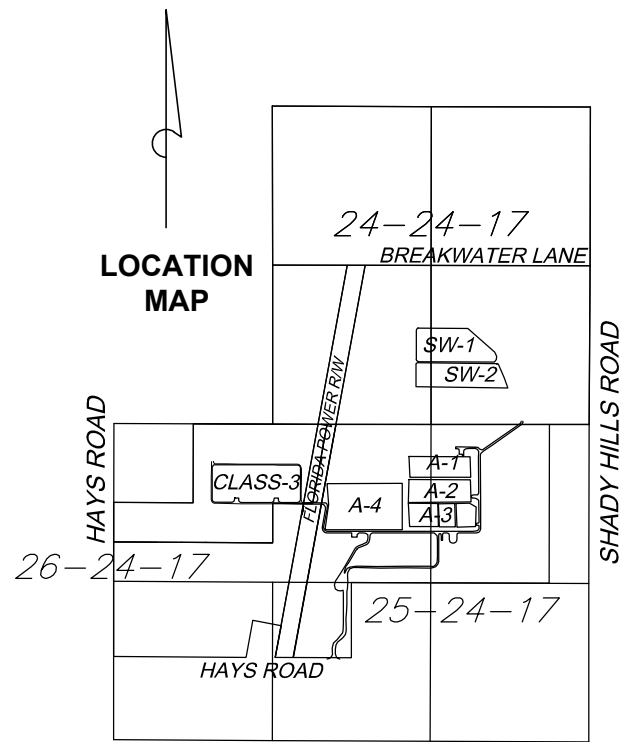
SURVEY CERTIFICATION


This certifies that a survey of the subject property was made under my supervision and meets the Minimum Technical Standards set forth by Board of Professional Surveyors & Mappers in Chapter 5J-17, of the Florida Administrative code, pursuant to Section 472.027, Florida Statutes.

Date of Survey: January 25, 2016
Type of Survey: Topographic Survey

LEGEND

- Contour Minor
- Contour Major
- - - Toe of Slope
- - - - Top of Bank
- Found Iron Rod and cap
- FND "PCED"
- Found Nail & Disk



REVISIONS						DRAWN BY S.S.	CHECKED BY CLM	PASCO COUNTY ENGINEERING SERVICES DEPARTMENT 8731 CITIZENS DRIVE NEW PORT RICHEY, FLORIDA 34654-5507	COORDINATE FILE 1516-WPLANDFILL.CRD DRAWING FILE TOPO_WP_LANDFILL.DWG	FIELD BOOK, PAGE(S) 834 02-04 January 25, 2016	SCALE 1" = 50' DATE DRAWN February 2, 2016		WEST PASCO LANDFILL SW-2 TOPOGRAPHIC SURVEY	SHEET 1 OF 2 PROJECT NUMBER X-9699.00
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION									

\\BCRHS01\SURVEY\Projects\FY16\1516-069 West Pasco Landfill Topo A-4 & SW-2\DWG\Topo_WP_Landfill.dwg, February 2, 2016 3:08 PM, Bcsurvey08w

ATTACHMENT 3
A-4 Grid Volume Computations

Grid Volume Computations

Thu Feb 11 13:58:43 2016

Upper Surface

Grid File Name:	C:\Users\jason\Desktop\A4 life 2_11_2016\all contours 2_11_16.grd
Grid Size:	26 rows x 100 columns
X Minimum:	6.757210871
X Maximum:	1047.655813
X Spacing:	10.514127294232
Y Minimum:	6.076903596
Y Maximum:	263.7127693
Y Spacing:	10.30543462816
Z Minimum:	50.361637296361
Z Maximum:	89.843776970578

Lower Surface

Level Surface defined by Z = 34

Volumes

Z Scale Factor: 1

Total Volumes by:

Trapezoidal Rule:	7993826.7183709
Simpson's Rule:	7996675.7211951
Simpson's 3/8 Rule:	7996843.2928357

Cut & Fill Volumes

Positive Volume [Cut]:	7993832.1041677
Negative Volume [Fill]:	0
Net Volume [Cut-Fill]:	7993832.1041677

Areas

Planar Areas

Positive Planar Area [Cut]:	268172.81246959
Negative Planar Area [Fill]:	0
Blanked Planar Area:	0
Total Planar Area:	268172.81246959

Surface Areas

Positive Surface Area [Cut]: 278372.04944105

Negative Surface Area [Fill]: 0

ATTACHMENT 4
SW-2 Grid Volume Calculations

Grid Volume Computations

Mon Feb 15 10:35:49 2016

Upper Surface

Grid File Name:	C:\Users\jason\Desktop\SW life 2_15_16\all.grd
Grid Size:	34 rows x 100 columns
X Minimum:	5.548872213
X Maximum:	1294.713242
X Spacing:	13.021862321081
Y Minimum:	2.332341916
Y Maximum:	427.246831
Y Spacing:	12.876196638909
Z Minimum:	48.08673839707
Z Maximum:	73.122184811926

Lower Surface

Level Surface defined by Z = 51

Volumes

Z Scale Factor:	0.95
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Total Volumes by:

Trapezoidal Rule:	5330540.7798407
Simpson's Rule:	5332194.3019516
Simpson's 3/8 Rule:	5332519.4312715

Cut & Fill Volumes

Positive Volume [Cut]:	5356644.2275086
Negative Volume [Fill]:	26055.747182168
Net Volume [Cut-Fill]:	5330588.4803264

Areas

Planar Areas

Positive Planar Area [Cut]:	526740.26281734
Negative Planar Area [Fill]:	21044.356715998
Blanked Planar Area:	0
Total Planar Area:	547784.61953334

Surface Areas

Positive Surface Area [Cut]: 530100.94278934

Negative Surface Area [Fill]: 21058.574259013

ATTACHMENT 5
2015 Waste Placement Records

PASCO COUNTY UTILITIES - SOLID WASTE

TONNAGE SUMMARY - FY 2015

Quarter Ending March 31, 2015

MATERIAL	West Pasco Class III Tonnage			West Pasco Class I Tonnage			WTE Tonnage			EPTS Tonnage		
	JANUARY	FEBRUARY	MARCH	JANUARY	FEBRUARY	MARCH	JANUARY	FEBRUARY	MARCH	JANUARY	FEBRUARY	MARCH
1 Municipal Solid Waste	0.00	0.00	0.00	0.00	0.00	0.00	28,402.20	25,444.19	30,673.11	6,387.76	5,884.78	6,644.36
2 Class III Waste	487.22	468.10	586.67	0.00	0.00	0.00	240.77	122.57	0.00	18.69	8.57	26.21
3 Ash Residue	0.00	0.00	0.00	6,548.92	6,337.37	4,654.86	0.00	0.00	0.00	0.00	0.00	0.00
4 Other Wastes	58.70	53.07	62.95	499.28	12.96	74.65	0.00	0.00	0.00	6.16	4.94	5.41
Total Tonnage Weighted IN	545.92	521.17	649.62	7,048.20	6,350.33	4,729.51	28,642.97	25,566.76	30,673.11	6,412.61	5,898.29	6,675.98
LESS: Yard Trash Stored/Mulched/to WTE	(181.79)	(155.09)	(222.97)									
Waste Tires Stored/Chipped/out/to WTE	(58.70)	(53.07)	(62.95)									
Total Tonnage Landfilled	305.43	313.01	363.70	7,048.20	6,350.33	4,729.51						
Total Tonnage Processed by WTE							28,642.97	25,566.76	30,673.11			
Total Tonnage Received @ Transfer Station										6,412.61	5,898.29	6,675.98
ASH CELL **				6,548.92	6,337.37	4,654.86						
SOLID WASTE CELL				499.28	12.96	74.65						

** = Ash Residue is the only Material Disposed of in the Ash Landfill.

PASCO COUNTY UTILITIES - SOLID WASTE

TONNAGE SUMMARY - FY 2015

Quarter Ending June 30, 2015

MATERIAL	West Pasco Class III Tonnage			West Pasco Class I Tonnage			WTE Tonnage			EPTS Tonnage		
	APRIL	MAY	JUNE	APRIL	MAY	JUNE	APRIL	MAY	JUNE	APRIL	MAY	JUNE
1 Municipal Solid Waste	0.00	0.00	0.00	0.00	0.00	0.00	28,925.07	27,188.82	28,514.02	6,798.35	5,766.89	6,124.56
2 Class III Waste	754.60	830.04	460.84	0.00	0.00	0.00	0.00	3.66	223.33	18.54	10.83	18.76
3 Ash Residue	0.00	0.00	0.00	6,528.72	7,091.90	6,338.58	0.00	0.00	0.00	0.00	0.00	0.00
4 Other Wastes	118.12	74.53	44.14	173.87	50.01	92.81	0.00	0.00	0.00	7.03	6.80	5.56
Total Tonnage Weighted IN	872.72	904.57	504.98	6,702.59	7,141.91	6,431.39	28,925.07	27,192.48	28,737.35	6,823.92	5,784.52	6,148.88
LESS: Yard Trash Stored/Mulched/to WTE	(248.18)	(252.58)	(166.21)									
Waste Tires Stored/Chipped/out/to WTE	(118.12)	(74.53)	(44.14)									
Total Tonnage Landfilled	506.42	577.46	294.63	6,702.59	7,141.91	6,431.39						
Total Tonnage Processed by WTE							28,925.07	27,192.48	28,737.35			
Total Tonnage Received @ Transfer Station										6,823.92	5,784.52	6,148.88

ASH CELL **

SOLID WASTE CELL

6,528.727,091.906,338.58

173.8750.0192.81

** = Ash Residue is the only Material Disposed of in the Ash Landfill.

PASCO COUNTY UTILITIES - SOLID WASTE

TONNAGE SUMMARY - FY 2015

Quarter Ending September 30, 2015

MATERIAL	West Pasco Class III Tonnage			West Pasco Class I Tonnage			WTE Tonnage			EPTS Tonnage		
	JULY	AUGUST	SEPTEMBER	JULY	AUGUST	SEPTEMBER	JULY	AUGUST	SEPTEMBER	JULY	AUGUST	SEPTEMBER
1 Municipal Solid Waste	0.00	0.00	0.00	0.00	0.00	0.00	29,127.52	28,486.75	27,267.94	6,001.41	6,158.58	5,691.75
2 Class III Waste	526.77	632.43	479.41	0.00	0.00	0.00	190.46	212.90	237.68	20.58	20.09	22.45
3 Ash Residue	0.00	0.00	0.00	7,085.65	7,039.96	7,259.31	0.00	0.00	0.00	0.00	0.00	0.00
4 Other Wastes	71.96	73.39	44.67	80.06	71.91	72.84	0.00	0.00	20.56	8.03	5.61	8.02
Total Tonnage Weighted IN	598.73	705.82	524.08	7,165.71	7,111.87	7,332.15	29,317.98	28,699.65	27,526.18	6,030.02	6,184.28	5,722.22
LESS: Yard Trash Stored/Mulched/to WTE	(178.77)	(245.44)	(222.14)									
Waste Tires Stored/Chipped/out/to WTE	(71.96)	(73.39)	(44.67)									
Total Tonnage Landfilled	348.00	386.99	257.27	7,165.71	7,111.87	7,332.15						
Total Tonnage Processed by WTE							29,317.98	28,699.65	27,526.18			
Total Tonnage Received @ Transfer Station										6,030.02	6,184.28	5,722.22
ASH CELL **				7,085.65	7,039.96	7,259.31						
SOLID WASTE CELL				80.06	71.91	72.84						

** = Ash Residue is the only Material Disposed of in the Ash Landfill.

PASCO COUNTY UTILITIES - SOLID WASTE

TONNAGE SUMMARY - FY 2016

Quarter Ending December 31, 2015

MATERIAL	West Pasco Class III Tonnage			West Pasco Class I Tonnage			WTE Tonnage			EPTS Tonnage		
	OCTOBER	NOVEMBER	DECEMBER	OCTOBER	NOVEMBER	DECEMBER	OCTOBER	NOVEMBER	DECEMBER	OCTOBER	NOVEMBER	DECEMBER
1 Municipal Solid Waste	0.00	0.00	0.00	0.00	0.00	0.00	27,948.00	27,167.29	30,192.25	3,283.94	6,119.90	7,027.99
2 Class III Waste	583.74	521.28	274.37	0.00	0.00	0.00	273.91	159.02	172.80	22.29	10.67	19.05
3 Ash Residue	0.00	0.00	0.00	5,722.23	6,211.75	6,816.88	0.00	0.00	0.00	0.00	0.00	0.00
4 Other Wastes	47.84	63.68	39.03	315.55	54.05	64.69	0.00	5.77	26.55	4.70	4.02	3.73
Total Tonnage Weighted IN	631.58	584.96	313.40	6,037.78	6,265.80	6,881.57	28,221.91	27,332.08	30,391.60	3,310.93	6,134.59	7,050.77
LESS: Yard Trash Stored/Mulched/to WTE	(239.79)	(245.05)	(121.65)									
Waste Tires Stored/Chipped/out/to WTE	(47.84)	(63.68)	(39.03)									
Total Tonnage Landfilled	343.95	276.23	152.72	6,037.78	6,265.80	6,881.57						
Total Tonnage Processed by WTE							28,221.91	27,332.08	30,391.60			
Total Tonnage Received @ Transfer Station										3,310.93	6,134.59	7,050.77
ASH CELL **				5,722.23	6,211.75	6,816.88						
SOLID WASTE CELL				315.55	54.05	64.69						